

**U.S. Department of Energy**

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Mr. Steve M. Alexander  
Perimeter Areas Section Manager  
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State of Washington  
Department of Ecology  
1315 W. Fourth Avenue  
Kennewick, Washington 99336-6018

Mr. Douglas R. Sherwood  
Hanford Project Manager  
U.S. Environmental Protection Agency  
712 Swift Boulevard, Suite 5  
Richland, Washington 99352-0539



Dear Messrs. Alexander and Sherwood:

**PROPOSAL TO MANAGE CONTAMINATED CONCRETE FROM THE 300 AREA PROCESS TRENCHES  
(APT) WEIR STRUCTURE**

- References:
- (1) DOE ltr. to S. M. Alexander, Ecology, from J. E. Rasmussen, RL, and W. T. Dixon, WHC, "Proposal to Manage Contaminated Media from the 300 Area Process Trenches," dtd. March 14, 1995 (CCN 011652). 40589
  - (2) DOE ltr. to S. M. Alexander, Ecology, from J. E. Rasmussen, RL, and J. F. Nemec, BHI, "Proposal to Manage Contaminated Media From the 300 Area Process Trenches (APT)," dtd. November 21, 1995 (CCN 023181). 023183 42620
  - (3) Ecology ltr. to J. E. Rasmussen, RL, from T. A. Wooley, "Conditional Management of 300 Area Process Trenches Soils for Waste Code U210," dtd. January 16, 1996 (CCN 025635). 42777
  - (4) Ecology ltr. to J. E. Rasmussen, RL, from S. M. Alexander, "Conditional Contained-In Determination for the 300 Area Process Trenches," dtd. May 15, 1997 (CCN 015665). ✓
  - (5) Meeting Minutes "300 Area Process Trenches Headworks Characterization: DQO Workshop," dtd. October 31, 1997 (CCN 050744). ✓

This letter provides a summary of the issue and a proposal from the U.S. Department of Energy, Richland Operations Office (RL), for addressing regulatory concerns related to management of the contaminated concrete weir structure, commonly referred to as the headworks of the 300 APT. The 300 APT



headworks structure was in contact with the same spent halogenated and non-halogenated solvents (carbon tetrachloride, chlorobenzene, methyl ethyl ketone, tetrachloroethene, toluene, xylenes, and trichloroethene) as the soils in the trenches that received them. Tetrachloroethene was also accidentally discarded as a result of spills during the Process Trenches operations.

A previously issued contained-in determination for the Process Trenches did not address the headworks structure. References 1 and 2 describe the process knowledge regarding these contaminants and are the RL contained-in determination requests for contaminated media in the 300 APT. References 3 and 4 are the State of Washington Department of Ecology (Ecology) letters granting conditional contained-in determinations for the 300 APT Spoils Pile. The headworks structure was determined to be radiologically contaminated during remediation of the Process Trenches and, therefore, is required to be excavated and disposed versus being broken into rubble and placed in the bottom of the trenches.

The attachment summarizes the headworks structure sampling strategy and associated agreements made in a Data Quality Objective meeting held on October 28, 1997 (Reference 5). It was agreed that sampling would be done to: (1) determine whether the levels of the seven listed solvents meet the criteria for a contained-in determination, (2) determine whether the concrete would designate as a characteristic dangerous waste for metals or certain volatile and semi-volatile organics pursuant to the toxicity characteristic leaching procedures (TCLP), and (3) determine contaminant levels of three additional 300-FF-1 contaminants of concern (COC). The attachment also includes a summary of all the laboratory results obtained from implementing the sampling plan. The laboratory results showed non-detectable levels for all seven listed waste constituents using detection limits which were below the Model Toxics Control Act (MTCA) Method B groundwater protection levels for soil. The results also show that the concrete contaminant levels were all below the designation limits for the TCLP characteristic. Finally, the concentrations of the three COCs (benzo(a)pyrene, chrysene, and thallium) are below the MTCA C cleanup standards for soil ingestion.

Given the information provided above and in the attachment, it is the considered judgment of RL that the Process Trenches headworks structure does not contain listed waste. RL, therefore, requests that Ecology provide a determination that this material does not need to be managed as a listed dangerous waste pursuant to WAC 173-303-070(2)(c)(ii). Ecology's expeditious evaluation of the facts and early determination is requested. RL is also requesting concurrence from the U.S. Environmental Protection Agency that considering this material as not containing a listed waste is consistent with the Resource Conservation and Recovery Act requirements as applied to the Hanford Site via Comprehensive Environmental Response, Compensation, and Liability Act and the Hanford Federal Facility Agreement and Consent Order.

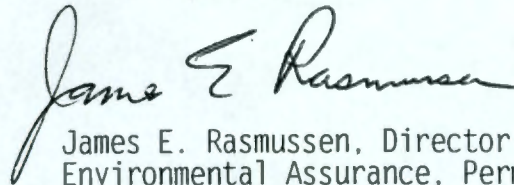
Messrs. Alexander and Sherwood

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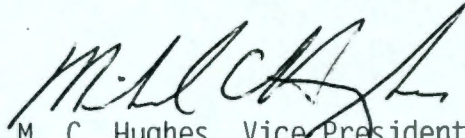
If you have any questions, please contact Mr. R. G. McLeod at 372-0096.

Sincerely,



James E. Rasmussen, Director  
Environmental Assurance, Permits,  
and Policy Division

RAP:RGM



M. C. Hughes, Vice President  
Operations  
Bechtel Hanford, Inc.

Attachment

cc w/attach:

D. R. Einar, EPA

C. R. Johnson, BHI

T. A. Wooley, Ecology



**300 AREA PROCESS TRENCHES HEADWORKS CHARACTERIZATION SUMMARY****1.0 Introduction**

The following information presents a summary of sampling and analysis activities performed at the 300-FF-1 Operable Unit for characterization of the 300 Area Process Trenches (APT) headworks structure debris. Characterization of the concrete headworks structure debris is required to support a contained-in determination within the RCRA treatment, storage, and disposal unit.

**2.0 Sampling Design**

On October 28, 1997, a focused Data Quality Objectives (DQO) session was held to develop the sampling design for the concrete headworks structure debris. Participants in the DQO session included representatives from Ecology, EPA, RL, and the ERC team. The sampling design identified below reflects the agreements made in the DQO session:

- Two samples of the concrete headworks debris would be required.
- Samples were to include the finished surface of the concrete that was likely exposed to the process effluent. A core of the finished concrete surface and internal materials (e.g., cement, aggregate) four inches in depth would be considered representative of the headworks concrete.
- Sample selection would be judgmental (as opposed to statistical) to bias the analytical results toward a worst case waste concentration. The two samples were to be selected from two discrete concrete pieces that had the highest level of radiological surface contamination (based on field survey measurements) with respect to the remaining concrete debris population.
- Samples were to be analyzed for the target constituents listed in Table 1.

**Table 1. Target Constituents for the 300 APT Headworks Structure**

| Analysis                       | Method    | Constituent  | Basis                                  |
|--------------------------------|-----------|--|--|
| TCLP metals                    | 1311/6010 | arsenic<br>barium<br>cadmium<br>chromium<br>lead<br>selenium<br>silver   | toxicity characteristic <sup>a</sup>   |
|                                | 1311/7470 | mercury  |  |
| volatile organics <sup>b</sup> | 8260A     | benzene<br>2-butanone<br>carbon tetrachloride<br>chlorobenzene<br>chloroform<br>1,2-dichloroethane<br>1,1-dichloroethene<br>tetrachloroethene<br>trichloroethene<br>vinyl chloride | toxicity characteristic <sup>a</sup>   |
| volatile organics              | 8260A     | 2-butanone<br>carbon tetrachloride<br>chlorobenzene<br>tetrachloroethene<br>toluene<br>trichloroethene<br>xylenes, total   | 300 APT Part A Permit<br>listed wastes |
| semivolatile organics          | 8270A     | benzo(a)pyrene<br>chrysene   | 300-FF-1 COC <sup>c</sup>              |
| ICP metals                     | 6010A     | thallium   | 300-FF-1 COC <sup>c</sup>              |

<sup>a</sup> WAC 173-303-090

<sup>b</sup> Concentrations of volatile organic constituents will be reported as "totals" and evaluated against regulatory limits based on TCLP. Detected constituents will be divided by 20 to account for the TCLP dilution factor.

<sup>c</sup> DOE/RL-96-70. COCs are evaluated against the MTCA C cleanup standards for soil.



### 3.0 Sample Collection

Samples were collected in accordance with the *300-FF-1 Remedial Design Report/Remedial Action Work Plan* (RDR/RAWP)(DOE/RL-96-70) and the design developed in the DQO session described in Section 2.0. Samples were collected on October 29, 1997, under Sample Authorization Form (SAF) B97-160 and documented in logbook number EL1395.

Debris from the headworks structure was surveyed in the field using an E600 meter to determine and select for sample collection the two discrete pieces with the highest level of radioactive surface contamination. The selected concrete pieces were pulverized using a roto-hammer. All roto-hammer attachments were thoroughly decontaminated with deionized water and chemwipes prior to use on each piece of concrete. The pulverized concrete was placed into a clean plastic bag using a decontaminated stainless-steel spoon, thoroughly homogenized, and transferred into the appropriate sample containers. A sample summary is presented in Table 2.

**Table 2. 300 APT Headworks Sampling Summary**

| Sample | Date/Time      | Survey Results <sup>a</sup>   | Core Size       |
|--------|----------------|---|-----------------|
| B0M961 | 10/29/97, 1120 | 6.5K dpm/100cm <sup>2</sup> beta/gamma<br>1.0K dpm/100cm <sup>2</sup> alpha | 4" dia/4" depth |
| B0M963 | 10/29/97, 1200 | 5.0K dpm/100cm <sup>2</sup> beta/gamma<br>1.0K dpm/100cm <sup>2</sup> alpha | 3" dia/4" depth |

<sup>a</sup> Survey measurements collected using an E600 instrument.

The radiological surface contamination survey measurements (using a P-11 instrument) of the headworks structure prior to demolition ranged from 3-15K dpm/100cm<sup>2</sup> beta/gamma and 210-336 dpm/100cm<sup>2</sup> alpha on the floor and walls (bath tub ring). The samples collected on October 29 were within the range of contamination identified on the surface of the headworks prior to demolition. With an estimate that penetration is typically limited to the first 0.25" of exposed concrete, the contaminated portion of concrete was calculated to represent approximately 2.3% of the headworks structure based on total volume. Using the same estimate for penetration depth, the headworks samples were calculated to represent greater than 6% of the contaminated portion of the concrete. Based on this information, it is concluded the objective to bias the sample collection as discussed in Section 2.0 was accomplished.

### 4.0 Sample Results

Samples were delivered under chain of custody to Quanterra on October 30, 1997. Samples were analyzed in accordance with the RDR/RAWP and the analytical methods identified in Table 1. Results of the samples with comparison to the applicable evaluation criteria are summarized in Table 3.

**Table 3. 300 APT Headworks Sample Results Summary**

| Analysis                       | Constituent          | Criteria | Limit (ppm) | B0M961 (ppm) | B0M963 (ppm) |
|--------------------------------|----------------------|----------|-------------|--------------|--------------|
| TCLP metals                    | arsenic              | TCLP     | 5           | 0.0056       | 0.0054       |
|                                | barium               |          | 100         | 0.625        | 0.433        |
|                                | cadmium              |          | 1           | 0.0007 U     | 0.0007 U     |
|                                | chromium             |          | 5           | 0.0392       | 0.0025       |
|                                | lead                 |          | 5           | 0.0011 U     | 0.0011 U     |
|                                | selenium             |          | 1           | 0.006        | 0.0044       |
|                                | silver               |          | 5           | 0.0011 U     | 0.0014       |
|                                | mercury              |          | 0.2         | 0.0001 U     | 0.0001 U     |
| volatile organics <sup>a</sup> | benzene              | TCLP     | 0.5         | 0.005 U      | 0.005 U      |
|                                | 2-butanone           |          | 200         | 0.02 U       | 0.02 U       |
|                                | carbon tetrachloride |          | 0.5         | 0.005 U      | 0.005 U      |
|                                | chlorobenzene        |          | 100         | 0.005 U      | 0.005 U      |
|                                | chloroform           |          | 6           | 0.005 U      | 0.005 U      |
|                                | 1,2-dichloroethane   |          | 0.5         | 0.005 U      | 0.005 U      |
|                                | 1,1-dichloroethene   |          | 0.7         | 0.005 U      | 0.005 U      |
|                                | tetrachloroethene    |          | 0.7         | 0.005 U      | 0.005 U      |
|                                | trichloroethene      |          | 0.5         | 0.005 U      | 0.005 U      |
|                                | vinyl chloride       |          | 0.2         | 0.01 U       | 0.01 U       |
| volatile organics              | 2-butanone           | SEE b    | 480         | 0.02 U       | 0.02 U       |
|                                | carbon tetrachloride |          | 0.034       | 0.005 U      | 0.005 U      |
|                                | chlorobenzene        |          | 16          | 0.005 U      | 0.005 U      |
|                                | tetrachloroethene    |          | 0.086       | 0.005 U      | 0.005 U      |
|                                | toluene              |          | 160         | 0.005 U      | 0.005 U      |
|                                | trichloroethene      |          | 0.398       | 0.005 U      | 0.005 U      |
|                                | xylene, total        |          | 1600        | 0.005 U      | 0.005 U      |
| semivolatile organics          | benzo(a)pyrene       | SEE c    | 18          | 6.6 U        | 6.6 U        |
|                                | chrysene             |          | 18          | 6.6 U        | 6.6 U        |
| ICP metals                     | thallium             | SEE c    | 245         | 1.7          | 1.5          |

Note: U - Constituent was not detected. Associated result is the sample quantitation limit.

<sup>a</sup> Concentrations of volatile organic constituents are reported as "totals" and evaluated against regulatory limits based on TCLP.

<sup>b</sup> Criteria and associated limits are derived from 100X the MTCA B groundwater standards.

<sup>c</sup> Criteria and associated limits are MTCA Method C cleanup standards for ingestion of soil.



## **5.0 Conclusion**

The objectives of the sampling design were accomplished. The analytical results were below the applicable evaluation criteria for all constituents. Based on this information, it is believed that a contained-in determination for debris pursuant to 40 CFR 261.3(f)(2) and WAC 173-303-070(2)(c)(ii) for the 300 APT headworks demolition can be supported.