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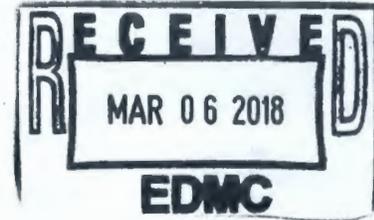
**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**MAR 05 2018**

18-ECD-0013

Ms. Alexandra K. Smith, Program Manager  
Nuclear Waste Program  
Washington State  
Department of Ecology  
3100 Port of Benton Blvd.  
Richland, Washington 99354



Ms. Smith:

**SUBMITTAL OF HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY  
ACT PERMIT MODIFICATION NOTIFICATION FORM 24590-LAB-PCN-ENV-14-001**

- References:
1. WA7890008967, "Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Operating Unit 10, 'Waste Treatment and Immobilization Plant.'"
  2. BNI letter from B.P. Reilly to B.T. Vance, ORP, "Submittal of Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAB-PCN-ENV-14-001," CCN: 303497, dated February 12, 2018.

This letter transmits Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAB-PCN-ENV-14-001, attached, for the Washington State Department of Ecology review and approval. The form describes a requested Class 1 modification to Reference 1.

Appendix 11.11 of Reference 1 currently includes the Independent, Qualified, Registered Professional Engineer Report, IA-3007244-000, *Structural Integrity Assessment for the LAB RLD LAB Area Sink Drain Collection Vessel (RLD-VSL-00164) and Hot Cell Drain Collection Vessel (RLD-VSL-00165)*. This Class 1 permit modification submits the Independent, Qualified, Registered Professional Engineer Report, IA-3007244-001, as a replacement integrity assessment report, and it submits revision changes to Mechanical Data Sheet 24590-LAB-MVD-RLD-P0164 currently found in Appendix 11.6 of Reference 1 and to Dangerous Waste Permit Table III.10.E.D.

Washington State Department of Ecology comments resulting from review of this modification notification form and the associated information have been dispositioned.

Ms. Alexandra K. Smith  
18-ECD-0013

-2-

MAR 05 2018

If you have any questions, please contact me, or your staff may contact Gae M. Neath,  
Environmental Compliance Division, (509) 376-7828.



Robert G. Hastings, Assistant Manager  
Technical and Regulatory Support

ECD:GMN

Attachment

cc w/attach:

B.L. Curn, BNI  
B.G. Erlandson, BNI  
D.E. Casey, BNI  
S.K. Murdock, BNI  
B.P. Reilly, BNI  
D.C. Robertson, BNI  
D. Rowland, YN

**Administrative Record (WTP H-0-8)**

BNI Correspondence  
Environmental Portal

cc electronic:

J. Cantu, Ecology (7 hard copies)  
A.S. Carlson, Ecology  
J. Decker, Ecology  
M.E. Jones, Ecology  
J.K. Perry, MSA  
A.C. McKarns, RL

cc w/o attach:

M. Johnson, CTUIR  
S.L. Dahl, Ecology  
D. McDonald, Ecology  
G.P. Bohnee, NPT  
K. Niles, Oregon Energy  
R. Longoria, YN (Acting)

**Attachment  
18-ECD-0013  
(29 Pages Excluding Cover Sheet)**

**Hanford Facility RCRA Permit Modification Notification  
Form 24590-LAB-PCN-ENV-14-001**

Quarter Ending March 31, 2018

24590-LAB-PCN-ENV-14-001

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**Hanford Facility RCRA Permit Modification Notification Form**  
**Part III, Operating Unit 10**  
**Waste Treatment and Immobilization Plant**

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**Index**

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant  
Replace the Mechanical Data Sheet for the LAB Area Sink Drain Collection Vessel (RLD-VSL-00164) in Appendix 11.6 of the Dangerous Waste Permit (DWP).  
Replace the Independent Qualified Registered Professional Engineer (IQRPE) Structural Integrity Assessment for the LAB RLD LAB Area Sink Drain Collection Vessel (RLD-VSL-00164) and Hot Cell Drain Collection Vessel (RLD-VSL-00165) in Appendix 11.11 of the DWP.

Submitted by Co-Operator:

Roger J. Landon      1/23/18  
Roger J. Landon      Date

Reviewed by ORP Program Office:

J. F. Grindstaff      2/26/18  
J. F. Grindstaff      Date

Quarter Ending March 31, 2018

24590-LAB-PCN-ENV-14-001

<b>Hanford Facility RCRA Permit Modification Notification Form</b>			
Unit:		Permit Part:	
<b>Waste Treatment and Immobilization Plant</b>		<b>Part III, Operating Unit 10</b>	
<b>Description of Modification:</b>			
The purpose of this Class 1 prime modification is to update and replace the following mechanical data sheet and IQRPE structural integrity assessment report in Appendices 11.6 and 11.11 of the DWP:			
<b>Appendix 11.6</b>			
Replace:	24590-LAB-MVD-RLD-P0164, Rev. 1	With:	24590-LAB-MVD-RLD-00164, Rev. 3
<b>Appendix 11.11</b>			
Replace:	AREVA-IA-3007244-000 - 24590-CM-HC4-HXYG-00240-02-00004	With:	IA-3007244-001
<p>This modification requests Ecology approval and incorporation into the permit the specific changes to the mechanical data sheet and IQRPE structural integrity assessment report indicated by revision notes, clouds and change bars. These documents include changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.). In addition, the mechanical data sheet and IQRPE structural integrity assessment report include changes associated with the resolution to comments on change documents since the issuance of the last revision of the permitted documents.</p> <p>Significant changes to the mechanical data sheet (24590-LAB-MVD-RLD-00164, Rev. 3) are summarized below:</p> <ul style="list-style-type: none"> <li>• Revised and added reference document numbers for the P&amp;ID, calculation, and vessel drawing.</li> <li>• Added a new field labeled "Reports/Other Documentation."</li> <li>• Updated Design Data such as quality level, seismic category, reference document number for fabrication specs, estimated weights (empty, operating, and test), and reference document number for seismic design.</li> <li>• Updated Materials of Construction Data for the pipe material and minimum thickness/size of the support (skirt).</li> <li>• Revised Remarks section.</li> <li>• Added Seismic section below the Remarks section.</li> </ul> <p>Updates to the integrity assessment report for vessels RLD-VSL-00164 and RLD-VSL-00165 are summarized below:</p> <ul style="list-style-type: none"> <li>• The documents listed in the "References" row and under the "Source of Information" column were updated. These documents were reviewed to assess the design of the vessels.</li> <li>• For each item of "Information Assessed" in the updated report, the items listed under the "Source of Information" column were reviewed and found to furnish adequate design requirements and controls to ensure the design fully satisfies the requirements of Washington Administrative Code (WAC), WAC-173-303-640, Dangerous Waste Regulations for Tank Systems.</li> </ul> <p>This PCN updates information in Appendices 11.6 and 11.11 to reflect current design. This DWP component may be re-evaluated to confirm design adequacy. If the re-evaluation results in future design changes, the changes will be reviewed by Ecology in subsequent permit modifications.</p> <p>The following outstanding change documents have been submitted to Ecology pursuant to Permit Condition III.10.C.9.h and are maintained in the WTP Operating Record:</p> <p><u>24590-LAB-MVD-RLD-00164, Rev. 3</u>  24590-WTP-CDR-CON-12-0524 – provided to Ecology in milk run (CCN 261745 and CCN 261749)</p>			

Quarter Ending March 31, 2018

24590-LAB-PCN-ENV-14-001

In accordance with Permit Condition III.10.C.2.e, this permit modification sent to Ecology may include page changes to the Permit, attachments, and permit application supporting documentation.

WAC 173-303-830 Modification Class:	Class 1	Class 1 <sup>1</sup>	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number: N/A  
 Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class 1<sup>1</sup> modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: <input type="checkbox"/> Yes <input type="checkbox"/> Denied (state reason below) Reason for denial:	Reviewed by Ecology:  _____ S. Dahl Date
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AFS-16-0195

September 21, 2016



Ms. Tess Klatt  
Subcontract Administrator  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

ISSUED BY  
RPP-WTP PDC

Dear Ms. Klatt:

**BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00240 IQRPE  
STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAB RLD-LAB AREA SINK DRAIN  
COLLECTION VESSEL (RLD-VSL-00164) AND HOT CELL DRAIN COLLECTION VESSEL  
(RLD-VSL-00165) (IA-3007244-001)**

The integrity assessment report of the subject vessels has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that these vessels are adequately designed and have sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that they will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 371-1975, or via email at [tarlok.hundal@areva.com](mailto:tarlok.hundal@areva.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'Elizabeth W. Smith'.

Elizabeth W. Smith, C.P.M  
Contract Administrator  
AREVA Federal Services LLC  
Richland Office

Enclosure (1)

LP

cc: D. C. Pfluger, MS12-2A w/enclosure (1)

**AREVA Federal Services LLC**



IA-3007244-001

**IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAB RLD  
LAB AREA SINK DRAIN COLLECTION VESSEL (RLD-VSL-00164) AND  
HOT CELL DRAIN COLLECTION VESSEL (RLD-VSL-00165)**

**Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts; that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.**



IA-3007244-001

**IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAB RLD  
LAB AREA SINK DRAIN COLLECTION VESSEL (RLD-VSL-00164) AND  
HOT CELL DRAIN COLLECTION VESSEL (RLD-VSL-00165)**

"I, Tarlok Singh Hundal, have reviewed and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the LAB Area Sink Drain Collection Vessel (RLD-VSL-00164) and Hot Cell Drain Collection Vessel (RLD-VSL-00165), as required by the Washington Administrative Code, Dangerous Waste Regulations, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is nineteen (19) pages numbered one (1) through nineteen (19).



T. Hundal  
Signature

9/21/2016  
Date

<b>Scope</b>	<b>Scope of this Integrity Assessment</b>	<p>This Integrity Assessment includes the following two vessels located in the Analytical Laboratory Building:</p> <ul style="list-style-type: none"><li>• LAB Area Sink Drain Collection Vessel (RLD-VSL-00164), located in cell A-B003 at Elevation (-) 18'-7" as shown on Drawing 24590-LAB-P1-60-00007 (see pages 4-11), and</li><li>• Hot Cell Drain Collection Vessel (RLD-VSL-00165), located in cell A-B004 at Elevation (-) 19'-2" as shown on Drawing 24590-LAB-P1-60-00007 (see pages 12-19).</li></ul> <p><b>Note:</b> This report IA-3007244-001, supersedes previous report 24590-CM-HC4-HXYG-00240-02-00004, Rev. 00A, (IA-3007244-000)</p>
<b>Summary of Assessment</b>	For each item of "Information Assessed" (i.e., Criteria) on the following pages, the documents listed under "Source of Information" were reviewed and found to furnish adequate design requirements and controls to ensure that the design fully satisfies the requirements of Washington Administrative Code (WAC), Chapter 173-303 WAC, <i>Dangerous Waste Regulations</i> , Section WAC-173-303-640 (3) (a) through (g) applicable elements of the <i>Tank Systems</i> .	

<b>References</b>	<p><u>Material Requisitions (MR):</u></p> <p>24590-CM-MRA-MVA0-00010, Rev. 1, Pressure Vessels, High Alloy or Clad-LAB (MS099) (N130) (for vessel RLD-VSL-00164, including Material Requisition Supplement Nos. S0003, S0004, S0005, S0006, S0007, and S0008 to MR Rev. 1); 24590-QL-MRA-MVA0-00008, Rev. 2, Pressure Vessels, Shop Fabricated, Large, QL-LAB (MS004) (N142) (for vessel RLD-VSL-00165, including Material Requisition Supplement No. S0006 to MR Rev. 2).</p> <p><u>Specifications:</u></p> <p>The following Specifications with their respective revision and Specification Change Notices (SCNs) are listed in the above listed Material Requisitions:</p> <p>24590-WTP-3PS-MV00-T0001, Engineering Specification for Pressure Vessel Design and Fabrication; 24590-WTP-3PS-MV00-T0002, Engineering Specification for Seismic Qualification Criteria for Pressure Vessels; 24590-WTP-3PS-MVB2-T0001, Engineering Specification for Welding of Pressure Vessels, Heat Exchangers, and Boilers; 24590-WTP-3PS-G000-T0002, Engineering Specification for Positive Material Identification (PMI) for Shop Fabrication; 24590-WTP-3PS-G000-T0003, Engineering Specification for Packaging, Handling, and Storage Requirements; 24590-WTP-3PS-FB01-T0001, Engineering Specification for Structural Design Loads for Seismic Category III &amp; IV Equipment and Tanks.</p> <p><u>Plant Drawings:</u></p> <p>24590-LAB-P1-60-00007, Rev. 3, Analytical Laboratory General Arrangement Plan at El. (-) 19'-2", Sections E-E, F-F, &amp; G-G; 24590-LAB-M5-V17T-00029, Rev. 4, WTP Analytical Laboratory Process Flow Diagram Radioactive Liquid Disposal; 24590-LAB-M6-RLD-00001001, Rev. 1, P &amp; ID-LAB Radioactive Liquid Waste Disposal System - C5 Collection and Transfer; 24590-LAB-M6-RLD-00002001, Rev. 1, P &amp; ID-LAB Radioactive Liquid Waste Disposal System - C3 Collection &amp; Transfer.</p>
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References (Cont'd)	<p>Drawings,          Mechanical Data          Sheets, and          System Design          Description</p>	<p><u>Vendor Fabrication Drawings (*Bechtel Status Code 1 Drawings):</u></p> <p>24590-CM-POA-MVA0-00010-01-02, Rev. 00H, (+LAB-VDCN-MS-14-00002) General Arrangement (RLD-VSL-00164);          24590-CM-POA-MVA0-00010-01-00006, Rev. 00F, Skirt Detail (RLD-VSL-00164);          24590-CM-POA-MVA0-00010-01-00007, Rev. 00G, (+LAB-VDCN-MS-14-00002) Nozzle Details (RLD-VSL-00164);          24590-CM-POA-MVA0-00010-01-00008, Rev. 00F, (+LAB-VDCN-MS-14-00002) Nozzle Details (RLD-VSL-00164);          24590-CM-POA-MVA0-00010-01-00012, Rev. 00D, (+LAB-VDCN-MS-14-00002) Nozzle Details (RLD-VSL-00164);          24590-CM-POA-MVA0-00010-01-00015, Rev. 00B, (+LAB-VDCN-MS-14-00003) Internal Nozzle Support Details (RLD-VSL-00164);          24590-CM-POA-MVA0-00010-01-00016, Rev. 00B, (+LAB-VDCN-MS-14-00003) Internal Support Details (RLD-VSL-00164);          24590-QL-POC-MVA0-00008-01-00001, Rev. 00G, Hot Cell Drain Collection Vessel Assembly Section &amp; Details (RLD-VSL-00165);          24590-QL-POC-MVA0-00008-01-00002, Rev. 00D, Hot Cell Drain Collection Vessel Assembly Section &amp; Details (RLD-VSL-00165);          24590-QL-POC-MVA0-00008-01-00004, Rev. 00D, Hot Cell Drain Collection Vessel Nozzle Shell &amp; Repad Details (RLD-VSL-00165);          24590-QL-POC-MVA0-00008-01-00007, Rev. 00D, Hot Cell Drain Collection Vessel Nozzle Shell &amp; Repad Details (RLD-VSL-00165);          24590-QL-POC-MVA0-00008-01-00009, Rev. 00D, Hot Cell Drain Collection Vessel Skirt Assembly &amp; Details (RLD-VSL-00165);          24590-QL-POC-MVA0-00008-01-00010, Rev. 00C, Hot Cell Drain Collection Vessel Skirt Assembly &amp; Details (RLD-VSL-00165).</p> <p>* Bechtel Status Code 1 Drawing is an "as fabricated vendor drawing" approved/accepted by Bechtel.</p> <p><u>Mechanical Data Sheets:</u></p> <p>24590-LAB-MVD-RLD-00164, Rev. 3, Lab Area Sink Drain Collection Vessel (RLD-VSL-00164);          24590-LAB-MVD-RLD-00165, Rev. 2, Hot Cell Drain Collection Vessel (RLD-VSL-00165).</p> <p><u>System Design Description :</u></p> <p>24590-LAB-3ZD-RLD-00001, Rev. 0, Lab Radioactive Liquid Waste Disposal (RLD) System Design Description.</p>
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	Information Assessed	Source of Information	Assessment
Design	<p>Vessel design standards are appropriate and adequate for the vessel's intended use.</p>	<p>Specifications, Drawings, and Mechanical Data Sheet listed above under References;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers.</p>	<p>The RLD system LAB Area Sink Drain Collection Vessel, RLD-VSL-00164 and all appurtenances are designed to the ASME B&amp;PV Code, Section VIII, Division 1 rules which are appropriate for pressure vessels operating with mixed waste solutions over the pressure and temperature ranges specified for this vessel. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure vessel fatigue analysis, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the vessel and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These are adequate and acceptable design standards for the intended use of the vessel. The Mechanical Data Sheet for the vessel identifies it as Quality Level (CM) and Seismic Category (SC-IV) equipment. The RLD-VSL-00164 is a vertical vessel with a 102 in. ID and a height of 69 in. from the bottom tangent line to the top tangent line. The vessel's shell is built with 3/8" thick plate and top and bottom Flanged &amp; Dished (F &amp; D) heads are built with 15/16" and 3/8" thick plates, respectively. The vessel is supported on a cylindrical skirt (approx. 1'-10" high) which in turn is supported on a base plate anchored to the concrete floor at Elev. (-) 18'-7". The vessel has internal equipment such as eductors, spray nozzles, and piping that are supported from the vessel's top head. Material for the shell, bottom and top head, and the vessel's internal equipment is UNS N08367 (6% Molybdenum stainless steel alloy) and hereafter referred to as 6% Mo. The supporting skirt is specified as SA-240 304 stainless steel plate (0.030% maximum carbon content) and is hereafter referred to as 304 stainless steel. The operating volume is to be about 2,740 gallons and the total internal volume is to be about 3,180 gallons.</p>

	Information Assessed	Source of Information	Assessment
Design (cont'd)	<p>If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.</p>	<p>Specifications, Material Requisition, Drawings, and Mechanical Data Sheet listed above under References;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-CM-POA-MVA0-00010-05-02, Rev. 00D, Pressure Vessel Calculations of Lab Area Sink Drain Collection Vessel (RLD-VSL-00164); 24590-LAB-VDCN-MS-11-00002, Revise Supplier Calculation for CM LAB RLD Collection Vessel 24590-LAB-MV-VSL-00164 to Incorporate IQRPE Comments (Vessel Anchorage Calculation); 24590-LAB-VDCN-MS-14-00002, Update Nozzle BOM and Code Calculation for Vessel 24590-LAB-MV-VSL-00164; 24590-LAB-VDCN-MS-14-00003, RLD-VSL-00164, Evaluation of Interior Pipe Guides Weld Deficiencies for Vessel 24590-LAB-MV-VSL-00164.</p>	<p>The RLD system LAB Area Sink Drain Collection Vessel, RLD-VSL-00164 is a non-standard ASME B&amp;PV Code, Section VIII, Division 1 vessel. The Mechanical Data Sheet requires that the ASME B&amp;PV Code, Section VIII, Division 1 vessel be delivered after design, fabrication, inspection and testing with an ASME code stamp and that the vessels be nationally registered. Supplemental design information is provided by the reference documents listed in the Source of Information column for utilizing sound engineering principles of construction of the vessels. Review of the Pressure Vessel Calculations (including listed VDCNs) shows that the vessel has been designed as a non-standard vessel per applicable requirements of ASME B&amp;PV Code, Section VIII, Division 1 and other documents listed in the Material Requisition for the vessel. The aforementioned statements and the vendor fabrication drawings reviewed demonstrate that sound engineering principles of construction and fabrication have been used for the vessel.</p>

Information Assessed	Source of Information	Assessment
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Design (cont'd)</b></p> <p>Vessel has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.</p>	<p>Specifications, Material Requisition, Drawings, and Mechanical Data Sheet listed above under References;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 2, Alternate Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>24590-CM-POA-MVA0-00010-05-02, Rev. 00D, Pressure Vessel Calculations of Lab Area Sink Drain Collection Vessel (RLD-VSL-00164);</p> <p>24590-LAB-VDCN-MS-11-00002, Revise Supplier Calculation for CM LAB RLD Collection Vessel 24590-LAB-MV-VSL-00164 to Incorporate IQRPE Comments (Vessel Anchorage Calculation);</p> <p>24590-LAB-VDCN-MS-14-00002, Update Nozzle BOM and Code Calculation for Vessel 24590-LAB-MV-VSL-00164;</p> <p>24590-LAB-VDCN-MS-14-00003, RLD-VSL-00164, Evaluation of Interior Pipe Guides Weld Deficiencies for Vessel 24590-LAB-MV-VSL-00164.</p>	<p>The Mechanical Data Sheet identifies the vessel's operating pressure and temperature ranges, the materials selected for the vessel, the corrosion allowance, and the vessel quality level, and requirements for seismic design. The specifications for the vessel require specific consideration of the operating pressures and temperatures and seismic loads in the design process. ASME B&amp;PV Code, Section VIII, Division 1 requires that corrosion allowance thickness shall be excluded from nominal vessel thickness when evaluating the adequacy of vessel components for these loads at end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels adopts ASME B&amp;PV Code, Section VIII, Division 2 design rules to address seismic design and analysis acceptance criteria for the vessel proper and ASME B&amp;PV Code, Section VIII, Division 1 for the vessel supports. Detailed requirements for seismic load determination are furnished in the specification for Seismic Category III &amp; IV Equipment and Tanks. Review of the Pressure Vessel Calculations (including listed VDCNs) shows that the vessel has adequate strength after the appropriate consideration of corrosion allowance, operating temperature and pressure, seismic, and other applicable loads have been accounted for. Furthermore, approval and acceptance of the vendor fabrication drawings by Bechtel National Inc. (BNI) is an added assurance that all applicable requirements stated above and as described in documents (including daughter documents) listed in Material Requisition for the vessel have been met.</p>

	Information Assessed	Source of Information	Assessment
Foundation	<p>Vessel foundation will maintain the load of a full vessel.</p>	<p>Specifications listed above under References;  ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-CM-POA-MVA0-00010-05-02, Rev. 00D, Pressure Vessel Calculations of Lab Area Sink Drain Collection Vessel (RLD-VSL-00164); 24590-LAB-VDCN-MS-11-00002, Revise Supplier Calculation for CM LAB RLD Collection Vessel 24590-LAB-MV-VSL-00164 to Incorporate IQRPE Comments (Vessel Anchorage Calculation); 24590-LAB-VDCN-MS-14-00002, Update Nozzle BOM and Code Calculation for Vessel 24590-LAB-MV-VSL-00164; 24590-LAB-VDCN-MS-14-00003, RLD-VSL-00164, Evaluation of Interior Pipe Guides Weld Deficiencies for Vessel 24590-LAB-MV-VSL-00164; 24590-WTP-DB-ENG-01-001, Rev. 3, Basis of Design.</p>	<p>The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME B&amp;PV Code, Section VIII, Division I for the design of the vessel supports. This code ensures an adequate design for the vessel supports. Review of the Pressure Vessel Calculations (including listed VDCNs) shows that the vessel's support skirt has adequate strength to maintain the load of full vessel. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the vessel support must be adequate to support the load from full vessel, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation is part of a separate integrity assessment report for the Secondary Containment of the vessel.</p>

Information Assessed	Source of Information	Assessment
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Foundation (cont'd)</b></p> <p>If in an area subject to flooding, the vessel is anchored.</p>	<p>Specifications listed above under References and Mechanical Data Sheet;</p> <p>24590-CM-POA-MVA0-00010-05-02, Rev. 00D, Pressure Vessel Calculations of Lab Area Sink Drain Collection Vessel (RLD-VSL-00164);                  24590-LAB-VDCN-MS-11-00002, Revise Supplier Calculation for CM LAB RLD Collection Vessel 24590-LAB-MV-VSL-00164 to Incorporate IQRPE Comments (Vessel Anchorage Calculation);                  24590-LAB-VDCN-MS-14-00002, Update Nozzle BOM and Code Calculation for Vessel 24590-LAB-MV-VSL-00164;                  24590-LAB-VDCN-MS-14-00003, RLD-VSL-00164, Evaluation of Interior Pipe Guides Weld Deficiencies for Vessel 24590-LAB-MV-VSL-00164.                  24590-LAB-DDC-S13T-00003, Rev. 1, C3 Vessel Anchorage-LAB Area Sink Drain Collection.                  24590-LAB-DDC-S13T-00014, Rev. 0, Anchor Bolts Design for C2, C3, and C5 Vessel (including 24590-LAB-DDE-S13T-00041).</p>	<p>The Specification for Pressure Vessel Design and Fabrication requires the anchors be designed to secure the buoyant vessel in case the vessel is submerged to the level indicated in the Mechanical Data Sheet (MDS). The MDS does not indicate any submerged conditions for the vessel. However, review of the Design Calculations (including listed VDCNs) of the vessel shows that the vessel is adequately anchored to the concrete floor to sustain other applicable forces such as seismic and sloshing loads on the vessel.</p>
<p>Vessel system will withstand the effects of frost heave.</p>	<p>24590-WTP-DC-ST-01-001, Rev. 13, Structural Design Criteria.</p>	<p>The Structural Design Criteria document requires that all structural foundations extend a distance below grade that exceeds the depth of the 30" frost line. The vessel is located inside/interior of the building at below grade elevation {(-) 18'-7"}, therefore, the vessel foundation is not subject to frost heave.</p>

Information Assessed	Source of Information	Assessment
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Waste Characteristics</b></p> <p>Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)</p>	<p>Mechanical Data Sheet listed above under References;  24590-LAB-N1D-RLD-00002, Rev. 2, Corrosion Evaluation, RLD-VSL-00164 (LAB) Lab Area Sink Drain Collection Vessel (RLD C3 Vessel); 24590-WTP-PSAR-ESH-01-002-01, Rev. 6a, Preliminary Documented Safety Analysis to Support Construction Authorization; General Information; 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems And Miscellaneous Treatment Unit Systems.</p>	<p>The Mechanical Data Sheet presents the waste specific gravity, storage temperatures and pressures. The Corrosion Evaluation document addresses the pH range and chemical composition of the waste to select appropriate vessel materials and specify the corrosion allowance. Other waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are addressed by the Preliminary Documented Safety Analysis report as an integral part of the design process. The RLD vessels provide primary confinement of the waste during normal operations, abnormal operations and during and after a Design Basis Earthquake. The vessel has mixing eductors to mitigate any sludge buildup and the vessel is actively vented via the LAB vent system to prevent any build-up of flammable gases. Prevention of Hydrogen Accumulation document shows that the contents of the vessels are not expected to generate hydrogen gas that would accumulate 1% by volume (i.e., 25% of the LFL) in the headspace. Therefore, this vessel does not pose hydrogen accumulation hazard. The vessel is also grounded to control ignition sources.</p>
<p>Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.</p>	<p>System Design Description listed above under Reference;  24590-LAB-N1D-RLD-00002, Rev. 2, Corrosion Evaluation, RLD-VSL-00164 (LAB) Lab Area Sink Drain Collection Vessel (RLD C3 Vessel).</p>	<p>The System Design Description discusses normal and abnormal operations for the RLD vessels. Diluted acid or water will be used for flushing/rinsing. The Corrosion Evaluation document demonstrates that the 6% Mo material selected for vessel design is appropriate to process, treat or store the waste discussed above.</p>
<p>The waste types are compatible with each other.</p>	<p>System Design Description listed above under Reference.</p>	<p>The System Design Description for the LAB (RLD) does not describe any operations where incompatible wastes are mixed in these vessels for processing. The RLD vessel's primary function is to collect, contain, and transfer liquid streams.</p>

	Information Assessed	Source of Information	Assessment
<b>Corrosion Protection</b>	<p>Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)</p>	<p>Drawings, Mechanical Data Sheet and System Design Description listed above under References;  24590-LAB-N1D-RLD-00002, Rev. 2, Corrosion Evaluation, RLD-VSL-00164 (LAB) Lab Area Sink Drain Collection Vessel (RLD C3 Vessel).</p>	<p>The Corrosion Evaluation document shows that the LAB Area Sink Drain Collection Vessel, RLD-VSL-00164 normally operates at a pH range of 6 to 8 and at a temperature of 78°F. The vessel is designed for a 15 psig pressure and a temperature of 240°F. Other pertinent vessel operation and design information is provided in the Mechanical Data Sheet. Potential acid cleaning operations of the vessel were also considered. The materials selected are 6 % Mo and a corrosion allowance of 0.04 in. The RLD vessel is located in the LAB cell (A-B003) at Elevation (-) 18'-7". The vessel's support skirt material is 304 stainless steel. This cell is equipped with a sump to pump out any leaks. Therefore, the cell should remain dry during normal operations which will limit external corrosion of the vessel over the facility design life. The RLD vessel receives waste from Floor Drain Collection Vessel (RLD-VSL-00163) and various floor and sink drains in the LAB facility for short term storage, and transfers it to the LAB Hot Cell Drain Collection Vessel (RLD-VSL-00165) for further processing.</p>
<b>Corrosion Allowance</b>	<p>Corrosion allowance is adequate for the intended service life of the vessel.</p>	<p>Mechanical Data Sheet listed above under References;  24590-LAB-N1D-RLD-00002, Rev. 2, Corrosion Evaluation, RLD-VSL-00164 (LAB) Lab Area Sink Drain Collection Vessel (RLD C3 Vessel).</p>	<p>The bases for the RLD vessel's material selection and corrosion allowance are furnished in the Corrosion Evaluation document. Selection of 6% Mo material for the vessel with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate. The material selections and corrosion allowances are carried forward to the Mechanical Data Sheet consistently and correctly.</p>

	Information Assessed	Source of Information	Assessment
<b>Pressure Relief</b>	<p>Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.</p>	<p>Drawings and System Design Description listed above under References.</p>	<p>The RLD system LAB Area Sink Drain Collection Vessel, RLD-VSL-00164 is designed to have unrestricted overflow through an 8" pipe line to the cell sump (RLD-SUMP-00041) as shown on the drawings and described in the System Design Description document. The sump contents will be transferred via pump (RLD-PMP-00182A/B) to the LAB Hot Cell Drain Collection Vessel (RLD-VSL-00165) for further processing. The vessel is also connected to the LAB vent system via an 8" pipe vent line to prevent its over pressurization.</p>

Information Assessed	Source of Information	Assessment
<p><b>Design</b></p> <p>Vessel design standards are appropriate and adequate for the vessel's intended use.</p>	<p>Specifications, Drawings, and Mechanical Data Sheet listed above under References;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers.</p>	<p>The RLD system Hot Cell Drain Collection Vessel, RLD-VSL-00165 and all appurtenances are designed to the ASME B&amp;PV Code, Section VIII, Division 1 rules which are appropriate for pressure vessels operating with mixed waste solutions over the pressure and temperature ranges specified for this vessel. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure vessel fatigue analysis, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the vessel and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These are adequate and acceptable design standards for the intended use of the vessel. The Mechanical Data Sheet for the vessel identifies it as a Quality Level (Q-2) and Seismic Category (SC-III) equipment. The RLD-VSL-00165 is a vertical vessel with a 192 in. ID and a height of 28.75 in. from the bottom tangent line to the top tangent line. The vessel's top and bottom Flanged &amp; Dished (F &amp; D) heads are built with 0.715" thick plate. Vessel's shell is built with 0.688" thick plate. The vessel is supported on a cylindrical skirt (approx. 3'-1" high) which in turn is supported on a base plate anchored to the concrete floor at Elev. (-) 19'-2". The vessel has internal equipment such as eductors, spray nozzles, and piping that are supported from the vessel's top head. Material for the shell, bottom and top head, and the vessel's internal equipment is UNS N08367 (6% Molybdenum stainless steel alloy) and hereafter referred to as 6% Mo. The supporting skirt is specified as SA-240 304 stainless steel plate (0.030% maximum carbon content, dual certified) and is hereafter referred to as 304 stainless steel. The operating volume is to be about 6,615 gallons and the total internal volume is to be about 9,100 gallons.</p>

Information Assessed	Source of Information	Assessment
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Design (cont'd)</b></p> <p>If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.</p>	<p>Specifications, Material Requisition, Drawings, and Mechanical Data Sheet listed above under References;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-QL-POC-MVA0-00008-02-00002, Rev. 00C, Design Report of the Hot Cell Drain Collection Vessel (RLD-VSL-00165); 24590-LAB-VDCN-MS-11-00003, Revise Supplier Calculation for LAB Hot Cell RLD Collection Vessel 24590-LAB-MV-VSL-00165 to Incorporate IQRPE Comments (Vessel Anchorage Calculation); 24590-LAB-VDCN-MS-14-00001, RLD-VSL-00165 Seismic Lateral Load on Vessel per UBC 97 and Nozzle Neck calculation per UG-45(a). 24590-LAB-MVC-RLD-00005, Rev. 0, RLD-VSL-00165 Nozzle Neck Evaluation per ASME Section VIII, Div-2, Appendix-4-138.</p>	<p>The RLD system Hot Cell Drain Collection Vessel, RLD-VSL-00165 is a non-standard ASME B&amp;PV Code, Section VIII, Division 1 vessel. The Mechanical Data Sheet requires that the ASME B&amp;PV Code, Section VIII, Division 1 vessel be delivered after design, fabrication, inspection and testing with an ASME code stamp and that the vessels be nationally registered. Supplemental design information is provided by the reference documents listed in the Source of Information column for utilizing sound engineering principles of construction of the vessels. Review of the Design Calculations (including listed VDCNs) of the vessel shows that it has been designed as a non-standard vessel per applicable requirements of ASME B&amp;PV Code, Section VIII, Division 1 and other documents listed in the Material Requisition for the vessel. The aforementioned statements and the vendor fabrication drawings reviewed demonstrate that sound engineering principles of construction and fabrication have been used for the vessel.</p>

Information Assessed	Source of Information	Assessment
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Design (cont'd)</b></p> <p>Vessel has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.</p>	<p>Specifications, Material Requisition, Drawings, and Mechanical Data Sheet listed above under References;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 2, Alternate Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>24590-QL-POC-MVA0-00008-02-00002, Rev. 00C, Design Report of the Hot Cell Drain Collection Vessel (RLD-VSL-00165);</p> <p>24590-LAB-VDCN-MS-11-00003, Revise Supplier Calculation for LAB Hot Cell RLD Collection Vessel 24590-LAB-MV-VSL-00165 to Incorporate IQRPE Comments (Vessel Anchorage Calculation);</p> <p>24590-LAB-VDCN-MS-14-00001, RLD-VSL-00165 Seismic Lateral Load on Vessel per UBC 97 and Nozzle Neck Calculation per UG-45(a).</p> <p>24590-LAB-MVC-RLD-00005, Rev. 0, RLD-VSL-00165 Nozzle Neck Evaluation per ASME Section VIII, Div-2, Appendix-4-138.</p>	<p>The Mechanical Data Sheet identifies the vessel's operating pressure and temperature ranges, the materials selected for the vessel, the corrosion allowance, and the vessel quality level, and requirements for seismic design. The design specifications for the vessels require specific consideration of the operating pressures and temperatures and seismic loads in the design process. ASME B&amp;PV Code, Section VIII, Division 1 requires that corrosion allowance thickness shall be excluded from nominal vessel thickness when evaluating the adequacy of vessel components for these loads at end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels adopts ASME B&amp;PV Code, Section VIII, Division 2 design rules to address seismic design and analysis acceptance criteria for the vessel proper and ASME B&amp;PV Code, Section VIII, Division 1 for the vessel supports. Detailed requirements for seismic load determination are furnished in the specification for Seismic Category III &amp; IV Equipment and Tanks. Review of the Design Report (including listed VDCNs) of the vessel shows that it has adequate strength after the appropriate consideration of corrosion allowance, operating temperature and pressure, seismic, and other applicable loads have been accounted for. Furthermore, approval and acceptance of the vendor fabrication drawings by Bechtel National Inc. (BNI) is an added assurance that all applicable requirements stated above and as described in documents (including daughter documents) listed in Material Requisition for the vessel have been met.</p>

	Information Assessed	Source of Information	Assessment
<b>Foundation</b>	<p>Vessel foundation will maintain the load of a full vessel.</p>	<p>Specifications listed above under References;                       ASME Boiler and Pressure Vessel (B&amp;PV) Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;                      24590-QL-POC-MVA0-00008-02-00002, Rev. 00C, Design Report of the Hot Cell Drain Collection Vessel (RLD-VSL-00165);                      24590-LAB-VDCN-MS-11-00003, Revise Supplier Calculation for LAB Hot Cell RLD Collection Vessel 24590-LAB-MV-VSL-00165 to Incorporate IQRPE Comments (Vessel Anchorage Calculation);                      24590-LAB-VDCN-MS-14-00001, RLD-VSL-00165 Seismic Lateral Load on Vessel per UBC 97 and Nozzle Neck calculation per UG-45(a);                      24590-LAB-MVC-RLD-00004, Rev. 1, Supplemental Seismic Calculation per UBC-97 for 24590-LAB-MV-RLD-VSL-00165 Vessel;                      24590-WTP-DB-ENG-01-001, Rev. 3, Basis of Design.</p>	<p>The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME B&amp;PV Code, Section VIII, Division 1 for the design of the vessel supports. This code ensures an adequate design for the vessel supports. Review of the Design Report (including listed VDCNs) of the vessel shows that the vessel's support skirt has adequate strength to maintain the load of full vessel. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the vessel support must be adequate to support the loads from full vessel, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation is part of a separate integrity assessment report for the Secondary Containment of the vessel.</p>

Information Assessed	Source of Information	Assessment
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Foundation (cont'd)</b></p> <p>If in an area subject to flooding, the vessel is anchored.</p>	<p>Specifications listed above under References and Mechanical Data Sheet;</p> <p>24590-QL-POC-MVA0-00008-02-00002, Rev. 00C, Design Report of the Hot Cell Drain Collection Vessel (RLD-VSL-00165);</p> <p>24590-LAB-VDCN-MS-11-00003, Revise Supplier Calculation for LAB Hot Cell RLD Collection Vessel 24590-LAB-MV-VSL-00165 to Incorporate IQRPE Comments (Vessel Anchorage Calculation);</p> <p>24590-LAB-VDCN-MS-14-00001, RLD-VSL-00165 Seismic Lateral Load on Vessel per UBC 97 and Nozzle Neck calculation per UG-45(a);</p> <p>24590-LAB-MVC-RLD-00004, Rev. 1, Supplemental Seismic Calculation per UBC-97 for 24590-LAB-MV-RLD-VSL-00165 Vessel;</p> <p>24590-LAB-DDC-S13T-00001, Rev. 1, C5 Vessel Anchorage-Hot Cell Drain Collection;</p> <p>24590-LAB-DDC-S13T-00014, Rev. 0, Anchor Bolts Design for C2, C3, and C5 Vessel (including 24590-LAB-DDE-S13T-00041).</p>	<p>The Specification for Pressure Vessel Design and Fabrication requires the anchors be designed to secure the buoyant vessel in case the vessel is submerged to the level indicated in the Mechanical Data Sheet (MDS). The MDS does not indicate any submerged conditions for the vessel. However, review of the Design Calculations (including listed VDCNs) of the vessel shows that the vessel is adequately anchored to the concrete floor to sustain the other applicable forces on the empty and full vessel.</p>
<p>Vessel system will withstand the effects of frost heave.</p>	<p>24590-WTP-DC-ST-01-001, Rev. 13, Structural Design Criteria.</p>	<p>The Structural Design Criteria document requires that all structural foundations extend a distance below grade that exceeds the depth of the 30" frost line. The vessel is located inside/interior of the building at below grade elevation {(-) 19'-2"}, therefore, the vessel foundation is not subject to frost heave.</p>

	Information Assessed	Source of Information	Assessment
<b>Waste Characteristics</b>	<p>Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)</p>	<p>Mechanical Data Sheet listed above under References;</p> <p>24590-LAB-N1D-RLD-00003, Rev. 4, Corrosion Evaluation, RLD-VSL-00165 (LAB) Hot Cell Drain Collection Vessel; 24590-WTP-PSAR-ESH-01-002-01, Rev. 6a, Preliminary Documented Safety Analysis to Support Construction Authorization: General Information; 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems And Miscellaneous Treatment Unit Systems.</p>	<p>The Mechanical Data Sheet presents the waste specific gravity, storage temperatures and pressures. The Corrosion Evaluation document addresses the pH range and chemical composition of the waste to select appropriate vessel materials and specify the corrosion allowance. Other waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are addressed by the Preliminary Documented Safety Analysis report as an integral part of the design process. The RLD vessels provide primary confinement of the waste during normal operations, abnormal operations and during and after a Design Basis Earthquake. The vessel has continually mixing eductors to mitigate any sludge buildup and the vessel is actively vented via the LAB vent system to prevent any build-up of flammable gases. Prevention of Hydrogen Accumulation document shows that the contents of the vessels are not expected to generate hydrogen gas that would accumulate 1% by volume (i.e., 25% of the LFL) in the headspace. Therefore, this vessel does not pose hydrogen accumulation hazard. The vessel is also grounded to control ignition sources.</p>
	<p>Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.</p>	<p>System Design Description listed above under Reference;</p> <p>24590-LAB-N1D-RLD-00003, Rev. 4, Corrosion Evaluation, RLD-VSL-00165 (LAB) Hot Cell Drain Collection Vessel.</p>	<p>The System Design Description discusses normal and abnormal operations for the RLD vessels. Diluted acid or water will be used for flushing/rinsing. The Corrosion Evaluation document demonstrates that the 6% Mo material selected for vessel design is appropriate to process, treat or store the waste discussed above.</p>
	<p>The waste types are compatible with each other.</p>	<p>System Design Description listed above under Reference.</p>	<p>The System Design Description for the LAB (RLD) does not describe any operations where incompatible wastes are mixed in these vessels for processing. The RLD vessel's primary function is to collect, contain, and transfer liquid streams.</p>

Information Assessed	Source of Information	Assessment
<p><b>Corrosion Protection</b></p> <p>Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)</p>	<p>Drawings, Mechanical Data Sheet, and System Design Description listed above under References;</p> <p>24590-LAB-N1D-RLD-00003, Rev. 4, Corrosion Evaluation, RLD-VSL-00165 (LAB) Hot Cell Drain Collection Vessel.</p>	<p>The Corrosion Evaluation document shows that the Hot Cell Drain Collection Vessel, RLD-VSL-00165 normally operates at a pH range of 6 to 8 and at a temperature of 78°F. The vessel is designed for a 15 psig pressure and a temperature of 240°F. Other pertinent vessel operation and design information is provided in the Mechanical Data Sheet. Potential acid cleaning operations of the vessel were also considered. The material selected is 6 % Mo and a corrosion allowance of 0.04 in. The RLD vessel is located in the LAB cell (A-B004) at Elevation (-) 19'-2". The vessel's support skirt material is 304 stainless steel. This cell is equipped with a sump to pump out any leaks. Therefore, the cell should remain dry during normal operations which will limit external corrosion of the vessel over the facility design life. The RLD vessel receives waste from Floor Drain Collection Vessel (RLD-VSL-00163) and cell sump, Lab Area Sink Drain Collection Vessel (RLD-VSL-00164) and cell sump, and various floor and sink drains in the LAB facility for short term storage, and transfers it to the PTF plant wash disposal vessel (PWD-VSL-00044 or PWD-VSL-00033) for further processing.</p>
<p><b>Corrosion Allowance</b></p> <p>Corrosion allowance is adequate for the intended service life of the vessel.</p>	<p>Mechanical Data Sheet listed above under References;</p> <p>24590-LAB-N1D-RLD-00003, Rev. 4, Corrosion Evaluation, RLD-VSL-00165 (LAB) Hot Cell Drain Collection Vessel.</p>	<p>The bases for the RLD vessel's material selection and corrosion allowance are furnished in the Corrosion Evaluation document. Selection of 6% Mo material for the vessel with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate. The material selections and corrosion allowances are carried forward to the Mechanical Data Sheet consistently and correctly.</p>

	Information Assessed	Source of Information	Assessment
<b>Pressure Relief</b>	<p>Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.</p>	<p>Drawings and System Design Description listed above under References.</p>	<p>The RLD system Hot Cell Drain Collection Vessel, RLD-VSL-00165 is designed to have unrestricted overflow through a 6" dip pipe to the cell sump (RLD-SUMP-00042) as shown on the drawings and described in the System Design Description document. The sump contents will be transferred via pump (RLD-PMP-00183A/B) to the PTF plant wash disposal vessel (PWD-VSL-00044 or PWD-VSL-00033) for further processing. The vessel is also connected to the LAB vent system via a 6" pipe vent line to prevent its over pressurization.</p>



**MECHANICAL DATA SHEET: VESSEL**

PLANT ITEM No.

24590-LAB-MV-RLD-VSL-00164

Project:	<b>RPP-WTP</b>	P&ID: <span style="border: 1px solid black; padding: 2px;">3</span>	<b>24590-LAB-M6-RLD-00002001</b>
Project No:	<b>24590</b>	Calculation: <span style="border: 1px solid black; padding: 2px;">3</span>	<b>24590-LAB-M6C-RLD-00004</b>
Project Site:	<b>Hanford</b>	Vessel Drawing	<b>24590-LAB-MV-RLD-00001</b>
Description:	<b>LAB Area Sink Drain Collection Vessel (RLD C3 Vessel)</b> <span style="border: 1px solid black; padding: 2px;">3</span>	Reports/Other Documentation <span style="border: 1px solid black; padding: 2px;">3</span>	<b>N/A</b>

**Reference Data**

Charge Vessels (Tag Numbers)	<b>None</b>
Pulsejet Mixers / Agitators (Tag Numbers)	<b>None</b>
RFDs/Pumps (Tag Numbers)	<b>None</b>

**Design Data**

Quality Level	<b>CM</b> <span style="border: 1px solid black; padding: 2px;">3</span>	Fabrication Specs	<b>24590-WTP-3PS-MV00-T0001</b>		
Seismic Category	<b>SC-IV</b> <span style="border: 1px solid black; padding: 2px;">3</span>	Design Code	<b>ASME Sec VIII Div 1</b>		
Service/Contents	<b>Radioactive Liquid Drain</b>	Code Stamp	<b>Yes</b>		
Design Specific Gravity	<b>1.02</b>	NB Registration	<b>Yes</b>		
Maximum Operating Volume	gal <b>2740 (Note 5)</b>	Weights (lbs)	Empty	Operating	Test
Total Volume	gal <b>3180 (Note 5)</b>	Estimated	<span style="border: 1px solid black; padding: 2px;">3</span> <b>10,278</b>	<span style="border: 1px solid black; padding: 2px;">3</span> <b>31,188</b>	<span style="border: 1px solid black; padding: 2px;">3</span> <b>36,988</b>
Environmental Qualification <span style="border: 1px solid black; padding: 2px;">3</span>	<b>Mild</b>	Actual *			

Inside Diameter	inch	<b>102</b>			Wind Design	<b>Not Required</b>	
Length/Height (TL-TL)	inch	<b>69</b>			Snow Design	<b>Not Required</b>	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	<b>24590-WTP-3PS-MV00-T0002 &amp; 24590-WTP-3PS-FB01-T0001</b>	
Internal Pressure	psig	<b>0</b>	<b>15</b>	<b>N/A</b>	Seismic Base Moment *	ft <sup>2</sup> lb	
External Pressure	psig	<b>0.15</b>	<b>7</b>	<b>N/A</b>	Postweld Heat Treat	<b>Not Required</b>	
Temperature	°F	<b>78</b>	<b>240</b>	<b>N/A</b>	Corrosion Allowance	inch	<b>0.04</b>
Min. Design Metal Temp.	°F	<b>-20</b>			Hydrostatic Test Pressure *	psig	

**Materials of Construction**

Component	Material	Minimum Thickness / Size	Containment
Top Head	<b>UNS N08367</b>	<b>See Drawing</b>	<b>Auxiliary</b>
Shell	<b>UNS N08367</b>	<b>See Drawing</b>	<b>Primary</b>
Bottom Head	<b>UNS N08367</b>	<b>See Drawing</b>	<b>Primary</b>
Support (skirt)	<b>SA 240 304 (Carbon Content Max .030%)</b>	<b>See Vendor Drawing</b> <span style="border: 1px solid black; padding: 2px;">3</span>	<b>N/A</b>
Jacket/Coils/Half-Pipe Jacket	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Internals	<b>UNS N08367</b>	<b>See Drawing</b>	<b>Secondary</b>
Pipe	<b>UNS N08367, N10276/N06022, Note 4</b> <span style="border: 1px solid black; padding: 2px;">3</span>	<b>See Drawing</b>	<b>See Note-1</b>
Forgings/ Bar stock	<b>UNS N08367</b>	<b>See Drawing</b>	<b>See Note-1 for Nozzle Necks</b>
Gaskets/Bolting	<b>None</b>	<b>N/A</b>	<b>N/A</b>

**Miscellaneous Data**

Orientation	<b>Vertical</b>	Support Type	<b>Skirt</b>
Insulation Function	<b>Not Applicable</b>	Insulation Material	<b>Not Applicable</b>
Insulation Thickness (inch)	<b>Not Applicable</b>	Internal Finish	<b>De-scale as laid</b>



**MECHANICAL DATA SHEET: VESSEL**

PLANT ITEM No.

24590-LAB-MV-RLD-VSL-00164

Remarks

**\*\* To be confirmed by Seller**

**Note 1: Nozzle necks below maximum operating level are primary, others auxiliary.**

**Note 2: Design life is 40 years**

**Note 3: Deleted**

**Note 4: Material of construction for nozzle No7 and No6 shall be Hastelloy N06022 or Hastelloy N010276**

**Note 5: Vessel volumes are approximates and do not account for manufacturing tolerances, nozzles, and displacement of internals**

**Note 6: Revised design data and deleted note No3**

**Note 7: Revised as identified by triangle's.**

**Note 8: Contents of this document are Dangerous Waste Permt Affecting**

**Note 9: Beta/gamma dose exposure rate is  $3.05E+02$  Rad/hr @ 1m 05/22/14**

Seismic

Seismic Per UBC-97

DOE Radioactive Materials Disclaimer:

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the US Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

Approval

Rev	Description	Vessel Engineer	Checked	System Engineer	MET	E&NS	Approved	Date
0	Issue for purchase	MA	CS/SK	MP	N/A	N/A	MH	08/26/03
1	Revised as per note No 6 and Issue for Purchase	MA	CS/SK	MP	N/A	N/A	MH	12/18/03
2	Added Pipe Material	MA	WK/RT	MP	Atri Sri	N/A	MH	07/29/04
3	Revise to remove Material Specification No. SB-622 for Seamless pipe, and revisions are identified by triangles. <i>incorporates 24590-LAB-M6N-KLD-0005</i>	M. Arulampalam	Kuldip Singh	Pete Ornel	Debbie Adler	Jim Aris	Sean Sweeney	

*24590-NTP-M6N-MSDI-0005*

Table III.10.E.D – Analytical Laboratory Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><b><u>Radioactive Liquid Waste Disposal System</u></b></p> <p>RLD-VSL-00164 (Laboratory Area Sink Drain Collection Vessel)</p> <p>RLD-VSL-00165 (Hotcell Drain Collection Vessel)</p>	<p>RLD</p>	<p><b><u>24590-LAB</u></b></p> <p>-3YD-RLD-00001<sup>a</sup></p> <p>-M5-V17T-00029, Rev 4</p> <p>-M6-RLD-00001001, Rev 1</p> <p>-M6-RLD-00001002, Rev 0</p> <p>-M6-RLD-00001003, Rev 0</p> <p>-M6-RLD-00001004, Rev 0</p> <p>-M6-RLD-00002001, Rev 1</p> <p>-M6-RLD-00002003, Rev 0</p> <p>-M6-RLD-00006001, Rev 0</p> <p>-M6-RLD-00006002, Rev 0</p> <p>-M6-RLD-00006003, Rev 0</p> <p>-M6-RLD-00007001, Rev 0</p> <p>-M6-RLD-00007002, Rev 0</p> <p>-M6-RLD-00008001, Rev 0</p> <p>-M6-RLD-00008002, Rev 0</p> <p>-MVD-RLD-<del>P</del>00164, Rev <del>3</del></p> <p>-MVD-RLD-P0165, Rev 1</p> <p>-MV-RLD-P0001, Rev 0</p> <p>-N1D-RLD-P0002, Rev 1</p> <p>-N1D-RLD-P0003, Rev 1</p> <p>-P1-60-00007, Rev 3</p> <p>-P1-60-00008, Rev 3</p>	<p>Section 4H.2.1; Table 4H-1 of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>RLD-VSL-00164 = 3180</p> <p>RLD-VSL-00165 = 9100</p>

**Table III.10.E.D – Analytical Laboratory Tank Systems Description**

<b>Mixed Waste Tank Systems Name</b>	<b>Unit Designation</b>	<b>Engineering Description (Drawing Nos, Specification Nos, etc.)</b>	<b>Narrative Description, Tables &amp; Figures</b>	<b>Maximum Capacity (gallons)</b>
		<u><b>24590-WTP</b></u> -3PS-G000-T0002, Rev 9 -3PS-MV00-T0001, Rev 5 -3PS-MV00-T0002, Rev 3 -3PS-MV00-T0003, Rev 3		
*System Descriptions are maintained in the Administrative Record, and are listed here for information only.				