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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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September 30, 1993

Mr. James E. Rasmussen
U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, WA 99352

Dear Mr. Rasmussen:

Re: Notice of Deficiency (NOD) for the Hanford Patrol Academy Demolition Site

This letter transmits Ecology's comments on the Hanford Patrol Academy Demolition Site Closure Permit Application NOD Response Table of June 15, 1993. The response table and closure permit application were reviewed for compliance with the closure requirements of final facility status standards in the State Dangerous Waste Regulations (Chapter 173-303 WAC).

I am requesting that the U.S. Department of Energy respond to these comments through the Unit Manager Issue Resolution. This process should be completed by November 30, 1993.

If you have any questions, please contact me at (509) 736-3035.

Sincerely,

Fenggang Ma
Nuclear & Mixed Waste Management Program

FM:sr
Enclosure

cc: (w/enclosure)
Bob McLeod, DOE
Dan Duncan, EPA
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closed." Obviously, Table 7-2 was missed in the text. The problem is that Table 7-1 did not include any contaminants from the detonation events before 1984. The argument was that there were no records kept for those events. If this is true, then, a broader range of contaminants should be sampled and tested to assure potential contaminations are not missed. Modify text to incorporate Appendix IX of 40 CFR Part 264. Finally, to make sure that nothing will be neglected, list explicitly the contaminants regulated under RCRA, and those under CERCLA.

(3) Action levels for constituents of concern.

RL/WHC Response 1: Action levels will be prepared for inclusion in Section 6.0 of Revision 1. Proposed action levels will be health-based values.

Ecology Response 1: Although the term "action levels" is defined within the closure plan as "concentrations of analytes of interest that prompt an action . . .", the term is not defined by WAC 173-303. As the closure plan addresses a RCRA unit and to avoid confusion on this subject, delete the "action level" term. It should be noted that a definition for "cleanup level" is provided by WAC 173-340-200 which may be utilized by reference of proposed WAC 173-330-610 (scheduled to promulgated in December 1993 to amend WAC 173-303-610 to include WAC 173-340-700 through 760 except 745).

2.

Deficiency: Throughout the closure plan, there are references to using only a mobile laboratory for sampling and analysis. It is not stated that this is an EPA accredited lab or that any secondary or follow-up analysis will be conducted at an accredited stationary lab. A mobile lab cannot meet SW-846 requirements. A mobile laboratory is a good tool for a first evaluation to determine where contamination is located. For closure, you must follow the sampling and analysis requirements of WAC 173-303-110.

Requirement: Revise the plan to require sampling and analysis to meet WAC 173-303-110. See also comments 40, 51, 60, and 61.

RL/WHC Response 1: Revised text will propose to perform initial (investigative) sampling with analytical support to be provided by the on-site Environmental Analytical Laboratory (EAL), previously referred to as the "mobile laboratory." The EAL will be providing analytical Level II

support, as opposed to Level III capabilities that were planned for the laboratory at the time Revision 0 of the closure plan was prepared. Tables 7-1, 7-2, 7A-1 and 7A-2 identify analytes of interest for initial sampling.

A separate round of confirmatory sampling will be proposed in Revision 1 of the plan. Confirmatory samples will be analyzed by an off-site, Ecology-acceptable analytical Level III laboratory. Subsequent to initial sampling and analysis and discussion of the results with Ecology, separate data quality objectives and analyte tables for confirmatory sampling will be prepared and documented as addenda to the closure plan.

Likewise, if soil removal is undertaken and verification sampling is to be carried out in support of soil removal, samples would be analyzed by an off-site analytical Level III laboratory. Separate data quality objectives and analyte tables would be developed for incorporation as addenda to the plan in that event.

Ecology Response 1: Concur with addition of this information in text. However, there are several more requirements needed to be satisfied: 1) Investigative sampling has to be done by level III laboratory. The EAL can only be used to support this sampling event, such as to determine the boundary of the contamination, to find the spot with the high concentration of contaminations, and so on. If initial samples at level II indicate a "no action," confirmatory level III analyses will have to be done to verify this alternative; 2) for every fifth sample, a split has to be taken and to sent off for level III analyses. This will help in determining validity of level II analyses as well as give some ICP/AA metals analyses; and 3) the test results should be not less than 10% CLP deliverable SW-846.

3. **Deficiency:** The closure plan cites many internal Westinghouse procedural manuals. It is not clear if these documents fulfill the procedures mandated by the regulations.

Requirement: Revise the plan or provide copies of the procedures referenced.

RL/WHC Response 1: Copies of the WHC Control Manuals cited in closure plans were furnished to Ecology's library in Lacey. The Ecology office in Kennewick should obtain as much information as possible from the Ecology Lacey office to support the review of RCRA closure plans.

Ecology Response 1: Concur.

4. iii/25

Deficiency: "idenyfication" is a typographic error.

Requirement: Correct the plan.

RL/WHC Response 1: Typographical error will be corrected.

Ecology Response 1: Concur with the correction.

5. 1-1/12-13

Deficiency: States that these demolition events were "a form of thermal treatment for spent or abandoned chemical waste." This is inconsistent with the waste description provided in Chapter 3, Process Information. On page 3-1, line 10, the waste is described as "discarded explosive."

Requirement: Revise the text to resolve the contradiction.

RL/WHC Response 1: Spent or abandoned wastes were never treated at HPADS. The text will be revised to state that only "discarded" explosive chemicals beyond their shelf life or which were no longer needed were treated at HPADS. With this revision the text will be consistent with the description on page 3-1.

Ecology Response 1: Concur with the revision.

6. 1-1/21

Deficiency: It is stated the closure plan will present the history of the waste treated, but the plan does not present adequate information to determine if the waste has been properly designated.

Requirement: Provide sufficient information to designate the waste, including information regarding the source of the waste (i.e., process derived from), and a distinction between wastes disposed in commercial form, and those which were spent material.

RL/WHC Response 1: Waste characterization per 40 CFR 261 and WAC 173-303 is summarized in Table 4-2 and in the Part A permit application. Table 4-2 was incorporated to show that the wastes treated at HPADS were amenable to thermal decomposition. As stated in the RL/WHC Response No. 1 to comment No. 5 only chemicals that were no longer needed or that were beyond their storage life were treated at HPADS.

No "spent" materials were treated at HPADS.

Ecology Response 1: Concur with the explanation that no "spent" materials were treated at HPADS. The statement "only chemicals that were no longer needed or that were beyond their storage life were treated at HPADS." should be explained further, because, under 40 CFR 265.382, open burning of hazardous waste (except for detonation of waste explosives) is prohibited. According to the federal regulation, "waste explosives include waste which has the potential to detonate and" The term of "amenable to thermal decomposition" used by RL/WHC in the response was not accurate. Thus, elaborate in the text that if the chemicals in Table 4-2 satisfy the requirements.

7. 1-1/38-41

Requirement: Describe how you will determine that contamination is not associated with Hanford Patrol Academy Demolition Sites (HPADS). State if RCRA post-closure care will be performed until CERCLA action takes place.

RL/WHC Response 1: P1-1/Ln40 will be revised to read ". . . will be coordinated with CERCLA" Table 4-1 provides a summary of the wastes treated at HPADS. Any contaminants not due to the operation of HPADS, and above action level, will be considered past practice and remediated in coordination with CERCLA activities. Post closure care, if needed, will be performed as explained in Section 8.2.

Ecology Response 1: See NOD No. 1 (2) response.

8. 2-2/1-51

Deficiency: The description of the demolition site does not provide adequate detail to allow potential exposure pathways to be evaluated.

Requirement: Provide description of depth to water table, soil characteristics, and any containment used during the detonation. Incorporate any available Hanford meteorological information for the times of the events. Weather conditions may have influenced the dispersion of contaminants.

RL/WHC Response 1: Information on groundwater is provided in Appendix 5A; information on the soil characteristics is located on P2-2/Ln10-14.

Any meteorological data that may exist would be from the Hanford Weather Station located 15 miles from HPADS. Due to this distance the weather data will not provide a one-to-one correlation of wind speed/direction at HPADS. Although no meteorological data was kept, HPADS procedures prohibited detonation activities when winds exceeded 35 miles per hour, so it is extremely unlikely that any unreacted residues were carried beyond the sampling perimeter. In the event that unreacted residues

are identified beyond the closure boundaries, soil sampling and analysis may require that the closure area boundary be expanded. Note that sampling will confirm the closure boundaries, as stated on page 6-1, lines 20-22.

Ecology Response 1:

A. Initial sampling outside the assumed boundary of Area No. 1 has to be done (see also NOD Nos. 1(1) and 10 responses).

B. 35mph wind speed is not restrictive enough to prevent dispersion. Refer to NOD No. 38 response for the requirements.

9. 2-2/17-20 and 2-2/25-28

Deficiency: "The DOE-RL also has allowed usage of the firing ranges by non-Hanford personnel . . . but ended that practice in 1982." "Since 1986, . . . the Richland Police department and other personnel have used the range for firearms training." These statements appear to contradict each other.

Requirement: Revise the text to resolve the contradiction.

RL/WHC Response 1: P2-2/Ln17-20 will be revised to read "During the pre-RCRA operation of HPADS. . . allowed minimally controlled usage . . ."

Ecology Response 1: Response is not clear. Needs to be clarified by RL/WHC.

10. 2-2/46-50

Deficiency: The plan states that the firing range containing Closure Area No. 1 has been repeatedly graded. Because of the grading, the entire firing range should be sampled to identify soil that may have been contaminated by the detonations.

Requirement: Revise the plan to increase the area to be sampled.

RL/WHC Response 1: Expansion of the detonation area due to soil dispersion during grading may have occurred but would not be significant when compared to the size of the closure area boundaries. These boundaries were established by personnel that were present during the detonation events and will be confirmed by the sample results.

Ecology Response 1: Nothing outside the boundary will be confirmed without sampling outside the boundary (see requirement of the NOD No. 1 (1) response). Since regrading Area No. 1 could very possibly

redistribute the surface layer of the contaminated soil in a non-negligible extent, in addition, there were no hard evidences other than personnel memory to locate the actual position for Area No. 1, initial sampling has to be done outside the assumed boundary of Area No. 1.

11. 2-3/17-22

Requirement: Determine if this paragraph is still accurate with the recent security downgrades.

RL/WHC Response 1: Section 2.4 will be revised, lines 8-22 will be deleted, and the remaining sentences will be incorporated into one paragraph.

Ecology Response 1: Concur with the revisions.

12. 3-1/10

Deficiency: This description does not agree with Page 1-1, lines 12-13, which state that these demolition events were "a form of thermal treatment for spent or abandoned chemical waste."

Requirement: Revise the text to resolve the contradiction and define discarded explosive chemicals more clearly.

RL/WHC Response 1: No spent chemicals were treated at HPADS. The word "spent" will be removed from P1-1/Ln12-13 to be consistent with the Chapter 3 usage of "discarded chemicals."

Ecology Response 1: The discarded chemicals have to be waste explosives, because, under 40 CFR 265.382, open burning of hazardous waste (except for detonation of waste explosives) is prohibited (see also NOD No. 6).

13. 3-1/14-16

Deficiency: This paragraph implies that the detonations took place at multiple locations. Thus, the boundary of Closure Area 1 should be enlarged.

Requirement: Revise the plan as necessary. See also comment 10.

RL/WHC Response 1: Page 2-2/Ln46-47 states that sampling will occur on both sides of the boundary wall to "confirm" the boundary. Refer to NOD Nos. 1A and 37 comment responses.

Ecology Response 1: See NOD Nos. 1 (1) and 37 responses.

14. 3-1/27-32

Requirement: The explosives used to initiate the detonation (and any regulated products potentially generated from the detonation) must be incorporated into the sampling and analysis plan.

RL/WHC Response 1: WAC 173-303-610 requires that dangerous waste and dangerous waste constituents managed at the facility be addressed at closure. The HPADS Closure Areas are completely within the Hanford Patrol Academy Firing Ranges; which since the 1950s, and until Hanford is closed, serve as the firearms training area for the Hanford Security Forces, and with RL permission other police agencies. Therefore, the lead within the HPADS Closure Areas will be handled in coordination with the final Hanford Patrol Academy remedial action. RL/WHC believe that any lead bullet fragments and residues from explosives used to initiate the detonations are not distinguishable from the firearm's training bullets and other materials that were used at the firing ranges.

Ecology Response 1: List the types of explosives used in the detonations. If the explosives are the same as those used in the firearm's training, the responses will be considered enough. Otherwise, please answer the question.

15. 3-2/30-38

Deficiency: This paragraph describes a demolition failure and a grass fire ignited by a detonation, but does not state when they occurred.

Requirement: Revise the plan to answer the following questions: When did the incidents described in this paragraph take place? Was it before or after 1984? After other detonations, how were the remains of the containers managed? Were the containers, or pieces of containers, removed from the site? If so, how were they managed?

RL/WHC Response 1: The incomplete detonation occurred on March 12, 1987. All containers except one metal can of ether (one pint) were destroyed. The ethyl ether container ruptured from the explosion and was burned. The following morning the contaminated soil was placed in 30 gallon drums. The drums were later shipped to an off-site treatment storage and disposal facility.

The grass fire occurred on October 30, 1985. At that time, dry nuisance grasses were surrounding the detonation pit. This information will be incorporated in the closure plan.

Ecology Response 1: Wind conditions may have influenced the incidents. Provide meteorological data.

16. 4-1/10-11 **Requirement:** Provide the best estimate of the amount of material detonated before 1984. Clearly state the limitations of the data.
- RL/WHC Response 1:** Prior to 1984 no accurate records of the detonation events were kept.
- Ecology Response 1: See NOD Nos. 1 (2) and 37 responses.
17. 4-1/31-35 **Deficiency:** Table 4-3, referred to here, is not included in the closure plan.
- Requirement:** Revise the plan by including the table or removing the reference.
- RL/WHC Response 1:** See response to 1C.
- Ecology Response 1: Refer to NOD No. 1(3) response.
18. 6-1/20-22 **Deficiency:** "The final closure area boundaries will be confirmed by the results of regulatory acceptable soil sampling and analyses." According to Page 7-6, lines 33-35, no samples are to be taken outside the boundaries of Closure Area 1. How will the boundaries be confirmed without taking samples outside the boundary?
- Requirement:** The boundary must be determined by sampling and analyzing for indicator parameters. See comment 37.
- RL/WHC Response 1:** Refer to NOD Nos. 1A and 37 comment responses.
- Deficiency:** The term "regulatory acceptable" is open to interpretation.
- Requirement:** Please replace with more specific wording.
- RL/WHC Response 1:** This section will be revised to read, ". . . by the results of a pre-approved sampling and analysis plan."
- Ecology Response 1: See NOD Nos. 1 (1) and 37 responses for the first part of the question. Concur with the correction to the second part of the question.

19. 6-1/33-37

Requirement: The closure plan should state that the metal posts marking Closure Area 1 are removed for safety when the firing range is in use.

RL/WHC Response 1: The metal posts were removed/replaced as a procedural step during firing events. When the posts are removed their location is marked with wood stakes placed in the ground. Upon completion of firing activities, the stakes are removed and the metal posts are driven by hand into the ground. These steps are performed as part of procedure and does not affect on the closure plan or boundaries.

Ecology Response 1: The demolition sites may have been contaminated already by hazardous wastes. Therefore, non TSD personnel should not have access at any time, including during the firing activities.

20. 6-1/38-39

Deficiency: The maximum soil depth of three feet for sampling is insufficient. Undetonated materials can be driven to considerable depths.

Requirement: The depth should be determined by sampling and analyzing for indicator parameters.

RL/WHC Response 1: Downward continuity of contamination will be evaluated as the sampling results indicate; i.e., contamination will be defined as necessary in all three primary directions. Refer to NOD No. 38 comment response.

Ecology Response 1: See NOD No. 38 response.

21. 6-1/42

Deficiency: "... a series of field screening surveys might be performed." This is not sufficient detail.

Requirement: Explain how the decision will be made to perform field screening surveys, when the decision will be made, and how the screening methods will be chosen. Also provide the methods that will be used, the capabilities of the instruments to be used, and Data Quality Objectives.

RL/WHC Response 1: Field screening methods may be applied in supplemental sampling to determine the extent of soil contamination. The need for supplemental sampling will be evaluated based on the results of initial sampling (described in Section 7.2). The decision to do field screening will not be made until initial sampling results have been compiled and reviewed with Ecology. The utility of various field screening instruments and methods will be considered based on their capabilities to identify specific contaminants of

concern at appropriate detection levels (see also NOD No. 48 comment response). Proposed disposition for this comment is to delete the fifth paragraph on page 6-1, from line 41 to line 44.

Ecology Response 1: Concur.

22. 6-2/4-5

Deficiency: The plan states that background will be Site-wide background threshold values as defined in the *Hanford Site Soil Background* (DOE/RL 1992d). At present, this study is not complete and Ecology has not yet received final data packages for constituents of concern.

Requirement: Ecology must review and approve the *Hanford Site Soil Background* (DOE/RL 1992d) before the values can be implemented for closure.

RL/WHC Response 1: The *Hanford Site Soil Background* (DOE/RL 1992d) was issued for Ecology review May 14, 1993.

Ecology Response 1: Ecology did receive The *Hanford Site Soil Background*. However, the document was considered incomplete. There is still a huge task ahead in order to finish the site-wide background analysis (see detail in the memo from Charles Cline, WA State Department of Ecology, to Steven Wisness, US DOE, dated at May 10, 1993).

Requirement: Ecology must review and approve the *Hanford Site Soil Background* (DOE/RL 1992d) before the values can be implemented for closure.

23. 6-2/11-12

Deficiency: This paragraph discusses the proposed method to determine cleanup levels. It is said that the health-based levels will be based on equations and exposure assumptions presented in the *Hanford Site Baseline Risk Assessment Methodology* (DOE/RL 1992B). This is not appropriate.

Requirement: Health-based levels, if permitted for closure, are determined from the Model Toxic Control Act (MTCA).

RL/WHC Response 1: HSBRAM is the onsite procedure, approved by Ecology, that implements MTCA. Copies of HSBRAM have been supplied to Ecology.

Ecology Response 1: HSBRAM is not approved to implement MTCA by Ecology. Instead, only some of the risk assessment requirements of the MTCA Cleanup Regulation was incorporated in HSBRAM by US DOE (see detail in the Memo from US DOE to George Hofer, US EPA, and Roger Stanley, WA Department of Ecology, dated at May 5, 1993).

Requirement: Health-based levels, if permitted for closure, are determined from the Model Toxic Control Act (MTCA).

24. 6-3/25-26

Requirement: Strike "and implemented by the *Hanford Site Baseline Risk Assessment Methodology* (DOE-RL 1992c)." See comment number 23.

RL/WHC Response 1: See comment No. 23 response.

Ecology Response 1: See NOD No. 23 response.

25. 6-4/26-41

Deficiency: There is no way to determine if contamination is from HPADS activities or other sources, therefore all contamination at the site must be addressed.

Requirement: Revise the plan to address all contamination.

Note: You may wish to consider remediating the entire site under RCRA rather than deferring to CERCLA since the same waste types are present.

RL/WHC Response #1: Table 4-1 provides a summary of the dangerous wastes treated at the HPADS. Sample analysis indicating contamination other than the wastes managed at the HPADS will be remediated in coordination with CERCLA activities as explained on page 6-4, lines 34-40.

Continuous use of the Hanford Patrol Academy is necessary to maintain overall Hanford site security.

Ecology Response 1: See NOD No. 1 (2) response.

26. 6-4/38-40

Deficiency: This sentence should state, "if the soil is contaminated only from sources other than HPADS activities."

Requirement: Revise the text.

RL/WHC Response 1: The text will be revised with the following deletions: ". . . in addition to HPADS activities . . ." from line 35 and lines 38-40. With these deletions this section states that contamination from HPADS will be addressed under RCRA, and contamination from other sources will be coordinated with CERCLA.

Ecology Response 1: See NOD No. 1 (2) response.

27. F6-1

Deficiency: This flowchart shows actions based on whether the contaminants found are RCRA or CERCLA. I understand that CERCLA contaminants expected at the site include those from wastes detonated before 1984. Also, samples are to be analyzed only for RCRA waste constituents. In that case, you cannot identify contaminants as RCRA or CERCLA.

Requirement: Revise to agree with revised plan.

RL/WHC Response 1: The flowchart will not be revised. If a contaminant from the waste inventory is detected above the action level it will be addressed by RCRA, regardless of it's regulatory status.

Ecology Response 1:

A. Refer action level to NOD No. 1(3) response.

B. RL/WHC Response 1 was not based on the flowchart.

C. The definition of CERCLA/RCRA integration in flow chart (F6-1) was vague. Refer to NOD No. 1(2) response.

28. 7-1/18-45

Deficiency: The text described possible existence of a canister of napalm B buried in either of the HPADS areas, and proposed a ground-penetrating radar (GPR) survey. The size of the canister is important in setting up the grid for a GPR survey. Nowhere in the text was the size of the object mentioned. A canister of very small size (eg., one or two feet length) would be difficult to detect at a five foot grid interval. Has an electromagnetic induction (EMI) survey been considered? Both GPR and EMI surveys show good results in identifying shallow buried metallic objects.

Requirement: Discuss the reasons for choosing a GPR survey in the closure plan.

RL/WHC Response 1: The canister is identified in text as containing 5 lb. of napalm B compound. Assuming a unit weight of 50 lbs/ft³, the container could be as small as 1 pt or 1 qt. Theoretically, either GPR or EMI could be used to locate a buried metal container of this size. With EMI, the WHC geophysics staff was pessimistic that a 1-qt container could be clearly distinguished from other objects such as a 50-cal bullet (i.e., there was concern that EMI would produce more false positives). Upon further review of the text, and with the benefit of recent field experience with these survey techniques, the WHC geophysics staff agrees that a smaller (say 1-meter) grid would be more appropriate. Text will be revised to reflect this assessment.

Ecology Response 1: Concur with revision.

29. 7-2/1-2

Question: If the mobile laboratory is not available, what will be the effect on the schedule? Will the closure still be completed in 180 days? Note that the mobile laboratory can only be used for indicator sampling to determine areas of contamination. See comment 2.

Requirement: The name of the laboratory that will be conducting the analyses must be submitted to Ecology before closure begins.

RL/WHC Response 1: If the mobile laboratory is not available to support sampling at the HPADS closure areas, then sample analysis would have to be performed by an offsite contractor laboratory. The following schedule forecast would apply in that event:

- **Sampling:** 1 week (no change)
- **Offsite analysis:** 12 weeks (9 weeks longer than shown for ML)
- **Data Evaluation:** 12 weeks (no change)

Offsite analysis would add 9 weeks to the initial (investigative) phase of soil sampling. Because the ML is now offering Analytical Level II services, rather than Level III, an additional round of confirmatory sampling will be required. The breakdown for offsite analysis (listed above) will increase the schedule in Figure 7-3 by 25 weeks. Closure in 180 days is infeasible.

Ecology Response 1: The increase of 25 weeks is not acceptable according to TPA. In TPA 9.6.2, it is stated that non-rad waste analyses have a maximum turnaround time of 50 days. Also, in TPA 9.6, the maximum validation and transfer times are 21 and 15 days, respectively. Thus, the maximum per Sample Delivery Group (SDG) should be 86 days. Revise the text accordingly.

30. 7-3/15-17

Deficiency: Microbial activity in this area is not very efficient. The sentence should read, "Unreacted volatiles and semivolatiles contaminant levels might have been reduced via microbial activity." It is unlikely that they would have been eliminated.

Requirement: Revise the text.

RL/WHC Response 1: Text will be revised to read: ". . . reduced via microbial activity and exposure to the desert environment."

Ecology Response 1: Concur with the revision.

31. 7-3/37-48

Deficiency: This paragraph states, "It is generally acknowledged that detonation and thermal destruction are very efficient processes, and that any dangerous waste constituents that might remain in the soil at either closure area probably would exist at very low concentrations..." A reference should be provided for this statement.

Requirement: Revise the text.

RL/WHC Response 1: Sentence will be revised to read "It is believed that detonation and thermal destruction are relatively efficient processes, and that any dangerous waste constituents that might remain in the soil at either closure area are likely to exist at very low concentrations, such that detection might be difficult." (Additional clarification to be provided by Ecology as appropriate.)

Ecology Response 1: Concur with the revision.

32. 7-3/44-48

Deficiency: Portable field screening instruments are considered level I, not level I and II.

Requirement: Revise the text.

Response: The text will be revised.

Ecology Response 1: Concur with the revision.

33. 7-3/21

Requirement: Define "action levels" for each constituent. The action levels must be approved by Ecology before closure begins. See comment .

RL/WHC Response 1: Action levels are defined on page 6-2, line 1-9.

Response: Action levels will be provided.

Ecology Response 1: Refer action level to NOD No. 1 (3) response.

34. 7-5/9-11

Deficiency: Benzoyl Peroxide is not unstable in the presence of moisture; it will explode when in the environment of <1 % water, and it should be mixed in an environment of at least 33% water (Hawleys Condensed Chemical Dictionary, Sax and Lewis, 1987, p. 134).

Requirement: Revise the text.

RL/WHC Response 1: Text will be revised to read as follows: "Butyllithium is unstable in the presence of moisture or moist air (e.g., soil moisture originating as dew or precipitation) (Sax and Lewis 1987, p. 188; Aldrich 1986, p. 251). Benzoyl peroxide is unstable under conditions of reduced moisture (i.e., < 1%) (Sax and Lewis 1987, p. 134); soil moisture conditions under 1% are common at the Hanford Site during the summer months of the year."

Ecology Response 1: Concur with the revision.

35. 7-5/41-42

Deficiency: Nitrate (NO_3^-) is not "environmentally benign" at or above regulatory limits. The decomposition products listed should also be verified.

Requirement: Revise the text.

RL/WHC Response 1: Accept. Will insert "... in trace quantities" at the end of line 43. (Additional clarification to be provided by Ecology as appropriate.)

Ecology Response 1: Concur with the answer to the first part of the question. Second part of the question remains to be answered.

36. 7-6/26-29

Requirement: Add a provision to sample any visibly contaminated areas in addition to grid sampling.

RL/WHC Response 1: There are no visibly contaminated areas. As discussed in Section 3.0, the sites were inspected immediately after demolition events, and any visibly contaminated areas were cleaned up. Specific instances where cleanups were performed are noted in paragraph 4, page 3-2.

Ecology Response 1: Concur. See also NOD No. 15 response.

37. 7-6/33-35

Deficiency: The sample locations given are all within the established boundaries of Closure Area 1. Page 6-1, lines 20-22, states that the boundaries may be adjusted based on the sampling results. How could the boundaries be adjusted if no samples are taken outside the boundaries?

Requirement: Samples must be taken outside the expected boundaries to determine the actual location of the boundaries. See also comment 10.

RL/WHC Response 1: As indicated in Chapter 4.0 and Table 4-1, a number of small (e.g., 1-pt or 1-qt) containers were detonated at Area 1 on one occasion in 1984. The containers were either initiated by rifle fire (i.e., detonated individually) or placed together in a shallow, hand-excavated pit and detonated en masse. The closure area boundaries are believed to be sufficiently large in this case to include any/all potential soil contamination from the 1984 demolition event. The principal issue is basically one of identifying any localized residual contamination within the designated closure area. If sample results from any of the locations identified in Figure 7-1 should indicate that contaminants (i.e., any of the analytes of interest in Table 7-1) are present at levels approaching proposed action levels, then applicable field screening methods would be used to determine the extent of contamination (within or beyond the current boundary).

Ecology Response 1:

A. Refer action level to NOD No. 1(3) response.

B. Note: Field screening instruments usually do not have the required detection levels to verify an area of contamination, and it is only indicative.

Requirement: The possible contaminations from the detonations before 1984 should also be sampled. Because of no hard evidences on the boundary of Area No. 1 and the regradation, initial sampling outside the so-called boundary has to be done for Area No. 1 (see also NOD Nos. 1(1) and 1(2) responses).

38. 7-7/20-38

Deficiency: At each sampling location, sampling and analysis for organics should be conducted at various depths to determine the depth of contamination. Closure Area 2 is gradually filling in as a result of erosion. The plan does not describe how the surface elevation of the pit during the detonations will be determined.

Requirement: Revise the plan to include sampling and analysis at a minimum of two feet intervals to a depth of twelve feet below the surface elevation during detonation.

RL/WHC Response 1: By nature, demolition events would have deposited reaction/combustion products (i.e., potential residual contamination) on the soil column surface (i.e., contamination inherently would be a "top down" phenomenon). Even at the point of initiation, products would not be injected or driven into the ground. The shock wave from the explosion and pressure generated by the expanding gases would cause the reaction products, container shards, and loose soil to be directed upward (the unconfined direction), not downward. It is not a reasonable expectation that contaminants could somehow be driven 12 feet into the ground as the result of the activities described in the closure plan.

Extensive research has been conducted at the Hanford Site regarding moisture evapotranspiration of soil moisture and infiltration (recharge) through the vadose zone. It has generally been determined, with some exceptions for isolated locations where the near-surface soils are extremely coarse, that wetting fronts generally do not penetrate to depths exceeding about 4 feet. Sampling to a depth of 12 feet would require working with either a hollow-stem auger rig or a backhoe. Either option represents a major departure (in terms of time and cost) from the proposed plan. To attempt to resolve this issue, WHC would propose to sample to a depth of 4 feet at the open circled locations shown in Figures 7-1 and 7-2 in the plan. WHC also would be willing to offer to resample at extended depths at any location where initial sampling results indicate that contaminants are present at or close to proposed action levels.

Concerning the elevation of the invert of the pit at the time of the most recent demolition event: it may not be feasible to provide this information with any degree of certainty. No effort was made to record or identify the invert surface datum while the site was in use, and there may be no surviving tangible evidence that would enable WHC to accurately identify the elevation at this time.

Ecology Response 1: The closure should be processed to achieve the performance standard of WAC 173-303-610(2) rather than be restricted by any proposed plan. Adjusting sampling depth according to the initial sampling results is considered acceptable. However, initial biased sampling to 12 feet was required at least 30% of the proposed sampling locations. It has to include the two sampling locations near the geometric center of the site. Otherwise, experimental and/or theoretical demonstrations must be furnished to show that the penetration depth of the waste explosives and byproducts from the detonation process and following precipitations are less than 12 feet under the specific geological conditions of the detonation sites. A biased sampling in the down-wind direction will also be required unless experimental and/or theoretical demonstrations can be furnished to show that the migration distance of the waste explosives and the byproducts is negligible assuming that the wind speed is less than, and/or equal to, 35 mph.

For Area No. 2, the beginning depth of sample should be the invert of the demolition pit not the current surface. If no way exists to determine the position of the invert, it should be deep enough to exclude any refill after the last detonation.

39. 7-8/8-12

Requirement: Explain why the adequacy of currently available background data cannot be evaluated now.

RL/WHC Response 1: When Section 7.0 of the closure plan draft was prepared, the list of analytes to be reported in the *Hanford Site Soil Background* report (DOE/RL 1992d) had not been finalized. However, it was recognized at an early stage of work on the plan that the majority of the analytes of interest would be organics. As stated on page 7-7, line 50 continuing to page 7-8, line 2, background values for organic analytes will be assumed to be negligibly small (i.e., essentially zero). The adequacy of background data for inorganics depends on the type of analyte(s) involved and the analytical method(s) used for quantitation. For example, *Hanford Site Soil Background* information for metals would not be usable as a basis for comparison because the background data were obtained by ICP and AA methods, whereas the proposed Environmental Analytical Laboratory will be analyzing metals by XRF. The only currently identified inorganic analyte of interest for HPADS is chloride (Table 7-2). Analysis by IC is proposed. A threshold value for chloride (determined by IC) is available in the *Hanford Site Soil Background* document. Section 7.2.3.2 will be updated in Revision 1 to reflect the current status.

Ecology Response 1:

A. For inorganic analyses, Level III (ICP/AA) should be used, thus data will be comparable to Hanford Site Soil Background.

B. Analysis by IC is acceptable as level II for analytical support; however, since little historical data available, do normal ICP/AA analyses for investigative phase. Describe also the methodology of IC more completely.

40. 7-8/(all), 7-9/(all)

Deficiency: Any initial characterization analyses must be performed by level III criteria, which is an EPA certified licensed, stationary laboratory. The mobile laboratory (level II analyses) should only be used to aid in determining a sampling location for characterization and plume mapping during the remediation.

Requirement: Revise the plan.

RL/WHC Response 1: See comment No. 2.

Ecology Response 1: See NOD No. 2 response.

41. 7-9/37-45

Deficiency: X-ray fluorescence is not an approved method for metals characterization. It is only to be used as an in-field screening method to determine sampling locations or areas of contamination (plume mapping).

Requirement: Revise the plan.

RL/WHC Response 1: XRF will be identified in the text as a method that is not sanctioned in SW-846, and a method for which Hanford Site-wide background data have not been collected.

Ecology Response 1: Concur with the revision.

42. 7-9/47-51

Requirement: Detection limits for the constituents listed must be below the regulatory limits, when possible. If regulatory limits are below detection limits, the method with the lowest detection limit must be used.

RL/WHC Response 1: Statements will be inserted at the beginning of Section 7.2.4 advising (1) that the information included in this section is general in nature and is not intended to indicate or specify analytes of interests for HPADS closure areas Nos. 1 and 2 and (2) the proposed analytes for the two HPADS closure areas are listed in Tables 7-1 and 7-2. (Clarification to be provided by Ecology.)

Ecology Response 1: Any analytical work at level II should have detection limits close or below regulated limits - response does not discuss how detection limits were chosen (criteria) here.

43. 7-10/20 **Deficiency:** The capabilities of on-site mobile laboratories are not "equivalent" to analytical level III. In certain analyses, they may be similar.
- Requirement:** Revise plan to meet WAC 173-303-110 methods.
- RL/WHC Response 1:** **Accept. Mobile laboratory capabilities will be identified in Revision 1 as analytical Level II. Refer to NOD No. 2 comment response.**
- Ecology Response 1: Concur.
44. 7-10/29-36 **Deficiency:** The reasoning for doing duplicate samples is to determine the laboratory's precision. If the laboratory does the duplicate preparation, they will know which samples are the same and the reason for doing duplicate samples would be void.
- Requirement:** Revise the plan to meet SW-846 requirements.
- RL/WHC Response 1:** **Terminology appearing in SW-846, Chapter 1.0 (Quality Control) will be used. Separate definitions will be provided in Section 7.2.5 for duplicates (prepared in the field) and replicates (prepared in the lab).**
- Ecology Response 1: Concur with the revisions. SW-846 was not referenced in Chapter 9. Correct the error.
45. 7-11/31-32 **Question:** Is a "sample lot" the same as a "sample batch" (defined on page 7-10, lines 30-32)? If so, use consistent terminology. If not, define "sample lot."
- Requirement:** Use terms as defined in regulations.
- RL/WHC Response 1:** **The intent in Rev. 0 was that the two terms are synonymous as they appeared in context. WAC 173-303-040 does not define either "sample batch" or "sample lot." SW-846 Section 1 (Quality Control) defines the term "analytical batch" for use in the intended context. "Analytical batch" will be used in place of "sample lot" and "sample batch" in the revised text.**
- Ecology Response 1: Concur with the revision.

46. 7-13/3-29

Deficiency: Was the initial sampling plan statistically designed? The sampling plan must be evaluated by a statistician prior to any work, to determine if the sampling and analyses are adequate to answer the information listed in this section.

Requirement: Refer to Ecology statistical guidance.

RL/WHC Response 1: The draft plan was reviewed by a qualified statistician. RL/WHC does not use Ecology's statistical guidance package; information on statistical guidance is found in Section 7.2.8. The sample locations were determined using a random number algorithm as explained in Section 7.2.3.1. The statistical package used by WHC is equivalent to, or better than, that presented in Ecology guidance.

Ecology Response 1: Submit the statistical package used by WHC for comparison with the Ecology package.

47. 7-13/34

Requirement: The action levels need to be determined prior to sampling. The text should mention when action levels will be proposed and contaminant levels will be compared against proposed action plans. More information is needed on the site background threshold values. At present, the Hanford soil background study is not complete and, as far as we know, we have yet to receive the final data packages for various inorganics and organics of our concern. The study must be approved by Ecology prior to use.

RL/WHC Response 1: Regarding action levels, refer to NOD No. 1C comment response. See comment No. 22 for information on site soil background.

Ecology Response 1: See NOD No. 1 (3) response regarding action level and NOD No. 22 for the response on site soil background.

48. 7-14/16-30

Deficiency: The random sampling method for the calculation of volume of contaminated soil is not acceptable. Although the determination of sampling locations by using random algorithm for **initial** characterization as specified in section 7.2.3 is acceptable, the location of sampling point for calculation of the volume of contaminated soil demands a systematic protocol. Sampling plans with well defined grid patterns will be a good approach for this. However, the grid spacing, location, etc. might vary depending on the results obtained in the initial characterization. The grid spacing, location, etc., must be approved by Ecology before it is implemented.

Requirement: Submit a sampling protocol to Ecology for approval before sampling.

RL/WHC Response 1: A sampling protocol will be provided in the closure plan for Ecology approval.

Ecology Response 1: Include the sampling protocol in next revision for Ecology's approval.

49. 7-14/35

Deficiency: Two feet vertical depth is not sufficient.

Requirement: Revise the text. See comment 38.

RL/WHC Response 1: Refer to NOD No. 38 comment response.

Ecology Response 1: See NOD No. 38 response.

50. 7-15/17-22

Deficiency: The application of water during removal to control dust needs careful examination and will depend on the contaminants of concern. There is a good chance that contaminants can migrate with water downward during the process. This is especially so since excavation is limited to the top two feet of the material. Other dust control devices may have to be applied depending on the nature of the contaminants. Also, creating a damp condition of the soil before excavation is risky.

Requirement: Determine the detailed process after we receive all the information on contaminants of concern. Submit to Ecology for approval before implementation.

RL/WHC Response 1: This information will be provided to Ecology before implementation.

Ecology Response 1: Concur.

51. 7-16/13-26

Deficiency: Regulatory requirements require that verification sample analyses be done at level III or IV. A mobile laboratory does not qualify. Verification analyses must be done in accordance with SW-846.

Requirement: Revise the text.

RL/WHC Response 1: Refer to NOD No. 2 comment response.

Ecology Response 1: Concur with the revision.

52. F7-1 and F7-2

Requirement: The map legend should explain what the black dots with a circle surrounding it means.

RL/WHC Response 1: The legend will be clarified.

Ecology Response 1: Concur.

53. F7-1 and F7-2

Deficiency: Sampling locations do not cover any areas in the downwind direction.

Requirement: Sampling must be done to characterize all areas that could possibly be contaminated. See comment 18.

RL/WHC Response 1: See response to comments 8 and 10.

Ecology Response 1: See NOD Nos. 8 and 10 responses.

54. F7-2

Requirement: Show location of demolition pit on grid.

RL/WHC Response 1: The grid will be revised to incorporate the demolition pit.

Ecology Response 1: Concur with the revision.

55. F7-3

This closure schedule does not allow for soil removal or show the times the firing range will be out of use.

Requirement: Show on the schedule the times the firing range will be out of use. Provide an estimate of the additional time needed if soil removal is necessary.

RL/WHC Response 1: RL/WHC believes that HPADS will be clean closed so soil removal is not necessary. In the event contamination is detected, the amount of contaminated soil will be determined based on soil sampling results and the constituent specific action levels and cannot be calculated prior to the soil sampling program.

Ecology Response 1: Clean closure doesn't mean that the site is clean. To achieve clean closure, the contaminated materials should either be removed from the sites or decontaminated. It is irrational to assume

that clean closure will be achieved due to no contaminations, even before sampling. Therefore, provide a time schedule in the next revision for a probable event of soil removing and decontamination.

56. F7-4

Deficiency: If Westinghouse Hanford Company is the "co-operator" of the site, then a representative of Westinghouse Hanford Company should sign the closure certification. See page iii, lines 34-44.

Requirement: Revise the figure.

RL/WHC Response 1: This comment mischaracterizes the legal nature of contractor responsibilities and would result in management inefficiencies because it attempts to inaccurately portray RL and WHC as equal partners with no distinction of responsibilities.

In Ecology's Dangerous Waste Regulations, "operator" is defined as the person responsible for the overall operation of a facility (WAC 173-303-040). WHC is not responsible for the overall operation of HPADS. The RL, Ecology, and the Environmental Protection Agency (EPA) have previously agreed in the Federal Facility Agreement and Consent Order (FFACO) that RL owns and operates the Hanford Facility. WHC has a more limited and specific role under its contract with the RL and may not be identified as responsible for all closure activities on the HPADS. Certifying the closure plan as co-operator is not required by the regulations. Certifying the closure plan is required by the owner or operator and an independent registered professional engineer (WAC 173-303-610). RL is the owner and operator and its signature along with the independent registered professional engineer is all that is required on the closure plan certification. A signature line for WHC will not be added to the certification.

Ecology Response 1: The response is contrary to the statement at the paragraph 4 of page iii in the closure plan. Also, according to the Hanford Facility Dangerous Waste Permit (Site wide permit), co-operator has to sign whatever he has done.

57. T7-1 and T7-2

Deficiency: These tables are inadequate.

Requirement: Appropriate methodologies and detection limits need to be listed. Also list method modifications and metal analyses.

Note: All method modifications must be approved by Ecology.

RL/WHC Response 1: Methodologies listed in Tables 7-1 and 7-2 are for EAL analyses. Analytical levels in Tables 7A-1 and 7A-2 will be revised from Level III to Level II. No metals have been proposed as analytes of interest in this plan.

New text will be included at the end of Section 7.2.4 and in Section 7A.7 indicating that the EAL will work to controlled manual(s). Copies of the manuals will be made available to Ecology for review and approval when issued by WHC. WHC will have Ecology-approved procedures in place in advance of sampling and analysis.

Additional discussion will be provided at the end of Section 7.2.2 regarding future submittal of analytes tables for confirmatory sampling (and verification sampling as necessary).

A footnote will be added to Tables 7-1 and 7-2 to indicate that PQLs are identified in Tables 7A-1 and 7A-2. (Clarification to be provided by Ecology).

Ecology Response 1: The terminologies in the tables are not accurate. For example, TCL is for CLP, not SW-846. Correct the mistake. See also NOD No. 65 for the requirements of detection limits and methodologies.

58. 8-2/26-28

Deficiency: The plan does not answer the following questions: How will access to the contaminated areas be controlled when even the fence posts marking the location must be removed during use of the firing range? Will the firing range be closed until CERCLA remediation takes place? When is the CERCLA study and remediation scheduled to take place?

Requirement: Revise to provide answers.

RL/WHC Response 1: The signs are affixed to poles that are removed from the post holes during firing activities. Upon completion of the firing activities the signs are returned to the post hole. The firing range will be maintained under controlled access throughout the firing activities.

The firing range will remain in operation and will not be closed until CERCLA remediation takes place.

The CERCLA study and remediation schedule is being prepared by the U.S. Army Corps of Engineers.

Ecology Response 1: Are those present kept off the demo. areas during firing events? See the earlier comment on the same subject. Include in next revision the description of control access procedure to the two demolition sites during use of the firing range according to WAC 173-303-310.

59. APP 5A-4/27-28

Requirement: Provide hydraulic properties that are available.

RL/WHC Response 1: No hydraulic studies were performed in the immediate area. The best available reference is, DOE-RL, 1990, Phase 1 Remedial Investigation Report for the Hanford Site 1100-EM-1 Operable Unit.

Ecology Response 1: Concur.

60. APP 7A-1/32-33

Deficiency: Confirmation samples cannot be analyzed by a "mobile laboratory" to determine the presence of contaminants of concern.

Requirement: Revise the plan.

RL/WHC Response 1: Refer to NOD No. 2 comment response.

Ecology Response 1: Concur.

61. APP 7A-1/40-45

Requirement: If remediation is required, confirmatory samples are required and must be done in an Ecology approved laboratory, not a mobile laboratory.

RL/WHC Response 1: Refer to NOD No. 2 comment response.

Ecology Response 1: Concur.

62. APP 7A-2/1-15

Requirement: EPA-QAMS-005/80, "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans", should also be referenced.

RL/WHC Response 1: This information will be included.

Ecology Response 1: Concur.

63. APP 7A-3/23-44 **Requirement:** These samples are not expected to be classified as "radioactive"; therefore, they must be shipped off-site to an Ecology approved laboratory.
- RL/WHC Response 1:** Lines 35-39 will be revised to be consistent with the comment response for NOD No. 2.
- Ecology Response 1: Concur.
64. APP 7A-5/9-11 **Deficiency:** It states that Tables 7A-1 and 7A-2 identify the methodology and analyte-specific quantitation limits, but they do not.
- Requirement:** Correct these tables to contain this information.
- RI/WHC Response 1:** Methodology and quantitation limits are specified in the tables. Also refer to NOD No. 57 comment response. (Clarification to be provided by Ecology).
- Ecology Response 1: Concur.
65. APP 7A-9/all **Deficiency:** This section is incomplete.
- Requirement:** Call out methodology for characterization.
- RL/WHC Response 1:** Clarification to be provided by Ecology.
- Ecology Response 1:
- A. Give the specific method No. from SW-846.
- B. PQLs are different for different materials at different laboratories. Thus, relate them to each contaminant and the laboratories which will be used to test them.
66. APP 7A-10/18-19 **Deficiency:** The reference provided for validation procedures, "Data Validation Procedures for Chemical Analysis" (WHC-SD-EN-SPP-002), is a validation procedure for Contract Laboratory Program (CLP) sample data, not analyses performed under SW-846.

Requirement: The correct reference should be "Sample Management and Administration" (WHC-CM-5-3).

RL/WHC Response 1: The reference will be corrected.

Ecology Response 1: Concur.

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