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## Department of Energy

Richland Field Office

P.O. Box 550

Richland, Washington 99352



MAY 06 1993

93-RPA-209

Mr. David C. Nylander, Manager  
State of Washington  
Department of Ecology  
7601 West Clearwater Avenue, Suite 102  
Kennewick, Washington 99336

Mr. Roger F. Stanley, Director  
Tri-Party Agreement Implementation  
State of Washington  
Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

Dear Messrs. Nylander and Stanley:

### ADDITIONAL INFORMATION ON CARBON TETRACHLORIDE RELEASES FROM THE PLUTONIUM FINISHING FACILITY (PRF), HANFORD SITE, RICHLAND, WASHINGTON

Notification of a continuous release of carbon tetrachloride from PRF was made by the U.S. Department of Energy, Richland Operations Office (RL) to the State of Washington Department of Ecology (Ecology), U.S. Environmental Protection Agency (EPA) Region 10, and the State and Local Emergency Planning Office on January 21, 1993. This notification was made under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements (see attachment). The emission is expected to result from the restart of the PRF, which is located in the 200 West Area of the Hanford Site. Based on the initial test runs conducted in January 1993, and prior operational data, it was determined that the facility would exceed the CERCLA Reportable Quantity. The solvent extraction process will normally be operated Monday through Friday and be suspended on the weekends. Weekend emissions are anticipated to exceed the reportable quantity of ten pounds per day but will be lower than the levels during active processing. The releases during the weekday operations are not expected to exceed those of past campaigns.

In addition to the reporting requirements, an evaluation of the threat to human health was made in accordance with Washington Administrative Code (WAC) 173-303-145. This evaluation was based on the potential concentration of carbon tetrachloride in the breathing atmosphere in the areas adjacent to the facility and offsite. The greatest onsite concentrations (300 meters from the stack) were compared to the occupational exposure limit set by Occupational Safety and Health Act of two parts per million (ppm). The greatest offsite concentrations were compared against the Toxic Air Pollutants (TAPs) regulation WAC 173-460 for carbon tetrachloride. Although the TAPs Acceptable Source Impact Level (ASIL) technically applies to a new



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source, and hence is not directly applicable to the PRF release, RL believes that comparison with this limit is appropriate for determining whether the anticipated concentrations of carbon tetrachloride would be considered a threat to human health by Ecology.

The input parameters used to make the calculations include a stack height of 200 feet, an inside diameter of 15.5 feet, a flow rate of 214,000 cubic feet per minute, and an emission concentration of 6.5 ppm. The emission concentration is an average concentration taken from the last four campaigns at PRF that ranged from 6.15 to 6.79 ppm. This concentration may be a conservatively high number when averaged on an annual basis since none of the four previous campaigns lasted an entire year.

The result of the calculation for the onsite location where employees would likely be exposed to the highest concentration is the 272-WA Building which is 620 meters west northwest of the release point. The peak calculated values using the standard conservative dispersion model (SCREEN) for the release of carbon tetrachloride should be compared with the suitable short duration air concentration reference value for members of the public. The peak air concentration from SCREEN is  $6.86 \mu\text{g}/\text{m}^3$ . The 1990 National Institute of Occupational Health Threshold Limit Value is 2 ppm, or  $12,600 \mu\text{g}/\text{m}^3$ , which is much larger than the projected maximum.

The result of the calculation for the offsite location where a member of the public would likely be exposed to the highest concentration is 23.77 kilometer east of the PFP on the Hanford Site boundary. As stated above, the release is an ongoing activity so the ASIL (WAC 173-460) is used for comparative purposes only. Using the dispersion model (industrial source code - long-term) the highest annual average air concentration is  $0.0128 \mu\text{g}/\text{m}^3$ . The ASIL defined in the WAC for carbon tetrachloride is  $0.067 \mu\text{g}/\text{m}^3$  (WAC 173-460-110), which is much larger than the projected average.

Based upon the fact that the anticipated annual average carbon tetrachloride concentration is below Ecology's ASIL, and given that the ASIL is based upon a lifetime exposure, RL believes that the discharge does not represent a threat to human health. To ensure that you are kept informed of the status of these releases, RL will continue to include Ecology on all transmittals to the EPA regarding continuous release reporting for this discharge.

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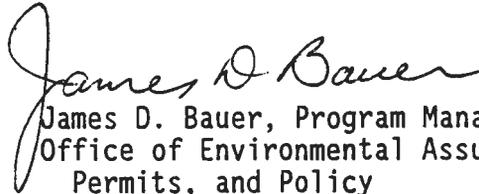
Messrs. Nylander and Stanley  
93-RPA-209

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If you have any questions regarding this transmittal, please call me or Mr. Alex Teimouri of my staff on (509) 376-6222.

Sincerely,

  
James D. Bauer, Program Manager  
Office of Environmental Assurance,  
Permits, and Policy

EAP:AET

Attachment

cc w/attach:  
B. G. Erlandson, WHC  
K. A. Gano, WHC  
P. T. Day, EPA  
B. King, Ecology

931302-122

**SECTION I: GENERAL INFORMATION**

CR-ERNS Number\* : 154457

Type of Report: Indicate below the type of report you are submitting.

- Initial Written Notification       Written Notification of a Change in the Source or Composition of a Release       Follow-up Report

If this report is a written notification of a change in the source or composition of a release, indicate below the type of change:

Adding a source       Deleting a source previously reported       Modifying the list of hazardous substances or mixtures released from a previously reported source

**Signed Statement:** I certify that the hazardous substance releases described herein are continuous and stable in quantity and rate under the definitions in 40 CFR 302.8(a) or 355.4(a)(2)(iii) and that all submitted information is accurate and current to the best of my knowledge.

James D. Bauer, Program Manager

Name and Position

Date

Signature

**Part A. Facility or Vessel Information**

Name of Facility or Vessel Hanford Site

Person in Charge of Facility or Vessel

Name of Person in Charge (last name, first name) Bauer, James D.  
 Position Program Manager, Office of Environmental Assurance, Permits, and Policy  
 Telephone No. (509) 376-5441      Alternate Telephone No. (509) 376-6222

Facility Address

Street 825 Jadwin Avenue      County Benton  
 City Richland      State WA      Zip Code 99352

Dun and Bradstreet Number for Facility

Vessel Port of Registration

Facility/Vessel Location

Latitude	Deg	<u>46°</u>	Min	<u>33</u>	Sec	<u>0</u>
Longitude	Deg	<u>119°</u>	Min	<u>38</u>	Sec	<u>0</u>

Vessel Loran Coordinates

**Part B. Population Information**

Population Density

Choose the range that describes the population density within a one-mile radius of your facility or vessel (indicate by placing an "X" in the appropriate blank below).

- 0 - 50 persons       101 - 500 persons       more than 1000 persons  
 51 - 100 persons       501 - 1000 persons

Sensitive Populations and Ecosystems

Identify and describe the location of any sensitive populations (e.g., elementary schools, hospitals, retirement communities) or ecosystems (e.g., wetlands, wildlife preserves) within a one-mile radius of your facility or vessel.

None

\* If hazardous substance releases from separate, contiguous, or adjacent facilities are included in this report, one unique CR-ERNS number will represent the entire site report. In this situation, however, releases of the same hazardous substance from different facilities on the site will be evaluated by EPA as if they were released from a single facility.

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SECTION II: SOURCE  
INFORMATION

CR-ERNS Number

154457

Part A: Basis for Asserting the Release is Continuous and Stable in Quantity and Rate

For each source of a release of a hazardous substance or mixture from your facility or vessel, provide the following information:

Name of Source: Plutonium Reclamation Facility 291-Z-1 Stack

1. Indicate whether the release from this source is either: continuous without interruption \_\_\_\_\_  
or  
routing, anticipated, intermittent Anticipated

2a. Identify the activity(ies) that results in the release from this source (e.g., batch process, filling of a storage tank).  
Plutonium Reclamation Facility (PRF)  
The solvent extraction (SX) process of PRF uses a mixture of tributyl phosphate (TBP) dissolved in carbon tetrachloride (CCl<sub>4</sub>) (Chemical Abstracts Service Registry Number [CASRN] 56235) to produce an organic solution capable of forming complexes with plutonium ions from an aqueous nitrate stream. The parameters of the extraction process require the use of immiscible liquids exhibiting a significant difference in their densities. The TBP has a density very near that of water and a high viscosity, so a suitable diluent was needed to increase or decrease the density of the stream. CCl<sub>4</sub> was chosen as the diluent because of its high density (1.59 g/m<sup>3</sup>). Use of CCl<sub>4</sub> has an additional benefit necessary for the PRF process: it serves as a fire suppressant when it combines with the hydrocarbon-based TBP, reducing the potential for fire in the PRF process.

2b. If the release results from a malfunction, describe the malfunction and explain why the release from the malfunction should be considered continuous and stable in quantity and rate.

3. Identify below how you established the pattern of the release and calculated release estimates.

Past release data       Your knowledge of the facility/vessel's operations and release history       Other (explain)  
 Engineering estimates       Your best professional judgment

\* Note that unanticipated events, such as spills, pipe ruptures, equipment failures, emergency shutdowns, or accidents, do not qualify for reduced reporting under CERCLA section 103(f)(2). Unanticipated events are not incidental to normal operations and, by definition, are not continuous or anticipated, and are not sufficiently predictable or regular to be considered stable in quantity and rate.

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**SECTION II: SOURCE INFORMATION**  
 (continued)

CR-ERNS Number

154457

**Part C. Identity and Quantity of Each Hazardous Substance or Mixture Released**  
**From Each Source Identified in Part B of Section II**

Name of Source: Plutonium Reclamation Facility 291-Z-1 Stack

List each hazardous substance released from the source identified above and provide the following information. (For an example, see Table 1 of the Guide.)

Name of Hazardous Substance	CASRN #	Normal Range (in lbs. or kg)*		Number of Releases (per year)	Total Annual Quantity Released (in lbs. or kg)*	Months During Which the Release Occurs
		Upper Bound	Lower Bound			
Carbon Tetrachloride	56235	400 lbs.	0		0*	Jan - Dec

\* Last operating year (1987) resulted in 18300 lbs. total quantity released.

List each mixture released from the source identified above and provide the following information. (For an example, see Table 2 of the Guide.)

Name of Mixture	Normal Range of Mixture (in lbs. or kg)*		Number of Releases (per year)	Total Annual Quantity of Mixture Released (in lbs. or kg)*	Months During Which the Release Occurs	Name of Hazardous Substance Components	CASRN #	Weight Percentage	Normal Range of Hazardous Substance Components (in lbs. or kg)*	
	Upper Bound	Lower Bound							Upper Bound	Lower Bound

\* Please be sure to include units where appropriate. Also, if the release is a radionuclide, units of curies (Ci) are appropriate.

SECTION III: HAZARDOUS  
SUBSTANCE  
INFORMATION

CR-ERNS Number

154457

Calculation of the SSI Trigger

List each hazardous substance or hazardous substance component of a mixture from each source for which you report release quantities in Section II, Part C. For an example of how to complete this section, refer to Table 3 of the Guide.

Name of Hazardous Substance: Carbon Tetrachloride

To calculate the SSI trigger (i.e., the upper bound of the normal range of a release) for the hazardous substance identified above, aggregate the upper bounds of the normal range of the identified hazardous substance across all sources identified in Section II, Part C. If the hazardous substance is also a component of a mixture, be certain to include the upper bound of the component as calculated in Section II, Part C, in your calculation of the SSI trigger.

Name of Source(s)

SSI Trigger (specify lbs, kg, or Ci)

Plutonium Reclamation Facility  
291-Z-1 Stack

400 lbs.

SSI trigger for this hazardous substance release: 400 lbs.

This method for calculating the SSI trigger for the hazardous substance assumes that all releases of the same hazardous substance or mixture occur simultaneously. To the extent that a hazardous substance is released from your facility from different sources and at different frequencies, you may adjust the SSI trigger, as appropriate, so that it more accurately reflects the frequency and quantity of the release. The SSI trigger in the final analysis must reflect the upper bound of the normal range of the release, taking into consideration all sources of the release at the facility or vessel. The normal range of the release includes all releases previously reported or occurring over a 24-hour period during the previous year.

9313022-1232

## CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
J. D. Bauer, RL (J. P. Zoric, WHC)	David C. Nylander, Ecology Roger F. Stanley, Ecology	Incoming: 9303955 (Xref: 9352783)

**Subject:** ADDITIONAL INFORMATION ON CARBON TETRACHLORIDE RELEASES FROM THE PLUTONIUM FINISHING FACILITY (PRF), HANFORD SITE, RICHLAND, WASHINGTON

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