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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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June 04, 1992

Mr. Bob McLeod  
Hanford Unit Manager  
P.O. Box 550  
Richland, WA 99352

Re: Notice of Deficiency (NOD): 216-B-3 Pond System Closure/Postclosure Plan (M-20-09)

Dear Mr. McLeod:

We have reviewed the 216-B-3 Pond Response Table dated March 03, 1992.

Enclosed, please find our comments to the Final NOD Response Table. The deficiencies we have found with the Phase I data received from U.S. Testing Laboratories are addressed in these comments.

This sampling situation must be dealt with. Too much time has been lost on old and missing data. A sampling plan must be submitted and approved by Ecology, so that we may be able to receive data which is readable, verifiable, and can be used to make a decision on how the area at B-Pond will be closed.

The enclosed comments should be addressed and a response forwarded to our office by September 8, 1992.

Sincerely,

Elizabeth Anne Wiley  
216-B-Pond Unit Manager  
Nuclear & Mixed Waste Management

BA:jw  
Enclosures

- cc: D. Duncan, USEPA
- T. Veneziano, WHC/RL
- S. Wisness, USDOE/RL
- D. Jansen, Ecology
- D. Nylander, Ecology



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DEPARTMENT OF ECOLOGY  
COMMENTS ON THE 216-B-3 POND CLOSURE PLAN  
NOD RESPONSE TABLE OF MARCH 3, 1992  
May 19, 1992

No. Comment

1 Deficiency: Section 1.0, Introduction Page 1-1

Although Ecology allows "partial closures" to be conducted on individual units within a facility while other units remain open, this closure does not relieve the owner/operator from maintaining a complete closure plan for the entire facility. This document provides a comprehensive closure plan for the lobes but an incomplete closure/postclosure plan for the main pond and ditch. The reason for incompleteness is the fact that closure details for the main pond and ditch are deferred to the 200-BP-11 operable unit.

Requirement:

The complete closure of the 216-B-3 Pond system cannot be deferred to the 200-BP-11 operable unit. This closure plan must be rewritten to address all closure activities for the main pond, lobes and ditch. Ecology recommends that the other facilities within the operable unit, such as 216-B-3-1 and 216-B-3-2 Ditches be designated as part of the B-3 Pond System and closed simultaneously.

DOE-RL/WHC Response: It is requested that the 216-B-3 Pond System Closure/Post Closure plan not be revised and that a response to this NOD comment be deferred until the sampling data from Phase III has been evaluated. Barring major delays or impacts to the current schedule, Phase III sampling evaluation tentatively could be completed by September 30, 1991. It is the intent to determine the feasibility of clean closure of the lobes prior to recommending a course of action concerning the 216-B-3 Pond System Closure/Postclosure Plan.

Ecology Requirement: Ecology requires that we have an answer to this deficiency by February 18, 1992.

DOE/RL/WHC Response: As of November 1991, Washington State Department of Ecology personnel have requested that data used to support the 216-B Pond system closure/postclosure strategy be subjected to an Ecology-directed data validation activity. In response to that directive, DOE/WHC has been providing both analytical data and technical guidance in support of this added requirement to Ecology personnel. Also, the resolution of

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RCRA/CERCLA integration and the RCRA site-wide Part-B permit issues between Ecology and DOE-RL/WHC are major milestones that influence the 216-B-3 Pond system closure strategy. It is requested that a reply to this NOD comment be deferred until a clarification of resolution of site-wide issue is accomplished, and until a response appraising the acceptability of current sample data is received from Ecology.

**Ecology Response/Requirement:** Ecology is unable to continue validating data until WHC/RL sends the original data to Ecology for review. The data which has thus far been received, is incomplete. This problem of missing data is causing a delay in the closure process at B-Pond. If DOE/RL cannot submit the data requested, the department shall require resampling at the site and CLP data package deliverables will be required for clean closures.

3

Deficiency: Page 1-2, Section 1.2, Closure Strategy

Assuming the main pond will be closed as a landfill, Ecology will not allow a nondangerous waste water discharge within the immediate vicinity of the main pond. Therefore, the A lobe, whether it is clean closed or not, is precluded from use as a liquid disposal facility. If the B and C lobes are clean closed, and it can be demonstrated that the mounding which will result from liquid discharges to these lobes will not commingle with the waste landfilled under the main lobe, Ecology will allow their continued use.

Requirement:

References throughout the document which discuss the continued use of the A lobe should be deleted. Furthermore, a discussion of the impacts of liquid discharges to B and C lobes on landfilled wastes under the main pond should be provided.

**DOE-RL/WHC Response:** Same as in number 1 above

**Ecology Requirement:** A response to this deficiency is required by February 18, 1992.

**DOE-RL/WHC Response:** As of November 1991, Washington State Department of Ecology personnel have requested that data used to support the 216-B-3 Pond system closure/postclosure strategy be subjected to an Ecology-directed data validation activity. In response to that directive, DOE/WHC has been providing both analytical data and technical guidance in support of this added requirement to Ecology personnel. Also, the resolution of RCRA/CERCLA integration and the RCRA site-wide Part B permit issues between Ecology and DOE-RL/WHC are major milestones that influence the 216-B-Pond system closure strategy. It is requested that the 216-B-3 Pond system closure/postclosure plan not be

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revised and that a reply to this NOD comment be deferred until a clarification of resolution of site-wide issues is accomplished, and until a response appraising the acceptability of current sample data is received.

Ecology Response/Requirement: Same as number 1.

4

Deficiency: Page 2-32, Section 2.2.2, Operational History

The text indicates that, at times, soil was removed from the lobe bottoms and used for dike fill after this soil has already been exposed to liquid wastes, i.e., via dike failure. It is not evident that the closure plan addresses the contamination which may be present in the earthen dikes surrounding this system.

Requirement:

The closure plan should discuss the possibility of contamination in the dikes surrounding this facility.

DOE-RL/WHC Response: Same as in number 1 above

Ecology Requirement: A response to this deficiency is required by February 18, 1992.

DOE-RL/WHC Response: As of November 1991, Washington State Department of Ecology personnel have requested that data used to support the 216-B-3 Pond system closure/postclosure strategy be subjected to an Ecology-directed data validation activity. In response to that directive, DOE/WHC has been providing both analytical data and technical guidance in support of this added requirement to Ecology personnel. Also, the resolution of RCRA/CERCLA integration and the RCRA site-wide Part B permit issues between Ecology and DOE-RL/WHC are major milestones that influence the 216-B-3 Pond System closure strategy. It is requested that the 216-B-3-Pond system closure/postclosure plan not be revised and that a reply to this NOD comment be deferred until a clarification of resolution of site-wide issues is accomplished, and until a response appraising the acceptability of current sample data is received from Ecology.

Ecology Response/Requirement: Have the questioned soils been analyzed for to check for suspected contaminants? See comment number 1.

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5

**Deficiency:** Page 2-43, Section 2.3, Security Information

The current security system around the 216-B-3 Pond System does not prevent or minimize the entry of livestock into this unit as described on lines 30-32.

**Requirement:** Discuss future modifications that will be made to this unit's security system which will comply with the security requirements of WAC 173-303-310.

**DOE-RL/WHC Response:** The Hanford site is surrounded by man-made and natural barriers to prevent unauthorized personnel and livestock from entering. Barbed wire fences enclose the southern portion of the Hanford Site and extend along the top of Rattlesnake Mountain and Ridge.

Additionally, the Hanford Site has barbed wire fences along both sides of Highway 240. The White Bluffs cliffs and the Columbia serve as natural barriers to the 216-B-3 Pond on the northern and eastern boundaries. Additionally, Hanford patrol watches for livestock during their surveillance of the Hanford site. The current security system on the Hanford Site complies with the security requirements of WAC 173-330-310; therefore, future modifications of the security system are not necessary.

**Ecology Requirement:** According to WAC 173-303-280 (2), enforcement actions may be brought in the event that management practices of a facility present an imminent and substantial hazard to the public health and the environment, regardless of the quantity or concentration of dangerous waste associated with the site.

Deer have been seen drinking water at the site which poses an imminent hazard to wildlife from the ingestion of contaminated water at the pond. A 6 foot chain link fence with a 1 foot security barrier (barbed wire) must be installed to prevent the entrance of deer and other wildlife to the site.

**DOE-RL/WHC Response:** Even though historical records indicate past releases of minor concentrations of chemicals into the system, it has not been accepted that the surface water is contaminated at levels which, through the most important and likely exposure pathways, present an imminent and substantial hazard to human health and environment. The 216-B-3 Pond System Phase I data includes analysis of pond and lobe surface water samples. In order to ascertain the potential risk to human health and the environment, these results will be incorporated into an Environmental Protection Agency (EPA) environmental exposure/risk assessment model, "Remedial Investigation Report, Silver

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Mountain Mine, Okanogan County, Washington, EPA, January 1990. The most important and likely exposure pathway for the scenario presented at the 216-B-3 Pond system is ingestion. The above referenced report establishes exposure risks for human health and environment. DOE-RL/WHC recognizes the importance of ascertaining this information, and will expedite the process. Once the potential risks have been measured and evaluated, the results will provide guidance on the appropriate remedial actions, if any. WHC/DOE-RL will provide the results of this analysis to Ecology by the end of April, 1992. If an imminent and substantial hazard to human health and environment is discovered through this process, then the appropriate preventative methods as defined in WAC 173-303 will be implemented.

**Ecology Response/Requirement:** Action will be delayed on this matter until the results of the risk assessment are available for review. If it is shown that ingestion proves a substantial hazard, the above requirement of providing fencing around the area will stand.

8

**Deficiency:** Page 3-22, Section 3.4, The 284-E Powerhouse

Although the boiler blowdown and cooling water do not come in contact with dangerous materials, there is a possibility of metals leaching from the system piping. This is not uncommon in commercial coal-fired power plants. This fact is not addressed.

**Requirement:** Provide a discussion of leached metals in the waste stream.

**DOE-RL/WHC Response:** The 216-B-3 Pond system closure/post closure plan was written to identify dangerous or extremely hazardous sources present in the effluent streams; however, corrosion products from the metal piping systems were not included. A review of data [see 284-E Power plant Wastewater Stream-Specific Report, Addendum 24 (WHC-EP-0342)] identifies the metal corrosion products as follows:

	Cooling Water Average Concentration	Blowdown
Iron	154 ppb	226 ppb
Chromium	<500 ppb	<5,000 ppb*

\* Not an average, only one sample point.

**Ecology Comment:** The Ground Water Quality Criteria in Table 1 of WAC 173-200-040, lists 0.05 mg/l (50 ppb) of chromium as the standard for ground water contamination. A concentration of <500 ppb in the cooling water and <5000 ppb in the blowdown are ... standards and need to be

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looked into further. Also a determination needs to be made as to what kind of chromium is found in the water. Is it Hexavalent Chromium or Trivalent Chromium? Analytical methods for these two types of chromium are different. Samples taken from a WPPSS blowdown earlier this year came up with elevated concentrations of Cu, Zn and Pb. These analytes are suspect and must be assessed.

**Requirement:** The leaching problem needs to be addressed and sampling for Cu, Cr, Zn, and Pb are to be done to determine what concentrations if any of these analytes, are present. Is this still an active site?

**DOE-RL/WHC Response:** The 216-B-3 Pond system closure/postclosure plan was written to identify dangerous or extremely hazardous sources present in the liquid effluent streams; however corrosion products from the metal piping systems were not included. a variety of heavy metals were analyzed in both the cooling water and boiler blowdown from the 284-E Plant. The analytes detected are listed in Specific Report, Addendum 24 (WHC-EP-0342). The heavy metals sampled for include Iron (Fe), Chromium (Cr), Copper (Cu), Zinc (Zn), and Lead (Pb). The results are as follows:

	Cooling Water	Blowdown Average Concentration	WAC 172-200
Fe	154ppb	226ppb	300ppb
Cr	<500ppb	<5000ppb*	50ppb
Cu	15ppb *	108ppb	1000ppb
Zn	9ppb	14ppb	5000ppb
Pb	<500ppb	<5000ppb	50ppb

\*Not an average, only one sample point.

The values for Fe, Cu, and Zn are shown to be less than the values required under WAC 173-200. The values for chromium and lead are shown to be less than the laboratory detection limits. Consequently, the actual values may be in the range between zero and the detection limit. The reported Chromium values are for total Chromium, which includes both Hexavalent and Trivalent Chromium. Differentiation of the levels of the two types of Chromium are not a requirement of the Specific Report, Addendum 24 (WHC-EP-0342).

The concentration of metals, using the ICP method are analyzed for in groundwater at the 216-B-3 Pond System Resource Conservation and Recovery Act (RCRA) monitoring wells. Total Chromium has been detected above the WAC 173-200 standard in groundwater from unfiltered samples and 32-40 ppb for filtered samples. Values for Iron were detected above the WAC 173-200 standard and range from 190-1100 ppb for unfiltered samples and from 34-640 ppb for filtered samples from the July 1991, sampling effort. Values for

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Lead, Copper, and Zinc are below the WAC 173-200 standard. Ecology references groundwater contamination standards under the Ground Water Quality Criteria in Table 1 of WAC 173-200-040. RCRA facility closure activities are not governed under these criteria, which may be applied as Comprehensive Environmental Response Compensation and Liability Act (CERCLA) operable unit cleanup standards. Groundwater contamination is addressed under applicable CERCLA regulations. Therefore, the above reference table and associated disposition are provided as a courtesy to Ecology to assist in illustrating the uncontaminated nature of the boiler blowdown and cooling water. Any evidence of chemical constituents in the groundwater above Ground Water Quality Criteria standards will be addressed when the facility is remediated under CERCLA operable unit status.

**Ecology Response/Requirement:** Regardless of whether a site is governed under RCRA or CERCLA the groundwater standards in WAC 173-200 apply. These standards are State groundwater standards and apply to all areas in the State of Washington. The leaching problem still needs to be addressed at this time and resampling for analytes of concern are necessary. If this site is to be clean closed, all State requirements regardless of their source including WAC 173-200 for this purpose must be met.

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**Deficiency:** Page 7-15, Section 7.1.1.4.2, Analytical Parameters

Ecology has outlined acceptable standards for determining the pH of solids in publication WDOE 83-13 Chemical Testing Methods. The method discussed on this page should be rewritten to be consistent with Ecology's policy.

**DOE-RL/WHC Response:** Upon review of publication WDOE 83-13 Chemical Testing Methods the called out procedure to accomplish pH testing is not easily accomplished under field conditions. Of particular concern is that WDOE 83-13 can be readily accomplished under standard laboratory conditions where work is not subjected to field radiological concerns (i. e., waste minimization, radiologically surveys (sic), and decontamination procedures). The purpose of the field pH's is to "serve to indicate gross anomalies in the soil". Based on the above concerns and the fact the pH's will only be used as gross indicators, the text will remain unmodified.

**Requirement:** The Test Method for Determining pH of Solutions in Contact with Solids; Appendix B, Attachment C-WDOE 83-13 Chemical Testing Methods shall be followed. Samples will be taken from the site and will be prepared in the lab for pH. The colored paper method is not very reliable. As an example, when a paper indicator is used to find the pH of a slurry and the method calls for an indicator level of 2, with the paper, the sampler would use an indicator level of 1. This is because of the inaccuracies

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using this method. Since data received from the lab will be used in determining if the site will be clean closed or closed as a landfill, a reliable method for the determination of pH in soils at B-Pond is to be used.

**DOE-RL/WHC Response:** Analytical results based on previous soil samples have indicated pH levels to be within acceptable Ecology parameters. The text will be modified to, "The paper technique will be used for the purpose of field screening and to serve to indicate the gross anomalies in the soil pH. If pH levels above or below certain prescribed levels (e.g. <3.5 or >10.5) are detected then the method specified in C-WDOE 83-13 will be followed.

**Ecology Response/Requirement:** The pH method stated, (using the probe) is required in the laboratory. Litmus paper may be used in the field, but if access to a field pH probe is available, the probe must be used.

20

**Deficiency:** Page 7-18, Section 7.1.1.8, Field Documentation

The sample label information provided here is not consistent with that given in the 2727-S storage closure facility plan. The labels in 2727-S are considered appropriate.

**Requirement:** The sampling label practices should be consistent in the work done for all closure plans. The sample label system in this document should be edited to conform with the system outlined in the 2727-S plan.

**DOE-RL/WHC Response:** Currently, the 2727-S closure plan is the only document that provides an example of a sample label. All subsequent closure plans do not provide a label, but list the same minimum required information on the sample label. A comparison of the label in 2727-S and the minimum required information in the 216-B-3 Pond Closure/Postclosure plan (and the other closure plans) does not reveal an advantage to 2727-S. These closure plans request the same basic information. The text will remain unmodified.

**Ecology Requirement:** In order to maintain continuity, sample labels are required to contain the same information from one project to another. The labels listed on page 7-28, section 7.1.1.8, do not contain the same amount of information as sample labels in the 2727-S plan. The 216-B pond labels lack information on the site ID number (place of collection), field information, hazard warnings and analyses requested. The sample labels for 216-B pond do not contain the same minimum required amount of information, and are therefore not acceptable.

**DOE-RL/WHC Response:** Labeling continuity or minimum information requirements are not promulgated under WAC 173-303 guidelines. Samples are currently labeled in order to identify the samples, which is the sole intent of sample labeling procedures. Due to the individuality of Hanford sampling efforts, WHC/DOE-RL labeling procedures will not be standardized. The text will be modified (p.7-18, Sec. 7.1.1.8, lines 40-42) replace "should" with "must" be supplied.

**Ecology Response/Requirement:** Since all clean closures shall follow CLP protocols for sampling and analyses, CLP protocols shall be followed regarding sample labels (tags). The requirements as specified by Ecology are used for all EPA sampling events. SW-846 also states, "The numbering and labeling system, chain-of-custody procedures, and how the samples are to be tracked from collection to shipment or receipt by the laboratory shall be specified." Attachment A shows an example of the Ecology sample tag.

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**Deficiency:** Page 7-42, Section 7.2.5.2, Decontamination Plan

The sealing method discussed on this page is not considered a decontamination method. Depending on the level of contaminants in the concrete, Ecology may not allow the sealing and continued use of this structure.

**Requirement:** This sealing procedure should not be listed as a decontamination method. At this time, Ecology will not allow the continued use of a contaminated structure.

**DOE-RL/WHC Response:** The sealing method discussed on page 7-42 will not be identified as a decontamination method, it will be discussed in the context as a sealing or encapsulating method. The text will be modified as follows (lines 17 through 26): "If concrete core samples indicate that concrete surfaces are contaminated to a depth exceeding 0.5 inch, gritblasting and concrete chippers may be unproductive. An alternative approach that will be more appropriate for deep absorbed contamination in concrete is sealing /encapsulating the surface. Sealing is a somewhat less desirable method when compared with chipping or gritblasting because contamination remains in place. However sealing may be an environmentally effective interim treatment that will enable the useful life of the structure to be extended beyond clean closure of the 3A and 3B ponds, until the ponds are no longer required".

The EPA has identified K-20 (EPA 1985, pg. 96) as a potential product, which reportedly has been used in a variety of sealing applications, including cinders, concrete, tile, brick, painting or spraying. Suitable equivalent sealants may be available from other vendor sources. Before any one product is selected and

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specifically proposed to ecology for use on concrete surfaces in the 216-B-353 overflow control structure, additional information will be required regarding product chemical composition(s), effectiveness, and durability.

**Ecology Requirements:** The problem of leaching still needs to be addressed. An area containing known contaminants should not be sealed and then be reused. No sealant is foolproof. The continued use of this area creates a potential problem of leaching contaminants into the groundwater and surrounding sediments. The piping which remains if contaminated is to be removed and then properly disposed.

**DOE-RL/WHC Response/Requirement:** The use of sealants as a proper decontamination method are dependent on the type of closure strategy implemented in the 216-B-3 Pond System closure/postclosure plan. the possibility of contaminant leaching from concrete structures depends on the concentrations and mobility of such contaminants within the chemical/physical matrix of the concrete (presuming contaminants are present in detectable quantities). It is believed that the mobility of any chemicals trapped within the concrete matrix is very low. Sealing is an EPA approved method to prevent the leaching of chemicals into the environment and has been used very effectively at Hanford to isolate and immobilize fixed radiological contamination on accessible surfaces on surfaces of plant buildings and equipment. Any concrete structures identified as being inessential to the closure strategy will either be removed or decontaminated in such a way as to prevent the leaching to any matrix-fixed contamination into the environment. Any remaining structures identified for use under clean closure status will be sampled and analyzed for potential leachability in accordance with the closure plan.

**Ecology Response/Requirement:** The problem of permeability exists with the use of sealing agents. Polymers are affected by radiation and sunlight and at the most can remain sealed for a period of approximately 5 years. Since this site is cited for clean closure, this type of remedy is unacceptable. The remaining concrete structures must be removed and properly disposed.

Responses to Fax of December 20, 1991

1

Deficiency:

Sample number B112,127,133,141,150,162,169,181,182,192,199,204 are rejected because sample dates and times are missing. Extraction dates are also missing. Because of this, a determination cannot be made as to whether these samples have met or exceeded holding times. Since this pertinent information is missing it is assumed that holding times are exceeded.

**Requirement:** Information regarding holding times is necessary to validate analytical data. Please supply this information if available.

**DOE-RL/WHC Response:** All sample dates are listed in the WHC Engineering Data Transmittal "Phase 1 Characterization of the 216-B-3 Pond System" (WHC-SD-EN-AP-042). This document was provided to Ecology during the November 12, 1991, unit manager meeting. Sample times are available in the field log books, however, they are not essential to a determination of overall data quality. U.S. Testing Company (UST) generated documentation of extraction dates was provided in the UST chemist reports transmitted to Ecology on December 20, 1991. Providing documentation of extraction dates is not requirement of the Battelle Pacific Northwest Laboratories (PNL) Statement of Work (SOW) or SW-846.

**Ecology Response/Requirement:** Chain of custody documentation was missing for some of the data the data which was received. We are unable to determine holding times without this information. Original data is also missing. This data is necessary in order to determine holding times for these samples. Attachment B contains deficiencies in information for this sampling event.

2 **Deficiency:** U.S. Testing has also failed to follow protocols as set forth in SW 846. Failure to follow this requirement puts U.S. Testing in violation of contract requirements.

**Requirement:** Provide the required information to Ecology.

**DOE-RL/WHC Response:** WHC has reviewed and analyzed all documentation and have found that "All SW-846 protocols essential to determining overall quality were followed." Documentation of UST compliance with these protocols has been transmitted to Ecology for their review.

**Ecology Response/Requirement:** Not all protocols established in SW-846 were followed. Attachment C points out some of the documentation required in SW-846 which was missing. Chain of Custody is one of the documents which as above was stated was not a requirement of SW-846, but according to the attached document obviously is. Refer to comment 1 in this section.

3 **Deficiency:** The OSM Statement of Work has not been followed. This SOW is a USDOE requirement, yet the lab for the DOE has not followed proper DOE protocols.

**Requirement:** Provide documentation that proper protocols were followed.

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**DOE-RL/WHC Response:** The SOW was issued through PNL, not the office of Sample Management (OSM). At the time of the sample analysis, OSM had not yet issued any SOW overseeing RCRA laboratory practices. Instead, the PNL SOW was issued under DOE guidelines, and all SW-846 protocols essential to determining overall data quality were followed. Documentation of UST compliance with these protocols has been transmitted to Ecology for their review.

**Ecology Response/Requirement:** During the next sampling event, the required CLP documentation must be used for clean closures.

4 **Deficiency:** The case narrative is insufficient in that it does not provide enough information on laboratory procedure.

**Requirement:** Please supply the specified information.

**DOE-RL/WHC Response:** Case narratives were not a requirement under SW-846. Samples of laboratory reports are provided in SW-846. They are suggested as examples, however, their use is not promulgated under SW-846 and are therefore not a reporting requirement.

**Ecology Response/Requirement:** SW-846 does require that a case narrative be included with the data. Attachment C on page One-20, states that, "Supporting documentation shall include at a minimum, data qualifiers with appropriate references and narrative on the quality of the results." This information must be submitted in the data package.

5 **Deficiency:** Laboratory calibration checks were not referenced. Calibration checks are required to be referenced so that it can be verified that all systems are working properly and there are no problems with contamination.

**Requirement:** Please provide this information on calibration checks.

**DOE-RL/WHC Response:** Laboratory calibration curves were required by the PNL SOW and were performed by UST. Evidence of this is found in the UST chemist reports transmitted to Ecology on December 20, 1991. Providing these chemist reports as part of the original data package was not required by the PNL SOW, however. The actual calibration curve documentation was not made available to DOE-RL/WHC because they were part of the original data set identified as evidence in the litigation between UST and PNL. The location of the original documentation is known, however it is an unreferenced format. In accounts from the October 10, 1991, report generated by Dr. Gilbert Omenn of the School of Public Health, University of Washington, titled, "Retrospective

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Evaluation of Data Submitted by U.S. Testing in Support of the Bioassay Program operated by Battelle Pacific Northwest Laboratories 1983-1990", it is stated that the level of knowledge of the UST record archive permits this reconstruction (data validation), but requires knowledge and time on the part of the persons extracting records from the archives". The validity of the UST data should not be questioned due to a series of circumstances beyond control of the parties named in the Tri-Party Agreement, especially when the lack of such information does not automatically infer that the data is flawed.

**Ecology Response/Requirement:** Regardless of whether the information requested by Ecology is in litigation, this documentation is still needed to conduct a data validation. Obtaining the calibration curves is not a judgement factor on the UST data, but is a requirement for all data validation procedures. Reconstruction and data validation are two different procedures. reconstruction is the same as obtaining reproducibility, meaning that the laboratory analysis can be reproduced. data validation is a check on all calculations, procedures and instrumentation. Refer to response number 1.

6 **Deficiency:** SW 846 Volume 1A, requires that specific forms be included in the data package. Forms I thru XIII were missing from the data package. Important information regarding laboratory procedures are contained in these forms and these forms are required for data validation. The department cannot perform a data validation without the proper forms attached. This is an incomplete data package.

**Requirement:** These forms are necessary to conduct a data validation of the submitted information.

**DOE-RL/WHC:** Samples of laboratory reports are provided in SW-846. They are suggested as examples, however, their use is not promulgated under SW-846 and are therefore not a mandatory reporting requirement.

**Ecology Response/Requirement:** Although laboratory reports are not specifically required, SW-846 states that the information contained on these reports is required to be documented and readily available to the regulators. The Department requires that this information be provided so that we can complete the validation procedure. refer to response number 1.

7 **Deficiency:** Chain-of-Custody sheets are missing. Since some sample dates are missing these forms are necessary to check sample dates and times. Matrices are also missing and these forms are required to check sample matrix.

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Requirement: Provide Ecology with the requested Chain-of Custody documents.

DOE-RL/WHC Response: The requested Chain-of-Custody documentation was hand-deliver to an Ecology representative on December 18, 1991. The documentation demonstrated the Chain-of-Custody procedures between DOE-RL/WHC and UST were followed in accordance with SW-846 protocol. Sample dates and matrix information was also documented and transmitted to Ecology during the November 12 and December 11, 1991 unit manger meetings.

Ecology Response/Requirement: Sixty-Five of the 110 samples which were analyzed by UST had Chain-of-Custody documentation. There are missing chain of custody forms and these are required to be submitted to Ecology. Refer to response number 1.

8

Deficiency: Since new wells are being drilled and B Ponds status has gone from a detection level determination to an assessment, I am rejecting the Phase I data because of deficiencies in information and for failure to follow the protocols as set forth in SW 846.

Requirement: All missing information for the sample analyses must be submitted.

DOE-RL/WHC Response: WHC has reviewed and analyzed all the documentation and have found that all SW-846 protocols essential to determining overall data quality were followed. The fact that the groundwater monitoring has gone from a detection level determination to the assessment phase does not affect the results from the phase I sampling effort. the groundwater wells are impacted from multiple sources other that the 216-B-3 Pond system. The groundwater monitoring program being in assessment phase has no relevance to the validity of the Phase I data.

Ecology Response/Requirement: Refer to Response 1.

U.S. Testing Phase I Data Analysis Comments, Second Series From Fax Sent on 11/5/91.

Atomic Absorption Analysis (AA): A blank and at least 3 standards, one of which is at the Contract Required Detection Limit-CRDL must be analyzed for each element detected by AA analysis-As, Pb, Se, Tl.

Calibration curves must have a correlation coefficient of greater than or equal to 0.995.

The data received from U.S. Testing does not list a blank and 3 standards, one of which must be at the CRDL, in the beginning of

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each segment of their AA analysis information. This is where the information is found. SW 846 also requires this information to be listed in Form VII which is also missing from the data package.

The correlation coefficient cannot be determined without standard concentration and instrument response (peak height). There are no standards and no instrument response information available in order to determine the correlation coefficient.

**Spike Sample Recovery:**

The data package case narrative states that values for antimony may be biased and are estimated due to low Matrix Spike/Matrix Spike Duplicate-MS/MSD recoveries. There are no values or work shown to validate this claim. SW 846 designates Form V for this purpose. These forms must be included so that the data validator can verify this information. EPA SOW for Inorganic Analysis No. 788 page E-11 indicates levels for spike sample analysis, page E-10 states requirements used if spike recovery is not at or within the limits of 75-125%. U.S. Testing has not followed these EPA guidelines.

**Duplicate Sample Analysis:**

The case narrative states that values for barium, cadmium, zinc, manganese and iron are estimated for sample 170 because of "high duplicate analysis RPD". SW 846 provides Form VI to include this information. Although the values are high, these values need to be included so that data validation can be performed on this sample. Relative Percent Differences-RPD's, for some of the samples need to be recalculated by the reviewer to verify control limits. SOW requirements state that an "\*\*" means that the result is outside the control limit, (USEPA Inorganic SOW No.788.) UST's "\*" means that the result is less than the detection limit.

Is this the contract required detection limit (CRDL) or the instrument detection limit (IDL). In order to maintain continuity, this lab if still operational would be required to perform according to stated protocols.

**Mercury Analysis:**

A blank and least four standards must be used during mercury analysis. No indication has been made that the required amount of standards have been used. Correlation coefficients need to be calibrated by the validator and this cannot be done without the information on standard concentrations and absorbances or peak heights. SW-846 provides form III for this purpose.U.S. Testing did not provide these forms or information with the data package.

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**Cyanide Analysis:**

A blank and 3 standards are required for cyanide analysis. Distillation logs are required to verify the midrange standard was distilled. Correlation coefficients need to be calibrated to verify that it is greater than or equal to 0.995. Form III is used for this purpose. Form III was not included in this data package, therefore data validation cannot be performed on cyanide samples.

**Initial Calibration Verification:**

Raw data needs to be verified so that the Initial Calibration Verification-ICV's agree with Form II. Some of the percent recoveries need to be recalculated for each method and need to be verified so that they agree with form II.  $\%R = \text{found value}/\text{true value} \times 100\%$ , the percent Recoveries-R's should all be within 90-110%, except that mercury can be 80-120% R and cyanide can be 85-115% R. The ICV for cyanide must be distilled. No information was provided for the validator to check this data.

**Continuing Calibrations:**

Continuing Calibration Verifications (CCV's) should be analyzed at a frequency of 10% or every 2 hours during an analysis run, whichever is more frequent. No continuing calibration data is included in this data package. Form II is required by SW-846 to report this data. This form was omitted and therefore CCV's cannot be verified by the reviewer.

**Instrument Detection Limit:**

Instrument Detection Limits-IDL's are to be verified to be less than the CRDL-Contract Required Detection Limit. Form XI is provided to report this information. No form XI's were included in the U.S. Testing data package, and there is no information included on the instrument detection limits.

**Blanks:**

Blanks are required for ICV, CCV, AA, Mercury, and Cyanide analyses. There is no information on blanks included in this data package. SW-846 requires that form III be used for this purpose, and the USEPA SOW 788, states that, " At least one preparation blank (or reagent blank-SW 846 requires a reagent blank), consisting of deionized distilled water processed through each sample preparation and analysis procedure must be prepared and analyzed with every Sample Delivery Group, or with each batch of samples digested, whichever is more frequent. This blank is to be reported for each SDG and used in all analyses to ascertain

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whether sample concentrations reflect contamination". Raw blank data must be verified by the validator so that the validator can verify if there is any contamination present.

**ICP Interference Check Sample:**

The Inductively Coupled Plasma-ICP check sample is run at the beginning and end of each ICP sample run or twice each 8 hours, whichever is more frequent. Information on the ICP check sample is required for the data validator to check %R's for solutions to verify that they are within the QC limits of 80-120%. This information is also necessary to check if interferences are present. If interferences are present, the raw data needs to be examined. SW-846 requires that form IV be submitted with this information. Neither this form nor the appropriate information were included in the data package.

**Laboratory Control Sample:**

No information is provided for the Laboratory Control Sample-LCS. Form VII is used for this purpose. Raw data needs to be verified by the reviewer so that the LCS agrees with form VII. %R calculations for aqueous samples need to be verified to determine if the LCS results fall within the control limits of 80-120%R. %R's are not able to be calculated due to the absence of form VII and the data contained in it.

**ICP Serial Dilution:**

One Serial Dilution sample must be analyzed per SDG, per matrix, per concentration level. There were some dilutions flagged in the data package from U.S. Testing, but there was no indication that they were serial dilutions. I proceeded to try to validate the ICP serial dilution (there is a formula for this purpose) from one of the samples on aluminum, but could not continue, because of lack of information on the IDL. The dilution results in this data package are useless since there is no way to determine %D, and if there are any interference effects.

**Furnace Atomic Absorption QC:**

Information which is required on all forms regarding Furnace Atomic Absorption-(FAA) are missing. Absorbance and concentrations are required to be included in the raw data. Analytical spike information is necessary to determine if the Methods of Standard Addition-MSA, will be required for quantitation. The narrative indicated that there were MS/MSD recoveries outside of control limits. The USEPA SOW on inorganics page E-16, section b., 1st paragraph states: "If the preparation blank analytical spike recovery is out of control (85-115%), the spiking solution must be verified by respiking and rerunning the

preparation blank once. If the preparation blank analytical spike recovery is still out of control, correct the problem and reanalyze all analytical samples associated with that blank." Why weren't these samples rerun in accordance to the SOW? If these samples were rerun, this should be indicated in the data package.

Requirement: Raw data needs to be verified so that it agrees with the forms and that there are no transcription errors. Forms were not provided by U.S. Testing and data validation cannot be performed on the package submitted. Since this package cannot be verified, it is difficult to determine if the data presented is valid. Ecology rejects all data because of lack of information and because of failure by the laboratory to follow specified protocols as stated in SW-846 and in the USEPA SOW for inorganics.

DOE-RL/WHC Response: DOE-RL/WHC agrees that raw data packages need to be verified so that these data may be used towards its intended purpose; however, when it was written, the data reporting guidelines required by PNL were sufficient to support the types of decisions for which the data were generated. It is agreed that analytical data reporting requirements for environmental decision making have, since then, changed both procedurally and technically. The intended purpose of the UST Phase I data is to determine the type and amount of chemical constituents present in the 216-B-3 Pond system soil, sediment and water, and these analytical results should not be subject to these updated requirements. Ecology should not apply current analytical data reporting requirements retrospectively to data packages already being performed under the current system. The UST Phase I analytical package existed and was being performed, with Ecology's knowledge, before the updated requirements became affective; consequently, any results generated from this package should be grandfathered into current regulatory review.

Technically, Ecology requirements violate the intent of SW-846 guidelines. All requirements listed in comment #12 are Contract Laboratory Procedures (CLP) used to analyze and validate samples under CERCLA regulations. The PNL SOW was produced in order to generate sample analysis under SW-846 guidelines, and hence, did not require the use of CLP guidelines. SW-846 analytical reporting requirements are not designed to afford the reviewer the ability to precisely validate the original data. UST Phase I analytical results generated under SW-846 are not meant to be and cannot be validated using the same stringent CLP protocol. The forms exhibited in SW-846 are examples that may be used to assist in reporting data, but are not a requirement promulgated by SW-846. Rather than nullifying the results of an entire data set due to the format in which the data was reported, it is suggested that a confirmation process be initiated in order to provide an increased level of confidence in the use of the UST data. WHC is currently preparing a statistical analysis spreadsheet that will

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examine the UST data results. Concurrently, a Site-Wide background document is also being prepared in order to determine the nature and amount of constituents occurring naturally in the Hanford soil and groundwater. It is proposed that the UST results be compared to the site wide background and statistical reports. Physical and statistical deviations from the norm generated from two reports can be readily identified. The comparisons accomplished from this process will serve to identify the reliability and, therefore, the utility of UST analytical results.

**Ecology Response Requirement:** The current analytical data reporting requirements have not changed significantly since the Phase I sampling occurred. It is not unreasonable to expect that the amount of information requested for these samples be the same as is required for current analyses. The information requested for the phase I data validation is of a standard format. The forms as listed in the SW-846 (EPA, 1986) version contain the same information as the 1990 SW-846 version. The only difference is, that now this information is required to be available.

Ecology is not violating the intent of SW-846. All requirements listed in #12 are also SW-846 methods.

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 <p>WASHINGTON DEPARTMENT OF ECOLOGY OFFICIAL SAMPLE SEAL</p>	SAMPLE NO.	DATE	SEAL BROKEN BY DATE
	SIGNATURE		
	PRINT NAME AND TITLE <i>(Inspector, Analyst or Technician)</i>		

STATION: \_\_\_\_\_

STUDY: \_\_\_\_\_

DATE:	TIME:	INITIALS:
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COMMENTS \_\_\_\_\_

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LAB USE ONLY:

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ECY 008-2-101

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**ATTACHMENT 1. SUPPORT DOCUMENTATION FOR SEMIVOLATILE  
ACID/BASE/NEUTRAL  
AND VOLATILE ORGANIC COMPOUND ANALYSES**

-	Case Narrative
-	Chain-of-Custody Records <sup>a</sup>
-	CLP-Equivalent Forms V (Tuning criteria data for DFTPP and BFB) and all original data
-	CLP-Equivalent Forms VI and VII (Initial and continuing calibration summaries) and all original data (quantification reports, spectral searches, reconstructed ion chromatograms)
-	CLP-Equivalent Forms IV (Method blank summaries)
-	CLP-Equivalent Forms III (Matrix spike summaries) and all original data <sup>b</sup>
-	CLP-Equivalent Forms II (Surrogate compound recovery summaries) <sup>c</sup>
-	CLP-Equivalent Forms VIII (Internal standards summaries)
-	CLP-Equivalent Forms I and I-TIC (Sample results) <sup>d</sup> , including all original data (quantification reports, spectral searches, reconstructed ion chromatograms)
-	All laboratory bench sheets (i.e, sample extraction logs, sample analysis/instrument logs, standards preparation logs, and handwritten calculations)

**Footnotes**

- <sup>a</sup>: Chain-of-Custody records were submitted for Phase I. Custody records for Phase III are absent.
- <sup>b</sup>: Matrix spike results were submitted for both Phase I and III, however, all original data are absent.
- <sup>c</sup>: Surrogate compound recovery summaries were submitted for both Phase I and III.
- <sup>d</sup>: All CLP-Equivalent Forms I and I-TICs have been submitted for Phase I and III, however, all original data are absent.

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## ATTACHMENT 2. SUPPORT DOCUMENTATION FOR PESTICIDE AND POLYCHLORINATED BIPHENYL ANALYSES

-	Case Narrative
-	Chain-of-Custody Records <sup>a</sup>
-	Evaluation check summaries for linearity, 4,4'-DDT/Endrin breakdown, and DBC retention time shifts
-	CLP-Equivalent Forms VII and IX (Initial and continuing calibration retention time window summaries for all pesticide and PCB standards) and all original data (chromatograms and integration reports)
-	Analytical sequence summaries
-	CLP-Equivalent Forms IV (Method blank summaries)
-	CLP-Equivalent Forms III (Matrix spike summaries) and all original data <sup>b</sup>
-	CLP-Equivalent Forms II (DBC surrogate compound recovery summaries) <sup>c</sup>
-	CLP-Equivalent Forms I and I-TIC (Sample results) <sup>d</sup> including all original data (chromatograms and integration reports)
-	All laboratory bench sheets (i.e, sample extraction logs, sample analysis/instrument logs, standards preparation logs, and handwritten calculations)

### Footnotes

<sup>a</sup>: Chain-of-Custody records were submitted for Phase I. Custody records for Phase III are absent.

<sup>b</sup>: Matrix spike results were submitted for both Phase I and III, however, all original data are absent.

<sup>c</sup>: Surrogate compound recovery summaries were submitted for both Phase I and III.

<sup>d</sup>: All CLP-Equivalent Forms I have been submitted for Phase I and III, however, all original data are absent.

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**ATTACHMENT 3. SUPPORT DOCUMENTATION FOR CHLORINATED HERBICIDE AND ORGANOPHOSPHORUS PESTICIDE ANALYSES**

-	Case Narrative
-	Chain-of-Custody Records*
-	CLP-Equivalent Forms VI and VII (Initial and continuing calibration summaries for standard analyses) and all original data (chromatograms and integration reports)
-	CLP-Equivalent Forms IV (Method blank summaries)
-	CLP-Equivalent Forms III (Matrix spike summaries) and all original data <sup>b</sup>
-	CLP-Equivalent Forms II (Surrogate compound recovery summaries) <sup>c</sup>
-	CLP-Equivalent Forms I and I-TIC (Sample results) <sup>d</sup> , including all original data (chromatograms and integration reports)
-	All laboratory bench sheets (i.e, sample extraction logs, sample analysis/instrument logs, standards preparation logs, and handwritten calculations)

**Footnotes**

- \*: Chain-of-Custody records were submitted for Phase I. Custody records for Phase III are absent.
- <sup>b</sup>: Matrix spike results were submitted for both Phase I and III, however, all original data are absent.
- <sup>c</sup>: Surrogate compound recovery summaries were submitted for both Phase I and III.
- <sup>d</sup>: All CLP-Equivalent Forms I have been submitted for Phase I and III, however, all original data are absent.

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**ATTACHMENT 4. SUPPORT DOCUMENTATION FOR  
DIOXIN ANALYSES**

-	Case Narrative
-	Chain-of-Custody Records <sup>a</sup>
-	CLP-Equivalent Forms VI and VII (Initial and continuing calibration summaries (response factors, ion abundance ratios, retention time summaries) and all original data
-	CLP-Equivalent Forms V (Window defining mix and resolution summaries)
-	CLP-Equivalent Forms IV (Method blank summaries)
-	CLP-Equivalent Forms III (Initial and ongoing precision and recovery summaries)
-	Isotopically labeled compound and cleanup standards recovery summaries)
-	CLP-Equivalent Forms I (Sample results), including all original data <sup>b</sup>
-	All laboratory bench sheets (i.e, sample extraction logs, sample analysis/instrument logs, standards preparation logs, and handwritten calculations)

**Footnotes**

<sup>a</sup>: Chain-of-Custody records were submitted for Phase I. Custody records for Phase III are absent.

<sup>b</sup>: All CLP-Equivalent Forms I have been submitted for Phase I and III, however, all original data are absent.

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## ATTACHMENT 5. SUPPORT DOCUMENTATION FOR ICP AND GFAA METALS ANALYSES

-	Case Narrative
-	Chain-of-Custody Records <sup>a</sup>
-	CLP-Equivalent Forms I (Sample results summaries) <sup>b</sup> and all instrument printouts
-	CLP-Equivalent Forms II (Initial and continuing calibration summaries and CRDL standard summaries) and all instrument printouts
-	CLP-Equivalent Forms III (Blank summaries) and all instrument printouts
-	CLP-Equivalent Forms IV (ICP interference check summaries) and all instrument printouts
-	CLP-Equivalent Forms V (Spike sample recovery summaries and post digestion spike recovery summaries) and all instrument printouts
-	CLP-Equivalent Forms VI (Duplicate summaries) and all instrument printouts
-	CLP-Equivalent Forms VII (Laboratory control sample summaries) and all instrument printouts
-	CLP-Equivalent Forms VIII (Standard addition results) and all instrument printouts
-	CLP-Equivalent Forms IX (ICP serial dilution summaries) and all instrument printouts
-	CLP-Equivalent Forms X (Instrument detection limit summaries -quarterly)
-	CLP-Equivalent Forms XI (ICP interelement correction factor summaries)
-	CLP-Equivalent Forms XII (ICP linear range summaries)
-	CLP-Equivalent Forms XIII (Preparation Logs)
-	All laboratory bench sheets (i.e. sample extraction logs, sample analysis/instrument logs, standards preparation logs, and handwritten calculations)

### Footnotes

<sup>a</sup>: Chain-of-Custody records were submitted for Phase I. Custody records for Phase III are absent.

<sup>b</sup>: All CLP-Equivalent Forms I have been submitted for Phase I and III, however, all original data is absent.

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## ATTACHMENT 5. SUPPORT DOCUMENTATION FOR ANIONS AND CYANIDE ANALYSES

-	Case Narrative
-	Chain-of-Custody Records <sup>a</sup>
-	CLP-Equivalent Forms I (Sample results summaries) <sup>b</sup> and all instrument printouts
-	CLP-Equivalent Forms II (Initial and continuing calibration summaries) and all instrument printouts
-	CLP-Equivalent Forms III (Blank summaries) and all instrument printouts
-	CLP-Equivalent Forms V (Spike sample recovery summaries) and all instrument printouts
-	CLP-Equivalent Forms VI (Duplicate summaries) and all instrument printouts
-	CLP-Equivalent Forms X (Instrument detection limit summaries - quarterly)
-	CLP-Equivalent Forms XIII (Preparation logs)
-	All ion-chromatograms and standard absorbance printouts for all anion analyses
-	All laboratory bench sheets (i.e., sample extraction logs, sample analysis/instrument logs, standards preparation logs, and handwritten calculations)

### Footnotes

<sup>a</sup>: Chain-of-Custody records were submitted for Phase I. Custody records for Phase III are absent.

<sup>b</sup>: All CLP-Equivalent Forms I have been submitted for Phase I and III, however, all original data is absent.

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