



STATE OF WASHINGTON  
 DEPARTMENT OF ECOLOGY  
 3100 Port of Benton Blvd • Richland, WA 99352 • (509) 372-7950

December 15, 2004

Mr. Roy J. Schepens, Manager  
 Office of River Protection  
 United States Department of Energy  
 P.O. Box 450, MSIN: H6-60  
 Richland, Washington 99352

**RECEIVED**  
 MAR 24 2005  
**EDMC**

Dear Mr. Schepens:

Re: Notice of Construction (NOC) for the Bulk Vitrification Test and Demonstration Facility and Partial Retrieval of Tank 241-S-109, Revision 1 Approval Order

Enclosed is Order No. DE 04NWP-002. If you have any questions concerning the content of the document, please contact Jerry Hensley at (509) 736-3017 or Douglas Hendrickson at 372-7983. The enclosed Order may be appealed. The appeal procedures are described in the Order.

Sincerely,

Michael Wilson  
 Program Manager  
 Nuclear Waste Program

JH:nc  
 Enclosure

cc w/enc. Dennis Bowser, USDOE  
 Mary Jarvis, USDOE  
 Brad Erlandson, BNI  
 Ed Aromi, CH2M  
 Don Carrell, CH2M  
 Moses Jaraysi, CH2M  
 Chris Kemp, CH2M Hill  
 Felix Miera, CH2M Hill  
 John Bates, FH  
 William Green, FH

John Cox, CTUIR  
 Stuart Harris, CTUIR  
 Pat Sobotta, NPT  
 Russell Jim, YN  
 Todd Martin, HAB  
 Ken Niles, ODOE  
 Ro Vinson, PAC  
 Al Conklin, WDOH  
 Administrative Record  
 Environmental Portal

## **DETERMINATION**

The Washington State Department of Ecology (Ecology), pursuant to Revised Code of Washington (RCW) 70.94.152, Washington Administrative Code (WAC) 173-400, and WAC 173-460 makes the following determinations:

The facility, if operated as described in the Notice of Construction Application (NOCA), will be in accordance with applicable rules and regulations, as set forth in Chapter 173-400 WAC and 173-460 WAC, and the operation thereof will not result in ambient air quality standards being exceeded. Information submitted in the NOCA shows criteria pollutant NO<sub>x</sub> will exceed the threshold level of two tons/year contained in WAC 173-400-110(5)(d). Emissions of other criteria pollutants (PM/PM<sub>10</sub>, CO, SO<sub>2</sub>, VOC) will be below the threshold levels contained in WAC 173-400-110(5)(d). Toxic air pollutants will be below Small Quantity Emission Rate thresholds and Acceptable Source Impact Level thresholds contained in WAC 173-460-080(2)(e).

The proposed activities require an NOCA in accordance with WAC 173-400-110(2), and WAC 173-460-040(1)(a) because potential emissions of NO<sub>x</sub> are calculated to be 13 tons/year.

The United States Department of Energy (USDOE) has elected to take a federally enforceable limit on the number of hours for the diesel-fired boiler and the emergency diesel generator that will operate each year.

The proposed project, if constructed and operated as herein required, will provide all known, available, and reasonable methods of emission control.

**THEREFORE, IT IS ORDERED** that the project as described in said NOCA is approved for construction, installation and operation, provided the following conditions are met:

### **APPROVAL CONDITIONS:**

#### **1. TOTAL EMISSION LIMITS**

- 1.1 The activities described in the NOCA will be permitted with the control technologies proposed, provided that the total emissions from all activities will not result in exceedance of WAC 173-460 Small Quantity Emission Rates (SQERs) and Acceptable Source Impact Levels (ASILs) or the criteria pollutants estimates listed under the WAC 173-400 section of the completeness checklist.
- 1.2 A modification submittal of an NOCA will be required if the total emissions of criteria and/or toxic air pollutants exceed the emissions estimated in the NOCA and/or other limits specified under this order.
- 1.3 NO<sub>x</sub> emissions shall not exceed 13 tons per rolling 12 month total.

## **2. EMISSIONS CONTROL**

- 2.1 The activities described in the NOCA and summarized in the completeness checklist will be permitted without requiring additional emission control, provided that Best Available Control Technology/Toxics-Best Available Control Technology (BACT/T-BACT) emission controls described in the NOCA are in service during waste disturbing and bulk vitrification activities.
- 2.2 Emission control for particle or particle-bound Toxic Air Pollutant (TAP) emissions are High-Efficiency Particulate Air (HEPA) filtration. The use of this system as a required abatement control technology is covered under the radioactive air license, issued by the State of Washington Department of Health, with conditions and limitation specified therein. Controls regulated under that approval are deemed sufficient to address concerns over de minimus criteria and/or particulate TAP emissions.
- 2.3 For waste retrieval activities a portable exhauster, including major components of: a demister, heater, pre-filter and two stages of HEPA filters in series, fulfills T-BACT requirements in accordance with WAC 173-460-040.
- 2.4 For bulk vitrification activities, one venturi scrubber, two stages of HEPA filters in series, and one selective catalytic reduction unit fulfill T-BACT requirements in accordance with WAC 173-460-040.
- 2.5 Particulate emissions from offloading and transfer of process additives will be controlled by dedicated baghouse and vent systems. A covered hopper with a sealed pneumatic conveying system will be used to transfer soil to the mixer/dryer soil holding tank or silos. Particulate matter collected at the baghouse system is returned to the appropriate additive storage area for reuse.
- 2.6 The mixer/dryer emissions will be partially treated for moisture removal using a glycol-cooled condenser and mist eliminator prior to being routed to the Off Gas Treatment System (OGTS) downstream of the chemical/venturi scrubber. Water condensed in the condenser and removed in the mist eliminator will be routed to a storage tank for sampling and subsequent treatment or disposal.
- 2.7 The Phase 1 OGTS will consist of two sintered metal filters in series, a glycol-cooled condenser, a quench section, an atomizing chemical scrubber/venturi scrubber, and mist eliminator system. Condensed liquids will be drained into the condenser exhaust duct. Two quench/scrubber/mist eliminator systems will be installed in parallel, with one in service and the other on standby. Dilute sodium hydroxide will be injected in the atomizing scrubber section to reduce hydrogen chloride and other acid gas emissions. Based on expected or measured emission levels of pollutants such as hydrogen fluoride, both systems may be used simultaneously to provide additional scrubbing capabilities. Scrubber system offgases will pass through an additional condenser and mist eliminator, with drainage from those units routed to the scrubber recycle tanks. An offgas heater, parallel HEPA filters (in series), and a carbon filter will follow the mist eliminator.

NO<sub>x</sub> treatment will be accomplished by use of a selective catalytic reduction (SCR) unit. More than one SCR unit may be used. A packed tower scrubber may be used to allow the option of routing exhaust gases either through the SCR unit(s) or the tower scrubber to determine the effect on both scrubbing efficiency and scrubber blowdown rates. From the SCR unit(s), offgases will be routed through a polishing filter before being discharged through the exhaust stack equipped with sample ports and monitoring equipment.

Dust collected from the sintered metal filters will be recycled to the mixer/dryer, except for the final dust batch, which will be vitrified and sent to the integrated disposal facility (IDF) or another permitted disposal facility. Blowdown from the scrubber recycle tank will be sampled and routed to the permitted Effluent Treatment Facility or other permitted facility. Carbon filters will be modular and, upon reaching saturation, will be removed, sampled, and disposed.

- 2.8 Performance of the OGTS will be enhanced for Phase 2 to allow higher waste processing rates and to examine other NO<sub>x</sub> treatment methods. A larger SCR unit may be used or an additional unit added in series based on the analysis of Phase 1 emissions data. A packed tower scrubber may be used to allow the option of routing exhaust gases either through the SCR unit(s) or the tower scrubbers to determine the effect on both scrubbing efficiency and scrubber blowdown rates.
- 2.9 The diesel-fired boiler shall not operate for more than 7,008 hours per year on a 2-month rolling summation calculated once per month. Compliance shall be monitored by installing and operating a non-resettable totalizer on the boiler.
- 2.10 During phase 1 of the project, the diesel generator shall not operate for more than 20 hours. During phase 2 the diesel generator shall not operate for more than 80 hours. Compliance shall be monitored by installing and operating a non-resettable totalizer on the generator.

### **3. EMISSION ESTIMATES VERIFICATION**

To ensure the emission estimates for waste disturbing and bulk vitrification activities are valid and bounding, the permittee shall confirm emission calculations derived from waste characterization data obtained through implementation of the Demonstration Bulk Vitrification System Data Quality Objective (DQO) (RPP-21227). The DQO will be implemented through the Ecology approved Sample and Analysis Plan as required by the Dangerous and/or Mixed Waste Research, Development, and Demonstration Permit (RD&D), Demonstration Bulk Vitrification System. The RD&D Permit and the Sample and Analysis Plan must be approved by Ecology prior to commencing any waste disturbing activities.

#### 4. EMISSION CONTROL MONITORS

Refer to Section 5.3.8 of the NOCA. Monitoring is required for NO<sub>x</sub> emissions from bulk vitrification processing. Monitoring of Volatile Organic Compound (VOC) is required during waste retrieval operations and is to be conducted in accordance with the Hanford Industrial Hygiene monitoring program for potential worker exposure.

#### 5. PROPOSED GENERAL APPROVAL CONDITIONS

- a. **Visible Emissions:** The emissions from the retrieval and bulk vitrification activities shall not exceed 10% opacity. This shall be achieved by maintaining proper abatement control technology as required by the Washington State Department of Health. The emissions from the diesel generator exhaust shall not exceed 20% opacity. Visible emissions survey must be conducted during daylight hours and during periods when the emission unit is operating. The frequency shall be at least once per calendar quarter when operated. If the operator observes visible emissions for more than 10 consecutive minutes during the observation period, the cause of the visible emission will be determined and corrective actions taken as necessary or a visible determination of opacity will be performed using Ecology Method 9A or the United States Environmental Protection Agency (EPA) Method 9. Records of corrective actions taken to reduce opacity shall be maintained and available for Ecology inspection.
- b. **Compliance Assurance Access:** Access to the source by EPA or Ecology shall be allowed for the purposes of compliance assurance inspections. Failure to allow access is grounds for revocation of the Order approving the NOCA.
- c. **Modification to Facility or Operating Procedures:** Any modification to T-BACT control equipment identified in 2.3 and 2.4 above, contrary to information in the NOCA, shall be reported to Ecology at least 60 days before such modification. Such modifications may require a new, or amended, NOC Approval Order.
- d. **Emissions Detrimental to Persons or Property:** No person shall cause or permit the emission of any air contaminant for any source if it is detrimental to the health, safety, or welfare of any person, or causes damage to property or business.
- e. **Activities Inconsistent with this Order:** Any activity undertaken by the Permittee or others, in a manner that is inconsistent with the NOCA, and this determination, shall be subject to Ecology enforcement under applicable regulations.
- f. **Obligations under Other Laws or Regulations:** Nothing in this Order shall be construed to relieve the Permittee of its obligations under any local, state, or federal laws, or regulations.
- g. Incorporate permit approval conditions into the Hanford Site Air Operating Permit when scheduled for revision.

Nothing in this approval shall be construed as obviating compliance with any requirement of law other than those imposed pursuant to the Washington Clean Air Act, and rules and regulations there under.

Any violation of such rules and regulations, or of the terms of this Order, shall be subject to the sanctions provided in Chapter 70.94 RCW.

**6. MANUALS**

Existing operation and maintenance (O&M) manuals for all equipment, procedures, and controls associated with the Off Gas Treatment System that have the potential to affect emissions to the atmosphere shall be followed. Manufacturers' instructions may be referenced. The O&M manuals shall be updated to reflect any modifications of the process or operating procedures. Copies of the O&M manuals shall be available to Ecology upon request.

**7. NOTIFICATION AND SUBMITTALS**

Any required notifications and submittals required under these Approval Conditions shall be sent to:

Washington State Department of Ecology  
Nuclear Waste Program  
3100 Port of Benton Boulevard  
Richland, Washington 99354-1670

**8. RECORDKEEPING**

Specific OGTS records shall be kept on-site by the Permittee and made available for inspection by Ecology upon request. The OGTS records shall be organized in a readily accessible manner and cover the most recent six month period and shall include the OGTS Work Package activities, including maintenance.

Applicable records required under this approval will be maintained on file and made available for Ecology inspector requests. Estimated emissions will be compiled and reported annually beginning with calendar year 2005 nonradioactive inventory of airborne emissions, pursuant to WAC 173-400-105.

- a. Monitoring and reporting of NO<sub>x</sub> emissions is required for bulk vitrification processing. Report nonradioactive NO<sub>x</sub> emissions annually beginning with calendar year 2005 pursuant to WAC 173-400-105.
- b. Monitoring of VOCs is required during waste retrieval operations and is to be conducted in accordance with the Hanford Industrial Hygiene Monitoring Program for potential worker exposure. Monitor once before exhauster operation begins, once during exhauster operation, and once after exhauster operation is completed. Records of VOC sample results will be maintained onsite and made available to Ecology upon request.

Specific VOC monitoring records during waste retrieval operations shall be made available for inspection by Ecology upon request.

**9. APPROVAL ORDER AND RESTRICTIONS**

Authorization may be modified, suspended or revoked in whole, or part, for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this authorization.
2. Obtaining this authorization by misrepresentation, or failure to disclose fully all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization, or application, or any provisions of this authorization to any circumstances is held invalid, the application of such provision to their circumstances, and the remainder of this authorization shall not be affected thereby.

Any person feeling aggrieved by this ORDER may obtain review thereof by application, within 30 days of receipt of the ORDER, to:

Pollution Control Hearing Board  
P.O. Box 40903  
Olympia, Washington 98504-0903

Concurrently, copies of the application must be sent to:

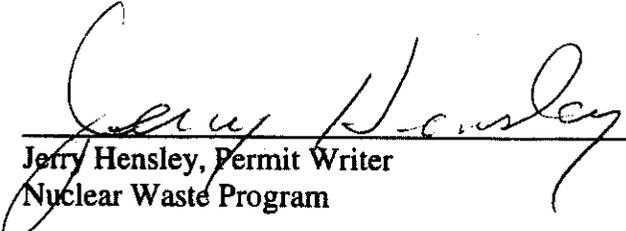
Washington State Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

Washington State Department of Ecology  
3100 Port of Benton Boulevard  
Richland, Washington 99354-1670

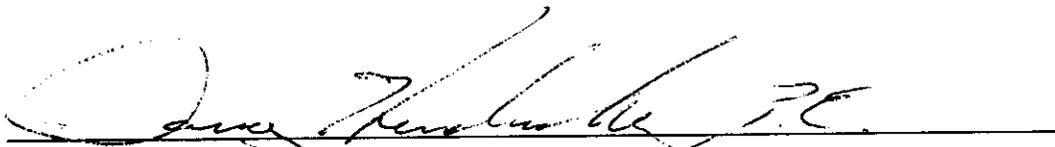
These procedures are consistent with the provisions of Chapter 43.21B RCW, and the rules and regulations adopted thereunder.

DATED at Richland, Washington, this 15<sup>th</sup> day of December 2004.

PREPARED BY:

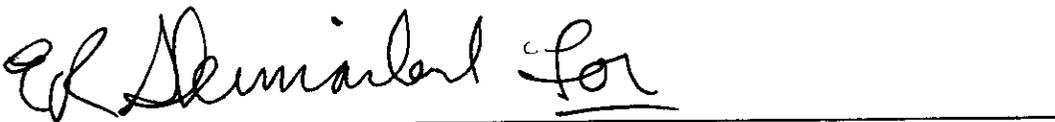
  
\_\_\_\_\_  
Jerry Hensley, Permit Writer  
Nuclear Waste Program

REVIEWED BY:



Doug Hendrickson, P.E. Lead Air Engineer  
Nuclear Waste Program

APPROVED BY:



Michael A. Wilson, Program Manager  
Nuclear Waste Program





STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

3100 Port of Benton Blvd • Richland, WA 99352 • (509) 372-7950

December 13, 2004

Mr. Roy J. Schepens, Manager  
Office of River Protection  
United States Department of Energy  
P.O. Box 450, MSIN: H6-60  
Richland, Washington 99354-1670

Mr. Keith A. Klein, Manager  
Richland Operations Office  
United States Department of Energy  
P.O. Box 550, MSIN: A7-50  
Richland, Washington 99354-1670

Mr. Edward S. Aromi  
CH2M HILL Hanford Group, Inc.  
P.O. Box 1500, MSIN: H6-08  
Richland, Washington 99354-1670

Dear Messrs. Schepens, Klein, and Aromi:

**Re: Final Dangerous and/or Mixed Waste Research, Development, and Demonstration  
Permit for the Demonstration Bulk Vitrification Facility**

Enclosed is the Dangerous and/or Mixed Waste Research, Development, and Demonstration Permit for the Demonstration Bulk Vitrification Facility (DBVS Facility), west of the 241-S Tank Farm in the 200 West Area of the Hanford Site. The Permit has been issued to the United States Department of Energy (USDOE), Office of River Protection (ORP) and CH2M HILL Hanford Group, Inc. (CH2M) in accordance with the applicable provisions of the Hazardous Waste Management Act, Chapter 70.105 Revised Code of Washington (RCW), and the regulations promulgated hereunder in Chapter 173-303 Washington Administrative Code (WAC). Also enclosed is the Fact Sheet for the Permit. Additional copies of the Permit will be provided on CD-ROM, if requested.



Messrs. Schepens, Klein, and Aromi  
December 13, 2004  
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This Permit is not a part of the Dangerous Waste Portion of the *Resource Conservation and Recovery Act of 1976* (RCRA) Permit for the Treatment, Storage, and Disposal of Dangerous Waste Permit issued to USDOE March 28, 2000.

This Permit is effective as of **January 12, 2004**, and shall remain in effect until December 13, 2007. This Permit shall not exceed 400 operating days of the Dangerous and/or Mixed Waste Research, Development, and Demonstration Activity authorized by this Permit.

During the 45-day public comment period of the draft permit, comments were received from eight individuals, Allan Panitch, CH2M HILL, Confederated Tribes of the Umatilla Indian Reservation, Ron Bourgoin, Allyn Boldt, Floyd E. Ivey, Heart of America Northwest, and Confederated Tribes and Bands of the Yakama Nation. The comments are addressed in the enclosed Responsiveness Summary as required by Washington Administrative Code (WAC) 173-303-840(9).

The final permit package consists of the Responsiveness Summary, Fact Sheet, Permit Conditions, and Permit Attachments 1, AA through LL (the approved Part A Permit Application).

The success of this expedited permitting effort is due in large part to the spirit of teamwork and cooperation exhibited by ORP, CH2M, and Ecology.

This Permit can be appealed. Your appeal must be filed with the Pollution Control Hearings Board, P.O. Box 40903, Olympia, Washington 98504-0903, within thirty (30) days of the receipt of the Permit and in accordance with WAC 173-303-845. At the same time, your appeal must be sent to the Department of Ecology, c/o Enforcement Officer, P.O. Box 47600, Olympia, Washington 98504-7600, and to Ecology's Nuclear Waste Program, 3100 Port of Benton Boulevard., Richland, Washington 99334-6018. The notice of appeal must contain a copy of the order or decision being appealed, and if the order or decision followed an application, a copy of the application. Your appeal alone will not stay the effectiveness of this Permit. Stay requests must be submitted in accordance with RCW 43.21B.320. These procedures are consistent with Chapter 43.21B RCW.

Any appeal must contain the following in accordance with the rules of the Hearings Board:

- A. The appellant's name and address.
- B. The coverage date and number of the permit appealed.
- C. A description of the substance of the permit coverage that is the subject of the appeal.
- D. A clear, separate, and concise statement of each error alleged to have been committed.

Messrs. Schepens, Klein, and Aromi  
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- E. A clear and concise statement of facts upon which the requester relies to sustain such statements of error.
- F. A statement setting forth the relief sought.

If you have any questions regarding this action, please call Kathy Conaway at (509) 372-7890 or Suzanne Dahl at (509) 372-7892.

Sincerely,



Michael Wilson  
Program Manager  
Nuclear Waste Program

KC:nc  
Enclosures

cc w/o enclosures: Joel Hebdon, USDOE  
Billie Mauss, USDOE  
Dennis Hamilton, CH2M  
Felix Miera, CH2M  
Richard Raymond, CH2M  
Ro Vinson, PAC  
Stuart Harris, CTUIR  
Pat Sobotta, NPT  
Russell Jim, YN  
Todd Martin, HAB  
Ken Niles, ODOE  
Environmental Portal

cc/enclosures: Administrative Record: RD&D



## **FACT SHEET**

**FOR**

**DANGEROUS AND/OR MIXED WASTE RESEARCH, DEVELOPMENT,  
AND DEMONSTRATION PERMIT**

**DEMONSTRATION BULK VITRIFICATION SYSTEM  
LOCATED IN THE  
200 WEST AREA OF THE HANFORD SITE  
RICHLAND, WASHINGTON 99354**

**WA7 89000 8967**

### **Permittees**

United States Department of Energy, Office of River Protection  
Owner/Operator  
P.O. Box 450  
Richland, Washington 99354

CH2M HILL Hanford Group, Inc.  
Co-Operator  
P.O. Box 1500  
Richland, Washington 99354

This fact sheet has been developed by the Washington State Department of Ecology (Ecology) in accordance with the requirements of Washington Administrative Code (WAC) 173-303-840(2)(f). Its purpose is to discuss the proposed draft research, development, and demonstration (RD&D) permit for the United States Department of Energy (USDOE), Office of River Protection (ORP) for the proposed Demonstration Bulk Vitrification System (DBVS) Facility located west of and adjacent to the 241-S Tank Farm in the 200 West area of the Hanford Site.

This fact sheet provides the following information:

- Section A – RD&D Permit Overview
- Section B – Description of the Bulk Vitrification Test and Demonstration Facility
- Section C – General requirements and administration for an RD&D permit in Washington
- Section D – Procedures for reaching a final decision on the DBVS Facility RD&D draft permit
- Section E – Summary of the approach and permit requirements in the draft RD&D permit for the DBVS Facility
- Section F – Time limits under this draft RD&D permit
- Section G – Conclusion

## **A. OVERVIEW**

The purpose of the RD&D Permit is to allow for the Test and Demonstration of the bulk vitrification facility for treatment of Hanford Site tank wastes. The Permit is temporary in duration and limits the quantities of dangerous and/or mixed waste to be treated. (Mixed waste is defined as a dangerous, extremely hazardous, or acutely hazardous waste that contains both radioactive and hazardous constituents). The Permit also includes stringent terms to protect public health and the environment.

The treatment process which would be developed under this Permit is a key element of the overall treatment system being developed to retrieve and remediate the mixed waste in the underground storage tanks at Hanford's tank farms. The safety and cleanup of these tanks has been a major public concern for some time.

Under this Permit, the Permittees will evaluate the ability of bulk vitrification to produce immobilized low-activity waste (ILAW) that is comparable to that proposed for the Hanford Site Waste Treatment and Immobilization Plant (WTP) immobilized low-activity waste form. The Permittees will be required to provide data for waste form qualifications, risk assessments, and performance assessments for treatment and near-surface land disposal of low-activity waste.

Mixed waste retrieved as salt-solution from single-shell Tank 241-S-109 will be processed through the bulk vitrification treatment system which consists of mixing the waste with glass-forming agents (soil and small amounts of minerals) and drying, transferring the contents into a container lined with heat-resistant insulation materials, and heating the contents by resistive heating through electrodes immersed in the soil/waste mixture. The heat produced by the resistance of the waste/soil mixture will create temperatures high enough to melt the glass formers and incorporate the low-activity waste. The resistive heating melts the waste and glass forming agents into a monolithic vitrified (glass) mass. Gases generated during the process are captured within the enclosed vitrification container and, along with cooling air, are routed to an offgas treatment system. Some of the containers will be "spiked" with various simulants and other additives to represent the wide variety of tank waste that is contained in the Hanford Tank Farms.

Containers of vitrified wastes from RD&D activities are expected to be disposed of on-site in a Resource Conservation and Recovery Act (RCRA) permitted disposal facility. Prior to final disposal, containers of vitrified wastes will be stored within the DBVS Facility, or other on-site permitted container storage areas, such as the Central Waste Complex. The vitrified waste form in the container will be sampled and analyzed in accordance with the Ecology approved DBVS Facility campaign plan. Some secondary wastes will be generated from the process. The secondary wastes will be analyzed, treated, and properly disposed of on-site at a permitted facility.

Exhaust gases (purge air, water vapor, waste decomposition products, etc.) from vitrification are vented to an offgas treatment system. The offgas treatment system will be designed, maintained, and operated to minimize the emissions of air contaminants and to minimize process upsets.

This RD&D project is a key step to the design of a full scale bulk vitrification facility if bulk vitrification is chosen as the best option for supplementing the low-activity waste vitrification at the WTP. This RD&D project is identified as milestone M-45-00 and M-62-00 in the *Hanford Federal Facilities Agreement and Consent Order* (HFFACO).

## **B. FACILITY DESCRIPTION**

Ecology received a Dangerous Waste Permit Application for the RD&D on May 10, 2004, USDOE, ORP and CH2M HILL Hanford Group Inc. (CH2M HILL). The proposed DBVS Facility is owned by ORP and will be managed and co-operated by CH2M HILL. ORP will have the responsibility for all administrative, operational, regulatory compliance, and other responsibilities associated with activities under the proposed RD&D Permit. All activities will be conducted at the Hanford Site, Richland, Washington. The United States Environmental Protection Agency (EPA) identification number is WA7 890008 967, which covers the entire Hanford Site. The RD&D Draft Permit is not part of the (Hanford Sitewide RCRA Permit) Dangerous Waste Portion of the RCRA Permit for the Treatment, Storage, and Disposal (TSD) of Dangerous Waste Permit issued to USDOE March 28, 2000, which has the same EPA identification number.

A *Washington State Environmental Policy Act* (SEPA) environmental checklist was submitted in support of the application for an RD&D Permit May 10, 2004. Ecology reviewed the draft permit and the SEPA environmental checklist and prepared a Mitigated Determination of Non-Significance (DNS). A Categorical Exclusion (CX) was prepared by ORP for the DBVS Facility in accordance with the National Environmental Policy Act (NEPA) and USDOE implementing regulations, 40 Code of Federal Regulations (CFR) 1500-1508 and 10 CFR 1021. General information concerning the Hanford Facility environment can be found in the *Hanford Site National Environmental Policy Act (NEPA) Characterization* report (PNNL-6415).

In addition to the RD&D Permit, ORP will apply for and obtain the following permits prior to the start-up of DBVS Facility operations:

- Emissions Source Construction Permit (Washington State Department of Ecology, Nuclear Waste Program). If nonradioactive emissions are below permitting thresholds found in WAC 173-400-102, an exemption from permitting requirements will be requested.
- Radioactive Emissions Source Construction Permit (Washington State Department of Health).

- Radioactive Air Emissions Notice of Construction Application for a Categorical Tank Farm Facility Waste Retrieval and Closure: Phase II – Waste Retrieval Operations (Washington State Department of Health).
- Criteria and Toxics Air Emissions, Categorical Notice of Construction Application for Operations of Waste Retrieval Systems in Single-Shell Tank Farms (Washington State Department of Ecology).

The DBVS Facility will test in-container bulk vitrification of Hanford Site dangerous and/or mixed wastes from Tank 241-S-109. The permit application proposes treatment of up to 1,135,500 liters, or about 300,000 gallons, of Tank 241-S-109 waste in two phases, or approximately one-half the waste contained in Tank 241-S-109. The 1,135,500 liters (300,000 gallons) is less than 1% of the 53 million gallons of tank waste stored in the Hanford double-shell tanks and single-shell tanks.

The ORP has created aggressive initiatives to accelerate the closure of the Hanford Site tank farms with single-shell tanks (SSTs) and double-shell tanks (DSTs) containing mixed radioactive and dangerous waste. To meet the *Hanford Federal Facilities Agreement and Consent Order* (HFFACO) requirements for completing retrieval of all SSTs by 2018 and completing tank waste treatment by 2028 (M-45-00 and M-62-00), and effectively managing costs, ORP is evaluating bulk vitrification treatment of waste from selected tanks to supplement high-level waste and low-activity waste (LAW) vitrification at the WTP.

Completing low-activity waste treatment by 2028 without adding a second LAW WTP facility would require making optimal use of the first WTP melter to maximize throughput during the design life of the plant. It will also require providing additional treatment approaches outside the WTP for low-activity waste streams such as bulk vitrification.

The proposed DBVS facility will be used to evaluate the ability to produce ILAW that is comparable to that proposed for the WTP ILAW; the compatibility of the technology with actual tank waste; the safety, efficiency, and potential cost-effectiveness of the bulk vitrification process; and the feasibility of full-scale application. The proposed DBVS Facility is designed to investigate requirements for feed material handling, equipment operation, residual material handling, production and control of secondary wastes, and potential environmental impacts associated with the process.

### **C. RCRA PERMITTING OF RD&D FACILITIES IN WASHINGTON**

The Washington State Hazardous Waste Management Act, Chapter 70.105 Revised Code of Washington (RCW) and the regulations promulgated there under in Chapter 173-303 of the WAC, regulate the management of dangerous waste in Washington. Ecology may issue an RD&D Permit to a facility that proposes to utilize an innovative and experimental dangerous waste treatment technology or process as specified in WAC 173-303-809. The following significant provisions of the regulations apply to permitting RD&D facilities:

- Ecology has the responsibility to ensure that an RD&D Permit includes terms and conditions on the design and operation of the facility to assure protection of human health and the environment. [WAC 173-303-809(1)]
- RD&D Permits will provide for the receipt and treatment by the facility of only those types and quantities of dangerous waste that is necessary for purposes of determining the efficacy and performance capabilities of the technology or process and its effects on human health and the environment. [WAC-173-303-809(1)(a)]
- RD&D Permits will include such requirements that are necessary to protect human health and the environment (including, but not limited to, requirements regarding monitoring, operation, financial responsibility, closure, and remedial action), and such requirements that are necessary for the purposes of testing and providing information on the operation of the facility. [WAC 173-303-809(1)(b)]
- Ecology has some discretion when determining which permitting requirements of a dangerous waste treatment facility should be applied to an RD&D facility. However, the primary mandate to protect human health and the environment must be assured. [WAC 173-303-809(2)]
- Ecology has the authority to immediately terminate all operations at an RD&D facility at any time it determines that termination is necessary to protect human health and the environment. [WAC 173-303-809(3)]
- Operation of an RD&D facility is limited to one year (based on 365 separate "operating days" which may be non-consecutive) unless renewed. An issued RD&D Permit may be renewed not more than three times. Each such renewal will be for a period of not more than one year. [WAC 173-303-809(1) and (4)]

The draft permit indicates Ecology's tentative decision to issue an RD&D Permit for the DBVS Facility. This tentative decision is subject to public review and comment. Ecology will consider all public comments before making its final decision on whether to issue an RD&D Permit to the DBVS Facility. [Regulatory requirements for the public review process are in WAC 173-303-840(3) through (9), and discussed in Section D of this Fact Sheet.]

Ecology will sign the RD&D Permit, if a final permit is issued to the facility. Ecology has primary responsibility for ensuring compliance with dangerous and/or mixed waste regulations, including making permitting decisions.

#### **D. PROCEDURES FOR RECEIVING PUBLIC COMMENT AND REACHING A FINAL PERMIT DECISION**

A 45-day public comment period on Ecology's tentative decision to issue an RD&D Permit to the DBVS Facility runs from July 26, 2004, to September 9, 2004. All comments received during the public comment period will be considered and responded to before final decisions are made on the proposed conditions. Comments must be post-marked or received by e-mail no later than September 9, 2004. Comments hand

delivered by September 9, 2004, to the address below, also will be accepted. Direct all written comments to:

Kathy Conaway  
Washington State Department of Ecology  
3100 Port of Benton Boulevard  
Richland, Washington 99354  
E-mail address: [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov)

A public meeting will be held on August 31, 2004, at the address shown above. Verbal comments can be made at the meeting. Ecology will consider and respond to all written comments submitted by the deadline and verbal comments submitted at the public meeting. After considering the comments and testimony, Ecology will either finalize their decision or make a new tentative decision. If Ecology finalizes the decision, it will become effective 30 days after Ecology provides notice of the decision to the Permittees and all who commented. However, if no public comments are received on the tentative decision, then the final decision will be effective as soon as Ecology announces it. If Ecology's decision includes substantial permit changes because of public comment, Ecology will initiate a new public comment period.

All commenters and the Permittees shall receive a copy of the responsiveness summary and a notification of the final decision. Ecology's final decision may be appealed within 30 days after the final decision has been received.

Copies of the Permit and Fact Sheet for the Hanford Facility are available for review at the Hanford Public Information Repositories listed below. [For additional information, call the Hanford Cleanup Hotline toll-free at (800) 321-2008].

### **HANFORD PUBLIC INFORMATION REPOSITORIES**

#### **Portland**

Portland State University  
Branford Price Miller Library  
934 SW Harrison and Park  
Portland, Oregon 97207  
(503) 725-3690  
Attn: Michael Bowman/Jocelyn Kramer  
E-mail: [bowman@lib.pdx.edu](mailto:bowman@lib.pdx.edu)

#### **Richland**

Public Reading Room  
2770 University Drive  
Consolidated Information Center, Room 101L  
Richland, Washington 99352  
(509) 372-7443  
Attn: Terri Traub  
E-mail: [reading\\_room@pnl.gov](mailto:reading_room@pnl.gov)

**Spokane**

Gonzaga University  
Foley Center  
East 502 Boone  
Spokane, Washington 99258-0001  
(509) 323-3839  
Attn: Connie Scarppelli  
E-mail: [carter@its.gonzaga.edu](mailto:carter@its.gonzaga.edu)

**Seattle**

University of Washington Suzzallo Library  
Government Publication Division  
Seattle, Washington 98195  
(206) 543-4664  
Attn: Eleanor Chase  
E-mail: [echase@u.washington.edu](mailto:echase@u.washington.edu)  
Public Service: (206) 543-1937

This fact sheet and draft permit are also available on the World Wide Web at  
<http://www.ecy.wa.gov/programs/nwp/>.

If special accommodations are needed for public comment, please contact Tim Hill,  
Washington State Department of Ecology, Nuclear Waste Program, at (509) 372-7908  
(voice) or (360) 407-6006 (TDD).

In addition, Ecology's SEPA decision of a determination of non-significance (DNS) is  
available for review and comment during this 45-day public comment period and at the  
public meeting. Direct all written SEPA comments to:

Melinda Brown  
Washington State Department of Ecology  
3100 Port of Benton Boulevard  
Richland, Washington 99354  
E-mail address: [Mbro461@ecy.wa.gov](mailto:Mbro461@ecy.wa.gov)

**E. PERMITTING APPROACH AND REQUIREMENTS**

The draft permit combines two approaches to ensure protection of human health and the  
environment as required by WAC 173-303-809. These are briefly described in the  
following paragraphs.

First, although the Permit is for an RD&D facility, it includes requirements that would  
apply to a commercial dangerous and/or mixed waste treatment and storage facility, such  
as procedures and standards of waste analysis, waste management, waste storage, tank  
systems, land disposal restrictions, and facility closure. Additionally, the Permit  
requirements for personnel training, general facility inspection, preparedness and  
prevention, emergency planning, record keeping, and reporting, are comparable to  
requirements for a commercial treatment and storage facility. These requirements are  
discussed more fully below.

Second, design, operation, and monitoring requirements and treatment effectiveness (e.g.,  
destruction and removal of constituents in the tank waste, constituent levels in glass  
product and offgas systems emissions) are set forth in the Permit to apply to each RD&D

campaign plan. For example, the Permittee is required to document in each RD&D campaign plan that the design and operation during the campaign is projected to meet performance standards (e.g., destruction and removal of organics, metal emissions, particulate emissions, etc.). The Permittee is also required during Phase 2 of the RD&D to perform emission testing to demonstrate performance standards. The Permit also requires that based on the organics projected to be introduced into DBVS, that no more than 50% of the organic design capacity of the carbon filter which is part of the offgas system will be utilized. The Permit requires that the remaining organic capacity of the carbon filter be tracked through a running count of the organic inventory fed, as well as, by emission monitoring. The Permit requires that emergency condition parameters and operating limits be established to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from the RD&D DBVS Facility and that the DBVS Facility be operated within these limits.

### **Equipment and Process Description**

The primary technology to be used for the Demonstration Bulk Vitrification System is an in-container vitrification process where waste and glass formers such as soil and minerals are mixed, dried, and then placed in a container for vitrification. The waste material consists of a liquid salt solution retrieved from Tank 241-S-109, which will be transferred to one or more storage tanks. The waste is mixed with glass formers in a mixer/dryer unit and dried prior to being transferred to the waste vitrification container.

Demonstration Bulk Vitrification System operations will emit both nonradioactive (regulated by Ecology) and radioactive (regulated by the Washington State Department of Health) emissions and be operated in compliance with required air permit conditions. Exhaust stacks for these sources will be equipped with continuous emissions monitoring systems (CEMS) that will monitor and record emissions of radionuclides, particulate matter, carbon monoxide (CO), oxides of sulfur (SO<sub>x</sub>), oxides of nitrogen (NO<sub>x</sub>), and organics. Offgas treatment will be performed for the following Demonstration Bulk Vitrification System effluents:

- Particulate and gaseous emissions from waste receipt and storage
- Particulate emissions from process additive receipt, storage, and transfer (not including fugitive emissions from stockpiles)
- Particulate and gaseous emissions from the mixer/dryer (dedicated partial system)
- Particulate and gaseous emissions from waste container filling and vitrification
- Particulate emissions from waste container top-off after vitrification

With the exception of nonhazardous and nonradioactive process additive management emissions, which will be controlled by dedicated baghouse and vent systems, all system emissions will be routed to a main offgas treatment system prior to discharge to the atmosphere. Condensed liquids are drained into the condenser exhaust duct. Two quench/scrubber/mist eliminator systems will be installed in parallel, with one in service and the other on standby. Scrubber system offgases will pass through an additional

condenser and mist eliminator, with drainage from those units routed to the scrubber recycle tanks. An offgas heater, parallel high efficiency particulate air (HEPA) filters, and a carbon filter and a polishing filter will follow the mist eliminator. Oxides of nitrogen treatment will be accomplished by a selective catalytic reduction unit. A packed tower scrubber will be used as a backup to the selective catalytic reduction (SCR) unit. This will also allow for the option of routing exhaust gases either through the SCR or the tower scrubber. Offgases will be discharged through redundant exhaust blowers in parallel, and the system stack.

The typical waste container for the vitrification process is expected to be a steel box approximately 3.0 m high (10 feet), 2.4 m wide (8 feet), and 7.3 m long (24 feet). The waste container is lined with sand and a heat insulating liner. A lid with the electrodes attached is bolted into place. Once the waste container is prepared, power cables are connected to the electrodes and the offgas system ductwork is connected to the lid. At this time, the waste/glass forming mixture is placed in the container through a contained transfer system. The initial waste/glass forming mixture will be placed into the waste container to a depth of about 1.55 m (about 5.1 feet). Electric power will be applied to the electrodes, vitrifying the container contents via resistive heating that produces immobilized low-activity waste. Exhaust gases (purge air, water vapor, waste decomposition products, etc.) from vitrification are vented to an offgas treatment system. As the mixture initially placed in the container melts, additional mixture is added until the container is filled to the appropriate level with melted immobilized low-activity waste. Electrical resistance heating for approximately 130 hours vitrifies the waste mixture in the container. During this time, temperatures in the container may range up to 1300 degrees centigrade.

After vitrification has been completed, the container will remain connected to the offgas treatment system while cooling occurs. When the container is cool enough, additional clean soil will be added around the electrodes and to cover the top of the vitrified mass, thereby minimizing empty headspace in the container and to meet disposal site criteria. Sampling of the vitrified waste, radiation surveying, and external decontamination, as necessary, will be performed. Sampling of the melt will be conducted by a coring process through a port in the container.

### **System Operation in a Phased Approach**

Under the planned project, The Demonstration Bulk Vitrification System will be conducted in two phases with a short period between phases for equipment and site upgrades. Phase 1 operations will utilize only minimal amounts of actual waste and will be conducted over a month to three-month time frame. At the completion of Phase 1 operations, the DBVS and Waste Receipt System (WRS) will be reconfigured for Phase 2 operations. Phase 1 and Phase 2 will include all required controls and safeguards for human health and the environment and will be in compliance with all applicable state regulations.

Phase 1 will consist of treatment of up to three container loads of waste (three campaign runs) approximately up to 300 gallons and no more than 1,080 gallons of tank waste from Tank 241-S-109 (not including liquid added for retrieval). Simulants (i.e., materials

similar in chemical composition to tank waste) will be added to the waste load along with the glass formers to create a container load of treated waste. The amount of waste introduced into each container will vary during Phase 1.

Phase 2 will consist of treatment of up to 300,000 gallons (1,135,500 L) of waste in the DBVS Facility from Tank 241-S-109 (not including liquid added for retrieval). The amount of waste introduced into each container will vary during Phase 2. No more than 50 containers will be vitrified for both phases for the duration of the RD&D project .

Tank waste that does not meet the waste acceptance criteria for the DBVS Facility will be transferred to the DST system. Tank waste, process additives, and process control parameters will be varied to establish acceptable operating process and parameters and envelopes. It is anticipated that one container load of material will be vitrified weekly over 400 operating days which is expected to extend to no more than one calendar year. The goal of Phase 2 is to optimize the DBVS performance and operation for full-scale use; land disposal restriction (LDR); *Hanford Site Solid Waste Acceptance Criteria* (HNF-EP-0063); and the waste acceptance criteria of the receiving TSD facility.

The sodium oxide concentration in each container load will vary from approximately 2% to 20%, or the maximum concentration that produces an acceptable waste form. Container loads will be processed over a range of process additive types and fractions, waste feeds, and a range of parameter settings in the various campaigns. A campaign is defined as the receipt, processing, and vitrification of waste into a single container.

Phase 1 and Phase 2 will require a written plan for each campaign developed by the Permittees to include the information required in the RD&D Permit that is submitted to Ecology for review and approval. This information will include, but is not limited to the following:

- Description of feed material and additives
- Baseline process parameters
- Range of parameter adjustments
- Operating procedures
- Management of treated waste
- Documentation that the design and operation during the campaign is projected to meet performance standards
- Updates to equipment design and configuration

### **Treated Waste Characteristics**

The treated waste, including those that contain simulants, will be characterized to determine compliance with land disposal requirements. The data obtained from the DBVS Facility will also be used for waste form qualification, risk assessment, and performance assessment.

Process knowledge, process history, pertinent literature on waste chemistry and tank history, and analysis on the waste retrieved during Phase 1 and Phase 2 will be used to

address the Dangerous Waste Codes D001 (Ignitability) and D003 (Reactivity) before transfer to the DBVS Facility to ensure that the characteristics associated with these codes do not exist in the waste feed. The Dangerous Waste Codes D001 and D003 are not allowed in the DBVS Facility as specified in the RD&D Permit. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS facility, documentation, not based solely on process knowledge, showing the removal of the codes D001 and D003 is to be submitted to Ecology for approval strictly for this RD&D Permit.

### **Secondary Waste Streams**

A variety of secondary waste streams will be generated during the DBVS Facility operations. All secondary waste streams, (i.e., any output stream other than the treated DBVS Facility waste), will be managed in accordance with the *Hanford Site Liquid Waste Acceptance Criteria* (HNF-3172) or *Hanford Site Solid Waste Acceptance Criteria* (HNF-EP-0063) for the treatment and/or disposal path for each stream.

Secondary liquid waste streams will be stored at the DBVS Facility in RCRA approved tanks, prior to being disposed at the 200 Area Effluent Treatment Facility (ETF).

Solid and semisolid waste streams that are dangerous and/or mixed waste include, but are not limited to, waste material residues in receipt and holding tanks, collected air pollution control equipment dusts/sludges, discarded protective equipment, and discarded samples taken during campaign testing. These materials will be properly designated and packaged per HNF-EP-0063 and managed at the appropriate TSD unit in accordance with the unit's waste acceptance criteria.

Nonradioactive, nonhazardous waste streams include air pollution control equipment dusts/sludges from process additive transfer and empty process additive containers. These waste materials will be managed as general solid waste per *Hanford Environmental Protection Requirements* (HNF-RD-15332).

### **Pretreatment of Tank Waste Outside of this RD&D Permit**

The Bulk Vitrification Demonstration Project will evaluate the ability to produce satisfactory product in the form of immobilized low-activity waste that meets on-site waste disposal acceptance criteria. The technical basis for the DBVS Facility product being low-activity waste is identical to the basis for the Waste Treatment Plant Nuclear Regulatory Commission letter from C.J. Paperiello to J. Kinzer, RL, "Classification of Hanford Low-Activity Tank Waste Fraction," dated June 9, 1997. (This subject is also discussed in more detail in the letters: CH2M HILL letter from E. S. Aromi to R. J. Schepens, USDOE-ORP, "The Application of the Waste Incidental to Reprocessing to Bulk Vitrification," CH2M-0301927, dated June 2, 2003; and, Memorandum from R. Schepens to P. F. Dunigan Jr., "Request Approval of Categorical Exclusion (CX) for the Treatability and Demonstration Testing of Supplemental Technologies on the Hanford Site," dated December 13, 2003. Copies of these letters will be found in the RD&D administrative record.

In brief, the 1997 Agreement between the Nuclear Regulatory Commission and USDOE set forth the waste management program to be used with respect to Hanford Site tank

waste. USDOE produced a Technical Basis Report (*Technical Basis for Classification of Low-Activity Waste Fraction from Hanford Site Tanks for the Tank Waste Remediation System*, WHC-SD-WM-TI-0699, Rev. 2), which demonstrated compliance with the three criteria in the 1997 Agreement. The three criteria are:

1. "Wastes have been processed (or will be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical." Specifics on how this criterion is satisfied will be elaborated on in the subsequent section.
2. "Wastes will be incorporated in a solid physical form at a concentration that does not exceed the applicable limits for Class C (Low-Level Waste) as set out in 10 CFR Part 61." The DBVS will establish that the Bulk Vitrification form does not exceed the Class C concentrations for low-level waste and will be in compliance with this criterion.
3. "Wastes are to be managed, pursuant to the *Atomic Energy Act of 1954*, so that safety requirements comparable to the performance objectives set out in 10 CFR 61, Subpart C, are satisfied." The DBVS project will establish waste form performance tests for the vitrified product to document that it will perform comparable to ILAW for long-term disposal.

As described below, the waste that will be used from Tank 241-S-109 has been and will be pretreated to remove as much radioactivity as is practicable for this RD&D project.

The pretreatment of Tank 241-S-109 consists of the following:

- Supernatant from a series of SSTs was removed and processed through cesium ion exchange at B Plant. The sludge that contains the majority of the strontium and transuranic wastes remained in the sludge left in the tanks.
- The supernatant was then processed through the 242-S Evaporator to reduce the volume prior to transfer to Tank 241-S-109.
- Storage in Tank 241-S-109 resulted in the crystallization of the saltcake with the cesium remaining in the liquid fraction. This liquid fraction containing the cesium was mostly removed by saltwell pumping that was completed in June 2001.
- Selective dissolution will be used (on a test basis) to further pretreat the wastes, which will further reduce the cesium concentration, along with other chemicals. Selective dissolution is the chemical separation of soluble chemical species (including Cs-137) on the basis of their solubility. The average C-137 concentration in the salt cake is .021 C./l.
- Simple solids/liquid separation will be performed as the waste is removed from Tank 241-S-109. This will act to separate any strontium and transuranic elements which exist primarily as particulates, from the feed to the DBVS Facility

For the DBVS project, the waste will be managed as approved in the Technical Basis Report referred to previously and in accordance with the Nuclear Regulatory Commission (NRC) criteria. The only waste that will be processed will meet the requirement of having been processed to the extent deemed technically and economically practical in the Technical Basis report and will not exceed the previous agreement for Cs-137. The waste selected for bulk vitrification will contain less than 0.05 curies (Ci) of Cs-137 per liter at a sodium concentration of 7 Molar. For the DBVS Facility, the need for simple/liquid separation is reduced because only salt cake waste will be processed. However, additional solids removal will be required for the RD&D project to assist in the removal of the insoluble Sr-90 and transuranic (TRU) constituents, thereby ensuring comparability between the WTP pretreatment process and the DBVS Facility and ensuring compliance with the NRC letter.

Waste that contains too high a level of cesium will be diverted to the SY Tank Farm. The waste that will be transferred after pretreatment into the RD&D permitted DBVS Facility will be used to demonstrate that the bulk vitrification process will meet the definition of low activity waste.

#### **Container Storage**

Under this Permit, the DBVS Facility is authorized to store dangerous and/or mixed waste ICV®-Packages in the approved container storage areas listed in the Permit. The storage of this waste must occur in areas designed to keep containers from contact with standing liquid and keep incompatible wastes separated. Regulatory requirements for container storage in the RD&D Permit include, but are not limited to, maintaining containers in good condition, only storing compatible wastes in the same container, labeling requirements, etc.

#### **Tank Systems**

Under this Permit, the DBVS Facility is authorized to store dangerous and/or mixed waste in approved tank systems listed in the Permit. The total volume of waste is limited to quantities specified for the individual units listed in the Permit. Regulatory requirements for tank systems in the RD&D Permit include, but are not limited to, secondary containment, integrity assessment, engineering certifications, design and operating requirements, etc.

#### **DBVS**

Under this Permit, the Permittee is authorized to treat dangerous and/or mixed waste in DBVS subsystems (e.g., Incontainer Vitrification System (ICV®), Dryer, Offgas System, etc.) listed in the Permit. The total volume of Tank 241-S-109 waste is limited as specified in the Permit for Phases 1 and 2. Regulatory requirements in the RD&D Permit for these subsystems include, but are not limited to, secondary containment, integrity assessments, engineering certifications, design, operating and monitoring requirements, etc.

### **Land Disposal Restrictions**

Regulatory and permit requirements for Land Disposal Restrictions in the RD&D Permit include, but are not limited to, waste sampling, analysis, and quality assurance and quality control to document meeting required treatment limits.

### **Training**

ORP is required to conduct a comprehensive training program for its employees at the DBVS Facility. Training includes the following topics: health and safety, facility operations, regulatory requirements, including requirements of this Permit, and emergency procedures. Additional specific training will be conducted when it is needed to prepare personnel for certain jobs at the facility. A training program will be conducted prior to the start of each campaign and during the campaign, as required. Permit Condition II.E.3.b. requires that the DBVS Facility operators be provided with specialized training, appropriately consistent with the American Society of Mechanical Engineers training for incineration systems.

### **Inspections**

The DBVS Facility is required to conduct periodic inspections at the facility on an ongoing basis. These inspections are meant to detect and prevent malfunctions, deterioration, operator error, or discharges from the facility that could cause harm to human health or the environment. Inspections would include, but are not limited to facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit.

The following are examples of some of the routine inspections that are required:

- Daily inspections of accessible areas subject to spills, including the above ground portions of tank systems, monitoring data from any leak detection equipment, and externally accessible portions of the tanks systems including secondary containment.
- Weekly inspections of accessible container storage areas to confirm that containers are segregated by material compatibility, containers are not leaking or deteriorating, adequate aisle space is maintained and that the security controls are in place.
- Additional inspections will include, but not be limited to, safety equipment and emergency response supplies, spill control equipment and supplies.

### **Emergency Planning**

The Permit includes a written contingency plan that the DBVS Facility will follow in the case of an emergency. This plan coordinates with the Hanford Emergency Management Plan that covers the entire Hanford Site. The plan includes general response procedures for emergencies, and requirements to notify public officials if an emergency occurs. The plan also includes a current list of names, addresses, and phone numbers of all persons qualified to act as the emergency coordinator.

### **Recordkeeping**

The DBVS Facility must maintain detailed operating records at the facility. These records document compliance with conditions of the Permit and the dangerous waste regulation. Records must also be made of spills, releases, incidents of noncompliance, and emergency situations. The records must be kept at the facility for a time period ranging from three years to the time the facility closes, depending on the type of record.

### **Reporting**

The DBVS Facility must report certain information to Ecology. For example, reports are required for the following: any incidence of noncompliance with this Permit; nonconformance reports, Independent Qualified Registered Professional Engineer (IQRPE) reports, campaign plan reports, incidents which cause the DBVS Facility to implement their contingency plan; annual reports on the facility's operation; and annual cost estimates for closure that are adjusted for inflation. The above list of reporting requirements does not include all reports the DBVS Facility must submit to Ecology.

### **Modification Process**

The RD&D Draft Permit specifically requires that the three tiered modification process outlined in WAC 173-303-830(4) be followed for permit modifications required by Permit Condition II.F.6. for revising the Contingency Plan, after its implementation, and Permit Condition II.H.3. for updating the Closure Plan prior to conducting the actual closure of the RD&D DBVS Facility. Numerous anticipated updates, revisions and/or changes (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.) have been specified as not requiring the permit modification process. Instead the RD&D Draft Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit. This process of incorporating this required information into the RD&D Draft Permit, though different from the three tiered permit modification process, provides the necessary flexibility needed under the expedited review and issuance process of an RD&D Permit for efficient completion of the proposed 50 campaign plans and maintains the continuing regulatory review for assuring protection of human health and the environment.

### **Closure**

The DBVS Facility must close its facility when it ceases operating as a permitted RD&D facility. Prior to closure, all of the dangerous waste must be removed from the facility. All equipment, structures, and any contaminated environmental media that may have resulted from facility operations (e.g., soil) must be either decontaminated (to pre-operational levels) or removed. If this cannot be accomplished, then ORP must conduct remedial action and/or post-closure care to ensure any contamination remaining on site would not cause additional contamination to the environment. Ecology expects that closure performance standards will be met through removal or decontamination, and that neither remedial action nor post-closure care will be required. However, if additional cleanup of the facility is needed, it can be required through an administrative order, a modification of this Permit, or issuance of another permit.

The Permit includes the requirements for cost estimate for facility closure and cost estimate for post-closure monitoring and maintenance in accordance with the regulations.

### **F. TIME LIMITS IN THE DBVS FACILITY DRAFT PERMIT**

Time limits in the draft permit are complex, and they warrant a detailed discussion in this fact sheet. There are two different time limits in the Permit. The Permit will expire when either of the two limits is first reached.

The first limit is 400 operating days for the RD&D treatment activities. The second limit is an expiration date of three years from the issue date of the Permit. The Permit may not be reissued.

A 365 operating day limit for a RD&D Permit is based on a regulatory limit [see WAC 173-303-809(1) and (4)] and specific federal guidance (see EPA Office of Solid Waste and Emergency Response (OSWER) "*Guidance Manual for Research, Development, and Demonstration Permits under 40 CFR Section 270.65*" (OSWER Guidance Manual; EPA/530-SW-86-008)). This limit is placed on an RD&D treatment project because those projects are intended to be temporary experiments, and not long-term commercial operations. According to the federal guidance, an operating day is any fraction of a calendar day when conducting an RD&D experiment. In other words, even if treatment activities occur for only several hours on one day, the entire day is counted as an operating day. Because there are days when no treatment activities occur, the 365 operating days may not run consecutively. An RD&D Permit can be renewed up to three times. Each such renewal is for a period of not more than one operating year.

The DBVS Facility RD&D Draft Permit has provided a 400 operating day limit for the RD&D treatment activities to provide the necessary time needed for the vitrification cycle of each campaign and for the efficient completion of the 50 proposed campaign plans. Ecology believes that the 400 operating days proposed is reasonable for the DBVS Facility operations and has made the decision not to include a provision in this RD&D Permit for its renewal. The regulations provide Ecology with the authority to renew an issued RD&D Permit a maximum of three times, each for a period of 365 operating days. This would be a total of 1,660 operating days (4 X 365 operating days) in contrast to the 400 operating days proposed under this RD&D Draft Permit. If the DBVS Facility wants to continue treatment activities authorized by this RD&D Draft Permit, the Permittee must apply for a final facility permit pursuant to WAC 173-303-806.

For the purposes of the DBVS Facility operating day, only "RD&D Treatment Activity" will be considered. The following will not be included when accounting for operating days: DBVS Facility construction; maintenance, repair, adjustment, or subsequent checkout operation of equipment not performed simultaneously with treatment, and storage, of dangerous and/or mixed waste; operating the DBVS Facility according to procedures and limits for treatability studies in compliance with WAC 173-303-071(3)(s), DBVS Facility ICV® box preparation and hook-up activities, prior to

discharge of dangerous and/or mixed waste feed to the ICV® package disconnect. If more than one “RD&D Treatment Activity” is conducted at the facility on any given calendar day, that calendar day shall be counted as one operating day.

The second time limit sets a maximum three year term for the DBVS Facility permit during which the 400 operating days must be used. Ecology believes that the three year term will provide sufficient time for the DBVS to complete their experiments. Operating information around the country indicates that RD&D projects may require several years to complete. The three year term will give the DBVS Facility an opportunity to establish its facility under a stable set of permitting requirements. At the same time, Ecology wishes to limit the maximum term of this Permit.

The time limits in this Permit do not restrict Ecology from taking other actions if Ecology or the public has significant concerns about the safety of the DBVS Facility’s operation. For example, Ecology could take any of the following actions:

- Order an immediate termination of operations at the facility if Ecology determined that to be necessary to protect human health and the environment. [See WAC 173-303-809(3) and Permit Condition I.C.4.]
- Initiate permit changes or revoke the Permit to include new requirements. [See WAC 173-303-830(3) and Permit Condition I.C.1.]
- Take enforcement action against the DBVS facility if the DBVS Facility does not comply with the conditions of the Permit. [See WAC 173-303-810(2) and Permit Condition I.E.1.]

## **G. CONCLUSION**

The ORP has demonstrated in their permit application that they are capable of safely operating an RD&D facility under the conditions required for a final permit. Therefore, Ecology has made the tentative decision to issue an RD&D Permit to the facility. The Permit includes the DBVS Facility’s permit application and additional requirements Ecology has specified as permit conditions.



**PERMIT FOR  
DANGEROUS AND OR MIXED WASTE RESEARCH, DEVELOPMENT, AND  
DEMONSTRATION**

Washington State Department of Ecology  
Nuclear Waste Program  
3100 Port of Benton Boulevard  
Richland, Washington 99354-1670  
Telephone: (509) 372-7950

This Permit is issued in accordance with the applicable provisions of the Hazardous Waste Management Act, Chapter 70.105 Revised Code of Washington (RCW), and the regulations promulgated hereunder in Chapter 173-303 Washington Administrative Code (WAC).

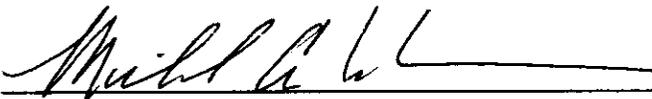
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ISSUED TO: United States Department of Energy  
Office of River Protection  
Owner/Operator  
P.O. Box 450  
Richland, Washington 99354

Co-Permittee: CH2M HILL Hanford Group, Inc.  
Co-Operator  
P.O. Box 1500  
Richland, Washington 99354

This Permit is effective as of January 12, 2005, and shall remain in effect until December 13, 2007, unless modified or revoked and reissued under WAC 173-303-830(3), or terminated under WAC 173-303-809(3) or WAC 173-303-830(5). This Permit shall not exceed four hundred (400) operating days of the Dangerous and or Waste Research, Development, and Demonstration Activity authorized by this permit.

ISSUED BY: WASHINGTON STATE DEPARTMENT OF ECOLOGY



---

Michael A. Wilson, Program Manager  
Nuclear Waste Program  
Washington State Department of Ecology

Date Signed 12/13/04

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## INTRODUCTION

### **Permittees:**

Owner/Operator: United States Department of Energy  
Office of River Protection

Facility Manager/Co-Operator: CH2M HILL Hanford Group, Inc.

**EPA/State Identification Number:** WA 7890008967

### Pursuant to:

Chapter 70.105 Revised Code of Washington (RCW), the Hazardous Waste Management Act of 1976, as amended, and regulations codified in Chapter 173-303-809 Washington Administrative Code (WAC).

A Permit is issued to the United States Department of Energy (USDOE), Office of River Protection (ORP) and CH2M HILL Hanford Group, Inc. (CH2M) (hereinafter called the Permittees), to operate a Dangerous Waste Research, Development, and Demonstration Facility for the Demonstration Bulk Vitrification System (DBVS Facility) west of the 241-S Tank Farm in the 200 West Area of the Hanford Site. This Permit is not a part of the Dangerous Waste Portion of the *Resource Conservation and Recovery Act of 1976* (RCRA) Permit for the Treatment, Storage, and Disposal of Dangerous Waste Permit issued to USDOE March 28, 2000.

The Permittees must comply with all terms and conditions set forth in this Permit and with Permit Attachments AA through LL. When the Permit and the attachments are in conflict, the wording of the Permit will prevail. The Permittees shall also comply with all applicable state regulations, including Chapter 173-303 WAC, and those specified in the Permit. Any procedure, method, data, or information contained in this document that relates to the radioactive source, byproduct material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954, as amended) is not provided for the purpose of regulating such components under the authority of this Permit and Chapter 70.105 RCW.

“Applicable state and federal regulations” are those which are in effect on the date of final administrative action on this Permit and any self-implementing statutory provisions and related regulations which, according to the requirements of RCRA (as amended) or state law, are automatically applicable to the Permittees’ dangerous waste management activities notwithstanding the conditions of this Permit.

This Permit is based upon the Administrative Record, as required by WAC 173-303-840. The Permittees’ failure in the application or during the Permit issuance process to fully disclose all relevant facts, or the Permittees’ misrepresentation of any relevant facts at any time, shall be

grounds for the termination or modification of this Permit and/or initiation of an enforcement action, including criminal proceedings. The Permittees shall inform the Director of the Washington State Department of Ecology (hereafter called the Director) of any deviations from permit conditions or changes from information provided in the Research, Development, and Demonstration Permit Application. In particular, the Permittees shall inform the Director of any proposed changes that might affect the ability of the Permittees to comply with applicable regulations and permit conditions or that alter any of the conditions of the Permit in any way.

The Washington State Department of Ecology (hereafter called Ecology) will enforce all conditions of this Permit, based on federal regulations for which the state of Washington has received final authorization and all conditions that are state-only requirements (i.e., required by state regulations, but not by federal regulations). Any challenges of any permit condition that concern state requirements (i.e., conditions of this Permit for which the state of Washington is authorized or conditions which are state-only requirements) shall be appealed to the Pollution Control Hearings Board in accordance with WAC 173-303-845. In the event that Ecology does not maintain its authorization for the state Hazardous Waste Program under RCRA, then the United States Environmental Protection Agency (EPA) will enforce all permit conditions except those that are state-only requirements.

LIST OF ATTACHMENTS

The following listed documents are hereby incorporated, in their entirety, by reference into this Permit. Some of the documents are excerpts from the Permittees' DBVS Facility Research, Development, and Demonstration Dangerous Waste Permit Application dated May 10, 2004 (document #04-TED-036); hereafter called the Permit Application. Ecology has, as deemed necessary, modified specific language in the attachments. These modifications are described in the permit conditions (Parts I through V), and thereby supersede the language of the attachment. These incorporated attachments are enforceable conditions of this Permit, as modified by the specific permit conditions, except for Attachment 1 which is included in this Permit for information purpose only;

- Attachment AA      Facility Description - Section 2 of the Permit Application
- Attachment BB      Waste Analysis Plan - Section 6 of the Permit Application; and  
Analytical Methods - Appendix D of the Permit Application
- Attachment CC      Personnel Training - Section 8 of the Permit Application
- Attachment DD      Contingency Plan - Section 10 of the Permit Application; and  
Hanford Test and Demonstration Facility Contingency Plan - Appendix C  
of the Permit Application
- Attachment EE      Closure Plan - Section 11 of the Permit Application
- Attachment FF      Emergency Preparedness and Prevention – Following Sections of the  
Permit Application:  
Section 2            Facility Description  
Section 4            Bulk Vitrification Test and Demonstration Facility  
Section 5            Operations Plan  
Appendix B          Process Flow Diagrams  
Appendix F          ICV<sup>®</sup> Container Refractory Information
- Attachment GG      Recordkeeping and Reporting - Section 9 of the Permit Application
- Attachment HH      RESERVED
- Attachment II      Inspection Plan - Section 7 of the Permit Application
- Attachment JJ      Container Management – Following Sections and Figures of the Permit  
Application:

	Section 2.3.2	Waste Retrieval and Storage
	Section 2.4	Treated Waste Packaging
	Section 4.2.9	Vitrification Container Preparation
	Section 4.2.10	In-Container Vitrification
	Section 4.2.11	Post-Vitrification Activities
	Section 7.2.4	Weekly Inspections
	Section 7.4	Corrective Action
	Figure 2-2	Test and Demonstration Facility Site and Equipment Layout – Page 1
	Figure 7-1	Typical Inspection Checklist for Waste Storage Area
	Figure B-1	Phase 1 Process Flow Diagram – Page 1
	Figure B-4	Phase 2 Process Flow Diagram – Page 1
	Appendix F	ICV® Container Refractory Information
Attachment KK	Tank Management – Following Sections, Figures, and Appendices of the Permit Application:	
	Section 2.2.1	Bulk Vitrification System Components
	Section 2.3.2	Waste Retrieval and Storage
	Section 2.3.3	Waste Transfer
	Section 2.6	Secondary Wastes
	Section 4	Bulk Vitrification Test and Demonstration Facility
	Section 7.2.3	Daily Inspections
	Section 7.4	Corrective Action
	Section 7.5	Recordkeeping
	Figure 2-2	Test and Demonstration Facility Site and Equipment Layout – Page 1
	Figure 2-4	Waste Retrieval System for Phase 1 and Phase 2
	Figure 7-2	Typical Inspection Checklist for Waste Tank Storage Area
	Appendix B	Process Flow Diagrams
	Appendix F	ICV® Container Refractory Information
Attachment LL	Demonstration Bulk Vitrification System - Following Sections and Appendices of the Permit Application:	
	Section 4	Bulk Vitrification Test and Demonstration Facility
	Section 5	Operations Plan
	Appendix A	Draft Test Matrix and Objectives
	Appendix B	Process Flow Diagrams
	Appendix E	Emergency Condition Parameter Limit Values
	Appendix F	ICV® Container Refractory Information
Attachment 1	Section 1.0	Introduction
	Section 1.1	Regulatory Basis

Section 1.2	Facility Owner and Operator Information
Section 1.3	Background Information
Section 1.4	Purpose of Test and Demonstration Project
Section 1.5	Project Objectives
Section 1.6	Justification for Project
Section 1.7	Planned Scale of Operation
Section 1.8	Other Facility Permits

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## DEFINITIONS

For purposes of this joint Permit, the following definitions shall apply:

- a. The term “**Batch**” means a quantity of material prepared in the mixer/dryer that consists of tank waste, simulants, soil, and/or additives that are transferred into the ICV® container for treatment.
- b. The term “**Blending**” means the mixing of the untreated waste with simulants that mimic certain characteristics of the untreated waste.
- c. The term “**Business Day**” means calendar day, excluding weekends and state and federal holidays.
- d. The term “**Calendar Day**” means any day, including state and federal holidays.
- e. The term “**Campaign**” means the receipt, processing, and vitrification of waste into a single ICV® container. Multiple batches from the mixer/dryer may be transferred into an ICV® container.
- f. The term “**Campaign Plan**” means a written plan for each campaign that is developed by the Permittees to include the information required of this Permit, that is submitted to Ecology for review and approval.
- g. The term “**Dangerous Waste**” means a waste designated in WAC 173-303-040 through 173-303-100 as dangerous, or extremely hazardous, or mixed waste.
- h. The term “**Director**” means the Director of the Washington State Department of Ecology or a designated representative.
- i. The term “**DBVS Facility**” means that property identified in the physical description of the area (including all contiguous land, structures, appurtenances, and improvements) used to manage dangerous and/or mixed waste. This property description is as set forth in Attachment AA of this Permit and includes the DBVS listed in Permit Tables V-1 and V-4.
- j. The term “**Ecology**” means the Washington State Department of Ecology (with the address as specified on page one of this Permit).
- k. The term “**Hazardous Waste**” means a waste as defined in WAC 173-303-040.
- l. The term “**High Winds**” means winds that are 85 miles per hour, or greater, as identified in “Demonstration Bulk Vitrification System Specification, Rev. 2” (RPP-17403) that is referenced in the Permit Application.
- m. The term “**ICV® Container**” or “**ICV® Box**” means a steel box approximately 3.0 m (10 feet) high, 2.4 m (8 feet) wide, and 7.3 m (24 feet) long.

- n. The term “**ICV® Package**” means a complete ICV® container that includes refractory materials, waste and/or stimulant, glass formers, electrodes, and lid.
- o. The term “**Independent Qualified Registered Professional Engineer (IQRPE)**” means a person who is licensed by the state of Washington, or a state which has reciprocity with the state of Washington as defined in RCW 18.43.100, and who is not an employee of the owner or operator of the facility for which construction or modification certification is required. A qualified professional engineer is an engineer with expertise in the specific area for which a certification is given (WAC 173-303-040).
- p. The term “**Operating Day**” means any fraction of a calendar day when conducting “RD&D Treatment Activity” at the DBVS Facility. For the purposes of accounting for an “Operating Day,” only “RD&D Treatment Activity” must be considered. The following will not be included when accounting for operating days: DBVS Facility construction; maintenance, repair, adjustment, or subsequent checkout operation of equipment not performed simultaneously with treatment and storage of dangerous and/or mixed waste; operating the DBVS Facility according to procedures and limits for treatability studies in compliance with WAC 173-303-071(3)(s), DBVS Facility ICV® Box Preparation and Hook-up Activities, prior to discharge of dangerous and/or mixed waste feed to the ICV® container, and DBVS Facility activities after ICV® Package disconnect. If more than one “RD&D Treatment Activity” is conducted at the facility on any given calendar day, that calendar day shall be counted as one operating day.
- q. The term “**Permittees**” means the United States Department of Energy, Office of River Protection, and CH2M HILL Hanford Group, Inc. (with the addresses as specified on page one of this Permit).
- r. The term “**RD&D Operations**” means the DBVS Facility.
- s. The term “**Test and Demonstration Facility**” means the DBVS Facility permitted under this RD&D Permit that is located west of the 241-S Tank Farm where the Bulk Vitrification System will be tested and demonstrated.
- t. The term “**DBVS**” as defined in Tables V.1. and V.4.
- u. The term “**Permit**” means the DBVS Research, Development, and Demonstration Permit issued by the Washington State Department of Ecology pursuant to Chapter 70.105 RCW and Chapter 173-303 WAC.
- v. All definitions contained in WAC 173-303-040 are hereby incorporated, in their entirety, by reference into this permit. Any of the definitions used above, (a) through (u), shall supersede any definition of the same term given in WAC 173-303-040. Where terms are not defined in the regulations or the permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

**ACRONYMS**

AEA .....	<i>Atomic Energy Act of 1954</i>
ALARA.....	as low as reasonably achievable
API.....	American Petroleum Institute
ASCE .....	American Society of Civil Engineers
AWFCO .....	automatic waste feed cut-off
AWTE.....	ancillary waste transfer enclosure
BACT.....	best available control technology
BBI.....	Best Basis Inventory
CERCLA.....	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
CEM.....	continuous emission monitoring
CEMS.....	continuous emission monitoring system
CFR.....	<i>Code of Federal Regulations</i>
CH2M or CH2M HILL.....	CH2M HILL Hanford Group, Inc.
Ci.....	curies
CO.....	carbon monoxide
COCs.....	contaminants of concern
Cs-137.....	cesium-137
DBVS.....	Demonstration Bulk Vitrification System
DRE.....	destruction and removal efficiency
dscf.....	dry standard cubic feet
dscm .....	dry standard cubic meter
DQO.....	Data Quality Objectives
DST.....	double-shell tank
Ecology .....	Washington State Department of Ecology
EHW .....	extremely hazardous waste
EPA.....	United States Environmental Protection Agency
ESP.....	Environmental Simulation Program
ETF .....	Effluent Treatment Facility
FHA.....	final hazard analysis
ft .....	foot
ft <sup>3</sup> .....	cubic foot
gpm .....	gallons per minute
HEPA .....	high-efficiency particulate air
HFFACO.....	<i>Hanford Federal Facility Agreement and Consent Order</i>
HIHTL.....	hose-in-hose transfer line

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HLVIT.....	high-level vitrification
HSWA.....	<i>Hazardous and Solid Waste Amendment of 1984</i>
ICV®.....	in-container vitrification (licensed process)
IDF.....	Integrated Disposal Facility
ILAW.....	immobilized low-activity waste
IQRPE.....	Independent Qualified Registered Professional Engineer
kg.....	kilogram
L.....	liter
lb.....	pound
L/min.....	liters per minute
LAW.....	low-activity waste
LDR.....	Land Disposal Restrictions
m.....	meter
m <sup>3</sup> .....	cubic meter
M.....	molar
min.....	minutes
MS/MSD.....	matrix spike/matrix spike duplicate
MTCA.....	<i>Model Toxics Control Act</i>
Na.....	sodium
NCi.....	nanocuries
NCR.....	Nonconformance Report
NOx.....	nitrogen oxides
NRC.....	Nuclear Regulatory Commission
ORP.....	Office of River Protection
OSHA.....	Occupational Safety and Health Administration
OSWER.....	Office of Solid Waste and Emergency Response
P&P.....	preparedness and prevention
PER.....	Problem Evaluation Request
pH.....	a measure on a scale from 0 to 14 of the acidity or alkalinity of a solution
ppm.....	parts per million
ppmv.....	parts per million by volume
QA/QC.....	Quality Assurance/Quality Control
RCRA.....	<i>Resource Conservation and Recovery Act of 1976</i>
RCW.....	<i>Revised Code of Washington</i>
RD&D.....	research, development, and demonstration
REDOX.....	reduction and oxidation
SAP.....	Sampling and Analysis Plan

SCR.....selective catalytic reduction  
SO<sub>x</sub> .....sulfur oxides  
SST.....single-shell tank  
TBD.....to be determined  
TEQ.....toxicity equivalence  
TSD.....treatment, storage, and disposal  
UBC .....Uniform Building Code  
USDOE.....United States Department of Energy  
USDOE-ORP .....United States Department of Energy, Office of River  
Protection  
USDOE-RL.....United States Department of Energy Richland Operations  
Office  
WAC .....*Washington Administrative Code*  
WAP.....Waste Analysis Plan  
WFQ.....waste form qualification  
WRS.....Waste Retrieval System  
WTP.....Waste Treatment Plant

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## **PART I – STANDARD CONDITIONS**

### **I.A. EFFECT OF PERMIT**

The Permittees are authorized to store and treat dangerous waste in accordance with the conditions of this Permit and the applicable provisions of Chapter 173-303 WAC. Any storage or treatment of dangerous and/or mixed waste by the Permittees at this facility that is not authorized by this Permit or by WAC 173-303-809 and for which a permit is required under WAC 173-303-800 is prohibited. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege [WAC 173-303-810(8)(b)]. Issuance of this Permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations [WAC 173-303-810(8)(c)].

### **I.B. GENERAL PERMIT CONDITIONS**

I.B.1. The general permit conditions under WAC 173-303-810, and final facility standards under WAC 173-303 as set forth in WAC 173-303-600, are incorporated as specified in this Permit and shall be adhered to by the Permittees. The Permittees shall also comply with any self-implementing statutory provisions, which according to the requirements of state law, are automatically applicable to the Permittees' dangerous and/or mixed waste activity, notwithstanding the conditions of this Permit.

I.B.2. The attachments listed on Permit pages seven (7) and eight (8) are incorporated by reference into this Permit. Facility operations shall be in accordance with the contents of the Permit attachments, as revised by this Permit.

### **I.C. PERMIT ACTIONS**

I.C.1. This Permit may be modified, revoked, or terminated by Ecology for cause as specified in WAC 173-303-830(3), (4), and (5) and WAC 173-303-809. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittees shall not stay the applicability or enforceability of any condition [WAC 173-303-810(7)].

#### **I.C.2. Permittee Initiated Modifications**

Permit modifications pursuant to this Permit for dangerous and/or mixed waste, at the request of the Permittees, must be done according to the three-tiered modification system specified in WAC 173-303-830(4) and Condition I.C.3. The permit modification request must include page changes to the Permit, attachments, and Permit Application supporting documentation necessary to incorporate the proposed permit modification and a draft with changes clearly noted in red-line strikeout to Ecology for review and approval.

I.C.3. In addition to other requirements in WAC 173-303-830, within forty-five (45) days of a permit change (i.e., permit modification) being put into effect or approved, the Permittees shall retype the relevant portions of the Permit and attachments, to incorporate the change (if not already reflected in the change pages submitted in the original permit modification request) and submit the reprinted pages. This submittal does not require certification described in WAC 173-303-810(13).

I.C.4. Ecology may order an immediate termination of all operations at the facility at any time it determines that termination is necessary to protect human health and the environment in accordance with WAC 173-303-809(3).

I.D. SEVERABILITY

I.D.1. Effect of Invalidation

The provisions of this Permit are severable. If any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby. Invalidation of any state or federal statutory or regulatory provision which forms the basis for any condition of this Permit does not affect the validity of any other state or federal statutory or regulatory basis for said condition.

I.E. DUTIES AND REQUIREMENTS

I.E.1. Duty to Comply

The Permittees shall comply with all conditions of this Permit [WAC 173-303-810(2)], except to the extent and for the duration such noncompliance is authorized by an emergency permit issued under WAC 173-303-804. Any permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of Chapter 173-303 WAC and/or RCRA and is grounds for: a) enforcement action; b) termination of this Permit; c) revocation and re-issuance of this Permit; d) modification of this Permit; or e) denial of a permit renewal application.

I.E.2. Need to Halt or Reduce Activity Not a Defense

A Permittee who has not complied with this Permit, and who subsequently is subject to enforcement actions, may not argue that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit [WAC 173-303-810(4)].

I.E.3. Duty to Mitigate

The Permittees must take all steps required by Ecology to minimize or correct any adverse impacts on the environment resulting from non-compliance with the Permit. Such mitigation shall not be a defense to enforcement [WAC 173-303-810(5)].

I.E.4. Proper Operation and Maintenance

The Permittees shall at all times properly operate and maintain all facilities and all systems of treatment and control which are installed or used by the Permittees to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control (QA/QC) procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit [WAC 173-303-810(6)].

I.E.5. Duty to Provide Information

The Permittees shall furnish to Ecology, within a reasonable time, any information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittees shall also furnish to Ecology, upon request, copies of records required to be kept by this Permit [WAC 173-303-810(9)].

I.E.6. Inspection and Entry

Pursuant to WAC 173-303-810(10), the Permittees shall allow representatives of Ecology upon the presentation of proper credentials to:

- I.E.6.a. During operating hours, and at all other reasonable times, enter the DBVS Facility or any unit or area within the DBVS Facility, where regulated activities or equipment are located or conducted, or where records must be kept under the conditions of this Permit;
- I.E.6.b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
- I.E.6.c. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

I.E.6.d. Sample or monitor, at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by state law as amended, any substances or parameters at any location.

I.E.7. Anticipated Non-Compliance

The Permittees shall give advance notice to Ecology of any planned changes in the permitted facility or activity which may result in noncompliance with Permit requirements. Prior to the implementation of the planned change(s), the Permittee must receive Ecology approval.

I.E.8. Reporting Planned Changes

The Permittees shall give advanced notice to Ecology, as soon as possible, of any planned physical alterations or additions to the facility subject to this Permit. Such notice does not authorize any noncompliance with, or modification of, this Permit.

I.E.9. Certification of Construction or Modification

The Permittees may not commence treatment or storage of dangerous and/or mixed waste in any new or modified portion of the facility until the Permittees have submitted to Ecology, by certified mail or hand delivery:

I.E.9.a. A letter signed by the Permittees and a registered professional engineer stating that the facility has been constructed or modified in compliance with the Permit; and

I.E.9.a.i. Ecology has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the Permit; or

I.E.9.a.ii. Ecology has either waived the inspection or has not, within fifteen (15) business days of the receipt of the Permittees' letter, notified the Permittees of intent to inspect.

I.E.10. Other Information

Whenever the Permittees become aware that they failed to submit relevant facts in the Permit Application or submitted incorrect information in a Permit Application or in any report to Ecology, the Permittees shall promptly submit such facts or information [WAC 173-303-810(14)(h)].

I.F. MONITORING, RECORDS, AND REPORTING

I.F.1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from WAC 173-303-110, or an equivalent method approved by Ecology.

Laboratory methods must be those specified in WAC 173-303-110(3)(a), other alternate methods approved in this Permit (e.g., Permit Attachment BB), or an equivalent method in accordance with Permit Condition I.F.2. of this Permit.

I.F.2. The Permittees may substitute analytical methods that are equivalent or superior to those specifically approved for use in this Permit in accordance with the following:

I.F.2.a. The Permittees must submit to Ecology a request for substitution of analytical method(s) specifically approved for use in this Permit. The request shall provide information demonstrating that the proposed method(s) requested to be substituted are equivalent or superior in terms of sensitivity, accuracy, and precision (i.e., reproducibility); and

I.F.2.b. The Permittee receives a written approval from Ecology for the substitution of analytical method(s). Such approval shall not require a permit modification under WAC 173-303-110.

I.F.3. Pursuant to WAC 173-303-810(11), records of monitoring information shall specify:

I.F.3.a. The dates, exact place, and times of sampling or measurements;

I.F.3.b. The individuals who performed the sampling or measurements;

I.F.3.c. The date(s) analyses were performed;

I.F.3.d. The individuals who performed the analyses;

I.F.3.e. The analytical techniques or methods used; and

I.F.3.f. The results of such analyses, including the QA/QC results and requirements.

I.F.4. Immediate Reporting

The Permittees shall immediately report to Ecology any release, fire, explosion, natural disaster, or incident of noncompliance with this Permit that may endanger human health or the environment. This reporting shall meet the requirements in WAC 173-303-360(2)(d) and WAC 173-303-810(14)(F).

I.F.5. Incident Reporting

Within five (5) calendar days of an incident that requires implementation of the Contingency Plan, the Permittees shall submit a written report of the incident to the Director meeting the requirements of WAC 173-303-360(2)(k) and WAC 173-303-810(14)(f).

I.F.6. The Permittees shall report to Ecology all incidents of noncompliance with this Permit, other than incidents specified in Permit Conditions I.F.3., I.F.4., and I.F.5., every three (3) months. These reports shall meet the requirements in WAC 173-303-810(14)(g).

I.F.7. Within thirty (30) days of a release to the environment from a dangerous waste tank system, the Permittees must send a written report that complies with WAC 173-303-640(7)(d)(iii).

I.G. COMPLIANCE NOT CONSTITUTING DEFENSE

Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought under any state or federal laws governing protection of public health or the environment. However, compliance with terms of this Permit does constitute a defense to any action alleging failure to comply with applicable standards upon which this Permit is based, or failure to operate under a permit required by WAC 173-303-800 with respect to those activities authorized by this Permit.

I.H. TRANSFER OF PERMITS

This Permit is not transferable to any person, except after notice to Ecology. In such instances, Ecology will require modification or revocation and reissuance of the Permit pursuant to WAC 173-303-830(2)(b).

I.I. PERMIT EXPIRATION

This Permit and all conditions herein are in effect as of the "effective date" as defined in the definitions of the Permit and will remain in effect:

I.I.1. For three hundred and sixty five (365) operating days with a maximum permit renewal for a duration of thirty-five (35) operating days; or

I.I.2. For three (3) years, whichever is earlier.

I.J. REPORTS, NOTIFICATIONS, AND SUBMISSIONS

All reports, notifications, or other submissions that are required by this Permit to be submitted to Ecology or the Director shall be sent certified mail or hand-delivered to:

Program Manager, Nuclear Waste Program  
Washington State Department of Ecology  
3100 Port of Benton Boulevard  
Richland, Washington 99354-1670  
Telephone: (509) 372-7950

The phone number and address may change, and such changes will be provided by Ecology. Such changes will not require a permit modification.

I.K. SIGNATORY REQUIREMENTS

All final reports that are required by this Permit to be submitted to Ecology shall be signed and certified in accordance with WAC 173-303-810(12), (13), and (14).

I.L. CONFIDENTIAL INFORMATION

Any information submitted by the Permittees to Ecology may be claimed as confidential by the Permittees in accordance with applicable provisions of WAC 173-30-810(15).

I.M. PERMIT RENEWAL

If the Permittees wish to continue the activities authorized by this Permit beyond this Permit's expiration date, the Permittees must apply for a final facility permit pursuant to WAC 173-303-806.

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## **PART II – GENERAL FACILITY CONDITIONS**

### **II.A. GENERAL WASTE MANAGEMENT**

- II.A.1. The Permittees are authorized to accept dangerous and/or mixed waste only from:
- II.A.1.a. Tank 241-S-109 that does not exceed the criteria listed in Permit Attachment BB, as specified in the Ecology approved campaign plan, and as specified on Permit Tables V.7 and V.8.
- II.A.2. During operations of the DBVS, pursuant to Permit Part V, processing of materials (including simulants) in the DBVS that would designate as dangerous waste is fully subject to the requirements of this Permit, excluding the DBVS Facility Waste Receipt System (WRS) and DBVS tank systems as identified in Table IV.1. This exclusion does not apply to mixed waste.
- II.A.3. Feed to the DBVS mixer/dryer and the ICV® container(s), limited as specified in Permit Attachments BB and LL, Permit Tables V.7 and V.8, and the Ecology approved DBVS Campaign Plan.
- II.A.4. Air pollution control devices and capture systems in the DBVS Facility shall be maintained and operated so as to minimize the emissions of air contaminants and to minimize additional air emission that may occur during process upsets. Procedures for ensuring that the above equipment is properly operated and maintained, so as to minimize the emission of air contaminants and minimize additional air emissions that may occur during process upsets, shall be established and followed in accordance with the Ecology approved DBVS Campaign Plan.
- II.A.5. The Permittees shall ensure that for all dangerous and/or mixed waste areas, systems, and units contained in the DBVS Facility that the DBVS offgas treatment systems shall be in operation prior to waste being introduced into these dangerous and/or mixed waste areas, systems, and units contained in the DBVS Facility. At any time the offgas treatment system ceases to operate or produces insufficient vacuum to recover emissions from the areas, systems, or units, the Permittees shall not commence any new treatment activities within the dangerous and/or mixed waste areas, systems, or units contained in the DBVS Facility and take measures to minimize evolution of emissions from on-going treatment, and shall not receive new dangerous and/or mixed waste shipments into the DBVS Facility. The Permittees shall not re-commence new treatment activities until the DBVS Facility offgas treatment systems are operational and producing sufficient vacuum to recover emissions.
- II.A.6. Containment systems for all waste management operations shall be constructed, operated, and maintained to ensure no spilled waste or storm water migrates outside

of the containment areas. In particular, the following waste management operations must be within such containment areas:

- II.A.6.a. Loading and unloading of dangerous and/or mixed waste; and
- II.A.6.b. Staging and processing of dangerous and/or mixed waste.
- II.A.7. Design and Construction of the Facility

The Permittees shall conduct all construction subject to this Permit in accordance with the approved designs, plans, and specifications that are required by this Permit, except as specified in Permit Conditions II.A.8. or II.A.9. For purposes of Permit Conditions II.A.8. and II.A.9., the Ecology representative will be an Ecology construction inspector, project manager, or other designated representative of Ecology.

- II.A.8. The Permittees shall submit a nonconformance report (NCR) to the Ecology representative, as applicable, within five (5) calendar days of the Permittees becoming aware of incorporation of minor nonconformance from the approved designs, plans, and specifications into the construction of the DBVS Facility. Such minor nonconformance shall be defined, for the purposes of this permit condition, as nonconformance that is necessary to accommodate proper construction and the substitution of the use of equivalent or superior materials or equipment that do not substantially alter permit conditions or reduce the capacity of the facility to protect human health or the environment. Such minor nonconformance shall not be considered a modification of this Permit. If Ecology determines that the nonconformance is minor, it will verbally notify the Permittees. If Ecology determines that the nonconformance is not minor, it will notify the Permittees in writing whether prior approval is required from Ecology before work proceeds which affects the nonconforming item. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.
- II.A.9. Upon completion of the DBVS Facility construction subject to this Permit, the Permittees shall produce as-built drawings of the project which incorporate the design and construction nonconformance resulting from all change documentation, as well as changes made pursuant to Permit Condition II.A.8. The Permittees shall place the as-built drawings into the operating record within three (3) months of completing construction.

## II.B. WASTE ANALYSIS

- II.B.1. The Permittees shall maintain adequate knowledge of any waste to be managed properly by the DBVS Facility before acceptance, after receipt, and during treatment and storage of these wastes. The Permittees will ensure this knowledge through compliance with the requirements of WAC 173-303-300 and with the

provisions of the Waste Analysis Plan (WAP), Permit Attachment BB, [WAC 173-303-806(4)(a)(iii) and WAC 173-303-300(1)].

- II.B.2. When laboratory analytical methods are required to confirm the Permittees' knowledge of the waste, the Permittees must ensure that the sampling and test methods listed as acceptable by WAC 173-303-110, or equivalent methods approved in writing by Ecology, are used pursuant to Permit Conditions I.F.1. and I.F.2.
- II.B.3. The Permittees are responsible for obtaining accurate information for each waste stream. Inaccurate waste analysis information provided by the generating site (or unit) is not a defense for noncompliance by the Permittees with the waste management requirements and conditions of this Permit, WAC 173-303, and in Chapter 173-303-140.
- II.B.4. Records and results of waste analyses described in this Permit shall be maintained as described in Permit Condition II.G. The DBVS Facility operating record shall include, but not be limited to, information requirements for waste analysis in Permit Condition II.G.
- II.B.5. All dangerous and/or mixed wastes shall be managed only in areas authorized for dangerous waste management under the conditions of this Permit.
- II.B.6. The Permittees shall comply with requirements for waste analysis specified in Permit Attachment BB, as changed pursuant to Permit Conditions II.B.7. and II.B.8., for all waste transferred from Tank 241-S-109 and for all waste at the DBVS Facility to include simulants and treated waste.

II.B.7. COMPLIANCE SCHEDULES

The following amendments to Permit Attachment BB are hereby made. The Permittee shall submit the revised pages reflecting these amendments to Ecology prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility. These amendments do not constitute a permit modification pursuant to Permit Conditions I.C.2. and I.C.3.:

- II.B.7.a. Section 6.1, page 6-1, first paragraph, first sentence is revised as follows: "The Waste Analysis Plan (WAP) provides the basis for measuring the adequacy of waste treatment and assists in optimizing the waste treatment operation based on treated waste analysis results and offgas emissions."
- II.B.7.b. Section 6.1, page 6-1, second paragraph, first sentence is revised as follows: "The WAP objective is to develop a sampling approach for (1) the final vitrified waste form to ensure compliance with the waste acceptance criteria of the IDF or another permitted disposal facility, and the land disposal restrictions listed in WAC 173-303-140; (2) develop waste feed limitations that will result in the final vitrified

waste form meeting (1) above and, in addition, meet the performance standards for offgas emissions in Section 6.4 of the RD&D Permit issued by Ecology. This second objective will be addressed in the Waste Form Qualification (WFQ) plans.”

- II.B.7.c. Section 6.2, page 6-2, Table 6-1, is revised to include under Phase 1, Vitrified Waste Header “6” as a superscript and as footnote “6” as follows: “The checkmark indicates that the waste code listed for the waste feed and the vitrified waste in Phase 1 will be sampled/analyzed as specified in Table 6.1.”
- II.B.7.d. Section 6.2, page 6-2, Table 6-1, footnote “2” is revised as follows: “Analyze once per full waste receipt tank unless a reduced analysis frequency and/or scope is approved by Ecology.”
- II.B.7.e. Section 6.2, page 6-2, Table 6-1, footnote “3” is revised as follows: “Analyze once per ICV® package for the initial 10 ICV® packages; subsequent frequency as specified in an Ecology approved WFQ plan.”
- II.B.7.f. Section 6.2.4, page 6-8, second sentence, “These waste feed batches will be sampled for constituents in Table 6-1.”
- II.B.7.g. Section 6.2.4, page 6-8, sixth sentence, “The analytical methods used for measuring concentrations will follow the analytical methods listed in Appendix D of the Permit Application; Permit Attachment BB.”
- II.B.7.h. Section 6.2.5, page 6-9, second sentence, “The frequency of analysis of the waste during Phase 2 will be once per full DBVS waste receipt tank or as specified in an Ecology approved WFQ plan.”
- II.B.7.i. Section 6.2.5.1, page 6-9, first paragraph, last sentence is revised as follows: “The frequency of sampling of ICV® packages will be once for the initial ten (10) ICV® packages; subsequent frequency as specified in an Ecology approved WFQ plan.”
- II.B.7.j. Section 6.2.5, page 6-10, Table 6-7, footnote “1” is revised as follows: “All tests will be performed as specified in an Ecology approved WFQ plan.”
- II.B.7.k. Section 6.5.1.1, page 6-11, third sentence is revised as follows: “The analytical methods and the associated QA/QC are specified in Appendix D of the Permit Application, Permit Attachment BB.”
- II.B.7.l. Section 6.5.2, page 6-11, sixth sentence, “At a minimum, at least one trip blank will accompany each shipment per sample type to the laboratory.”
- II.B.7.m. Section 6, page 6-13, Figure 6-1, the block entitled “WRS” is deleted.

- II.B.7.n. Section 6, page 6-13, Figure 6-1, the block entitled "Waste Feed," the narrative under "Sampling Point" is revised as follows:
- "Phase 1: Waste staging tank"
  - "Phase 2: Liquid waste pump skid for the DBVS Facility waste and simulant staging tanks."
- "Purpose of Feed Sampling" is amended to include the following: "Provide mass balance information"
- II.B.7.o. Section 6, page 6-13, Figure 6-1, the block entitled "Offgas Treatment System" is amended to also include the following:
- RD&D Permit issued by Ecology under WAC 173-303-809 for the DBVS Facility.
- II.B.7.p. Section 6, page 6-13, Figure 6-1, the block entitled "Treated Waste," the narrative under "Sampling Point," replace with: "ICV® Package."
- II.B.7.q. Section 6, page 6-13, Figure 6-1, the block entitled "Secondary Liquid Effluent," the narrative under "Purpose of Waste Sampling" is amended to include "and provide mass balance information."
- II.B.7.r. Section 6, page 6-13, Figure 6-1, the block entitled "Treated Waste," the narrative under "Sampling Frequency" is revised as follows: "Once per ICV® package for the initial ten (10) ICV® packages; subsequent frequency as specified in an Ecology approved WFQ plan."
- "Purpose of Feed Sampling" is amended to include the following: "Provide mass balance information."
- II.B.7.s. Section 6, page 6-13, Figure 6-1, the block entitled "Secondary Liquid Effluent," the narrative under "Sampling Point" is revised as follows: "Effluent Holding Tanks."
- II.B.7.t. Section 6, page 6-13, Figure 6-1, the block entitled "Secondary Liquid Effluent," the narrative under "Sampling Frequency" is revised as follows: "Every tanker truckload during startup (3 batches) as required by the ETF Disposal Facility for mass balance as specified in the approved WFQ Plan."
- II.B.7.u. Section 6, page 6-13, Figure 6-1, the block entitled "Secondary Liquid Effluent," the narrative under "Analytical Methods Will Measure" is amended to include the following: "Appendix D of the Permit Application; Permit Attachment BB for mass balance information."

- II.B.7.v. Section 6, page 6-13, Figure 6-1, the block entitled "Solid Secondary Waste," the narrative under "Purpose of Waste Sampling" is amended to include the following: "and provide mass balance information."
- II.B.7.w. Section 6, page 6-13, Figure 6-1, the block entitled "Solid Secondary Waste," the narrative under "Sampling Point, Sampling Method, and Sampling Frequency" is revised as follows: "Meet the Waste Acceptance Criteria of a Disposal Facility."
- II.B.7.x. Section 6, page 6-13, Figure 6-1, the block entitled "Solid Secondary Waste," the narrative under "Analytical Methods Will Measure" is amended to include the following: "Appendix D of the Permit Application; Permit Attachment BB for mass balance information."
- II.B.7.y. Section 6, page 6-13, Figure 6-1, under "Assumptions," revise third bullet as follows: "Waste Analysis for compliance with WAC 173-303-395 will be determined pursuant to the RD&D Permit issued by Ecology."
- II.B.7.z. Section 6.2.3.2, Table 6-3, add D004 through D011 constituents to table, HLVIT LDR Treatment Standard for D004 through D011, footnote "3" to sulfates and organic carbon, and a parenthesis before the word "Land" in the title of the third column.
- II.B.8. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, Permittees shall submit and receive written approval from Ecology for the following revisions of Permit Attachment BB. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:
- II.B.8.a. Amend the sampling, analysis, and QA/QC procedures to address any sumps that are part of secondary containment systems for the DBVS Facility storage and treatment units.
- II.B.8.b. Amend to include, "Sampling and analysis for those others and QA/QC procedures and sampling frequency for the parameters identified in Section 6.2.3.4, 1 through 3, and in Table 6-2 for Phase 1."
- II.B.8.c. Amend to include an Appendix specifying limitations for the ICV® packages addressing at a minimum the following:
  - II.B.8.c.i. Size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, and disposal facility testing/acceptance requirements.
- II.B.8.d. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit to Ecology for approval, and strictly for this RD&D Permit, documentation not based solely on process knowledge, that shows the removal of the characteristic codes D001 and D003 from S-109 tank waste.

II.B.9. Prior to the initial receipt of dangerous and/or mixed waste in the DVBS Facility, the Permittees shall submit Section 2 of Permit Attachment AA amended to include the following specified as "for information only." These amendments do not constitute a permit modification pursuant to Permit Conditions I.C.2. and I.C.3.:

II.B.9.a. A description of all ninety (90) day storage and satellite accumulation areas within the DBVS Facility.

II.B.9.b. A description of each waste to be located in the areas designated in "a" above.

II.B.9.c. A map clearly depicting the areas designated in "a" above.

II.C. PREPAREDNESS AND PREVENTION

II.C.1. In accordance with WAC 173-303-340, the facility shall be designed, constructed, maintained, and operated to minimize the possibility of fire, explosion, or any unplanned release, sudden or non-sudden, of dangerous and/or mixed waste or dangerous waste constituent to air, soil, or surface or groundwater that could threaten human health or the environment.

II.C.2. The Permittees shall ensure all water related safety equipment, such as eyewash units and emergency showers, remain operable at all times, including during periods of subfreezing temperatures.

II.C.3. The Permittees shall comply with WAC 173-303-340(4) and WAC 173-303-355(1) pertaining to arrangements with local authorities.

II.C.4. The Permittees shall comply with Permit Attachment FF (WAC 173-303-340).

II.C.5. RESERVED

II.C.6. COMPLIANCE SCHEDULES

Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for incorporation in Permit Attachment FF, of the following, with the exception of II.C.6.a.viii. A., which will be incorporated into the Permit Administrative Record. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:

II.C.6.a. Description of procedures, structures, or equipment used at the facility to:

II.C.6.a.i. Prevent hazards and contain spills in unloading/loading operations (e.g., ramps, berms, pavement, special forklifts);

- II.C.6.a.ii. Prevent run-off from dangerous and/or mixed waste handling areas to other areas of the facility or environment, or to prevent flooding (e.g., berms, dikes, trenches);
  - II.C.6.a.iii. Prevent contamination of water supplies;
  - II.C.6.a.iv. Mitigate effects of equipment failure and power outages;
  - II.C.6.a.v. Prevent undue exposure of personnel to dangerous and/or mixed waste (e.g., protective clothing);
  - II.C.6.a.vi. Prevent releases to the atmosphere; and
  - II.C.6.a.vii. Test and maintain equipment to assure proper operation in the event of an emergency pursuant to WAC 173-303-340(1).
  - II.C.6.a.viii. A description of precautions to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes as required to demonstrate compliance with WAC 173-303-395, including documentation demonstrating compliance with WAC 173-303-395(1)(c), to include, at a minimum, the following:
    - A. USDOE "Final Hazard Analysis (FHA) for Demonstration Bulk Vitrification System (DBVS)." If the FHA is not completed prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility the Preliminary Hazard Analysis (PHA) shall be submitted and the FHA shall be submitted to replace it when it is completed.
    - B. Operating Procedures and/or waste feed limitations that will be followed and incorporated into Permit Attachment BB and/or Permit Attachment FF (Preparedness and Prevention) to assure flammable/toxic gases will not accumulate in any of DBVS Facility storage or treatment units/systems at hydrogen gas levels above the lower explosive limit.
    - C. Operating parameters to be monitored/controlled and limitations for these parameters addressing each DBVS Facility storage and treatment unit for waste compatibility, safe operation, and compatibility with unit materials of construction. Amend Permit Attachment BB to include these parameters and the monitoring frequency.
- II.D. INSPECTION PLAN
- II.D.1. The Permittees shall include inspections for all DBVS Facility dangerous and/or mixed waste management units specified in Permit Parts III, IV, and V to prevent malfunctions and deterioration, operator errors, and discharges that may cause or lead to the release of dangerous waste constituents to the environment, or a threat to human health. Inspections must be conducted in accordance with the DBVS Facility Inspection Schedule, Permit Attachment II [WAC 173-303-320].

## II.D.2. COMPLIANCE SCHEDULE

Prior to the receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall update and resubmit and receive written approval from Ecology of the Inspection Schedule in Permit Attachment II. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. The revised schedule shall include, but not be limited to, a through c below. In addition, the Permittees shall submit to Ecology for incorporation into the Administrative Record, the basis for developing Inspection Schedule frequencies.

- II.D.2.a. Detailed dangerous and/or mixed waste management unit specific and general inspection schedules and description of procedures (not examples) pursuant to WAC 173-303-630(6), 173-303-640(3)(c) and (6), and 173-303-670(7)(b) in accordance with WAC 173-303-680(3). The inspection schedule shall be presented in the form of a table (not typical) that includes a description of the inspection requirement, inspection frequency, and types of problems to look for during the inspections;
- II.D.2.b. Integrity assessment program and schedule for all tanks under Permit Part IV and the DBVS under Part V of this Permit shall address the conducting of periodic integrity assessments over the life of the units, in accordance with WAC 173-303-640(3)(b), and descriptions of procedures for addressing problems detected during integrity assessments. The schedule must be based on past integrity assessments, age of unit, materials of construction, characteristics of the waste, and any other relevant factors [WAC 173-303-640(3)(b)]; and
- II.D.2.c. Inspection schedules for all tanks under Permit Part IV and the DBVS under Permit Part V which have leak detection system and control instrumentation to include, but is not limited to valves, pressure devices, flow devices, measuring devices, as specified in Permit Conditions IV.A.4.b. and V.A.1.n.

## II.E. TRAINING

- II.E.1. The Permittees shall ensure that the DBVS Facility is operated and maintained at all times by persons who are trained and qualified to perform these and any other duties that may reasonably be expected to directly affect emissions from the DBVS Facility [WAC 173-303-680(2)] and in accordance with WAC 173-303-330.
- II.E.2. The Permittees shall conduct personnel training in accordance with the training program, Permit Attachment CC.
- II.E.3. COMPLIANCE SCHEDULE

Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility units, the Permittees shall update and resubmit and receive approval from Ecology for the Training Program description in Permit Attachment CC. Such approval

shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. The revised Training Program description shall include, but not be limited to:

- II.E.3.a. Detailed unit specific and general training program descriptions (not typical) consistent with WAC 173-303-806(4)(a)(xii).
- II.E.3.b. Sufficient detail to document that the training and qualification program for all categories of personnel whose activities may reasonably be expected to directly affect emissions from DBVS, except control room operators, is appropriately consistent with 40 Code of Federal Regulations (CFR) 63.1206(c)(6)(ii), and for control room operators, is appropriately consistent with 40 CFR 63.1206(c)(6)(i) and 63.1206(c)(6)(iii) through 63.1206(c)(6)(vi) [WAC 173-303-680(2)] from WAC 173-303-806, as implemented in WAC 173-303-330(1).

II.F. CONTINGENCY PLAN

- II.F.1. The Permittee shall comply with the requirements of WAC 173-303-350(4) for maintaining copies of the Contingency Plan, Permit Attachment DD, at the DBVS Facility, and providing copies to the authorities listed therein.
- II.F.2. At all times, the Permittees shall have qualified persons designated as the emergency coordinator and alternate emergency coordinators.
- II.F.3. The Permittees shall immediately carry out applicable provisions of Permit Attachment DD, pursuant to WAC 173-303-360(2), whenever there is a release of dangerous and/or mixed waste or dangerous waste constituents, or other emergency circumstance, any of which threatens human health or the environment.

II.F.4. COMPLIANCE SCHEDULE

The following amendment to Permit Attachment DD, is hereby made. The Permittee shall submit the revised page reflecting this amendment to Ecology prior to the initial receipt of dangerous and/or mixed waste. This amendment does not constitute a permit modification pursuant to Permit Conditions I.C.2. and I.C.3.:

Page C-10, Figure C-2, Tank No. "32-D74-004" is renumbered Tank No. "32-D74-016."

- II.F.5. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall update and resubmit and receive written approval from Ecology of Permit Attachment DD to be consistent with design details and schedule described in Parts III, IV, and V and Attachments JJ, KK, and LL of this Permit. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.

- II.F.6. After initial receipt of dangerous and/or mixed waste, the Permittees shall review and amend, if necessary, the applicable portions of the Contingency Plan, Permit Attachment DD, in accordance with the provisions of WAC 173-303-350(5) and WAC 173-303-830(4). The amended Contingency Plan shall be submitted to Ecology as a permit modification pursuant to Permit Conditions I.C.2. and I.C.3.
- II.F.7. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall revise, resubmit, and receive written approval from Ecology of Permit Attachment DD to include the following. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:
- II.F.7.a. Sections C.8.1, C.8.2, C.8.4, C.11.0, amended to provide the information currently designated "TBD" and/or "(to be determined)."
- II.F.7.b. Section C.3.1, page C-4, Table C-1, amended to include a current list of names, addresses, and phone numbers (office and home available through the Hanford Patrol Operation Center) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator and others must be listed in the order in which they will assume responsibility as alternates.

II.G. RECORDKEEPING AND REPORTING

- II.G.1. In addition to the recordkeeping and reporting requirements specified elsewhere in this Permit, including Permit Attachment GG, the Permittees shall comply with all the applicable notification, certification, and recordkeeping requirements described in WAC 173-303-380(l)(j), (k), (m), and (o).
- II.G.2. The Permittees shall maintain a written operating record at the DBVS Facility in accordance with WAC 173-303-380(1) consisting of records kept for the length of time specified below. Also, the Permittees shall record all information referenced in this Permit in the operating record within two (2) business days of the information becoming available. The operating record shall include, but is not limited to, the information listed below:
- II.G.2.a. The following records shall be maintained until final closure is complete and certification is accepted by Ecology:
- II.G.2.a.i. An up-to-date map showing the locations where dangerous and/or mixed wastes are managed within the facility;
- II.G.2.a.ii. Written reports pursuant to Permit Condition II.F., Contingency Plan, and WAC 173-303-360(2)(k) of all incidents that require implementation of the Contingency Plan, Permit Attachment DD;
- II.G.2.a.iii. Record of spills and releases;

- II.G.2.a.iv. Written reports and records of immediate notification to the Director to address releases, fires, and explosions [WAC 173-303-810(14)(f)];
- II.G.2.a.v. Summaries of all records of corrective action;
- II.G.2.a.vi. All other environmental permits;
- II.G.2.a.vii. Records and results of waste analyses required by Permit Attachment BB and WAC 173-303-380(1)(c) that include, at a minimum:
- The date(s), exact location, and times of sampling or measurements;
  - The name(s) of the individual(s) who performed the sampling or measurements;
  - The date(s) analyses were performed demonstrating that EPA SW-846 holding times were satisfied;
  - The name of the individual(s) who performed the analyses;
  - The analytical techniques or methods used;
  - The analytical results;
  - The QA/QC results and requirements; and
  - The unique identity of the equipment or instrument used for the analysis including the type/model number and either the serial number or the inventory number; and
- II.G.2.a.viii. Training records of facility personnel.
- II.G.2.b. The following records shall be maintained for a minimum of five (5) years. This time period may be extended by the Director in the event of enforcement action or notification by the Director that an investigation is ongoing. In the case of notification of investigation/inspection, the Permittees will not be required to keep the records longer than one (1) year past the normal timeframe unless an enforcement action is issued:
- II.G.2.b.i. Facility operation and maintenance records and reports prepared pursuant to this permit;
- II.G.2.b.ii. Date(s) and methods(s) of treatment used for waste process operation including name(s) of personnel performing actual operation;
- II.G.2.b.iii. Progress reports and any required notifications prepared pursuant to this Permit;

- II.G.2.b.iv. The notice and certification required of a generator under WAC 173-303-140 (Land Disposal Restrictions);
- II.G.2.b.v. Records of all inspection and monitoring information meeting requirements of WAC 173-303-320(2)(d) and this Permit including, at a minimum, the following calibration and maintenance records:
  - The date(s) and time(s) of data recording;
  - The name of the person taking and recording the information; and
  - The recorded information itself whether consisting of observation, data measurement, instrument reading, or any other monitoring method;
- II.G.2.b.vi. Records of all inspections meeting the requirements in WAC 173-303-395(1)(d);
- II.G.2.b.vii. Annual reports submitted in compliance with WAC 173-303-220(1), Generator Report-Form 4. However, if the reports are necessary to supplement the facility operating record, they must be retained until final closure is complete and certified.
- II.G.2.b.viii. Annual reports submitted in compliance with WAC 173-303-390(2), TSD Facility Report-Form 5. However, if the reports are necessary to supplement the facility operating record, they must be retained until final closure and corrective action is complete and certified;
- II.G.2.b.ix. Manifests; and
- II.G.2.b.x. Training records of former facility personnel.
- II.G.2.c. Up-to-date copies of the following documents as amended, revised, and modified shall be maintained at the facility until final closure certification is accepted by Ecology:
  - II.G.2.c.i. The Permit and all attachments;
  - II.G.2.c.ii. The Certified RD&D Permit Application dated May 10, 2004;
  - II.G.2.c.iii. Documentation of arrangements made with local authorities pursuant to WAC 173-303-340(4) and (5); and
  - II.G.2.c.iv. All closure documents prepared pursuant to this Permit [WAC 173-303-610(3)(a)].
- II.G.2.d. For all new tank systems and components, pursuant to WAC 173-303-640(3), an assessment by an independent, registered, professional engineer or by an independent, qualified, installation inspector not affiliated with the tank vendor and

certified by an independent, qualified, registered, professional engineer, that the tank system was installed properly and that all discrepancies have been repaired as required by WAC 173-303-640(3)(c).

- II.G.2.d.i. Results of periodic tightness testing and integrity assessments of all tank systems; and
- II.G.2.d.ii. For all tanks that require corrosion protection, submit a written statement from an independent corrosion expert that attests to the proper design and installation of any corrosion protection measures.
- II.G.2.e. For all DBVS Facility and DBVS components, pursuant to WAC 173-303-640(3), an assessment by an independent, qualified, registered, professional engineer or by an independent, qualified tank installation inspector not affiliated with the tank vendor and certified by an independent, registered, professional engineer, that the tank system was installed properly and that all discrepancies have been repaired as required by WAC 173-303-640(3)(c).

(For purposes of Permit Conditions II.G.2.e.i. and II.G.2.e.ii., where reference is made to WAC 173-303-640, the following substitutions apply: substituting the terms "DBVS" for "tank system(s)," "sub-system(s)" for "tank(s)," "sub-system equipment" for "ancillary equipment," and "sub-system(s) or sub-system equipment of a DBVS" for "component(s)" in accordance with WAC 173-303-680, with the exception that these substitutions do not apply to the subsystems that are marked with an asterisk or an "a" on Permit Tables V.1. and V.4., and do not apply to ICV® Stations listed on Permit Tables V.1. and V.4.

- II.G.2.e.i. Results of periodic tightness testing and integrity assessments of all tank systems; and
- II.G.2.e.ii. For all DBVS subsystems that require corrosion protection, submit a written statement from an independent corrosion expert that attests to the proper design and installation of any corrosion protection measures.

## II.H. CLOSURE

- II.H.1. The Permittees must conduct closure of the DBVS Facility and piping leading to the DBVS according to Permit Attachment EE and Condition II.H. The closure plan shall be modified according to provisions of WAC 173-303-610(3)(b)(ii).
- II.H.2. The Permittees shall submit and receive written approval from Ecology, for any update to the Closure Plan, Permit Attachment EE, prior to commencing partial closure.

- II.H.3. The Permittees shall submit and receive written approval from Ecology for a Sampling and Analysis Plan and a revised Closure Plan prior to commencing final closure.
- II.H.4. At least forty-five (45) days before initiating closure, the Permittees must provide Notification of Closure pursuant to WAC 173-303-610(3)(c).
- II.H.5. Ecology may require additional sampling and/or inspection after the Permittees implement the approved Sampling and Analysis Plan if Ecology determines that the sampling and analyses have not adequately demonstrated whether clean closure has been achieved. Such a requirement will be implemented pursuant to WAC 173-303-830(3). Additional sampling and analysis may be required for the following reasons:
  - II.H.5.a. Specialized sample collection or analytical techniques are required to ensure adequate quantization limits for chemical constituents; or
  - II.H.5.b. Results indicate the need to analyze for additional constituents at certain locations; or
  - II.H.5.c. Results indicate additional soil sampling is required in certain locations; or
  - II.H.5.d. Other reasons indicate the Sampling and Analysis Plan has not adequately demonstrated whether clean closure has been achieved.
- II.H.6. Documentation supporting the independent, qualified, registered professional engineer's certification of closure must be submitted to Ecology with the closure certification required by WAC 173-303-610(6). The Permittees are required to furnish documentation supporting the independent registered professional engineer's certification to Ecology upon request, until Ecology has notified the Permittees in writing that Ecology agrees with and has accepted the Permittees' closure certification. The closure documentation must include, at a minimum, the following:
  - II.H.6.a. Sampling procedures that were followed;
  - II.H.6.b. Soil and concrete locations that were sampled;
  - II.H.6.c. Sample labeling and handling procedures that were followed, including chain of custody procedures;
  - II.H.6.d. Description of procedures that were followed to decontaminate concrete or metal to meet the clean closure standards as set by Ecology, on a case by case basis, in accordance with the closure performance standards of WAC 173-303-610(2)(a)(ii) and in a manner that minimizes or eliminates post-closure escape of dangerous

waste constituents, or to achieve a "clean debris surface" as specified in WAC 173-303-140 [WAC 173-303-610(2)(b)(ii)].

- II.H.6.e. Laboratory and field data, including supporting QA/QC results and requirements;
- II.H.6.f. Report that summarizes closure activities;
- II.H.6.g. Copy of all field notes taken by the independent, qualified, registered professional engineer; and
- II.H.6.h. Copy of all contamination survey results.
- II.H.7. In addition to other requirements in Permit Attachment EE, the Permittees shall sample and analyze soils at the following locations:
  - II.H.7.a. Where dangerous wastes constituents migrated outside of secondary containment systems as a result of leaks, spills, or other releases of dangerous waste; and
  - II.H.7.b. Where cracks or gaps developed in the concrete of secondary containment systems at any time during the operation of the facility and leaks, spills, or other releases of dangerous waste may have occurred to such cracks or gaps.
- II.H.8. If the value from a soil sample analysis is above the clean closure level for any constituent and represents contamination from the DBVS Facility, then the area represented by the sample (subunit or unit) will be considered to be above the standard for clean closure and the Permittees shall propose additional actions. Ecology will determine whether the additional actions proposed are adequate considering circumstances at the facility. If Ecology determines the actions proposed by the Permittees are not adequate, then Ecology will specify additional actions to be taken. Examples of additional actions may include, but are not limited to, the following:
  - II.H.8.a. Removing or remediating soil that has contamination above the cleanup levels followed by conformational sampling to ensure clean closure standards are met;
  - II.H.8.b. Reanalyzing soils of the entire subunit or unit represented by the sample that has contamination above the cleanup levels using other samples taken within the subunit or unit and approved statistical methods. Approved statistical methods include, but are not limited to, calculating the upper 95 percent confidence interval about the mean for sample data. If this parameter value for the constituent in question is lower than the Ecology approved numeric cleanup level for clean closure in accordance with WAC 173-303-610(2)(b)(i), then the subunit or unit will be considered to meet the clean closure standards for that constituent. Samples included in this statistical analysis must be randomly selected and the distribution of their concentrations must fit a lognormal or normal distribution;

- II.H.8.c. Establishing post closure care for the areas not able to attain clean closure standards;
- II.H.8.d. Sample labeling and handling including chain of custody procedures;
- II.H.8.e. Decontamination procedures of secondary containment systems; and
- II.H.8.f. Ecology may require modification of the closure plan if significant releases occur at the facility prior to the time of closure.

II.H.9. COMPLIANCE SCHEDULE

Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall update and resubmit and receive written approval from Ecology for the Closure Plan, Permit Attachment EE, to be consistent with design details and schedule described in Permit Attachments JJ, KK, and LL. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. The updated Closure Plan, Permit Attachment EE, must be consistent with the closure performance standards specified in WAC 173-303-610(2).

- II.H.10. The following amendment to Permit Attachment EE is hereby made. The Permittee shall submit the revised page reflecting this amendment to Ecology prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility. This amendment does not constitute a permit modification pursuant to Permit Conditions I.C.2. and I.C.3.

Section 11.3, page 11-1, second sentence, is revised as follows: "Closure will require the removal and disposal of all dangerous and/or mixed waste present, removal of contaminated process equipment and contaminated structural components, and removal of all soil contaminated by the DBVS Facility in accordance with WAC 173-303-610(2)(a)."

II.I. EQUIVALENT MATERIALS

If certain equipment, materials, and administrative information (such as names, phone numbers, and addresses) are specified in the Permit, the Permittees may use equivalent or superior substitutes. Use of such equivalent or superior items within the limits (e.g., ranges, tolerances, and alternatives) already clearly specified in sufficient detail in this Permit is not considered a modification of this Permit. However, the Permittees must place documentation of the substitution, accompanied by a narrative explanation and the date the substitution became effective, in the operating record within seven (7) days of putting the substitution into effect, and submit documentation of the substitution to Ecology.

Note: The format of tables and forms contained in Permit Attachment FF are not subject to the requirements of this Permit, and may be revised at the Permittees' discretion.

If Ecology determines that a substitution was not equivalent to the original, they will notify the Permittees that the Permittees' claim of equivalency has been denied, of the reasons for the denial, and that the original material or equipment must be used.

**II.J. CLEANUP OF RELEASED MATERIAL**

II.J.1. The Permittees shall comply with the requirements of WAC 173-303-145, including but not limited to, notification, mitigation, and control measures specified in WAC 173-303-145(2) and (3) under the following circumstances:

II.J.1.a. A spill or non-permitted discharge of dangerous and/or mixed waste or hazardous substance that is intentionally or accidentally spilled or discharged into the environment (unless otherwise permitted) such that human health or the environment is threatened, regardless of the quantity of dangerous and/or mixed waste or hazardous substance. For spills or discharges onto the ground, into the groundwater, or into the surface water notify all local authorities in accordance with the local emergency plan.

II.J.1.b. A spill or non-permitted discharge of dangerous or mixed waste or hazardous substance results in emission into the air such that human health or the environment is threatened.

II.J.1.c. Other spills or discharges occur which threaten human health or the environment.

II.J.2. Consistent with good management for abatement of initiating cause and prudent consideration of health and safety risks to personnel, the Permittees shall remove spilled or leaked waste within secondary containment within twenty-four (24) hours, or in as timely a manner as is possible, to prevent harm to human health and the environment.

**II.K. FINANCIAL ASSURANCE AND LIABILITY REQUIREMENTS**

II.K.1. The Permittees are subject to the cost estimate requirements for facility closure in accordance with WAC 173-303-620(3) and the cost estimate requirements for post-closure monitoring and maintenance as in WAC 173-303-620(5). The Permittees are exempt from the liability requirements in WAC 173-303-620(8) and the financial assurance requirements in WAC 173-303-620(4).

II.L. LAND DISPOSAL RESTRICTIONS

II.L.1. The Permittees must meet LDR standards for disposal of final waste forms for waste codes on the SST Part A Permit Application Form 3 as listed in Permit Attachment BB, Table 6-1. All waste forms subject to LDR standards must be demonstrated to meet all applicable treatment standards and requirements (WAC 173-303-140/40 CFR Part 268). Waste that has dangerous and/or mixed waste constituents shall be analyzed in accordance with this Permit and WAC 173-303-140/40 CFR 268. Waste that has dangerous/hazardous constituents shall be analyzed in accordance with this Permit and WAC 173-303-140/40 CFR 268. For waste that has treatment standards that are not concentration based, the generator and/or treatment facility must demonstrate that the waste meets the applicable treatment standards using process knowledge and/or by waste analysis, as required by this Permit.

II.M. AIR EMISSIONS

II.M.1. Prior to installing or using any equipment subject to the requirements of WAC 173-303-690, the Permittees shall obtain a permit modification following the Permit Conditions I.C.2. and I.C.3. process to incorporate WAC 173-303-690 standards into the Permit Application and this Permit prior to generation/receipt of dangerous and/or mixed waste in the DBVS Facility.

II.M.2. Prior to installing or using any equipment subject to the requirements of WAC 173-303-691, the Permittees shall obtain a permit modification following the Permit Condition I.C.2. and I.C.3. process to incorporate WAC 173-303-691 standards into the Permit Application and this Permit prior to generation/receipt of dangerous and/or mixed waste in the DBVS Facility.

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### **PART III – CONTAINERS**

For purposes of Permit Part III, all references to Permit Attachment JJ shall be read as references to Permit Attachment JJ, as revised pursuant to Permit Condition III.G.

#### **III.A. CONTAINER MANAGEMENT AREAS AND ACCUMULATION LIMITS**

III.A.1. The Permittees shall place or store dangerous and/or mixed waste ICV® Packages in the areas identified in Figure 2-3 of Permit Attachment JJ and Permit Table III.1.

III.A.2. Any dangerous and/or mixed waste generated and managed in containers by the facility shall be managed in accordance with the generator requirements in WAC 173-303-200.

III.A.3. For the purpose of determining compliance with storage capacity limits, every ICV® Package shall be considered to be full.

III.A.4. The Permittees may store dangerous and/or mixed waste ICV® Packages with the waste codes listed in Table 6-1, excluding characteristic code D001 and D003 of Permit Attachment BB, in accordance with Permit Attachment BB, as changed pursuant to Permit Conditions II.B.7. and II.B.8. Total containerized dangerous and/or mixed waste storage at the DBVS Facility shall not exceed capacity specified on Permit Table III.1.

III.A.5. The Permittees may place and store dangerous and/or mixed waste only in approved container storage areas listed in Permit Table III.1. The Permittees shall limit the total volume of waste to quantities specified for the individual container storage areas listed in Permit Table III.1.

III.A.6. The Permittees are not authorized to store free liquids in any of the approved container storage areas listed in Permit Table III.1.

III.A.7. The Permittees shall maintain documentation in the operating record for each container storage area listed in Permit Table III.1. in accordance with WAC 173-303-380 and 173-303-210.

#### **III.B. CONTAINER STORAGE AREAS DESIGN AND CONSTRUCTION**

III.B.1. The Permittees shall construct container storage areas identified in Permit Table III.1., as specified in all applicable drawings and specifications in Permit Attachment JJ and Permit Part III.

III.B.2. All container storage areas identified in Permit Table III.1. must be constructed in accordance with WAC 173-303-630(7)(c).

III.C. CONTAINER MANAGEMENT PRACTICES

- III.C.1. No dangerous and/or mixed waste shall be managed in the container storage areas unless the operating conditions specified under Permit Condition III.C. are complied with.
- III.C.2. The Permittees shall manage all containerized dangerous and/or mixed waste for container storage areas identified in Permit Table III.1. in accordance with procedures described in Permit Attachment JJ and the following conditions:
- III.C.2.i. The operating records and waste tracking procedures shall indicate all times at which containerized dangerous and/or mixed waste were placed, removed from, and returned to designated storage areas as approved pursuant to Permit Conditions III.F. and II.G., Recordkeeping [WAC 173-303-380];
- III.C.2.ii. The physical arrangement (i.e., spacing) of dangerous and/or mixed waste containers shall be in compliance with WAC 173-303-630(5)(c) as specified in Figure 2-2 of Permit Attachment JJ;
- III.C.2.iii. All container storage areas must be operated in accordance with WAC 173-303-630;
- III.C.2.iv. The Permittee shall not place and store ignitable and/or reactive dangerous and/or mixed waste in the container storage areas specified in Permit Table III.1. [WAC 173-303-630 (8)];
- III.C.2.v. At all times, the Permittees shall not place and store incompatible dangerous and/or mixed waste, or dangerous and/or mixed waste and materials, in the container storage areas specified in Permit Table III.1. [WAC 173-303-630 (9)(a)];
- III.C.2.vi. At all times, containers holding dangerous and/or mixed waste in container storage areas must be closed, except when it is necessary to add or remove waste [WAC 173-303-630(5)(a)];
- III.C.2.vii. At all times, containers holding dangerous and/or mixed waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak [WAC 173-303-630(5)(b)];
- III.C.2.viii. If a container holding dangerous and/or mixed waste is not in good condition (e.g., exhibits severe rusting, apparent structural defects, or any other condition that could lead to container rupture or leakage) or is leaking, the Permittees shall manage the container in accordance with procedures described in Permit Attachment JJ [WAC 173-303-630(2)];
- III.C.2.ix. The Permittees shall ensure that all containers used for dangerous and/or mixed waste management are made of or lined with materials which will not react with,

and are otherwise compatible with, the waste to be stored [WAC 173-303-630(4)];  
and

- III.C.2.x. The Permittees shall not place incompatible dangerous and/or mixed wastes, or incompatible dangerous and/or mixed wastes and materials, in the same container unless WAC 173-303-395(1)(b) is complied with [WAC 173-303-630(9)(a)].

III.D. IDENTIFICATION OF CONTAINERS AND CONTAINER STORAGE AREAS

- III.D.1. Pursuant to WAC 173-303-630(3), the Permittees shall ensure that all dangerous and/or mixed waste containers are labeled in a manner that adequately identifies the major risk(s) associated with the contents.

- III.D.2. For all dangerous and/or mixed waste containers, the Permittees shall ensure that:

III.D.2.i. Labels are not obscured or otherwise unreadable;

III.D.2.ii. Waste containers are oriented so as to allow inspection of the labels identified in Permit Conditions III.D.1. and III.D.2., the container tracking number, and, to the extent possible, any labels which the generator placed upon the container; and

III.D.2.iii. Empty dangerous and/or mixed waste containers, as defined by WAC 173-303-160(2), must have their dangerous and/or mixed waste labels destroyed, or otherwise removed, immediately upon being rendered empty.

- III.D.3. The Permittees shall post entrances and access points to container storage areas specified in Permit Table III.1. with signs that meet the requirements of WAC 173-303-310(2)(a).

III.E. INSPECTIONS AND RECORDKEEPING

III.E.1. The Permittees shall ensure all containment areas are inspected and maintained such that they are free of cracks, gaps, and are impervious to leaks, spills, and accumulation of rainfall until the collected material is removed. The Permittees shall inspect the container storage areas in accordance with the Inspection Schedules in Permit Attachment II, as revised pursuant to Permit Condition II.D.2.

III.E.2. For the container storage areas, the Permittees shall record and maintain in the DBVS Facility operating record, all monitoring, recording, maintenance, calibration, test data, and inspection data compiled under the conditions of this Permit, in accordance with Permit Condition II.G.

III.F. CLOSURE

III.F.1. The Permittees shall close the DBVS Facility container storage areas in accordance with Permit Condition II.H. as revised pursuant to Permit Condition II.H.9.

III.G. COMPLIANCE SCHEDULES

- III.G.1. All information identified for submittal to Ecology in Permit Conditions III.G.2. through III.G.4. of this compliance schedule must be signed and certified in accordance with the requirements in WAC 173-303-810(12) and (13).
- III.G.2. Prior to construction of the DBVS Facility container storage area, as identified in Permit Table III.1., the Permittees shall submit and receive written approval from Ecology for engineering information as specified below, for incorporation into Permit Attachment JJ. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:
- III.G.2.a. Design drawings (General Arrangement Drawings - in plan and cross sections) and specifications including references to specific codes and standards (e.g., UBC, ASCE, etc.) for each container storage areas' foundation. These items should show basic design parameters and dimensions, and location of the container storage areas, to keep containers from contact with standing liquids (i.e., elevated or are otherwise protected).
- III.G.3. Prior to initial receipt of dangerous and/or mixed waste to the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for Permit Table III.1., updated to include the contents of Column 2 "Engineering Description" to reflect the engineering information provided under III.G.2.a. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.
- III.G.4. Prior to initial receipt of dangerous and/or mixed waste to the DBVS Facility, the Permittees shall update and submit and receive written approval from Ecology for the following, as specified below, for incorporation into Permit Attachment JJ. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:
- III.G.4.a. Narrative Descriptions, updated;
- III.G.4.b. Descriptions of procedures for precluding release of contents of ICV® Package to the environment during the ICV® Package disconnect and sampling the ICV® Package including, but not limited, to the following:
- III.G.4.b.i. Sealing the sampling port;
- III.G.4.b.ii. Coring process;
- III.G.4.b.iii. External decontamination; and
- III.G.4.b.iv. ICV® Package disconnect procedures;

- III.G.4.c. Descriptions of procedures for handling and transport of containers within the DVBS Facility;
- III.G.4.d. Description of the tracking system used to track containers throughout the DBVS Facility pursuant to WAC 173-303-380. The tracking system, at a minimum, will do the following:
  - III.G.4.d.i. Track the location of containers within the DBVS Facility;
  - III.G.4.d.ii. Track which containers have been shipped off-facility and/or off-site, and to where they have been shipped, as appropriate;
  - III.G.4.d.iii. For containers intended for transport off-site, include information in accordance with the requirements specified in WAC 173-303-190(3)(b);
  - III.G.4.d.iv. Record the date container is placed in the container storage area;
  - III.G.4.d.v. Record the nature of the waste in any given container, including dangerous waste designation codes, any associated Land Disposal Restriction treatment requirements, and the major risk(s) associated with the waste as described in Permit Condition III.D.;
- III.G.4.e. The Description(s) of procedures for container spacing, stacking, and labeling pursuant to WAC 173-303-630(3), WAC 173-303-630(5)(c), and WAC 173-303-340(3);
- III.G.4.f. The Description(s) of procedures for inspecting the container storage areas [WAC 173-303-320 and WAC 173-303-630(6)]; and
- III.G.4.g. The Description(s) of procedures for responding to damaged (e.g., severe rusting, apparent structural defects) or leaking containers [WAC 173-303-630(2)].

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**TABLE III.1.**  
**DESCRIPTION OF DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS)**  
**FACILITY CONTAINER STORAGE AREAS**

<b>Dangerous Waste and Mixed Waste Container Storage Areas</b>	<b>Maximum Capacity Solids</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables &amp; Figures</b>
ICV® Package Storage Area	2,718 m <sup>3</sup> (96,000 ft <sup>3</sup> )	RESERVED	Sections 2.3.2, 2.4, 4.2.9, 4.2.1.0, 4.2.11, 7.2.4, and 7.4 Figures 2-2, B-1, B-4, and 7-1
ICV® Package Sampling Area	54.4 m <sup>3</sup> (1,920 ft <sup>3</sup> )	RESERVED	Sections 2.4, 7.2.4, and 7.4. Figures 2-2, B-1, B-4, and 7-1
ICV® Package Preparation	54.4 m <sup>3</sup> (1,920 ft <sup>3</sup> )	RESERVED	Sections 2.4, 7.2.4, and 7.4. Figures 2-2, B-1, B-4, and 7-1
ICV® Package Cooling Area	54.4 m <sup>3</sup> (1,920 ft <sup>3</sup> )	RESERVED	Sections 2.4, 7.2.4, and 7.4. Figures 2-2, B-1, B-4, and 7-1

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## **PART IV – TANKS**

### **IV.A. TANK SYSTEMS**

For purposes of Permit Part IV, all references to Permit Attachment KK shall be read as references to Permit Attachment KK, as revised pursuant to Permit Condition IV.A.8.

#### **IV.A.1. Approved Waste and Storage Limits**

IV.A.1.a. The Permittees may store in tank systems all dangerous and/or mixed waste with the waste codes listed in Table 6-1 and described in Permit Attachment BB, as changed pursuant to Permit Conditions II.B.7. and II.B.8. (mixed waste retrieved from Tank 241-S-109 and Simulant Dangerous Waste) and as specified in Permit Conditions II.A.1. and II.A.2. excluding characteristic codes D001 and D003.

IV.A.1.b. The Permittees may store and manage dangerous and/or mixed waste only in approved tank systems listed in Permit Table IV.1. and as specified in Permit Attachment KK. The Permittees shall limit the total volume of waste to quantities specified for the individual units listed in Permit Table IV.1.

IV.A.1.c. The Permittees shall manage dangerous and/or mixed waste in any DBVS Facility tank system specified in Permit Attachment KK and Permit Table IV.1., with the waste codes listed in Table 6-1 of Permit Attachment BB, in accordance with Permit Attachment BB, as changed pursuant to Permit Conditions II.B.7. and II.B.8., excluding characteristic codes D001 and D003.

IV.A.1.d. The Permittees shall ensure all certifications required by independent specialists (e.g., IQRPE, independent corrosion expert, independent qualified installation inspector, etc.) use the certification statement listed in WAC 173-303-810(13).

IV.A.1.e. In all future permit submittals, the Permittees shall include tank names with the tank designation (e.g., Tri-Mer Effluent tanks located in the offgas treatment system are designated 37-D74-013).

#### **IV.A.2. Tank System Design and Construction**

IV.A.2.a. The Permittees shall construct the DBVS Facility tank systems, as listed in Permit Table IV.1., in accordance with Permit Attachment KK and Permit Part IV.

#### **IV.A.3. Tank System Installation and Certification for Aboveground Tank Systems**

IV.A.3.a. The use of new aboveground tanks will require certification by an IQRPE that the tank(s) system has sufficient structural integrity and is acceptable for the storing and treatment of dangerous and/or mixed waste in accordance with WAC 173-303-640(3)(a).

- IV.A.3.b. Used aboveground tanks must be certified sound by an IQRPE in accordance with WAC 173-303-640(2)(c).
- IV.A.3.c. The Permittees must ensure that proper handling procedures are adhered to in order to prevent damage to the DBVS Facility tank system during installation. An independent, qualified installation inspector or an IQRPE, trained and experienced in the proper installation of tank systems or components, must inspect the system for the presence of any weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, other structural damage, or inadequate construction/installations.
- All discrepancies must be remedied before the DBVS Facility tank system is enclosed or placed into use [WAC 173-303-640(3)(c)].
- IV.A.3.d. The Permittees must test for tightness all new tanks and ancillary equipment prior to these components being placed into use. If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) in the system must be performed prior to the tank system being enclosed or placed into use [WAC 173-303-640(3)(e)].
- IV.A.3.e. The Permittees must ensure ancillary equipment is supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction [WAC 173-303-640(3)(f)].
- IV.A.3.f. Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall obtain, and keep on file in the operating record, written statements by those persons required to certify the design of the DBVS Facility tank system and supervise the installation of the tank system in accordance with the requirements of WAC 173-303-640(3)(c), (e), and (f), attesting that each DBVS Facility tank system and corresponding containment system listed in Permit Table IV.2. and Permit Attachment KK was properly designed and installed, and that repairs pursuant to WAC 173-303-640(3)(c) and (e) were performed [WAC 173-303-640(3)(a) and WAC 173-303-640(3)(h)].
- IV.A.3.g. The independent tank system installation inspection and subsequent written statements shall be certified pursuant to IV.A.1.d., comply with all requirements of WAC 173-303-640(3)(h), and shall consider, but not be limited to, the following tank system installation documentation:
- IV.A.3.g.i. Field installation report with date of installation;
- IV.A.3.g.ii. Approved welding procedures;
- IV.A.3.g.iii. Welder qualifications and certifications;

- IV.A.3.g.iv. Hydro-test reports, as applicable, in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Division 1, American Petroleum Institute (API) Standard 620, or Standard 650, as applicable;
- IV.A.3.g.v. Tester credentials;
- IV.A.3.g.vi. Field inspector credentials;
- IV.A.3.g.vii. Field inspector reports;
- IV.A.3.g.viii. Field waiver reports; and
- IV.A.3.g.ix. Non-compliance reports and corrective action (including field waiver reports) and repair reports.
- IV.A.3.h. The Permittees shall ensure periodic integrity assessments are conducted on the DBVS Facility tank systems listed in Permit Table IV.1. over the term of this Permit as specified in WAC 173-303-640(3)(b), following the description of the integrity assessment program Permit Attachment II, as revised pursuant to Permit Condition II.D.2.
- IV.A.3.i. The Permittees shall address problems detected during the DBVS Facility tank system integrity assessments specified in Permit Condition IV.A.3.i., following the integrity assessment program in Permit Attachment II, as revised pursuant to Permit Condition II.D.2.
- IV.A.3.j. The Permittees must immediately and safely remove from service any DBVS Facility tank system or secondary containment system which through an integrity assessment is found to be "unfit for use" as defined in WAC 173-303-040, following Permit Condition IV.A.4.h.v. The affected tank system or secondary containment system must be either repaired or closed in accordance with Permit Condition IV.A.4.h.v. [WAC 173-303-640(7)(e) and (f) and WAC 173-303-640(8)].
- IV.A.3.k. The Permittees must provide the type and degree of corrosion protection recommended by an independent corrosion expert, based on the information provided in Permit Attachments BB, as revised pursuant to Permit Conditions II.B.7. and II.B.8., and Permit Attachments FF and KK, as revised pursuant to Permit Condition IV.A.8., or other corrosion protection, if Ecology believes other corrosion protection is necessary to ensure the integrity of the tank system during its use. The installation of a corrosion protection system that is field fabricated must be supervised by an independent corrosion expert to ensure proper installation [WAC 173-303-640(3)(g)].
- IV.A.4. TANK MANAGEMENT PRACTICES

- IV.A.4.a. No dangerous and/or mixed waste shall be managed in the DBVS Facility tank systems unless the operating conditions specified under Permit Condition IV.A.4. and Permit Attachment KK are complied with.
- IV.A.4.b. The Permittees shall install and test all process and leak detection system monitoring/instrumentation as specified in Permit Table IV.3. and Permit Attachment KK.
- IV.A.4.c. The Permittees shall not place mixed waste, treatment reagents, or other materials in the DBVS Facility tank systems if these substances could cause the DBVS Facility tank systems to rupture, leak, corrode, or otherwise fail [WAC 173-303-640(5)(a)].
- IV.A.4.d. The Permittees shall operate the DBVS Facility tank systems to prevent spills and overflows using the description of controls and practices as required in WAC 173-303-640(5)(b).
- IV.A.4.e. The Permittees shall mark all these tank systems holding dangerous and/or mixed waste with labels, or signs, to identify the waste contained in the tank. The labels, or signs, must be legible at a distance of at least fifty (50) feet and must bear a legend that identifies the waste in a manner which adequately warns employees, emergency response personnel, and the public of the major risk(s) associated with the waste being stored or treated in the tank system(s) [WAC 173-303-640(5)(d)].
- IV.A.4.f. The Permittees shall ensure that the secondary containment systems for the DBVS Facility tank systems listed in Permit Table IV.1. and Permit Attachment KK are free of cracks or gaps to prevent any migration of dangerous and/or mixed waste or accumulated liquid out of the system to the soil, groundwater, or surface water at any time that waste is in the tank system. Any indication that a crack or gap may exist in the containment systems shall be investigated and repaired [WAC 173-303-320, WAC 173-303-640(4)(b)(i), WAC 173-303-640(4)(e)(i)(C), and WAC 173-303-640(6)].
- IV.A.4.g. An impermeable interior coating or lining shall be maintained for all concrete containment systems and concrete portion of containment systems. Concrete containment systems that have construction joints must meet the requirements of WAC 173-303-640(4)(e)(ii)(C). The coating shall prevent migration of any dangerous and/or mixed waste into the concrete. All coatings shall meet the following performance standards:
  - IV.A.4.g.i. The coating must seal the containment surface such that no cracks, seams, or other avenues through which liquid could migrate are present;
  - IV.A.4.g.ii. The coating must be of adequate thickness and strength to withstand the normal operation of equipment and personnel within the given area such that degradation or

physical damage to the coating or lining can be identified and remedied before dangerous and/or mixed waste could migrate from the system; and

- I.V.A.4.g.iii. The coating must be compatible with the dangerous and/or mixed waste, treatment reagents, or other materials managed in the containment system [WAC 173-303-640(4)(e)(ii)(D)].
- IV.A.4.h. The Permittees shall inspect all secondary containment systems for the DBVS Facility tank systems in accordance with the Inspection Schedule specified in Permit Attachment II, as revised pursuant to Permit Condition II.D.2., and take the following actions if a leak or spill of dangerous and/or mixed waste is detected in these containment systems [WAC 173-303-320, WAC 173-303-640(5)(c), and WAC 173-303-640(6)]:
  - IV.A.4.h.i. Immediately and safely stop the flow of dangerous and/or mixed waste into the DBVS Facility tank system or secondary containment system, in accordance with procedures based on all applicable safety analysis documentation [WAC 173-303-640(7)(a)];
  - IV.A.4.h.ii. Determine the source of the dangerous and/or mixed waste;
  - IV.A.4.h.iii. Remove the waste from the secondary containment area pursuant to WAC 173-303-640(7)(b). The waste removed from the containment areas of the DBVS Facility tank system shall be managed as dangerous and/or mixed waste;
  - IV.A.4.h.iv. If the cause of the release was a spill that has not damaged the integrity of the DBVS Facility tank system, the Permittees may return the tank system to service pursuant to WAC 173-303-640(7)(e)(ii). In such a case, the Permittees shall take action to ensure the incident that caused liquid to enter the containment systems of these tank systems will not reoccur [WAC 173-303-320(3)];
  - IV.A.4.h.v. If the source of the dangerous and/or mixed waste is determined to be a leak from a DBVS Facility primary tank system or the system is unfit for use as determined through an integrity assessment or other inspection, the Permittees must comply with the requirements of WAC 173-303-640(7) and close the DBVS Facility tank system according to procedures in WAC 173-303-640(7)(e)(i) through (iv) or repair and re-certify the DBVS Facility tank system in accordance with WAC 173-303-810(13)(a) before the tank system is placed back into service [WAC 173-303-640(7)(e) and (f)];
  - IV.A.4.h.vi. The Permittees shall document in the operating record actions/procedures taken to comply with i. through v. above in accordance with WAC 173-303-640(6)(d); and
  - IV.A.4.h.vii. The Permittees shall notify and report releases to the environment to Ecology in accordance with WAC 173-303-640(7)(d).

IV.A.4.i. If liquids (e.g., dangerous and/or mixed waste leaks and spills, precipitation, fire water liquids from damaged or broken pipes) cannot be removed from the DBVS Facility tank systems secondary containment system within twenty-four (24) hours, Ecology will be verbally notified within twenty-four (24) hours of discovery. The notification shall provide the information in i., ii., and iii. listed below. The Permittees shall provide Ecology with a written demonstration within seven (7) business days, identifying at a minimum [WAC 173-303-640(4)(c) and WAC 173-303-640(7)(b)(ii)]:

IV.A.4.i.i. The reasons for delayed removal;

IV.A.4.i.ii. The measures implemented to ensure continued protection of human health and the environment; and

IV.A.4.i.iii. The current actions being taken to remove liquids from secondary containment.

IV.A.5. Inspections [WAC 173-303-640(6)]

IV.A.5.a. The Permittees shall inspect the DBVS Facility tank systems in accordance with the Inspection Schedules in Permit Attachment II, as revised pursuant to Permit Condition II.D.2.

IV.A.5.b. The inspection data for the DBVS Facility tank systems shall be recorded, and the records shall be placed in the DBVS Facility tank systems operating record, as specified in accordance with Permit Condition II.G.

IV.A.6. Recordkeeping [WAC 173-303-380]

For the DBVS Facility tank systems, the Permittees shall record and maintain in the operating record, all monitoring, calibration, recording, maintenance, test data, and inspection data compiled under the conditions of this Permit in accordance with Permit Attachment KK, Permit Table IV.3., and Permit Conditions II.G. and II.C.

IV.A.7. CLOSURE

The Permittees shall close the DBVS Facility tank systems in accordance with Permit Condition II.H., as revised pursuant to Permit Condition II.H.9.

IV.A.8. COMPLIANCE SCHEDULE

IV.A.8.a. All information identified for submittal to Ecology in IV.A.8.b. through IV.A.8.e. of this compliance schedule must be signed and certified in accordance with requirements in WAC 173-303-810(12) and (13).

IV.A.8.b. Prior to construction of each DBVS Facility tank system, excluding ancillary equipment addressed in Permit Condition IV.A.8.c., as identified in Permit Table

IV.1., the Permittees shall submit and receive approval from Ecology for the engineering information, as specified below, for incorporation into Permit Attachment KK. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. At a minimum, engineering information specified below will show the following as required pursuant to WAC-173-303-640 (the information specified below will include dimensioned engineering drawings and information on sumps and floor drains):

- IV.A.8.b.i. IQRPE Reports for each DBVS Facility tank system, excluding ancillary equipment addressed in Permit Condition IV.A.8.c., shall include review of design drawings, calculations, and other information on which the certification report is based and shall include as applicable, but not limited to, review of such information described below. IQRPE Reports shall be consistent with the information separately provided in ii. through viii. below [WAC-173-303-640(3)(a)];
- IV.A.8.b.ii. Design Drawings, including references to codes and standards (general arrangement drawings in plan and cross section), updated Appendix B of Permit Attachment KK process flow diagrams, specifications, piping and instrument diagrams (including pressure control systems, instrumentation/control loops and liner installation details), and leak detection methodology. These items should show the dimensions, volume calculations, and location of the secondary containment system and should include items such as floor/pipe slopes to sumps, tanks, floor drains, location, and physical attributes of each tank [WAC 173-303-640(4)(b) through (f) and WAC 173-303-640(3)(a)];
- IV.A.8.b.iii. A description of materials and equipment used to provide corrosion protection for external metal components in contact with soil, including factors affecting the potential for corrosion as required under WAC 173-303-640(3)(a)(iii)(B) [WAC 173-303-806(4)(c)(v)];
- IV.A.8.b.iv. Detailed description of how the secondary containment for each DBVS Facility tank system will be installed in compliance with WAC 173-303-640(3)(c);
- IV.A.8.b.v. Tank, secondary containment/foundation, and leak detection system materials selection documentation (including, but not limited to, concrete coatings and water stops, and liner materials as applicable) (e.g., physical and chemical tolerances) [WAC 173-303-640(3)(a) and WAC 173-303-806(4)(c)(i)];
- IV.A.8.b.vi. Tank vendor information (including, but not limited to, required performance warranties, as available) consistent with information submitted under ii. above [WAC 173-303-640(3)(a)];
- IV.A.8.b.vii. Detailed description of how the tanks will be installed in compliance with WAC 173-303-640(3)(c), (d), and (e); and

- IV.A.8.b.viii. Tanks designed to prevent the escape of vapors, fumes, and emissions of acutely or chronically toxic (upon inhalation) extremely hazardous waste (EHW), and to prevent the buildup of explosive gases/vapors [WAC 173-303-640(5)(e)].
- IV.A.8.c. Prior to installation of ancillary equipment that is used to distribute, meter, or control the flow of dangerous and/or mixed waste from its point of generation to a storage or treatment tank(s); between dangerous and/or mixed waste storage and treatment tanks to a point of disposal on-site; or to a point of shipment for disposal off-site for each DBVS Facility tank system, as identified in Permit Table IV.1., the Permittees shall submit and receive approval from Ecology for the engineering information as specified below, for incorporation into Permit Attachment KK (the information specified below will include dimensioned engineering drawings). Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:
- IV.A.8.c.i. IQRPE Reports verifying that the ancillary equipment has sufficient structural integrity and is acceptable for the storing and treating of dangerous waste and/or mixed waste, shall include a review of design drawings, calculations, and other information as applicable, on which the certification report is based and shall include as applicable, but not be limited to, review of such information described below. The IQRPE Reports shall be consistent with the information provided separately in ii. through v. below, and the IQRPE Reports specified in Permit Condition IV.A.8.b. [WAC 173-303-640(3)(a)];
- IV.A.8.c.ii. Design drawings (Process Flow Diagrams, Piping and Instrumentation Diagrams [including pressure control systems], etc.), updated Appendix B of Permit Attachment KK, projected performance standards, and other information specific to ancillary equipment (these drawings should include all equipment such as pipe, valves, fittings, pumps, instruments, etc.) [WAC 173-303-640(3)(a)];
- IV.A.8.c.iii. Design criteria (references to codes and standards, load definitions, and load combinations, materials of construction, and analysis/design methodology) and typical design details for the support of the ancillary equipment [WAC 173-303-640(3)(a) and WAC 173-303-640(3)(f)];
- IV.A.8.c.iv. A detailed description of how the ancillary equipment will be installed and tested in compliance with WAC 173-303-640(3)(c) through (e) and WAC 173-303-640(4)(b) and (c); and
- IV.A.8.c.v. Ancillary equipment designed to prevent the escape of vapors, fumes, and emissions of acutely or chronically toxic (upon inhalation) EHW, and to prevent the buildup of explosive gases/vapors [WAC 173-303-640(5)(e)].
- IV.A.8.d. Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility tank systems, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment KK. All information

provided under this permit condition must be consistent with information provided pursuant to Permit Conditions IV.A.8.b. and c. as approved by Ecology. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.

- IV.A.8.d.i. Integrity assessment program and schedule for all DBVS Facility tank systems shall address the conducting of periodic integrity assessments on all DBVS Facility tank systems over the life of the tank, in accordance with Permit Conditions IV.A.3.i., IV.A.3.j., IV.A.3.k., and Permit Attachment II, as revised pursuant to Permit Condition II.D.2. and WAC 173-303-640(3)(b), and descriptions of procedures for addressing problems detected during integrity assessments. The schedule must be based on past integrity assessments, age of the tank system, materials of construction, characteristics of the waste, and any other relevant factors [WAC 173-303-640(3)(b)];
- IV.A.8.d.ii. Detailed plans and descriptions demonstrating the leak detection system is operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous and/or mixed waste, or accumulated liquid in the secondary containment system within twenty-four (24) hours [WAC 173-303-640(7)(b)(i)]. Leak detection for HIHTL shall detect, within 24-hours, a leak rate as specified by the Permittees' *Temporary Waste Transfer Line Management Program, RPP-12711*. Provide a table summarizing line length, total holdup volume until detection, total time until detection occurs, and minimum detectable leak rate.
- IV.A.8.d.iii. Detailed operational plans and descriptions demonstrating that spilled or leaked waste and accumulated liquids can be removed from the secondary containment system within twenty-four (24) hours [WAC 173-303-806(4)(c)(vii)];
- IV.A.8.d.iv. Descriptions of operational procedures demonstrating appropriate controls and practices are in place to prevent spills and overflows from the DBVS Facility tanks or containment systems in compliance with WAC 173-303-640(5)(b)(i) through (iii) and WAC 173-303-806(4)(viii);
- IV.A.8.d.v. Description of procedures for investigation and repair of the DBVS Facility tank systems [WAC 173-303-320, WAC 173-303-640(6), WAC 173-303-640(7)(e) and (f), WAC 173-303-806(4)(a)(v), and WAC 173-303-806(4)(viii)];
- IV.A.8.d.vi. The Permittees will provide a description of procedures for management of dangerous and/or mixed waste as specified in WAC 173-303-640(9) and (10) with the waste codes listed in Table 6-1, excluding D002 of Permit Attachment BB, in accordance with Permit Attachment BB, as changed pursuant to Permit Conditions II.B.7. and II.B.8.; and
- IV.A.8.d.vii. A description of the tracking system used to track dangerous and/or mixed waste throughout the DBVS Facility tank system, pursuant to WAC 173-303-380.

- IV.A.8.e. Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility tank systems, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into this Permit. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions IV.A.8.b. through d.
- IV.A.8.e.i. Permit Table IV.1. amended as follows:
- A. Under column 1, update and complete list of dangerous and/or mixed waste DBVS Facility tank systems.
  - B. Under column 2, update and complete system designations.
  - C. Under column 3, replace the 'Reserved' with the appropriate references (e.g., drawing numbers, etc.) to the updated portions of Permit Attachment KK.
  - D. Under column 4, update and complete list of narrative description, tables, and figures.
  - E. Under column 5, update and replace the "Reserved" with the appropriate capacity.
- IV.A.8.e.ii. Permit Table IV.2., shall be completed to provide for all secondary containment sumps and floor drains, the information as specified in each column heading.
- IV.A.8.e.iii. Permit Table IV.3., shall be completed for the DBVS Facility tank system leak detection system instruments and parameters to provide the information as specified in each column heading.
- IV.A.8.f. The following amendments to Permit Attachment KK are hereby made. The Permittees shall submit the revised pages reflecting these amendments to Ecology prior to installation of the DBVS tank system as identified in Permit Table IV.1. These amendments do not constitute a permit modification pursuant to Permit Conditions I.C.2. and I.C.3.:
- IV.A.8.f.i. Figure B-4, revised to include two (2) additional Waste and Simulant Staging Tanks, consistent with Permit Table IV.1., the first numbered 32-D74-016 and the second to be numbered.
  - IV.A.8.f.ii. Figure B-6, revised to include four additional Tri-Mer Effluent Tanks, consistent with Permit Table IV.1.
  - IV.A.8.f.iii. Figure B-4, revised to include one additional Tri-Mer Bleed Sump Tank, consistent with Permit Table IV.1.

**TABLE IV.1.**  
**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) FACILITY TANK**  
**SYSTEMS DESCRIPTION**

<b>Dangerous and/or Mixed Waste Tank Systems Name</b>	<b>System Designation and Equipment Number</b>	<b>Engineering Description (Drawing No., Specification No., etc.)<sup>b</sup></b>	<b>Narrative Description, Table &amp; Figures</b>	<b>Maximum Capacity (gallons)</b>
Waste and Simulant Staging Tank	WRS-Tanks RESERVED	RESERVED	Sections 2.3.2 and 4.2.3; Table 2-1; Figures 2-3, 2-4, and Figure B-7	1,000
Waste and Simulant Staging Tanks	DBVS-Tanks	RESERVED	Sections 2.3.2 and 4.2.2.2; Table 2-1; Figures 2-2 and B-1	
#1	32-D74-002			18,000
#2	32-D74-003			18,000
#3	32-D74-016			18,000
#4	RESERVED			18,000
Receiver Tank From Bottom of Dryer	DBVS-Tanks	RESERVED	RESERVED	RESERVED
Dry Waste Silos (Hoppers)	DBVS-Tanks	RESERVED	Sections 2.3.3 and 4.2.8 and Figure B-1	
#1	34-D002-007			140 cubic feet
#2	34-D002-008			140 cubic feet
Dryer Condensate Tanks	DBVS-Tanks 37-D74-009 37-D74-010	RESERVED	Sections 2.6 and 4.3.2; Table 4-5; Figures 2-2, B-1, and B-4	Dryer Condensate: 18,000 18,000
Dryer Offgas Condensate Tank	DBVS-Tanks 33-D74-015	RESERVED	Figure B-1 and B-4	500

<b>Dangerous and/or Mixed Waste Tank Systems Name</b>	<b>System Designation and Equipment Number</b>	<b>Engineering Description (Drawing No., Specification No., etc.)<sup>b</sup></b>	<b>Narrative Description, Table &amp; Figures</b>	<b>Maximum Capacity (gallons)</b>
Venturi Scrubber System (VSS) #1	DBVS Tank 36-D74-052	RESERVED	Sections 2 and 4; Figures B-2 and B-5	690
#2	36-D74-054			690
Venturi Scrubber System (VSS) Bleed Tanks #1	DBVS -Tanks 37-D74-011	RESERVED	Section 4.2.15; Figures 2-2, B-2, and B-5	18,000
#2	37-D74-012			18,000
Tri-Mer Effluent #1	DBVS -Tanks 37-D74-013	RESERVED	Sections 2.6 and 4.2.15; Figures 2-2, B-3, and B-6	18,000
#2	37-D74-014			18,000
#3	RESERVED			18,000
#4	RESERVED			18,000
#5	RESERVED			18,000
#6	RESERVED			18,000
NH3 Scrubber Effluent/Bleed Tank	DBVS-Tank RESERVED	RESERVED	Figure B-3	2,000
Tri-Mer Bleed Sump Tank	RESERVED	RESERVED	RESERVED	RESERVED



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**PART V. – DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS)**

For purposes of Permit Part V, where reference is made to WAC 173-303-640, the following substitutions apply: substituting the terms “DBVS” for “tank system(s),” “sub-system(s)” for “tank(s),” “sub-system equipment” for “ancillary equipment,” and “sub-system(s) or sub-system equipment of a DBVS” for “component(s)” in accordance with WAC 173-303-680, with the exception that these substitutions do not apply to the subsystems that are marked with an asterisk or an “a” on Permit Tables V.1. and V.4. and do not apply to ICV® Stations listed on Permit Tables V.1. and V.4. For purposes of Permit Part V., all references to Permit Attachment LL shall be read as references to Permit Attachment LL, as modified pursuant to Permit Condition V.I.

V.A. **GENERAL CONDITIONS**

V.A.1. **CONSTRUCTION AND MAINTENANCE**

[WAC 173-303-640, in accordance with WAC 173-303-680(2) and (3) and WAC 173-303-340].

- V.A.1.a. The Permittees shall construct the DBVS (listed in Permit Tables V.1. and V.4.), as specified in Permit Attachment LL and Permit Part V.
- V.A.1.b. The Permittees shall construct all containment systems for the DBVS as specified in Permit Attachment LL and Part V. of this Permit.
- V.A.1.c. The Permittees shall ensure all certifications required by specialists (e.g., independent, qualified registered professional engineer, independent corrosion expert, independent, qualified installation inspector, etc.) use the certification statement listed in WAC 173-303-810(13).
- V.A.1.d. The Permittees must ensure that proper handling procedures are adhered to in order to prevent damage to the DBVS during installation. Prior to covering, enclosing, or placing the new DBVS or component in use, an independent, qualified, installation inspector or an independent, qualified, registered professional engineer, either of whom is trained and experienced in the proper installation of similar systems or components, must inspect the system for the presence of any of the following items:
- V.A.1.d.i. Weld breaks;
  - V.A.1.d.ii. Punctures;
  - V.A.1.d.iii. Scrapes of protective coatings;
  - V.A.1.d.iv. Cracks;
  - V.A.1.d.v. Corrosion; or
  - V.A.1.d.vi. Other structural damage or inadequate construction/installation.

All discrepancies must be remedied before the DBVS is covered, enclosed, or placed into use [WAC 173-303-640(3)(c), in accordance with WAC 173-303-680(2) and (3)].

- V.A.1.e. For the DBVS components, as applicable, that are placed underground and that are back-filled, the Permittees must provide a backfill material that is a non-corrosive, porous, homogeneous substance. The backfill must be installed so that it is placed completely around the DBVS component and compacted to ensure that the DBVS component is fully and uniformly supported [WAC 173-303-640(3)(d), in accordance with WAC 173-303-680(2) and (3)].
- V.A.1.f. The Permittees must test for tightness the DBVS components, as applicable, prior to being covered, enclosed, or placed into use. If the DBVS components are found not to be tight, all repairs necessary to remedy the leak(s) in the system must be performed prior to the DBVS component being covered, enclosed, or placed into use [WAC 173-303-640(3)(e), in accordance with WAC 173-303-680(2) and (3)].
- V.A.1.g. The Permittees must ensure the DBVS equipment is supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction [WAC 173-303-640(3)(f), in accordance with WAC 173-303-680(2) and (3)].
- V.A.1.h. The Permittees must provide the type and degree of corrosion protection recommended by an independent corrosion expert, based on the information provided in Permit Attachment LL. The installation of a corrosion protection system that is field fabricated must be supervised by an independent corrosion expert to ensure proper installation [WAC 173-303-640(3)(g), in accordance with WAC 173-303-680(2) and (3)].
- V.A.1.i. For each DBVS sub-system holding dangerous waste which are acutely or chronically toxic by inhalation, the Permittees shall operate the system to prevent escape of vapors, fumes, or other emissions into the air [WAC 173-303-806(4)(i)(i)(B) and WAC 173-303-640(5)(e), in accordance with WAC 173-303-680].
- V.A.1.j. The independent DBVS installation inspection and subsequent written statements shall be certified pursuant to V.A.1.c., to comply with all requirements of WAC 173-303-640(3)(h), in accordance with WAC 173-303-680, and shall consider, but not be limited to, the following DBVS System installation documentation:
  - V.A.1.j.i. Field installation report with date of installation;
  - V.A.1.j.ii. Approved welding procedures;
  - V.A.1.j.iii. Welder qualification and certifications;

- V.A.1.j.iv. Hydro-test reports, as applicable, in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Division 1; American Petroleum Institute (API) Standard 620, or Standard 650, as applicable;
- V.A.1.j.v. Tester credentials;
- V.A.1.j.vi. Field inspector credentials;
- V.A.1.j.vii. Field inspector reports;
- V.A.1.j.viii. Field waiver reports; and
- V.A.1.j.ix. Non-compliance reports and corrective action (including field waiver reports) and repair reports.
- V.A.1.k. The Permittees shall ensure periodic integrity assessments are conducted on the DBVS sub-systems which are not marked with an asterisk or an "a" on Permit Tables V.1. and V.4., over the term of this Permit in accordance with WAC 173-303-680(2) and (3), as specified in WAC 173-303-640(3)(b), following the description of the integrity assessment program and schedule in Permit Attachment II, as revised pursuant to Permit Condition II.D.2.
- V.A.1.l. The Permittees shall address problems detected during the DBVS System integrity assessments specified in Permit Condition V.A.1.k., following the integrity assessment program in Permit Attachment II, as modified pursuant to Permit Condition II.D.2.
- V.A.1.m. Process monitors/instruments, as specified in Permit Tables V.3. and V.6., shall be equipped with operational alarms to warn of deviation, or imminent deviation from the limits specified in Permit Tables V.7. and V.8. and Permit Attachment LL.
- V.A.1.n. The Permittees shall install and test all process and leak detection system monitors/instrumentation as specified in Permit Tables V.3. and V.6. in accordance with Permit Attachment LL.
- V.A.1.o. No dangerous and/or mixed waste shall be treated in the DBVS unless the operating conditions, specified under Permit Condition V.C. are complied with.
- V.A.1.p. The Permittees shall not place dangerous and/or mixed waste, treatment reagents, or other materials in the DBVS if these substances could cause the sub-system, sub-system equipment, or the containment system to rupture, leak, corrode, or otherwise fail [WAC 173-303-640(5)(a), in accordance with WAC 173-303-680(2)].
- V.A.1.q. The Permittees shall operate the DBVS to prevent spills and overflows using controls and practices as required under WAC 173-303-640(5)(b) and in Permit

Condition II.C. [WAC 173-303-640(5)(b), in accordance with WAC 173-303-680(2) and (3) and WAC 173-303-806(4)(c)(ix)].

- V.A.1.r. The Permittees shall mark all DBVS sub-systems holding dangerous and/or mixed waste with labels, or signs, to identify the waste contained in the DBVS sub-systems. The labels, or signs, must be legible at a distance of at least fifty (50) feet, and must bear a legend which identifies the waste in a manner which adequately warns employees, emergency response personnel, and the public of the major risk(s) associated with the waste being stored or treated in the DBVS sub-systems [WAC 173-303-640(5)(d), in accordance with WAC 173-303-680(2)].
- V.A.1.s. The Permittees shall ensure that the secondary containment systems for the DBVS sub-systems listed in Permit Tables V.1. and V.4., are free of cracks or gaps to prevent any migration of dangerous and/or mixed waste or accumulated liquid out of the system to the soil, groundwater, or surface water at any time during use of the DBVS sub-systems. Any indication that a crack or gap may exist in the containment systems shall be investigated and repaired in accordance with Permit Attachment II, as revised pursuant to Permit Condition II.D.2. [WAC 173-303-640(4)(b)(i), WAC 173-303-640(4)(e)(i)(C), and WAC 173-303-640(6), in accordance with WAC 173-303-680(2) and (3), WAC 173-303-806(4)(i)(i)(B), and WAC 173-303-320].
- V.A.1.t. The Permittees must immediately, and safely, remove from service any DBVS or secondary containment system which through an integrity assessment is found to be "unfit for use" as defined in WAC 173-303-040, following Permit Condition V.A.1.v. The affected DBVS or secondary containment system must be either repaired or closed in accordance with Permit Condition V.A.1.v. [WAC 173-303-640(7)(e) and (f) and WAC 173-303-640(8), in accordance with WAC 173-303-680(3)].
- V.A.1.u. An impermeable interior coating or lining, as specified in Permit Attachment LL, shall be maintained for all concrete containment systems and concrete portions of containment systems for each DBVS sub-system listed in Permit Tables V.1. and V.4. pursuant to WAC 173-303-640(4)(e)(i), in accordance with WAC 173-303-680(2), and concrete containment systems that have construction joints shall meet the requirements of WAC 173-303-640(4)(e)(ii)(C), in accordance with WAC 173-303-680(2). The coating shall prevent migration of any dangerous and/or mixed waste into the concrete. All coatings shall meet the following performance standards:
- V.A.1.u.i. The impermeable interior coating or lining must seal the containment surface such that no cracks, seams, or other avenues through which liquid could migrate are present;
- V.A.1.u.ii. The coating must be of adequate thickness and strength to withstand the normal operation of equipment and personnel within the given area such that degradation or

physical damage to the coating or lining can be identified and remedied before dangerous and/or mixed waste could migrate from the system; and

- V.A.1.u.iii. The coating must be compatible with the dangerous and/or mixed waste, treatment reagents, or other materials managed in the containment system [WAC 173-303-640(4)(e)(ii)(D), in accordance with WAC 173-303-680(2) and (3) and WAC 173-303-806(4)(i)(i)(A)].
- V.A.1.v. The Permittees shall inspect all secondary containment systems for the DBVS sub-systems listed in Permit Tables V.1. and V.4. in accordance with the Inspection Schedule specified in Permit Attachment II, as modified pursuant to Permit Condition II.D.2., and take the following actions if a leak or spill of dangerous and/or mixed waste is detected in these containment systems [WAC 173-303-640(5)(c) and WAC 173-303-640(6) and (7), in accordance with WAC 173-303-680(2) and (3), WAC 173-303-320, and WAC 173-303-806(4)(i)(i)(B)]:
- V.A.1.v.i. Immediately, and safely, stop the flow of dangerous and/or mixed waste into the DBVS sub-systems or secondary containment system.
- V.A.1.v.ii. Determine the source of the dangerous and/or mixed waste.
- V.A.1.v.iii. Remove the dangerous and/or mixed waste from the containment area in accordance with WAC 173-303-680(2) and (3) as specified in WAC 173-303-640(7)(b). The dangerous and/or mixed waste removed from containment areas of the DBVS sub-systems shall be, as a minimum, managed as dangerous and/or mixed waste.
- V.A.1.v.iv. If the cause of the release was a spill that has not damaged the integrity of the DBVS sub-system, the Permittees may return the DBVS sub-system to service in accordance with WAC 173-303-680(2) and (3) as specified in WAC 173-303-640(7)(e)(ii). In such case, the Permittees shall take action to insure the incident that caused the dangerous and/or mixed waste to enter the containment system will not reoccur [WAC 173-303-320(3)].
- V.A.1.v.v. If the source of the dangerous and/or mixed waste is determined to be a leak from the primary DBVS System into the secondary containment system, or the system is unfit for use as determined through an integrity assessment or other inspection, the Permittees shall comply with the requirements of WAC 173-303-640(7) and take the following actions:
- Close the DBVS sub-system following procedures in WAC 173-303-640(7)(e)(i), in accordance with WAC 173-303-680 and Permit Condition II.H., as revised pursuant to Permit Condition II.H.9.; or
  - Repair and re-certify (in accordance with WAC 173-303-810(13)(a), as modified pursuant to Permit Condition V.A.1.c.) the DBVS, in accordance with

Permit Attachment II, as revised pursuant to Permit Condition II.D.2. before the DBVS is placed back into service [WAC 173-303-640(7)(e)(iii) and WAC 173-303-640(7)(f), in accordance with WAC 173-303-680].

- V.A.1.v.vi. The Permittees shall document in the operating record actions/procedures taken to comply with i. through v. above as specified in WAC 173-303-640(6)(d), in accordance with WAC 173-303-680(2) and (3).
- V.A.1.v.vii. In accordance with WAC 173-303-680(2) and (3), the Permittees shall notify and report releases to the environment to Ecology as specified in WAC 173-303-640(7)(d).
- V.A.1.w. If liquids (e.g., dangerous and/or mixed waste leaks and spills, precipitation, fire water, liquids from damaged or broken pipes) cannot be removed from the secondary containment system within twenty-four (24) hours, Ecology will be verbally notified within twenty-four (24) hours of discovery. The notification shall provide the information in i., ii., and iii. listed below. The Permittees shall provide Ecology with a written demonstration within seven (7) business days, identifying at a minimum [WAC 173-303-640(4)(c)(iv) and WAC 173-303-640(7)(b)(ii), in accordance with WAC 173-303-680(3) and WAC 173-303-806(4)(i)(i)(B)]:
  - V.A.1.w.i. Reasons for delayed removal;
  - V.A.1.w.ii. Measures implemented to ensure continued protection of human health and the environment; and
  - V.A.1.w.iii. Current actions being taken to remove liquids from secondary containment.
- V.A.1.x. Air pollution control devices and capture systems in the DBVS shall be maintained and operated in a manner so as to minimize the emissions of air contaminants and to minimize process upsets. Procedures for ensuring that the air pollution control devices and capture systems in the DBVS System are properly operated and maintained so as to minimize the emission of air contaminants and process upsets shall be established.
- V.A.1.y. In all future narrative permit submittals, the Permittees shall include DBVS sub-system names with the sub-system designation.
- V.A.1.z. Changes to approved design, plans, and projected performance documentation in Permit Attachment LL for the DBVS shall require that the Permittee submit and receive written approval from Ecology, except as specified in Permit Conditions II.A.8., II.A.9., or II.I. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.
- V.A.1.aa. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall obtain and keep on file in the DBVS operating record, written statements by

those persons required to certify the design of the DBVS and supervise the installation of the DBVS, as specified in WAC 173-303-640(3)(b), (c), (d), (e), (f), and (g), in accordance with WAC 173-303-680, attesting that the DBVS and corresponding containment system listed in Permit Tables V.2. and V.5., were properly designed and installed, and that repairs, in accordance with WAC 173-303-640(3)(c) and (e) were performed [WAC 173-303-640(3)(a) and WAC 173-303-640(3)(h), in accordance with WAC 173-303-680(3)].

**V.B. PERFORMANCE STANDARDS**

The Permittees shall provide information supporting DBVS targeted and actual performance in the DBVS Campaign Plans and DBVS Campaign Summary Reports, respectively, as specified in Permit Conditions V.I.6., V.I.7., V.I.8., V.I.9., and V.I.10.

**V.C. OPERATING CONDITIONS**

[WAC-303-670(6), in accordance with WAC 173-303-680(2) and (3)].

**V.C.1.** The Permittees shall operate the DBVS in accordance with Permit Attachment LL, Permit Part V., and in accordance with the following:

**V.C.1.a.** The Permittees shall operate the DBVS in order to maintain the systems and process parameters listed in Permit Tables V.3., V.6., V.7., and V.8., within the set-points specified in Permit Tables V.7. and V.8.

**V.C.1.b.** The Permittees shall operate the Emergency Parameter Control/Response System, specified in Permit Table V.8., to respond (e.g., automatically cut-off and/or lock-out the dangerous and mixed waste feed to the DBVS, etc.) as specified in Permit Table V.8. when the operating conditions exceed the set-points specified in Permit Table V.8.

**V.C.1.c.** The Permittees shall operate the Emergency Parameter Control/Response System, specified in Permit Table V.8., to respond (e.g., automatically cut-off and/or lock-out the dangerous and mixed waste feed to the DBVS, etc.) as specified in Permit Table V.8. when any instrument or component specified on Permit Tables V.7. and V.8. for setting or measuring the monitored parameter fail or operate outside its span value.

**V.C.1.d.** The Permittees shall operate the Emergency Parameter Control/Response System, specified in Permit Table V.8. to respond (e.g., automatically cut-off and/or lock-out the dangerous and mixed waste feed to the DBVS, etc.) as specified in Permit Table V.8. when any portion of the DBVS that is specified for operation in the Ecology Approved DBVS Campaign Plan pursuant to Permit Conditions V.I.6. and V.I.7. is bypassed. The terms "bypassed" and "bypass event" as used in Permit Part V. shall mean if any portion of the DBVS is bypassed so that gases are not treated

as specified in the Ecology Approved DBVS Campaign Plan, pursuant to Permit Conditions V.I.6., V.I.7., and V.I.8.

- V.C.1.e. In the event of a malfunction of the Emergency Parameter Control/Response System, specified in Permit Table V.8., to respond (e.g., automatically cut-off and/or lock-out the dangerous and mixed waste feed to the DBVS, etc.) as specified in Permit Table V.8. The Permittees shall not resume operations as prior to the malfunction until the problem causing the malfunction has been identified and corrected.
- V.C.1.f. The Permittees shall manually implement the response specified in Permit Table V.8. when the operating conditions deviate from the limits specified in Permit Condition V.C.1.b., unless the deviation automatically, as specified in Permit Table V.8., activates the response sequence specified in Permit Conditions V.C.1.b., V.C.1.c., and/or V.C.1.d.
- V.C.1.g. The Permittees shall control fugitive emissions from the DBVS by maintaining/operating the DBVS offgas systems in accordance with Permit Conditions II.A.4. and II.A.5.
- V.C.1.h. The Permittees shall not exceed fifty percent (50%) of the organic design capacity of the carbon filter and shall change-out the carbon filter prior to commencement of the next DBVS Campaign if it is projected that this capacity would be exceeded during a DBVS Campaign.
- V.C.1.i. The Permittees shall change-out the carbon filter following detection of organic break-through as specified in Permit Attachment LL.

V.D. INSPECTION REQUIREMENTS  
[WAC 173-303-680(3)].

- V.D.1. The Permittees shall inspect the DBVS and the DBVS Emergency Parameter Control/Response System in accordance with the Inspection Schedules in Permit Attachment II, as modified pursuant to II.D.2.
- V.D.2. The inspection data for DBVS and the DBVS Emergency Parameter Control/Response System shall be recorded, and the records shall be placed in the DBVS operating record for the DBVS, in accordance with Permit Conditions II.D. and II.G.
- V.D.3. The Permittees shall comply with the inspection requirements specified in Permit Attachment II, as revised pursuant to Permit Condition II.D.2.

V.E. MONITORING REQUIREMENTS  
[WAC 173-303-670(5), (6), and (7) and WAC 173-303-807(2), in accordance with WAC 173-303-680(3)].

- V.E.1. The Permittees shall comply with the monitoring requirements specified in Permit Attachment LL, Ecology approved DBVS Campaign Plan, and Permit Part V.
- V.E.2. The Permittees shall operate, calibrate, and maintain the carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), particulate emission, and organic monitors, and any other monitors required for the DBVS by the Ecology approved DBVS Campaign Plan in accordance with the EPA Performance Specifications in 40 CFR Part 60, Appendix B, as specified in Attachment LL of this Permit, the Ecology approved DBVS Campaign Plan, and Part V. of this Permit.
- V.E.3. The Permittees shall operate, calibrate, and maintain the instruments specified on Permit Tables V.3., V.6., and V.8., in accordance with Attachment LL of this Permit, the Ecology approved DBVS Campaign Plan, and Part V. of this Permit.
- V.F. RECORDKEEPING REQUIREMENTS  
[WAC 173-303-380 and WAC 173-303-680(3)].
- V.F.1. The Permittees shall record and maintain in the operating record for the DBVS, all monitoring, calibration, maintenance, test data, and inspection data compiled under the conditions of this Permit, in accordance with Permit Conditions II.D., and II.G.
- V.F.2. The Permittees shall record in the DBVS operating record the date, time, and duration of Emergency Parameter Control/Response System activation (e.g., automatic waste feed cutoffs and/or lockouts, etc.) including the triggering parameters, reason for the deviation, and recurrence of the incident. The Permittees shall also record all incidents of the Emergency Parameter Control/Response System function failures, including the corrective measures taken to correct the condition that caused the failure.
- V.G. CLOSURE
- The Permittees shall close the DBVS System in accordance with Permit Condition II.H., as revised pursuant to Permit Condition II.H.9.
- V.H. PHASE 1 AND PHASE 2 CAMPAIGNS  
[WAC 173-303-670(5), (6), and (7), and WAC 173-303-807(2), in accordance with WAC 173-303-680(2) and (3)].
- V.H.1. The Permittees shall conduct Phase 1 and Phase 2 in accordance with Permit Attachment LL, Ecology approved DBVS Campaign Plan and Permit Part V.
- V.H.2. Phase 1 and Phase 2 Limitations and Allowable Waste Feed
- V.H.2.a. The Permittees shall comply with the Phase 1 and Phase 2 feed limits specified on Permit Tables V.7. and V.8., Permit Conditions II.A. and II.B., the Ecology

approved DBVS Campaign Plan pursuant to Permit Conditions V.I.6., V.I.7., and V.I.8., and Permit Attachment BB, as changed pursuant to Permit Conditions II.B.7. and II.B.8., and amended to exclude feed of D001 and D003.

- V.H.3. The Permittees shall not commence Phase 1 until the Permittees have submitted and received Ecology approval for the Phase 1 DBVS Campaign Plan pursuant to Permit Condition V.I.6.
- V.H.4. The Permittees shall not commence the first campaign under Phase 2 until the following has occurred:
  - V.H.4.a. The Permittees have submitted the portions of the Phase 1 DBVS Campaign Summary Report to Ecology, as specified in Permit Condition V.I.9., that were identified in DBVS Phase 1 Campaign Plan, as approved by Ecology, as critical to development of the first campaign under Phase 2's DBVS Campaign Plan.
  - V.H.4.b. The Permittees have submitted and received Ecology approval for the first Phase 2 DBVS Campaign Plan pursuant to Permit Condition V.I.7.
- V.H.5. The Permittees shall not commence each subsequent campaign under Phase 2 until the following has occurred:
  - V.H.5.a. The Permittees have submitted the portions of the previous Phase 2 DBVS Campaign Summary Report(s) to Ecology, as specified in Permit Condition V.I.9., that were identified in the previous DBVS Phase 2 Campaign Plan(s), as approved by Ecology, as critical to development of this subsequent DBVS Phase 2 Campaign Plan.
  - V.H.5.b. The Permittees have submitted and received Ecology approval for the DBVS Campaign Plan under Phase 2, which the Permittees are requesting approval to commence pursuant to Permit Conditions V.I.7. and/or V.I.8.

V.I. COMPLIANCE SCHEDULES

- V.I.1. All information identified for submittal to Ecology in V.I.2. through V.I.5. and in V.I.10. of this compliance schedule must be signed and certified in accordance with requirements in WAC 173-303-810(12).
- V.I.2. Prior to construction of each secondary containment and leak detection system for the DBVS as identified in Permit Tables V.2. and V.5., the Permittees shall submit and receive Ecology approval for the engineering information as specified below, for incorporation into Permit Attachment LL. At a minimum, engineering information specified below will show the following as described in WAC 173-303-640, in accordance with WAC 173-303-680 (the information specified below will include dimensioned engineering drawings and information on sumps and floor

drains). Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:

- V.I.2.a. IQRPE Reports (specific to foundation, secondary containment, and leak detection system) shall include review of design drawings, calculations, and other information on which the certification report is based and shall include as applicable, but not limited to, review of such information described below (drawings, specifications, etc.). IQRPE Reports shall be consistent with the information separately provided in b. through f. below [WAC 173-303-640(3)(a), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)];
- V.I.2.b. Design drawings to include references to codes and standards (General Arrangement Drawings, in plan, and cross sections) and projected performance documentation for the foundation, secondary containment including liner installation details, and leak detection methodology. These items should show the dimensions, volume calculations, and location of the secondary containment system, and should include items such as floor/pipe slopes to sumps, tanks, floor drains [WAC 173-303-640(4)(b) through (f) and WAC 173-303-640(3)(a), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)];
- V.I.2.c. The Permittees shall provide the design criteria (references to codes and standards, load definitions, and load combinations, materials of construction, and analysis/design methodology) and typical design details for the support of the secondary containment system. This information shall demonstrate the foundation will be capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift [WAC 173-303-640(4)(c)(ii), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(i)(B)];
- V.I.2.d. A description of materials and equipment used to provide corrosion protection for external metal components in contact with soil, including factors affecting the potential for corrosion [WAC 173-303-640(3)(a)(iii)(B), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(A) through (B)];
- V.I.2.e. Secondary containment/foundation, and leak detection system, materials selection documentation (including, but not limited to, concrete coatings and water stops, and liner materials) as applicable [WAC 173-303-806(4)(i)(i)(A) through (B)]; and
- V.I.2.f. Detailed description of how the secondary containment for the DBVS will be installed in compliance with WAC 173-303-640(3)(c), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(A) through (B).
- V.I.3. Prior to installation of each sub-system as identified in Permit Tables V.1. and V.4., the Permittees shall submit and receive approval from Ecology for the engineering information as specified below, for incorporation into Permit Attachment LL (the

information specified below will include dimensioned engineering drawings). Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3.:

- V.I.3.a. IQRPE Reports verifying that the subsystems that are not marked with an asterisk on Permit Tables V.1. and V.4. have sufficient structural integrity and are acceptable for the storing and treating of dangerous and/or mixed waste shall include review of design drawings, calculations, and other information on which the certification report is based and shall include as applicable a review of such information described below. The IQRPE Reports shall be consistent with the information separately provided in b. through e. below, and the IQRPE Report specified in Permit Condition V.I.2. [WAC 173-303-640(3)(a), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(i)];
- V.I.3.b. For subsystems that are marked with an asterisk on Permit Tables V.1. and V.4. the Permittees shall provide design information including: updated Appendix B of Permit Attachment LL process flow diagrams, piping and instrumentation diagrams (including pressure control systems and mass and energy balances), physical and chemical tolerances of equipment, projected performance documentation, instrumentation/control loops, and materials of construction;
- V.I.3.c. For subsystems that are not marked with an asterisk on Permit Tables V.1. and V.4. shall provide design information including: design drawings (General Arrangement Drawings in plan and cross section, references to codes and standards, updated Appendix B of Permit Attachment LL process flow diagrams, piping and instrumentation diagrams [including pressure control systems and mass and energy balances]), projected performance documentation, instrumentation/control loops for each subsystem, materials of construction, analysis/design methodology, fan curves for exhaust fan 1 (36-N31-025) and exhaust fan 2 (36-N31-026), physical and chemical tolerances of equipment, carbon filter organic (volatile, semi-volatile and non-volatile) design capacity and typical design details to support the subsystems and projected operational capability [WAC 173-303-640(3)(a), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(i)(B)];
- V.I.3.d. A detailed description of how the subsystems that are not marked with an asterisk or an "a" on Permit Tables V.1. and V.4. will be installed in compliance with WAC 173-303-640(3)(c), (d), and (e), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(B); and
- V.I.3.e. Subsystem design to prevent escape of vapors and emissions of acutely or chronically toxic (upon inhalation) EHW, and to prevent the build-up of explosive gases/vapors [WAC 173-303-640(5)(e), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(i)(B)].
- V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for

incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2. and V.I.3., as approved by Ecology:

- V.I.4.a. A correction factor, with supporting description, and monitoring, that can be applied to the performance standards specified in Permit Condition V.I.6.f. that would assure that the design and operation of the DBVS promotes the reduction of the total quantity of dangerous/hazardous constituents released as air emissions by maximizing removal and destruction of constituents prior to release from the exhaust stack versus significant reduction of the concentration of the emissions in the exhaust by increased dilution air. The supporting description shall discuss how it will be applied and the appropriateness of its application to each performance standard specified in Permit Condition V.I.6.f. and specific details on how the factor will be monitored during operation.
- V.I.4.b. Detailed Description of an Emergency Parameter Control/Response System addressing operating parameters specified in Permit Tables V.7. and V.8., as approved pursuant to Permit Conditions V.I.4.k. and V.I.6.c.
- V.I.4.c. Integrity assessment program and schedule for the DBVS shall address the conducting of periodic integrity assessments on the DBVS subsystems which are not marked with an asterisk or an "a" on Permit Tables V.1. and V.4., over the life of the system, as specified in Permit Condition V.A.1.k. and WAC 173-303-640(3)(b), in accordance with WAC 173-303-680, and descriptions of procedures for addressing problems detected during integrity assessments. The schedule must be based on past integrity assessments, age of the system, materials of construction, characteristics of the waste, and any other relevant factors [WAC 173-303-640(3)(b), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(B)].
- V.I.4.d. Detailed plans and descriptions, demonstrating the leak detection system is operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous and/or mixed waste or accumulated liquid in the secondary containment system within twenty-four (24) hours [WAC 173-303-640(4)(c)(iii)]. Leak detection for HIHTL shall detect, within 24-hours, a leak rate as specified by the Permittees' *Temporary Waste Transfer Line Management Program, RPP-12711*. Provide a table summarizing line length, total holdup volume until detection, total time until detection occurs, and minimum detectable leak rate.
- V.I.4.e. Detailed operational plans and descriptions, demonstrating that spilled or leaked waste and accumulated liquids can be removed from the secondary containment system within twenty-four (24) hours [WAC 173-303-806(4)(i)(i)(B)].

- V.I.4.f. Descriptions of operational procedures demonstrating appropriate controls and practices are in place to prevent spills and overflows from the DBVS or containment systems in compliance with WAC 173-303-640(5)(b)(i) through (iii), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(B).
- V.I.4.g. Description of procedures for inspection and repair of the DBVS [WAC 173-303-640(6) and WAC 173-303-640(7)(e) and (f), in accordance with WAC 173-303-680, WAC 173-303-320, WAC 173-303-806(4)(a)(v), and WAC 173-303-806(4)(i)(i)(B)].
- V.I.4.h. The Permittees will provide a description of procedures for management of dangerous and/or mixed waste as specified in WAC 173-303-640(9) and (10) with the waste codes listed in Table 6-1, excluding characteristic code D001 and D003 of Permit Attachment BB, in accordance with Permit Attachment BB, as changed pursuant to Permit Conditions II.B.7. and II.B.8.
- V.I.4.i. A description of the tracking system used to manage dangerous and/or mixed waste generated throughout the DBVS, pursuant to WAC 173-303-380.
- V.I.4.j. Detailed description of procedures for start-up and shutdown of waste feed and controlling and minimizing emissions in the event of an equipment malfunction, including off-normal and emergency shutdown procedures, procedures for switching to back-up systems and tie into Permit Tables V.7. and V.8. and Appendix E of Permit Attachment LL.
- V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3., V.6., and V.8. completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS. Appendix E shall include a narrative description and information to support the parameters and limits values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.
- V.I.4.l. ICV® Container Refractory Information as Appendix F of Permit Attachment LL.
- V.I.4.m. Continuous emission monitor for measuring organic breakthrough of the DBVS carbon filter. Include monitor specifications, proposed location, monitoring plan and documentation that the monitor is capable of detecting the organics (volatile, semi-volatile, and non-volatile) that could potentially be emitted from the DBVS.
- V.I.4.n. Detailed procedures for maintaining and documenting in the DBVS operating record, a running count of the organic inventory fed to DBVS Waste Dryer from the DBVS Facility on a per campaign basis of spiked and non-spiked constituents and

change-out of the carbon filter so as not to exceed 50% of the organic design capacity of the carbon filter.

- V.I.4.o. Operation, calibration, and maintenance procedures for the particulate matter, carbon monoxide, nitrogen oxides, sulfur oxides, organic continuous emission monitors, and the monitoring for the correction factor under Permit Condition V.I.4.a., including references to the technically appropriate specifications from 40 CFR Part 60, Appendix B, for each parameter.
- V.I.4.p. Description of the design/operating resolutions developed to address the following potential DBVS shortfalls:
- V.I.4.p.i. Main offgas system not meeting ASME AG-1, N509, N510.
- V.I.4.p.ii. Tri-Mer subsystem capacity insufficient to handle incoming gas flow.
- V.I.4.p.iii. Excessive ICV® Package bottom temperature.
- V.I.4.p.iv. Waste Dryer not demonstrated to be able to achieve a total operating efficiency of at least 70%.
- V.I.4.q. Section 4.2.14, page 4-10 of Permit Attachment LL, first sentence is revised as follows: "The mixer/dryer emissions will be partially treated for moisture removal using a glycol-cooled condenser prior to being routed to the main offgas treatment system."
- V.I.4.r. Section 4.2.16, page 4-12 of Permit Attachment LL, second sentence is revised as follows: "However, if the Phase 1 offgas treatment system performance does not meet expectations, changes to the system will be made with prior Ecology approval."
- V.I.5. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following as specified below for incorporation into this Permit. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2., V.I.3., and V.I.4., as approved by Ecology:
- V.I.5.a. Permit Tables V.3. and V.6. shall be completed for DBVS leak detection system instruments and parameters, to provide the information as specified in each column heading [WAC 173-303-680, WAC 173-303-806(4)(i)(i)(A) through (B), and WAC 173-303-806(4)(i)(v)].
- V.I.5.b. Permit Tables V.1. and V.4. amended as follows [WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(A) through (B)]:

- V.I.5.b.i. Under column 1, update and complete list of dangerous and/or mixed waste DBVS subsystems.
- V.I.5.b.ii. Under column 2, update and complete system designations.
- V.I.5.b.iii. Under column 3, replace 'Reserved' with the appropriate references (e.g., drawing numbers, etc.) to the updated portions of Permit Attachment LL.
- V.I.5.b.iv. Under column 4, update and complete list of narrative description, tables, and figures.
- V.I.5.b.v. Under column 5, update and replace "Reserved" with the appropriate capacity.
- V.I.5.c. Submit Permit Tables V.2. and V.5. completed to provide for all secondary containment sumps and floor drains, the information as specified in each column heading consistent with information to be provided in V.I.2.a. through V.I.2.f. above.
- V.I.6. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive approval from Ecology for the Phase 1 DBVS Campaign Plan. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. The Phase 1 DBVS Campaign Plan shall include the information specified in Section 5 and Appendix A of Permit Attachment LL in addition to the following:
  - V.I.6.a. Updated Demonstration Test Matrix, as appropriate to the DBVS Campaign Plan and identification of the portions of the information expected to be collected during this campaign and to be included in this DBVS Campaign Summary Report, that are critical to development of subsequent DBVS Campaign Plan(s), including clearly identifying which DBVS Campaign Plan(s) the information is projected to be critical to.
  - V.I.6.b. Sampling, analysis, and QA/QC procedures/methods for any constituents/samples necessary to implement the DBVS Campaign Plan that were not addressed in Permit Attachment BB, as revised pursuant to Permit Conditions II.B.7. and II.B.8. These sampling, analysis, and QA/QC procedures/methods must explicitly address data needed to demonstrate LDR compliance for constituents in Tables 6-1 and 6-3 of Permit Attachment BB.
  - V.I.6.c. Updated, as appropriate to the DBVS Campaign Plan, Appendix E of Permit Attachment LL and Permit Tables V.3., V.6., and V.8. completed to include this updated information. Appendix E shall include a narrative description and information to support the updated parameters and limits values specified.
  - V.I.6.d. Changes to DBVS Facility including updates to all impacted portions of the Permit and Permit Attachments, as appropriate to the DBVS Campaign Plan.

V.I.6.e. Documentation (e.g., engineering calculations, test data, and/or manufacturer/vendor's warranties/operations and maintenance documentation, etc.) to support that the DBVS Campaign Plan design and operation during the campaign is projected to meet the performance standards specified in Permit Condition V.I.6.f. within and at the bounding conditions detailed as follows:

(For purposes of this permit condition outside of expected bounds of process operations shall be defined as follows):

Fifty percent (50%) of the metals specified on Table V.7., as fed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System are retained in the ICV® Melt and the remainder of the metals enter the main offgas treatment system (as specified on Permit Tables V.1. and V.4. and Permit Attachment LL), with the exception of mercury which would be assumed to enter the main offgas treatment system (as specified on Permit Tables V.1. and V.4. and Permit Attachment LL) at one hundred percent (100%) of the concentration as fed to the DBVS Waste Dryer from the DBVS Waste and Stimulant Staging Tank Feed System.

Zero percent (0%) of the organics as fed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System are retained in the ICV® Melt. One hundred percent (100%) of the volatile organics, and fifty percent (50%) of the semi-volatile organics as fed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System enter the Dryer Offgas Treatment System, which includes the Main Offgas Treatment System subsystems downstream of mist eliminator #3 (36-N24-041). Fifty percent (50%) of the semi-volatile organics and one hundred percent (100%) of nonvolatile organics as feed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System enter the Main Offgas Treatment System (as specified on Permit Tables V.1. and V.4. and Permit Attachment LL).

Zero percent (0%) of the constituents that contribute to the formation of HCl, NO<sub>x</sub>, and SO<sub>x</sub> as fed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System are retained in the ICV® melt and one hundred percent (100%) of these constituents that contribute to the formation of HCl, NO<sub>x</sub>, and SO<sub>x</sub> as feed to DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System are available to form HCL, NO<sub>x</sub>, and SO<sub>x</sub> in the ICV® melt or in the Main Offgas Treatment System (as specified on Permit Tables V.1. and V.4. and Permit Attachment LL).

Dryer Offgas Treatment System and the Main Offgas Treatment System operation at or below lower bounds of expected efficiencies, as specified on Permit Tables V.1. and V.4. and Permit Attachment LL.

V.I.6.f. Performance Standards (as referenced in Permit Condition V.I.6.e.)

- V.I.6.f.i. A destruction and removal efficiency (DRE) of ninety-nine point nine, nine percent (99.99%) for the Organic Compounds listed on Table 6-1 of Permit Attachment BB [40 CFR §63.1203(c)(1), 40 CFR 63.1203(c)(2), in accordance with WAC 173-303-680(2)]:

DRE in this permit condition shall be calculated in accordance with the formula given below:

$$\text{DRE}=[1-(W_{\text{out}}/W_{\text{in}})] \times 100\%$$

Where:

$W_{\text{in}}$ =mass feed-of the organic compound in a waste feed stream; and

$W_{\text{out}}$ =mass emission of the same organic compound present in emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere.

- V.I.6.f.ii. Particulate matter emissions from the DBVS offgas exhaust stack (36-N26-024) prior to the atmosphere not exceeding 34 mg/dscm (0.015 grains/dscf) [40 CFR §63.1203(b)(7), in accordance with WAC 173-303-680(2)].
- V.I.6.f.iii. Hydrochloric acid and chlorine gas emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 21 ppmv, combined [40 CFR §63.1203(b)(6), in accordance with WAC 173-303-680(2)].
- V.I.6.f.iv. Dioxin and Furan TEQ emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 0.2 nanograms (ng)/dscm [40 CFR §63.1203(b)(1), in accordance with WAC 173-303-680(2)].
- V.I.6.f.v. Mercury emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 45 µg/dscm [40 CFR §63.1203(b)(2), in accordance with WAC 173-303-680(2)].
- V.I.6.f.vi. Lead and cadmium emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 120 µg/dscm, combined [40 CFR §63.1203(b)(3), in accordance with WAC 173-303-680(2)].
- V.I.6.f.vii. Arsenic, beryllium, and chromium emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 97 µg/dscm, combined [40 CFR §63.1203(b)(4), in accordance with WAC 173-303-680(2)].
- V.I.6.f.viii. Carbon monoxide (CO) emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 100 parts per million (ppm) by volume, over an hourly rolling average (as measured and recorded by the continuous monitoring system), dry basis [40 CFR §63.1203(b)(5)(i), in accordance with WAC 173-303-680(2)].

- V.I.6.f.ix. Hydrocarbon emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 10 parts per million (ppm) by volume, over an hourly rolling average (as measured and recorded by the continuous monitoring system), dry basis, and reported as propane [40 CFR §63.1203(b)(5)(ii), in accordance with WAC 173-303-680(2)].
- V.I.6.g. Document that fifty percent (50%) of the organic design capacity of the carbon filter, as specified in Permit Attachment LL, will not be exceeded during this DBVS Campaign.
- V.I.6.h. Documentation of the expected levels of constituents in DBVS feed materials and additives during the DBVS Campaign which have the potential to impact the performance of the DBVS with respect to the Performance Standards identified in Permit Condition V.I.6.f. and update Permit Tables V.7. and V.8.
- V.I.6.i. Updated Appendix B of the Permit Attachment LL to reflect the equipment configuration that will be followed for the DBVS Campaign.

- V.I.7. Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign, Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. Such approval shall not require a permit modification under Permit Conditions I.C.2. and I.C.3. The Phase 2 DBVS Campaign Plan shall include the information specified in Permit Condition V.I.6.

In addition, the Phase 2 DBVS Campaign Plans shall be designed to collect the information specified in Permit Conditions V.I.7.c. through V.I.7.e. (below) and the Phase 2 DBVS Campaign Plans designed to provide "Feed Envelope Verification and/or Process Improvement," shall also include the information specified in Permit Conditions V.I.7.a. and V.I.7.b. (below):

- V.I.7.a. Emission testing for demonstrating performance standards listed in Permit Condition V.I.6.f.
- V.I.7.b. Detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, planned analytical procedures for sample analysis and a short summary narrative description of each stack sample method with identification of the performance standard(s) identified in Permit Condition V.I.6.f. that the method will be used to demonstrate the performance of the DBVS.
- V.I.7.c. One or more test campaigns shall be conducted to generate mass balance information sufficient to address the fate/concentration of potential constituents of concern, such as Iodine-129 and Technetium-99, within the ICV® Package and its

- various components, the offgas systems, offgas systems' secondary liquid waste, and solid and secondary semi-solid waste.
- V.I.7.d. One or more test campaigns shall be conducted to generate information to assess the potential for waste minimization as it relates to secondary liquid waste.
- V.I.7.e. One or more test campaigns shall be conducted to generate information to assess how potential future recycled waste from the WTP could be incorporated into a Bulk Vitrification full-scale production facility waste stream, should Ecology make the decision to permit a full-scale production facility, and the impacts related to including these recycles into the DBVS Facility waste stream. These test campaigns would be specifically designed to observe, record, and analyze impacts related to waste loading and potential constituents of concern, such as sulfate, sodium, metals, iodine, and technetium.
- V.I.8. The Permittee shall not require Ecology approval for a Phase 2 DBVS Campaign Plan(s) prior to commencement of the individual campaign under the following conditions, as an exception to Permit Condition V.I.7. The first Phase 2 DBVS Campaign Plan and the DBVS Phase 2 Campaign Plan which addresses the information specified in Permit Conditions V.I.7.a. and V.I.7.b. are not eligible for this exception. Any DBVS Phase 2 Campaign Plan that qualifies for this exception shall be considered an Ecology Approved DBVS Campaign Plan for the purposes of this Permit:
- V.I.8.a. DBVS Campaign Plans that do not require submittal of information under Permit Conditions V.I.6.b., V.I.6.c., V.I.6.d., or V.I.6.i.
- V.I.9. The Permittees shall submit to Ecology a Draft DBVS Campaign Report within ninety (90) days after the completion of each campaign that includes the following (NOTE: Preliminary analytical data is acceptable):
- V.I.9.a. Information specified in Section 9.3.1 of Permit Attachment GG;
- V.I.9.b. Information specified in Section 5 and Appendix A of Permit Attachment LL;
- V.I.9.c. Information collected to document the capability of the DBVS to meet the performance standards specified in Permit Condition V.1.6.f.;
- V.I.9.d. Information collected to document organic design capacity remaining in DBVS Carbon Filter; and
- V.I.9.e. Information collected to document implementation of the DBVS control system during the campaign including:
- V.I.9.e.i. The parameter(s) that deviated from the set-point(s) in Permit Table V.8.;

- V.I.9.e.ii. The magnitude, dates, and duration of the deviations;
- V.I.9.e.iii. Results of the investigation of the cause of the deviations; and
- V.I.9.e.iv. Corrective measures taken to minimize future occurrences of the deviations.
- V.I.10. The Permittees shall submit to Ecology the Final DBVS Campaign Summary Report within one hundred and twenty (120) days after the completion of the last DBVS Campaign Summary Report as specified in V.I.9. that includes the information specified in Permit Conditions V.I.9.b., c., d., e., and the following:
  - V.I.10.a. The information specified in Section 9.3.2 of Permit Attachment GG; and
  - V.I.10.b. All quarterly Calibration Error and Annual Performance Specification Tests for monitors conducted in accordance with Permit Condition V.E.2.
  - V.I.10.c. ICV® Package detailed final limitations for size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, disposal facility, and testing/acceptance requirements.

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**TABLE V.1.**

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) - PHASE 1  
 DESCRIPTION FOR NON-MAJOR COMPONENTS (E.G., PUMPS, FILTERS, FANS,  
 COMPRESSORS, ETC. NOT SPECIFICALLY LISTED)**

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
Control system for feed from the Waste & Simulant Staging Tanks to Waste Dryer <sup>a*</sup> (Waste Transfer Pump Skid)	32-D58-007	RESERVED	Sections 2.3.2, 2.3.3, 4.2, 4.2.1, 4.2.2.1, 4.2.3, 4.2.4, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Waste Dryer including:  Dust Recycle Feed to Dryer <sup>a</sup>	33-D25-006  00-A-0016	RESERVED  RESERVED	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, B-2, B-4, and B-5	2645  NA
Waste Drying System including:  Control system for clean soil feed to dryer <sup>a*</sup>  The waste dryer steam supply control system <sup>a*</sup>	33-D58-068	RESERVED	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, and B-4	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
<b>DRYER OFFGAS TREATMENT SYSTEM</b>				
Dryer Offgas Condenser including:  Condenser chilled water feed control system <sup>a*</sup>	33-D10-005	RESERVED	Sections 4.2.14, 4.2.17; Tables 4-2, 4-3, 4-5; Figures 2-2, B-1, and B-4	NA
<b>ICV® STATIONS</b>				
Vitrification Container Preparation*	RESERVED	RESERVED	Sections 4.2.9, 4.2.17; Tables 4-1, 4-5; Figures 2-2 and B-1	N/A
ICV® System (Container Waste Fill, ICV® Melt & Vented Cooling) including:  Dry waste feed control system <sup>a</sup>	RESERVED	RESERVED	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Top-off, and Container Sealing including:  Top-off soil feed control system <sup>a*</sup>	RESERVED	RESERVED	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Transport to Storage Pad (Sample Point)*	RESERVED	RESERVED	Section 2.2.1, 4.2.11; Figures 2-2, B-1, and B-4	N/A

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
<b>MAIN OFFGAS TREATMENT SYSTEM</b>				
Sintered Metal Filter #1	36-N02-019	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
Sintered Metal Filter #2	36-N02-020	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
<b>Venturi Scrubber System (VSS)-1</b> Quencher #1	36-N83-034	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-3; Figures B-2 and B-5	RESERVED
<b>VSS-1</b> Scrubber Feed System Tank #1 <sup>a*</sup> includes: Caustic make-up feed control system <sup>a*</sup>	36-D74-052	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
<b>VSS-1</b> Heat Exchanger #1 includes: Chilled water feed control system <sup>a*</sup>	36-D30-046	RESERVED	Figures B-2 and B-5	RESERVED

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
VSS -1 Scrubber #1	36-N73-035	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVED
VSS-1 Mist Eliminator #1	36-N24-036	RESERVED	Sections 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	N/A
Venturi Scrubber System (VSS)-2 Quencher #2	36-N83-037	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	RESERVED
VSS-2 Scrubber Tank Feed System #2 <sup>a*</sup> includes: Caustic make-up feed control system <sup>a*</sup>	36-D74-054	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
VSS-2 Heat Exchanger #2 includes: Chilled water feed control system <sup>a*</sup>	36-D30-047	RESERVED	Figures B-2 and B-5	RESERVED

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
VSS-2 Scrubber #2	36-N73-038	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVED
VSS-2 Mist Eliminator #2	36-N24-039	RESERVED	Sections 4.2.15, 4.2.17; Figures B-2 and B-5	N/A
Scrubber Condenser	36-D10-040	RESERVED	Figures B-2 and B-5	N/A
Mist Eliminator #3	36-N24-041	RESERVED	Figures B-2 and B-5	N/A
HEPA Filter Heater*	36-N84-042	RESERVED	Sections 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-2, 4-3, 4-5, 4-6; Figures 2-2 and B-2	N/A
HEPA Filters #1 #2 #3	36-N02-043 36-NO2-044 36-NO2-045	RESERVED RESERVED RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Tables 4-2, 4-6; Figures B-2 and B-5	N/A
Carbon Filter	36-NO2-064	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17, 4.3.3; Tables 4-2, 4-6; Figures 2-2, B-2, and B-5	N/A
Offgas Polishing Filter	36-NO2-79	RESERVED	Figures 2-2 and B-3	N/A

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
Tri-Mer Quencher includes: Water feed control system <sup>a*</sup>	36-N83-068	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer OX1 Tower including: H <sub>2</sub> SO <sub>4</sub> feed control system <sup>a*</sup> NaClO <sub>2</sub> feed control system <sup>a*</sup>	36-D77-069	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer RC1 Tower & RC1 Tower Sump including: Na <sub>2</sub> S feed control system <sup>a*</sup> NaOH feed control system <sup>a*</sup>	36-D77-070 36-D74-074	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer OX2 Tower including: H <sub>2</sub> SO <sub>4</sub> feed control system <sup>a*</sup> NaClO <sub>2</sub> feed control system <sup>a*</sup>	36-D77-071	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Tri-Mer RC2 Tower & RC2 Tower Sump including: Na <sub>2</sub> S feed control system <sup>a*</sup> NaOH feed control system <sup>a*</sup>	36-D77-072  36-D74-075	RESERVED  RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer CC Tower & CC Tower Sump including: NaOH feed control system <sup>a*</sup>	36-D77-073  36-D74-076	RESERVED  RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
SCR Heater*	36-N84-078	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A
SCR Catalyst Bed including: Ammonia feed control system <sup>a*</sup>	36-D59-003	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
SCR Heat Exchanger*	36-D30-077	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A
Ammonia scrubber including: Dilute H <sub>2</sub> SO <sub>4</sub> feed control system <sup>a*</sup>	RESERVED	RESERVED	Figures B-3 and B-6	N/A
Offgas Exhaust Stack*	36-N26-024	RESERVED	Section 4.2.12, 4.2.17; Figures 2-2, B-3, and B-6	N/A

<sup>a</sup> These subsystems only include feed control system components, with the exception of the boiler, which only includes the steam control system for the dryer. No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

\* No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

N/A means no secondary containment required



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**TABLE V.4.**  
**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) - PHASE 2**  
**DESCRIPTION FOR NON-MAJOR COMPONENTS (E.G., PUMPS, FILTERS, FANS,**  
**COMPRESSORS, ETC NOT SPECIFICALLY LISTED)**

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
Control system for feed from the Waste & Simulant Staging Tanks to Waste Dryer <sup>a*</sup> (Waste Transfer Pump Skid)	32-D58-007	RESERVED	Sections 2.3.2, 2.3.3, 4.2, 4.2.1, 4.2.2.1, 4.2.3, 4.2.4, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Waste Dryer including:	33-D25-006	RESERVED	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, B-2, B-4, and B-5	2645
Dust Recycle Feed to Dryer <sup>a</sup>	00-A-0016	RESERVED		NA
Waste Drying System including: Control system for clean soil feed to dryer <sup>a*</sup> The waste dryer steam supply control system <sup>a*</sup>	33-D58-068	RESERVED	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, and B-4	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
<b>DRYER OFFGAS TREATMENT SYSTEM</b>				
Dryer Offgas Condenser including:  Condenser chilled water feed control system <sup>a*</sup>	33-D10-005	RESERVED	Sections 4.2.14, 4.2.17; Tables 4-2, 4-3, 4-5; Figures 2-2, B-1, and B-4	NA
<b>ICV® STATIONS</b>				
Vitrification Container Preparation*	RESERVED	RESERVED	Sections 4.2.9, 4.2.17; Tables 4-1, 4-5; Figures 2-2 and B-1	N/A
ICV® System (Container Waste Fill, ICV® Melt & Vented Cooling) including:  Dry waste feed control system <sup>a</sup>	RESERVED	RESERVED	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Top-Off, and Container Sealing including:  Top-off soil feed control system <sup>a*</sup>	RESERVED	RESERVED	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Transport to Storage Pad (Sample Point)*	RESERVED	RESERVED	Section 2.2.1, 4.2.11; Figures 2-2, B-1, and B-4	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
<b>MAIN OFFGAS TREATMENT SYSTEM</b>				
Sintered Metal Filter #1	36-N02-019	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
Sintered Metal Filter #2	36-N02-020	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
<b>Venturi Scrubber System (VSS)-1</b> Quencher #1	36-N83-034	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-3; Figures B-2 and B-5	RESERVED
<b>VSS-1</b> Scrubber Feed System Tank #1 <sup>a*</sup> includes: Caustic make-up feed control system <sup>a*</sup>	36-D74-052	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
<b>VSS-1</b> Heat Exchanger #1 includes: Chilled water feed control system <sup>a*</sup>	36-D30-046	RESERVED	Figures B-2 and B-5	RESERVED

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
<b>VSS -1</b> Scrubber #1	36-N73-035	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVED
<b>VSS-1</b> Mist Eliminator #1	36-N24-036	RESERVED	Sections 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	N/A
<b>Venturi Scrubber System (VSS)-2</b> Quencher #2	36-N83-037	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	RESERVED
<b>VSS-2</b> Scrubber Tank Feed System #2 <sup>a*</sup> includes: Caustic make-up feed control system <sup>a*</sup>	36-D74-054	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
<b>VSS-2</b> Heat Exchanger #2 includes: Chilled water feed control system <sup>a*</sup>	36-D30-047	RESERVED	Figures B-2 and B-5	RESERVED

<b>Sub-system Description</b>	<b>Sub-system Designation</b>	<b>Engineering Description (Drawing No., Specification No., etc.)</b>	<b>Narrative Description, Tables and Figures</b>	<b>Maximum Capacity (gallons)</b>
VSS-2 Scrubber #2	36-N73-038	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVED
VSS-2 Mist Eliminator #2	36-N24-039	RESERVED	Sections 4.2.15, 4.2.17; Figures B-2 and B-5	N/A
Scrubber Condenser	36-D10-040	RESERVED	Figures B-2 and B-5	N/A
Mist Eliminator #3	36-N24-041	RESERVED	Figures B-2 and B-5	N/A
HEPA Filter Heater*	36-N84-042	RESERVED	Sections 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-2, 4-3, 4-5, 4-6; Figures 2-2 and B-2	N/A
HEPA Filters #1 #2 #3	36-N02-043 36-NO2-044 36-NO2-045	RESERVED RESERVED RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Tables 4-2, 4-6; Figures B-2 and B-5	N/A
Carbon Filter	36-NO2-064	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17, 4.3.3; Tables 4-2, 4-6; Figures 2-2, B-2, and B-5	N/A
Offgas Polishing Filter	36-NO2-79	RESERVED	Figures 2-2 and B-3	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Tri-Mer Quencher includes: Water feed control system <sup>a*</sup>	36-N83-068	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer OX1 Tower including: H <sub>2</sub> SO <sub>4</sub> feed control system <sup>a*</sup> NaClO <sub>2</sub> feed control system <sup>a*</sup>	36-D77-069	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer RC1 Tower & RC1 Tower Sump including: Na <sub>2</sub> S feed control system <sup>a*</sup> NaOH feed control system <sup>a*</sup>	36-D77-070 36-D74-074	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer OX2 Tower including: H <sub>2</sub> SO <sub>4</sub> feed control system <sup>a*</sup> NaClO <sub>2</sub> feed control system <sup>a*</sup>	36-D77-071	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Tri-Mer RC2 Tower & RC2 Tower Sump including: Na <sub>2</sub> S feed control system <sup>a*</sup> NaOH feed control system <sup>a*</sup>	36-D77-072  36-D74-075	RESERVED  RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer CC Tower & CC Tower Sump including: NaOH feed control system <sup>a*</sup>	36-D77-073  36-D74-076	RESERVED  RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
SCR Heater*	36-N84-078	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, B-6	N/A
SCR Catalyst Bed including: Ammonia feed control system <sup>a*</sup>	36-D59-003	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
SCR Heat Exchanger*	36-D30-077	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A
Ammonia scrubber including: Dilute H <sub>2</sub> SO <sub>4</sub> feed control system <sup>a*</sup>	RESERVED	RESERVED	Figures B-3 and B-6	N/A
Offgas Exhaust Stack*	36-N26-024	RESERVED	Section 4.2.12, 4.2.17; Figures 2-2, B-3, and B-6	N/A

<sup>a</sup> These subsystems only include feed control system components, with the exception of the boiler, which only includes the steam control system for the dryer. No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

\* No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

N/A means no secondary containment required

**TABLE V.5.**

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) – PHASE 2  
 SECONDARY CONTAINMENT SYSTEMS INCLUDING SUMPS AND FLOOR  
 DRAINS**

Sump/Floor Drain I.D. No. & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions (feet) & Materials of Construction	Engineering Description (Drawing No., Specification No., etc.)
RESERVED	RESERVED	RESERVED	RESERVED

**TABLE V.6.**

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) – PHASE 2 PROCESS  
 AND LEAK DETECTION SYSTEM INSTRUMENTS AND PARAMETERS**

Sub-system Locator and Name (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method No. and Range
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

**TABLE V.7.**

**MAXIMUM FEED AND FEED-RATES TO DEMONSTRATION BULK  
 VITRIFICATION SYSTEM (DBVS) – PHASE 1 AND 2**

Description of Waste	Phase 1	Phase 2
<b>Tank 241-S-109 Waste</b>	1080 gallons	300,000 gallons
<b># of ICV® Container Loads</b>	3	50 minus number of ICV® Container Loads processed during Phase 1
Dryer Feed (pounds/hour)	RESERVED	RESERVED
Mixed Waste	RESERVED	RESERVED
Simulant Dangerous Waste	RESERVED	RESERVED
Simulant Non-Dangerous Waste		

Description of Waste	Phase 1	Phase 2
Soil	RESERVED	RESERVED
ICV® Feed (pounds/hour)	RESERVED	RESERVED
Mixed Waste	RESERVED	RESERVED
Simulant Dangerous Waste	RESERVED	RESERVED
Simulant Non-Dangerous Waste	RESERVED	RESERVED
Soil	RESERVED	RESERVED
Dryer Feed (pounds/hour)	RESERVED	RESERVED
Total Chlorine/Chloride Feed-rate	RESERVED	RESERVED
Total Metal Feed-rates	RESERVED	RESERVED
Arsenic	RESERVED	RESERVED
Cadmium	RESERVED	RESERVED
Chromium (total)	RESERVED	RESERVED
Lead	RESERVED	RESERVED
Mercury	RESERVED	RESERVED
Beryllium	RESERVED	RESERVED
Total Organics (Organic Compounds listed on Table 6-1 of Attachment BB of this Permit.	RESERVED	RESERVED

**TABLE V.8.**

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) EMERGENCY  
 PARAMETER CONTROL / RESPONSE SYSTEM (RESERVED)**

Sub-system Designation	Instrument or Component Tag Number	Parameter Description	Setpoints Limits During Phase 1	Setpoints Limits During Phase 2 Campaign No.	Respond to Deviation from setpoint*
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

\*(e.g., automatically cut-off and/or lock-out the dangerous and mixed waste feed to the DBVS, etc.)

**PART VI – FACILITY SUBMITTAL SCHEDULE**

Any procedure, method, data, or information contained in this document that relates solely to radionuclides or to the radioactive source, byproduct material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954, as amended) is not provided for the purpose of regulating the radiation hazards of such components under the authority of this Permit and Chapter 70.105 RCW.

**TABLE VI.1.**  
**REQUIRED SUBMITTALS AND COMPLIANCE SCHEDULE**

Reference	Required Submission	Date or Event
<b>PART II – GENERAL FACILITY CONDITIONS</b>		
I.E.9.	The Permittees may not commence treatment or storage of dangerous and/or mixed waste in any new or modified portion of the facility, until the requirements of I.E.9.a. through I.E.9.a.ii. have been met.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.B.7.	The Permittees shall submit to Ecology the revised pages of Permit Attachment BB reflecting the amendments in II.B.7.a. through II.B.7.z. of this Permit.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.B.8.	The Permittees shall submit and receive written approval from Ecology for Permit Attachment BB revisions reflected in II.B.8.a. through II.B.8.c.i. of this Permit.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.B.8.d.	The Permittees shall submit to Ecology for approval and strictly for this RD&D Permit, documentation, not based solely on process knowledge that shows the removal of the characteristic code D001 and D003 from S-109 tank waste.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.

Reference	Required Submission	Date or Event
II.B.9.	The Permittees shall submit Section 2 of Permit Attachment AA amended as described in II.B.9.a. through II.B.9.c. specified "for information only."	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.C.6.	The Permittees shall submit and receive written approval from Ecology for Permit Attachment FF, revisions reflected in II.C.6.a. through II.C.6.a.viii. of this Permit, with the exception of II.C.6.a.viii. A., which will be incorporated into the Permit Administrative Record.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.D.2.	The Permittees shall update and resubmit and receive written approval from Ecology for the Inspection Schedule in Permit Attachment II. The revised schedule shall include, but not be limited to, II.D.2.a. through II.D.2.c. of this Permit. In addition, the Permittees shall submit to Ecology for incorporation into the Administrative Record, the basis for developing Inspection Schedule frequencies.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.E.3.	The Permittees shall update and resubmit and receive approval from Ecology for the Training Program description in Permit Attachment CC. The revised Training Program description shall include, but not be limited to, the information requested in II.E.3.a. through II.E.3.b. of this Permit.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility units.
II.F.4.	The Permittee shall submit the revised page to Ecology reflecting the amendment in II.F.4. of this Permit.	Prior to initial receipt of dangerous and/or mixed waste.
II.F.5.	The Permittees shall update and resubmit and receive written approval from Ecology of Permit Attachment DD to be consistent with design details and schedule described in Parts III, IV, and V and Attachments JJ, KK, and LL of this Permit.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.

Reference	Required Submission	Date or Event
II.F.6.	The Permittees shall review and amend, if necessary, the applicable portions of the Contingency Plan, Permit Attachment DD, in accordance with the provisions of WAC 173-303-350(5) and WAC 173-303-830(4). The amended Contingency Plan shall be submitted to Ecology as a Permit Modification pursuant to Permit Conditions I.C.2. and I.C.3.	After initial receipt of dangerous and/or mixed waste.
II.F.7.	The Permittees shall revise, resubmit, and receive written approval from Ecology of Permit Attachment DD to include the information in II.F.7.a. and II.F.7.b. of this Permit.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.G.2.b.vii.	Generator Report – Form 4 as required in WAC 173-303-220(1).	Annually, after initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.G.2.b.viii.	TSD Facility Report – Form 5 in compliance with WAC 173-303-390(2).	Annually, after initial receipt of dangerous and/or mixed waste in the DBVS Facility.
II.H.2.	The Permittees shall submit and receive written approval from Ecology, for any update to the Closure Plan, Attachment EE.	Prior to commencing partial closure.
II.H.3.	The Permittees shall submit and receive written approval from Ecology for a Sampling and Analysis Plan and a revised Closure Plan.	Prior to commencing final closure.
II.H.6.	The Permittees are required to furnish documentation supporting the independent registered professional engineer's certification to Ecology upon request, until Ecology has notified the Permittees in writing that Ecology agrees with and has accepted the Permittees' closure certification. The closure documentation must include at a minimum the information contained in II.H.6.a. through II.H.6.h. of this Permit.	After closure activities have been completed.

Reference	Required Submission	Date or Event
II.H.9.	The Permittees shall update and resubmit and receive written approval from Ecology for the Closure Plan, Permit Attachment EE, to be consistent with design details and schedule described in Permit Attachments JJ, KK, and LL. The updated Closure Plan, Permit Attachment EE, must be consistent with the closure performance standards specified in WAC 173-303-610(2).	Prior to initial receipt of dangerous and/or mixed waste in DBVS Facility.
II.H.10.	The Permittee shall submit the revised page reflecting the amendment in II.H.10. of this Permit to Ecology.	Prior to initial receipt of dangerous and/or mixed waste in DBVS Facility.
II.I.	The Permittees must submit documentation of a substitution of an equivalent or superior equipment, materials and/or administrative information, accompanied by a narrative explanation and the date the substitution became effective.	Place in the operating record and submit to Ecology within seven days of putting the substitution into effect.
<b>PART III – CONTAINER MANAGEMENT PRACTICES</b>		
III.G.2.	The Permittees shall submit and receive written approval from Ecology for engineering information as specified in III.G.2.a. of this Permit for incorporation into Attachment JJ.	Prior to construction of the DBVS Facility container storage area.
III.G.3.	The Permittees shall submit and receive written approval from Ecology for Permit Table III.1. updated to include the contents of Column 2 “Engineering Description,” to reflect the engineering information provided under III.G.2.a. of this Permit.	Prior to initial receipt of dangerous and/or mixed waste to the DBVS Facility.
III.G.4.	The Permittees shall update and submit and receive written approval from Ecology for the following, as specified in Permit Conditions III.6.4.a. through III.6.4.g., for incorporation into Permit Attachment JJ.	Prior to initial receipt of dangerous and/or mixed waste to the DBVS Facility.

Reference	Required Submission	Date or Event
<b>SECTION IV – TANK SYSTEMS</b>		
IV.A.8.b.	The Permittees shall submit and receive approval from Ecology for the engineering information as specified in IV.A.8.b.i. through IV.a.8.b.viii. of this Permit for incorporation into Permit Attachment KK.	Prior to construction of each DBVS Facility Tank System.
IV.A.8.c.	The Permittees shall submit and receive approval from Ecology for the engineering information specified in IV.A.8.c.i. through IV.A.8.c.v. for incorporation into Permit Attachment KK.	Prior to installation of ancillary equipment for each DBVS Facility Tank System.
IV.A.8.d.	The Permittees shall submit and receive Ecology approval for incorporation, into Permit Attachment KK, the information specified in IV.A.8.d.i. through IV.A.8.d.vii. of this Permit. All information provided under this Permit condition must be consistent with information provided pursuant to Permit Conditions IV.A.8.b. and IV.A.8.c.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility Tank Systems.
IV.A.8.e.	The Permittees shall submit and receive Ecology approval as specified in IV.A.8.e.i. through IV.A.8.e.iii. for incorporation into this Permit. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions IV.A.8.b. through IV.A.8.d.	Prior to initial receipt of dangerous and/or mixed waste into the DBVS Facility Tank Systems.
IV.A.8.f.	The Permittees shall submit the revised pages for incorporation into Permit Attachment KK as specified in IV.A.8.f.i. through IV.A.8.f.iii. of this Permit to Ecology.	Prior to installation of the DBVS Tank System as identified in Permit Table IV.1.
<b>SECTION V – DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS)</b>		
V.A.1.z.	Changes to approved design, plans, and projected performance documentation in Permit Attachment LL for the DBVS shall require that the Permittee submit and receive written approval from Ecology, except as specified in Permit Conditions II.A.8., II.A.9., or II.I.	As needed.

Reference	Required Submission	Date or Event
V.H.3.	The Permittees shall not commence Phase 1 until the Permittees have submitted and received Ecology approval for the Phase 1 DBVS Campaign Plan pursuant to Permit Condition V.I.6.	Prior to start of Phase 1.
V.H.4.	The Permittees shall not commence the first campaign under Phase 2 until the requirements in V.H.4.a. through V.H.4.b. of this Permit have been met.	Prior to start of Phase 2.
V.H.5.	The Permittees shall not commence each subsequent campaign under Phase 2 until the actions listed in V.H.5.a. through V.H.5.b. have occurred.	Before commencing each subsequent campaign under Phase 2.
V.I.2.	The Permittee shall submit and receive Ecology approval for the engineering information as specified in V.I.2.a. through V.I.2.f. for incorporation into Permit Attachment LL.	Prior to construction of each secondary containment and leak detection system for the DBVS as identified in Permit Tables V.2. and V.5.
V.I.3.	The Permittee shall submit and receive approval from Ecology for the engineering information as specified in V.I.3.a. through V.I.3.e. of this Permit for incorporation into Permit Attachment LL.	Prior to installation of each sub-system as identified in Permit Tables V.1. and V.4.
V.I.4.	The Permittee shall submit and receive Ecology approval as specified in V.I.4.a. through V.I.4.r. of this Permit for incorporation into Permit Attachment LL. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2. and V.I.3., as approved by Ecology.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
V.I.5.	The Permittees shall submit and receive Ecology approval as specified in V.I.5.a. through V.I.5.c., for incorporation into this Permit. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2., VI.3., and V.I.4., as approved by Ecology.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.

Reference	Required Submission	Date or Event
V.I.6.	The Permittee shall submit and receive approval from Ecology for the Phase 1 DBVS Campaign Plan. The Phase 1 DBVS Campaign Plan shall include the information specified in Sections 5 and Appendix A of Permit Attachment LL in addition to V.I.6.a. through V.I.6.i. of this Permit.	Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility.
V.I.7.	The Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. The Phase 2 DBVS Campaign Plan shall include the information specified in Permit Condition V.I.6. In addition, the Phase 2 DBVS Campaign Plans shall be designed to collect the information specified in Permit Conditions V.I.7.c. through V.I.7.e. and the Phase 2 DBVS Campaign Plans designed to provide "Feed Envelope Verification and/or Process Improvement," shall also include the information specified in Permit Conditions V.I.7.a. and V.I.7.b.	Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign.
V.I.9.	The Permittees shall submit to Ecology the Draft DBVS Campaign Report that includes information listed in V.I.9.a. through V.I.9.e.iv. of this Permit.	Within 90 days after the completion of the Draft DBVS Campaign Report.
V.I.10.	The Permittees shall submit to Ecology a Final DBVS Campaign Summary Report that includes the information specified in V.I.9.b. through V.I.9.e. and V.I.10.a. through V.I.10.c. of this Permit.	Within 120 days after the completion of the last DBVS Campaign Report specified in V.I.9.



## **RESPONSIVENESS SUMMARY**

### **DRAFT PERMIT FOR DANGEROUS AND OR MIXED WASTE RESEARCH, DEVELOPMENT, AND DEMONSTRATION**

**Hanford Facility Demonstration Bulk Vitrification System (DBVS Facility)  
In the 200 West Area of the Hanford Site**

**November 2004**

#### **Introduction**

This responsiveness summary is a result of written comments received by the Washington State Department of Ecology (referred to hereafter as Ecology or Department) on the proposed Draft Permit to the Hanford Facility Dangerous and/or Mixed Waste Research, Development, and Demonstration (RD&D) Permit. This Permit sets the conditions for operation and management of the Demonstration Bulk Vitrification System (DBVS Facility). The Draft Permit and Fact Sheet were available for public review and comment from July 26, 2004, to September 9, 2004. A Public meeting/hearing was held August 31, 2004. The following is a summary of changes made to the Draft RD&D Permit:

#### Introduction

No changes were made.

#### List of Attachments

These Attachments were revised to include portions of the Permit Application that were omitted from the Draft Permit.

- Appendix A of the Permit Application was added to Permit Attachment LL.
- Appendix B of the Permit Application was added to Permit Attachment FF.
- Appendix F of the Permit Application was added to Permit Attachment FF.
- Appendix F of the Permit Application was added to Permit Attachment JJ.
- Appendix F of the Permit Application was added to Permit Attachment KK.

Permit Attachment 1 was added to incorporate Section 1.0 of the Permit Application into the Permit for information purposes only

#### Definitions

A definition for "high winds" was added.

#### Acronyms

- No new or revised acronyms were added.

### Part I, Standard Conditions

- Permit Condition I.I was revised to make the proposed permit language more clear with respect to the proposed permit duration of 400 operating days.

### Part II, General Facility Conditions

- Permit Condition II.B.7.z was added to clarify Land Disposal Restriction (LDR) Standards in Attachment BB.
- Permit Condition II.L was modified to clarify meeting the LDR Standards.

### Part III, Containers

- No changes.

### Part IV, Tanks

- Permit Condition IV.A.8.d.ii was changed to address hose-in-hose-transfer-line leak detection.

### Part V, Demonstration Bulk Vitrification System (DBVS)

- Permit Condition V.I.4.d was changed to address hose-in-hose-transfer-line leak detection.
- Permit Condition V.I.6.b was revised to include the need to collect data to demonstrate LDR compliance.
- Permit Condition V.I.6.e was revised to clarify the intent of the permit condition.
- Permit Condition V.I.7 was modified to add requirements to generate information on the fate of constituents of concern, to generate information to assess the potential for waste minimization for secondary wastes, and to generate information on accepting a potential waste stream from the future Waste Treatment Plant in the Phase 2 Campaign Plans.

### Part VI, Facility Submittal Schedule

Two changes were made to Table VI.1 as follows:

- A row was added to the table to include the required submissions in Permit Condition III.G.4.
- The permit condition citations listed for Reference "II.C.6" was changed to the correct erroneous permit condition cited.

### Miscellaneous Changes

- Several minor changes were made throughout the Permit for grammar and consistency in presentation.
- The list of attachments was updated.

This Responsiveness Summary is intended to address all the comments received and show how those comments were evaluated. Ecology received the following comments, and has responded to each in the following order:

- 1 comment was received from Allan Panitch on August 16, 2004.
- 1 comment was received from CH2M HILL, on August 20, 2004.
- 70 comments were received from Rodney S. Skeen and the Confederated Tribes of the Umatilla Indian Reservation on August 25, 2004.
- 1 comment was received from Ron Bourgoin on September 1, 2004.
- 9 comments were received from Allyn Boldt on September 8, 2004.
- 17 comments were received from Floyd E. Ivey on September 9, 2004.
- 15 comments were received from Heart of America Northwest, Gerald Pollett on September 9, 2004.
- 4 comments were received from the Confederated Tribes and Bands of the Yakima Nation, Andrea J. Spencer on September 13, 2004.

This Responsiveness Summary will be made part of the Hanford Facility Administrative Record for future reference.

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## ACRONYMS

BBI.....	best basis inventory
CERCLA.....	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
CFR.....	<i>Code of Federal Regulations</i>
CH2M HILL .....	CH2M Hill Hanford Group, Inc.
Cs-137 .....	cesium-137
DBVS FACILITY.....	Demonstration Bulk Vitrification System
DEIS.....	Draft Environmental Impact Statement
DNS.....	determination of nonsignificance
DRE.....	destruction and removal efficiency
dscm .....	dry standard cubic meter
DST .....	double-shell tank
Ecology .....	Washington State Department of Ecology
EHW .....	extremely hazardous waste
EIS.....	Environmental Impact Statement
EPA.....	United States Environmental Protection Agency
ERA.....	<i>Energy Reorganization Act</i>
ESP.....	Environmental Simulation Program
ETF .....	Effluent Treatment Facility
FHA.....	final hazard analysis
GAO.....	Government Accountability Office
gpm .....	gallons per minute
HFFACO.....	<i>Hanford Federal Facility Agreement and Consent Order</i>
HIHTL.....	hose-in-hose transfer line
HLVIT.....	high-level vitrification
ICV <sup>®</sup> .....	in-container vitrification
IDF .....	Integrated Disposal Facility
ILAW .....	immobilized low-activity waste
INEEL.....	Idaho National Engineering and Environmental Laboratory

kg.....	kilogram
LDR.....	Land Disposal Restriction
LAW .....	low-activity waste
M <sup>3</sup> .....	cubic meter
MACT.....	Maximum Achievable Control Technology
MDWS .....	Mitigated Determination of Nonsignificance
MT.....	metric ton
NAS.....	National Academy of Sciences
NCR .....	Nonconformance Report
NEPA .....	<i>National Environmental Policy Act</i>
NRC .....	Nuclear Regulatory Commission
NWP.....	Nuclear Waste Program
NWPA.....	Nuclear Waste Policy Act
ORP.....	Office of River Protection
OSWER.....	Office of Solid Waste and Emergency Response
PCB.....	Polychlorinated Biphenyl
PHA.....	Preliminary Hazard Analysis
PNNL.....	Pacific Northwest National Laboratory
ppm .....	parts per million
ppmv .....	parts per million by volume
QA/QC .....	Quality Assurance/Quality Control
RCRA.....	<i>Resource Conservation and Recovery Act</i>
RCW .....	<i>Revised Code of Washington</i>
RD&D .....	research, development, and demonstration
SCR.....	selective catalytic reduction
SST.....	single-shell tank
TBD.....	to be determined
TEQ.....	toxicity equivalence
TWRS .....	Tank Waste Remediation System
TSCA .....	<i>Toxic Substances Control Act</i>
TSD.....	treatment, storage, and disposal
TWINS.....	Tank Waste Inventory Network System

USDOE .....United States Department of Energy  
USDOE-ORP.....United States Department of Energy, Office of River  
Protection  
USDOE-RL.....United States Department of Energy-Richland Operations  
Office  
VOC.....Volatile Organic Analysis  
WAC.....*Washington Administrative Code*  
WAP.....Waste Analysis Plan  
WFQ.....waste form qualification  
WIR.....waste incidental to reprocessing  
WRS.....Waste Retrieval System  
wt.....weight

**COMMENTS:**

Alan Panitch  
P.O. Box 99387  
Seattle, WA 98199-0387

The commenter states the following:

**COMMENT 1:** "I do not trust the pronouncements of the Feds (AEC/NRC, etc.) especially the present administration. The enclosed clipping (New York Times newspaper article "*High Accident Risk is Seen in Atomic Waste Project*") is essentially what I think i.e., when in doubt, don't. I've had 30 some years as contract manager dealing with government agencies. I just don't believe them in this area."

**ECOLOGY RESPONSE:** Ecology appreciates the comment.

Ecology has the responsibility to ensure that the RD&D Permit includes terms and conditions on the design and operation of the facility to assure the protection of human health and the environment.

The purpose of the RD&D Permit is to allow for the Test and Demonstration of the bulk vitrification facility for treatment of Hanford tank wastes. The Permit is temporary in duration and limits the quantities of dangerous and/or mixed waste to be treated. The Permittees must comply with all terms and conditions set forth in this Permit. The Permittees shall also comply with all applicable state regulations, including Chapter 173-303 Washington Administrative Code (WAC) and those specified in the Permit. Ecology will enforce all conditions of this Permit, based on federal regulations for which the state of Washington has received final authorization and all conditions that are state-only requirements.

**COMMENTS:**

CH2M HILL Hanford Group, Inc.  
2440 Stevens Center Place  
Richland, WA 99354

**COMMENT 1:** Office of River Protection (ORP) and CH2M HILL propose that the leak detection rate for the Hose-in Hose-Transfer Lines (HIHTL) be different than that specified in the Permit for tank systems. The Draft Permit Condition IV.A.8.d.ii states, "detection of a leak of at least 0.1 gallons per hour within twenty-four (24) hours is defined as being able to detect a leak within twenty-four (24) hours". This is not practical for HIHTLs and is not what is currently being required on the Hanford site. Our proposed change would be to revise Permit Conditions IV.A.8.d.ii and V.I.4.d to state, "Leak detection for HIHTL shall detect within 24-hours a leak rate as specified by the Permittees" *Temporary Waste Transfer Line Management Program, RPP-12711* and approved by Ecology for use with HIHTLs. This is consistent with the current agreement with Ecology.

**ECOLOGY RESPONSE:** Ecology agrees to revise the Permit Conditions IV.A.8.d.ii and V.I.4.d to read, "Detailed plans and descriptions, demonstrating the leak detection system is operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous and/or mixed waste, or accumulated liquid in the secondary containment system within twenty-four (24) hours [WAC 173-303-640(7)(b)(i)]. Leak detection for HIHTL shall detect within 24-hours a leak rate as specified by the Permittees' *Temporary Waste Transfer Line Management Program, RPP-12711.*" Note: The Permittee will be responsible for providing a table for inclusion in the RD&D Permit (e.g., Table IV-2) summarizing line length, total holdup volume until detection, total time until detection occurs and minimum detectable leak rate.

**COMMENTER:**

Rodney S. Skeen, PhD, P.E.

Manager, Modeling Program of the Confederated Tribes of the Umatilla Indian Reservation  
Department of Science and Engineering (DOSE)

Page 3 of 101, Table of Contents: General Comment.

**COMMENT 1:** The attachments to the Permit are not listed in the table of contents. Please add a list of the permit attachments to the table of contents.

**REQUEST ACTION:** Please add a list of the permit attachments to the table of contents.

**ECOLOGY RESPONSE:** Ecology makes no change because The "List of Attachments" was included in the RD&D Permit Table of Contents on Page 2. A List of Attachments can be found on Page 7 of the RD&D Permit.

Page 21 of 101, Section II.A.5, text stating: "*At any time the offgas treatment system ceases to operate or produces insufficient vacuum to recover emissions from the areas, systems, or units, the Permittees shall ... take measures to minimize evolution of emissions....*"

**COMMENT 2:** This reviewer could find no details within the Permit on what measures would be taken by the Permittees to minimize emissions during a failure of the offgas treatment system. Also, no analysis is provided to quantify a best and worst case emission level that can be expected during an offgas treatment system failure.

**REQUEST ACTION:** Please add the indicated information to the Permit and initiate Government-to-Government consultation processes and another public comment period to allow adequate review of the document.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that the RD&D Permit Application was deficient in providing this information. Ecology included compliance schedules under the following permit conditions in the RD&D Permit to require that the Permittees specifically identify measures it will implement to comply with this requirement and submit this information for Ecology review and approval.

Permit Condition II.C.6. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for incorporation in Permit Attachment FF, of the following, with the exception of II.C.6.a.viii.A,

which will be incorporated into the Permit Administrative Record. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3:

Permit Condition II.C.6.a.iv. Mitigate effects of equipment failure and power outages.

Permit Condition II.C.6.a.vi. Prevent releases to the atmosphere.

Permit Condition II.C.6.a.vii. Test and maintain equipment to assure proper operation in the event of an emergency pursuant to WAC 173-303-340(1).

Permit Condition V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2 and V.I.3, as approved by Ecology:

Permit Condition V.I.4.j. Detailed description of procedures for start-up and shutdown of waste feed and controlling and minimizing emissions in the event of an equipment malfunction including off-normal and emergency shutdown procedures, procedures for switching to back-up systems and tie into Permit Tables V.7 and V.8 and Appendix E of Permit Attachment LL.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3, V.6, and V.8 completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS. Appendix E shall include a narrative description and information to support the parameters and limit values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

Also, as specifically reflected in Permit Condition II.A.4, "Air pollution control devices and capture systems in the DBVS Facility shall be maintained and operated so as to minimize the emissions of air contaminants and to minimize process upsets. Procedures for ensuring that the above equipment is properly operated and maintained, so as to minimize the emission of air contaminants and process upsets, shall be established and followed in accordance with the Ecology approved DBVS Campaign Plan." Permit Condition VI.6.c requires that the DBVS Campaign Plans include a narrative description and information to support any updated Emergency Parameters and Limit Values (Emergency Parameters and Limit Values originally required under Permit Condition V.I.4.k).

With respect to the second question on Permit Condition II.A.5, concerning projecting best and worse case emission levels during an offgas treatment system failure; it is expected that the testing and monitoring under the RD&D Permit will provide information for such an evaluation to support an application for a long-term treatment permit, if the RD&D activities are determined to be successful.

However, Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the Nuclear Waste Program (NWP) website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permit tee's commencement of

Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such r changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

Page 22 of 101, Section II.A.9, text stating: "Upon completion of the DBVS Facility construction subject to this Permit, the Permittees shall produce as-built drawings...."

**COMMENT 3:** This item is not included in the compliance table.

**REQUEST ACTION:** Please add item II.A.9 to the compliance table in Section VI, to ensure the table provides a complete list of the future information the Permittees must provide.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below:

The complete text of Permit Condition II.A.9 reads as follows, "Upon completion of the DBVS Facility construction subject to this Permit, the Permittees shall produce as-built drawings of the project which incorporate the design and construction nonconformance resulting from all change documentations, as well as changes made pursuant to Permit Condition II.A.8. The Permittees shall place the as-built drawings into the operating record within three (3) months of completing construction." The DBVS as-built drawings will become a part of the operating record and are not required to be submitted to Ecology.

Page 36 of 101, Section II.H.10, text stating: "*Section 11.3, page 11-1, second sentence, is revised as follows: 'Closure will require the removal...'*"

**COMMENT 4:** The indicated modification of the closure plan does not explicitly state that the goal of closure is to leave the site in a condition that is at least as clean as when the project commenced. The text should be modified to read:

*Section 11.3, page 11-1, second sentence, is revised as follows: 'The closure process will restore the facility to pre-test conditions. Closure will require the removal...'*

**REQUESTED ACTION:** Please consider making the indicated change and, if the goal of closure is not to leave the site in a condition that is at least as clean as when the project commenced, please indicate under which applicable laws, statutes, and regulations this type of action is permitted.

**ECOLOGY RESPONSE:** Ecology agrees that the language in the Permit Application is not clear and consequently added language in Permit Condition II.H.10. Permit Condition II.H.10

states, "The following amendment to Permit Attachment EE is hereby made. The Permittee shall submit the revised page reflecting this amendment to Ecology prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility. This amendment does not constitute a permit modification pursuant to Permit Conditions I.C.2 and I.C.3".

Section 11.3, page 11-1, second sentence, is revised as follows: "Closure will require the removal and disposal of all dangerous and/or mixed waste present, removal of contaminated process equipment and contaminated structural components, and removal of all soil contaminated by the DBVS Facility in accordance with WAC 173-303-610(2)(a)]."

Ecology believes that this permit condition addresses the commenter's concerns.

Page 37 of 101, Sections II.J.1.a through II.J.1.c, text stating: "...such that the human health or the environment is threatened ...."

**COMMENT 5:** It is not clear from the Permit what criteria will be applied to evaluate whether or not a spill threatens human health or the environment.

**REQUEST ACTION:** Please revise the Permit to include the indicated evaluation criteria.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action and provides the following for clarification.

All spills, regardless of quantity, are to be reported as required under Permit Condition II.J.1.a, and Washington Administrative Code 173-303-145. WAC 173-303-145 cited in Permit Condition II.J.1, clearly states what actions are required of the permittee in the event of a spill or release of dangerous or mixed waste. For example, Washington Administrative Code 173-303-145 is titled "Spills and discharges into the environment" and includes notification, and mitigation and control requirements for such instances.

Pages 42 and 43 of 101, Sections III.G.4: General comment.

**COMMENT 6:** This section is not included in the compliance table.

**REQUEST ACTION:** Please add the items in Section III.G.4 to the compliance table in Section VI, to ensure the table provides a complete list of the future information the Permittees must provide.

**ECOLOGY RESPONSE:** Ecology agrees to include Section III.G.4 in the Compliance Table, Part VI of the Permit.

Page 45 of 101, Section IV.A.3.f, text stating: "Prior to initial receipt of dangerous and/or mixed waste in the DBVS...."

**COMMENT 7:** This item is not included in the compliance table.

**REQUEST ACTION:** Please add item IV.A.3.f to the compliance table in Section VI, to ensure the table provides a complete list of the future information the Permittees must provide.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action. Permit Condition IV.A.3.f is information that is a requirement of WAC 173-303-640 and the DBVS Facility's operating record. The permit condition is not a compliance schedule or an additional required submittal.

Page 57 of 101, Section V.A.1.b, text stating: “*The Permittees shall construct all containment systems for the DBVS as specified in Permit Attachment LL and Part V. of this Permit.*”

**COMMENT 8:** The indicated condition suggests that tank construction requirements are included in the Permit. However, as noted previously, the Permit contains very little specific technical information, but rather only provides vague language on tank size and functions and proposes future addition of design specifics. Addition of these specifics will not require a permit modification and therefore will not be subject to Tribal or public scrutiny.

**REQUEST ACTION:** Please revise the Permit to ensure the public has an adequate opportunity to comment on the technical details of the construction and operation of the DBVS.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Permit Condition V.A.1, Construction and Maintenance, also requires tank construction in accordance with WAC 173-303-640, in accordance with WAC 173-303-680(2) and (3), and WAC 173-303-340.

Permit Condition V.I, Compliance Schedules, adequately provides for the submittals of information signed and certified in accordance with WAC 173-303-810(12) prior to construction, and/or installation, and/or initial receipt of dangerous and/or mixed waste for each system, sub-system, operation procedures, integrity assessments, and emissions.

Ecology disagrees with the commenter’s request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology’s RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400 operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD & D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD & D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD & D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

Page 58 of 101, Section V.A.1.h, text stating: *"The Permittees must provide the type and degree of corrosion protection recommended by an independent corrosion expert, based on information provided in Permit Attachment LL."*

**COMMENT 9:** As previously noted for other details, the adequacy of corrosion protection cannot be evaluated from the information provided in this Permit.

**REQUEST ACTION:** Please ensure when details on material of construction and waste characteristics are added to the Permit that the Tribes and the public have an opportunity to comment on the corrosion protection proposed for the system.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that the Permittees must provide the type and degree of corrosion protection to Permit Attachment LL. The permit conditions listed below identify the requirement to submit this information for Ecology review and approval prior to accepting dangerous and/or mixed waste into the facility.

Permit Condition V.I.2. Prior to construction of each secondary containment and leak detection system for the DBVS as identified in Permit Tables V.2 and V.5, the Permittees shall submit and receive Ecology approval for the engineering information as specified below, for incorporation into Permit Attachment LL.

Permit Condition V.I.2.d. A description of materials and equipment used to provide corrosion protection for external metal components in contact with soil, including factors affecting the potential for corrosion [WAC 173-303-640(3)(a)(iii)(B), in accordance with WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(A) through (B)].

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400 operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD & D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD & D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD & D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

Page 59 of 101, Section V.A.1.m, text stating: *“Process monitors/instruments, as specified in Permit Tables V.3 and V.6, shall be equipped with operational alarms to warn...from the limits specified in Permit Tables V.7 and V.8 and Permit Attachment LL.”*

**COMMENT 10:** Tables V.3, V.6, V.7, V.8, and Attachment LL have no details.

**REQUEST ACTION:** Please ensure when details are added on the location and types of processing monitoring that the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the public has an opportunity to comment on the adequacy of the system.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that these tables in the Draft Permit and Permit Attachment LL need to be completed. The permit conditions listed below identify the requirement to submit this information for Ecology review and approval prior to accepting dangerous or mixed waste into

the facility.

Permit Condition V.I.4.b. Detailed Description of an Emergency Parameter Control/Response System addressing operating parameters specified in Permit Tables V.7 and V.8, as approved pursuant to Permit Conditions V.I.4.k and V.I.6.c.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values to be identified in Appendix E of Permit Attachment LL, and Permit Tables V.3, V.6 and V.8, completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS. Appendix E shall include a narrative description and information to support the parameters and limits values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

Permit Condition V.I.5.a. Permit Tables V.3 and V.6 shall be completed for DBVS leak detection system instruments and parameters, to provide the information as specified in each column heading.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400 operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating

the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD & D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD & D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD & D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

Page 62 of 101, Section V.A.1.aa, text stating: "*Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall....*"

**COMMENT 11:** This item is not included in the compliance table.

**REQUEST ACTION:** Please add item V.A.1.aa to the compliance table in Section VI to ensure the table provides a complete list of the future information the Permittees must provide.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action as discussed below.

Part VI, Facility Submittal Schedule of the RD&D Permit is a table that contains a list of the information the DBVS Facility is required to submit to Ecology. Permit Condition V.A.1.aa is

information that is required to be maintained in the operating record of the DBVS Facility, not submitted to Ecology. Therefore, this would not be included in Table VI.1 of Part VI in the RD&D Permit.

Page 63 of 101, Section V.C.1.b, text stating: “*The Permittees shall operate the DBVS in order to maintain the systems and process parameters listed in Permit Tables V.3, V.6, V.7, and V.8,....*”

**COMMENT 12:** Tables V.3, V.6, V.7, and V.8 contain no details.

**REQUEST ACTION:** Please ensure when details are added to the indicated tables that the public has an opportunity to comment on the proposed operating ranges and set points for the system.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that the tables have no details. The permit conditions listed below identify the requirement to submit this information for Ecology review and approval prior to accepting dangerous and/or mixed waste into the facility.

Permit Condition V.I.4.b. Detailed Description of an Emergency Parameter Control/Response System addressing operating parameters specified in Permit Tables V.7 and V.8, as approved pursuant to Permit Conditions V.I.4.k and V.I.6.c.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3, V.6, and V.8, completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS. Appendix E shall include a narrative description and information to support the parameters and limits values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

Permit Condition V.I.5.a. Permit Tables V.3 and V.6 shall be completed for DBVS leak detection system instruments and parameters, to provide the information as specified in each column heading.

Ecology disagrees with the commenter’s request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400 operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC

173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; kcon461@ecy.wa.gov.

Page 64 of 101, Section V.C.1.h, text stating: “*The Permittees shall not exceed 50% of the organic design capacity of the carbon filter and shall change-out the carbon filter prior....*”

**COMMENT 13:** The relative humidity of the vapor stream that passes through the carbon filter can have a large effect on the adsorption capacity of the carbon bed since water will compete for adsorption sites. To account for this phenomenon, the Permit should contain a requirement for monitoring the relative humidity of the air exiting the carbon filters and also include an upper limit on the amount of moisture allowed at this point.

**REQUEST ACTION:** Please ensure the Permit has the indicated additions.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that relative humidity of the exhaust gas stream from the DBVS is one of the parameters (e.g., temperature, incoming constituent concentration, constituent vapor pressure, etc.) that is an important indicator for tracking remaining organic capacity of the carbon filter. Ecology included compliance schedules under the following permit conditions in the RD&D Permit to require that the Permittees specifically develop a program subject to Ecology review and approval (i.e., monitoring, procedures, tracking, etc., instrumentation and control systems) to assure that 50% of the organic design capacity of the carbon filter is not exceeded:

Permit Condition V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Condition I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2 and V.I.3, as approved by Ecology:

Permit Condition V.I.4.m. Continuous emission monitor for measuring organic breakthrough of the DBVS carbon filter. Include monitor specifications, proposed location, monitoring plan, and documentation that the monitor is capable of detecting the organics (volatile, semi-volatile, and non-volatile) that could potentially be emitted from the DBVS.

Permit Condition V.I.4.n. Detailed procedures for maintaining and documenting in the DBVS operating record, a running count of the organic inventory fed to DBVS Waste Dryer from the DBVS Facility on a per campaign basis of spiked and non-spiked constituents and change-out of the carbon filter so as not to exceed fifty percent (50%) of the organic design capacity of the carbon filter.

Permit Condition V.I.4.o. Operation, calibration and maintenance procedures for the particulate matter, carbon monoxide, nitrogen oxide, sulfur oxides, organic continuous emission monitors, and the monitoring for the correction factor under Permit Condition V.I.4.a, including references to the technically appropriate specifications from 40 Code of Federal Regulations (CFR) Part 60, Appendix B, for each parameter.

Permit Condition V.I.3. Prior to installation of each sub-system as identified in Permit Tables V.1 and V.4, the Permittees shall submit and receive approval from Ecology for the engineering information as specified below, for incorporation into Permit Attachment LL (the information specified below will include dimensioned engineering drawings). Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3:

Permit Condition V.I.3.c. For subsystems that are not marked with an asterisk on Permit Tables V.1 and V.4 shall provide design information including: design drawings (General Arrangement Drawings in plan and cross section, references to codes and standards, updated Appendix B of Permit Attachment LL process flow diagrams, piping and instrumentation diagrams [including pressure control systems and mass and energy balances]), projected performance documentation, instrumentation/control loops for each subsystem, materials of construction, analysis/design methodology, fan curves for exhaust fan 1 (36-N31-025) and exhaust fan 2 (36-N31-026), physical and chemical tolerances of equipment, carbon filter organic (volatile, semi-volatile, non-volatile) design capacity and typical design details to support the subsystems and projected operational capability [WAC 173-303-640(3)(a), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(B)].

Permit Condition V.I.6.c. Also requires that the Permittees provide documentation with each DBVS Campaign Plan that fifty percent (50%) of the organic design capacity of the carbon filter, as specified in Permit Attachment LL, will not be exceeded during the DBVS Campaign.

Ecology believes that this addresses the commenter's concerns.

Page 64 of 101, Section V.E.3, text stating: "*The Permittees shall operate, calibrate, and maintain the instruments specified on Permit Tables V.3, V.6, and V.8, ....*"

**COMMENT 14:** Tables V.3, V.6, and V.8 contain no details.

**REQUEST ACTION:** Please ensure when details are added to the indicated tables that the CTUIR and the public has an opportunity to comment on the proposed instrumentation.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that these tables in the Draft Permit need to be completed. The permit conditions listed below identify the requirement to submit this information for Ecology review and approval prior to accepting dangerous or mixed waste into the facility.

Permit Condition V.I.4.b. Detailed Description of an Emergency Parameter Control/Response System addressing operating parameters specified in Permit Tables V.7 and V.8, as approved pursuant to Permit Conditions V.I.4.k and V.I.6.c.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3, V.6, and V.8, completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS. Appendix E shall include a narrative description and information to support the parameters and limits values,

parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

Permit Condition V.I.5.a. Permit Tables V.3 and V.6 shall be completed for DBVS leak detection system instruments and parameters, to provide the information as specified in each column heading.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400 operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

Page 68 of 101, Section V.I.3.c, text stating: "*For subsystems that are not marked with an asterisk on Permit Tables V.1 and V.4 shall provide design information including:...*"

**COMMENT 15:** The detailed information needed to properly review of Tables V.1 and V.4 has not been included in this Permit.

**REQUEST ACTION:** Please ensure when the indicated details are added to the Permit that the CTUIR and the public has an opportunity to review and provide comment.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that these tables in the Draft Permit and Permit Attachment LL need to be completed. The permit conditions listed below identify the requirement to submit this information for Ecology review and approval prior to accepting dangerous or mixed waste into the facility.

Permit Condition V.I.3. Prior to installation of each subsystem as identified in Permit Tables V.1 and V.4, the Permittees shall submit and receive approval from Ecology for the engineering information as specified below, for incorporation into Permit Attachment LL (the information specified below will include dimensioned engineering drawings). Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.

Permit Condition V.I.3.b. For subsystems that are marked with an asterisk on Permit Tables V.1 and V.4, the Permittees shall provide design information including: updated Appendix B of Permit Attachment LL process flow diagrams, piping and instrumentation diagrams (including pressure control system and mass and energy balances, physical and chemical tolerances of

equipment, projected performance documentation, instrumentation/control loops, and materials of construction.

Permit Condition V.I.3.c. For subsystems that are not marked with an asterisk on Permit Tables V.1 and V.4, shall provide design information including: design drawings (General Arrangement Drawings in plan and cross section, references to codes and standards, updated Appendix B of Permit Attachment LL process flow diagrams, piping and instrumentation diagrams [including pressure control systems and mass and energy balances]), projected performance documentation, instrumentation/control loops for each subsystem, materials of construction, analysis/design methodology, fan curves for exhaust fan 1 (36-N31-025) and exhaust fan 2 (36-N31-026), physical and chemical tolerances of equipment, carbon filter organic (volatile, semi-volatile and non-volatile) design capacity and typical design details to support the subsystems and projected operational capability.

Ecology disagrees with the commenter's request for another public comment period as previously explained in Comment 12.

Page 68 through 71 of 101, Section V.I.4, text stating: "*Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL.*"

**COMMENT 16:** The information detailed in the subsections of V.I.4 is extremely important to defining how the facility will be operated.

**REQUEST ACTION:** Please ensure when the indicated details are added to the Permit that the CTUIR and the public has an opportunity to review and provide comment.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The information detailed in the subsections of V.I.4 is extremely important, and the Permittees are required to submit this information to Ecology for approval prior to accepting dangerous and/or mixed waste into the facility.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400 operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the

environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

Page 70 of 101, Section V.I.4.p.iii, text stating: “*Excessive ICV® package bottom temperature.*”

**COMMENT 17:** Is the bottom of the ICV® package the only portion that is subject to excessive temperatures? Should this condition also be extended to the sides of the unit where off-normal circumstances such as improper placement of insulating materials could result in unacceptable temperatures?

**REQUEST ACTION:** Please evaluate the need for including the sides of the container in condition V.I.4.p.iii.

**ECOLOGY RESPONSE:** Ecology provides the following clarification as discussed below.

This permit condition was not intended to address potential off-normal circumstances, but rather to address the potential that the bottom of the ICV® package might be subject to excessive temperatures during normal operations. Ecology believes that it is not necessary to include the box sides in Permit Condition V.I.4.p.iii. The only way that the box sides could be exposed to excessive temperatures would be under the off-normal circumstance where the insulating panels were missing from the box sides. The box assembly, including the insulation board and refractory materials will be inspected before use.

Page 71 of 101, Section V.I.5, text stating: “*Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into this Permit.*”

**COMMENT 18:** The information detailed in the subsequent subsections of V.I.5 is extremely important to defining how the facility will be operated.

**REQUEST ACTION:** Please ensure when the indicated details are added to the Permit so that the CTUIR and the public has an opportunity to review and provide comment.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that the information the Permittees are required to submit in Permit Condition V.I.5 is important, however, Permit Condition V.1, Compliance Schedules, adequately provides for the submittals of information signed and certified in accordance with WAC 173-303-810(12) prior to construction, and/or installation, and/or initial receipt of dangerous and/or mixed waste for each system, sub-system, operation procedures, integrity assessments, and emissions.

Ecology disagrees with the commenter’s request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD & D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD & D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD & D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC

173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; kcon461@ecy.wa.gov.

Page 72 and 73 of 101, Section V.I.6.e, text stating: “...to support that the DBVS Campaign Plan design and operation during the campaign is projected to meet performance standards specified in Permit Condition V.I.6.f, within and outside of expected bounds of DBVS operations: (For purposes of this permit condition outside of expected bounds of process operations shall be defined as follows):”

**COMMENT 19:** In the opinion of this reviewer, this permit condition is awkwardly worded. The text indicated above is followed by a description of what appears to be bounding design conditions that must be met by the proposed DBVS. However, the term “outside of expected bounds” does not imply a specific set of extreme values, but rather any value that is above (or below) an expected range. Hence, it is not clear how the indicated bounding values are to be applied to evaluate the sufficiency of the design. If this section is intended to describe bounding design conditions then it would be clearer if the indicated text were rewording as follows:

*“...to support that the DBVS Campaign Plan design and operation during the campaign is projected to meet performance standards specified in permit Condition V.I.6.f while operating under normal conditions and at the bounding conditions detailed as follows:*

**REQUEST ACTION:** Please consider making the indicated changes to the text.

**ECOLOGY RESPONSE:** Ecology agrees that the recommended wording is clearer and has revised Draft Permit Condition V.I.6.e to incorporate it. The draft permit condition now reads:

“V.I.6.e. Documentation (e.g., engineering calculations, test data, and/or manufacturer/vendor’s warranties/operations and maintenance documentation, etc.) to support that the DBVS Campaign Plan design and operation during the campaign is projected to meet performance standards specified in Permit Condition V.I.6.f while operating under normal conditions and at the bounding conditions detailed as follows:”

Page 73, third paragraph, text stating: “Dryer Offgas Treatment System and the Main Offgas Treatment System operation at or below lower bounds of expected efficiencies, as specified on Permit Tables V.1 and V.4 and Permit Attachment LL.”

**COMMENT 20:** Since no lower bound is given in this condition, the phrase “at or below” implies that the indicated systems must meet its performance standards while operating at an efficiency that could range down to zero (0.0). Was this lower level of efficiency intended by the permit writer?

**REQUEST ACTION:** Please verify that the text in the Permit fulfills the intended purpose.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The intent was not to assume zero efficiency for all the offgas treatment equipment, but to assume appropriately conservative values for the expected system performance when establishing that the campaign is expected to meet the offgas system performance standards. In

some cases, an appropriately conservative value may be zero (e.g., acid gas removal in the condenser which is listed with a nominal control efficiency of <10%).

Ecology included compliance schedules under the following permit conditions in the RD&D Permit to require that the Permittees to specifically update Permit Attachment LL and complete Tables V.1 and V.4, to include information on projected DBVS subsystem efficiencies, subject to Ecology review and approval. If the lower bound of efficiency of a DBVS subsystem for a particular constituent is zero under normal operations, then it would be expected that zero credit would be accounted for that constituent for that subsystem towards meeting the performance standards. The RD&D Permit language does as such fulfill its intended purpose.

Permit Condition V.I.3. Prior to installation of each sub-system as identified in Permit Tables V.1 and V.4, the Permittees shall submit and receive approval from Ecology for the engineering information as specified below, for incorporation into Permit Attachment LL (the information specified below will include dimensioned engineering drawings). Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.

Permit Condition V.I.3.c. For subsystems that are not marked with an asterisk on Permit Tables V.1 and V.4, shall provide design information including: design drawings (General Arrangement Drawings in plan and cross section, references to codes and standards, updated Appendix B of Permit Attachment LL process flow diagrams, piping and instrumentation diagrams [including pressure control systems and mass and energy balances]), projected performance documentation, instrumentation/control loops for each subsystem, materials of construction, analysis/design methodology, fan curves for exhaust fan 1 (36-N31-025) and exhaust fan 2 (36-N31-026), physical and chemical tolerances of equipment, carbon filter organic (volatile, semi-volatile, non-volatile) design capacity and typical design details to support the subsystems and projected operational capability [WAC 173-303-640(3)(a), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(i)(B)].

Permit Condition V.I.5. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following as specified below for incorporation into this Permit. Such approval shall not require a permit modification under Permit Condition I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2, V.I.3, and V.I.4, as approved by Ecology:

Permit Condition V.I.5.b. Permit Tables V.1 and V.4 amended as follows [WAC 173-303-680 and WAC 173-303-806(4)(i)(i)(A) through (B)]:

Permit Condition V.I.5.b.iii. Under column 3, replace "Reserved" with the appropriate references (e.g., drawing numbers, etc.) to the updated portions of Permit Attachment LL.

Permit Condition V.I.5.b.iv. Under column 4, update and complete list of narrative description, tables and figures.

Page 73 of 101, Section V.I.6.f.i, text stating: "A destruction and removal efficiency (DRE)..."

**COMMENT 21:** Although a DRE is being established for organics, it does not appear that this Permit contains concentration limits for organics other than dioxins and furans.

**REQUEST ACTION:** Please consider adding risk based concentration limits for individual organics and an additional overall limit based on the additive effects of all the organics.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology has included other requirements in the RD&D Permit to limit the emission of organics including requiring continuous emission monitoring for measuring organic breakthrough of the DBVS carbon filter (Permit Condition V.E), tracking organics into the DBVS and change-out of carbon filter so as not to exceed fifty percent (50%) of the organic design capacity of the carbon filter (Permit Conditions V.C.1.h and V.C.1.i), monitoring carbon monoxide as an indicator of the organics in the DBVS emissions (Permit Condition V.E), and requiring that the Permittees take no credit for retention of organics in the melt in determining projected compliance with performance standards (Permit Condition V.I.6.e). These requirements are conservative and appropriately specific, consistent with the RD&D nature of the activities covered under this Permit. It is expected that the testing and monitoring under the RD&D Permit will provide information to develop risk based concentrations for individual organics to support a Permit Application for a long-term treatment permit, if the RD&D activities are determined to be successful.

Page 73 of 101, Section V.I.6.f.ii text stating: “Particulate mater emissions from the DBVS offgas exhaust stack....”

**COMMENT 22:** It is stated in 40 CFR 63.1203(b)(7) that measured particulate level must be corrected to a dry, seven percent (7%) oxygen basis before being compared to the required limit of 34 mg/ dry standard cubic meter (dscm).

**REQUEST ACTION:** Please add language to the permit to specify that the particulate matter limit is based on the offgas level corrected to a dry, seven percent (7%) oxygen basis.

**ECOLOGY RESPONSE:** Ecology neither agrees or disagrees and provides clarification as discussed below.

Though Ecology has determined that it is appropriate to apply the hazardous waste combustion numerical emission standards for incinerators under 40 CFR Part 63 Subpart EEE to the DBVS as a thermal treatment system under the RD&D Permit, Ecology has not made a determination that the seven percent (7%) oxygen correction factor that is applied to these numerical standards for incinerators is appropriate for the DBVS Facility. Ecology has included the following permit conditions to determine the appropriate correction factor, that should be applied to the DBVS Facility and to require the monitoring necessary to implement this correction factor:

Permit Condition V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Condition I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2 and V.I.3, as approved by Ecology:

Permit Condition V.I.4.a. A correction factor, with supporting description, and monitoring that can be applied to the performance standards specified in Permit Condition V.I.6.f that would assure that the design and operation of the DBVS promotes the reduction of the total quantity of dangerous/hazardous constituents released as air emissions by maximizing removal and destruction of constituents prior to release from the exhaust stack, versus significant reduction of the concentration of the emissions in the exhaust by increased dilution air. The supporting description shall discuss how it will be applied and the appropriateness of its application to each performance standard specified in Permit Condition V.I.6.f and specific details on how the factor will be monitored during operation.

Permit Condition V.I.4.o. Operation, calibration and maintenance procedures for the particulate matter, carbon monoxide, nitrogen oxide, sulfur oxides, organic continuous emission monitors, and the monitoring for the correction factor under Permit Condition V.I.4.a, including references to the technically appropriate specifications from 40 CFR Part 60, Appendix B, for each parameter.

Page 73 of 101, Section V.I.6.f.iii, text stating: "Hydrochloric acid and chlorine gas emissions from the DBVS offgas exhaust stack..."

**COMMENT 23:** It is stated in 40 CFR 63.1203 that measured hydrochloric acid and chlorine level must be corrected to a dry, seven percent (7%) oxygen basis before being compared to the required limit of 21 parts per million by volume (ppmv).

**REQUEST ACTION:** Please add language to the permit to specify that the hydrochloric acid and chlorine matter limit is based on the offgas level corrected to a dry, seven percent (7%) oxygen basis.

**ECOLOGY RESPONSE:** Ecology neither agrees nor disagrees and provides clarification as discussed below.

Though Ecology has determined that it is appropriate to apply the hazardous waste combustion numerical emission standards for incinerators under 40 CFR Part 63 Subpart EEE to the DBVS as a thermal treatment system under the RD&D Permit, Ecology has not made a determination that the seven percent (7%) oxygen correction factor that is applied to these numerical standards for incinerators is appropriate for the DBVS. Ecology has included the following permit conditions to determine the appropriate correction factor, that should be applied to the DBVS and to require the monitoring necessary to implement this correction factor:

Permit Condition V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Condition I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2 and V.I.3, as approved by Ecology:

Permit Condition V.I.4.a. A correction factor, with supporting description, and monitoring that can be applied to the performance standards specified in Permit Condition V.I.6.f that would assure that the design and operation of the DBVS promotes the reduction of the total quantity of dangerous/hazardous constituents released as air emissions by maximizing removal and

destruction of constituents prior to release from the exhaust stack versus, significant reduction of the concentration of the emissions in the exhaust by increased dilution air. The supporting description shall discuss how it will be applied and the appropriateness of its application to each performance standard specified in Permit Condition V.I.6.f and specific details on how the factor will be monitored during operation.

Permit Condition V.I.4.o. Operation, calibration and maintenance procedures for the particulate matter, carbon monoxide, nitrogen oxide, sulfur oxides, organic continuous emission monitors, and the monitoring for the correction factor under Permit Condition V.I.4.a, including references to the technically appropriate specifications from 40 CFR Part 60, Appendix B, for each parameter.

Page 74 of 101, Section V.I.6.f.viii, text stating: “Carbon monoxide emissions from the DBVS offgas exhaust stack...”

**COMMENT 24:** It is stated in 40 CFR 63.1203(b)(5)(i) that carbon monoxide level must be corrected to a dry, seven percent (7%) oxygen basis before being compared to the required limit of 100 parts per million (ppm).

**REQUEST ACTION:** Please add language to the permit to specify that the carbon monoxide limit is based on the offgas level corrected to a dry seven percent (7%) oxygen basis.

**ECOLOGY RESPONSE:** Ecology neither agrees nor disagrees as discussed below.

Though Ecology has determined that it is appropriate to apply the hazardous waste combustion numerical emission standards for incinerators under 40 CFR Part 63 Subpart EEE to the DBVS as a thermal treatment system under the RD&D Permit, Ecology has not made a determination that the seven percent (7%) oxygen correction factor that is applied to these numerical standards for incinerators is appropriate for the DBVS. Ecology has included the following permit conditions to determine the appropriate correction factor, that should be applied to the DBVS and to require the monitoring necessary to implement this correction factor:

Permit Condition V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Condition I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2 and V.I.3, as approved by Ecology:

Permit Condition V.I.4.a. A correction factor, with supporting description, and monitoring that can be applied to the performance standards specified in Permit Condition V.I.6.f that would assure that the design and operation of the DBVS promotes the reduction of the total quantity of dangerous/hazardous constituents released as air emissions by maximizing removal and destruction of constituents prior to release from the exhaust stack, versus significant reduction of the concentration of the emissions in the exhaust by increased dilution air. The supporting description shall discuss how it will be applied and the appropriateness of its application to each performance standard specified in Permit Condition V.I.6.f and specific details on how the factor will be monitored during operation.

Permit Condition V.I.4.o. Operation, calibration and maintenance procedures for the particulate matter, carbon monoxide, nitrogen oxide, sulfur oxides, organic continuous emission monitors, and the monitoring for the correction factor under Permit Condition V.I.4.a, including references to the technically appropriate specifications from 40 CFR Part 60, Appendix B, for each parameter.

Page 74 of 101, Section V.I.6.f.ix, text stating: "Hydrocarbon emissions from the DBVS offgas exhaust stack..."

**COMMENT 25:** It is stated in 40 CFR 63.1203 that hydrocarbon level must be corrected to a dry, seven percent (7%) oxygen basis before being compared to the required limit of 10 ppm.

**REQUEST ACTION:** Please add language to the permit to specify that the hydrocarbon limit is based on the offgas level corrected to a dry seven percent (7%) oxygen basis.

**ECOLOGY RESPONSE:** Ecology neither agrees nor disagrees as discussed below.

Though Ecology has determined that it is appropriate to apply the hazardous waste combustion numerical emission standards for incinerators under 40 CFR Part 63 Subpart EEE to the DBVS as a thermal treatment system under the RD&D Permit, Ecology has not made a determination that the seven percent (7%) oxygen correction factor that is applied to these numerical standards for incinerators is appropriate for the DBVS. Ecology has included the following permit conditions to determine the appropriate correction factor, that should be applied to the DBVS and to require the monitoring necessary to implement this correction factor:

Permit Condition V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Condition I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2 and V.I.3, as approved by Ecology:

Permit Condition V.I.4.a. A correction factor, with supporting description, and monitoring that can be applied to the performance standards specified in Permit Condition V.I.6.f that would assure that the design and operation of the DBVS promotes the reduction of the total quantity of dangerous/hazardous constituents released as air emissions by maximizing removal and destruction of constituents prior to release from the exhaust stack, versus significant reduction of the concentration of the emissions in the exhaust by increased dilution air. The supporting description shall discuss how it will be applied and the appropriateness of its application to each performance standard specified in Permit Condition V.I.6.f and specific details on how the factor will be monitored during operation.

Permit Condition V.I.4.o. Operation, calibration and maintenance procedures for the particulate matter, carbon monoxide, nitrogen oxide, sulfur oxides, organic continuous emission monitors, and the monitoring for the correction factor under Permit Condition V.I.4.a, including references to the technically appropriate specifications from 40 CFR Part 60, Appendix B, for each parameter.

Page 74 of 101, Section V.I.7, text stating: "...Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan...."

**COMMENT 26:** The CTUIR and the public should be given opportunity to review and comment on this document prior to approval.

**REQUEST ACTION:** Please ensure that the CTUIR and the public has an opportunity to review and provide comment to the Phase 2 Campaign Plan.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term

operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

Page 94 of 101, Table V.7: General Comment

**COMMENT 27:** It was not apparent to this reviewer that this Permit contained emissions limits for either total radioactivity, or for the concentration of individual radioactive components.

**REQUEST ACTION:** Please justify the omission of emission limits for radioactive materials.

**ECOLOGY RESPONSE:** Ecology provides the following clarification as discussed below.

Radioactive emissions are regulated by the Washington State Department of Health under Washington Administrative Code 246-247, and the Department of Health issued on September 23, 2004, a Notice of Construction Approval Order which regulates the radioactive emissions for the DBVS Facility.

In the introduction section of the RD&D Permit (page 5) and the first paragraph in Part VI of the Permit, it states, "Any procedure, method, data, or information contained in this document that relates solely to radionuclides or to the radioactive source, byproduct material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954, as amended) is not provided for the purpose of regulating the radiation hazards of such components under the authority of this Permit and Chapter 70.105 RCW." Therefore, no emissions limits for radioactivity or individual radioactive components will be included in this Permit.

Page 96 of 101, second table entry, text stating: "...with the exception of II.C.1.a.viii.A, which will be ...."

**COMMENT 28:** Does Ecology mean II.C.6.a.vii.A rather than II.C.1.a.vii.A?

**REQUEST ACTION:** Please verify the accuracy of the indicated reference.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action.

Ecology does mean Permit Condition II.C.6.a.viii and has made the correction in the table.

## COMMENTS TO PERMIT ATTACHMENT AA

Page 2-5, Section 2.5.3, text stating: General Comment.

**COMMENT 29:** It is not possible from the information provided with this Permit to determine if a 1200-kw backup power system is of adequate size to ensure safe shutdown of the DBVS in the case of a failure of the main power system. Please make certain that an evaluation of the power requirements of critical systems is included with subsequent submissions to support the sizing of the backup generator.

**REQUEST ACTION:** Please consider the indicated comment when planning subsequent modifications to the Permit and provide opportunity for the CTUIR and the public to review and comment.

**ECOLOGY RESPONSE:** Ecology provides the following information for clarification on the backup power system for the DBVS Facility.

The RD&D Permit has the following permit conditions to require the submittal of this information as provided below.

Permit Condition II.C.6. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for incorporation in Permit Attachment FF, of the following, with the exception of II.C.1.a.viii A, which will be incorporated into the Permit Administrative Record. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.

Permit Condition II.C.6.a.iv. Mitigate effects of equipment failure and power outages.

Ecology believes that this answers the commenter's concerns on the backup power system.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation.

Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD & D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD & D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD & D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The

purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; kcon461@ecy.wa.gov.

Page 2-6, Lines 12 and 13, text stating: "Quench blowdown =..."

**COMMENT 30:** The operating time basis used to estimate liquid waste production is 168 hr/ICV<sup>®</sup>-batch for the quench blowdown and 200 hr/ICV<sup>®</sup>-batch for the Tri-Mer Scrubber blowdown. Given these two unit operations are part of the same offgas system, it is not clear why different operating time assumptions are proposed.

**REQUEST ACTION:** Please justify the use of different operating times in the indicated calculations.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

As explained in the Permit Application, the Tri-Mer scrubber is only planned to be used as a backup in the offgas treatment system for emergency shutdown of the DBVS. The 200 hours of operating time would be a worse case scenario for the Tri-Mer that would maximize the volume of liquid secondary waste for the Tri-Mer. These worse case scenario figures were used to estimate the maximum number of tanks needed for the storage of secondary liquid waste.

Page 2-6, Lines 29-31, text stating: "Verification sampling to document the absence of characteristic codes will be performed on the first batch of retrieved waste as part of the WRS prior to transfer to the DBVS waste receipt tank."

**COMMENT 31:** Tank waste is highly heterogeneous making it difficult to obtain a representative sample.

**REQUEST ACTION:** Please provide justification for using a single batch of waste to verify the absence of waste with the indicated characteristic codes.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action and provides the following clarification as discussed below.

The codes are not being removed from all 177 tanks, only from Tank 241-S-109. Where it is true that the waste contained in the 177 single-shell tanks (SST) and double-shell tanks is heterogeneous, the dissolved saltcake waste to be used for this demonstration from Tank 241-S-109 will be fully characterized. The retrieval methods to be used to dissolve the saltcake waste will promote homogeneity through selective dissolution and mixing.

The following permit condition provides additional justification.

II.B.8.d. Prior to the initial receipt of dangerous and or mixed waste in the DBVS Facility, the Permittees shall submit to Ecology for approval and strictly for this RD&D Permit, documentation, not based solely on process knowledge that shows the removal of the characteristic code D001 and D003 from S-109 tank waste.

## COMMENTS TO PERMIT ATTACHMENT BB

Page 6-2, Table 6-1: General comment.

**COMMENT 32:** It is not evident to this reviewer what the permittee means by an entry of “√” in the indicated table.

**REQUEST ACTION:** Please clarify in Table 6-1 what is meant by a check mark.

**ECOLOGY RESPONSE:** Ecology provides the following clarification as discussed below.

The “√” indicates that the waste code listed for the waste feed and the vitrified waste in Phase 1 will be analyzed as specified in Table 6-1. Permit Condition II.B.7.c will be amended to more clearly reflect this as follows:

II.B.7.c        Section 6.2, page 6-2, Table 6-1, is revised to include under Phase 1, Header “6” as a superscript and as footnote “6” as follows: “The checkmark indicates that the waste code listed for the waste feed and the vitrified waste in Phase 1 will be sampled/analyzed as specified in Table 6-1.

Page 6-4, Table 6-3: General comments.

**COMMENT 33:** This table contains the following errors:

- Both sulfate and organic carbon will be destroyed or removed during the IVC process and so should have footnote “3” applied.
- The title of the third column is missing a parenthesis before the word “Land.”
- The criteria used to designate a compound as a “key contaminant” are not provided in the table or accompanying text.

**REQUEST ACTION:** Please correct the indicated deficiencies.

**ECOLOGY RESPONSE:** Ecology provides the following clarification as discussed below.

Permit condition II.B.7.z will be amended to require that Footnote “3” be added to sulfates and organic carbon and that a parenthesis before the word “Lnad” will be added to the title of the third column as follows:

II.B.7.Z.        Section 6.2.3.2, Table 6-3, add D004 through D011 constituents to table, HLVT LDR treatment standard for D004 through D011, footnote “3” to sulfates and organic carbon, and a parenthesis before the word “Land” in the title of the third column.

- The first paragraph in section 6.2.3.1 “Saltcake Key Chemical and Radiological Contaminants” states that the constituents listed are important for glass performance and are key contaminants in the Tank 241-S-109 saltcake waste.

Page 6-5, Table 6-4, text stating: "Table 6-4 Key Radionuclide Contaminants in Average Tank 241-S-109 Saltcake Waste"

**COMMENT 34:** The criteria used to designate a compound as a "key radionuclide contaminant" is not provided in the table or accompanying text.

**REQUEST ACTION:** Please correct the indicated deficiency.

**ECOLOGY RESPONSE:** Ecology provides the following information for clarification as discussed below.

Key radionuclide contaminants drive one of the following three aspects of the Research, Development & Demonstration operations: 1) determines the limiting specifications for waste feed to the Demonstration Bulk Vitrification System, 2) a main contributor to the operational radiation dose and drives shielding requirements or 3) is a contaminant of concern from a performance assessment perspective.

The introduction section of the RD&D Permit (page 5) and the first paragraph in Part VI of the permit states, "Any procedure, method, data, or information contained in this document that relates solely to radionuclides or to the radioactive source, byproduct material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954, as amended) is not provided for the purpose of regulating the radiation hazards of such components under the authority of this Permit and Chapter 70.105 RCW."

Page 6-5, Lines 19-22, text stating: "These retrieval phases will maximize the quantity of dissolution brine retrieved while minimizing the incorporation of the interstitial liquid."

**COMMENT 35:** How does the Permittee propose to accomplish the stated goal of dissolving and retrieving the brine without incorporating the associated pore liquid?

**REQUEST ACTION:** Please provide clarification of the methods that will be used to meet the stated objective.

**ECOLOGY RESPONSE:** Ecology provides the following clarification as discussed below.

Permit Attachment BB (Section 6.2.3.2, line numbers 13-18) states that water will be added to Tank S-109 to aid in the retrieval of the interstitial (pore) liquid that will be pumped and transferred to the double-shell tank system. After the interstitial liquid has been removed, further addition of water will dissolve the brine that will be retrieved and used for the Demonstration Bulk Vitrification System process.

Page 6-6, Line 30, text stating: "...on a 7M sodium basis ..."

**COMMENT 36:** Other values within this attachment are normalized to a 5M sodium basis.

**REQUEST ACTION:** Please correct this value to reflect the common basis of 5M sodium used in this document.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action and provides the following clarification as discussed below.

The Draft Permit referred to “0.05 Ci/L (on a 7 molar basis)” to be consistent with the technical basis for the Waste Treatment Plant Low-Activity Waste developed by the Nuclear Regulatory Commission (Paperiello, C.J., “Classification of Hanford Low Activity Tank Waste Fraction” Letter to J. Kinzer, ORP, June 9, 1997). The 7 molar basis can be converted to a 5 molar basis by multiplying by a factor of 5/7 so the limit on a 5 molar basis is 0.0357 Ci/L.

Page 6-7, Table 6-5, text stating: General comments.

**COMMENT 37:** This table contains the following errors:

- No quantitative definition is provided for the “low solubility” label used in the table. A foot note is needed to indicate the cut-off on water solubility that was used to define a material as having a “low solubility.”
- The criteria used to designate a compound as “key chemical constituents/contaminants” are not provided in the table or accompanying text.

REQUEST ACTION: Please correct the indicated deficiencies.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Ecology doesn't believe that there are errors in the table. Ecology believes that the term “low solubility in water” is self-explanatory. For further clarification, the species labeled “low solubility in water” are those that form solid oxides and hydroxides that have some solubility in the original alkaline interstitial liquid, but are essentially insoluble in water (e.g., aluminum hydroxide).

It is agreed that “key chemical constituents/contaminants” is not provided in the Table 6-5. However, it is provided in the first paragraph in Permit Attachment BB, Section 6.2.3.1 “Saltcake Key Chemical and Radiological Contaminants” states that the constituents listed are important for glass performance and are key contaminants in the Tank 241-S-109 saltcake waste.

Ecology believes that this addresses the commenter's concerns.

Page 6-8, Table 6-6, text stating: General comments.

**COMMENT 38:** This table contains the following errors:

- No quantitative definition is provided for the “low solubility” label used in the table. A foot note is needed to indicate the cut-off on water solubility that was used to define a material as having a “low solubility.”
- The criteria used to designate these compounds as “key radionuclide contaminants” are not provided in the table or accompanying text.

REQUEST ACTION: Please correct the indicated deficiencies.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action as discussed below.

- Ecology has provided a response in Comment 37 in regard to “low solubility”.

- It is agreed that “key radionuclide contaminants” is not provided in the Table 6-6. However, it is provided in the first paragraph in Permit Attachment BB, Section 6.2.3.1 “Saltcake Key Chemical and Radiological Contaminants” states that the constituents listed are important for glass performance and are key contaminants in the Tank 241-S-109 saltcake waste.

Page 6-8, Line 17-18, text stating: “Waste feed verification is part of the testing protocol to verify presence of a bounding waste envelope.”

**COMMENT 39:** Does the Permittee mean by a “bounding waste envelope” that they are verifying the upper and lower bounds on chemical and physical properties of the waste that must be processed in the DBVS? If so, then please change the text to state this and provide a list of the properties that are to be bounded by the waste characterization.

**REQUEST ACTION:** Please consider altering the text as indicated.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Simulants will be added to ensure that the range of waste properties used during the DBVS testing properly bounds the projected Waste Treatment Plant waste properties for the constituents reflected in Permit Attachment BB, Tables 6-2, 6-3, 6-4, 6-5 and 6-6.

The reference to the bounding waste envelope indicates that waste feed is analyzed to support generation of a process control strategy that allows information about the waste characteristics, process parameters, and glass additives to be used to determine if the final waste product is acceptable. Thus, if the waste is within a bounding waste envelope, it will produce an acceptable waste form in the bulk vitrification waste system. Section 5.1.2 in Permit Attachment FF describes the three test parameters that are graphically represented in Figure 5-1. This indicates that the waste feed will be sampled and analyzed to support verification that the bounding waste envelope determined through laboratory and/or engineering scale tests is also valid for the large-scale glass samples.

Page 6-9, Lines 20-22, text stating: “...after which random sampling will take place, as agreed to in the final test matrix...”

**COMMENT 40:** No details are provided on how a protocol for random sampling will be developed.

**REQUEST ACTION:** Please provide details on the statistical approach that will be used to develop the protocol for random sampling.

**ECOLOGY RESPONSE:** Ecology provides the following clarification.

The Permit revised the Permit Application as described below to explain detail how the sampling protocol will be developed. Per Permit Condition II.B.7.i, Section 6.2.5.1, page 6-9, first paragraph, last sentence is revised as follows: “The frequency of sampling of ICV<sup>®</sup> packages will be once for the initial ten (10) ICV<sup>®</sup> packages; subsequent frequency as specified in an Ecology approved Waste Form Qualification (WFQ) plan” plan “random sampling” has been replaced as stated above.

Also, the RD&D Permit requires in Permit Condition V.I.6 (for Phase 1) and V.I.7 (for Phase 2) that the Permittees submit and receive approval from Ecology for the DBVS Facility Campaign Plans prior to receipt of dangerous and/or mixed waste in the DBVS Facility. The campaign plans will detail the protocol for sampling of the treated waste product.

Permit Condition V.I.6. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive approval from Ecology for the Phase 1 DBVS Campaign Plan. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 1 DBVS Campaign Plan shall include the information specified in Sections 5 and Appendix A of Permit Attachment LL in addition to the following: see permit conditions V.I.6.a through V.I.6.i.

Permit Condition V.I.7. Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign, Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 2 DBVS Campaign Plan shall include the information specified in Permit Condition V.I.6. In addition, the Phase 2 DBVS Campaign Plans designed to provide "Feed Envelope Verification and/or Process Improvement," shall include the following:

- V.I.7.a. Emission testing for demonstrating performance standards listed in Permit Condition V.I.6.f.
- V.I.7.b. Detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, planned analytical procedures for sample analysis and a short summary narrative description of each stack sample method with identification of the performance standard(s) identified in Permit Condition V.I.6.f that the method will be used to demonstrate the performance of the DBVS.

Page 8-9, Section 6.3, text stating: "A variety of secondary wastes will be generated during DBVS operations. This section covers general requirements for management of expected secondary wastes."

**COMMENT 41:** Prior to Phase 1 operations, the Permittee should be required to identify all secondary wastes streams that will be generated during the operation of this facility and provide details on how each stream will be managed.

**REQUEST ACTION:** Please ensure the Waste Analysis Plan is modified prior to the start of Phase 1 operations to ensure all secondary wastes have been identified and management strategies are in place for each waste stream.

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter's request.

In Permit Attachment FF, Page 4-13, all potential secondary waste streams have been identified and the management of each has been described.

Page 6-11, Sections 6.5.2 and 6.5.3: General comment.

**COMMENT 42:** These sections do not provide specific details on how the Quality assurance/Quality Control (QA/QC) program will use trip blanks, equipment blanks, and duplicate samples to ensure sample purity and measurement accuracy. Please add information on when and how these types of samples will be used.

**REQUEST ACTION:** Please consider adding the indicated information.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Ecology agrees that Sections 6.5.2 and 6.5.3 do not provide specific details and provides clarification as discussed below.

Ecology has included the following permit conditions to include these details.

Permit Condition II.B.7.K. Section 6.5.1.1, page 6-11, third sentence is revised as follows: "The analytical methods and the associated QA/QC are specified in Appendix D of the Permit Application, Permit Attachment BB."

Permit Condition II.B.7.l. Section 6.5.2, page 6-11, sixth sentence, "At a minimum, at least one trip blank will accompany each shipment per sample type to the laboratory."

Permit Condition V.I.6.b. Sampling, analysis, and QA/QC procedures/methods for any constituents/samples necessary to implement the DBVS Campaign Plan that were not addressed in Permit Attachment BB, as revised pursuant to Permit Conditions II.B.7 and II.B.8.

Ecology believes that this answers the commenter's concerns on the QA/QC program.

Page D-1 through D-6, Tables 9-3 through 9-8: General comment.

**COMMENT 43:** Are the Permittees proposing to measure all the compounds listed in Tables 9-3 through 9-8? If all these compounds are to be measured then the main body of the Waste Analysis Plan should be modified to reflect this fact. If all these compounds will not be quantified then Tables 9-3 through 9-8 should be modified to reflect only those compounds that will be measured in this work.

**REQUEST ACTION:** Please make the appropriate corrections.

**ECOLOGY RESPONSE:** Ecology provides the following clarification as discussed below.

The Permittees are not required to measure all of the compounds listed in Tables 9-3 through 9-8. These tables are provided to establish detection limits and methods for these compounds. Permit Attachment BB, Section 6.2.4, states, "The analytical methods used for measuring concentrations will follow the analytical methods listed in Table 3.3 of the Waste Treatment Plant Waste Analysis Plan (24590-WTP-RPT-ENV-01-003) and the analytical methods listed in Appendix D from the Regulatory data Quality Objectives Optimization Report for the Waste Treatment Plant (WTP) (24590-WTP-RPT-MGT-04-001). Because of the nature of this demonstration project all the constituents that may be tested were included to establish the analytical method and target minimum reportable quantity ranges. The methods identified for this work include several catchall methods. For example, Method 8260B for the analysis of volatile organics and method 6010B for the analysis of metals are methods that are designed to support the analysis of broad lists of analytes.

## COMMENTS TO PERMIT ATTACHMENT DD

Page C-8, Line 16, text stating: “*Upon notification of impending high winds,...*”

**COMMENT 44:** Please quantify what is meant by high winds.

**REQUEST ACTION:** Add a specific definition of high winds to the text.

**ECOLOGY RESPONSE:** Ecology agrees to add a definition for “high winds” to the definition section of the RD&D Permit.

High winds are defined as 85 miles per hour as identified in “Demonstration Bulk Vitrification System Specification, Rev. 2” (RPP-17403) that is referenced in the Permit Application.

Pages C-16 through C-17: General comment

**COMMENT 45:** Section C-8, C-9, C-10, and C-11 are missing numerous details.

**REQUEST ACTION:** Please ensure that the revision of attachment DD listed in the compliance schedule includes providing all information currently labeled as TBD in the indicated sections.

**ECOLOGY RESPONSE:** Ecology provides the clarification as discussed below.

Ecology has included the following permit conditions to include all information labeled “TBD”.

Permit Condition II.F.4. The following amendment to Permit Attachment DD, is hereby made. The Permittee shall submit the revised page reflecting this amendment to Ecology prior to the initial receipt of dangerous and/or mixed waste. This amendment does not constitute a permit modification pursuant to Permit Conditions I.C.2 and I.C.3.

Page C-10, Figure C-2, Tank Number “32-D74-004” is renumbered Tank Number “32-D74-016.”

Permit Condition II.F.5. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall update and resubmit and receive written approval from Ecology of Permit Attachment DD to be consistent with design details and schedule described in Parts III, IV, and V and Permit Attachments JJ, KK, and LL of this Permit. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.

Permit Condition II.F.6. After initial receipt of dangerous and/or mixed waste, the Permittees shall review and amend, if necessary, the applicable portions of the Contingency Plan, Permit Attachment DD, in accordance with the provisions of WAC 173-303-350(5) and WAC 173-303-830(4). The amended Contingency Plan shall be submitted to Ecology as a permit modification pursuant to Permit Conditions I.C.2 and I.C.3.

Permit Condition II.F.7. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall revise, resubmit, and receive written approval from Ecology of Permit Attachment DD to include the following. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.:

Permit Condition II.F.7.a. Sections C.8.1, C.8.2, C.8.4, C.11.0, amended to provide the information currently designated "TBD" and/or "(to be determined)."

Permit Condition II.F.7.b. Section C.3.1, page C-4, Table C-1, amended to include a current list of names, addresses, and phone numbers (office and home available through the Hanford Patrol Operation Center) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator and others must be listed in the order in which they will assume responsibility as alternates.

Ecology believes that this answers the commenter's concerns.

## COMMENTS TO PERMIT ATTACHMENT EE

Page 11-1, Lines 8 and 9, text stating: "...restoration of the site to its pre-RD&D activity state."

**COMMENT 46:** Will base line contaminant data be collected to compare with post operation data to ensure that the site is restored to its pre-operation condition?

**REQUEST ACTION:** Please clarify where the permit details the pre-test Site Monitoring Plan.

**ECOLOGY RESPONSE:** Ecology provides the clarification as discussed below.

Soils from the proposed Demonstration Site location will be analyzed for baseline contaminants prior to beginning operations. The closure plan will require post operation sampling to include the site of any spills or releases to ensure that all contamination is removed to pre-operational conditions prior to closure of the facility. Ecology recognizes the importance of returning the site to pre-RD&D conditions as included in the compliance schedule requirements for post-closure sampling. Permit Condition II.H.10 details these requirements.

Permit Condition II.H.10. The following amendment to Permit Attachment EE is hereby made. The Permittee shall submit the revised page reflecting this amendment to Ecology prior to initial receipt of dangerous and/or mixed waste in DBVS Facility. This amendment does not constitute a permit modification pursuant to Permit Conditions I.C.2 and I.C.3.

Section 11.3, second sentence is revised as follows: "Closure will require the removal and disposal of all dangerous and/or mixed waste present, removal of contaminated process equipment and contaminated structural components, and removal of all soil contaminated by the DBVS Facility in accordance with WAC 173-303-610(2)(a).

Page 11-1, Line 24, text stating: "...HHFACO ..."

**COMMENT 47:** No definition is provided for HHFACO.

**REQUEST ACTION:** Please add the definition of HHFACO to the text.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The RD&D Permit includes a list of acronyms on page 11 to 13. HFFACO is included and stands for Hanford Federal Facility Agreement and Consent Order.

## COMMENTS TO PERMIT ATTACHMENT FF

Page 2-4, Lines 28-29, text stating: “*Final disposal of treated waste will be at a permitted Hanford Site facility....*”

**COMMENT 48:** The presence of the ICV<sup>®</sup> containers should be included in a Hanford site-wide analysis that estimates the long-term impacts of buried contaminants on the Hanford subsurface and the Columbia River. This analysis should be part of the testing program for ICV<sup>®</sup> since there is the potential for the process to be a technical success, but ultimately not be usable because the disposal of these High Level Waste monoliths at Hanford would represent an unacceptable contaminant burden to the site.

**REQUEST ACTION:** Please ensure that the indicated analysis is conducted as part of the ICV<sup>®</sup> testing program.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The purpose of the RD&D Permit is to provide information to help decision makers analyze the question of long-term risk from disposal of Bulk Vitrification waste. It is planned that the testing needed to answer the long-term disposal question is a part of the RD&D test plan.

Ecology also provided the following permit conditions to provide the necessary information on the ICV<sup>®</sup> containers.

Permit Condition VI.10.c. ICV<sup>®</sup> Package detailed final limitations for size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, disposal facility, and testing/acceptance requirements.

The TWRS EIS analyzed the impacts of retrieving tank waste and treating it through a suite of alternative treatment technologies. Among the alternatives that the TWRS EIS evaluated were several that evaluated the impacts to human health and the environment from tank waste treatment and disposal outside of the tanks (ex-situ treatment). See TWRS, Volume 1, Section 3.4.6 Ex Situ Intermediate Separations, Section 3.4.7 Ex Situ No Separations, 3.4.8 Ex Situ Extensive Separations, and Section 3.4.9 Ex Situ/in Situ Combination 1 and 2 Alternatives. The ex-situ alternatives that the TWRS EIS evaluated allowed for separation of the tank waste into high-level waste and low-activity waste (LAW) components to “minimize the waste volume requiring offsite disposal” (TWRS EIS Volume 2, Section B.2.1.1.1, page B-29).

The TWRS EIS evaluated two waste forms resulting from ex-situ treatment, glass that was cast in monoliths and cullet that was formed by quenching the molten glass into gravel (TWRS EIS Volume 1, Section 3.4.1.5, page 3-36). Ex situ alternatives also included opportunities to separate into high-level and low activity fractions (TWRS EIS Volume 2, Appendix B, Section B.2.1.1.1, page B-29). Section B.3.5.3 provided a summary of the tank treatment process that included a step to separate the LAW from the HLW and another to dispose of the LAW onsite.

TWRS EIS Volume 1, Section 5.0 Environmental Consequences documents the analyses of the potential impacts to the environment from implementing each of the alternatives described in TWRS EIS Section 3.0, for 20 separate environmental components. Complex impact assessments were prepared for human ecological health (Volume 3, Appendix D), potential accidents (Volume 4, Appendix E), groundwater quality (Volume 4, Appendix F), Air Quality (Volume Five, Appendix G), and socioeconomic impacts (Volume 5, Appendix H). The environmental consequences of the ex-situ alternatives all assumed that 99% of the total volume of waste would be retrieved from the tanks and the LAW treatment plant would produce 200 metric tones of LAW glass cullet per day.

The Permittees proposed to conduct their RD&D effort using less than 1% of the total tank waste volume, which is to be retrieved from Single Shell Tank 241-S-109. They proposed to vitrify up to 50 containers of waste combined with glass forming agents; however, the system will be constructed and operated to vitrify a single container per campaign. After review of the TWRS EIS alternatives and their impacts, Ecology deemed the TWRS EIS to contain more than sufficient information about ex-situ vitrification to support the determination of non-significance assigned to the DBVS RD&D effort.

The Draft Research, Demonstration and Development Permit does not govern the disposal of the vitrified waste form. The Permit is for treatment and storage. Permit condition II.B.7.b requires that the Waste Analysis Plan develop a sampling approach for the final vitrified waste form to ensure compliance with the waste acceptance criteria of the Integrated Disposal Facility or another permitted disposal facility and the land disposal restrictions listed in WAC 173-303-140. It also requires the Permittee to develop waste feed limitations that will result in the final vitrified waste form meeting the IDF or another permitted disposal facility's waste acceptance criteria and in addition, meeting the performance standards for offgas emissions.

- Permit Condition I.A.1 limits the 241-S-109 waste to be accepted to waste that does not exceed the criteria listed in Permit Attachment BB and Tables V.7 and V.8.
- Permit Condition II.A.7 requires the USDOE and CH2M HILL to design and build the DBVS designs, plans, and specifications required by the Permit and approved by Ecology.
- Permit Condition II.B requires that the USDOE and CH2M HILL maintain knowledge of their wastes before it is accepted into the DBVS Facility, when it is received for treatment, and during treatment and storage of the treated waste form.

Permit Condition II.B.7.b requires the Permittees to modify their Permit Application to develop a sampling approach that will ensure compliance with the waste acceptance criteria of the Integrated Disposal Facility or another permitted facility. That condition also requires them to develop waste feed limitations that will result in the vitrified waste form meeting the IDF acceptance criteria.

As part of SEPA's environmental review, Ecology also evaluated the proposal against the alternatives and impacts in the *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement* (DOE/EIS-0189, August 1996). Ecology sought to determine whether "all or part of the proposal, alternatives, or impacts have been analyzed in a previously prepared environmental document, which can be adopted or

incorporated by reference.” See WAC 197-11-30(2)(a). The TWRS EIS addressed the final remediation of 177 underground storage tanks and 60 miscellaneous underground storage tanks (TWRS EIS Volume 2, Appendix B, page B-27). In those tanks were approximately 56 million gallons of radioactive mixed waste in the form of liquid, solids in the form of crystallized salts, and sludges.

Page 4-1, Line 16, text stating: “...Appendix B ....”

**COMMENT 49:** There is no Appendix B in Attachment FF.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action.

Ecology will add Appendix B to Permit Attachment FF.

Page 4-1, Line 26, text stating: “...Appendix F ....”

**COMMENT 50:** There is no Appendix F in Attachment FF.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action.

Ecology will add Appendix F to Permit Attachment FF.

Page 4-9, Line 35, text stating: “...Appendix B ....”

**COMMENT 51:** There is no Appendix B in Attachment FF.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action.

Ecology will add Appendix B to Permit Attachment FF.

Page 4-14, Table 4-5, third column: General comment.

**COMMENT 52:** The third column should contain quantitative information on the amounts and frequencies that the various secondary wastes will be generated.

**REQUEST ACTION:** Please add the indicated details to the Permit.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The Permittee provided in their Permit Application the secondary waste generation amounts and frequencies for the mixer/dryer condenser, the mist eliminator drainage, and the scrubber system blow down or bleed in Permit Attachment AA (Section 2.6, line numbers 9-14), therefore it was not necessary to include this information in Table 4-5 of Permit Attachment FF. The wash down water frequency would occur on an irregular basis and would be minimal. The boiler blow down is estimated to be 3 gallons per minute (gpm) during the mixer dryer operation that could occur for 8 hours for each mixer/dryer batch.

The estimated amounts of secondary liquid waste per container listed in the Permit Application are:

- Dryer Condensate 12,900 gallons
- Quench Blowdown 24,100 gallons
- Tri-Mer Scrubber Blowdown 51,500 gallons (only if in operation)

Page 4-15, Table 4-6, third column: General comment.

**COMMENT 53:** The third column should contain quantitative information on the amounts and frequencies that the various secondary wastes will be generated.

**REQUEST ACTION:** Please add the indicated details to the Permit.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

The exact amounts of secondary solid waste information requested for Table 4-6 in Permit Attachment FF are not currently known; however, they are expected to be small. These wastes will be properly designated and disposed of in accordance with the *Hanford Site Solid Waste Acceptance Criteria* (HNF-EP-0063). Ecology provided a permit condition that will require that these amounts be determined as part of the RD&D operations in order to calculate a mass balance.

Permit Condition II.B.7.v, Section 6, Figure 6-1, the block entitled "Solid Secondary Waste", the narrative under "Purpose of Waste Sampling", is amended to include the following: "and provide mass balance information."

Page 5-5, Line 5, text stating: "...(*Section 10.0 and Appendix C*)..."

**COMMENT 54:** There is no Section 10.0 or Appendix C in Attachment FF.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Although Section 10 was not found in Permit Attachment FF, Section 10 is included in Permit Attachment DD which is all part of the RD&D Permit. Ecology does not feel it necessary to include it in Permit Attachment FF.

Page 5-6, Figure 5-1: General comment.

**COMMENT 55:** This figure suggests that the operating range is a function of one independent variable and two dependent variables. However, this representation is not accurate since each of the indicated variables is not a single variable, but represents groups of parameters. As such, the figure provides no real information and should be omitted.

**REQUEST ACTION:** Please consider removing Figure 5-1.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Figure 5-1 will not be removed and is intended to provide a general representation of the types or categories of variables/test parameters that influence acceptable operations, and was not intended to represent all of individual and independent variables of importance. Although it does not provide any specific information on single variables, it does help graphically describe the general relationship of the classes of operating parameters of importance as described in section 5.1.2. A graphical representation of the relationship between all of the single variables would be too complex to be of value in describing the general relationship of these classes of parameters. Campaign plans will include more detail on the single variables/test parameters being evaluated and their relationship to acceptable operating envelopes.

## COMMENTS TO PERMIT ATTACHMENT JJ

Page 2-3, table title, text stating: "...Error! ..."

**COMMENT 56:** The table title has typos.

**REQUEST ACTION:** Please correct the text as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action and will correct the text.

Page 2-3, sixth paragraph, text stating: "Secondary containment will provide..."

**COMMENT 57:** Details on the capacity of containment structures and sumps should be added to the text along with a discussion of provisions for keeping tank capacity available to allow transfer of material from leaking tanks.

**REQUEST ACTION:** Please consider making the indicated modifications to the text.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Ecology agrees with this comment and the Draft Permit requires details of the capacity of containment structures and sumps to be provided for Ecology approval in accordance with permit conditions in Part IV and Part V of the RD&D Permit as listed below.

Permit Condition IV.A.8.e.ii. Permit Table IV.2, complete to provide for all secondary containment sumps and floor drains, the information as specified in each column heading.

Permit Condition V.I.5.c. Submit Permit Tables V.2 and V.5 completed to provide for all secondary containment sumps and floor drains, the information as specified in each column heading consistent with information to be provided in V.I.2.a through V.I.2.f above.

The above listed permit conditions are required to populate these tables and will be consistent with the WAC 173-303-640 requirements for tank systems.

Page 2-4, Section 2.4: General Comment.

**COMMENT 58:** This section should contain a discussion of the design requirements for the ICV<sup>®</sup> containers and provide details on how the containers will be tested after the vitrification process to ensure they meet the required standards.

**REQUEST ACTION:** Please provide the indicated information.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Part III (Containers), and Part V, (DBVS) of the Draft Permit contains permit conditions so that details on testing container design and testing requirements will be provided.

Permit Condition III.G.4. Requires the Permittee to submit additional information concerning the ICV® containers prior to accepting dangerous/mixed waste into the Demonstration Bulk Vitrification System Facility. The containers will meet disposal waste acceptance criteria for a permitted disposal facility.

Permit Condition III.G.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall update and submit and receive written approval from Ecology for the following, as specified below, for incorporation into Permit Attachment JJ. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3:

Permit Condition III.G.4.a. Narrative Descriptions, updated;

Permit Condition III.G.4.b. Descriptions of procedures for precluding release of contents of ICV® Package to the environment during the ICV® Package disconnect and sampling the ICV® Package including but not limited to the following:

Permit Condition III.G.4.b.i. Sealing the sampling port.

Permit Condition III.G.4.b.ii. Coring process.

Permit Condition III.G.4.b.iii. External decontamination.

Permit Condition III.G.4.b.iv. ICV® Package disconnect procedures.

Permit Condition III.G.4.c. Descriptions of procedures for handling and transport of containers within the DBVS Facility.

Permit Condition V.I.10.c: ICV® Package detailed final limitations for size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, disposal facility, and testing/acceptance requirements.

Ecology believes that the above permit conditions address the commenter's concerns.

Page 4-7, Section 4.2.9, text stating: "...Appendix F..."

**COMMENT 59:** There is no Appendix F in Attachment JJ.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action to include Appendix F in Permit Attachment JJ.

As clarification, Permit Condition V.I.4.1 requires the submittal of Appendix F, "ICV<sup>®</sup> Container Refractory Information", in Permit Attachment LL to be provided prior to receipt of dangerous and/or mixed waste in the DBVS Facility.

Page 7-4, Figure title: "...Error! ...."

**COMMENT 60:** The table title has typos.

**REQUEST ACTION:** Please correct the text as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested comment and has corrected the text.

## COMMENTS TO PERMIT ATTACHMENT KK

Page 2-3, Table 4-1, text stating: "...Table 4-1...."

**COMMENT 61:** The text refers to this table as Table 2-1.

**REQUEST ACTION:** Please correct the text as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Permit Attachment JJ which are documents incorporated, in their entirety, by reference into the RD&D Permit is an excerpt from the Permittee's DBVS Facility RD&D Permit Application. The text is correct in the original Permit Application, however, an error occurred in the transfer of this information to the permit attachment. Ecology will correct the text as appropriate.

Page 4-1, Line 8, text stating: "...Section 1.5 ...."

**COMMENT 62:** There is no Section 1.5 in Attachment KK.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action and all of Section 1 of the Permit Application, to include Section 1.5, will be added, for information purposes only, as a separate Permit Attachment.

Page 4-1, Line 16, text stating: "...Appendix B ...."

**COMMENT 63:** There is no Appendix B in Attachment KK.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action. Appendix B, Process Flow Diagrams, is included in Permit Attachment KK.

Page 4-1, Line 19, text stating: "...Section 1.7.3 ...."

**COMMENT 64:** There is no Section 1.7.3 in Attachment KK.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action and all of Section 1 of the Permit Application will be added, for information purposes only, as a separate Permit Attachment.

Page 4-1, Line 26, text stating: "...Appendix F...."

**COMMENT 65:** There is no Appendix F in Attachment KK.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology agrees with the requested action. Appendix F will be added to Permit Attachment KK.

Page 4-9, Line 35, text stating: "...Appendix B ...."

**COMMENT 66:** There is no Appendix B in Attachment KK.

**REQUEST ACTION:** Please correct the attachment as appropriate.

**ECOLOGY RESPONSE:** Ecology disagrees with the requested action. Appendix B, Process Flow Diagrams, is included in Permit Attachment KK.

Page 7-5, Figure 7-2: General comment.

**COMMENT 67:** This inspection check list is different from that presented as Figure 7-1 in Attachment JJ, yet both are intended for the same purpose.

**REQUEST ACTION:** Please ensure consistency in the document.

**ECOLOGY RESPONSE:** Ecology disagrees and provides clarification as discussed below.

Figure 7-2 is an inspection checklist to be used for the tank waste storage area of the DBVS Facility in Part IV of the RD&D Permit. Figure 7-1 is an inspection checklist to be used for the container storage area of the DBVS Facility in Part III of the RD&D Permit. The checklists are intended for two different storage areas.

## COMMENTS TO PERMIT ATTACHMENT KK

Page 4-i, Table of Contents: General comment.

**COMMENT 68:** This section is identical to Section 4.0 of Attachment FF. It is not apparent why this information must be duplicated.

**REQUEST ACTION:** Please eliminate the redundant presentation of material within the permit attachments.

**ECOLOGY RESPONSE:** Ecology intentionally duplicates sections of the Permit Application as incorporated in the Draft Permit Attachments.

The Permit Attachments reference specific regulatory subjects as indicated in the attachment title (e.g., Permit Attachment FF, "Emergency Preparedness and Prevention"). Even though the

Permit sections are duplicated, references to the Permit Attachment refer only to the regulatory subject in the title of the attachment.

Page 5-i, Table of Contents: General comment.

**COMMENT 69:** This section is identical to Section 5.0 of Attachment FF. It is not apparent why this information must be duplicated.

**REQUEST ACTION:** Please eliminate the redundant presentation of material within the permit attachments.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology intentionally duplicates sections of the Permit Application as incorporated in the Draft Permit Attachments.

The Permit Attachments reference specific regulatory subjects as indicated in the attachment title (e.g., Permit Attachment FF, "Emergency Preparedness and Prevention"). Even though the Permit sections are duplicated, references to the Permit Attachment refer only to the regulatory subject in the title of the attachment.

Page F-ii, first two lines, text stating: "*Information to be provided....*"

**COMMENT 70:** This Permit is incomplete and cannot be properly reviewed by the public.

**REQUEST ACTION:** Please provided a completed permit for CTUIR and the public review and comment.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology believes that this Draft RD&D Permit is complete and includes all terms and conditions that ensures protection of human health and the environment.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the

environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD & D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD & D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD & D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

**COMMENTER:**

Ron Bourgoin  
Edgecombe Community College  
Rocky Mount, North Carolina

The commenter states the following.

**COMMENT 1:** “I understand the Department of Ecology heard public comments at 6:30 P.M. last night at your Richland office regarding the AMEC Earth and Environmental, Inc., London, bulk vitrification project that will fuse silica-rich soil with tank wastes. I was not able to be at the meeting but should like to submit the following question for the record. As we all know, the U.S. District Court in Idaho ruled last July that all 53 million gallons of Hanford's tank wastes are high level. Why then are we paying \$1.4 billion for a program that treats the bulk of these high-level wastes as low-level?”

**ECOLOGY RESPONSE:** Ecology disagrees with the comment as discussed below.

The decision by the U.S. Federal Court for the District of Idaho (Idaho District Court) in *NRDC v. Abraham* invalidated the portion of USDOE Order 435.1 that purported to authorize USDOE to classify high-level radioactive waste as incidental to reprocessing, and to dispose of the waste as low-level or transuranic waste. The court ruled that the Order, as crafted, was inconsistent with the Nuclear Waste Policy Act. On November 5, 2004, the U.S. Court of Appeals for the Ninth Circuit vacated the Idaho District Court's decision and remanded the case with direction to dismiss the action.

In any event, the RD&D Permit is consistent with the Idaho District Court's decision and Ecology's position in the case. The court confirmed that properly retrieved, treated, and solidified waste that no longer contain fission products in sufficient concentrations to require deep geologic disposal are not “high level waste” and may be disposed of in a facility other than a deep geologic repository. Ecology's views concerning whether Hanford's tank wastes may appropriately be disposed of on-site have long been informed by the Nuclear Regulatory Commission letter of 1997 (Paperiello, C.J., “Classification of Hanford Low Activity Tank Waste Fraction”, Letter to J. Kinzer, ORP, June 9, 1997) that specifically addressed the issue of low-activity waste (LAW) at the Hanford Site as outlined in the RD&D Draft Permit. Ecology continues to believe that WTP LAW and bulk vitrification LAW, if properly retrieved, treated and solidified, may, consistent with the Nuclear Waste Policy Act, properly be disposed of on-site at Hanford and that such plans are not dependent on USDOE Order 435.1. The Nuclear Regulatory Commission (Paperiello, C.J., “Classification of Hanford Low Activity Tank Waste Fraction”, Letter to J. Kinzer, ORP, June 9, 1997) outlined a process of pretreatment and treatment that allowed HLW to be separated into LAW that could be disposed in near surface disposal units. The \$1.4 billion, as stated, appears to refer to a cost estimate of a production scale (full scale) bulk vitrification facility; the proposed cost for the RD&D facility is less than \$50 million.

**COMMENTER:**

Allyn Boldt  
1019 S. Irby St.  
Kennewick, WA. 99338

**COMMENT 1:** The proposed bulk vitrification and demonstration test will treat 300,000 gallons of single-shell tank waste containing 280 metric tons (MT) of sodium and result in the generation of approximately 1,000,000 gallons of concentrated double-shell tank waste containing 700 MT of new sodium. The review of the draft test permit for the proposed test developing these values is in the attached letter.

The generation of 1,000,000 gallons of new waste reducing the contingency tank waste storage space available over the next 10 years is significant. The additional 700 MT of sodium to be treated in 2028 will also result in a significant environmental impact. The attachment letter provides comments that may minimize the impacts on storage and ultimate treatment and disposal of the newly generated secondary wastes.

My comment is:

Ecology should rescind the current Determination of Non-significance (DNS) and reevaluate the Bulk Vitrification Test and Demonstration Facility following review and revision of the Permit for Dangerous and or Mixed Waste Research, Development, and Demonstration, Permit No: WA 7890008967, Washington State Department of Ecology.

**ECOLOGY RESPONSE:** Ecology disagrees and provides clarification as discussed below.

As stated in Permit Attachment LL, Section 4.2.15, the Tri-Mer System will predominantly be used as a backup system. Per Permit Attachment LL, Section 4.2.16, if enhancements are required to the offgas treatment system between Phases 1 and 2, Ecology approval will be required for these changes. To assume Tri-Mer scrubber is in constant operation, and the generation of a significant volume of secondary waste is not in keeping with the planned activities as described in the RD&D Permit Application.

The DBVS Facility will not generate 1,000,000 gallons of concentrated double-shell tank waste as stated by the commenter. The DBVS Facility does not plan to generate any double-shell tank waste.

The State Environmental Policy Act (SEPA) DNS is premised on Ecology's requirement that campaign plans for every campaign (i.e., each box) will be submitted for approval, as applicable, prior to initiation of vitrification.

Should the DBVS Facility lead to an Ecology decision to permit a full-scale production facility to treat other single-shell tank waste (should this technology be proven to yield a waste form whose performance is comparable to the WTP glass), then the emissions control system would be an efficient one that would not present a threat to the environment.

**COMMENT 2a:** The process flow diagrams and stream data in the Draft Permit are inadequate in defining the proposed testing and the compositions of secondary liquid wastes. Table 4-4 Scrubber Blowdown Contaminants, (reference 1, Attachment LL) provides composition for the venturi scrubber blowdown. The compositions of secondary liquid wastes, dryer condensate, venturi scrubber blowdown, and Tri-Mer scrubber blowdown are not defined in the process flow diagrams (reference 1, Attachment KK, Appendix B). The process flow diagrams do give the specific gravity of the Tri-Mer scrubber blowdown as 1.07 and the venturi scrubber blowdown specific gravity as 1.11. The volumes of the secondary wastes per In Container Vitrification (ICV<sup>®</sup>) batch are provided in Section 2.6 of reference 1, Attachment KK. The volumes for the dryer condensate, venturi scrubber blowdown, Tri-Mer scrubber blowdown, and total liquid secondary wastes are 12,900 gallons, 24,100 gallons, 51,500 gallons, and 88,500 gallons per ICV<sup>®</sup> container, respectively.

**ECOLOGY RESPONSE:** Ecology disagrees and provides the clarification as discussed below.

Ecology believes that information provided in Permit Attachment AA, Section 2-6 and the Process Flow Diagrams provides data that defines secondary liquid waste volumes as detailed below. Demonstration Bulk Vitrification System secondary liquid wastes will consist of 12,900 gallons of dryer condensate (specific gravity 1.00) and 24,100 gallons of scrubber blow down (specific gravity 1.11). The Tri-Mer scrubber is projected to be operated long enough to shut down a melt should the Selective Catalytic Reduction (SCR) fail. The Tri-Mer would have to operate for eight hours (not 139) and would produce 5,100 gallons which would contain 466 kilogram (kg) sodium.

**COMMENT 2b:** The venturi scrubber blowdown contains 6,004 kg of sodium per container batch. If the Tri-Mer scrubber sodium concentration is assumed to be proportional the specific gravities, the Tri-Mer scrubber blowdown may contain 8,100 kg of sodium per container batch. This totals approximately 14,000 kg sodium in liquid secondary wastes per container batch. The process flow diagrams indicate the 20 wt percent sodium oxide loading in the glass is derived from 17.6 wt percent tank waste sodium oxide and 2.4 wt percent sodium oxide from soil and starter path additives. The process flow diagrams indicate a total 15.8 M<sup>3</sup> of glass, 43.8 metric ton (MT) glass, containing 5,700 kg of tank waste sodium per ICV<sup>®</sup> container with an external volume of approximately 55 M<sup>3</sup>. The proposed vitrification demonstration will generate an estimated 2.4 metric tons new sodium in secondary waste per MT of tank waste sodium vitrified.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The proposed vitrification demonstration will generate an estimated 1.05 metric tons of new sodium in secondary waste per metric ton of tank waste sodium vitrified. The assumption that the Tri-Mer will be operated continually is incorrect. Section 4.2.15 (page 4-12) of Permit Attachment LL indicates that the Tri-Mer packed tower scrubber will predominantly be used as a back-up to the SCR. This means that the Tri-Mer is projected to be operated long enough to control emissions while processing is stopped. If this should occur, the process will not be restarted until the SCR is back on line. The estimated amount of secondary waste sodium generated by the proposed vitrification process is estimated to be 1.05 metric tons, without the use of the Tri-Mer, per metric ton of tank waste sodium vitrified. The secondary waste has a

different disposal path than the vitrified tank waste, and as such comparison of the mass of sodium between the two waste streams is not meaningful.

**COMMENT 2c:** Total quantities of liquid waste for the proposed 50 container test, processing 280 MT of tank waste sodium, are 4,425,000 gallons of liquid secondary waste containing approximately 700 MT of sodium. If the secondary waste sodium was packaged at the Effluent Treatment Facility (ETF) by the new, undefined cementation process (reference 2), the ETF Low Level Waste (LLW) for the demonstration would be 50,000 55 gallon drums assuming a flowsheet similar to previously proposed grout processing.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Total quantities of liquid waste for the proposed 50 container test, processing 280 MT of tank waste sodium, is about 1,850,000 gallons of liquid secondary waste containing approximately 300 MT of sodium. The Effluent Treatment Facility estimates that a maximum of 8,000 55 gallon drums containing a solid waste would be produced from a proposed 50 container test [*Demonstration Bulk Vitrification System (DBVS) Liquid Effluent Treatability Evaluation*, HNF-22442.]

**COMMENT 2d:** The total 177 tank mission at Hanford proposes to process 34,100 MT of sodium by supplemental treatment (reference 3). Using the vitrified and secondary waste volumes from the Draft Permit, waste volumes can be estimated for the 177 tank Hanford mission. The 34,100 MT of sodium treated with bulk vitrification would result in 6,000 ICV<sup>®</sup> containers with a burial volume of 330,000 M<sup>3</sup>. The liquid secondary waste sent to ETF is 530 million gallons containing 84,000 MT of sodium. The grouted volume would be 1,200,000 M<sup>3</sup> contained in 6,000,000 55 gallon drums. The balance of the LAW (19,800 MT sodium) is vitrified in the immobilized low-activity waste (ILAW) facility and results in 70,000 M<sup>3</sup>. The total ILAW and LAW volume for the scenario using bulk vitrification is 1,600,000 M<sup>3</sup> compared to a total volume of 220,000 M<sup>3</sup> for borosilicate glass vitrification in two ILAW facilities or 105,000 M<sup>3</sup> for iron phosphate glass vitrification in the current ILAW vitrification facility.

**ECOLOGY RESPONSE:** Ecology neither agrees nor disagrees and provides the information as discussed below.

Ecology is proposing to issue an RD&D Permit for the Demonstration Bulk Vitrification System. The RD&D Permit allows for 300,000 gallons of S-109 Tank waste to be treated for this demonstration. Should the DBVS Facility lead to an Ecology decision to permit a full-scale production facility, process enhancements would be included which may not be economical for an RD&D demonstration facility. For instance, the scrubber solution could be slaked lime instead of caustic. The gypsum produced might be evaluated for use as top off material for the In Container Vitrification to reduce the secondary waste disposal volume. Also, dryer condensate could be used as make up water for the scrubber system, reducing the quantity of liquid sent to the Effluent Treatment Facility by approximately one third. Other process enhancements would also be explored.

One of the purposes of the RD&D activity is to gather data and information to determine if this technology would be viable for full-scale production. Until the RD&D activity is completed, it would be premature to make assumptions and calculations as stated by the commenter.

A permit condition for the purposes of better assessing the potential for waste minimization as it relates to secondary liquid waste has been added as follows:

V.I.7.d. One or more campaign plans shall be conducted to generate information to assess the potential for waste minimization as it relates to secondary liquid waste.

**COMMENT 2e:** It is obvious that the offgas treatment process used for the ICV<sup>®</sup> demonstration would not be deployed for final treatment of the tank wastes. An offgas treatment system that produces less secondary wastes is required for ICV<sup>®</sup>. The ICV<sup>®</sup> demonstration and permit should be revised to include the more efficient offgas treatment system that would be deployed in the production system. This would result in significantly lower secondary waste quantities produced in the ICV<sup>®</sup> demonstration. If premature to test the production version of the offgas treatment system, it is proposed that the permit restrictions include maximum sodium content in liquid secondary wastes of 100 MT sodium. This would result in a maximum number of seven ICV<sup>®</sup> tests without improvement of the offgas treatment process or up to 50 ICV<sup>®</sup> tests with improved processes.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The offgas treatment process includes elements that could be used in a full-scale production facility (high-efficiency particulate air filters, Selective Catalytic Reduction, scrubbers, condensers). The decision to switch from the Tri-Mer scrubbing system to a Selective Catalytic Reduction for the primary NO<sub>x</sub> removal was made to reduce the amount of secondary liquid waste that would be produced by the DBVS Facility. In addition, efficiencies are desirable and some will be tested during the RD&D Permit operating period. A limit on sodium is not required because the secondary wastes will not be sent to a system that limits the amounts of sodium such as the double-shell tank system. Thus there is no "sodium balance" to calculate. It is not appropriate to compare sodium removed from Tank 241-S-109 to the amount of sodium sent to the Effluent Treatment Facility for processing and disposal since the sodium sent to the ETF has a different disposal path.

**COMMENT 3a:** The Draft Permit states the Disposition of secondary liquid effluent waste streams will be managed in accordance with reference 4 the acceptance criteria of the receiving facility, as necessary. The reference 4 waste acceptance criteria is not currently valid for secondary wastes derived from tank waste processing. The solid waste Environmental Impact Statement, reference 2, establishes new I-129 concentrations and ETF waste form that are not reflected in the current reference 4. The solid waste Environmental Impact Statement (EIS) (reference 2) establishes the total I-129 inventory in the ETF secondary waste for all 177 tanks at 5 curies I-129 in a cement waste form with a diffusion coefficient of  $1 \text{ E-}12 \text{ cm}^2\text{s}^{-1}$  for I-129. If the 5 Ci of I-129 were contained in the proposed 500 million gallons of secondary waste, the I-129 concentration would be approximately  $2.5 \text{ E-}09 \text{ Ci/L}$ . This value is approximately 1,000 times lower than the current maximum acceptance criteria I-129 concentration of  $1.8 \text{ E-}06 \text{ Ci/L}$ .

in reference 4. The reference 4 document should to be revised to support the revision of the draft ICV<sup>®</sup> demonstration permit.

**ECOLOGY RESPONSE:** Ecology disagrees and provides clarification as discussed below.

The commenter's reference 4 document (*Liquid Waste Processing Facilities Waste Acceptance Criteria*, HNF-3172) is a USDOE document that is not enforceable and/or is not required under this RD&D Permit. Ecology believes that the secondary liquid waste will meet the appropriate ETF waste acceptance criteria for final disposal.

The ETF has performed a treatability evaluation of the DBVS Facility secondary liquid effluent waste streams proposed to be sent to the ETF in accordance with the *Liquid Waste Processing Facilities Waste Acceptance Criteria* (HNF-3172). It concluded that the DBVS Facility waste streams are: (a) within the treatment capabilities of ETF; and (b) result in a dried by-product that is within the disposal criteria for the Hanford Environmental Restoration Disposal Facility – true for all radionuclides (including <sup>129</sup>I) and chemical constituents of the liquid effluent. The Effluent Treatment Facility treatability evaluation used effluent stream data consistent with stream numbers 6, 27, and 37 shown in Appendix B of Permit Attachment KK. It should also be clear that this RD&D Permit is for treatment of only the saltcake fraction of one specific tank, Tank S-109, not 177 waste tanks.

Without agreeing or disagreeing with the commenter's arguments, Ecology agrees to include an additional permit condition for the purpose of better assessing the potential for waste minimization as stated in Ecology's response to comment 2d above.

USDOE has also agreed to assess the fate/concentration of potential constituents of concern, in the secondary liquid waste and solid waste produced at the ETF. Information collected will also provide a material balance.

Ecology believes that this addresses the commenter's concerns.

**COMMENT 3b:** The reference 4 average monthly limits for nitrate as nitrogen and for total dissolved solids are 620 and 250,000 micrograms per liter, respectively. The composite 88,500 gallons of liquid secondary waste has calculated values of 23,000,000 micrograms nitrogen per liter and 32,000,000 micrograms dissolved solids per liter. These values for nitrogen and dissolved solids in the total ICV<sup>®</sup> liquid secondary waste are 10,000 and 130 times the limits, respectively. It is expected that the projected I-129 concentration in the secondary liquid wastes will be about 10 times the new I-129 concentration limits when they are established in revised criteria.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The monthly limits for nitrogen and total dissolved solids stated in your comment apply to the end of pipe discharges for State Waste Discharge Permit (ST-4502) for the 200 Area Treated Effluent Disposal Facility (TEDF). There are no plans to send secondary liquid waste from the DBVS Facility to the TEDF. These nitrogen and total dissolved solids (TEDF) permit limits do not apply to the incoming waste streams to the ETF. As stated in Ecology response to comment

3a above, the ETF has performed a treatability evaluation of the DBVS secondary liquid effluent waste streams and is in accordance with the *Liquid Waste Processing Facilities Waste Acceptance Criteria* (HNF-3172), including I-129.

**COMMENT 3c:** The ETF processing of liquids can take advantage of commingling waste liquids in the liquid effluent retention facility basin to dilute some wastes. The draft ICV<sup>®</sup> demonstration permit proposes to vitrify 50 containers over 400 calendar days / 365 operating days. This results in about 4 container runs per month or a total of 350,000 gallons of liquid secondary waste per month. It is unreasonable to expect other liquid wastes 10,000 times or even 130 times the expected volume of 350,000 gallons per month of ICV<sup>®</sup> demonstration liquid secondary wastes to dilute the wastes into specification.

The draft ICV<sup>®</sup> demonstration permit also states that if the secondary liquid wastes do not meet ETF waste acceptance criteria, it will be sent to a double-shell tank (DST) or other approved Hanford Site storage facilities. Total quantities of liquid waste for the proposed 50 container test, processing 280 MT of tank waste sodium, are 4,425,000 gallons of liquid secondary waste containing approximately 700 MT of sodium. If the secondary waste sodium is sent to the double-shell tanks, the wastes will be concentrated by the tank farm evaporator for storage. The 700 MT of sodium will result in 800,000 to 1,600,000 gallons of DST waste (10 molar sodium to 5 molar sodium terminal concentration). Approximately 1,000,000 gallons of new DST waste is produced awaiting treatment in following years. The tank farm evaporator will boil off an additional 3.5 million gallons of water and the 3.5 million gallons of condensate will be treated by ETF for disposal. The one million gallons of new DST waste also reduces the available contingency or spare space available in the future until year 2012 or later. This large volume generation of 1,000,000 gallons of new DST waste for treatment of 300,000 gallons of single-shell tank waste does not qualify as an environmental determination of nonsignificance.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Nowhere in the Permit does it state that we plan to generate 1,000,000 gallons of concentrated double-shell tank waste. The RD&D project does not plan to generate any double-shell tank waste. Also, see comment responses to #1, # 2, and # 3 of this responsive summary.

However, four containers per month will result in approximately 148,000 gallons of liquid secondary waste per month not 350,000 gallons per month. As stated previously, the ETF has performed a treatability evaluation of the DBVS Facility secondary liquid effluent waste streams proposed to be sent to the ETF is in accordance with the *Liquid Waste Processing Facilities Waste Acceptance Criteria* (HNF-3172), including I-129.

The total quantities of liquid waste for the proposed 50 container test, processing 280 MT of tank waste sodium, is 1,850,000 gallons of liquid secondary waste containing approximately 300 MT of sodium. The ETF estimates that a maximum of 8,000 55 gallon drums of solid material would be produced [*Demonstration Bulk Vitrification System (DBVS) Liquid Effluent Treatability Evaluation*, HNF-22442]. Secondary liquid waste consistent with the Permit Attachment KK, Appendix B is within the ETF treatment capabilities. No secondary wastes are expected to be sent to DSTs. Only in an off-normal situation would there be a potential need to send secondary

liquid wastes to DSTs. Such off-normal situations would cause an investigation that would lead to corrective actions, resulting in normal operations. As such, only small volumes of waste would have the potential to be sent to DSTs. This would not approach double-shell tank storage thresholds nor 242-A evaporator capabilities.

**COMMENT 3d:** The previous section of this letter suggested incorporation of a total secondary waste sodium limit for the ICV<sup>®</sup> demonstration permit. The suggested sodium limit of 100 MT sodium would result in limiting the amount of new DST waste to approximately 150,000 gallons if the secondary wastes do not meet the ETF waste acceptance criteria. This may be an acceptable value for a determination of nonsignificance if the 280 MT of tank waste sodium is vitrified. If less than 100 MT of tank waste sodium is vitrified, the 100 MT of new sodium waste would no longer be considered a determination of nonsignificance.

**ECOLOGY RESPONSE:** Ecology disagrees as previously discussed above and as discussed below.

The total quantities of liquid waste for the proposed 50 container test, processing 280 MT of tank waste sodium, is 1,850,000 gallons of liquid secondary waste containing approximately 300 MT of sodium [*Demonstration Bulk Vitrification System (DBVS) Liquid Effluent Treatability Evaluation, HNF-22442*]. The ETF estimates that a maximum of 8000 55 gallon drums of solid waste would be produced. Secondary liquid waste consistent with Permit Attachment KK, and Appendix B (process flow diagrams) is within the ETF treatment capabilities. No secondary wastes are expected to be sent to DSTs. Only in an off-normal situation would there be a potential to send secondary liquid wastes to DSTs. Such off-normal situations would cause an investigation that would lead to corrective actions, resulting in normal operations. As such, only small volumes of waste would have the potential to go to DSTs. This would not approach double-shell tank storage thresholds nor 242-A evaporator capabilities.

**COMMENT 3e:** The Draft Permit is inadequate in defining the amount, composition, and disposition of the secondary wastes. The draft ICV<sup>®</sup> demonstration permit should be revised to provide complete definition and material balances of the ICV<sup>®</sup> demonstration including secondary waste treatment and disposal. The revised draft ICV<sup>®</sup> demonstration permit should include flow diagrams and material balances including sulfur and sulfur oxides for both ETF and DST options. The DST option should include chemical additions to meet tank farm specifications, tank farm evaporator operation, and final ETF treatment of tank farm evaporator condensate. The revised draft ICV<sup>®</sup> demonstration permit should also discuss the capability of the tank farm evaporator and the ETF to increase throughput by the proposed 350,000 gallons per month.

**ECOLOGY RESPONSE:** Ecology disagrees in part as discussed previously and provides additional information below.

The secondary liquid wastes will be treated at ETF using the standard ETF flow sheet and under the ETF state wastewater discharge permit requirements (ST-4500) and the ETF Resource Conservation and Recovery Act (RCRA) Permit. There have been no modifications required to either ETF permit as a result of this Draft RD&D Permit.

As explained previously, the secondary liquid wastes will only be sent to the double-shell tank system in the event of a process upset that would result in a composition that cannot be treated at ETF. The probability is low and 37,000 gallons of secondary waste would be generated from one ICV<sup>®</sup> vitrification box. This would have a negligible effect on 242-A evaporator operations. There are no plans to use the secondary liquid wastes for double-shell tank chemistry adjustment during the DBVS demonstration. However, this could be considered should the DBVS Facility lead to an Ecology decision to permit a full-scale production facility.

A permit condition for the purposes of better assessing the potential for waste minimization as it relates to secondary liquid waste has been added as follows:

- V.I.7.d. One or more campaign plans shall be conducted to generate information to assess the potential for waste minimization as it relates to secondary liquid waste.

**COMMENT 4a:** In 1996, The United States Department of Energy (USDOE) proposed a waste classification of a low activity fraction of waste separated from the tank wastes. The technical basis for the proposed High Level Waste (HLW) and Low Activity Waste (LAW) fractions was documented in reference 5. Two critical assumptions in the basis were the LAW was vitrified glass and the I-129 inventory was contained in the LAW glass. The technical basis and supporting waste disposal analysis indicated that the LAW disposal system would meet the criteria, "Are to be managed, pursuant to the Atomic Energy Act, so that safety requirements comparable to the performance objectives set out in 10 CFR Part 61 are satisfied."

In November 1996, USDOE requested the Nuclear Regulatory Commission's (NRC) assessment of USDOE's proposed waste classification for the LAW removed from the tanks. USDOE was seeking NRC's technical views and whether NRC agreed with USDOE's proposal.

Reference 6 provided the results of the NRC staff's technical review of USDOE's proposed method for management of USDOE's tank waste at Hanford. The NRC staff concluded that the waste planned for removal from the tanks and disposed on site was incidental waste and, therefore, would not be subject to NRC's licensing authority. However, the staff was also of the view that the preliminary nature of USDOE's performance assessment and other information was not sufficient to allow the staff to provide more than tentative views and listed several instances that would warrant re-evaluation. Thus, the staff "provisionally agreed" with USDOE that the waste it wanted to dispose of on site was incidental waste but, recognizing that significant changes in the information or management program could affect NRC's technical findings, NRC believed that USDOE should consult further with NRC should such changes occur.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The comment, "Two critical assumptions in the basis were the LAW was vitrified glass and the I-129 inventory was contained in the LAW glass" is incorrect. Page 4-22 of the document cited Reference 5 by the commenter, "Technical Basis for Classification of Low-Activity Waste Fraction from Hanford Site Tanks" (WHC-SD-WM-TI-699, Rev 2, September 1996) clearly indicates that, "The path of <sup>129</sup>I in the LAW vitrification process is released to the atmosphere and an unknown quantity to the chloride purge stream...20 to 80 percent of the <sup>129</sup>I inventory

may accumulate with the chloride and fluoride streams...for purge and disposal as grout". Similarly, Table 5.3 of that technical basis report did not show "...the I-129 inventory was contained in the LAW glass." Rather it showed that the amount in the glass would be less than 51 curies. The technical basis report and the NRC, therefore, anticipated that approximately 40 curies of I-129 would be disposed of as secondary waste grout. Although changes have occurred in the estimated tank waste I-129 inventory since 1996, currently the Best Basis Inventory estimates show a lower total inventory for the I-129.

**COMMENT 4b:** In 2001, the NRC stated in a summary of NRC involvement with USDOE in the Tank Waste Remediation System (reference 7):

"Under the present system, unless the NRC determines that this LAW/incidental waste is not HLW, the waste must be disposed of as HLW in a federal repository."

In 2003, the U.S. District Court of Idaho ruled that the USDOE violated the Nuclear Waste Policy Act (NWPA) when it granted itself the authority to reclassify HLW and declared invalid the incidental waste portion of DOE Order 435.1 (reference 8).

**ECOLOGY RESPONSE:** Ecology disagrees and provides clarification as discussed below.

The commenter quotes NRC as saying, "Under the present system, unless the NRC determines that this LAW/incidental waste is not HLW, the waste must be disposed of as HLW in a federal repository". First, the LAW treatment approach for both waste treatment plant LAW glass and bulk vitrification produced LAW glass remain consistent with the assumptions set forth in the document cited Reference 5 by the commenter, "Technical Basis for Classification of Low-Activity Waste Fraction from Hanford Site Tanks" (WHC-SD-WM-TI-699, Rev 2, September 1996) and the NRC's response to that document in the June 9, 1997, letter to Mr. Jackson Kinzer, Assistant Manager, Office of Tank Waste Remediation System, U.S. Department of Energy, Richland Operations Office, from Carl J. Paperiello, Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Subject: Classification of Hanford Low-Activity Tank Waste Fraction. Second, the quoted NRC staff statement refers to USDOE's policy of using the NRC in a consultation role. The 1997 (Paperiello, C.J., "Classification of Hanford Low Activity Tank Waste Fraction" Letter to J. Kinzer, ORP, June 9, 1997) LAW determination was consistent with USDOE's policy of consulting with the NRC on tank waste determinations. Ecology believes all actions required in the RD&D Permit are consistent with the criteria established in Letter to J. Kinzer, ORP, June 9, 1997, from C. J. Paperiello, *Classification of Hanford Low Activity Tank Waste Fraction*.

**COMMENT 4c:** In 2004, the NRC clarified the NRC's views regarding the USDOE's accelerated cleanup program at the Hanford site (reference 9). The NRC stated:

"In its review of the Hanford waste program in SECY-97-083 (reference 6), the NRC was acting in an advisory capacity by providing a technical review of DOE's proposed actions and was not providing any regulatory or licensing approval." and;

“the decision to consult with NRC is within DOE’s discretion .... it is our understanding that DOE does intend to consult with NRC and seek our advice regarding aspects of its tank closure program at a future time.”

Thus, the U.S. District Court of Idaho has ruled that USDOE does not have the authority to classify a portion of the tank waste as LAW/incidental waste, and the NRC has not provided any regulatory or licensing action for Hanford tank waste classification. The NRC position is also that the tank waste is HLW until the NRC determines the LAW/incidental waste is not HLW. Without resolution of the waste classification issue, any waste produced by the ICV<sup>®</sup> demonstration is HLW until the issue is resolved. There may be legal, regulatory, and programmatic issues in surface storage and/or ultimate disposal of the orphan HLW produced by the ICV<sup>®</sup> demonstration until the classification issue is resolved.

**ECOLOGY RESPONSE:** Ecology does not agree with the commenter’s interpretation of the NRC letter as discussed below.

The commenter states that “Without resolution of the waste classification issue, any waste produced by the ICV<sup>®</sup> demonstration is HLW until the issue is resolved.” That is the commenter’s opinion but it is not anchored in fact. The basis for LAW classification, whether vitrified in the waste treatment plant or by bulk vitrification, is a 1997 letter from the NRC (Paperiello, C.J., “Classification of Hanford Low Activity Tank Waste Fraction” Letter to J. Kinzer, ORP, June 9, 1997), not DOE M 435.1-1. Further, the Idaho District Court’s decision in NRDC et. al v. Abraham et. al. was vacated by the U.S. Court of Appeals for the Ninth Circuit on November 5, 2004.

**COMMENT 4d:** There is also concern with the proposed ICV<sup>®</sup> demonstration ETF solids for LLW disposal. The proposed ICV<sup>®</sup> demonstration routes 87 percent of the tank I-129 inventory to the ETF. The resulting ETF waste solids containing the I-129 potentially will not, “be managed, pursuant to the Atomic Energy Act, so that safety requirements comparable to the performance objectives set out in 10 CFR Part 61 are satisfied.” If the ETF solids can not meet the performance objectives, the ETF solids are high level waste.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The commenter states that, “If the ETF solids can not meet the performance objectives, the ETF solids are high level waste”. As noted in the response to Comment 1, the I-129 inventory that may be disposed as secondary waste was anticipated when the 1997 letter (Paperiello, C. J., “Classification of Hanford Low Activity Tank Waste Fraction” Letter to J. Kinzer, ORP, June 9, 1997) was issued. Ecology supports partial retrieval of the dissolved salt cake in Single-Shell Tank (SST) 241-S-109 for use as the feed material for treatment in the Demonstration Bulk Vitrification System (DBVS) because use of that waste will ensure that I-129 concentrations are reduced. The concentration of I-129 in the waste is low, based upon data in the best basis inventory (BBI) maintained by the USDOE Office of River Protection and its contractor, CH2M Hill Hanford. The Tank Farm inventory of iodine is approximately 43.9 Ci, which results in an average concentration of 9.3E-7 Ci/kg Na. The inventory of I-129 in 241-S-109 per the BBI is 0.313 Ci, which results in an average concentration of 4E-7 Ci/kg Na (based on estimates, rather than sample results). Estimates vary as to the amount of I-129 that will be contained in the

vitrified waste and in the secondary waste produced by the process; however, if one assumed that 50% to 90% of the I-129 in the waste appeared in the secondary waste, the total amount of iodine in the secondary waste produced by the DBVS as a result of the research, demonstration & development effort would be from 0.015 to 0.06 Ci. The total amount of I-129 in the secondary waste would therefore, constitute only 0.03% to 0.14% of the total tank farm inventory of I-129.

**COMMENT 4e:** The current project system plan for the 177 tank mission (reference 3) includes the bulk vitrification treatment of 60 percent of the tank waste sodium and produces a new, large volume ETF waste stream containing 87 percent of the I-129. The ICV<sup>®</sup> glass contains about 13 percent of the I-129. This is a significant change from the reference 5 technical basis for waste classification that processed 100 percent of the LAW in conventional borosilicate glass melters with glass in canisters containing 100 percent of the I-129 in the LAW glass. The NRC recognized that significant changes in the information or management program could affect NRC's technical findings and provisional agreement with the USDOE waste classification analysis. NRC believed that USDOE should consult further with NRC should such significant changes occur (reference 6).

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The Draft RD&D Permit for bulk vitrification is for the treatment of 300,000 gallons of tank waste from one tank; Tank 241-S-109. The purpose of the RD&D Permit is to allow for the Test and Demonstration of the bulk vitrification process to evaluate its potential use for treatment of other Hanford Site tank wastes. The Permit is temporary in duration and limits the quantities of dangerous and/or mixed waste to be treated. WAC 173-303-040 defines a mixed waste as a dangerous, extremely hazardous, or acutely hazardous waste that contains both radioactive and hazardous constituents). The Permit also includes stringent terms to protect public health and the environment.

The treatment process which would be developed under this Permit is a key element of the overall treatment system being developed to retrieve and remediate the mixed waste in the underground storage tanks at Hanford's tank farms. The safety and cleanup of these tanks has been a major public concern for some time.

Under this Permit, the Permittees will evaluate the ability of bulk vitrification to produce immobilized low-activity waste that is comparable to that proposed for the Hanford Site Waste Treatment and Immobilization Plant (WTP) immobilized low-activity waste form. The Permittees will be required to provide data for waste form qualifications, risk assessments, and performance assessments for treatment and near-surface land disposal of low-activity waste.

Page 4-22 of the document cited by the commenter, "Technical Basis for Classification of Low-Activity Waste Fraction from Hanford Site Tanks" (WHC-SD-WM-TI-699, Rev 2, September 1996) clearly indicates that, "The path of <sup>129</sup>I in the LAW vitrification process is released to the atmosphere and an unknown quantity to the chloride purge stream...20 to 80 percent of the <sup>129</sup>I inventory may accumulate with the chloride and fluoride streams...for purge and disposal as grout". Similarly, Table 5.3 of that technical basis report did not show "...the I-129 inventory was contained in the LAW glass." Rather it showed that the amount in the glass would be less than 51 curies. The technical basis report and the Nonconformance Report (NCR), therefore,

anticipated that approximately 40 curies of I-129 would be disposed of as secondary waste grout. Although changes have occurred in the estimated tank waste I-129 inventory since 1996, currently the Best Basis Inventory estimates show a lower total inventory for the I-129.

The commenter states, "This is a significant change from the reference 5 technical basis for waste classification that processed 100 percent of the LAW in conventional borosilicate glass melters is glass in canisters containing 100 percent of the I-129 in the LAW glass". The commenter misinterpreted WHC-SD-WM-TI-699, Rev 2. We refer the commenter to footnote "a" of Table 5.2 which states, "To be conservative, it is assumed that 100 percent of the <sup>99</sup>Tc, <sup>79</sup>Se, <sup>14</sup>C, <sup>3</sup>H, <sup>129</sup>I, and <sup>126</sup>Sn inventories (soluble and insoluble fractions) are incorporated into the immobilized low-activity waste. See text in Section 4.0 for discussion." In other words, the 100 percent of the I-129 assumption was only intended to conservatively demonstrate that the Class C concentrations would be met for the LAW. The reader is also directed to Section 4, which as previously discussed, indicates that a large fraction of the I-129 would be grouted in secondary waste. The current conditions as specified in the RD&D Permit are consistent with WHC-SD-WM-TI-699, Rev 2.

**COMMENT 4f:** Ecology should include a provision in the Draft Permit that no ICV<sup>®</sup> tests can be performed until the waste classification issues are resolved. Ecology should request USDOE to ask NRC for a rulemaking on classification of Hanford Site tank waste fractions; ILAW canisters, ICV<sup>®</sup> containers, ETF wastes, and other secondary wastes (silver mordenite and activated charcoal absorber beds); for both the ICV<sup>®</sup> demonstration and the 177 tank mission. The U.S. District Court of Idaho ruled that USDOE does not have the authority to classify a portion of the tank waste as LAW/incidental waste. The U.S. District Court of Idaho was not asked nor made a ruling if the NRC has the authority to classify a portion of the Hanford tank waste as LAW/incidental waste, not HLW.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The commenter states that, "Ecology should request USDOE to ask NRC for a rulemaking..." The NRC has previously indicated (FR, Vol. 58, No. 71, 12342, March 4, 1993) that it does not believe such a rulemaking is warranted.

The commenter states that, "The U.S. District Court of Idaho ruled that USDOE does not have the authority to classify a portion of the tank waste as LAW/incidental waste." The decision by the U.S. Federal Court for the District of Idaho (Idaho District Court) in *NRDC v. Abraham* invalidated a portion of USDOE Order 435.1 that purported to authorize USDOE to classify high-level radioactive waste as incidental to reprocessing, and to dispose of the waste as low-level or transuranic waste. The court ruled that the Order, as crafted, was inconsistent with the Nuclear Waste Policy Act. On November 5, 2004, the U. S. Court of Appeals for the Ninth Circuit vacated the Idaho District Court's decision and remanded the case with direction to dismiss the action.

In any event, the RD&D Permit is consistent with the Idaho District Court's decision and Ecology's position in the case. The court confirmed that properly retrieved, treated, and solidified waste that no longer contain fission products in sufficient concentrations to require deep geologic disposal are not "high level waste" and may be disposed of in a facility other than

a deep geologic repository. Ecology's views concerning whether Hanford's tank wastes may appropriately be disposed of on-site have long been informed by the Nuclear Regulatory Commission letter of 1997 (Paperiello, C.J., "Classification of Hanford Low Activity Tank Waste Fraction", Letter to J. Kinzer, ORP, June 9, 1997) that specifically addressed the issue of low-activity waste (LAW) at the Hanford Site as outlined in the RD&D Draft Permit. Ecology continues to believe that WTP LAW and bulk vitrification LAW, if properly retrieved, treated and solidified, may, consistent with the Nuclear Waste Policy Act, properly be disposed of on-site at Hanford and that such plans are not dependent on USDOE Order 435.1. The Nuclear Regulatory Commission (Paperiello, C.J., "Classification of Hanford Low Activity Tank Waste Fraction" Letter to J. Kinzer, ORP, June 9, 1997) outlined a process of pretreatment and treatment that allowed HLW to be separated into LAW that could be disposed in near surface disposal units.

**COMMENT 5:** Revise the process flow diagrams and stream data to include the principal constituents and provide a mass balance adequate for third party review. Include flow diagrams and stream data for treatment of secondary wastes. Include both options for routing/disposal of the secondary ICV<sup>®</sup> wastes; 1) directly to ETF and 2) routed to DSTs (chemical adjustment for tank waste specifications, tank farm evaporator operation, and ETF treatment of evaporator condensate).

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The appropriate level of detail on the secondary waste streams was provided in Permit Attachment LL, Appendix B of the Permit Application. An objective of this RD&D project is to evaluate the secondary waste streams and to provide engineering information that will assist in designing a full-scale facility, should the DBVS Facility lead to an Ecology decision to permit a full-scale production facility.

The secondary liquid wastes will be treated at Effluent Treatment Facility using the standard Effluent Treatment Facility flow sheet and under the Effluent Treatment Facility permit requirements. There have been no modifications required to the Effluent Treatment Facility as a result of this Research, Development & Demonstration activity.

Secondary liquid wastes will only be sent to the double-shell tank system in the event of a process upset that results in a composition that cannot be treated at Effluent Treatment Facility. There are no plans to use the secondary liquid wastes for double-shell tank chemistry adjustment during the RD&D Permit period.

Ecology disagrees with the commenter's request for third party review. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation.

Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD & D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD & D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD & D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The

purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; kcon461@ecy.wa.gov.

**COMMENT 6:** Secondary waste generation by the offgas treatment system is excessive. Revise the offgas treatment system to use the more efficient process and equipment that are intended for the 177 tank mission production system.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

As responded to in previous comments, Ecology disagrees with the premise that the Tri-Mer will be used as the primary offgas treatment system as suggested by the commenter. It should also be clear that this RD&D Permit is for treatment of only the saltcake fraction of one specific tank, Tank 241-S-109.

It was recognized that use of the Tri-Mer would result in a significant amount of secondary liquid waste, which is why the Selective Catalytic Reduction was selected as the primary NO<sub>x</sub> reduction technology. It should also be noted that Selective Catalytic Reduction is the baseline NO<sub>x</sub> reduction process to be used by the Waste Treatment Plant. The Tri-Mer Scrubber would only be used as a backup as previously discussed. Each campaign plan (one In Container Vitrification box) will generate approximately 13,000 gallons of dryer condensate and 24,000 gallons of quench blowdown.

The Draft RD&D Permit for bulk vitrification is for the treatment of 300,000 gallons of tank waste from one tank, Tank 241-S-109. The purpose of the RD&D Permit is to allow for the Test and Demonstration of the bulk vitrification process for potential future use in the treatment of other Hanford Site tank wastes. The Permit is temporary in duration and limits the quantities of dangerous and/or mixed waste to be treated. (Mixed waste is defined as a dangerous, extremely hazardous, or acutely hazardous waste that contains both radioactive and hazardous constituents). The Permit also includes stringent terms to protect public health and the environment.

The treatment process which would be developed under this Permit is a key element of the overall treatment system being developed to retrieve and remediate the mixed waste in the underground storage tanks at Hanford's tank farms. The safety and cleanup of these tanks has been a major public concern for some time.

Under this Permit, the Permittees will evaluate the ability of bulk vitrification to produce immobilized low-activity waste that is comparable to that proposed for the Hanford Site Waste Treatment and Immobilization Plant immobilized low-activity waste form. The Permittees will be required to provide data for waste form qualifications, risk assessments, and performance assessments for treatment and near-surface land disposal of low-activity waste.

**COMMENT 7:** Include a permit condition that sets a maximum total quantity of sodium in the secondary wastes for the total demonstration series. A maximum of 100 MT sodium is suggested for consideration.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology does not agree a permit condition is required for maximum sodium limits. A condition on sodium is not required because the secondary wastes will only be sent to the double-shell tank system in a severe upset condition and in limited volumes, as discussed in many previous responses. Therefore, a comparison of sodium removed from Tank 241-S-109 in this RD&D Permit to the amount of secondary waste sodium sent to the ETF for processing and disposal (under the ETF RCRA and State Waste Discharge Permits) is not necessary. ETF can accept and treat all proposed DBVS Facility secondary waste under its current permits.

However, Ecology will add permit conditions that will require one or more of the campaign plans address how future recycle waste from the WTP could be incorporated into a bulk vitrification waste stream. These campaign plans would be specifically designed to observe, record, and analyze impacts related to waste loading and potential constituents of concern, such as sulfate, sodium, metals, iodine, and technetium. The permit condition is as follows:

- V.I.7. Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign, Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 2 DBVS Campaign Plans shall include the information specified in Permit Condition V.I.6. In addition, the Phase 2 DBVS Campaign Plans shall be designed to collect the information specified in Permit Conditions V.I.7.c through V.I.7.e below, and the Phase 2 DBVS Campaign Plans designed to provide "Feed Envelope Verification and/or Process Improvement," shall also include the information specified in Permit Conditions V.I.7.a and V.I.7.b, below:
- V.I.7.a. Emission testing for demonstrating performance standards listed in Permit Condition V.I.6.f.
- V.I.7.b. Detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, planned analytical procedures for sample analysis and a short summary narrative description of each stack sample method with identification of the performance standard(s) identified in Permit Condition V.I.6.f that the method will be used to demonstrate the performance of the DBVS.
- V.I.7.c. One or more test campaigns shall be conducted to generate mass balance information sufficient to address the fate/concentration of potential constituents of concern, such as Iodine-129 and Technetium-99, within the ICV<sup>®</sup> Package and its various components, the offgas systems, offgas systems' secondary liquid waste, solid and secondary semi-solid waste.

- V.I.7.d. One or more test campaigns shall be conducted to generate information to assess the potential for waste minimization as it relates to secondary liquid waste.
- V.I.7.e. One or more test campaigns shall be conducted to generate information to assess how potential future recycle waste from the WTP could be incorporated into a Bulk Vitrification full-scale production facility waste stream, should Ecology make the decision to permit a full-scale production facility, and the impacts related to including these recycles into the DBVS Facility waste stream. These test campaigns would be specifically designed to observe, record and analyze impacts related to waste loading and potential constituents of concern, such as sulfate, sodium, metals, iodine, and technetium.

**COMMENT 8:** Revise the ETF waste acceptance specifications to reflect the findings of the Hanford Solid Waste EIS (reference 2). Include a comparison of the ICV liquid secondary wastes to the ETF acceptance specifications in the ICV<sup>®</sup> demonstration permit.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The *Liquid Waste Processing Facilities Waste Acceptance Criteria* (HNF-3172) is a USDOE document that is not enforceable and/or is not required under this RD&D Permit.

Ecology believes the secondary liquid waste will meet the appropriate waste acceptance criteria for the Effluent Treatment Facility. The Effluent Treatment Facility has performed a treatability evaluation of the Demonstration Bulk Vitrification System secondary liquid effluent waste streams proposed to be sent to the Effluent Treatment Facility in accordance with the *Liquid Waste Processing Facilities Waste Acceptance Criteria* (HNF-3172), and found that these waste streams are: (a) within the treatment capabilities of Effluent Treatment Facility; and (b) result in a dried by-product that is within the disposal criteria for Environmental Restoration Disposal Facility-true for all radionuclides (including <sup>129</sup>I) and chemical constituents of the liquid effluent. The Effluent Treatment Facility treatability evaluation used effluent stream data consistent with stream numbers 6, 27, and 37 shown in Appendix B of Permit Attachment KK.

The secondary liquid wastes will be treated at Effluent Treatment Facility using the standard Effluent Treatment Facility flow sheet and under the Effluent Treatment Facility permit requirements. There have been no modifications required as a result of this Research, Development & Demonstration project. The Effluent Treatment Facility permit and flow sheet are outside the scope of the RD&D Permit.

**COMMENT 9:** Add a permit restriction that precludes demonstration operation without resolution of the waste classification issue. Ecology should request USDOE to ask NRC for a rulemaking on classification of Hanford Site tank waste fractions to expedite resolution of the issue. The rule making request should include ILAW canisters, ICV<sup>®</sup> containers, ETF wastes, and other secondary wastes (silver mordenite and activated charcoal absorber beds) for both the ICV<sup>®</sup> demonstration and the 177 tank mission.

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter's request. See Ecology's response to Comment 4f.

**COMMENTER:**

Liebler, Ivey, Connor, Berry & St. Hilaire  
1141 North Edison, Suite C  
P.O. Box 6125  
Kennewick, WA 99336-0125

**COMMENT 1:** The DBVS has the potential to treat F001-F005 coded waste as listed in Appendix B, Table 6.1, yet there is not a permit condition requiring an equivalency demonstration to the performance standards of an incinerator as required by LDRs. Will a requirement to demonstrate equivalency be added to the Permit?

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology disagrees with the need for a determination of equivalent treatment with incinerator performance standards. Incinerator performance standards are not applicable to this waste stream for the purpose of meeting the land disposal requirements in 40 CFR 268.40.

Under 40 CFR Part 268.40 Treatment Standards for hazardous waste the only F001-F005 solvent waste which have a treatment standard as the specified technology code CMBST, which includes incinerators, are (1) F005 solvent waste containing 2-Nitropropane as the only listed F001-5 solvent, and F005 solvent waste containing 2-ethoxyethanol as the only listed F001-5 solvent. As specified on Appendix B, Table 6-1, the waste to be treated under this RD&D is not limited to these hazardous constituents and is consequently not limited to the CMBST treatment technology. An equivalency determination is therefore not required.

**COMMENT 2:** What is the total amount of secondary wastes (Type, e.g., hazardous, mixed, and form, e.g., debris, liquid) produced by the RD&D project? For example, Appendix FF, Sections 4 and 5, estimate the secondary liquid waste alone produced from processing a total of 50 containers at approximately 2.6M gallons. Do existing Hanford site treatment facilities such as ETF have the excess capacity to manage this additional volume of waste? What is the projected composition of the secondary liquid wastes? The flow diagram shows the scrubber solution downstream of the sintered metal filter being sent to the ETF. This scrubber should adsorb large quantities of nitrates. Can the ETF handle such large quantities of nitrates?

**ECOLOGY RESPONSE:** Ecology provides the following clarification on the commenter's analysis of secondary wastes quantities as discussed below.

The Permittee provided in the Permit Application the secondary waste generation amounts and frequencies for the mixer/dryer condenser, the mist eliminator drainage, and the scrubber system blow down or bleed in Permit Attachment AA (Section 2.6, line numbers 9-14) The wash down water frequency would occur on an irregular basis and would be minimal. The boiler blow down is estimated to be 3 gpm during the mixer dryer operation that could occur for 8 hours for each mixer/dryer batch.

The estimated amounts of secondary liquid waste per container listed in the Permit Application are:

- Dryer Condensate 12,900 gallons
- Quench Blowdown 24,100 gallons
- Trimer Scrubber Blowdown 51,500 gallons (only if in operation)

These wastes will be properly designated and disposed of in accordance with the *Hanford Site Solid Waste Acceptance Criteria* (HNF-EP-0063). Ecology provided a permit condition that will require that these amounts be determined as part of the RD&D operations in order to calculate a mass balance.

Section 2.6 of Permit Attachment AA of the Draft RD&D Permit describes the types and estimated amounts of secondary liquid waste. As detailed in the Permit Application, the Tri-Mer Scrubber is only planned to be used as a backup in the off gas treatment system for emergency shutdown of the DBVS Facility. However, if the Tri-Mer is in operation during the total time it takes to vitrify a container, the total estimated secondary waste produced from vitrifying one container is 88,500 gallons. The current planned operation of the DBVS Facility as detailed in the Permit Application will produce 37,000 gallons of secondary waste for each container of vitrified waste when using the Selective Catalytic Reduction (SCR) in the offgas treatment system and not the Tri-Mer. In accordance with Hanford Liquid Waste Acceptance Criteria (HNF-EP-0063, Rev. 9), ETF facility personnel have performed a treatability analysis of the secondary waste and have confirmed that this waste stream and the DBVS Facility projected waste stream volumes can be treated in the ETF through the life of the RD&D Permit.

**COMMENT 3:** There are significant informational gaps in the Application which results in the need for compliance schedules in the Permit. The lack of specifics such as waste feed concentrations, automatic waste feed cut-off set points, and clearly defined sampling plans indicates the technology may not be sufficiently developed to allow permit issuance. Without a complete application package, how can the project's impacts be completely and fairly evaluated?

**ECOLOGY RESPONSE:** Ecology disagrees in part as discussed below.

Ecology is in agreement with the commenter that the level of detail provided in the RD&D Permit Application would not be sufficient to support the issuance of a long-term treatment permit or a full-scale facility. However, Ecology has determined that the level of detail provided in the Permit Application combined with the additional information required by the compliance schedules is adequate to authorize RD&D testing activities consistent with the flexibility allowed under WAC 173-303-809.

Automatic waste feed cut-off set points are addressed in the following permit conditions:

Permit Condition V.I.4.k. Ecology has required that the Permittees' submit for Ecology review and approval information concerning emergency parameter limit values and responses to these limit values which may include automatic waste feed cut-off as all or part of the response to reaching these limit values. In addition, Permit Condition V.I.4.j requires that the Permittees'

submit for Ecology review and approval detailed procedures for controlling and minimizing emissions in the event of an equipment malfunction.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3, V.6, and V.8 are to be completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS Facility offgas systems to recover emissions from the areas, systems or units, loss of DBVS Facility subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS Facility. Appendix E shall include a narrative description and information to support the parameters and limit values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

Waste feed concentrations and sampling plans are addressed in the following permit conditions:

**Permit Condition II.B.7. COMPLIANCE SCHEDULES.**

The following amendments to Permit Attachment BB are hereby made. The Permittee shall submit the revised pages reflecting these amendments to Ecology prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility. These amendments do not constitute a permit modification pursuant to Permit Conditions I.C.2 and I.C.3.

Ecology has modified the Permittees' Waste Analysis Plan to clarify requirements for constituents to be analyzed for in the wastes and the secondary waste and to clarify the frequency that this analysis will be performed. The Permittees' are required to resubmit for approval the Waste Analysis Plan modified to reflect Ecology's clarifications.

Permit Condition II.B.8. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, Permittees shall submit and receive written approval from Ecology for the following revisions of Permit Attachment BB. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. Ecology has required the Permittees' to submit for Ecology review and approval further details on sampling and analysis and quality assurance and quality control procedures, limitation on the ICV<sup>®</sup> packages and documentation that the waste are not ignitable or reactive.

Permit Condition V.I.6.b. Sampling, analysis, and QA/QC procedures/methods for any constituents/samples necessary to implement the DBVS Campaign Plan that were not addressed in Permit Attachment BB, as revised pursuant to Permit Conditions II.B.7 and II.B.8.

**COMMENT 4:** What are the risks to the environment, workers, and the public from the DBVS RD&D project? For example, what is the plan for disposal of a full scale waste container that does not meet the long term disposal, (10,000 years) requirements of the Hanford site for this type of waste?

**ECOLOGY RESPONSE:** Ecology provides additional information as discussed below.

Ecology believes the risks from the DBVS Facility will be minimal due to the limited inventories of hazardous and radioactive constituents associated with the RD&D operations.

The treatment objectives are designed to ensure that waste acceptance criteria for the proposed 50 ICV<sup>®</sup> containers meet the permitted final disposal site. In the unlikely event than an out of specification ICV<sup>®</sup> container is produced, the limited inventory of dangerous mixed waste being processed will not result in, or cause adverse environmental impacts from the disposal facility. The RD&D Permit requires in Permit Condition V.I.10.c that the “ICV<sup>®</sup> Package detailed final limitations for size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, disposal facility, and testing/acceptance requirements”, be provided to Ecology for review and approval prior to acceptance of waste feed into the DBVS Facility.

### **SPECIFIC COMMENTS**

**COMMENT 1: II.A.1.A.** Tank 241-S-109 that does not exceed the criteria listed in Permit Attachment BB, as specified in the Ecology approved campaign plan, and as specified on Permit Tables V.7 and V.8.

Permit Tables V.7 and V.8 do not contain values from which an evaluation of the effectiveness of the system may be assessed. When the information is submitted to Ecology for approval, will these and other required permit submittals be made available for public comment prior to incorporation?

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that these tables in the Draft Permit and Permit Attachment LL need to be completed. The permit conditions listed below identify the requirement to submit this information for Ecology review and approval prior to accepting dangerous or mixed waste into the facility.

Permit Condition V.I.4.b. Detailed Description of an Emergency Parameter Control/Response System addressing operating parameters specified in Permit Tables V.7 and V.8, as approved pursuant to Permit Conditions V.I.4.k and V.I.6.c.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3, V.6 and V.8, completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS Facility offgas systems to recover emissions from the areas, systems or units, loss of DBVS Facility subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS Facility. Appendix E shall include a narrative description and information to support the parameters and limits values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

Permit Condition V.I.5.a. Permit Tables V.3 and V.6 shall be completed for DBVS leak detection system instruments and parameters, to provide the information as specified in each

column heading.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the

list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

**COMMENT 2 : II.A.4.** Air pollution control devices and capture systems in the DBVS Facility shall be maintained and operated so as to minimize the emissions of air contaminants and to minimize process upsets. Procedures for ensuring that the above equipment is properly operated and maintained, so as to minimize the emission of air contaminants and process upsets, shall be established and followed in accordance with the Ecology approved DBVS Campaign Plan.

What is the definition of..."minimize the emission of air contaminants and process upsets."? Don't you mean "... to minimize the emission of air contaminants and minimize *adverse environmental effects* of process upsets."

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter, This condition is intended to be broad and encompassing in scope with respect to operations and maintenance of air pollution control devices in contrast to the more explicit requirements of for example, permit condition V.C.1.a which requires the operation of systems and process parameters within specified set points. Broadly speaking, an upset would be operation outside of the projected range and not be limited to an upset which has been determined to result in increased emissions with an adverse environmental effect.

**COMMENT 3:** Appendix B Section 6.4 Offgas Treatment System – The main offgas treatment system exhaust will be monitored continuously for radionuclides contributing greater than 0.1 mrem/year using a record sample collection system. The offgas treatment system will also be continuously monitored for criteria pollutants (i.e., particulate matter, CO, NO<sub>x</sub>, SO<sub>x</sub>).

What other criteria pollutants will be continuously monitored? What is the limit for radionuclides contributing greater than 0.1 mrem/year? The flow diagram does not show a thermal oxidizer. How will VOCs and CO be oxidized to meet MACT compliance limits if there is no oxidizer?

**ECOLOGY RESPONSE:** Ecology provides the clarification as discussed below.

Criteria Pollutants are regulated under Washington Administrative Code 173-400, -401 and -460, air regulations and not Chapter 173-303-WAC, Dangerous Waste Regulations. Ecology has received a toxics air Notice of Construction Application, and issued a Draft Approval Order and Conditions to regulate these constituents; a 30-day public comment period for the Draft Notice of Construction was held from September 29, 2004, to October 28, 2004.

Radioactive emissions are regulated by the Washington State Department of Health under Washington Administrative Code 246-247. The Department of Health issued on September 23, 2004, a Notice of Construction Approval order which regulates the radioactive emissions for the DBVS Facility.

**COMMENT 4a : IIA.5.** The Permittees shall ensure that for all dangerous and/or mixed waste areas, systems, and units contained in the DBVS Facility that the DBVS Facility offgas treatment systems shall be in operation prior to waste being introduced into these dangerous and/or mixed waste areas, systems, and units contained in the DBVS Facility. At any time the offgas treatment system ceases to operate or produces insufficient vacuum to recover emissions from the areas, systems, or units, the Permittees shall not commence any new treatment activities within the dangerous and/or mixed waste areas, systems, or units contained in the DBVS Facility and take measures to minimized evolution of emissions from on-going treatment, and shall not receive new dangerous and/or mixed waste shipments into the DBVS Facility. The Permittees shall not re-commence new treatment activities until the DBVS Facility offgas treatment system are operational and producing sufficient vacuum to recover emissions.

This permit condition would allow ongoing treatment operations to continue in the event of an offgas treatment system failure. If the offgas treatment system fails during operations, shouldn't the treatment operation cease until the off gas treatment system is fully operational?

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology disagrees with the interpretation of the Draft Permit Condition IIA.5. The permit requires that, upon offgas treatment system failure, no new treatment activities shall be initiated. This prevents new feed into the melter.

Permit Condition IIA.5 also requires, "...and takes measures to minimize evolution of emissions from on-going treatment, and shall not receive new dangerous and/or mixed waste shipments into the DBVS Facility."

The RD&D Permit Application was deficient in specifying the specific actions which would be taken if the offgas treatment system failed to minimize the impacts of this event (e.g., releases of constituents, etc.). Ecology included compliance schedules under the following permit conditions in the RD&D Permit to require that the Permittees specifically identify measures it will implement to respond to this event and submit this information for Ecology review and approval. These measures may include shutdown of treatment systems as all or part of the response.

Permit Condition II.C.6. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for incorporation in Permit Attachment FF, of the following, with the exception of II.C.6.a.viii.A (listed below) which will be incorporated into the Permit Administrative Record. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.

Permit Condition II.C.6.a.iv. Mitigate effects of equipment failure and power outages.

Permit Condition II.C.6.a.vi. Prevent releases to the atmosphere.

Permit Condition II.C.6.a.vii. Test and maintain equipment to assure proper operation in the event of an emergency pursuant to WAC 173-303-340(1).

Permit Condition II.C.6.a.viii. A description of precautions to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes as required to demonstrate compliance with WAC 173-303-395, including documentation demonstrating compliance with WAC 173-303-395 (1)(c), to include at a minimum the following:

A. USDOE "Final Hazard Analysis (FHA) for Demonstration Bulk Vitrification System (DBVS)". If the FHA is not completed prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility the Preliminary Hazard Analysis (PHA) shall be submitted and the FHA shall be submitted to replace it when its is completed.

Permit Condition V.I.4. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive Ecology approval of the following, as specified below, for incorporation into Permit Attachment LL. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. All information provided under this permit condition must be consistent with information provided pursuant to Permit Conditions V.I.2 and V.I.3, as approved by Ecology:

Permit Condition V.I.4.j. Detailed description of procedures for startup and shutdown of waste feed and controlling and minimizing emissions in the event of an equipment malfunction including off-normal and emergency shutdown procedures, procedures for switching to back-up systems and tie into Permit Tables V.7 and V.8 and Appendix E of Permit Attachment LL.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3, V.6, and V.8 completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS. Appendix E shall include a narrative description and information to support the parameters and limit values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

Also, as specifically reflected in Permit Condition II.A.4, "Air pollution control devices and capture systems in the DBVS Facility shall be maintained and operated so as to minimize the emissions of air contaminants and to minimize process upsets. Procedures for ensuring that the

above equipment is properly operated and maintained, so as to minimize the emission of air contaminants and process upsets, shall be established and followed in accordance with the Ecology approved DBVS Campaign Plan". Permit Condition VI.6.c requires that the DBVS Campaign Plans include a narrative description and information to support any updated Emergency Parameters and Limit values (Emergency Parameters and Limit Values originally required under Permit Condition V.I.4.k.).

Ecology believes that the commenter's concerns have been addressed.

**COMMENT 4b:** If the offgas system were to fail during operation, how quickly could the system be brought to a safe shutdown condition?

**ECOLOGY RESPONSE:** Ecology provides the additional information as discussed below.

It could take up to eight hours to bring the system to a safe shutdown condition depending on the time in the cycle where the upset condition occurs. If the offgas system fails near the end of the 139 hour melt cycle, the unreacted feed in the melter may continue to generate offgases because there will be sufficient residual heat in the molten vitrified product to cause the reaction even without power applied to the melter. The maximum unreacted feed at any one time in the melter is one dry waste silo full (1/3 dryer batch). In actual operations, this will be lower because waste feed to the melter will be metered in, not batched in, which means less unreacted waste.

Ecology included compliance schedules under the following permit conditions in the RD&D Permit to fully identify specific actions that should be taken if the offgas treatment system failed to minimize the impacts of this event (e.g., releases of constituents, etc.). It is required that the Permittees provide this information for Ecology review and approval.

Permit Conditions V.I.4.j. Detailed description of procedures for startup and shutdown of waste feed and controlling and minimizing emissions in the event of an equipment malfunction including off-normal and emergency shutdown procedures, procedures for switching to backup systems and tie into Permit Tables V.7 and V.8 and Appendix E of Permit Attachment LL.

Permit Condition II.C.6. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for incorporation in Permit Attachment FF, of the following, with the exception of II.C.6.a.viii.A, which will be incorporated into the Permit Administrative Record. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.

Permit Condition II.C.6.a.iv. Mitigate effects of equipment failure and power outages.

Permit Condition II.C.6.a.vi. Prevent releases to the atmosphere.

Permit Condition II.C.6.a.vii. Test and maintain equipment to assure proper operation in the event of an emergency pursuant to WAC 173-303-340(1)."

**COMMENT 4c:** What emissions might occur during the shutdown transient? How robust is the offgas system to prevent environmental releases from unplanned shutdowns or upsets?

**ECOLOGY RESPONSE:** Ecology provides the additional information as discussed below.

During the shut down transient, the gases are expected to include the same types of emissions (i.e., organics, metals, particulate matter, halogens) as produced during normal operations at varying concentration levels dependant at what stage in the melting cycle the shutdown transient occurred.

The RD&D Permit requires that the Permittees' provide documentation of projected compliance with the performance standards for emissions (i.e., organics, metals, particulate matter, halogens) for each campaign plan based on the following conservative assumptions for the efficiencies of operation:

Third paragraph of Permit Condition V.I.6.e. Fifty percent (50%) of the metals specified in Table V.7, as fed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System are retained in the ICV<sup>®</sup> Melt and the remainder of the metals enter the main offgas treatment system (as specified on Permit Tables V.1 and V.4 and Permit Attachment LL), with the exception of mercury which would be assumed to enter the main offgas treatment system (as specified on Permit Tables V.1 and V.4 and Permit Attachment LL) at one hundred percent (100%) of the concentration as fed to the DBVS Dryer from the DBVS Waste and Stimulant Staging Tank Feed System.

Zero percent (0%) of the organics as fed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System are retained in the ICV<sup>®</sup> Melt. One hundred percent (100%) of the volatile organics, and fifty percent (50%) of the semi-volatile organics as fed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System enter the Dryer Offgas Treatment System, which includes the Main Offgas Treatment System subsystems downstream of mist eliminator #3 (36-N24-041). Fifty percent (50%) of the semi-volatile organics and one hundred percent (100%) of nonvolatile organics as feed to the DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System enter the Main Offgas Treatment System (as specified on Permit Tables V.1 and V.4 and Permit Attachment LL).

Zero percent (0%) of the constituents that contribute to the formation of HCL NO<sub>x</sub>, and SO<sub>x</sub> as fed to DBVS Waste Dryer from the DBVS Waste and Simulant Staging Tank Feed System are available to form HCL, NO<sub>x</sub>, and SO<sub>x</sub> in ICV<sup>®</sup> melt or in Main Offgas Treatment System (as specified on Permit Tables V.1 and V.4 and Permit Attachment LL).

*Dryer Offgas Treatment System and the Main Offgas Treatment System operation at or below lower bounds of expected efficiencies, as specified on Permit Tables V.1 and V.4 and Permit Attachment LL."*

Ecology has also included other requirements in the RD&D to limit the emission of organics including requiring continuous emission monitoring for measuring organic breakthrough of the DBVS Facility carbon filter (Permit Condition V.E.), tracking organics into the DBVS Facility and change-out of carbon filter so as not to exceed fifty percent (50%) of the organic design

capacity of the carbon filter (Permit Conditions V.C.1.h and V.C.1.i), monitoring carbon monoxide as an indicator of the organics in the DBVS Facility emissions (V.E.), and requiring as specified above in Permit Condition V.I.6.e, that the Permittees take no credit for retention of organics in the melt in determining projected compliance with performance standards (Permit Condition V.I.6.e). Other continuous monitoring required under the RD&D Permit includes NO<sub>x</sub>, SO<sub>x</sub>, and particulate matter. The RD&D Permit also requires the Permittee to perform emission testing to document the capability of the treatment system to meet the performance standards specified in Permit Condition V.I.6.f.

These requirements (performance standards, treatment efficiency, emission testing and monitoring) are conservative and appropriately specific, consistent with the RD&D nature of the activities covered under this Permit. It is expected that the testing and monitoring under the RD&D Permit will provide information to support the development of projections for emissions during normal and off-normal operations to support a Permit Application for a long-term treatment permit, if the RD&D activities are determined to be successful.

**COMMENT 4d:** Can the offgas system handle potentially flammable or explosive gases in such a shutdown condition where gases are still being produced but the offgas system is not functional? What levels of flammable or explosive gases are generated in this situation? How are such flammable and explosive conditions prevented or contained, i.e. is equipment all explosion proof?

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Ecology included compliance schedules under the following permit conditions in the RD&D Permit to require that the Permittees specifically identify procedures and design features that have been incorporated for the treatment system to prevent the formation of explosive gases and submit this information for Ecology review and approval.

Permit Condition II.C.6. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for incorporation in Permit Attachment FF, of the following, with the exception of II.C.6.a.viii.A, which will be incorporated into the Permit Administrative Record. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3.

Permit Condition II.C.6.a.iv. Mitigate effects of equipment failure and power outages.

Permit Condition II.C.6.a.vi. Prevent releases to the atmosphere.

Permit Condition II.C.6.a.viii. A description of precautions to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes as required to demonstrate compliance with WAC 173-303-395, including documentation demonstrating compliance with WAC 173-303-395(1)(c), to include, at a minimum, the following:

USDOE "Final Hazard Analysis (FHA) for Demonstrating Bulk Vitrification System (DBVS)."  
If the FHA is not completed prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility the Preliminary Hazard Analysis (PHA) shall be submitted and the FHA shall be

submitted to replace it when it is completed. Operating Procedures and/or waste feed limitations that will be followed and incorporated into Permit Attachment BB and/or Permit Attachment FF (Preparedness and Prevention) to assure flammable/toxic gases will not accumulate in any of the DBVS Facility storage or treatment units/systems at hydrogen gas levels above the lower explosive limits.

Operating parameters to be monitored/controlled and limitations for these parameters addressing each DBVS Facility storage and treatment unit for waste compatibility, safe operation, and compatibility with unit materials of construction. Amend Permit Attachment BB to include these parameters and monitoring frequency.

Permit Condition V.I.3. For subsystems that are not marked with an asterisk on Permit Tables V.1 and V.4, shall provide design information including: design drawings (General Arrangement Drawings in plan and cross section, references to codes and standards, updated Appendix B of Permit Attachment LL process flow diagrams, piping and instrumentation diagrams [including pressure control systems and mass and energy balances]), projected performance documentation, instrumentation/control loops for each subsystem, materials of construction, analysis/design methodology, fan curves for exhaust fan 1 (36-N31-025) and exhaust fan 2 (36-N31-026), physical and chemical tolerances of equipment, carbon filter organic (volatile, semi-volatile and non-volatile) design capacity and typical design details to support the subsystems and projected operational capability [WAC 173-303-640(3)(a), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(i)(B)]:

Permit Condition V.I.3.e. Subsystem design to prevent escape of vapors and emissions of acutely or chronically toxic (upon inhalation) extremely hazardous waste (EHW) and to prevent the build-up of explosive gases/vapors [WAC 173-303-640(5)(e), in accordance with WAC 173-303-680(2) and WAC 173-303-806(4)(i)(i)(B)].

Ecology believes that this addresses the commenter's concerns.

**COMMENT 5 : II.B.1.** The Permittees shall maintain adequate knowledge of any waste to be managed properly by the DBVS Facility before acceptance, after receipt, and during treatment and storage of these wastes. The Permittees will ensure this knowledge through compliance with the requirements of WAC 173-303-3000 and with the provisions of the Waste Analysis Plan (WAP), Permit Attachment BB, [WAC 173-303-806(4)(a)(iii) and WAC 173-303-300(1)].

Permit Condition II.B.8.d. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit to Ecology for approval, and strictly for this RD&D Permit, documentation, not based solely on process knowledge that shows the removal of the characteristic codes D001 and D003 from S-109 tank waste.

Appendix B, Table 6-1. Dangerous Waste Designation and Sampling/Analysis Strategy lists constituents in the feed and process which may be sampled and analyzed. The table indicates a check mark for a number of constituents yet there is no foot note to indicate the meaning of the mark. At what frequency will these constituents be sampled and analyzed? What corrective action will be taken should the waste feed designate for characteristic codes D001 and D003?

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

There is not an Appendix BB in the Draft Permit. However, there is a Table 6.1 in Permit Attachment BB. This response is based on this change.

The “√” indicates that the waste code listed for the waste feed and the vitrified waste in Phase 1 will be analyzed as specified in Table 6-1. Permit Condition II.B.7.c will be amended to more clearly reflect this as follows:

II.B.7.c. Section 6.2, page 6-2, Table 6-1, is revised to include under Phase 1 Header “6” as a superscript and as foot note “6” as follows: “The checkmark indicates that the waste code listed for the waste feed and the vitrified waste in Phase 1 will be sampled/analyzed as specified in Table 6-1.

The frequency of sampling and analysis for both Phase 1 and Phase 2 will be detailed in each campaign plan as required in the following permit conditions:

Permit Condition V.I.6. Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive approval from Ecology for the Phase 1 DBVS Campaign Plan. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 1 DBVS Campaign Plan shall include the information specified in Sections 5 and Appendix A of Permit Attachment LL in addition to the following:

Permit Condition V.I.6.a. Updated Demonstration Test Matrix, as appropriate to the DBVS Campaign and identification of the portions of the information expected to be collected during this campaign and to be included in this DBVS Campaign Summary Report, that are critical to development of subsequent DBVS Campaign Plan(s), including clearly identifying which DBVS Campaign Plan(s) the information is projected to be critical to.

Permit Condition V.I.7. Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign, Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 2 DBVS Campaign Plan shall include the information specified in Permit Condition V.I.6. In addition, the Phase 2 DBVS Campaign Plans designed to provide “Feed Envelope Verification and/or Process Improvement”, shall include the following:

Permit Condition V.I.7.b. Detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, planned analytical procedures for sample analysis and a short summary narrative description of each stack sample method with identification of the performance standard(s) identified in Permit Condition V.I.6.f that the method will be used to demonstrate the performance of the DBVS.

Permit Condition II.B.8.d. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the permittee shall submit to Ecology for approval and strictly for this RD&D Permit, documentation, not based solely on process knowledge that shows the removal of the characteristic codes D001 and D003 from Tank 241-S-109 tank waste.

**COMMENT 6a:** Appendix B Section 6.2.5.1 Treated Waste Sampling and LDR Compliance. The final vitrified waste will be sampled to provide data for waste form qualification, risk assessment, performance assessment, and regulatory compliance. The vitrified waste will be tested for waste constituents on the SST Part A, which are LDR restricted for disposal in WAC 173-303-140 and 40 CFR 268.40. The constituents analyzed for are based on documented process knowledge, analysis of the waste feed, and are reasonably expected to be present in the final waste form. A composite vitrified waste core sample will be analyzed for the dangerous waste constituents that were detected in the tank waste feed to determine compliance with LDR requirements. The frequency of sampling the treated waste will be once per vitrified container of waste for an initial 10 sample set, after which random sampling will take place, as agreed to in the final test matrix. Table 6-7 lists some of the physical properties that the treated waste will be analyzed for in order to determine waste form qualifications. Will the composite vitrified waste core samples be timed to coincide with the waste feed samples to support a mass and energy balance and determine the treatment efficiency?

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Sampling processes and protocol for the bulk vitrification process will allow a direct correlation between the feed materials and the final waste form. The eight batches of dry feed material required to produce a single bulk vitrification box are from the same waste feed tank so all dried materials will have the same composition. There is also significant mixing of the feed materials during melting so the glass in a given box is expected to be homogenous. The energy used during the melting of a single box and the waste feed information from the initial waste feed tank can be directly correlated to the core sample taken from a bulk vitrification box to complete a mass and energy balance.

In addition, Ecology is modifying and adding permit conditions concerning LDR compliance associated with the RD&D disposal requirements.

- II.B.7.z. Section 6.2.3.2, Table 6-3, add D004 through D011 constituents to table and add HLVT LDR treatment standard for D004 and D011.
- II.L.2. The Permittees' must meet LDR standards for disposal of final waste forms for waste codes on the SST Part A Form 3 as listed in Permit Attachment BB, Table 6-1. All waste forms subject to LDR standards must be demonstrated to meet all applicable treatment standards and requirements (WAC 173-303-140/40 CFR Part 268). For waste that has dangerous/hazardous constituents shall be analyze in accordance with this Permit and WAC 173-303-140/40 CFR 268. For waste that has treatment standards that are not concentration based, the generator and/or treatment facility must demonstrate that the waste meets the applicable treatment standards using process knowledge and/or by waste analysis, as required by this Permit and the applicable sections of WAC 173-303-140/40 CFR 268.
- V.I.6.b. Sampling, analysis, and QA/QC procedures/methods for any constituents/samples necessary to implement the DBVS Campaign Plan that were not addressed in Permit Attachment BB, as revised pursuant to Permit Conditions II.B.7 and

II.B.8. These sampling, analysis, and QA/QC procedures/methods must explicitly address data needed to demonstrate LDR compliance for constituents in Tables 6-1 and 6-3 of Permit Attachment BB.

**COMMENT 6b:** Why does Table 6-7 list some of the physical properties that the treated waste will be analyzed for to determine waste form qualifications? What other tests will be performed to determine waste form qualifications and will those tests methods be included as requirements in future modifications to this Permit?

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Table 6-7 only listed potential examples of additional tests that might be conducted on the final waste form if they cannot be verified on laboratory simulant glass, and was never intended to be an all encompassing list. The treated waste sampling for each box will be determined and documented in the Ecology approved waste form qualification plan and Demonstration Bulk Vitrification System Campaign Plans which will not require permit modifications as defined in WAC 173-303-830(4).

However, Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this Permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

**COMMENT 6c:** A composite sample will not result in the detection of more volatile constituents which may have migrated to the outer edges of the melt. Constituents such as technicium-99 existing in sufficient concentrations as to present a potential leachability concern may go undetected. Discrete sampling of the melt and refractory liner would ensure the effectiveness of the treatment process and provide data useful in subsequent evaluations. Past test results for this process showed significant migration of some radionuclides into the refractory and into a foam layer on top of the melt. How will a composite sample accurately reflect the real risk of the accumulation of leach prone radionuclides in these known problem areas? How will the refractory/melt boundary and inner areas in the refractory be accurately sampled? How will the location of the core sample be chosen, (e.g., will the sample location be selected such that tests can confirm that potential radionuclide migration does not adversely affect the waste form long term disposal performance)?

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The composite core sample discussed in the Permit Application will include portions of the refractory to capture the more volatile constituents that could migrate to the outer edges of the melt. Treating this sample as a composite will allow a compliance determination for all LDR constituents.

The potential for migration of constituents of concern (e.g., technetium-99) into other areas of the bulk vitrification container is one of the primary reasons for conducting the Demonstration Bulk Vitrification System operations under an RD&D Permit. This was recognized as a main objective and developmental work began immediately to explore methods to reduce the amount of residual soluble Tc-99 that may potentially migrate to the bulk vitrification container. Process changes as described in the RD&D Permit Application have eliminated the foam layer at the top of the melt, and effective methods have been developed to determine the amount of soluble material in the refractory. The following permit conditions have been established in the Draft RD&D Permit to develop this information, and require Ecology approval prior to initial receipt of waste.

Permit Condition III.G.4.b. Descriptions of procedures for precluding release of contents of ICV<sup>®</sup>-Package to the environment during the ICV<sup>®</sup> Package disconnect and sampling the ICV<sup>®</sup>-Package including but not limited to the following:

Permit Condition III.G.4.b.i. Sealing the sampling port.

Permit Condition III.G.4.b.ii. Coring process.

In addition, Ecology is adding new permit conditions as follows:

- V.I.7. Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign, Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 2 DBVS Campaign Plans shall include the information specified in Permit Condition V.I.6. In addition, the Phase 2 DBVS Campaign Plans shall be designed to collect the information specified in Permit Conditions V.I.7.c through V.I.7.e below, and the Phase 2 DBVS Campaign Plans designed to provide "Feed Envelope Verification and/or Process Improvement," shall also include the information specified in Permit Conditions V.I.7.a and V.I.7.b, below:
- V.I.7.a. Emission testing for demonstrating performance standards listed in Permit Condition V.I.6.f.
- V.I.7.b Detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, planned analytical procedures for sample analysis and a short summary narrative description of each stack sample method with identification of

the performance standard(s) identified in Permit Condition V.I.6.f that the method will be used to demonstrate the performance of the DBVS.

- V.I.7.c. One or more test campaigns shall be conducted to generate mass balance information sufficient to address the fate/concentration of potential constituents of concern, such as Iodine-129 and Technetium-99, within the ICV<sup>®</sup> Package and its various components, the offgas systems, offgas systems' secondary liquid waste, solid and secondary semi-solid waste.
- V.I.7.d. One or more test campaigns shall be conducted to generate information to assess the potential for waste minimization as it relates to secondary liquid waste.
- V.I.7.e. One or more test campaigns shall be conducted to generate information to assess how potential future recycle waste from the WTP could be incorporated into a Bulk Vitrification full-scale production facility waste stream, should Ecology make the decision to permit a full-scale production facility, and the impacts related to including these recycles into the DBVS Facility waste stream. These test campaigns would be specifically designed to observe, record and analyze impacts related to waste loading and potential constituents of concern, such as sulfate, sodium, metals, iodine, and technetium.

**COMMENT 7a:** Appendix B, Table 6-7. Physical Properties Sampling and Analysis<sup>1</sup> Property Requirement Citation, footnote: <sup>1</sup>Not all tests will be performed on all treated waste results from stimulant tests may be used where applicable.

Why will all tests not be performed on all wastes? Simulant testing provides valuable data from which to evaluate whether or not to proceed to actual waste treatment operations. It does not provide proof of treatment on actual waste, nor would simulant data support a mass and energy balance.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The RD&D Permit does not require that all tests be performed on all wastes. All the major chemical components of the tank waste are readily simulated, and will provide a complete energy balance. Extensive Waste Treatment Plant and bulk vitrification laboratory tests have shown that glasses made with simulants are representative of glasses made with actual waste, as long as the chemical composition of the glasses are the same. Thus, confirmation of the chemical composition of the bulk vitrification glasses produced in Demonstration Bulk Vitrification System is required, but only limited glass performance testing is necessary once the composition has been established. Laboratory-scale and engineering-scale tests have provided sufficient information to justify a proposal to conduct a pilot full-scale RD&D activity.

**COMMENT 7b:** There has been no data made public to show how Tc might behave in a full-size bulk vitrification system and especially in how it might accumulate in the foam layer on top of the glass. Also, no data has been made public on how Tc and other radioactive materials of concern might migrate into the refractory liner. There is no full-scale data to show how this

critical performance measure will actually behave in the full-scale system. In fact, according to newspaper accounts, there is concern on the part of the technical people working on this project that a glaze may be required to prevent migration of radioactive material in to the refractory material of the vitrification container. The refractory layer (sides and bottom) surely must be sampled to develop process knowledge during this demo program. Otherwise there will be no data on Tc and other radionuclide migration into materials of concern in a production bulk vitrification system.

**ECOLOGY RESPONSE:** Ecology provides the following for information and clarification.

The evaluation of the fate and behavior of constituents of concern (e.g., Tc-99) is one of the primary purposes for permitting this RD&D to use actual tank waste and to operate the DBVS Facility using a full-sized container. The operation of the DBVS Facility will provide the information necessary to verify the extent of immobilization for the constituents of concern in the glass, refractory, and other components of the ICV<sup>®</sup> Containers. As required in Permit Condition II.B.7.e: the level of testing for each box will be defined in campaign plans, as information becomes available. The composite core sample discussed in the Draft Permit will include portions of the refractory to capture the more volatile constituents that could migrate to the outer edges of the melt. Treating this sample as a composite will allow a compliance determination for all LDR constituents.

The potential migration of constituents of concern (e.g., Tc-99) into other areas of the bulk vitrification disposal box is one of the primary reasons for conducting the Demonstration Bulk Vitrification System. This was recognized as a main objective and developmental work started immediately to explore methods to reduce the amount of soluble Tc-99 that remains in the bulk vitrification disposal container. Process changes as described in the RD&D Permit Application (Section 4.2.10 of Permit Attachment FF) have eliminated the foam layer at the top of the melt and effective methods have been developed to determine the amount of soluble material in the refractory. The following permit conditions require Ecology approval prior to initial receipt of waste:

Permit Condition III.G.4.b. Descriptions of procedures for precluding release of contents of ICV<sup>®</sup> Package to the environment during the ICV<sup>®</sup> Package disconnect and sampling the ICV<sup>®</sup> Package including but not limited to the following:

Permit Condition III.G.4.b.i. Sealing the sampling port.

Permit Condition III.G.4.b.ii. Coring process.

In addition, Ecology is adding new permit conditions as follows:

V.I.7. Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign, Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 2 DBVS Campaign Plans shall include the information specified in Permit Condition V.I.6. In addition, the Phase 2 DBVS Campaign Plans shall be designed to collect the

information specified in Permit Conditions V.I.7.c through V.I.7.e below, and the Phase 2 DBVS Campaign Plans designed to provide “Feed Envelope Verification and/or Process Improvement,” shall also include the information specified in Permit Conditions V.I.7.a and V.I.7.b, below:

- V.I.7.a. Emission testing for demonstrating performance standards listed in Permit Condition V.I.6.f.
- V.I.7.b Detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, planned analytical procedures for sample analysis and a short summary narrative description of each stack sample method with identification of the performance standard(s) identified in Permit Condition V.I.6.f that the method will be used to demonstrate the performance of the DBVS.
- V.I.7.c. One or more test campaigns shall be conducted to generate mass balance information sufficient to address the fate/concentration of potential constituents of concern, such as Iodine-129 and Technetium-99, within the ICV<sup>®</sup> Package and its various components, the offgas systems, offgas systems’ secondary liquid waste, solid and secondary semi-solid waste.
- V.I.7.d. One or more test campaigns shall be conducted to generate information to assess the potential for waste minimization as it relates to secondary liquid waste.
- V.I.7.e. One or more test campaigns shall be conducted to generate information to assess how potential future recycle waste from the WTP could be incorporated into a Bulk Vitrification full-scale production facility waste stream, should Ecology make the decision to permit a full-scale production facility, and the impacts related to including these recycles into the DBVS Facility waste stream. These test campaigns would be specifically designed to observe, record and analyze impacts related to waste loading and potential constituents of concern, such as sulfate, sodium, metals, iodine, and technetium.

**COMMENT 8 :** II.B.7.c. Section 6.2, page 6-2, Table 6-1, is revised to include under Phase 1, Vitrified Waste Header “4) as a superscript and as footnote” 4) as follows: “All constituents checked will be sampled/analyzed for each ICV<sup>®</sup> package generated during Phase 1.”

The table currently contains a “4” footnote. If this footnote is added only to the vitrified waste header, what frequency will all other checked items be sampled/analyzed?

**ECOLOGY RESPONSE:** Ecology agrees and provides clarification as discussed below.

Ecology will change the footnote number to “6” in Table 6-1.

Footnotes 1 and 2 of Table 6-1, checked items (✓), provide the frequency of items to be sampled/analyzed.

**COMMENT 9:** II.C.6 Compliance Schedules. Prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility, the Permittees shall submit and receive written approval from Ecology for incorporation in Permit Attachment FF, of the following, with the exception of II.C.6.a.viii.A, which will be incorporated into the Permit Administrative Record. II.C.6.a.viii. A description of precautions to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes as required to demonstrate compliance with WAC 173-303-395, including documentation demonstrating compliance with WAC 173-303-395(1)(c), to include, at a minimum, the following:

- A. USDOE “Final Hazard Analysis (FHA) for Demonstration Bulk Vitrification System (DBVS).” If the FHA is not completed prior to the initial receipt of dangerous and/or mixed waste in the DBVS Facility the PHA shall be submitted and the FHA shall be submitted to replace it when it is completed.

Will the USDOE “*Final Hazard Analysis (FHA) for Demonstration Bulk Vitrification System (DBVS)*” be submitted for Ecology approval? Will it be available for public comment if submitted to Ecology?

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The Final Hazard Analysis will be submitted to Ecology, and it will be incorporated into the RD&D Permit administrative record.

**COMMENT 10** – Isn’t WAC 173-303-692, air emission standards for tanks, surface impoundments, and containers applicable to the project? This requirement is negated by the allowed continued operation of the melter (to the continued offgassing of the melt) when the offgas system is inoperative (see concern discussed in [4] above).

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

WAC 173-303-692(b)(vi) states that the requirements of 40 CFR Part 264 Subpart CC do not apply to waste management units at a facility that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act. The Final Hazard Analysis for the Demonstration Bulk Vitrification Facility will be completed in early 2005.

**COMMENT 11 :** V.C.1.a. The Permittee shall operate the DBVS in order to maintain the systems and process parameters listed in Permit Tables V.3, V.6, V.7, and V.8, within the set-points specified in Permit Tables V.7 and V.8.

The tables are substantially reserved and therefore do not provide enough information to evaluate the system performance capability or the applicable permit conditions. Will the submittals required under permit condition V.B be available for public comment prior to incorporation into the permit?

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that these tables in the Draft Permit and Permit Attachment LL need to be completed. The permit conditions listed below identify the requirement to submit this information for Ecology review and approval prior to accepting dangerous or mixed waste into the facility.

Permit Condition V.I.4.b. Detailed Description of an Emergency Parameter Control/Response System addressing operating parameters specified in Permit Tables V.7 and V.8, as approved pursuant to Permit Conditions V.I.4.k and V.I.6.c.

Permit Condition V.I.4.k. Emergency Condition Parameter Limit Values as Appendix E of Permit Attachment LL and Permit Tables V.3, V.6 and V.8, completed to include this information. These emergency condition parameters should include parameters to warn of potential for fire, explosion, loss of sufficient vacuum in the DBVS offgas systems to recover emissions from the areas, systems or units, loss of DBVS subsystem vessel integrity, and off-normal operating conditions that could lead to potential for release from DBVS. Appendix E shall include a narrative description and information to support the parameters and limits values, parameter loop narratives, along with their process functions, the response required when they trip, and instrument fail safe condition.

V.I.5.a. Permit Tables V.3 and V.6 shall be completed for DBVS leak detection system instruments and parameters, to provide the information as specified in each column heading.

Ecology disagrees with the commenter's request for another public comment period. The regulations for permitting RD&D facilities allow Ecology some discretion when determining which permitting requirements governing dangerous waste treatment facilities should apply to RD&D facilities. However, the Permit must include such terms and conditions as will assure protection of human health and the environment.

Pursuant to WAC 173-303-809(2), Ecology has modified the Permit Application and issuance requirements in order to expedite review and issuance of the RD&D Permit. Nonetheless, the process for issuance of this Permit has included significant opportunities for public participation. Ecology published public notice of the publication of the Draft Permit on July 26, 2004, provided a 45-day comment period, and held a public meeting on August 31, 2004.

Ecology's RD&D Permit has authorized operation of the Bulk Vitrification Test and Demonstration Facility for a maximum of 400-operating days, which includes a 365-day initial operating period and a 35-operating day renewal. No other renewals of this permit are allowed. Limiting the duration of operations will help minimize any potential risk to human health and the environment, and will help ensure that use of the facility will be limited to the demonstration activities defined in the Permit.

In order to enable the demonstration activities authorized by this Permit to proceed in a timely manner, the Permit includes a schedule for the submission of specified information for Ecology approval prior to commencing certain construction activities, prior to receipt of dangerous or mixed wastes in the facility, and prior to closure. Such information, once approved, will be incorporated into the Permit.

The three-tiered permit modification process outlined in WAC 173-303-830(4) will be required for revisions to the Contingency Plan after the RD&D Permit is initially issued, and for updating the Closure Plan prior to conducting the actual closure of the facility. It will also be required for any significant change to the original RD&D permit terms.

The Permit specifies numerous anticipated updates, revisions and/or changes that will *not* be made via the three-tiered permit modification process (e.g., DBVS campaign specific plans, substitution of equivalent or superior equipment or procedures, equipment design and configuration updates, etc.). Instead the RD&D Permit will require that the Permittee submit this updated, revised and/or changed information for Ecology review and approval prior to its incorporation into the issued permit.

This process of incorporating specified information into the RD&D Permit will provide the flexibility needed for expedited review and permitting decisions throughout the short-term operation of the RD&D facility, while maintaining continuing regulatory review to assure protection of human health and the environment.

Ecology will continue to share information about the RD&D facility with the public by immediately posting on the NWP website documents that are not business sensitive, placing a hard copy in the administrative record, and notifying the Hanford-Info email distribution list of public contacts via email (600 public contacts are on the list). Individuals may sign up for the list at <http://listserv.wa.gov/cgi-bin/wa?SUBED1=hanford-info&A=1> or by calling the Hanford Information line at 800-321-2008. In addition, Ecology will provide the public a 30 day notice of its intent to approve the Permittee's commencement of Phase 1 DBVS operations and commencement of Phase 2 DBVS operations, which are two critical stages in the RD &D project. These approvals will be based on for Phase 1, the Permittee's submittal of all information required by the RD &D permit for initial receipt of dangerous and/or mixed waste in the DBVS and commencement of Phase 1 DBVS operations and for Phase 2, all information required by the RD &D permit for commencement of the first DBVS Campaign under Phase 2. This notice will be shared with the public as described above. Ecology will consider comments it receives regarding such updates, revisions and changes, and these approvals, but it does not intend to conduct a formal public comment period nor prepare a responsiveness summary. The purpose and function of the RD&D facility would be impaired if all such changes required formal comment periods. As noted, Ecology will process any significant changes to the original RD&D permit terms pursuant to the three-tiered permit modification process set forth in WAC 173-303-830(4). Questions or comments concerning any submittal should be directed to Kathy Conaway, 3100 Port of Benton Road, Richland, WA 99354; (509) 372-7890; [kcon461@ecy.wa.gov](mailto:kcon461@ecy.wa.gov).

**COMMENT 12 : V.1.6.f. Performance Standards (as referenced in Permit Condition V.I.6.e)**

Without values in table V.7, how were the performance standards contained in this permit condition set?

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Ecology has determined that it is appropriate to apply the hazardous waste combustion numerical emission standards for incinerators under 40 CFR Part 63 Subpart EEE to the DBVS as a thermal treatment system under the RD&D Permit.

The basis for this determination is that like an incinerator processing organics, metals, and halogens (i.e., chlorine, fluorine, etc.), DBVS will: (1) volatilize organics; (2) breakdown organics (i.e., destroy); (3) promote formation of products of incomplete destruction; (4) remove organics and metals and transfer to liquid, solid and/or gas media; and (5) collect and remove acid gases and particulate matter.

**COMMENT 13** – V.I.6.f.iv. Dioxin and Furan toxicity equivalence (TEQ) emissions from the DBVS offgas exhaust stack (36-N26-024) prior to release to the atmosphere not exceeding 0.2 nanograms (ng)/dscm [40 CFR 63.1203(b)(1), in accordance with WAC 173-303-680(2)].

What contaminant(s) in the waste feed stream prompt this performance standard? Does tank 241-S-109 contain Polychlorinated Biphenyl (PCBs), and if so, at a sufficient concentration to require Toxic Substances Control Act (TSCA) treatment standards?

**ECOLOGY RESPONSE:** Ecology provides additional information as discussed below.

Ecology has determined that it is appropriate to apply the hazardous waste combustion numerical emission standards for incinerators under 40 CFR Part 63 Subpart EEE, which includes this emission standard for dioxins and furans, to the DBVS as a thermal treatment system under the RD&D Permit.

The basis for this determination is that like an incinerator processing organics, metals, and halogens (i.e. chlorine, fluorine, etc.), DBVS will: (1) volatilize organics; (2) breakdown organics (i.e. destroy); (3) promote formation of products of incomplete destruction; (4) remove organics and metals and transfer to liquid, solid and/or gas media; and (5) collect and remove acid gases and particulate matter.

Tank 241-S-109 was placed into use in December 1952 and last received waste in September 1974, prior to the effective date of the TSCA regulations of 1978. Analytical results have been reported for samples taken from S-109 and indicate that PCB levels are well below the regulated level of 50 ppm.

**COMMENTER:**

Gerald Pollett, JD; Executive Director  
Heart of America Northwest  
1305 Fourth Ave. #208  
Seattle, WA 98101

**COMMENT 1:** Taken from the Overview section on page 1.

The commenter states, “The proposed Bulk Vitrification Test and Demonstration Facility is not eligible under federal and state hazardous waste laws for a research, development and

demonstration permit, as proposed. This extensive project –with a price tag of over \$100 million – is not eligible for a State Environmental Policy Act (SEPA) Determination of Non-Significance, nor does it qualify for an exclusion from the federal National Environmental Policy Act’s requirement that the project have an environmental impact statement.”

“The uncontrolled and inexplicable escalation of costs for this project warrant the strictest of scrutiny. The project will now cost so much as to be an irreversible commitment of resources – diverting resources from other necessary Hanford Clean-Up programs – triggering the requirement for an environmental impact statement under federal and state laws.”

“When first proposed, USDOE stated that this demonstration bulk vitrification facility would be a \$15 million test – including both capital and operation. The price tag has now grown to \$102 million. These are dollars that USDOE has had to divert from other important Hanford Clean-Up programs. \$102 million would pay for a year of soil cleanup in the River Corridor, would exhume large amounts of transuranic waste that USDOE says it can not afford to exhume, would pay for a licensed and safe storage facility for Remote Handled TRU, would pay for a legally compliant groundwater monitoring network at all burial grounds and tank farms .... \$100 million would have been more than adequate to pay for a third melter in the first phase Low Activity Waste Vitrification Plant, providing capacity to treat the same wastes with a proven technology and with a final waste form that USDOE says meets environmental protection criteria.”

“USDOE has improperly failed to inform Congress of either the price for this capital project or the massive escalation in cost. Despite the massive cost, USDOE failed to include any mention or line item for this facility in its Congressional Budget Request. Washington Ecology must not condone or be complicit in this fundamental failure to inform Congress, lest Congress respond by imposing restrictions on a wide range of Hanford Clean-Up projects or cutting the budget for tank waste retrieval and construction of the TPA required Waste Treatment Facility (Vitrification Plant).”

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

First, the DBVS Facility is eligible under state and federal laws for an RD&D Permit. The Washington State Hazardous Waste Management Act, Chapter 70.105 Revised Code of Washington (RCW) and the regulations promulgated there under in Chapter 173-303 of the WAC, regulate the management of dangerous waste in Washington. Ecology may issue an RD&D permit to any dangerous waste treatment facility that proposes to utilize an innovative and experimental dangerous waste treatment technology or process as specified in WAC 173-303-809. Any such permit will include such terms and conditions as will assure protection of human health and the environment.

The purpose of this RD&D Permit is to allow for the Test and Demonstration of the bulk vitrification facility. The Permit is temporary in duration and limits the quantities of dangerous and/or mixed waste to be treated. (Mixed waste is defined as a dangerous, extremely hazardous, or acutely hazardous waste that contains both radioactive and hazardous constituents). The Permit also includes stringent terms to protect public health and the environment. The general permit conditions under WAC 173-303-810, and final facility standards under WAC 173-303 as set forth in WAC 173-303-600, are incorporated as specified in this Permit and shall be adhered to by the Permittees.

The treatment process which would be developed under this Permit is a key element of the overall treatment system being developed to reduce the volume of mixed waste in the underground storage tanks at Hanford's tank farms. The safety and cleanup of these tanks has been a major public concern for some time.

Under this Permit, the Permittees will evaluate the ability of bulk vitrification to produce ILAW that is equivalent to the Hanford Site WTP immobilized low-activity waste form. The Permittees will be required to provide data for waste form qualifications, risk assessments, and performance assessments for treatment and near-surface land disposal of low-activity waste.

This RD&D project is a key step in the design of a full scale bulk vitrification facility in the 200 Area Waste Treatment Immobilization Plant. The permitted RD&D activity would take place at one location within the Hanford Facility. This RD&D project is identified as milestone M-45-00 and M-62-00 in the *Hanford Federal Facilities Agreement and Consent Order* (HFFACO).

Second, cost is not a criteria to determine if a project is eligible for a Research, Development & Demonstration Permit under WAC 173-303-809 or The Office of Solid Waste and Emergency Response (OSWER) Guidance Manual Research, Development and Demonstration Permits under 40 CFR Section 270.65 (OSWER Policy Directive #9527.00-1A). The OSWER Guidance Manual, Section 2 provides the following, "Criteria for Research, Development, and Demonstration Permits" states that "...Research, Development & Demonstration proposal will include a variety of demonstration and experimental activities such as small-scale original research, state-of-the-art technologies and processes, and modifications of existing technologies or processes, which may have been used for treating non-hazardous wastes or other hazardous wastes. Furthermore, the Agency recognizes that Research, Development & Demonstration facilities will involve testing of one or more technologies or processes at laboratory-scale, bench-scale, pilot-scale, and/or full-scale."

Third, USDOE has concluded that this RD&D Permit does qualify for National Environmental Policy Act (NEPA) exclusion and Ecology has determined that it is eligible for a SEPA determination of non-significance. USDOE regulations state that for a pilot-scale demonstration, the appropriate NEPA document is a Categorical Exclusion (CX). 10 CFR 1021, "National Environmental Policy Act (NEPA) Implementing Procedures," Subpart D, Appendix B (61 Federal Register 36222, July 9, 1996) provide the following Categorical Exclusions (CX) that was determined to apply to this project:

"B6.2 Siting, construction, and operation of temporary (generally less than two years) pilot-scale waste collection and treatment facilities, ..."; and "B1.15 Siting, construction (or modification) and operation of support buildings and support structures (including but not limited to, trailers and prefabricated buildings) within or contiguous to an already developed area..." This information is explained in greater detail in DOE/ORP-2003-24, "Categorical Exclusion for Treatability and Demonstration Testing of Supplemental Technologies, Hanford Site, Richland, Washington, December 2003."

A *Washington State Environmental Policy Act* (SEPA) environmental checklist was submitted in support of the Permit Application for an RD&D Permit May 10, 2004. Ecology reviewed the SEPA environmental checklist and prepared a DNS. SEPA regulations require Ecology to review the proposal and determine if an Environmental Impact Statement is required. Ecology

performed the determination and issued a Mitigated Determination of Nonsignificance, based upon planned mitigation measures included in the design of the DBVS Facility.

The Washington State Department of Ecology respectfully disagrees with the premise that an Environmental Impact Statement is required to evaluate the action to issue a RD&D Permit for the DBVS Facility.

Lastly, information on the cost is provided for clarification only. Financial responsibility and requirements under this RD&D Permit pertain to facility closure as outlined in WAC 173-303-620. The statement, "When first proposed, USDOE stated that this demonstration bulk vitrification facility would be a \$15 million test – including both capital and operation" is confusing. The \$15 million estimate was for the original surrogate (nonradioactive) waste testing, not an RD&D Facility, and no portion of it was capital funds. It is incorrect to say that USDOE diverted funds from other cleanup programs. This funding was earmarked to address priority cleanup activities that could significantly accelerate Office of River Protection cleanup activities.

The commenter states, "At the escalated cost for this project, there is no longer a reasonable belief that bulk vitrification offers any significant budgetary advantage over the use of proven vitrification technology and construction of a second phase Low Activity Vitrification Plant. *USDOE is substituting bulk vitrification with unproven final waste performance for a well proven waste form – a gamble that offers no significant savings, and diverts necessary funds from vitrification, installation of groundwater monitoring or a plethora of other projects.*"

As noted in the permit Fact Sheet: "Under this permit, the Permittees will evaluate the ability of bulk vitrification to produce immobilized low-activity waste (ILAW) that is comparable to that proposed for the Hanford Site Waste Treatment and Immobilization Plant (WTP) immobilized low-activity waste form. The Permittees will be required to provide data for waste form qualifications, risk assessments, and performance assessments for treatment and near-surface land disposal of low-activity waste".

The commenter states, "Indeed, for the cost of this project on a per gallon basis, it would cost billions and billions to treat Low Activity High-Level Waste. (300,000 gallons for a cost of \$102 million plus decommissioning and cleanup of the bulk vitrification facility translates to \$18 billion to treat 53 million gallons of waste in the tanks; or, \$8 billion to bulk vitrify 24 million gallons of LAW that may not go to the first phase LAW vitrification plant. In comparison, a second phase LAW vitrification plant would be expected to have capital costs of \$1 billion and operational costs of \$2 billion (current dollars) through the end of treatment."

The original cost estimate for the DBVS Facility was approximately \$46 million. The cost has increased due to (1) more detailed design and construction cost estimates, (2) Operation of Pilot Scale Facility (3) Tank 241-S-109 retrieval costs, (4) Extensive Waste Form Qualification testing and analysis to ensure ILAW comparability and (5) Additional engineering-scale testing with low-activity tank waste. The life-cycle costs will be provided in January 2005 as a requirement of the HFFACO milestone M-62.

**COMMENT 2a:** Page 2, beginning with EIS Required.

The commenter states, "If a proposed project diverts funds from environmentally beneficial or legally required activities, and the funding level becomes significant, the funding is an irreversible commitment of resources triggering an environmental impact statement. In this case, \$102 million is being diverted from the same budget pool that would be available to pay for legal compliance for groundwater monitoring, leak detection during tank waste retrieval, or for vitrification of the same wastes."

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Financial responsibility and requirements under this RD&D Permit pertain to facility closure as outlined in WAC 173-303-620. Ecology appreciates your comments but does not concur with the conclusions reached. A similar comment to this one has already been responded to. WAC Chapter 197-11-330(1)(d) requires agencies to determine if a proposal is likely to have a significant environmental impact. Ecology does not agree that a direct correlation can be made between the use of federal funds for the DBVS and a significant adverse environmental impact on groundwater monitoring, leak detection during tank waste retrieval, or vitrification of wastes in the WTP.

**COMMENT 2b:** EIS Required (continued)

The commenter states, "Bulk vitrification involves risks of releases of hazardous wastes and process upsets that would have clearly significant human health and environmental impacts. Indeed, the lack of legally required characterization of these wastes prior to treatment or construction of a TSD unit also creates a per se potentially significant set of impacts. USDOE has no reasonable, quantifiable knowledge of the composition of the tank sludges. When an agency fails to determine the probability of known highly significant potential impacts because it has not bothered to study and quantify those known risks, it can not claim an exemption – based on that ignorance – from SEPA or NEPA requirements for an environmental impact statement that discloses and considers these risks."

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The RD&D Permit for the DBVS Facility only allows the Permittees to retrieve saltcake waste from Single-Shell Tank 241-S-109, not the sludge fraction of Tank S-109 as explained in Permit Attachment KK, Section 2.3.3 listed below.

### 2.3.3 Waste Transfer

"Waste transfer will be in the form of waterborne salt solution. Waste left in a waste receipt tank at the end of a campaign may be transferred to another tank and mixed with incoming waste for processing. A waste transfer line water flush may be made after each batch transfer of waste feed, as needed. Waste transfer will occur only after verification that all systems are ready for the transfer/receipt of waste. The vitrification station will be located beneath the dried waste hoppers for gravity feed of waste to the container. The mixer/dryer, vitrification, cooldown, and top off/survey stations will be provided with radiation shielding and spill containment curbs.

Secondary containment will be provided for liquid waste transfer operations in the form of hose-in-hose or pipe-in-pipe transfer lines. Dried waste transfer from the mixer/dryer to the hipper will have secondary containment. Dried waste transfer from the hopper to the container will be conducted inside a removable hood sealed to the container top. Cleanup of spills within the hood will be performed using a containment system.”

Therefore, the Draft RD&D Permit does not address retrieval and treatment of sludge from Tank S-109. This RD&D Permit does qualify for NEPA exclusion and is eligible for a SEPA determination of non-significance, and USDOE has concluded that it qualifies for a NEPA exclusion, as discussed in comment 1.

**COMMENT 2c: EIS Required (continued)**

The commenter states, “Attachment 2 states that permit conditions will require “emergency response actions planned.” Yet, this is entirely lacking. (The lack of consideration of SARA planning requirements for emergency response is another forgotten lesson). The public is entitled to see a description of those potential emergency conditions, to understand the potential consequences, and to comment on proposed specific emergency response and mitigation measures.”

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The Superfund Amendments & Reauthorization Act (SARA) is intended for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities and is not applicable to RCRA treatment activities. The RD&D Permit is for RCRA treatment activities. The RD&D Permit requires submittal of Emergency Preparedness information as defined in Permit Condition II.C of the RD&D Permit, and in accordance with WAC 173-303-340. Permit Condition II.F addresses the updated contingency plan.

Permit Condition II.C. PREPAREDNESS AND PREVENTION

Permit Condition II.F. CONTINGENCY PLAN

Ecology believes that this addresses the commenter’s concerns.

**COMMENT 2d – EIS Required (continued)**

The commenter states, “The need to supply one full Megawatt of electricity to operate the bulk vitrification facility is, in and of itself, a potentially significant environmental and health impact. This is a very large amount of additional electrical generation capacity that would be required, and USDOE has failed to show any mitigation for the impacts. Saying that another facility (such as the LAW vitrification facility, which did have an EIS) will also require a large amount of electricity is not a legal excuse for failing to consider the impacts (and mitigation) from this proposed facility.”

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

It is an inaccurate statement that, “additional electrical generation capacity would be required.” The power requirements for the DBVS Facility are being met by the existing Hanford electrical utilities without additional electrical generation capacity. An Environmental Impact Statement (EIS) is not required.

**COMMENT 2e:** EIS Required (continued)

The commenter states, “Retrieval of waste from Tank S-109 is an integral part of this project. It is not permissible under SEPA for Ecology to piecemeal consideration of the potential impacts of the project, by pretending that the bulk vitrification is a stand alone project. Ecology and USDOE’s documents make clear that retrieval of the waste is an integral part of this project. There are significant potential impacts from retrieval, including the potential for further leaks and releases. The public is entitled to know those risks and whether they will be mitigated by use of legally required best available technology for leak detection before retrieval begins.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that retrieval of Hanford tank waste could present the potential for a significant adverse environmental impact and is an integral part of the RD&D; however, it is not part of the RD&D Permit. The Tank Waste Remediation System EIS evaluated the risk associated with retrieval of tank waste. See Vol. 4, Appendix E, Tables E.1.0.1 “*List of Evaluation Basis Accident Analyses in Accelerated Safety Analysis*” and E.1.1.1 “*Summary of Potential Accidents*”. Retrieval of waste from SSTs has been addressed under the Tank Waste Remediation System EIS.

In addition, the transfer of waste from Tank 241-S-109 to the DBVS Facility will be regulated by an Ecology approved Functions and Requirements document, not the RD&D Permit, and will address any potential 241-S-109 leaks during retrieval. The RD&D Permit is not part of the Dangerous Waste Portion of the *Resource Conservation and Recovery Act of 1976* (RCRA) Permit for the Treatment, Storage, and Disposal of Dangerous Waste Permit issued to USDOE March 28, 2000. It is a stand-alone permit. Ecology does not agree with the commenter that the SEPA DNS constitutes segmentation of the proposal through omission of retrieval.

**COMMENT 2f:** EIS Required (continued)

The commenter states, “Temporary storage” of the bulk vitrification product is not legally permissible. (DNS at 7). These wastes are Mixed Wastes, and any storage facility must be permitted, and limited to legally applicable time periods for “storage”.

The lack of any available permanent disposal facility for bulk vitrified wastes automatically triggers both SEPA and NEPA. Indeed, if USDOE wishes to create a significant quantity of bulk vitrified waste (and there is no denying that the massive blocks of waste from this facility will be significant), it must disclose and consider the impacts, and alternatives, in the upcoming Tank Waste Retrieval, Treatment and Closure EIS. Prior to issuing that EIS, neither USDOE nor

Ecology can legally proceed to authorize a project that will create such large High-level Waste blocks that can never leave the Hanford site. We must point out that there is still legal uncertainty – which USDOE repeatedly cites in other forums (and the Government Accountability Office [GAO] recently cited as well) – over whether these wastes can legally be left forever at Hanford. However, unlike with the retrievable glass frit that would result from the approved LAW Vitrification facility, bulk vitrification results in a High-Level Waste form that is simply not retrievable, or movable to a repository. This is a significant potential impact which the DNS and USDOE’s application fail to consider. A Determination of Non-Significance is not available when the project will result in waste forms that can never leave and which have clear potential significant impacts if they are left at the surface in a Hanford landfill.

**ECOLOGY RESPONSE:** Ecology disagrees and provides clarification as discussed below.

The Draft RD&D Permit for the DBVS Facility is for treatment and storage, not disposal. WAC 173-303-809, OSWER Guidance allow for an RD&D to store quantities of treated waste until the permit expires and closure of the facility begins as required under Permit Condition II.H and WAC 173-303-610.

The United States Environmental Protection Agency (EPA) OSWER Guidance for RD&D permits further allows treatment of limited quantities of waste at a scale of operation sufficient to conduct an experiment. In addition, the guidance states, “Although RD&D permits are intended for treatment of hazardous waste, the storage of hazardous waste at an RD&D facility, incident to the treatment is permitted under the RD&D Permit.”

Ecology does not agree with the commenter that treated Tank 241-S-109 waste cannot be stored at the DBVS Facility. Permit Condition III.A.2 requires waste generated at the facility and placed in containers to be managed according to those requirements, including WAC 197-303-200(1).

The DBVS Facility containers are to be filled with treated waste. Containers of treated waste are subject to the requirements of WAC 173-303-630 Use and Management of Containers.

The ICV<sup>®</sup> containers are expected to be disposed of onsite in a RCRA permitted disposal facility. Ecology anticipates that the DBVS treated waste will meet the same technical criteria contemplated for pre-treatment and vitrification of Hanford LAW at the Waste Treatment Plant, and therefore may be disposed of as low activity waste. As noted in the permit Fact Sheet: “Under this permit, the Permittees will evaluate the ability of bulk vitrification to produce immobilized low-activity waste (ILAW) that is comparable to that proposed for the Hanford Site Waste Treatment and Immobilization Plant immobilized low-activity waste form. The Permittees will be required to provide data for waste form qualifications, risk assessments, and performance assessments for treatment and near-surface land disposal of low-activity waste.”

The commenter says that the HLW form can never leave the Hanford Site and further states that the bulk vitrification results, “in a waste form that is simply not retrievable or movable to a repository” This is incorrect; This Research, Development & Demonstration facility will vitrify pretreated tank waste. If the Research, Development & Demonstration waste packages are not ultimately accepted for final disposal as low-activity waste at Hanford, the borosilicate glass

waste form will be suitable for disposal in a repository or for long-term storage as provided for under the Nuclear Waste Policy Act.

The Draft RD&D Permit allows for the treatment of 50 ICV<sup>®</sup> containers. Permit Condition V.I.10.c requires ICV<sup>®</sup> Package detailed final limitations for size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, disposal facility, and testing/acceptance requirements.

Permit Condition II.A.1. The Permittees are authorized to accept dangerous and/or mixed waste only from:

Permit Condition II.A.1.a. Tank 241-S-109 that does not exceed the criteria listed in Permit Attachment BB, as specified in the Ecology approved campaign plan, and as specified on Permit Tables V.7 and V.8.

Permit Condition II.B.7.a. Requires that the Waste Analysis Plan objectives include developing a sampling approach for the final vitrified waste form to ensure compliance with the waste acceptance criteria (WAC) of the permitted facility.

In addition, the WAP plan objectives are intended to develop a sampling approach that will be used to support waste feed limitations that will result in the waste forming meeting the disposal facility's WAC.

**COMMENT 2g: EIS Required (continued)**

“Again, if this were a lab scale test, it would be truly Research, Development and Demonstration... and, the final waste forms would not be so massive that they must stay at the surface at Hanford regardless of what the future environmental impacts are from these wastes. The State has repeatedly asserted that it would not allow any waste form to be used for Hanford's High-Level Wastes that did not beat the performance of glass from the approved vitrification plants. Approval of this permit and project would result in massive monoliths of waste whose performance is unknown. Nor will the performance be determined by any requirement of this permit, since the permit totally fails to specify what tests of performance will be legally required. (It is not adequate to have a list of proposed tests, without any minimum enforceable standards for the testing of the final waste form. Nor has USDOE ever shown why it must “demonstrate” for research purposes a waste form of this size, rather than produce smaller, retrievable bulk vitrification forms. Ecology and USDOE are legally required under SEPA and NEPA to consider this alternative.”

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

An RD&D Permit is not restricted to a “lab-scale size” demonstration. WAC 173-303-809 and the OSWER Guidance Manual allow for the waste quantity proposed in this RD&D Permit. OSWER, Section 2. “Criteria for Research, Development, and Demonstration Permits” states that, “...Research, Development & Demonstration proposal will include a variety of demonstration and experimental activities such as small-scale original research, state-of-the-art technologies and processes, and modifications of existing technologies or processes, which may

have been used for treating non-hazardous wastes or other hazardous wastes. Furthermore, the Agency recognizes that Research, Development & Demonstration facilities will involve testing of one or more technologies or processes at laboratory-scale, bench-scale, pilot-scale, and/or full-scale.”

The purpose of the RD&D Permit is to allow for the Test and Demonstration of the bulk vitrification facility. The proposed facility will be used to evaluate the ability to produce immobilized low activity waste (ILAW) that is equivalent to WTP ILAW; the compatibility of the technology with actual tank waste; the safety, efficiency, and potential cost-effectiveness of the bulk vitrification process; and the feasibility of full-scale Permit Application. The proposed DBVS Facility is designed to investigate requirements for feed material handling, equipment operation, residual material handling, production and control of secondary wastes, and potential environmental impacts associated with the process. Second, the general performance standards set forth in the Permit apply to each RD&D campaign plan performed at the DBVS Facility. Each Ecology approved DBVS campaign plan will provide documentation to support that the DBVS campaign plan design and operation during the campaign is projected to meet the performance standards specified in the Permit.

Performance will be determined by enforceable permit conditions and campaign plans required in the RD&D Permit as listed below:

Prior to initial receipt of dangerous and/or mixed waste in the DBVS, the Permittees shall submit and receive approval from Ecology for the Phase 1 DBVS Campaign Plan. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 1 DBVS Campaign Plan shall include the information specified in Section 5 and Appendix A of Permit Attachment LL in addition to the following:

- V.I.7. Prior to commencement of the Phase 2 DBVS Campaign and prior to commencement of each Phase 2 DBVS Campaign, Permittees shall submit and receive approval from Ecology for the Phase 2 DBVS Campaign Plan, except as specified in Permit Condition V.I.8. Such approval shall not require a permit modification under Permit Conditions I.C.2 and I.C.3. The Phase 2 DBVS Campaign Plans shall include the information specified in Permit Condition V.I.6. In addition, the Phase 2 DBVS Campaign Plans shall be designed to collect the information specified in Permit Conditions V.I.7.c through V.I.7.e below, and the Phase 2 DBVS Campaign Plans designed to provide “Feed Envelope Verification and/or Process Improvement,” shall also include the information specified in Permit Conditions V.I.7.a and V.I.7.b, below:
  - V.I.7.a. Emission testing for demonstrating performance standards listed in Permit Condition V.I.6.f.
  - V.I.7.b Detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, planned analytical procedures for sample analysis and a short summary narrative description of each stack sample method with identification of the performance standard(s) identified in Permit Condition V.I.6.f that the method will be used to demonstrate the performance of the DBVS.

- V.I.7.c. One or more test campaigns shall be conducted to generate mass balance information sufficient to address the fate/concentration of potential constituents of concern, such as Iodine-129 and Technetium-99, within the ICV<sup>®</sup> Package and its various components, the offgas systems, offgas systems' secondary liquid waste, solid and secondary semi-solid waste.
- V.I.7.d. One or more test campaigns shall be conducted to generate information to assess the potential for waste minimization as it relates to secondary liquid waste.
- V.I.7.e. One or more test campaigns shall be conducted to generate information to assess how potential future recycle waste from the WTP could be incorporated into a Bulk Vitrification full-scale production facility waste stream, should Ecology make the decision to permit a full-scale production facility, and the impacts related to including these recycles into the DBVS Facility waste stream. These test campaigns would be specifically designed to observe, record and analyze impacts related to waste loading and potential constituents of concern, such as sulfate, sodium, metals, iodine, and technetium.

**COMMENT 2h: EIS Required (continued)**

The commenter states, "The claim that the final waste form will meet the waste acceptance criteria for the disposal facility (DNS at 7) is simply ludicrous!!! There is no final disposal facility for these wastes, and there is no waste acceptance criteria for the proposed landfill. Washington State is in federal court challenging the Hanford Solid Waste EIS as being legally inadequate. Thus, Ecology and USDOE can not claim that disposal of the bulk vitrified waste (with unknown constituents and performance) will meet the unknown future waste acceptance criteria for a not yet existing landfill, the impacts of which Washington State believes have not been adequately determined."

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The RD&D Permit is for treatment and storage, not disposal. The containers will be stored within the DBVS Facility until completion of the RD&D project. Final disposal of the treated waste will be at an approved permitted disposal facility. Prior to final disposal, containers of vitrified wastes will be stored within the DBVS Facility, or other on-site permitted container storage areas, such as the Central Waste Complex. The vitrified waste form in each container will be sampled and analyzed in accordance with the Ecology approved DBVS Facility campaign plan. Some secondary wastes will be generated from the process. The secondary wastes will be analyzed, treated, and properly disposed of onsite at a permitted facility.

As indicated in the Permit Condition II.A.1.a, Tank 241-S-109 waste cannot exceed criteria listed in Permit Attachment BB and Permit Tables V.7 and V.8. Permit Condition II.B.7.a requires that the Waste Analysis Plan objectives include developing a sampling approach for the final vitrified waste form to ensure compliance with the waste acceptance criteria (WAC) of the Integrated Disposal Facility (IDF) or another permitted facility. In addition, the WAP plan

objectives are intended to develop a sampling approach that will be used to support waste feed limitations that will result in the waste forming meeting the disposal facility's WAC.

**COMMENT 2i: EIS Required (continued)**

The DNS states that, "Final disposal of treated waste will be at a permitted disposal facility." Exactly what "permitted disposal facility" will "final disposal of treated waste" occur at? The proposed facility has no waste acceptance criteria, and the impact statement supporting it was legally inadequate. This statement can not be made.

USDOE and Ecology describe the bulk vitrification facility as, "a key element of the overall treatment system." (See overview). USDOE and Washington acknowledge that the full treatment system can not proceed without the upcoming EIS. Since this is a key element (interrelated proposal) of that system, it can not be broken off and receive a Determination of Non-Significance.

The DNS must be withdrawn and either the USDOE must scale back the bulk vitrification facility dramatically (including limiting the scale to true research and limiting the wastes that will be generated); or, it must be put on hold pending the issuance of a final EIS on Tank Waste Retrieval, Treatment and Closure and, reissuance of a legally adequate EIS for the proposed disposal landfill.

There is no SEPA or NEPA categorical exclusion from EIS requirements available when a RDD facility (which has no exemption in state law) will be operated for three years, rather than the one year maximum specified for an RD&D permit in federal and state laws.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The SEPA requirement to review reasonable alternatives to the proposed action appears in the general requirements for an environmental impact statement [WAC 197-11-401(1)]. Ecology issued a Mitigated Determination of Nonsignificance (MDNS) per WAC 197-11-350. The MDNS included Attachment 2 that contained mitigation measures included in the RD&D Permit. Unless substantial changes are made that would result in a significant adverse environmental impact or significant new information indicates a proposal's significant adverse environmental impact, Ecology will not initiate scoping for an EIS. Ecology will comply with the provisions of WAC 197-11-240(2)(b)(f), to consider timely comments.

Treatment of tank waste through vitrification was the subject of the Tank Waste Remediation System (TWRS) EIS. The TWRS EIS evaluated vitrification of the low activity wastes in the Waste Treatment Plant. The engineered controls on the DBVS Facility and the selection of Tank 241-S-109 waste, (which has already undergone some treatment and which will undergo selective dissolution during retrieval) will ensure that the potential for significant adverse environmental impact from the final vitrified waste is far less than the risk from leaving the untreated waste in the SST.

A threshold determination based on the SEPA checklist provided with the Permit and the Permit Application was appropriate. That determination led to a mitigated determination of nonsignificance.

Ecology's permit conditions will mitigate potential adverse environmental impacts of the DBVS operation and storage of vitrified waste. Ecology maintains that operation of the DBVS does not require preparation of an EIS because of the engineered components and administrative controls that will control operation and closure of the facility. WAC 173-303-809(1)(a) allows for the operation of an RD&D facility for not longer than one year unless renewed. An RD&D permit may be renewed not more than three times and each renewal for a period of not more than one year. This RD&D Permit allows for 365-operating days (in accordance with the OSWER Guidance) with an additional 35-operating days (a total of 400-operating days) to be used within three years allowed by this Permit.

**COMMENT 3: Waste Retrieval System Triggers Both SEPA and Missing Permit Requirements**

The commenter states, "Attachment 1 to the Determination of Non-Significance describes "Facility Components" as including the "Waste retrieval system. However, neither the permit nor the DNS include the waste retrieval system. Retrieval of waste from the tanks is not legally covered by any exclusion in NEPA or SEPA from requirements for an environmental impact statement. Indeed, the fact that retrieval from a non-compliant tank system is required shows that there is a legally per se significant potential impact from retrieval actions."

The permit can not be truncated – otherwise there is no permit in place for retrieval of the waste from Tank S-109. Operation of a retrieval system without a permit will violate both federal and state hazardous waste laws.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology does not agree that retrieval of tank waste has not been evaluated. Retrieval of the single-shell tanks was evaluated in the *Tank Waste Retrieval System Environmental Impact Statement* DOE/EIS-0189. EIS Section 1.1.3 stated that the USDOE decided to perform additional development and characterization before making decisions on final disposal of SST waste when the agency issued the *Record of Decision for the Hanford Defense Waste EIS* (6450-01-P, 1997). Section 1.1.4 listed changes that affected planning for the TWRS EIS, including retrieval of waste from the SSTs and treatment of SST waste in combination with DST Waste. On page 1-13 of the TWRS EIS, in a box devoted to a discussion of the relationship of the Safety Interim Storage EIS to the TWRS EIS, the USDOE stated that several TWRS EIS alternatives would involve transfers of waste from 200 West Area to the 200 East Area for waste separation and immobilization, using the replacement cross-site transfer system to move the waste. The text stated that the TWRS EIS examined the potential environment impacts associated with those waste transfers.

TWRS EIS Section 3.4.1.4 table 3.4.1 listed major assumptions for ex situ alternatives, including retrieval efficiency (percent recovered from the tanks (page 3-32). Page 3-32 discussed assumptions made about retrieval of the SSTs, including the assumption that each of the SST retrievals would cause leaks of 4,000 gallons of waste to the soil. The assumptions also included

waste released at the maximum predicted concentrations; no dilution of the waste during retrieval was assumed.

Evaluation of the impacts to the vadose zone and groundwater appeared in Section 5.0 Environmental Consequences. Section 5.2.1.2 Results discussed contamination releases to the vadose zone from retrieval for the Ex Situ Intermediate Separations Alternative (pp 5-35ff), Ex Situ Extensive Separations Alternative (pp 5-40 and 5-41), Ex Situ/In Situ Combination 1 Alternative (pp. 5-41ff) Ex Situ/In Situ Combination 2 Alternative (pp. 5-43ff), Phased Implementation Phase 2 (page 5-51).

Air emissions from retrieval were also evaluated in the TWRS EIS. Table 5.3.1 shows the major pollutants released by alternative, as well as the calculated maximum concentration for each alternative (page 5-67) Risk from the alternatives is then discussed in Section 5.11 Anticipated Health Effects for both the remediation (Section 5.11.1) and post-remediation (Section 5.11.2).

Retrievals have been conducted as part of interim stabilization and to remove wastes from SST 241-C-106. As was stated in response to previous comments, the retrieval of SST 241-S-109 will occur only after Ecology approves a Functions and Requirements document that will address retrieval, including leak detection and monitoring. With Ecology approval of SST 241-S-109 plans for retrieval required, the risks of retrieval will be addressed appropriately.

**COMMENT 4a:** The project fails to meet the following criteria to be eligible for an RD&D permit; the commenter provides the following:

- Under federal hazardous waste law, pursuant to which Washington Ecology is delegated authority to administer RCRA permits, RD&D permits must be limited to one year. Extension provisions are not complied with in the draft.
- RD&D permits are limited to research, development or demonstration of technology; this project is a full scale facility. USDOE admits that this may be the full scale of additional facilities, if it chooses to use a modular engineering approach.

Research, Development and Demonstration permits, as the name implies, are only available for a proposed dangerous waste treatment facility or process:

“which proposes to utilize an innovative and experimental dangerous waste treatment technology or process for which permit standards for such experimental activity have not been promulgated under WAC 173-303-500 through 173-303-695.”  
- WAC 173-303-809(1)

A \$102 million bulk vitrification facility – sized large enough for 300,000 gallons of processing over several years, fails to meet this test. There are already applicable vitrification performance and treatment operating standards that the Department is applying to the Hanford Waste Vitrification Plants.

Bulk Vitrification is not an innovative and experimental treatment technology. Ecology officials have repeatedly stated that selection of an alternative to the current Tri-Party Agreement (TPA)

required vitrification plant and process must meet or exceed the same standards for performance. Those standards exist.

Prior experiments have already been conducted on bulk vitrification at Hanford – which now requires cleanup actions under CERCLA. Since there have previously been vitrification “demonstrations” at Hanford, this project is not an “experimental activity”. Indeed, the scale of this is described by USDOE as a potential full scale bulk vitrification facility and operation. Without any enforceable requirements for testing long-term performance of the waste product, it is clear that this facility is NOT an experiment for purposes of testing the bulk vitrification form. Given the experience that the prior demonstration sites are now CERCLA cleanup sites, it is also clear that this full scale facility can not receive a Determination of Non-Significance.

“Congress clearly intended that RD&D permits be used for: (1) the purpose of generating new information to evaluate the technical or economic feasibility of an innovative and experimental waste management technology, process, method, or device; (2) treating hazardous waste in a unit or device made primarily from non-earthen materials; (3) treating limited quantities of waste at a scale of operation necessary to conduct the experiment; and, (4) operation for a period of time necessary to adequately prove the feasibility of the technology or process.”  
RDD Guidance.

The bottom line is that the proposed Bulk Vitrification facility (cost \$102 million) is not designed or intended to treat quantities of waste limited to the scale needed to conduct an experiment to determine if the process is technically or economically “feasible”.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

The full text of the cited Washington State Dangerous Waste Regulations as they apply to a Research, Development and Demonstration Permit. [WAC 173-303-809 (1) and (4)] provides that operation of an RD&D facility is limited to one year (based on 365 separate “operating days” which may be non-consecutive from the OSWER Guidance) unless renewed by Ecology. An issued RD&D permit may not be renewed more than three times, each time for one year.

As stated in the RD&D Permit Fact Sheet, “The purpose of the RD&D Permit is to allow for the Test and Demonstration of the bulk vitrification facility for treatment of Hanford Site tank wastes. The Permit is temporary in duration and limits the quantities of dangerous and/or mixed waste to be treated. The Permit also includes stringent terms to protect public health and the environment.”

As stated in the foreword of the OSWER Guidance Manual for RD&D Permits (EPA/530-SW-86-008) “RD&D permits will allow testing of new and modified technologies and processes at lab-scale, pilot-scale, and full-scale.”

As previously explained, the state and federal regulations for RD&D permits do not establish cost as a discriminator to a final decision for issuing an RD&D permit. The total amount of waste proposed to be treated under this Draft RD&D Permit (300,000 gallons) is less than 1% of the total volume of wastes in the Hanford tanks (approximately 54,000,000 gallon). Also, as stated in the Draft RD&D Fact Sheet, it is Ecology’s expectation that the proposed DBVS

Facility will be used to evaluate the ability to produce immobilized low-activity waste (ILAW) that is comparable to that proposed for the Waste Treatment ILAW.

The purpose of the Demonstration project is to evaluate the compatibility of the technology with actual Hanford tank waste; the safety, efficiency, and potential cost-effectiveness of the bulk vitrification process; and the feasibility of full-scale Permit Application.

Ecology believes that these criteria and the Permit Application meet the requirements for an RD&D Permit.

**COMMENT 4b:** The project fails to meet the following criteria to be eligible for an RD&D permit. The commenter provided the following:

If the RD&D permit is not available due to scale, then neither can the project receive a DNS under SEPA.

Contrary to fact sheets, summaries and other public information materials, which state the basis for providing an RD&D Permit is that the Permit is limited to a one year research and demonstration project, the Draft Permit reads:

“This Permit shall not exceed 400 operating days of the Dangerous Waste Research, Development, and Demonstration Activity authorized by this permit.”

Cf: WAC 173-303-809(1) (a) requires the operation of the facility “for no longer than one year”.

A check of all desk and wall calendars in our office and homes has determined that most years do not exceed 365 days.

The Permit defines “operating day” in a manner that would illegally allow this RD&D facility to “operate” for years. The permit’s allowance for “operating” 399 days is neither consistent with the RCRA or the WAC, nor consistent with the purpose of RD&D permits.

If issued at all (which it should not be without being scaled back in size, waste volume and, only after the EIS is completed), the Permit must only be issued for one year.

“Because an RD&D permit is intended to develop and test a technology or process, it is inherent in RD&D activities that such a test is temporary, or short-term, in relation to the commercial use of the process. By statute, RD&D permits are limited to a permit term of one year, which is defined as 365 days of actual operation”.

- OSWER Policy Directive #9527.00-1A.

“Actual operation” for any TSD facility includes all days in which hazardous waste is stored, not just the days during which a particular experiment or process is underway:

“If an RD&D unit or process is used to store or treat hazardous waste for any reason other than the hazardous waste management experiment, then these activities must be permitted, and operated, in accordance with all applicable sections of 40 CFR Parts 264 and 270.”

- OSWER Policy Directive #9527.00-1A.

Any fraction of a day during which the “experiment” is run, also counts as a full “operating day” under the law. (OSWER Policy Directive #9527.00-1A.)

Permit Condition I.I allows the permit to “remain in effect until the expiration of 400 operating days or three (3) years, whichever is earlier.”

WAC 173-303-809(1)(a) allows operation of an RD&D facility “for no longer than one year”. The condition exceeds the maximum allowed by the WAC.

The publicly available description of a one year test is also misleading. In fact, the parties propose to allow multiple renewals. This increases potential impacts, and further obviates the claim that the facility does not require an environmental impact statement.

“Any permit issued under this section may be renewed not more than three times. Each such renewal will be for a period of not more than one year.” WAC 173-303-809(4).

Consistent with WAC and OSWER Policy Directive 9527.00-1A, the Permit must specify that accumulation or storage of waste products must not exceed the maximum allowable time period prior to disposal. If there is no disposal facility available, the Permit must require the operator to cease production of waste in a manner that would exceed applicable accumulation limits. Again, because of the tie between the retrieval, treatment and disposal, the EIS for disposal (Solid Waste Disposal) and a SEPA adequate EIS on a disposal facility, specifically considering disposal of bulk vit wastes, must be available prior to proceeding.

The permit must bar “storage”, as opposed to “accumulation” of waste produced during the testing/experiment prior to final disposal. Condition III.A.4 states, “The Permittees may store dangerous and/or mixed wastes...” Storage requires a dangerous waste permit – this is not supposed to be a storage facility. The permit condition should be re-written to clearly and correctly describe only waste accumulation as the dangerous waste management activity being permitted by Condition III.A.

**ECOLOGY RESPONSE:** Ecology agrees in part as discussed below.

Ecology agrees that Permit Condition I.I should have been clearer with respect to the proposed permit duration of 400-operating days or three (3) years, whichever is earlier” which was intended to reflect the Permit duration with respect to the initial permit for a duration of 365-operating days and a maximum permit renewal for a duration of 35-operating days. The proposed permit language intended to emphasize this total cap on duration with the more stringent requirement that this Permit could not be reissued versus the allowance in the regulations for three potential renewals which reflects a potential total of 1460-operating days. Permit Condition I.I has been revised to make it clear that the permit duration of 400-operating days does include the initial permit for a duration of 365-operating days and a maximum permit renewal for a duration of 35-operating days.

Permit Condition I.I. “PERMIT EXPIRATION” will be modified as follows:

Permit Condition I.I. This Permit and all conditions herein are in effect as of the “effective date” as defined in the definitions of the Permit and will remain in effect:

Permit Condition I.I.1. for 365-operating days with a maximum permit renewal for a duration of 35-operating days or

Permit Condition I.I.2 for three (3) years, whichever is earlier.

With respect to the use of a DNS that a lead agency (Ecology for the DBVS DNS) issues after conducting its threshold determination per WAC 197-11-330 Threshold Determination Process, the process does not preclude issuance of a mitigated DNS for proposals based on a certain dollar cost or for Research, Demonstration and Development proposals. [See WAC 197-11-330(1)(b)].

This RD&D proposal is limited to constructing, operating, and closing a miscellaneous treatment and storage unit, as defined in WAC 173-303-680. The unit is not designed and will not be operated as a large-scale treatment and storage facility that will treat every form of waste in the SSTs.

The OSWER Guidance Manual defines the term of RD&D permits as "...365 days of actual operation using hazardous waste; it does not refer to calendar days when treatment of hazardous waste is not occurring, to periods of construction, or to operation using materials other than hazardous waste." The DBVS Facility will not be used to store or treat hazardous waste that is not a part of this "hazardous waste management experiment".

As noted in the DNS, the Permittees will install engineered systems to mitigate environmental impacts. Those engineered systems include containment for tanks (Condition IV.A.4.f), corrosion protection for tanks (Condition IV.A.3.k), container storage areas constructed to comply with WAC 173-303-630(7) (see Condition III.B.2), secondary containment systems for the DBVS that comply with WAC 173-303-640(4), leak detection systems for tanks and the DBVS Facility that will be incorporated in Table IV.2 per Condition IV.A.8.e, and offgas treatment systems (see Table V.1).

The permit requires the Permittees to submit campaign plans for every campaign prior to filling an ICV<sup>®</sup> container in accordance with Permit Conditions V.1.6 for Phase 1 and V.1.7 for Phase 2. A Campaign is defined in the RD&D Permit as the receipt, processing, and vitrification into a single ICV<sup>®</sup> container.

In addition, the Permittees must take additional actions to protect against spills and releases, such as inspections of containment systems for tanks (Permit Condition IV.A.4.h). Other permit conditions govern DBVS operating conditions (Permit Condition V.C), tank management (Permit Condition IV.A), container management (Permit Condition III.C),

The RD&D Permit Conditions II.A.1 and II.A.1.a does not allow the Permittees to treat waste from other Hanford SSTs. In addition, the Permit does not grant the Permittees the right to treat all of the waste in SST 241-S-109. (See Permit Attachment AA, Section 2.1 and Permit Attachment BB Section 6.2.3.1).

The ICV<sup>®</sup> System will be used to treat only the dissolved saltcake fraction of the waste in S-109. Permit Condition II.A.1 a requires that the waste must be meet three conditions to be treated in the Demonstration Bulk Vitrification System (DBVS): the waste must not exceed the criteria in

Permit Attachment BB, it must be treated as specified in the campaign plan for each DBVS container that Ecology will approve, and as specified in Permit Tables V.7 and V.8.

By authority in WAC 197-11-350(3), Ecology can [and did] specify mitigation measures in the Permit that were intended to protect the environment from a significant adverse environmental impact. A Mitigated DNS is therefore appropriate to close SEPA actions for the proposal.

As noted in previous comments, Ecology has explained why this RD&D Permit can receive a DNS under SEPA.

Permit Condition II.A.1. The Permittees are authorized to accept dangerous and/or mixed waste only from:

Permit Condition II.A.1.a. Tank 241-S-109 that does not exceed the criteria listed in Permit Attachment BB, as specified in the Ecology approved campaign plan, and as specified on Permit Tables V.7 and V.8.

**COMMENT 5b:** The commenter states the following below.

“The permit fails to require that any specific tests will be required to prove that the final product is as good as vitrified glass, or otherwise to demonstrate performance (continued)

To meet the State’s stated goal of ensuring that the product performs “as good as glass”, the long term performance (leaching, cracking, off gas, imperfections...) of the bulk vitrification product must be specified as a sampling requirement of this RD&D permit.

Table 6-7 does not specify any sampling which must be performed, or have any enforceable sampling/testing requirements (table footnote: “Not all tests will be performed on all treated waste. Results from stimulant tests may be used where applicable.”). The “Waste Analysis Plan” (WAP) does not include any enforceable provision to ensure that USDOE evaluate glass performance according to any standards set by the State.

The Permit should specify methods by which the glass will be evaluated for: 1) solid inclusions, 2) gaseous inclusions, 3) vitreous inhomogenities, and 4) contamination by unintentional components. The terminology applied to these defects includes: stones, batch stones, devit, refractory stones, secondary refractory stones, scum stones, seeds, seed with condensate, blisters, airlines, knots, cord, striae, and ream. Glass coloration can also result from composition contamination. For solid defects, the petrographic microscope has traditionally been the primary tool for identification, relying on the well-known optical properties of many crystals. Petrographic microscope inspection/evaluation of the glass for defects should be added to the WAP and to table 6-7 of the WAP. The WAP should clearly identify defects (by industry terminology) that will be evaluated. Laboratory tests, inspection, corrosion rate measurement etc. to evaluate defects caused by glass/refractory reactions Determining bulk vit glass performance is supposed to be a fundamental objective of the RD&D permit – if this is not going to be specified, then what is the research and demonstration qualifying this for an RD&D permit? The WAP, as currently written, is significantly deficient and does not satisfy the most fundamental objectives.

Finally, the Permit must specify what level of defects or other standard will be used to determine if the waste can be disposed and if further waste may be produced under the RD&D Permit.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

The RD&D Permit requires in Permit Condition V.I.10.c that the "ICV<sup>®</sup> Package detailed final limitations for size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, disposal facility, and testing/acceptance requirements", be provided to Ecology for review and approval prior to acceptance of waste feed into the DBVS Facility.

The intent of Table 6-7, Permit Attachment BB, was to identify some of the physical properties that the treated waste will be analyzed for. The specifics for the analyses to be performed will be provided as required under Permit Condition II.B.7 that states, "The following amendments to the Permit Attachment BB are hereby made. The Permittee shall submit the revised pages reflecting these amendments to Ecology prior to initial receipt of dangerous and/or mixed waste in the DBVS Facility. These amendments do not constitute a permit modification pursuant to Permit Conditions I.C.2 and I.C.3.

Ecology agrees that the WAP was deficient in the Permit Application. Permit Condition II.B.7 requires a series of amendments to the Waste Analysis Plan with the objective to develop a sampling approach that complies with WAC 173-303-300. This is a research, development, and demonstration activity that is designed to provide information through campaign plans that will evaluate many of these data points. Each campaign plan will be approved by Ecology prior to each box vitrification. Glass performance will be evaluated as described in Permit Conditions V.I.6.f and V.I.7. The WAP will be a complete document prior to any tank waste going to the DBVS Facility and it will be fully enforceable under WAC-173-303-300 and the RD&D Permit.

The Permit does not require any sampling associated with "1) solid inclusions, 2) gaseous inclusions, 3) vitreous inhomogenities, and 4) contamination by unintentional components." These defects are important when determining the quality of finished glass ware but are not important in determining the durability of a final glass waste product. Therefore, criteria for these types of defects will not be included in the RD&D operations or campaign plans and petrographic microscope inspection/evaluation of the glass is not necessary.

Laboratory-scale tests of the glass formulations planned for DBVS Facility have met the same requirements as WTP glass. The RD&D operations are being conducted to gather the information required to verify that a full-scale system can generate the same glass as that produced in the laboratory scale tests. The required information will change over the several boxes produced in the RD&D operations so the specific measurements are specified in the campaign plans that are approved by Ecology. The Permit does require core sampling of at least the first ten boxes and analyses as specified in the campaign plans. This will be conducted to determine if the waste packages are acceptable for disposal under the waste acceptance criteria of the final disposal facility.

The treatment objectives are designed to ensure that the waste acceptance criteria for the permitted final disposal site will be met. The RD&D Permit requires in Permit Condition

V.I.10.c, that the “ICV<sup>®</sup> Package detailed final limitations for size, durability, compressibility, stacking, handling, retrievability from storage and after final disposal, outside and inside package residual contamination, disposal facility, and testing/acceptance requirements”, be provided to Ecology for review and approval prior to acceptance of the waste feed into the DBVS Facility.

Ecology believes that the commenter’s concerns have been addressed.

**COMMENT 6a:** The commenter states the following about emissions.

“Attachment BB, Section 6.4. Hanford high-level waste tank offgas emissions include far more hazardous substances which must be continuously monitored, (not limited to ammonia; HCl and HF). Monitoring must include the gases which are the subject of increased surveillance for worker health in the tank farms. The incidence of increased worker exposure and health impacts belies any possibility that the potential impacts from increased emissions (including from releases) are not a significant impact – especially when considering the cumulative impacts from retrieval and other tank farm operations. Ecology can not ignore these cumulative impacts and issue a DNS.”

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Ecology will regulate tank offgas emissions; however, not as a part of this RD&D Permit. The tank offgas emissions are included and regulated by other permits that the DBVS Facility is required to have prior to initial receipt of waste. WAC 173-400, -401, -460 regulates air emissions for various toxic gases. A Notice of Construction was submitted to Ecology for these activities. A public comment period on a Draft Notice of Construction Approval Order was conducted from September 29, 2004, to October 28, 2004. This Notice of Construction states that monitoring for fugitive organic emissions will occur as a part of the Hanford Industrial Hygiene program. Ecology did not ignore cumulative impacts when it issued the DNS.

**COMMENT 6b:** The commenter states the following about retrieval of waste.

“As discussed earlier, retrieval of waste is an essential activity under the Permit and the bulk vitrification demonstration; and, legally (under NEPA) retrieval is an inter-related activity. The Permit must specify all Tank 241-S-109 components that will be used to transfer waste to the DBVS Facility and clearly identify which components belong to which units. Examples of system components and activities which must have enforceable permit conditions for this demonstration include, but are not limited to: transfer lines and requirements for transfer of retrieved waste; and, leak detection for transfers and retrieval (real time leak detection for the tanks during retrieval, rather than relying on old, defunct level gauges or groundwater monitoring wells). For enforcement purpose, definitions must clearly state which activities and system components fall under which permit. And, components and requirements may fall under both this Permit and the conditions of another permit (i.e. another chapter of the sitewide RCRA permit).”

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology disagrees that retrieval is a necessary component of the RD&D Permit. 1) NEPA coverage for tank waste retrieval is provided by the *Tank Waste Remediation System, Final Environmental Impact Statement* issued in 1996 and the accompanying Record of Decision issued in 1997; and 2) the RD&D Permit Application, while providing an overview of retrieval activities, clearly states that in Permit Attachment AA, “the retrieval detail for Tank 241-S-109 is presented in RPP-18812, *Tank S-109 Partial Retrieval Functions and Requirements*, and has been submitted to Ecology for approval of the retrieval process.” Therefore, retrieval requirements do not fall under this Draft RD&D Permit that Ecology has provided for public review and comment.

Submittal of the *Tank S-109 Partial Retrieval Functions and Requirements* document to Ecology is required by Tri-Party Agreement Milestone M-45, as detailed in the *Hanford Federal Facility Agreement and Consent Order*. This document provides information and details on transfer lines, transfer components, leak detection and ground water monitoring requirements. The document is not a requirement of the RD&D Permit.

**COMMENTER:**

Andrea Spencer, Acting Director  
Department of Natural Resources  
Confederated Tribes and Bands of the Yakama Nation

**EXECUTIVE SUMMARY**

The pending Permit Application should be denied for four reasons.

First, the Application should be denied because it is contrary to the District Court’s Order in NRDC and Yakama Nation v. Abraham, 271 F. Supp. 1260 (Idaho 2003) (appeal pending). The violation is that the Application would unlawfully allow “highly radioactive waste” (HLW) to be disposed of at Hanford in near-surface burial rather than in a deep geologic repository as required by the Nuclear Waste Policy Act. 42 USC § 10101 et seq.

Second, the Application should be denied because the Nuclear Regulatory Commission (NRC) has not issued a formal determination that the wastes to be processed in the permit application are not high-level radioactive wastes. A June 9, 1997, NRC staff letter (Paperiello, C.J., “Classification of Hanford Low Activity Tank Waste Fraction” Letter to J. Kinzer, ORP, June 9, 1997), which USDOE cites as justification for this project, makes it clear that HLW processing at Hanford “is not sufficient to make an absolute determination at this time.” See Appendix A. A formal NRC determination prior to approval is also required by the NRC disposition for Washington’s and Oregon’s petition for rulemaking in case FRM-60-04 and the NRC staff letter of March 1993 implementing that process. See Appendix B. Approval of the Application would also be contrary to the policy set out in Governor Locke’s May 5, 2004, letter of “careful review by the Nuclear Regulatory Commission” of any tank waste to be “disposed of at Hanford”, and it would be contrary to the positions and hard work of Washington’s U.S. Senators opposing USDOE’s efforts to statutorily reclassify HLW.

Third, the Application should be denied because an Environmental Impact Statement (EIS) has not been prepared and because the Agency's Mitigated Determination of Non-Significance dated July 22, 2004, is insufficient to eliminate the need for an EIS.

Fourth, the Application should be denied because of data discrepancies regarding the radionuclides in tank S-109, and the fact that there has been no National Academy of Sciences guidance on safe disposal practices for waste incidental to reprocessing of spent nuclear fuel in tanks such as S-109.

#### **COMMENT 1: REASON FOR DENIAL #1 – VIOLATION OF COURT ORDER**

The pending Permit Application should be denied because it is contrary to the District Court's Order in *NRDC and Yakama Nation v. Abraham*, 271 F. Supp. 2d 1260 (Idaho 2003) (appeal pending, oral argument October 5, 2004). The application violates the District Court's Order because it would unlawfully allow "high level radioactive waste" to be disposed of in other than a deep geologic repository. 42 USC § 10101(12)(A), 10107.

The radioactive waste in tank S-109 has been judicially determined to be both 1) "highly radioactive material" and 2) to "result from the reprocessing of spent nuclear fuel." *NRDC and Yakama Nation v. Abraham*, 271 F. Supp. At 1265. ("It is undisputed that the waste stored at Hanford, INEEL and Savannah River is highly radioactive and the result of reprocessing"). Such radioactive waste can only be disposed of in a deep geologic repository. *id.* At 1263 ("DOE does not have discretion to dispose of defense HLW [high level waste] somewhere other than a [deep geologic] repository established under the NWPA [Nuclear Waste Policy Act]").

Under the Application, some waste in tank S-109 would be removed, separated from other S-109 waste, bulk vitrified [turned into glass] and permanently buried in a near-surface disposal area at Hanford, rather than in a deep geologic repository. This is lawful only if the bulk vitrified material is no longer "highly radioactive material" 42 USC § 10101(12)(A), §10107.

The Permit Application must be denied because it provides no assurance or process for assuring that the material to be bulk vitrified for disposal in a near surface repository is no longer "highly radioactive material". In other words, this Permit violates the District Court's Order in *NRDC and Yakama Nation v. Abraham* because S-109 waste, which has already been determined to be HLW, would be disposed of at a near-surface burial site without first verifying that the waste in question was no longer "highly radioactive material" and therefore no longer HLW.

The Permit Application should be denied.

At a minimum, consideration should be withheld until the Court of Appeals has ruled in *NRDC and Yakama Nation v. Abraham*, which is anticipated to be within the next six months.

**ECOLOGY RESPONSE:** Ecology disagrees as discussed below.

Ecology disagrees with the commenter's request to deny the Permit Application. The decision by the U.S. Federal Court for the District of Idaho (Idaho District Court) in *NRDC v. Abraham* invalidated the portion of USDOE Order 435.1 that purported to authorize USDOE to classify

high-level radioactive waste as incidental to reprocessing, and to dispose of the waste as low-level or transuranic waste. The court ruled that the Order, as crafted, was inconsistent with the Nuclear Waste Policy Act. On November 5, 2004, the U.S. Court of Appeals for the Ninth Circuit vacated the Idaho District Court's decision and remanded the case with direction to dismiss the action.

In any event, the RD&D Permit is consistent with the Idaho District Court's decision and Ecology's position in the case. The court confirmed that properly retrieved, treated, and solidified waste that no longer contain fission products in sufficient concentrations to require deep geologic disposal are not "high level waste" and may be disposed of in a facility other than a deep geologic repository. Ecology's views concerning whether Hanford's tank wastes may appropriately be disposed of on-site have long been informed by the Nuclear Regulatory Commission letter of 1997 (Paperiello, C.J., "Classification of Hanford Low Activity Tank Waste Fraction", Letter to J. Kinzer, ORP, June 9, 1997) that specifically addressed the issue of low-activity waste (LAW) at the Hanford Site as outlined in the RD&D Draft Permit. Ecology continues to believe that WTP LAW and bulk vitrification LAW, if properly retrieved, treated and solidified, may, consistent with the Nuclear Waste Policy Act, properly be disposed of on-site at Hanford and that such plans are not dependent on USDOE Order 435.1. The Nuclear Regulatory Commission (Paperiello, C.J., "Classification of Hanford Low Activity Tank Waste Fraction", Letter to J. Kinzer, ORP, June 9, 1997) outlined a process of pretreatment and treatment that allowed HLW to be separated into LAW that could be disposed in near surface disposal units. Delaying bulk vitrification testing will result in delaying tank waste cleanup and extending the risk it poses to humans and the environment. This Research, Development & Demonstration facility will vitrify pretreated tank waste. If the Research, Development & Demonstration waste packages are not ultimately accepted for final disposal as low-activity waste at Hanford, the borosilicate glass waste form will be suitable for disposal in a repository or for long-term storage as provided for under the Nuclear Waste Policy Act.

#### **COMMENT 2a: REASON FOR DENIAL #2 – NO PRIOR NUCLEAR REGULATORY COMMISSION APPROVAL**

Prior NRC Approval Required for Application Process – The pending Permit Application should be denied because prior NRC approval has not been obtained. Approval would be contrary to 1) longstanding legal and regulatory requirements for HLW disposal, 2) the policy announced in the attached May 5, 2004, letter of Governor Locke of prior NRC approval, and 3) the hard work of Washington's U.S. Senate delegation this Spring opposing USDOE's efforts to statutorily reclassify HLW.

The following chronology informs the requirement for prior NRC approval and underscores both the regulatory authority of the NRC over HLW disposal and Washington State's efforts to strengthen that authority.

1974 – Under the Energy Reorganization Act (ERA) of 1974. Congress gave regulatory authority for long term storage and disposal of HLW. The NRC definition of high-level waste is at 10 CFR 60.2, (which is consistent with the definition of high-level radioactive waste in 10 CFR Part 50, Appendix F).

1982 – The Nuclear Waste Policy Act of 1982, as amended, (NWPA) reinforced the regulatory authority of the NRC over disposal of defense high-level radioactive wastes, by providing a statutory definition for these wastes, which the USDOE is now aggressively seeking to overturn.

1986 – The NRC explicitly spelled out its regulatory authority to the USDOE in comments on the USDOE draft environmental impact statement (DEIS), Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes by stating:

“...under Section 202(4) of the Energy Reorganization Act of 1974, any facilities expressly authorized for disposal of defense high-level wastes are subject to the licensing and related regulatory authority of the Commission. Whether the express authorization for particular facilities is legislative or administrative in our judgment has no bearing upon the concerns that led Congress to provide for licensing by NRC.”

1989 – In 1989, after withdrawing a rulemaking to establish a concentration-based standard for HLW, the NRC concluded:

“At Hanford, the question of waste classification (and NRC licensing authority) has been complicated by the mixing of waste from various sources over the past 45 years....”

1990 – On December 17, 1990, the states of Washington, Oregon, and the Yakama Nation petitioned the NRC for a rulemaking to amend 10 CFR 60 “to clarify the definition of HLW and the definition of a HLW facility.” The petition was made because of the high degree of uncertainty regarding characterization of HLW in Hanford tanks; and because of USDOE’s policy, at the time, to defer action on removal and disposition of wastes from Hanford’s single-shell tanks for several decades.

1993 – On February 26, 1993, the NRC denied the petition on the grounds that the existing framework for regulating defense high-level waste disposal was adequate and did not require change. The NRC ruled that the petition was not necessary because its existing regulation of defense HLW disposal was appropriate and comported with historical practice. NRC also found that its regulatory approach provided flexibility, by making incidental waste classifications on a case-by-case basis – using criteria stipulated to USDOE in 1989. Moreover the NRC did not rule it has no regulatory authority.

NRC’s denial did not extend to wastes in Hanford’s single-shell tanks, because their disposition had been deferred by USDOE. The NRC stated, “it should be noted that the appropriate classification of some Hanford wastes remain to be determined – specifically, any single-shell tank wastes, and any empty but still contaminated waste tanks DOE might dispose of in-place for both types of wastes, a case-by-case determination of the appropriate waste classification might be necessary.”

1997 – With the approval of the Commission, the NRC staff entered into a provisional agreement with USDOE for plans to decontaminate and dispose of soluble materials in Hanford’s high-level waste tanks onsite as “incidental” wastes. This provisional staff agreement was based on the processing and disposal of wastes from all of Hanford’s 177 high-Level Waste tanks. Specifically, the agreement was premised on a “Technical Basis Report” submitted by USDOE. This report was based on the Tank Waste Remediation System, which spelled out detailed steps,

involving multiple ion-exchange processes, that were expected to result in the removal of at least 98 percent (98%) of the radioactivity in soluble wastes prior to onsite disposal.

However, the NRC staff made it clear to USDOE in this letter that this provisional agreement did not constitute a formal approval to dispose of these wastes as “incidental” to reprocessing. The 1997 letter specifically states that USDOE’s plan, “is not sufficient to make an absolute determination at this time.” [emphasis added] Furthermore, NRC staff stipulated that, “if the Hanford Tank waste is not managed using a program comparable to that set forth in the Technical Basis Report, or current characterization of tank contents is not confirmed, the incidental waste classification must be revisited by DOE and NRC consulted.”

2001 – In 2001, the NRC staff underscored its regulatory authority to the Commission in June 2001 regarding high-level waste processing at Hanford by stating:

*“From a regulatory perspective, LAW [low activity waste] is still HLW and has high radiation levels requiring handling within shielded structures... Under the present system, unless the NRC determines that this Law/incidental waste is not HLW, the waste must be disposed of as a HLW in a federal repository.”*

2004 – A recent article, soon to be published in a scientific journal at Princeton University, reviewed the processing and disposal of high-level wastes at Hanford. It concludes, among other things, that USDOE is in violation of the 1997 provisional staff agreement. According to this analysis:

- USDOE’s “Accelerated Cleanup Plan” will result in more than twice the amount of radioactivity stipulated by NRC staff in 1997 for onsite disposal as “incidental waste.”
- Tank waste inventories, particularly long-lived and highly toxic transuranic materials, are nearly three times higher than submitted to the NRC in 1997;
- Bulk vitrification, now under consideration for permitting, falls outside of the boundary of “technical Basis Report, which was limited only to the Waste Treatment Plant as designed in 1996;
- USDOE’s waste performance assessment requirements for onsite disposal are not being met.

This chronology, and the documents cited in it, established the basis for the requirement of prior NRC approval before this Permit Application can be considered. Since no NRC approval has been obtained, the Application should be denied or held until such approval has been obtained.

**ECOLOGY RESPONSE:** See Ecology’s response to Comment 1. Although Ecology has encouraged USDOE to consult with the NRC regarding the RD&D facility, USDOE has chosen not to do so. Ecology is persuaded that the performance of the RD&D facility will remain within the parameters outlined by the NRC in its 1993 denial of the Petition for Rulemaking and its 1997 letter to Mr. Kinzer. Therefore, Ecology disagrees with the commenter’s request to deny issuance of the RD&D Permit .

**COMMENT 2b:** Application Contrary to Governor Locke Letter

Governor Gary Locke's May 5, 2004, letter to the Chairman and Ranking Member of the U.S. Senate Committee on Armed Services expressed his opposition to legislation authorizing the USDOE to reclassify high-level radioactive wastes without NRC review. According to Governor Locke:

"Let me be clear: the state of Washington has agreed that "low activity" tank waste, as defined after careful review by the Nuclear Regulatory Commission [emphasis added] and included in our Tri-Party cleanup agreement, can be disposed of at Hanford ... I strongly oppose any congressional attempt to preempt the Ninth Circuit's consideration of issues. Current law does not allow, and Congress should not sanction DOE's claimed authority to unilaterally re-define what is high-level waste and what is not."

Unfortunately, the issuance of a permit by the State Department of Ecology to allow the disposal of high-level wastes from Hanford tank S-109 would allow USDOE to implicitly assume illegal authority to redefine these wastes, in the complete absence of a formal determination by the NRC. A permit from Ecology flies in the face of the policy of Washington's Governor. It also creates a dangerous precedent, which according to Governor Locke, "would allow significant volumes of additional high-level nuclear waste to be disposed at Hanford – near the Columbia River – rather than at a geologic repository as required by current law." The permit Application should be denied.

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter's request to deny issuance of the RD&D Permit as discussed below.

Ecology disagrees with the commenter statement that "The application is contrary to the Governor Locke letter cited. Governor Locke's letter states, "the state of Washington has agreed that "low activity" tank waste, as defined after careful review by the Nuclear Regulatory Commission and included in our Tri-Party cleanup agreement, can be disposed of at Hanford." The waste planned for bulk vitrification subject to this RD&D Permit meets this requirement and falls within the parameters of what Governor Locke indicated the State would accept.

#### **COMMENT 2c: Application Contrary to Washing Senators' HLW Reclassification Position**

Issuance of the Permit Application would also be inconsistent with the strong position taken by Washington's Senators opposing legislative reclassification of HLW by USDOE. Over the past year, the USDOE has been aggressively seeking authorizing legislation in the U.S. Congress to reclassify high-level radioactive wastes as "incidental" for permanent onsite disposal. This is because USDOE intends to dispose of approximately 90 percent (90%) of Hanford's high-level wastes onsite, process the remainder into glass for geological disposal, and permanently close 177 large tanks, and related infrastructure.

As mentioned, Governor Locke and several members of the Washington State Congressional delegation have strenuously opposed USDOE's efforts to change existing law in the Department of Energy National Security Act for Fiscal Year 2005 passed by the U.S. Senate (S. 2403, Section 3116, Defense Site Acceleration Completion).

There was extended debate over a provision offered by Senator Graham (SC) to allow USDOE to redefine high-level wastes for onsite disposal at the Savannah River Plant. Opposition to this provision was led by the Senators Cantwell and Murray, on the grounds that it would set a dangerous precedent and that existing law was adequate to address defense HLW disposal. The provision won on a tie vote of 49 to 49, hardly an overwhelming endorsement for the USDOE. The U.S. House of Representatives did not include such a provision when it enacted a similar bill.

Nonetheless, the provision passed by the Senate requires that any change in definition of high-level wastes at Savannah River be done through rule making and with the approval of the Nuclear Regulatory Commission.

Now it appears that the Department of Ecology is considering issuance of a permit which would be in direct contradiction to the positions taken by the State of Washington's highest elected officials. Doing so would significantly lower the threshold requirements for protection of human health and the environment for this matter of national controversy, by proceeding to permit HLW disposal in the absence of formal approval by the NRC. The June 9, 1997, letter (Paperiello, C.J., "Classification of Hanford Low Activity Tank Waste Fraction" Letter to J. Kinzer, ORP, June 9, 1997) from the NRC staff made it clear that the Commission was not making an "absolute determination" through a staff-level agreement.

The issuance of a permit to allow disposal of high-level wastes by the Department of Ecology undermines the hard fought efforts by Governor Locke, and Washington's Senators to prevent an irreversible precedent from being created by allowing USDOE to unilaterally determine that high-level wastes can be disposed of in near surface burial.

The situation is clear: The Department of Ecology's authority is limited to non-radioactive hazardous materials. Ecology does not have legal authority over disposal of radioactive constituents in high-level radioactive wastes. The Energy Department does not have this authority, and any such determination of 'waste incidental to reprocessing' rests with the NRC. Current legislation passed by the U.S. Senate to reclassify HLW, which was hotly contested by Washington's Senators requires a significantly higher standard than being applied by the Department of Ecology – namely NRC approval. Issuance of the subject permit by Ecology would effectively undermine efforts by the Governor and Washington's U.S. Senators to prevent self-regulation by USDOE for critical HLW disposal decisions.

The Permit Application should be denied.

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter's request to deny issuance of the RD&D Permit as discussed below.

See Ecology's response to Comments 1, 2.a, and 2.b. Ecology disagrees with the commenter's statement that, "the Application is contrary to Washington Senators' HLW reclassification position regarding S. 2403, Section 3116 of the Department of Energy National Security Act for Fiscal Year 2005." Washington's concern about S-2403 was that USDOE would use it as a basis for leaving unretrieved, untreated tank waste in place, rather than removing it from Hanford's tanks and converting it to a more stable form via vitrification. The waste to be treated in the demonstration will be treated in a manner consistent with the U.S. Nuclear Regulatory

Commission letter from Carl J. Paperiello, Director Office of Nuclear Material Safety and Security, to Jackson Kinzer, Assistant Manager, Office of Tank Waste Remediation System, U.S. Department of Energy, Richland Operations Office (June 9, 1997). The NRC agreement was provisional because the Performance Assessment was interim and because USDOE had not yet conducted the proposed program. The NRC listed changes that would necessitate USDOE re-evaluation and further consultation with NRC. Since 1997, USDOE has submitted updated Performance Assessments to the NRC<sup>1,2</sup> and the planned treatment and immobilization of the S-109 waste is comparable to the program set forth in the Technical Basis Report.

### **COMMENT 3: REASON FOR DENIAL #3 – NO EIS**

Second, the Application should be denied because an EIS has not been performed. Washington law generally requires an EIS to be performed in situations like this. WAC 197-11-010 et. seq. A Mitigated Determination of Non-Significance can eliminate the need for an EIS unless the “proposal continues to have a probable significant adverse environmental impact, even with the mitigations measures.” In such cases an EIS is still required.

In this matter a Mitigated Determination of Non-Significance was issued on July 22, 2004. The mitigation measures in that document are insufficient to negate the “probable significant adverse environmental impact” from disposing of S-109 tank waste at Hanford. Furthermore, the District Court in *NRDC and Yakama Nation v. Abraham* determined that the waste in all of the tanks at Hanford, including S-109, was “high level radioactive waste.” In light of that judicial determination, mitigation measures in the Mitigation Determination of Non-Significance under WAC 197-11-250(2) cannot eliminate the need for an EIS. The Mitigated Determination of Non-Significance is legally insufficient to justify non-performance of an EIS.

The Permit Application should be denied.

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter’s request to deny issuance of the RD&D Permit as discussed below.

First, the Idaho District Court ruling that the comment relied upon was overturned by the Ninth Circuit Court of Appeals as previously noted in responses to other comments by this commenter. State of Washington SEPA regulations require Ecology to review the proposal and determine if an Environmental Impact Statement is required. Ecology performed the determination and issued a Mitigated Determination of Nonsignificance, based upon planned mitigation measures included in the design of the DBVS.

The Department of Ecology respectfully disagrees with the premise that an Environmental Impact Statement is required to evaluate the action to issue a dangerous waste Research,

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<sup>1</sup> Letter, *Submittal of March 1998 Report, Hanford Immobilized Low-Activity Tank Waste Performance Assessment*, J.E. Kinzer, Assistant Manager, Tank Waste Remediation System, U.S. Department of Energy, to C.J. Paperiello, Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, dated August 28, 1998

<sup>2</sup> Letter, *Submittal of Annual Summary of ILAW Performance Assessment, DOE/ORP-2000-19, Rev. 0*, Richard T. French, Manager, Office of River Protection, U.S. Department of Energy to Carl J. Paperiello, Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, dated July 13, 2000

Demonstration and Development Permit for the Demonstration Bulk Vitrification System under WAC 173-303-809. As will be explained in greater detail below, the Permit will be issued for a design that incorporates several different engineering features to protect against significant adverse impacts to the environment and human health from releases to the environment. In addition, the Permit requires the operator to conduct operations in such a manner as to be protective of the environment.

The Draft Research, Demonstration and Development Permit does not govern the disposal of the vitrified waste form. The Permit is for treatment and storage. Permit condition II.B.7.b requires that the Waste Analysis Plan develop a sampling approach for the final vitrified waste form to ensure compliance with the waste acceptance criteria of the Integrated Disposal Facility or another permitted disposal facility and the land disposal restrictions listed in WAC 173-303-140. It also requires the Permittee to develop waste feed limitations that will result in the final vitrified waste form meeting the IDF or another permitted disposal facility's waste acceptance criteria and in addition, meeting the performance standards for offgas emissions.

- Permit Condition I.A.1 limits the 241-S-109 waste to be accepted to waste that does not exceed the criteria listed in Permit Attachment BB and Tables V.7 and V.8.
- Permit Condition II.A.7 requires the USDOE and CH2M HILL to design and build the DBVS designs, plans, and specifications required by the Permit and approved by Ecology.
- Permit Condition II.B requires that the USDOE and CH2M HILL maintain knowledge of their wastes before it is accepted into the DBVS Facility, when it is received for treatment, and during treatment and storage of the treated waste form.

Permit Condition II.B.7.b requires the Permittees to modify their Permit Application to develop a sampling approach that will ensure compliance with the waste acceptance criteria of the Integrated Disposal Facility or another permitted facility. That condition also requires them to develop waste feed limitations that will result in the vitrified waste form meeting the IDF acceptance criteria.

As part of SEPA's environmental review, Ecology also evaluated the proposal against the alternatives and impacts in the *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement* (DOE/EIS-0189, August 1996). Ecology sought to determine whether "all or part of the proposal, alternatives, or impacts have been analyzed in a previously prepared environmental document, which can be adopted or incorporated by reference." See WAC 197-11-30(2)(a). The TWRS EIS addressed the final remediation of 177 underground storage tanks and 60 miscellaneous underground storage tanks (TWRS EIS Volume 2, Appendix B, page B-27). In those tanks were approximately 56 million gallons of radioactive mixed waste in the form of liquid, solids in the form of crystallized salts, and sludges.

The TWRS EIS analyzed the impacts of retrieving tank waste and treating it through a suite of alternative treatment technologies. Among the alternatives that the TWRS EIS evaluated were several that evaluated the impacts to human health and the environment from tank waste treatment and disposal outside of the tanks (ex-situ treatment). See TWRS, Volume 1, Section 3.4.6 Ex Situ Intermediate Separations, Section 3.4.7 Ex Situ No Separations, 3.4.8 Ex Situ

Extensive Separations, and Section 3.4.9 Ex Situ/in Situ Combination 1 and 2 Alternatives. The ex-situ alternatives that the TWRS EIS evaluated allowed for separation of the tank waste into high-level waste and low-activity waste (LAW) components to “minimize the waste volume requiring offsite disposal” (TWRS EIS Volume 2, Section B.2.1.1.1, page B-29).

The TWRS EIS evaluated two waste forms resulting from ex-situ treatment, glass that was cast in monoliths and cullet that was formed by quenching the molten glass into gravel (TWRS EIS Volume 1, Section 3.4.1.5, page 3-36). Ex situ alternatives also included opportunities to separate into high-level and low activity fractions (TWRS EIS Volume 2, Appendix B, Section B.2.1.1.1, page B-29). Section B.3.5.3 provided a summary of the tank treatment process that included a step to separate the LAW from the HLW and another to dispose of the LAW onsite.

TWRS EIS Volume 1, Section 5.0 Environmental Consequences documents the analyses of the potential impacts to the environment from implementing each of the alternatives described in TWRS EIS Section 3.0, for 20 separate environmental components. Complex impact assessments were prepared for human ecological health (Volume 3, Appendix D), potential accidents (Volume 4, Appendix E), groundwater quality (Volume 4, Appendix F), Air Quality (Volume Five, Appendix G), and socioeconomic impacts (Volume 5, Appendix H). The environmental consequences of the ex-situ alternatives all assumed that 99% of the total volume of waste would be retrieved from the tanks and the LAW treatment plant would produce 200 metric tones of LAW glass cullet per day.

The Permittees proposed to conduct their RD&D effort using less than 1% of the total tank waste volume, which is to be retrieved from Single Shell Tank 241-S-109. They proposed to vitrify up to 50 containers of waste combined with glass forming agents; however, the system will be constructed and operated to vitrify a single container per campaign. After review of the TWRS EIS alternatives and their impacts, Ecology deemed the TWRS EIS to contain more than sufficient information about ex-situ vitrification to support the determination of non-significance assigned to the DBVS RD&D effort.

#### **COMMENT 4a: Lack of Adequate Waste Characterization Data**

There are significant discrepancies in the data officially used by the USDOE, Washington State Department of Ecology and the EPA to inform decisions and changes in the Hanford Tri-Party environmental compliance agreement. These data are assembled into the Tank Waste Inventory Network System (TWINS), which are maintained by PNNL and are analyzed by CH2M HILL for the implementation of its contract work. The TWINS data are cited in regulatory documents as USDOE’s “best estimate” of the radioactive and non-radioactive constituents in Hanford’s 177 tanks.

There appears to be major discrepancies in the data being used by the Department of Ecology to consider a permit for the disposal of high-level wastes from tank S-109. Based on data recently provided by the Department of Ecology, Tank S-109 is estimated to contain a total of 43,600 curies of cesium-137 and 49,600 curies of strontium-90. However, it is not clear if this estimate includes the highly radioactive decay products of cesium-137 (Cs-137) and Sr-90 (barium 137m, and Yttrium-90) which must be added to the total, as they are in equilibrium, and would be disposed of as well.

**ECOLOGY RESPONSE:** Ecology provides clarification as discussed below.

Significantly more has been learned about the tank waste and its processing since the National Academy of Sciences (NAS) report in 1996. The waste to be treated under this Permit Application (i.e. only the saltcake fraction from Tank 241-S-109) will be a homogeneous solution that will be sampled and analyzed prior to being fed to the bulk vitrification system.

Permit Attachment BB, Table 6-4 in the permit documentation did (for simplification) omit the daughter radioisotopes of Ba-137m and Y-90. However, the process flow sheet and process design take into account daughter radioisotopes and all the species in the Best Basis Inventory maintained on Tank Waste Information Network System. Thus, the technical specifications and safety of the project are not impacted.

The Draft Research, Demonstration and Development Permit does not govern the disposal of the vitrified waste form. The Permit is for treatment and storage. Permit condition II.B.7.b requires that the Waste Analysis Plan develop a sampling approach for the final vitrified waste form to ensure compliance with the waste acceptance criteria of the Integrated Disposal Facility or another permitted disposal facility and the land disposal restrictions listed in WAC 173-303-140. It also requires the Permittee to develop waste feed limitations that will result in the final vitrified waste form meeting the IDF or another permitted disposal facility's waste acceptance criteria and in addition, meeting the performance standards for offgas emissions.

**COMMENT 4b: Lack of Adequate Waste Characterization Data**

Based on the September 2003 iteration of the TWINS data the total amount of Cs-137 and Sr-90 with decay products is 92,700 curies and 121,000 curies respectively. Thus, there appears to be more than twice the amount of Cs-137 and Sr-90 and their decay products than the amount documented by USDOE in the Permit Application. Some of this discrepancy could be due to radioactive decay. However, the failure to include decay products of Cs-137 and Sr-90 deserves further explanation and may impact the technical specifications and safety of this proposed project.

The preponderance of sampling data used to characterize Hanford's HLW, including Tank S-109, was done primarily to address the safety of stored wastes and is of limited value for treatment and disposal. According to the National Academy of Science (NAS), "while the sampling of the gas phase above the residues and analysis of one or two cores of residues per tank is useful to satisfy questions relating to possible safety issues, it is little value in designing chemical remediation processing, particularly if the horizontal heterogeneity is extensive."

There remain major uncertainties relative to the accuracy of tank characterization data. There are several forms and layers of wastes, which are, according to the NAS, "heterogeneous in all phases, both within a given tank and among different tanks."

There also remain major uncertainties relative to the accuracy of tank characterization data. For instance, estimates of the total amount of plutonium in Hanford HLW tanks vary widely. Based on these data, plutonium inventories estimates range from 26,000 Curies (390 Kilograms) to

69,100 curies (1,036.5 kilograms) -- a discrepancy of about 646 kilograms -- enough to fuel roughly 110 Nakasaki-size atomic bombs.

There are even greater discrepancies in estimates for transuranic elements in Hanford tanks, which include plutonium, neptunium, americium and curium that have very long half-lives. They range from 131,000 curies to 353,000 curies a discrepancy of 270%.

Based solely on these data discrepancies, the Permit Application should be denied.

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter's request to deny issuance of the RD&D Permit as discussed below.

The difference in the Tank Waste Information Network System data and the Permit Application is due to the fact that the permit inventory is based on the saltcake contents that are to be retrieved and do not include the sludge portion of Tank 241-S-109 that will not be retrieved for this demonstration.

It should also be noted that the Cs-137 content (and therefore the Ba-137m content) of the transferred waste will be monitored so that radioactive waste not meeting acceptance criteria can be sent to the Hanford double-shelled tank system (DSTs) rather than the Demonstration Bulk Vitrification System. This is one safeguard against possible impacts of waste inhomogeneity.

In addition, the waste solution will be directed to a staging tank, not directly to the Demonstration Bulk Vitrification System. The staging tank will be sampled before any liquid goes to the Demonstration Bulk Vitrification System for vitrification. Any waste that does not meet the acceptance criteria will be sent to the DSTs. Thus, the waste characterization is not the final determining factor in process operation.

#### **COMMENT 4c: Need for Review by the National Academy of Science**

The safety and operability of this project is highly dependent on knowledge of physical and chemical properties of the wastes. However, as mentioned previously, the National Research Council finds that Hanford waste data "is of little value in designing chemical remediation processing." In light of these uncertainties, world-wide high-level waste vitrification experience encourages extraordinary caution be exercised at Hanford.

Given the major uncertainties in HLW characterization, the issuance of a permit to dispose of high-level wastes onsite from Hanford Tank S-109 should be based on an independent, rigorous, scientific and technical review of the disposition of USDOE high-level radioactive wastes. Such a review should be done by the NAS. Both the U.S. Senate and House of Representative have passed legislation, now in Conference, requesting an NAS review -- in light of the controversy over USDOE's attempts to self-regulate disposal of high-level radioactive wastes.

Otherwise, the Department of Ecology will be taking an unacceptable risk by approving a project on potentially flawed data and technical assumptions. Over the past several decades, the USDOE and its predecessors have repeatedly embarked on deploying unproven disposal technologies which turned into expensive failures.

The Permit Application should be denied. Protecting, at a minimum, the interests of the State's citizens and resources, a review by the NAS should be completed prior to any decision regarding high level radioactive waste reclassification, and until their recommendations can be implemented.

**ECOLOGY RESPONSE:** Ecology disagrees with the commenter's request to deny issuance of the RD&D Permit as discussed below.

Actinide uncertainties are not relevant to the RD&D Permit. Actinides, such as plutonium, primarily exist as insoluble solids in the sludge at the bottom of the tank. In accordance with the 1997 NRC letter (Paperiello, C.J., "Classification of Hanford Low Activity Tank Waste Fraction" Letter to J. Kinzer, ORP, June 9, 1997), the dissolved S-109 saltcake waste will undergo a liquids/solids separation to remove insoluble actinides and Sr-90 prior to the liquid being fed to bulk vitrification. The radionuclides thus removed will ultimately be fed to the high-level waste vitrification feed stream.

The RD&D Permit is not for disposal of high-level waste or disposal of any waste on site. The Permit is for a Research, Development & Demonstration facility to test treatment of pretreated Tank 241-S-109 waste. Disposal of the treated product from this Research, Development & Demonstration facility is subject to the requirements of a disposal facility permit and waste acceptance criteria.

National Academy of Science (NAS) committees have previously reviewed USDOE's tank waste treatment plans several times. (Several NAS Committee reviews have been performed regarding the disposition of USDOE HLW. Examples include: The Hanford Tanks: Environmental Impacts and Policy Choices; Risk Based ... for defining needs/Hanford tanks example; Alternative High-Level Waste Treatments at the Idaho National Engineering and Environmental Laboratory [INEEL]; SRS Salt Processing.) A common theme in most of those reviews is support for 1) consideration of multiple options for disposition of high-level waste, including pretreatment and production of both immobilized high-level waste and immobilized low-activity waste fractions, 2) development, testing, and analysis of alternatives, including pilot-treatment plants. Pursuit of Research, Development & Demonstration facility to evaluate the performance, cost, and risks of a proposed alternative is consistent with recommendations previously received from the NAS reviews.

This Research, Development & Demonstration facility will vitrify pretreated tank waste. If the Research, Development & Demonstration waste packages are not ultimately accepted for final disposal as low-activity waste at Hanford, the borosilicate glass waste form will be suitable for disposal in a repository or for long-term storage as provided for under the Nuclear Waste Policy Act.

# **PERMIT ATTACHMENT 1**

## **Introduction – Section 1.0 of the Permit Application**

**Permit Number: WA 7890008967**

The following listed documents are hereby incorporated, in their entirety, by reference into this Permit. Some of the documents are excerpts from the Permittees' DBVS Facility Research, Development, and Demonstration Dangerous Waste Permit Application dated May 10, 2004 (document #04-TED-036); hereafter called the Permit Application. Ecology has, as deemed necessary, modified specific language in the attachments. These modifications are described in the permit conditions (Parts I through V), and thereby supersede the language of the attachment. These incorporated attachments are enforceable conditions of this Permit, as modified by the specific permit conditions.

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1 **1.0 INTRODUCTION**

2 **1.1 REGULATORY BASIS**

3 This application for a Research, Development, and Demonstration (RD&D) Permit is submitted  
4 to the Washington State Department of Ecology (Ecology) pursuant to the provisions of U.S.  
5 Environmental Protection Agency (EPA) Regulation Title 40 *Code of Federal Regulations*  
6 (CFR) Section 270.65; Section 173-303-809 of the *Washington Administrative Code (WAC)*;  
7 and the EPA Office of Solid Waste and Emergency Response (OSWER) "*Guidance Manual for*  
8 *Research, Development, and Demonstration Permits under 40 CFR Section 270.65*"  
9 (OSWER Guidance Manual; EPA/530-SW-86-008).

10 The purpose of the RD&D Permit is to ensure the testing of experimental and innovative  
11 hazardous waste treatment alternatives to land disposal in a manner that is fully protective of  
12 human health and the environment. An RD&D Permit also has the purpose of determining the  
13 efficacy and performance capabilities of the technology or process and the effects of such  
14 technology or process on human health and the environment (WAC 173-303-809). The RD&D  
15 process allows testing and demonstration of innovative and experimental waste treatment  
16 technologies and processes that are not currently subject to activity standards under existing  
17 federal or state regulations.

18 **1.2 FACILITY OWNER AND OPERATOR INFORMATION**

19 The Test and Demonstration Facility will be owned and operated by the U.S. Department of  
20 Energy (DOE), Office of River Protection (ORP). ORP will have responsibility for all  
21 administrative, operational, regulatory compliance, and other responsibilities associated with  
22 activities under the proposed RD&D Permit. All activities will be conducted at the Hanford Site,  
23 Richland, Washington (Figure 1-1). The EPA identification number is WA7890008967, which  
24 covers the entire Hanford Site. The RD&D Permit will be a separate permit from the Hanford  
25 Site-Wide Final Status Permit. The Test and Demonstration Facility will be managed and co-  
26 operated by CH2M HILL Hanford Group, Inc. (CH2M HILL) for ORP under contract  
27 DE-AC27-99RL-14047.

28 **FACILITY NAME**

29 Bulk Vitrification Test and Demonstration Facility  
30 U.S. Department of Energy Hanford Site  
31 River Protection Project, Tank Farms

32 **FACILITY LOCATION**

33 Benton County, Washington; within the 200 Area of the Hanford Site

34 **OWNER/OPERATOR**

35 U.S. Department of Energy  
36 Office of River Protection  
37 P.O. Box 450  
38 Richland, Washington 99352

1 **FACILITY MANAGER/CO-OPERATOR**

2 CH2M HILL Hanford Group, Incorporated  
3 P.O. Box 1500  
4 Richland, Washington 99352

5 **1.3 BACKGROUND INFORMATION**

6 ORP has created aggressive initiatives to accelerate the closure of single-shell tanks (SSTs)  
7 containing mixed radioactive and dangerous waste at the Hanford Site. To meet the *Hanford*  
8 *Federal Facilities Agreement and Consent Order* (HFFACO) (Ecology et al. 1989) requirements  
9 for completing retrieval of SSTs by 2018 and completing tank waste treatment by 2028  
10 (M-45-00 and M-62-00), ORP is evaluating optimizing the Hanford Site Waste Treatment Plant  
11 (WTP) high-level waste (HLW) and low-activity waste (LAW) vitrification in addition to  
12 treating waste using supplemental technologies.

13 ORP contracted with vendors in fiscal year 2003 to provide engineering design and testing on  
14 simulated LAW to support analysis and selection of appropriate supplemental technologies.  
15 Further testing using Hanford tank waste is needed to provide data for waste form qualifications,  
16 risk assessments, and performance assessments for treatment and near-surface land disposal of  
17 LAW. This RD&D permit application is for the Demonstration Bulk Vitrification System  
18 (DBVS) and its associated Waste Retrieval System (WRS).

19 **1.4 PURPOSE OF TEST AND DEMONSTRATION PROJECT**

20 Implied in the term "RD&D" is that operation of a given treatment system will demonstrate that  
21 the treatment has justifiable potential for full-scale operation. That is, a successful  
22 demonstration of the treatment should yield results that provide insight and direction to the  
23 development of full-scale system design and operations.

24 The Test and Demonstration Facility will be used to evaluate: the ability to produce  
25 immobilized LAW (ILAW) that is equivalent to WTP ILAW; the compatibility of the  
26 technology with actual tank waste; the safety, efficiency, and potential cost-effectiveness of the  
27 bulk vitrification process; and the feasibility for full-scale application. This project is designed  
28 to investigate requirements for feed material handling, equipment operation, residual material  
29 handling, production and control of secondary wastes, and potential environmental impacts  
30 associated with the process.

31 The planned experimental test activities described in this permit application include the  
32 construction, operation, and closure of the Test and Demonstration Facility that will consist of  
33 the DBVS and the WRS. Construction and operation of the facility are described in Section 2.0.  
34 An equipment process description of the DBVS, the WRS and associated support facilities are in  
35 Section 4.0. Closure is described in Section 11.0.

36 Source, special nuclear and by-product materials, as defined in the *Atomic Energy Act of 1954*,  
37 are regulated at DOE facilities exclusively by DOE acting pursuant to its AEA authority. These  
38 materials are not subject to regulation by the State of Washington under the Washington

1 "Hazardous Waste Management Act," the federal *Resource Conservation and Recovery Act of*  
2 *1976* (RCRA), or any other relevant provision of law.

3 Where information regarding processing, packaging, management, and disposal of the  
4 radioactive source, byproduct material and/or special nuclear components of mixed waste (as  
5 defined by the *Atomic Energy Act of 1954*, as amended) has been incorporated into this permit, it  
6 is not incorporated for the purpose of regulating the radiation hazards of such components under  
7 the authority of this permit modification nor Chapter 70.105 *Revised Code of Washington*  
8 (RCW), but is only presented for general knowledge in support of the project discussion.

## 9 **1.5 PROJECT OBJECTIVES**

10 The project objective is to determine that the bulk vitrification product (i.e., ILAW) will meet  
11 applicable disposal requirements. The test project and individual campaigns conducted under  
12 this project are designed to:

- 13 • Provide direct experimental verification of whether or not bulk vitrification is suitable for  
14 full-scale treatment of WTP pretreated mixed LAW.
- 15 • Determine any equipment or treatment requirements not recognized by testing conducted to  
16 date.
- 17 • Determine the potential range of feed material characteristics, treatment rates, process  
18 operating conditions, and other parameters compatible with successful waste treatment.
- 19 • Determine the optimum process operating conditions for successful waste treatment at  
20 maximum feed rates.
- 21 • Determine optimal process operating conditions with respect to operating and maintenance  
22 labor requirements, utility/feed additive consumption, and environmental impact.
- 23 • Develop a qualifications approach for the final vitrified waste form to ensure compliance  
24 with waste acceptance criteria of the Integrated Disposal Facility (IDF) and EPA/Ecology  
25 Land Disposal Restrictions (LDR).
- 26 • Gather data for use in determining whether or not scale-up to full-scale operation is feasible  
27 on actual tank waste.
- 28 • Gather data for use in finalizing full-scale system design and operational requirements.
- 29 • Determine whether or not LAW can be immobilized in a waste form that is equivalent to  
30 WTP ILAW.
- 31 • Gather data to determine whether or not the DBVS can meet applicable environmental  
32 regulations in a full-scale production facility, including emission standards.
- 33 • Gather data for design to enhance decontamination and decommissioning and closure of a  
34 full facility.
- 35 • Develop waste minimization procedures for operation of the bulk vitrification equipment.

1 Draft Test Matrix and Objectives Tables that identify an approach to meet these objectives are  
2 provided in Appendix A. This table is under development by ORP and Ecology and is presented  
3 for information purposes only.

## 4 **1.6 JUSTIFICATION FOR PROJECT**

### 5 **1.6.1 Requirement for Use of Innovative and Experimental Processes**

6 Pursuant to 40 CFR 270.65(a) and WAC 173-303-809(1), an RD&D permit is justified only  
7 when the requesting entity proposes to employ “innovative and experimental hazardous  
8 (dangerous) waste treatment technology or process for which permit standards for such  
9 experimental activity has not been promulgated...”(WAC 173-303-809(i)).

### 10 **1.6.2 Compliance with Requirement**

11 While waste vitrification has established an operating history with other types of waste, it has not  
12 been applied to in-container treatment of actual Hanford tank waste on a pilot- or full-scale basis.  
13 In-container treatment (i.e., DBVS) and subsequent land disposal of the resulting ILAW  
14 represent an innovative approach that minimizes treated waste handling. It is anticipated that  
15 waste treatment can be optimized to produce ILAW that is equivalent to the WTP ILAW.

### 16 **1.6.3 Equipment Design and Operational Considerations**

17 The waste feed for the DBVS is Hanford tank waste from Tank 241-S-109 that has both  
18 dangerous waste and radioactive waste components. The design, operation, and maintenance of  
19 processing equipment must be adapted to this environment. The following are innovative  
20 aspects of the planned project:

- 21 • Conduct of waste handling and processing to minimize worker exposure (as low as  
22 reasonably achievable [ALARA]).
- 23 • Placement of controls, drive mechanisms, and feed addition points outside of radiation  
24 control provisions to minimize potential contamination, thereby minimizing hazardous and  
25 radioactive waste upon closure (waste minimization).
- 26 • Modification of system operational and maintenance requirements to accommodate remote  
27 manipulation and/or access by personnel wearing protective gear in furtherance of ALARA  
28 principles.
- 29 • Provisions for equipment cleaning and prevention of waste spills beyond those required for  
30 normal nonradioactive material processing (waste minimization and ALARA).
- 31 • The use of an offgas handling system using aqueous and chemical scrubbing to meet best  
32 available control technology (BACT).
- 33 • Methods to enhance decontamination and decommissioning.

### 34 **1.6.4 Treated Waste Packaging**

35 The treated waste produced by the DBVS must be an immobilized material suitable for ultimate  
36 disposal in a dangerous and/or hazardous waste disposal facility permitted by the State of

1 Washington and must meet LDR, including underlying hazardous constituents, for land-disposed  
2 waste. The Waste Analysis Plan (WAP) for verifying LDR compliance is presented in  
3 Section 6.0.

## 4 1.7 PLANNED SCALE OF OPERATION

### 5 1.7.1 Phased Approach

6 Under the planned project, testing will be conducted in two phases with a short period between  
7 phases for equipment and site upgrades, if required. Phase 1 operations will utilize only minimal  
8 amounts of actual tank waste and will be conducted over a one- to three-month timeframe. At  
9 the completion of Phase 1 operations, the DBVS and WRS will be reconfigured for Phase 2  
10 operations.

11 The phases of operation are described as follows:

- 12 • The Phase 1 DBVS and WRS will include all required controls and safeguards for human  
13 health and the environment and will be in compliance with all applicable EPA and Ecology  
14 regulations. Phase 1 will consist of treatment of up to three container loads, each  
15 incorporating up to 1,135 L (300 gal) of tank waste. Simulants (i.e., materials similar in  
16 chemical composition to tank waste) will be added to the waste load along with the glass  
17 formers to create a container load of treated waste. Appendix B contains process flow  
18 diagrams for Phase 1.
- 19 • Phase 2 will consist of treatment of up to 50 container loads of waste (including containers  
20 vitrified in Phase 1); up to 1,135,500 L (300,000 gal) of tank waste could be used in the  
21 DBVS from Tank 241-S-109 (not including liquid added for retrieval). The 300,000 gal is  
22 less than 1% of the 53 million gal of waste stored in Hanford double-shell tanks (DSTs) and  
23 SSTs. Tank waste that does not meet the waste acceptance criteria for the DBVS will be  
24 transferred to the DST system or recycled back to Tank 241-S-109. Tank waste, process  
25 additives, and process control parameters will be varied to establish acceptable operating  
26 process parameters or envelopes. It is anticipated that one container load of material will be  
27 vitrified weekly over one operating year (one operating year will consist of 365 total days of  
28 waste treatment per the OSWER Guidance Manual). The goal of Phase 2 is to optimize the  
29 DBVS performance and operation for full-scale use; LDR; *Hanford Site Solid Waste*  
30 *Acceptance Criteria* (HNF-EP-0063); and the waste acceptance criteria of the receiving  
31 treatment, storage, and disposal (TSD) facility. The 50 containers will be temporarily stored  
32 at the Test and Demonstration Facility during the RD&D project. Upon closure of the Test  
33 and Demonstration Facility, the containers will be transferred to the IDF or another permitted  
34 disposal facility. Appendix B contains process flow diagrams for Phase 2.

35 The sodium oxide concentration in each container load will vary from approximately two  
36 percent (2%) to twenty percent (20%), or the maximum concentration that produces an  
37 acceptable waste form (Table 6-2). Container loads up to 54.4 m<sup>3</sup> (1,920 ft<sup>3</sup>) will be  
38 processed over a range of process additive types and fractions, waste feeds, and a range of  
39 parameter settings in the various campaigns. A campaign is defined as the vitrification of  
40 waste in a container.

1 The DBVS and WRS may be upgraded in Phase 2 to ensure proper performance while  
2 meeting treatment rates and applicable air quality requirements at higher waste  
3 concentrations. Specific changes planned include additional waste storage capacity,  
4 increased process additive storage and handling capacity, and testing to determine optimum  
5 offgas treatment systems.

### 6 **1.7.2 Project Schedule**

7 Figure 1-2 shows the proposed schedule for the RD&D project. Phase 1 is expected to last one  
8 to three months. The interval between the completion of Phase 1 and start of Phase 2 is  
9 approximately three months and is based on the best current estimate of tasks to be performed  
10 during that interval. Operations are expected to last one operating year and may require more  
11 than one calendar year to complete.

### 12 **1.7.3 Evaluation of Nuclear Regulatory Commission Criterion for Low-Activity Waste**

13 The following is for information only. See Section 1.4 for a discussion of what materials are  
14 subject to regulation under *Resource Conservation and Recovery Act of 1976* (RCRA).  
15 HFFACO Milestone M-62-00 requires: "...pretreatment processing and vitrification of Hanford  
16 HLW and LAW wastes," by December 31, 2028. The Bulk Vitrification Demonstration Project  
17 will evaluate the ability to produce satisfactory product in the form of ILAW that meets on-site  
18 waste disposal acceptance criteria. The technical basis for the Bulk Vitrification Facility product  
19 being LAW is identical to the basis for the WTP Nuclear Regulatory Commission (NRC) letter  
20 from C.J. Paperiello to J. Kinzer, RL, "Classification of Hanford Low-Activity Tank Waste  
21 Fraction," dated June 9, 1997. This subject is also discussed in more detail in the letters:  
22 CH2M HILL letter from E. S. Aromi to R. J. Schepens, ORP, "The Application of the Waste  
23 Incidental to Reprocessing to Bulk Vitrification," CH2M-0301927, dated June 2, 2003; and,  
24 Memorandum from R. Schepens to P. F. Dunigan Jr., "Request Approval of Categorical  
25 Exclusion (CX) for the Treatability and Demonstration Testing of Supplemental Technologies on  
26 the Hanford Site," dated December 13, 2003.

27 In brief, the 1997 Agreement between the NRC and DOE (Paperiello 1997) set forth the waste  
28 management program to be used with respect to Hanford Site tank waste. The DOE produced a  
29 Technical Basis Report (*Technical Basis for Classification of Low-Activity Waste Fraction from  
30 Hanford Site Tanks for the Tank Waste Remediation System*, WHC-SD-WM-TI-0699, Rev. 2),  
31 which demonstrated compliance with the three criteria in the 1997 Agreement. The three criteria  
32 are:

- 33 1. "Wastes have been processed (or will be further processed) to remove key  
34 radionuclides to the maximum extent that is technically and economically practical."  
35 Specifics on how this criterion is satisfied will be elaborated on in the subsequent  
36 section.
- 37 2. "Wastes will be incorporated in a solid physical form at a concentration that does not  
38 exceed the applicable limits for Class C (Low-Level Waste) as set out in  
39 10 CFR Part 61." The DBVS will establish that the Bulk Vitrification form does not  
40 exceed the Class C concentrations for low-level waste and will be in compliance with  
41 this criterion.

- 1           3. "Wastes are to be managed, pursuant to the *Atomic Energy Act of 1954*, so that safety  
2 requirements comparable to the performance objectives set out in 10 CFR 61, Subpart  
3 C, are satisfied." The DVBS project will establish waste form performance tests for  
4 the vitrified product to document that it will perform equivalent to LAW for long-  
5 term disposal.

6 **1.7.3.1 Waste Feed Pretreatment.** Current plans and contracts for the WTP LAW treatment  
7 facilities assume pretreatment to meet Criterion One above will be performed in the WTP  
8 pretreatment facility. Table 1-1 contains the NRC basis for the Hanford Site LAW and compares  
9 the 1997 NRC letter, the WTP processes, and how they relate to Tank 241-S-109 saltcake waste  
10 (DOE/ORP-2003-24). It should be noted that with the WTP pretreatment processes (ion  
11 exchange), it is always possible to recycle a waste stream one more time through the ion  
12 exchange columns (but at ever increasing cost per Curie separated) and that separation below the  
13 contract limit is possible in order to optimize the overall facility design and operation. However,  
14 since the WTP pretreatment facility will not be available to pretreat waste for the demonstration  
15 project, waste that was previously pretreated (using ion exchange technology very similar to that  
16 described in the NRC letter) in B Plant in the 1970's will be processed. A simple solids/liquid  
17 separation will be used as required by the NRC letter. In addition, a new technology or method  
18 called "selective dissolution" will be tested to determine its effectiveness with real waste as a  
19 potential additional method of pretreatment during retrieval for the test and demonstration  
20 project. If the bulk vitrification technology is selected for full-scale implementation, the waste  
21 feed will come from the WTP pretreatment facility or as otherwise agreed during the  
22 negotiations required as part of HFFACO milestone M-62-11.

23 For the Bulk Vitrification Test and Demonstration Project, the waste will be managed as  
24 approved in the Technical Basis Report referred to previously and in accordance with the NRC  
25 criteria. The only waste that will be processed will meet the requirement of having been  
26 processed to the extent deemed technically and economically practical in the Technical Basis  
27 Report, and will not exceed the previous agreement for Cs-137. The waste selected for Bulk  
28 Vitrification will contain less than 0.05 curies (Ci) of Cs-137 per liter at a sodium concentration  
29 of 7 M. For the Bulk Vitrification Test and Demonstration Project, the need for simple  
30 solids/liquid separation is reduced because only salt cake waste will be processed. However,  
31 additional solids removal will be required for the Test and Demonstration Project to assist in  
32 removal of the insoluble Sr-90 and transuranic constituents, thereby ensuring equivalency  
33 between the WTP pretreatment process and DBVS and ensuring compliance with the 1997 NRC  
34 letter.

35 Technical information on the history of the waste in Tank 241-S-109 and detailed technical  
36 information on the past processing of the waste, e.g., pretreatment to remove Cs-137, was  
37 detailed by M. E. Johnson in a memorandum titled "Synopsis of Tank 241-S-109 Waste History"  
38 (Johnson 2004). Planned activities during the retrieval of waste include selective dissolution and  
39 simple solids/liquid separation for further pretreatment of the waste to meet NRC criteria.

40 The waste currently contained in Tank 241-S-109 will meet the first NRC criterion discussed  
41 above as follows:

- 1       • Supernatant from a series of SSTs was removed to be processed through cesium ion  
2       exchange at B Plant. The sludge that contains the majority of the strontium and  
3       transuranic wastes remained in the sludge left in the tanks.
  
- 4       • The supernatant was processed through cesium ion exchange at B Plant that removed the  
5       majority of the cesium.
  
- 6       • The supernatant was then processed through the 242-S Evaporator to reduce the volume  
7       prior to transfer to Tank 241-S-109.
  
- 8       • Storage in Tank 241-S-109 resulted in the crystallization of the saltcake with the cesium  
9       remaining in the liquid fraction. This liquid fraction containing the cesium was mostly  
10      removed by saltwell pumping that was completed in June 2001.
  
- 11      • Selective dissolution will be used (on a test basis) to further pretreat the wastes, which  
12      will further reduce the cesium concentration, along with other chemicals. Selective  
13      dissolution is the chemical separation of soluble chemical species (including Cs-137) on  
14      the basis of their solubilities.
  
- 15      • Simple solids/liquid separation will be performed as the waste is removed from the tank.

16   **1.7.3.2 Prior Pretreatment of Tank 241-S-109 Tank Waste.** Tank 241-S-109 first received  
17   waste on December 24, 1952. Tank 241-S-109 was used to store reduction and oxidation  
18   (REDOX) salt waste from December 1952 to February 1974. The REDOX salt waste was  
19   removed from Tank 241-S-109 and processed through the 242-S Evaporator between November  
20   1973 and February 1974. The REDOX salt waste originally in Tank 241-S-109 was  
21   concentrated in the 242-S Evaporator and stored in Tanks 241-S-103, 241-S-105, and 241-S-106.  
22   A heel of REDOX sludge (13,000-gal) and salt waste (66,000-gal) remained in Tank 241-S-109  
23   in February 1974. (Note that recent core samples were not able to reach down to this sludge  
24   layer, but it is assumed to still be present today). Tank 241-S-109 then received concentrated salt  
25   waste from the 242-S Evaporator from February 1974 through September 1974. The feed to the  
26   242-S Evaporator during this period was from numerous SSTs in the 200 East and 200 West  
27   Areas. By September 30, 1974, Tank 241-S-109 was filled with approximately 653,000 gal of  
28   solids (principally saltcake) and 47,000 gal of supernatant. Waste processed through the 242-S  
29   Evaporator included supernatant waste decanted from several tanks that had been processed  
30   through B Plant for cesium removal by ion exchange (Johnson 2004). Strontium and transuranic  
31   wastes are concentrated in the solids that remained in the tanks when the supernatant was  
32   decanted for cesium ion exchange. The supernatant was concentrated in the 242-S Evaporator  
33   and transferred for storage to Tank 241-S-109. During storage the waste crystallized  
34   concentrating the remaining cesium in the interstitial liquid. This is confirmed by the salt cake  
35   core samples taken from the tank. Waste was not added to Tank 241-S-109 after 1974.

36   **1.7.3.3 Pretreatment for Bulk Vitrification Demonstration Project Waste Feed.**  
37   Tank 241-S-109 was recently saltwell pumped (2001) to remove free liquids and likely resulted  
38   in the removal of additional dissolved cesium. The average Cs-137 concentration in the saltcake  
39   is currently 0.009 Ci/L (relative to 7 M sodium) (Best Basis Inventory [BBI] 2001). Additional  
40   pretreatment methods that will be employed during retrieval of the waste include:

- 1           • Cs-137 reduction through selective dissolution during the retrieval process. Selective  
2           dissolution is solubilizing of contaminants that will undergo dissolution when liquid  
3           is added. A description is located in Section 6.2.3.
  
- 4           • Post-retrieval simple solid/liquid separation. This will be accomplished with a  
5           hydroclone solids/liquid separator. Additional information is contained in  
6           Section 4.2.2.
  
- 7

**Table 1-1. NRC Basis for Hanford Site LAW**

1997 NRC Letter, Classification of Hanford Low-Activity Waste Fraction	Waste Treatment Plant Processes	S-109 Saltcake Waste Processes Applicable to Bulk Vitrification Test and Demonstration Facility RD&D Permit
"... a simple solids liquid separation ..."	Filtration: Entrained solids are to be separated using a filter.	Two stage filtration: 1) in-tank pumping above the sludge layer and in-tank solid/liquid separation using settling and selective retrieval (solids in the sludge are not retrieved), 2) out of tank, post retrieval, simple solid /liquid separations
The LAW should be separated using "... single cycle ion exchange removal of cesium-137 from certain wastes..." if the "... <sup>137</sup> Cs concentrations > 0.05 Ci/L" (7 Molar basis).	Cesium separation using ion exchange to an average level of 0.0018 Ci/L to meet disposal system specifications (specification is < 3 Ci/m <sup>3</sup> of <sup>137</sup> Cs in the glass product, see basis below).	Saltcake waste was separated using single cycle ion exchange during the 1970's and 1980's. The waste in S-109 was reduced in Cs concentration in 1974 to a tank average level of less than 0.0086 Ci/L (current BBI for Saltcake waste in tank). Additional separation will be tested as part of the RD&D by a) in-tank Cs-137 reduction through crystallization of the salt solution in the tank that leaves the Cs-137 in the liquid phase which can then be removed separately by, b) Saltwell pumping which removes the higher concentration liquid thus reducing the average Cs concentration remaining in the tank. And finally by c) Cs-137 reduction through selective dissolution during the retrieval process
And the "... wastes will be incorporated in a solid physical form at a concentration that does not exceed the applicable concentration limits for Class C [low-level waste] as set forth in 10 CFR Part 61." Which results in a concentration limit of "4,600 Ci/m <sup>3</sup> "of <sup>137</sup> Cs. The DOE waste management plan was to be, on the average, below 32 Ci/m <sup>3</sup> of <sup>137</sup> Cs.	< 3 Ci/m <sup>3</sup> of <sup>137</sup> Cs. This is based on a surface dose rate limit for the disposal package to meet disposal system specifications and not on waste form performance.	About 22 Ci/m <sup>3</sup> of <sup>137</sup> Cs in glass at 20wt% NaO <sub>2</sub> waste loading while still meeting the surface dose limit for the disposal package to meet disposal system specifications
Vitrified waste form	Vitrified waste form: borosilicate glass	Vitrified waste form: borosilicate glass
Meet disposal performance assessment criteria	Meet disposal performance assessment criteria	Meet disposal performance assessment criteria

1-10

**1.7.4 Total Amount of Waste Processed**

To accomplish the RD&D project objectives at least 757,000 L (200,000 gal), but not more than 1,135,500 L (300,000 gal), of tank waste will be treated. Tank waste storage and treatment limits are proposed in Section 1.7.5.

**1.7.5 Planned Processing Rates**

To ensure the successful acquisition of data during the RD&D project and to ensure that sufficient waste quantities are stored at any given time to meet the required treatment rates of the DBVS, the waste storage and treatment rates noted in Table 1-2 are planned. The treatment rates and quantities represent dangerous waste entering the treatment process prior to mixing with any process additives or soil (i.e., mixer/dryer) and may not be directly reflected in the amount of treated waste produced.

During Phase 1, the amount of waste to be treated in an individual container load is limited to 1,135 L (300 gal) or 1,700 kg (3,745 lb) calculated using a density of 1.29 kg/L (10.75 lb/gal). The Phase 1 hourly waste treatment rate listed in Table 1-2 is derived from the total amount of waste placed in the mixer/dryer divided by the minimum mixer/dryer cycle time of six hours.

**Table 1-2. Proposed Waste Storage Quantities and Treatment Rates**

Project Phase	Waste Storage Quantity	Maximum Monthly Waste Treatment Quantity	Maximum Hourly Waste Treatment Rate
1	4,880 kg (10,750 lb)	4,880 kg (10,750 lb)	285 kg/hr (625 lb/hr)
2	351,090 kg (774,000 lb)	231,700 kg (510,900 lb)	1,205 kg/hr (2,660 lb/hr)

During Phase 2 operations, the amount of waste treated per container will be increased to levels representative of full-scale operation. The maximum hourly treatment rate for this phase will be based on a mixer/dryer of 10,000 L (2,640 gal) capacity and 48.4% fill, resulting in a load volume of 4,840 L (1,280 gal). The corresponding weight of waste in the load is 7,240 kg (15,970 lb). The nominal mixer/dryer cycle time will be 8 hours for waste feed with a nominal 5 M sodium concentration. However, for waste with a higher salt concentration than 5 M sodium (i.e., waste feed solution with less water to evaporate), the mixer/dryer cycle time may be as short as 6 hours. The Phase 2 hourly throughput assumes the 6-hour cycle time will be used, resulting in a maximum expected treatment rate of 1,205 kg/hr (2,660 lb/hr). It is anticipated that up to eight mixer/dryer loads will be placed in each container for vitrification and that four container loads will be treated monthly. The resulting monthly treatment rate is 231,700 kg/month (510,900 lb/month).

Waste storage requirements for the system are directly related to treated waste container size and the frequency of container filling. One mixer/dryer load will contain 7,240 kg (15,970 lb). With up to 8 mixer/dryer loads deposited in one container for vitrification, one container load will contain up to 57,940 kg (127,720 lb). It is planned to allow a storage equivalent of approximately four container loads of tank waste, where two container loads of waste will be available for processing and two container loads of tank waste will be undergoing sampling and

1 analysis. A total waste storage capacity of 351,090 kg (774,000 lb) is planned for Phase 2, based  
2 on capacities of commercially available tanks (Section 2.3.2).

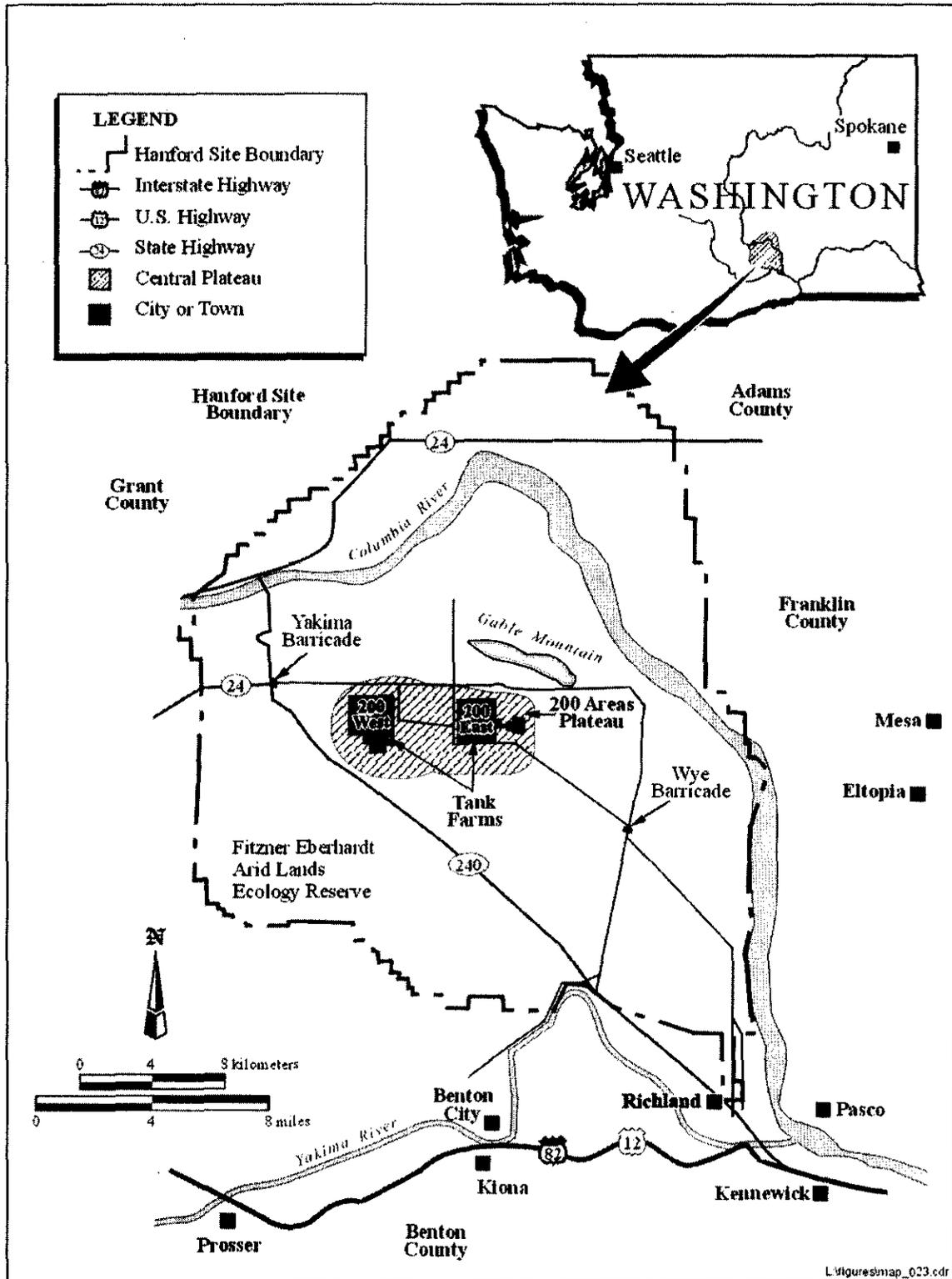
### 3 **1.8 OTHER FACILITY PERMITS**

4 In addition to the RD&D Permit, ORP will apply for and obtain the following permits prior to  
5 facility operation:

- 6 • Emissions Source Construction Permit (Washington State Department of Ecology, Nuclear  
7 Waste Program). If nonradioactive emissions are below permitting thresholds found in  
8 WAC 173-400-102, an exemption from permitting requirements will be requested.
- 9 • Radioactive Emissions Source Construction Permit (Washington Department of Health).
- 10 • National Emissions Standards for the Hazardous Air Pollutants (EPA).
- 11 • Radioactive Air Emissions Notice of Construction Application for a Categorical Tank Farm  
12 Facility Waste Retrieval and Closure: Phase II – Waste Retrieval Operations (Washington  
13 State Department of Health).
- 14 • Criteria & Toxics Air Emissions, Categorical Notice of Construction Application for  
15 Operations of Waste Retrieval Systems in Single-Shell Tank Farms (Ecology).

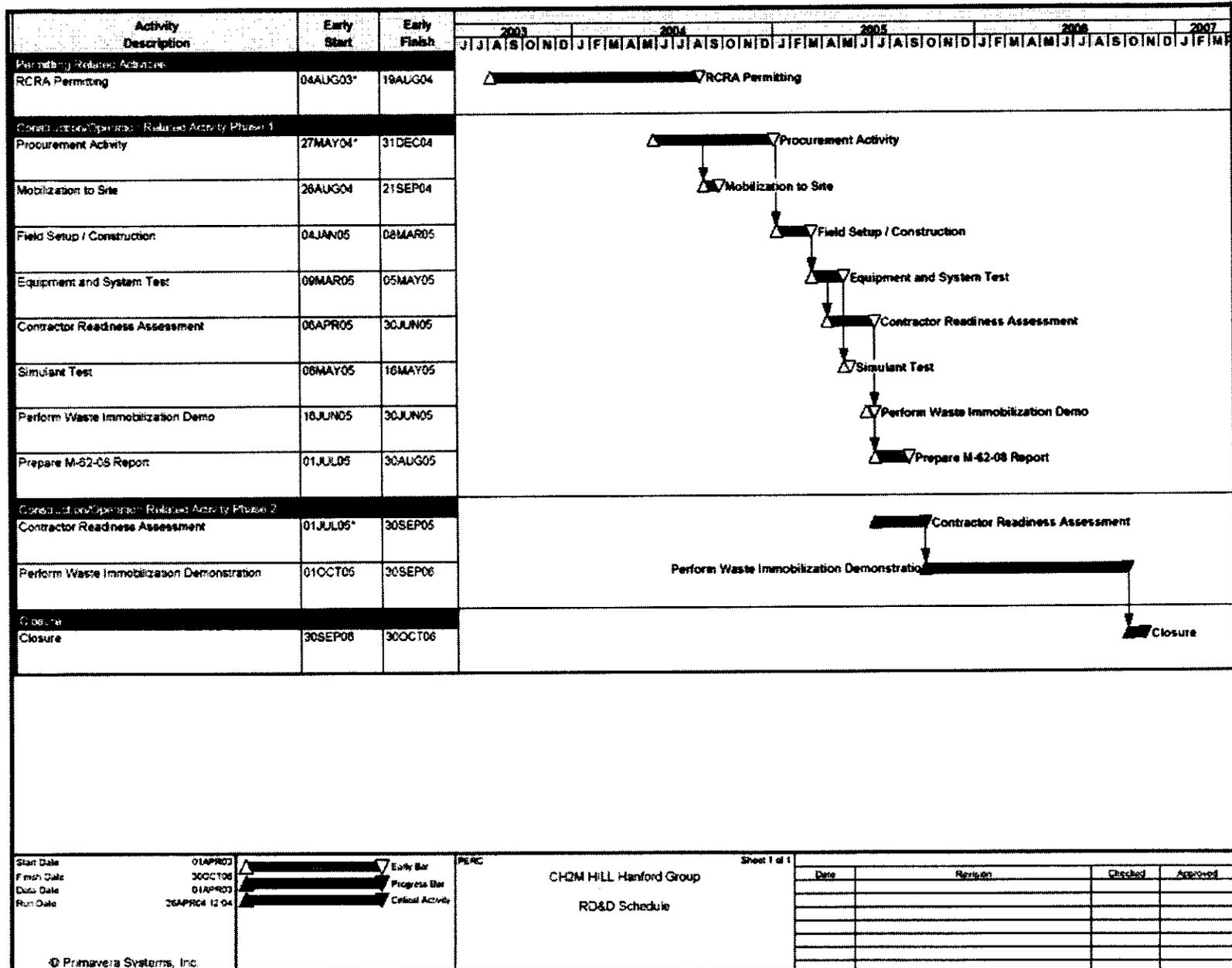
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Figure 1-1. Hanford Site  
OFFICIAL USE ONLY



3

Figure 1-2. Proposed Project Schedule



1-14



# **PERMIT ATTACHMENT AA**

Facility Description – Section 2 of the Permit Application

Permit Number: WA 7890008967

The following listed documents are hereby incorporated, in their entirety, by reference into this Permit. Some of the documents are excerpts from the Permittees' DBVS Facility Research, Development, and Demonstration Dangerous Waste Permit Application dated May 10, 2004 (document #04-TED-036); hereafter called the Permit Application. Ecology has, as deemed necessary, modified specific language in the attachments. These modifications are described in the permit conditions (Parts I through V), and thereby supersede the language of the attachment. These incorporated attachments are enforceable conditions of this Permit, as modified by the specific permit conditions.

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1    **2.0    FACILITY DESCRIPTION**

2    **2.1    FACILITY SITING**

3    The planned site location for the Test and Demonstration Facility is shown in Figure 2-1. The  
4    site is located immediately west of the 241-S Tank Farm in the 200 West Area of the Hanford  
5    Site. The wastes planned for treatment are currently stored in Tank 241-S-109; a 2,839,050-L  
6    (750,000-gal) SST located in the 200 West Area. The waste from Tank 241-S-109 will be  
7    transferred to a waste staging tank and/or waste receipt tank(s) at the planned Test and  
8    Demonstration Facility location after pretreatment.

9    The site is west of the existing 241-S Tank Farm fence in an already disturbed area and will  
10   support process and ancillary equipment for the DBVS. The proposed location allows close  
11   access to existing electrical and raw water utilities, telephone, and Hanford local area network  
12   services. Surface materials consist of soft sand and soil that are free from surface contamination.  
13   The site is sufficiently level to provide for equipment placement with minimum grading or  
14   excavation. Cooper Avenue, running north-south on the west side of the 241-S Tank Farm,  
15   provides ingress and egress to the area.

16   **2.2    PHYSICAL PLANT**

17   The Test and Demonstration Facility (Figures 2-2 and 2-3) will make use of existing  
18   infrastructure to the maximum extent possible. Because of the unit-specific installation,  
19   operational, and closure needs of the DBVS, some infrastructure elements may be modified,  
20   augmented, or added. Potential infrastructure elements include:

- 21       • Utilities (water, electric power, sewer, steam)
- 22       • Communications (telephone and computer)
- 23       • Roadways
- 24       • Radioactive material containment
- 25       • Hazardous material containment
- 26       • Secondary waste storage/transfer systems
- 27       • Treated waste storage/transfer systems.

28   Facility security provisions and signage will comply with applicable portions of  
29   WAC 173-303-310.

30   **2.2.1   Bulk Vitrification System Components**

31   The DBVS consists of trailer-mounted and skid-mounted equipment suitable for field  
32   installation, operation, and removal at the completion of the project. The system includes the  
33   major components, systems, and areas listed below, which are described in detail in Section 4.0.

34

1 The general arrangement of the following components for Phase 1 and for Phase 2 (Figures 2-2  
2 and 2-3) includes:

- 3 • Waste retrieval system
- 4 • Waste staging tank and pumps
- 5 • Waste receipt tanks and pumps
- 6 • Process additive storage/handling
- 7 • Waste feed preparation (mixer/dryer)
- 8 • Vitrification container preparation system
- 9 • In-container vitrification (ICV<sup>®</sup>) system
- 10 • Electrical equipment
- 11 • Offgas treatment system
- 12 • Control and data acquisition system
- 13 • ILAW storage
- 14 • Secondary waste storage and handling (containers or tanks).

### 15 **2.2.2 Support Systems**

16 Support systems are systems that are required to operate the DBVS, but are not directly involved  
17 with the process. The support systems consist of:

- 18 • Control station
- 19 • Personnel contamination control and survey station
- 20 • Personnel rest areas (e.g., lunch room and restrooms)
- 21 • Change room
- 22 • Safety showers and eye wash stations
- 23 • Backup generator.

## 24 **2.3 WASTE CHARACTERISTICS, RETRIEVAL/STORAGE, AND TRANSFER**

### 25 **2.3.1 Waste Characteristics**

26 The waste in Tank 241-S-109 is stratified. In the bottom of the tank is a layer of sludge. On top  
27 of the sludge is a mixed saltcake solid and liquid layer and the top layer is drained saltcake. The  
28 salt cake waste is the source waste material for the Test and Demonstration Facility. Some  
29 characterization of the waste in Tank 241-S-109 was previously conducted. Characterization  
30 results represent the Best Basis Inventory (BBI) for the liquid and saltcake fraction of the tank  
31 waste. A detailed discussion of the waste characteristics is located in Section 6.2.

1 **2.3.2 Waste Retrieval and Storage**

2 The retrieval detail for Tank 241-S-109 is presented in RPP-18812, *Tank S-109 Partial Retrieval*  
3 *Functions and Requirements*, and has been submitted to Ecology for approval of the retrieval  
4 process.

5 There will be a difference in the retrieval of waste from Tank 241-S-109 and its transfer to the  
6 DBVS between Phases 1 and 2 of the program. During Phase 1, waste from Tank S-109 will be  
7 routed through a solids/liquid hydroclone separator and sensing instruments to a staging tank that  
8 will hold 3,780 L (1,000 gal) of material (Figure 2-4). The sensing instruments will provide  
9 process control or waste characterization information. Staging tank discharge will be pumped to  
10 either a DBVS waste receipt tank or, if not suitable for processing in the DBVS, to the DST  
11 system.

12 During Phase 2 the waste will be transferred directly to the waste receipt tanks. The transfer  
13 route will go through the solids/liquid hydroclone separator and sensing instrumentation, but  
14 bypass the 3,780 L (1,000 gal) waste staging tank (Figure 2-4).

15 The Test and Demonstration Facility will accept tank waste into waste receipt tanks with  
16 capacities shown in Table 2-1.

**Table 2-1. Waste Receipt Tank Capacity**

Phase	Number of Tanks	Capacity	Total Capacity
1	1	3,780 L (1,000 gal)	3,780 L (1,000 gal)
2	4	68,140 L (18,000 gal)	272,160 L (72,000 gal)

17  
18 All waste storage tanks and containers including the waste staging tank and waste receipt tanks  
19 will be properly and legibly marked in accordance with the requirements of WAC 173-303-  
20 395(6). Containers will be managed in accordance with the requirements of WAC 173-303-630.  
21 All waste tank systems will comply with the design, installation, and operating requirements of  
22 WAC 173-303-640, as applicable. Tank system materials of construction will be selected with  
23 appropriate consideration for the corrosion potential of the materials stored and process  
24 conditions.

25 Secondary containment will be provided for all tanks in the form of double-walled tankage or  
26 containment structures with sumps. Containment provisions will be designed and constructed  
27 for compliance with WAC 173-303-640(4).

28 During Phase 1, the waste staging tank and waste receipt tank will be double shell tanks or  
29 placed in containment structures with sumps (Figures 2-2 and 2-3). For Phase 2, the waste  
30 staging tank will be bypassed but will either remain in its structure or be removed and  
31 decontaminated in compliance with the Test and Demonstration Facility closure plan (Section  
32 11.0).

1 **2.3.3 Waste Transfer**

2 Waste transfer will be in the form of waterborne salt solution. Waste left in a waste receipt tank  
3 at the end of a campaign may be transferred to another tank and mixed with incoming waste for  
4 processing. A waste transfer line water flush may be made after each batch transfer of waste  
5 feed, as needed. Waste transfer will occur only after verification that all systems are ready for  
6 the transfer/receipt of waste. The vitrification station will be located beneath the dried waste  
7 hoppers for gravity feed of waste to the container. The mixer/dryer, vitrification, cooldown, and  
8 topoff/survey stations will be provided with radiation shielding and spill containment curbs.

9 Secondary containment will be provided for liquid waste transfer operations in the form of hose-  
10 in-hose or pipe-in-pipe transfer lines. Dried waste transfer from the mixer/dryer to the hopper  
11 will have secondary containment. Dried waste transfer from the hopper to the container will be  
12 conducted inside a removable hood sealed to the container top. Cleanup of spills within the hood  
13 will be performed using a containment system.

14 **2.4 TREATED WASTE PACKAGING**

15 Containers of treated waste resulting from the bulk vitrification process will be placed in a  
16 dedicated temporary storage area at the Test and Demonstration Facility site (Figure 2-2) during  
17 the RD&D permit duration. By generating immobilized treated waste directly in the container,  
18 the treatment container also serves as the final disposal container. The storage area will be  
19 designed to hold all containers of treated waste generated during the project. The storage area  
20 will meet the provisions of WAC 173-303-630(7)(c)(i) and (ii) which are applicable for storage  
21 areas that store containers holding only wastes that do not contain free liquids (i.e., the bulk  
22 vitrification waste containers):

23 (i) *The storage area is sloped or otherwise designed and operated to drain and remove*  
24 *liquid resulting from precipitation; or*

25 (ii) *The containers are elevated or are otherwise protected from contact with*  
26 *accumulated liquids.*

27 All containers, handling procedures, and handling equipment will meet the waste acceptance  
28 criteria of the accepting disposal facility. Final disposal of treated waste will be at a permitted  
29 Hanford Site facility.

30 **2.5 NON-REGULATED MATERIALS/SYSTEMS**

31 Information provided in the following sections is general in nature and represents the minimum  
32 considerations for handling of non-regulated materials. Management of specific materials  
33 related to DBVS operation is discussed in Section 4.0.

34 **2.5.1 Potable Water**

35 Water for process use will be transported by tanker truck to the Test and Demonstration Facility.  
36 The water source will provide settled river water or potable water. Backflow prevention will be  
37 provided to prevent the backflow of potable water to the tanker truck by utilizing an air gap as

1 the backflow mechanism, or other approved backflow prevention device, as applicable.  
2 Backflow prevention devices will be Washington State-certified models accessible for inspection  
3 by a water purveyor in a non-radiological zone.

4 Administrative and engineering controls (e.g., scheduled inspections, containment pads and  
5 curbs) will be in place to avoid spillage of water (which could potentially result in the  
6 mobilization of contaminants in the vadose zone).

### 7 **2.5.2 Raw Materials, Process Additives, and Consumables**

8 Raw materials, process additives, and other consumable materials will be stored in tanks,  
9 containers, or bulk storage in the Test and Demonstration Facility (Figure 2-2). Storage and  
10 delivery systems will be designed to accommodate the ingress and egress of trucks delivering  
11 raw materials and consumables. This accommodation may be composed of docks or stockpiles  
12 that allow for ease of loading/off-loading of the materials and consumables. Soil storage may be  
13 provided by a hopper truck with pneumatic conveying of soil to the DBVS during both phases.  
14 For Phase 2, a soil stockpile may be used in lieu of the hopper truck due to the higher usage rate  
15 of soil. Refractory sand will be stored in a stockpile for both phases. Other process additives  
16 will be stored in containers. The design and location of the loading/off-loading areas will be  
17 compatible with existing Hanford Site roadways and/or other roadways added for the planned  
18 Test and Demonstration Facility.

### 19 **2.5.3 Electric Power System**

20 Under normal operating conditions, all electric power for the Test and Demonstration Facility  
21 will be obtained from the Hanford Site grid through a local transformer. A backup generator will  
22 be located at the site to provide power in the event grid power is lost. The backup generator will  
23 have about a 1,200-kilowatt total load rating. The generator will be diesel-powered. A 37,850-L  
24 (10,000-gal) diesel fuel storage tank will be provided for the generator drive motor.

25 The backup generator is capable of powering the Test and Demonstration Facility systems with  
26 480 volt loads on a continuous basis. However, it will be intended only for use in continuous  
27 operation of the offgas treatment system, system pumps, the control system, and other  
28 electrically-operated equipment needed for a controlled system shutdown in the event of a power  
29 outage and achieving full system shutdown until power from the Hanford Site grid can be  
30 restored.

## 31 **2.6 SECONDARY WASTES**

32 A variety of secondary wastes may be generated during the planned project. This section covers  
33 general requirements for management of expected secondary wastes. Details are provided in  
34 Section 4.0.

35 Secondary waste streams such as liquid effluent will be disposed of in the Liquid Effluent  
36 Retention Facility, the Effluent Treatment Facility (ETF), or the 200 Area Treated Effluent  
37 Disposal Facility, as appropriate. Disposition of solid waste streams will be managed in  
38 accordance with HNF-EP-0063, *Hanford Site Solid Waste Acceptance Criteria*, and the waste

1 acceptance criteria of the receiving facility, as necessary. Disposition of secondary liquid  
2 effluent waste streams will be managed in accordance with HNF-3172, *Liquid Waste Processing*  
3 *Facilities Waste Acceptance Criteria*, and the acceptance criteria of the receiving facility, as  
4 necessary.

5 Dedicated tanks will be provided for onsite liquid waste storage pending sampling and transfer to  
6 a treatment facility. It is anticipated that up to ten 68,140L (18,000 gal) tanks may be used. The  
7 actual capacity and number of tanks will be determined during the DBVS project. Tank systems  
8 will comply with the applicable portions of WAC 173-303-640.

9 Storage tank capacity requirements are based on the following assumptions:

- 10 • Dryer condensate = 3.40 gpm x 60 min/hr x 7.9 hr/dryer batch x 8 dryer  
11 batches  $\approx$  12,900 gal
- 12 • Quench blowdown = 2.39 gpm x 60 min/hr x 168 hr/ICV batch  $\approx$  24,100 gal
- 13 • Tri-Mer Scrubber blowdown<sup>1</sup> = 4.29 gpm x 60 min/hr x 200 hr/ICV batch  $\approx$  51,500 gal
- 14 • Total flow to ETF per ICV container  $\approx$  88,500 gal per container.

15 Offgas treatment system equipment designs will comply with the applicable requirements of  
16 WAC 173-400, 173-401, 173-460, WAC 246-247, and ASME AG-1, *Code on Nuclear Air and*  
17 *Gas Treatment*. The design of the gaseous and particulate effluent monitoring system will  
18 comply with ANSI/HPS N13.1, *Sampling and Monitoring Releases of Airborne Radioactive*  
19 *Substances from the Stacks and Ducts of Nuclear Facilities*. The process equipment will  
20 interface with systems that transport secondary waste to appropriate locations.

## 21 **2.7 IGNITABLE, REACTIVE, AND/OR INCOMPATIBLE MATERIALS**

22 In the course of the RD&D project, it is unlikely that tank waste batches will be received that are  
23 incompatible with other materials present in the facility, especially process additives. DOE has  
24 identified flammable/toxic gases as a potential waste incompatibility. Incompatibilities will be  
25 addressed in DOE safety documentation to comply with WAC 173-303-395. Process  
26 knowledge, process history, pertinent literature on waste chemistry and tank history and waste  
27 analysis will be used to address the Dangerous Waste Codes D001 (Ignitability), D002  
28 (Corrosivity), and D003 (Reactivity) for the waste before transfer to the Test and Demonstration  
29 Facility. Verification sampling to document the absence of characteristic codes will be  
30 performed on the first batch of retrieved waste as part of the WRS prior to transfer to the DBVS  
31 waste receipt tank.

## 32 **2.8 OCCUPATIONAL SAFETY AND HEALTH**

33 All buildings, structures, and equipment utilized in the planned project will incorporate design  
34 features that comply with applicable subparts of Occupational Safety and Health Administration  
35 (OSHA) Regulation 29 CFR 1910, "Occupational Safety and Health Standards."

36 <sup>1</sup> Only if used as a backup to the SCR.