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**RESOURCE CONSERVATION AND  
RECOVERY ACT  
40 CFR PART 264, SUBPART J  
NEW TANK CERTIFICATION**

**Prepared For**

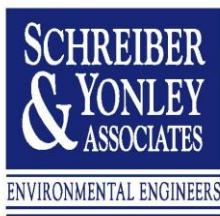
**PERMA-FIX NORTHWEST RICHLAND, INC.  
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RICHLAND, WASHINGTON 99352**

**MARCH 30, 2009**

**Prepared By:**

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**Project No. 070116**



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## **PROFESSIONAL ENGINEERING CERTIFICATION**

Based on the information provided and documented in this report and in accordance with the provisions of 40 CFR 264.192, I certify that the new tank system as described herein, referred to as the Vitrification Tank System and including tanks VT-01, VT-02, and VT-03, is adequately designed and that the tank system has sufficient structural strength to manage the materials to be stored and processed in it. I also certify that, based on the information provided, the materials of construction are compatible with the wastes to be stored and processed in the system and that adequate corrosion protection has been specified and applied to the tank systems.

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision according to a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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## **1.0 INTRODUCTION**

Perma-Fix Northwest Richland, Inc (PFNW) owns and operates a mixed waste management facility located in Richland, Washington. Appendix A contains maps of the facility location. This facility manages various types of mixed waste materials (radioactive and hazardous wastes) through numerous processes as described in the hazardous waste facility permit. One of these processes involves the tank and blending system associated with the waste vitrification system. In short, the vitrification system utilizes electrical current to destroy certain combustible compounds (i.e., organics) while capturing the non-combustible portions (i.e., metals) in a molten glass mixture. This molten glass mixture is later removed from the process, allowed to cool, and then managed for disposal at another facility. To support this vitrification system, a blending and feed tank system has been designed to inject a blended mixture into the melter portion of the vitrification system. Various types of materials can be selected for processing in the vitrification system. The mixed waste is transported to the facility in numerous container types, including, but not limited to, drums, totes, boxes, intermodal containers, tanker trucks, and railcars. Once on site and approved for unloading, the mixed waste containers are transferred to storage within the facility's process and storage buildings (Building 13 and/or Building 20) for eventual transfer to the vitrification blend and feed tanks. The new tank units included in the Vitrification Tank System are designated as:

- Tank No. VT-01, a 1,500-gallon storage and blend tank;
- Tank No. VT-02, a 1,500-gallon storage and blend tank; and,
- Tank No. VT-03, a 200-gallon storage and blend tank.

In addition to the three tank units, ancillary equipment such as process piping, vent piping, pumps, and monitoring equipment have been designed and installed. A schematic of the complete Vitrification Tank System is included in Appendix B.

Since this new tank system is to manage material classified as hazardous wastes, as defined in 40 CFR Part 261, Identification and Listing of Hazardous Waste, a certification of the tank system must be performed under the requirements of the Resource Conservation and Recovery Act (RCRA). The Richland facility is a permitted treatment, storage, and disposal facility (TSDF), as defined in 40 CFR Part 264; therefore, the tank certification requirements are located in Subpart J, Tank System, of this part. The identified tank system is a new unit, and the applicable certification is found in 40 CFR 264.192.

## **2.0 SCOPE**

PFNW has retained Schreiber, Yonley & Associates (SYA) to complete a RCRA new tank system certification for the new Vitrification Tank System described above. This assessment and certification does not extend to any other units in place or proposed at the facility. The tank assessment and certification is completed in accordance with the provisions of 40 CFR 264.192 only.

### **3.0 REGULATORY REFERENCE**

This tank system certification is based on the permitted facility regulations in place at the time of construction and as found in 40 CFR 264.192. A copy of the applicable text is included in Appendix C. Specifically, the assessment includes:

- a description and review of the design criteria used for the new tank system;
- a review of the hazardous waste characteristics in reference to the tank system's materials of construction;
- an assessment of any corrosion potential for the tank system due to contact with soil or water;
- a review of vehicular traffic patterns that could damage any of the tank system components; and
- an assessment of other design considerations specifically included in the regulation.

### **4.0 DESIGN REVIEW (40 CFR 264.192(a))**

The following sections provide the detail of the various tank assessment and certification areas reviewed.

#### **4.1 Design Standards (40 CFR 264.192(a)(1))**

All three tanks were designed in accordance with the Underwriters Laboratories (UL) Standard 142, Steel Aboveground Tanks for Flammable and Combustible Liquids. Based on the design assessment, specification sheets for each tank have been completed and are included in Appendix D. The venting requirements of these tanks are in accordance with the UL-142 requirements and were rechecked using the American Petroleum Institute (API) Standard 2000, Venting Atmospheric and Low Pressure Storage Tanks. The venting system specifications are also included on the tank specification sheets included in Appendix D. The ancillary piping systems were designed in accordance with the specifications of the American Society of Mechanical Engineers (ASME) Code B31.3, Process Piping.

#### **4.2 Hazardous Waste Characteristics (40 CFR 265.192(a)(2))**

The mixed waste vitrification feed material is a mixture of water, inorganic salts, metal solids and sludges, organic solids and sludges, and flammable/combustible organic compounds. These materials are primarily taken from various Department of Defense and Department of Energy waste removal projects. A typical component profile for the mixed waste is included in Appendix E of this certification.

In accordance with data found in Table 23-2, Detailed Corrosion Data on Construction Materials, of *Perry's Chemical Engineering Handbook, Sixth Edition*, the materials of construction for the tanks and ancillary equipment (grade 304 stainless steel or better) is found to be compatible with the various constituents typically found in the mixed waste. For all significant mixed waste materials available in the table and at the expected

maximum temperature range of the tank, the expected corrosion rate was found to be <0.02 inch per year. In addition, thickness testing of the tank shell is to be performed periodically to confirm that the specified corrosion allowance is maintained.

#### **4.3 Soil and Water Contact (40 CFR 264.192(a)(3))**

The new tanks and their ancillary equipment are designed and constructed within a concrete containment structure that eliminates any contact with the soil. As detailed in the RCRA Part B permit, this tank system is housed within Building 13. Therefore, in accordance with 40 CFR 264.193(c)(4), no contact with accumulated water is expected that will accelerate the tank corrosion rate.

In addition, a proper coating is maintained on all portions of the tank system to further inhibit corrosion. The specifications for the tank and piping coating are included in Appendix F.

#### **4.4 Vehicular Traffic Issues (40 CFR 265.192(a)(4))**

No portion of the new tank system is located underground. SYA has reviewed the tank system design layout to determine whether current traffic patterns could pose a danger to any portion of the new tank systems. SYA has determined that no portion of the system can be damaged by vehicular traffic patterns.

#### **4.5 Design Considerations (40 CFR 265.192(a)(5))**

The following are additional design considerations that were reviewed in order to complete the RCRA tank system certification.

##### **4.5.1 Tank Foundation Design (40 CFR 265.192(a)(5)(i))**

The tank foundation design calculations are included in Appendix G of this report and show that the floor system within Building 13 is adequately designed for these tank units.

##### **4.5.2 Tank Anchoring Systems (40 CFR 265.192(a)(5)(ii))**

No tank anchoring system is needed or designed since the tanks will not be constructed/installed where tank floatation and/or dislodgement would occur. The tanks will be installed within an existing building and above the top of the containment walls.

##### **4.5.3 Frost Heave Calculations (40 CFR 265.192(a)(5)(iii))**

No frost heave calculations are included herein since the tank system is to be installed within a process building.

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**FACILITY MAPS**

**APPENDIX B**

**TANK SYSTEM DRAWINGS**

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**REGULATORY REFERENCES**

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**TANK DESIGN DRAWINGS AND SPECIFICATIONS**

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**MIXED WASTE CONSTITUENT DATA**

**APPENDIX F**  
**COATING SPECIFICATIONS**

**APPENDIX G**

**PREVIOUS CONCRETE FOUNDATION ASSESSMENT AND CERTIFICATION**