MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-HLP-VSL-00022

Project:	***RPP-WTP***	P&ID:	***24590-PTF-M6-HLP-P0002***
Project No:	***24590***	Process Calculation: 1	***24590-PTF-MVC-HLP-00001***
Project Site:	***Hanford***	Vessel Drawing	***24590-PTF-MV-HLP-P0003***
Description:	***HLW Feed Receipt Vessel***		

ISSUED BY RPP-WTP PDC
INIT DATE 12.22.03

R10182255

Reference Data

Charge Vessels (Tag Numbers)	***DELETED***
Pulsejet Mixers / Agitators (Tag Numbers)	***HLP-PJM-00056, HLP-PJM-00057, HLP-PJM-00084, HLP-PJM-00085, HLP-PJM-00086, HLP-PJM-00087, HLP-PJM-00088, HLP-PJM-00089, HLP-PJM-00090, HLP-PJM-00091, HLP-PJM-00092, HLP-PJM-00093***
RFDs/Pumps (Tag Numbers)	***DELETED***

Design Data

Quality Level		***See Vessel Drawing***	Fabrication Specs	***24590-WTP-3PS-MV00-TP001***		
Seismic Category		***SC-I***	Design Code	***ASME VIII Div 1***		
Service/Contents		***Radioactive Liquid***	Code Stamp	***Yes***		
Design Specific Gravity		***1.50***	NB Registration	***Yes***		
Maximum Operating Volume	gal	***234,500***	Weights (lbs)	Empty	Operating	Test
Total Volume	gal	***270,600***	Estimated	***494,900***	***3,453,500***	***2,769,900***
			Actual *			

Inside Diameter	inch	***456***			Wind Design	***Not Required***	
Length/Height (TL-TL)	inch	***290***			Snow Design	***Not Required***	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	***24590-WTP-3PS-MV00-TP002 24590-WTP-3PS-SS90-T0001***	
Internal Pressure	psig	***0*** 1	***15***	***35***	Seismic Base Moment *	ft*lb	
External Pressure	psig	***0.217***	***4.5 (Note 4)***	***15*** 1	Postweld Heat Treat	***Not Required***	
Temperature	°F	***190***	***215***	***215*** 1	Corrosion Allowance	Inch	***0.04 (Note 7)*** 1
Min. Design Metal Temp.	°F	***40***			Hydrostatic Test Pressure *	psig	

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.

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EXPIRES 12/10/04

This Bound Document Contains a total of 4 pages

REV	DATE	REASON FOR REVISION	PREPARER	CHECKER	REVIEWER	APPROVER
1	12/22/03	Issued for Permitting Use				
0	10/3/03	Issued for Permitting Use	Jessica Jackson	Rob Simmons	Cliff Slater	Mark Hoffmann

Processed/Date Entry ☐ Copied/QA ☒ Scanned ☐ Filed
12/22/03
12/22/03

DATA SHEET #: 24590-PTF-MVD-HLP-P0006, Rev 1

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-HLP-VSL-00022

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	SA-240 316 (Note 3)	See Drawing	Auxiliary
Shell	SA-240 316 (Note 3)	See Drawing	Primary
Bottom Head	SA-240 316 (Note 3)	See Drawing	Primary
Support	SA-240 304 (Note 3)	See Drawing	N/A
Jacket/Coils/Half-Pipe Jacket	SA-240 316 (Note 3)	See Drawing	N/A
Internals	SA-240 316 (Note 3)	See Drawing	Thermowells Primary
Pipe	SA-312 TP316 Smls (Note 3)	See Drawing	Note 1
Forgings/ Bar stock	SA-182 F316 (Note 3)	See Drawing	Note 1
Wash Ring Pipe 1	SA-312 TP316 Smls (Note 3)	See Drawing	N/A
Bolting/ Gaskets	N/A	N/A	N/A

Miscellaneous Data

Orientation	Vertical	Support Type	Skirt
Insulation Function	Not Applicable	Insulation Material	Not Applicable
Insulation Thickness (inch)	Not Applicable	Weld Surface Finish 1	Welds Descaled as Laid (Note 2)

Remarks

* To be determined by the vendor.

Note 1: Nozzle necks below normal operating level are primary, others auxiliary. See 24590-WTP-3PS-MV00-TP001 and vessel drawing for NDT.

Note 2: Grind smooth shell welds at shell-jacket welds.

Note 3: Maximum carbon content of 0.030% for all welded components.

Note 4: External design pressure under the jacket shall be rated for the jacket design pressure plus 1 psig internal vacuum in the vessel to account for ventilation fan pressures. 1

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

Note 6: Contents of this document are Dangerous Waste Permit affecting.

Note 7: Corrosion allowance for jacket shall be 0.04 inch. 1

Note 8: The vessel design external pressure is estimated only and shall be confirmed by the Seller's calculations. 1

	MECHANICAL DATA SHEET: VESSEL	PLANT ITEM No. 24590-PTF-MV-HLP-VSL-00022

Equipment Cyclic Data Sheet

Component Plant Item Number	***PTF-MV-HLP-VSL-00022***
Component Description	***Parent Vessel***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA-240 316 with maximum carbon content of 0.030%***
Design Life	***40 Years***
Component Function and Life Cycle Description	***This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day and emptied to complete a 92 day cycle. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year. The temperature is maintained normally at or below 190°F.*** 1

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	***-4.5***	***15***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***-0.217***	***0***	***200***	
Operating Temperature	°F	***50***	***190***	***200***	
Contents Specific Gravity		***1.00***	***1.50***	***200***	***Dependent on fluid properties of waste stream***
Contents Level	inch	***0***	***362***	***200***	***Liquid level measured from crown of bottom head***
Localized Features					
Nozzles		***Within 9°F of operating temperature range.***		***As above***	
Supports					

Notes

- ***Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.***

BECHTEL	**MECHANICAL DATA SHEET: VESSEL**	PLANT ITEM No. ***24590-PTF-MV-HLP-VSL-00022***

Equipment Cyclic Data Sheet

Component Plant Item Number	***HLP-PJM-00056, HLP-PJM-00057, HLP-PJM-00084, HLP-PJM-00085, HLP-PJM-00086, HLP-PJM-00087, HLP-PJM-00088, HLP-PJM-00089, HLP-PJM-00090, HLP-PJM-00091, HLP-PJM-00092, HLP-PJM-00093***
Component Description	***Pulse Jet Mixers***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA-240 316 with maximum carbon content of 0.030%***
Design Life	***40 Years***
Component Function and Life Cycle Description	***These pulse jet mixers (PJMs) are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum design pressure and the minimum design pressure plus the external static head imposed by the parent vessel. The PJM supports shall be designed to cycle between fully buoyant (PJM empty and parent vessel full) and fully loaded (PJM full and parent vessel empty) in addition to thrust.*** 1

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	***FV***	***80***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***FV***	***72.5***	***7.9X 10⁶***	
Operating Temperature	°F	***50***	***190***	***200***	***Parent Vessel will be operated normally at a temperature of 190°F.*** 1
Contents Specific Gravity		***1.00***	***1.50***	***200***	***Dependent on fluid properties of waste stream.***
Contents Level	inch	***Empty***	***Flooded***	***7.9 X 10⁶***	
Localized Features					
Nozzles					
Supports					

Notes

- ***Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.***