Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

19-ESQ-0100

OCT 0 8 2019

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

Dear Ms. Smith:

CLASS 1 MODIFICATIONS TO THE HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT PERMIT, QUARTER ENDING SEPTEMBER 30, 2019

In accordance with the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste (Permit) Condition I.C.3, attached are Class 1 permit modification documents for the quarter ending September 30, 2019.

The enclosed modification package updates information in Attachment 9 and Part III of the Permit Revision 8C. The Part III changes address the Waste Treatment and Immobilization Plant (OUG 10). The modifications are being made to ensure activities are conducted in compliance with the Permit. A record of the modifications is maintained in the Hanford Facility Operating Record.

The U.S. Department of Energy and the Washington State Department of Ecology use Permit Change Notices (PCNs) to help track Class 1 permit modifications. This modification package addresses the following PCNs:

PCN Identifier:	**Affected Permit Section:**
PCN-HFSW-2019-04	Attachment 9 (Permit Applicability Matrix)
24590-LAW-PCN-ENV-18-010	OUG-10, Appendix 9.11
24590-LAW-PCN-ENV-19-001	OUG-10, Appendix 9.6
24590-BOF-PCN-ENV-19-002	OUG-10, Appendix 13.4

If you have any questions, please contact me, or your staff may contact Brian J. Stickney, Assistant Manager for Safety and Environment, on (509) 376-9079.

Sincerely,

Brian T. Vance
Manager

ESQ:ACM

Attachment

cc w/attach:
D. J. Alexander, Ecology (CD ROM)
J. L. Cantu, Ecology (CD ROM)
C. J. Kemp, ORP (CD ROM)
Administrative Record, TSD: H-0-1 and
H-0-8 (Hardcopy & CD ROM)
Ecology NWP Library (Hardcopy & CD ROM)
Environmental Portal, G3-35 (CD ROM)
HF Operating Record (J. K. Perry, MSA, A3-01)

cc w/o attach:
J. E. Bramson, CHPRC
R. E. Bullock, CHPRC
A. S. Carlson, Ecology
B. A. Costas, BNI
S. L. Dahl, Ecology
L. M. Dittmer, CHPRC
P. E. Eberlein, CHPRC
M. D. Ellefson, PNNL
R. L. Evans, ORP
R. E. Fox, CHPRC
L. A. Huffman, ORP
M. E. Jones, Ecology
J. A. Lerch, CHPRC
P. W. Martin, CHPRC
G. M. Neath, ORP
B. Peck, BNI
F. A. Ruck, CHPRC
M. Schappell, BNI
M. T. Schanke, CHPRC
D. G. Singleton, CHPRC
S. A. Thompson, WRPS
G. D. Trenchard, ORP
R. E. Varljen, WRPS
M. B. Wilson, MSA
D. M. Yasek, BNI

ENCLOSURE

Class 1 Modifications for Quarter Ending September 30, 2019

Consisting of 50 pages,
including this cover page

Hanford Facility RCRA Permit Modification Notification Forms

Attachment 9 (Permit Applicability Matrix)

Index

Page 2 of 3 Attachment 9, Permit Applicability Matrix
Page 3 of 3 Revision Instructions

Reviewed by RL Program Office:

PAUL HIRSCHMAN, ACTING DEPAMSE
(FOR BRIAN STIGSNEY)

7/29/2019
Date

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	Permit Part
N/A	**Attachment 9, Permit Applicability Matrix**

Description of Modification:

Changes address inconsistency with Parts I & II. A recent change was made to the Part II permit conditions, whereby condition II.A.5 was added. An update is being made to Attachment 9 to account for the newly added condition. Below is reference information about the newly added condition:

- The permit modification tracking number is PCN-HFSW-2019-03
- The modification documents are provided in 19-ESQ-0080 (July 10, 2019)

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number:
A.1 Administrative and informational changes . . . .

Modification Concurrence: ☑ Yes ☐ No	Reviewed by Ecology:
	S. L. Dahl-Crumpler 8/5/19 Date

Revision Instructions:

Revise Attachment 9, Permit Applicability Matrix to incorporate the changes shown herein.

Part II									
Condition		Category							Qualifiers
Part	Title	A	B	C	D	E	F	G	
II.A	**Facility Contingency Plan**								
II.A.1					*	*	*	*	For Category D, II.A Conditions only apply to releases of hazardous substances that threaten human health or the environment.
II.A.2					*	*	*	*	
II.A.3					*	*	*	*	
II.A.4					*	*	*	*	
II.A.5				*	*	*	*	*	Additional information is provided in 19-ESQ-0080, 7/10/19 (P-HFSW-2019-03)
II.B	**Preparedness and Prevention**								
II.B.1						*	*		
II.B.2						*	*		
II.B.3						*	*		
II.B.4						*	*		
II.B.5						*	*		
II.C	**Personnel Training**								
II.C.1						*	*	*	
II.C.2					*	*	*	*	
II.C.3						*	*	*	
II.C.4					*	*	*	*	For Category D, Condition II.C.4 will not apply to unrestricted (publicly accessible) areas.

Categories are Defined as Follows:

A. Leased Land
B. North Slope and Arid Lands Ecology Reserve (ALE)
C. Interim Status Treatment, Storage, or Disposal Facility (TSD) Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post-Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

1 – For Category B, Part I Conditions only apply if future TSD activities are begun on the North Slope or ALE.

2 – For Category C, all Part I Conditions apply to activities subject to Conditions II.U. and II.V.

3 – For Category D, Part I Conditions only apply to activities subject to Conditions II.A., II.C., II.D.4., II.G., II.I., II.L.2.e, II.O., II.Q., II.S., II.T., II.X., and II.Y.

Quarter Ending Sept 30, 2019 24590-LAW-PCN-ENV-18-010

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

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant

This Integrity Assessment addresses updates to the LAW Catalytic Oxidizer/Reducer Miscellaneous Units, collectively known as Thermal Catalytic/Oxidizer (TCO Unit). The TCO Unit is mounted on a skid (LVP-SKID-00002) located in Room L-0304F at Floor Elevation 48'-0".

Submitted by Co-Operator:		Reviewed by ORP Program Office:	
Robert D. Haggard	6/13/19	Thomas W. Fletcher	7/8/19
Robert D. Haggard	*Date*	*Thomas W. Fletcher*	*Date*

Quarter Ending Sept 30, 2019 24590-LAW-PCN-ENV-18-010

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

This Class [1]1 modification requests Ecology approval and incorporation into the permit the below referenced structural integrity assessment report. The report has been updated by the Independent Qualified Registered Professional Engineer (IQRPE).

Appendix 9.11			
Replace:	24590-CM-HC4-HXYG-00240-02-00012, Rev. 00A, IA-3013146-000; IQRPE Structural Integrity Assessment Report for LAW LVP Thermal Catalytic Oxidizer/Reducer (TCO Unit)	With:	24590-CM-HC4-HXYG-00240-02-00012, Rev. 00B, IA-3013146-001; IQRPE Structural Integrity Assessment Report for LAW LVP Thermal Catalytic Oxidizer/Reducer (TCO Unit)

The scope of this Structural Integrity Assessment includes the LAW Catalytic Oxidizer/Reducer Miscellaneous Units, collectively known as Thermal Catalytic/Oxidizer (TCO Unit). This TCO Unit houses four subcomponents namely; Selective Catalyst Oxidizer (LVP-SCO-00001), Selective Catalyst Reducer (LVP-SCR-00001), Electric Heater (LVP-HTR-00002), and Heat Recovery Exchanger (LVP-HX-00001).

For each item of "Information Assessed" in the integrity assessment report, the items listed under the "Source of Information" column were reviewed and found to contain adequate design requirements and controls to ensure the design fully satisfies the requirements of State of Washington Administrative Code (WAC), 173-303-640 WAC, Dangerous Waste Regulations.

This PCN updates information in Appendix 9.11 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.

In accordance with Permit Condition III.10.C.2.e, this permit modification includes an updated IQRPE Structural Integrity Assessment Report for inclusion in Appendix 9.11.

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	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 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: ☑ Yes ☐ Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

S. Dahl 8-22-19

Date

24590-CM-HC4-HXYG-00240-02-00012
Rev. 00B

R11960063

ISSUED BY
RPP-WTP PDC

orano

FS-19-0132

May 21, 2019

Ms. Andrea Dorsey
Subcontractor Administrator
Bechtel National, Inc.
2435 Stevens Center Place
Richland, WA 99354

Orano Federal
Services LLC

9530 Bedford St
Pasco, WA 99301

Tel: +1 509 862 4747

Dear Ms. Dorsey,

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00240 IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW LVP THERMAL CATALYTIC OXIDIZER/REDUCER (TCO UNIT) (IA-3013146-001)

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

If you have any questions, please contact Tarlok Hundal at (509) 862-4765, or via email at tarlok.hundal@orano.group.

Sincerely,

W. Keith Wilkerson
Sr. Contract Administrator
Orano Federal Services LLC
Charlotte Office

lap
cc: J.S. Evans, w/Enclosure (1)

orano

IA-3013146-001

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW LVP THERMAL CATALYTIC OXIDIZER/REDUCER (TCO UNIT)

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.

orano

IA-3013146-001

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT
FOR
LAW LVP THERMAL CATALYTIC OXIDIZER/REDUCER (TCO UNIT)

"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 LAW LVP Thermal Catalytic Oxidizer/Reducer (TCO Unit), as required by the Washington Administrative Code (WAC), Chapter 173-303 WAC, *Dangerous Waste Regulations*, Section WAC-173-303-640 (3) (a) through (g) applicable elements of the *Tank Systems.*"

"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 twelve (12) pages numbered one (1) through twelve (12).

TARLOK SINGH HUNDAL
STATE OF WASHINGTON
20213
REGISTERED
PROFESSIONAL ENGINEER

T S Hundal

T S Hundal 5/21/2019

Signature Date

Scope	Scope of this Integrity Assessment	The scope of this integrity assessment includes LAW Catalytic Oxidizer/Reducer Miscelleneous Units, collectively known as Thermal Catalytic/Oxidizer (TCO Unit) and hereinafter is also synonymously termed as Plant Item. This TCO Unit houses four subcomponents namely; Selective Catalyst Oxidizer (LVP-SCO-00001), Selective Catalyst Reducer (LVP-SCR-00001), Electric Heater (LVP-HTR-00002), and Heat Recovery Exchanger (LVP-HX-00001). The TCO Unit associated with the LVP system is shown on the Process Flow Diagram drawing 24590-LAW-M5-V17T-00011. The LAW LVP system receives melter offgas from the Primary Offgas System (LOP) and its primary safety function is to ensure containment of hazardous gases within the system. The offgas stream has potentially high levels of Volatile Organic Compounds (VOCs) and Oxides of Nitrogen (NO_x). The LAW TCO Unit's catalysts remove VOCs and NO_x compounds from the offgas, before further processing in caustic scrubber and exhausters, prior to its release to atmosphere via discharge stack. The TCO Unit is mounted on a skid (LVP-SKID-00002) located in Room L-0304F at Floor Elevation 48'-0" of the LAW facility as shown on General Arrangement Plan drawing 24590-LAW-P1-P01T-00005. **Note:** **This report (IA-3013146-001) is a revision of the previous report (IA-3013146-000; BNI # 24590-CM-HC4-HXYG-00240-02-00012, Rev. 00A).**
Summary of Assessment		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, *Dangerous Waste Regulations,* Section WAC-173-303-640 (3) (a) through (g) applicable elements of the *Tank Systems.* Note: Numerous change documents were issued against various documents listed in the "References" section and "Source of Information" column below. The change documents were reviewed and those which had any impact on the "Assessment" results were appropriately included, however, those which did not have any impact on the "Assessment" results were not included herein.

References	Material Requisition, Specifications, and Plant Drawings	Material Requisition (MR): 24590-QL-MRA-MBT0-00007, Rev. 6, Oxidizers, Thermal Catalytic LAW. Specifications: The following Specifications with their respective revision and Specification Change Notices (SCNs) are listed in the above listed MR, except as marked with asterisk *: 24590-LAW-3PS-MBTV-T0001, Engineering Specification for LAW Thermal Catalytic Oxidizer/Reducer; 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-MV00-T0003, Engineering Specification for Fatigue Analysis of 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 & IV Equipment and Tanks; 24590-WTP-3PS-SS00-T0001, Engineering Specification for Welding of Structural Carbon Steel; 24590-WTP-3PS-SS00-T0002, Engineering Specification for Welding of Structural Stainless Steel and Welding of Structural Carbon Steel to Structural Stainless Steel. Plant Drawings: 24590-LAW-P1-P01T-00005, Rev. 7, LAW Vitrification Building General Arrangement Plan at El. 48'-0"; 24590-LAW-P1-P23T-00051, Rev. 6, LAW Vitrification Building Equipment Location Plan El. 48'-0"/Area 4; 24590-LAW-P1-P23T-00052, Rev. 7, LAW Vitrification Building Equipment Location Plan El. 48'-0"/Area 5; 24590-LAW-DB-S13T-00135, Rev. 9, LAW Vitrification Building Main Building Partial Conc Forming Plan Zone 5 @ El. (+) 48'-0"; 24590-LAW-DD-S13T-00306, Rev. 10, LAW Vitrification Building Carbon Bed Adsorbers and Catalytic Oxidizer/Reducer Equipment Anchorage @ El. 48'-0"; 24590-LAW-DD-S13T-00313, Rev. 0, LAW Vitrification Building Thermal Catalytic Oxidizer/Reducer Anchor Bolt Schedule at El. 48'-0"; 24590-LAW-DD-S13T-00314, Rev. 0, LAW Vitrification Building Catalytic Oxidizer/Reducer Equipment Anchorage @ El. (+) 47'-0"; 24590-LAW-SS-S15T-00028, Rev. 6, LAW Vitrification Building Main Building Structural Steel Partial Floor Framing Plan Zone 5 @ TOS El. (+) 47'-0"; 24590-LAW-M5-V17T-00011, Rev. 6, Process Flow Diagram LAW Vit Secondary Offgas Treatment (System LVP); 24590-LAW-M6-LVP-00005001, Rev. 4, P&ID- LAW Secondary Offgas/Vessel Vent Process System Amonia Dilution Skid; 24590-LAW-M6-LVP-00005002, Rev. 4, P&ID- LAW Secondary Offgas/Vessel Vent Process System SCO/SCR Skid.

References (cont'd)	Vendor Fabrication Drawings	<u>Vendor Fabrication Drawings (*Bechtel Status Code 1 Drawings)</u>: 24590-CD-POC-MBT0-00007-01-00182, Rev. 00G, LAW Thermal Catalytic Oxidizer-VOC SCO Housing Weldment, Sht. 1-2; 24590-CD-POC-MBT0-00007-01-00237, Rev. 00G, LAW Thermal Catalytic Oxidizer-VOC-SCO Front Weldment; 24590-CD-POC-MBT0-00007-01-00238, Rev. 00H, LAW Thermal Catalytic Oxidizer-Mechanism General Assembly; 24590-CD-POC-MBT0-00007-01-00239, Rev. 00O, LAW Thermal Catalytic Oxidizer-VOC SCO General Assembly, Sht. 1-3; 24590-CD-POC-MBT0-00007-01-00240, Rev. 00I, LAW Thermal Catalytic Oxidizer-NOX Housing Weldment, Sht. 1-2; 24590-CD-POC-MBT0-00007-01-00253, Rev. 00L, LAW Thermal Catalytic Oxidizer-NOX Front Weldment; 24590-CD-POC-MBT0-00007-01-00254, Rev. 00M, LAW Thermal Catalytic Oxidizer-NOX General Assembly, Sht. 1-3; 24590-CD-POC-MBT0-00007-01-00255, Rev. 00K, LAW Thermal Catalytic Oxidizer-Heat Exchanger Weldment, Sht. 1-2; 24590-CD-POC-MBT0-00007-01-00279, Rev. B00, LAW Thermal Catalytic Oxidizer-Heat Exchanger General Assembly, Sht. 1-3; 24590-CD-POC-MBT0-00007-01-00281, Rev. 00E, LAW Thermal Catalytic Oxidizer-Heater Housing Weldment; 24590-CD-POC-MBT0-00007-01-00282, Rev. 00D, LAW Thermal Catalytic Oxidizer-Heater Inlet Duct Weldment; 24590-CD-POC-MBT0-00007-01-00283, Rev. 00D, LAW Thermal Catalytic Oxidizer-Heater Outlet Duct Weldment; 24590-CD-POC-MBT0-00007-01-00315, Rev. 00E, LAW Thermal Catalytic Oxidizer-Heater Front Weldment; 24590-CD-POC-MBT0-00007-01-00325, Rev. 00L, LAW Thermal Catalytic Oxidizer-Heater General Assembly, Sht. 1-3; 24590-CD-POC-MBT0-00007-01-00326, Rev. 00J, LAW Thermal Catalytic Oxidizer-Heater Inlet Duct General Assembly, Sht. 1-2; 24590-CD-POC-MBT0-00007-01-00327, Rev. 00K, LAW Thermal Catalytic Oxidizer-Heater Outlet Duct General Assembly, Sht. 1-3; 24590-CD-POC-MBT0-00007-01-00328, Rev. 00K, LAW Thermal Catalytic Oxidizer-VOC Inlet Weldment; 24590-CD-POC-MBT0-00007-01-00348, Rev. 00E, LAW Thermal Catalytic Oxidizer-VOC SCO Base Frame Weldment; 24590-CD-POC-MBT0-00007-01-00351, Rev. 00G, LAW Thermal Catalytic Oxidizer-NH3-NOX Base Frame Weldment; 24590-CD-POC-MBT0-00007-01-00352, Rev. 00E, LAW Thermal Catalytic Oxidizer-Heat Exchanger Base Frame Weldment; 24590-CD-POC-MBT0-00007-01-00353, Rev. B02, LAW Thermal Catalytic Oxidizer-TCO General Arrangement, Sht. 1-4; 24590-CD-POC-MBT0-00007-01-00354, Rev. B00, LAW Thermal Catalytic Oxidizer-LAW TCO Final Assembly, Sht. 1-4; 24590-CD-POC-MBT0-00007-01-00357, Rev. 00H, LAW Thermal Catalytic Oxidizer-Heat Exchanger Inlet/Outlet Weldment; 24590-CD-POC-MBT0-00007-01-00386, Rev. B01, LAW Thermal Catalytic Oxidizer-TCO General Assembly, Sht. 1-2; 24590-CD-POC-MBT0-00007-01-00387, Rev. 00G, LAW Thermal Catalytic Oxidizer-Heat Exchanger Inlet/Outlet General Assembly; 24590-CD-POC-MBT0-00007-01-00388, Rev. 00F, LAW Thermal Catalytic Oxidizer-Heat Exchanger Inlet-Outlet Machined; 24590-CD-POC-MBT0-00007-01-00389, Rev. 00E, LAW Thermal Catalytic Oxidizer-Heater Housing Machined; 24590-CD-POC-MBT0-00007-01-00390, Rev. 00F, LAW Thermal Catalytic Oxidizer-Heater Inlet Duct Machined; 24590-CD-POC-MBT0-00007-01-00391, Rev. 00E, LAW Thermal Catalytic Oxidizer-Heater Outlet Duct Machined; 24590-CD-POC-MBT0-00007-01-00397, Rev. 00D, LAW Thermal Catalytic Oxidizer-TCO Field Installation, Sht. 1-9; 24590-CD-POC-MBT0-00007-01-00401, Rev. 00G, LAW Thermal Catalytic Oxidizer-Shipping Drawings, Sht. 1-6. * Bechtel Status Code 1 Drawing is an "as fabricated vendor drawing" approved/accepted by Bechtel.

References (cont'd)	Mechanical Data Sheet, Corrosion Evaluation, and System Design Description	<u>Mechanical Data Sheet (MDS)</u>: 24590-LAW-MKD-LVP-00012, Rev. 15, LAW Catalytic Oxidizer/Reducer (LVP-SKID-00002/00003). <u>Corrosion Evaluation</u>: 24590-LAW-N1D-LVP-00005, Rev. 3, LAW Catalytic Oxidizer Heat Recovery Exchanger (LVP-HX-00001); 24590-LAW-N1D-LVP-00006, Rev. 3, LAW Catalytic Oxidizer Electric Heater (LVP-HTR-00002); 24590-LAW-N1D-LVP-00007, Rev. 4, LAW Thermal Catalytic Oxidizer (LVP-SCO-00001); 24590-LAW-N1D-LVP-00008, Rev. 3, LAW NOx Selective Catalytic Reducer (LVP-SCR-00001). <u>System Design Description:</u> 24590-LAW-3ZD-LOP-00001, Rev. 3, LAW Primary Offgas Process (LOP) and LAW Secondary Offgas/Vessel Vent Process (LVP) System Design Description, including SDDCN # 24590-LAW-3ZN-LOP-00012.

	Information Assessed	Source of Information	Assessment
Design	Plant Item design standards are appropriate and adequate for the vessel have intended use.	Material Requsition, Specifications, Drawings, and Mechanical Data Sheet listed above under References; ASME Boiler and Pressure Vessel Code (B&PV), Section VIII, Division 1 & 2, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers; AISC N690, American National Standard-Nuclear Facilities-Steel Safety Related Structures for Design, Fabrication, and Erection, American Society of Steel Construction; AISC M016, Manual of Steel Construction, ASD 9th Edition, American Society of Steel Construction; AWS 1.1, Structural Welding Code-Steel, American Welding Society; AWS 1.6, Structural Welding Code-Stainless Steel; American Welding Society; UBC 1997, Uniform Building Code. 24590-WTP-DC-ST-01-001, Rev. 14, Structural Design Criteria; ASTM Standards, American Society for Testing and Materials.	The LAW TCO Unit is considered as a vessel. The TCO Unit is also interchangeably termed herein as Plant Item or Miscellaneous Unit. The Engineering Specifications, Material Requisition, and Mechanical Data Sheet documents require that the TCO Unit housing and its components design, fabrication, and installation be per applicable codes, standards, and design criteria listed in the Source of Information column herein. The unit will be without the National Board of Registration ASME Code stamp. Supplementary requirements for the TCO Unit are specified in the listed referenced engineering specifications. The supplementary requirements include structural design requirements, fatigue, seismic, and thermal analyses, positive material identification, fabrication tolerances, welding procedures, welder qualifications and testing records, NDE inspections and records, packaging, handling, and storage requirements. The TCO Unit is identified as Safety Significant (SS), Quality Level (Q), and Seismic Category (SC-III) in the Mechanical Data Sheet. The Vendor Fabrication drawings show that the TCO Unit is approximately 43 ft (L) x 10 ft (W) x 13 ft (H). The drawings reviewed show that TCO Unit housing and its numerous components are built with various grades of stainless steel material (mainly type 347). The TCO Unit is adequately insulated to maintain the surface temperature below 140 °F for protection of the workers and below 150 °F for support steel and concrete elements as required per Engineering Specification for TCO Unit and Structural Design Criteria, respectively. The TCO Unit is mounted on an ASTM A992 carbon steel frame skid. The design requirements specified in the aforementioned codes, standards, and specifications are appropriate and adequate for the intended use of the TCO Unit.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	If a non-standard Plant Item is to be used, the design calculations demonstrate sound engineering principles of construction.	Material Requisition, Mechanical Data Sheet, Specifications, and Drawings listed above under References; ASME Boiler and Pressure Vessel Code (B&PV), Section VIII, Division 1 & 2, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers; AISC N690, American National Standard-Nuclear Facilities-Steel Safety Related Structures for Design, Fabrication, and Erection, American Society of Steel Construction; AISC M016, Manual of Steel Construction, ASD 9th Edition, American Society of Steel Construction; AWS 1.1, Structural Welding Code-Steel, American Welding Society; AWS 1.6, Structural Welding Code-Stainless Steel; American Welding Society; UBC 1997, Uniform Building Code. 24590-WTP-DC-ST-01-001, Rev. 14, Structural Design Criteria; ASTM Standards, American Society for Testing and Materials. 24590-LAW-MVC-LVP-00004, Rev. 0, LVP-SKID-00002, LAW Thermal Catalytic Oxidizer/Reducer, Stress Analysis with ANSYS.	The LAW LVP TCO Unit is a non-standard offgas treatment assembly that is shop fabricated. The referenced Material Requisition, Mechanical Data Sheet, and Specifications require that the TCO Unit be designed, fabricated, inspected, tested, and installed per the applicable codes, standards, and design criteria listed in the Source of Information column herein. Review of the TCO Stress Analysis and drawings show that appropriate applicable load cases and combinations thereof were used utilizing sound engineering principles for the design and construction of the TCO Unit. Furthermore, approval and acceptance of the vendor fabrication drawings by Bechtel National Inc. (BNI), is an added assurance that all applicable requirements stated in aforementioned documents (including daughter documents) for the TCO Unit have been met.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Plant Item has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Material Requisition, Specifications, Mechanical Data Sheet, and Corrosion Evaluation listed above under References; ASME Boiler and Pressure Vessel Code (B&PV), Section VIII, Division 1 & 2, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers; AISC N690, American National Standard-Nuclear Facilities-Steel Safety Related Structures for Design, Fabrication, and Erection, American Society of Steel Construction; AISC M016, Manual of Steel Construction, ASD 9th Edition, American Society of Steel Construction; AWS 1.1, Structural Welding Code-Steel, American Welding Society; AWS 1.6, Structural Welding Code-Stainless Steel; American Welding Society; UBC 1997, Uniform Building Code; 24590-WTP-DC-ST-01-001, Rev. 14, Structural Design Criteria; ASTM Standards, American Society for Testing and Materials. 24590-LAW-MVC-LVP-00004, Rev. 0, LVP-SKID-00002, LAW Thermal Catalytic Oxidizer/Reducer, Stress Analysis with ANSYS.	The Engineering Specification for LAW TCO Unit and Mechanical Data Sheet documents require that the TCO Unit housing including all related components and appurtenances be designed and fabricated in accordance with the applicable sections of codes, standards, and design criteria listed in the Source of Information column herein. These codes and standards require specific consideration of operating pressures, temperatures, corrosion allowance, and seismic loads in the design process. Supplementary requirements are specified in the referenced engineering specifications. The supplementary requirements include structural design, fatigue and thermal analyses, positive material identification, fabrication tolerances, acceptable welding procedures, welder qualifications and testing records, NDE inspections and records, and packaging, handling, and storage requirements for the TCO Unit. The Mechanical Data Sheet identifies the operating pressure and temperature ranges and seismic category for the TCO Unit. Corrosion allowance of 0.010" is recommended for the TCO Unit as identified in the Corrosion Evaluation and Mechanical Data Sheet documents. The Engineering Specification for Seismic Design of Pressure Vessels specifies requirements for the seismic design. The Stress Analysis with ANSYS document reviewed shows that the applicable design and loading parameters were appropriately considered in the design process and the TCO Unit has adequate strength to sustain them during its design life.

	Information Assessed	Source of Information	Assessment
Foundation	Plant Item foundation will maintain the load of a full unit.	Material Requisition, Specifications, and Mechanical Data Sheet listed above under references; ASME Boiler and Pressure Vessel Code (B&PV), Section VIII, Division 1 & 2, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; AISC N690, American National Standard-Nuclear Facilities-Steel Safety Related Structures for Design, Fabrication, and Erection, American Society of Steel Construction; AISC M016, Manual of Steel Construction, ASD 9th Edition, American Society of Steel Construction; AWS 1.1, Structural Welding Code-Steel, American Welding Society; AWS 1.6, Structural Welding Code-Stainless Steel; American Welding Society; UBC 1997, Uniform Building Code; 24590-WTP-DC-ST-01-001, Rev. 14, Structural Design Criteria; 24590-WTP-DB-ENG-01-001, Rev. 8, Basis of Design; 24590-LAW-MVC-LVP-00004, Rev. 0, LVP-SKID-00002, LAW Thermal Catalytic Oxidizer/Reducer, Stress Analysis with ANSYS; 24590-LAW-DDC-S13T-00055, Rev. 2, LAW Thermal Catalytic Oxidizer/Reducer Anchorage.	The Engineering Specifications, Material Requisition, and Mechanical Data Sheet documents require that the TCO Unit housing support be designed per applicable requirements of the codes, standards, and design criteria listed in Source of Information column herein. The requirements in the aforementioned codes and standards have adequate structural design requirements to ensure proper support for the TCO Unit. The Basis of Design document requires that the supports and foundations shall be designed adequately to sustain all applicable loads including the full weight of the unit. The review of Stress Analysis and Anchorage calculation documents shows that the supporting frame of the TCO Unit housing has been designed adequately to handle the applicable loads. However, it should be noted that the evaluation of the TCO Unit housing foundation (concrete floor slab @ Elev. 48'-0") is not in the scope of this report. However, it is covered in a separate integrity assessment report titled, "IQRPE Structural Integrity Assessment Report for LAW Secondary Containment."

	Information Assessed	Source of Information	Assessment
Foundation (cont'd)	If in an area subject to flooding, the Plant Item is anchored.	Drawings, Specifications, and Mechanical Data Sheet listed above under References; 24590-LAW-MVC-LVP-00004, Rev. 0, LVP-SKID-00002, LAW Thermal Catalytic Oxidizer / Reducer, Stress Analysis with ANSYS; 24590-LAW-DDC-S13T-00055, Rev. 2, LAW Thermal Catalytic Oxidizer/Reducer Anchorage; 24590-LAW-DDC-S13T-00060, Rev. 4, Anchorage of LVP Pipe Support Frame Near LAW +48'-0" TCO.	As shown on the referenced drawings, the TCO Unit is located at floor Elevation 48'-0" of the LAW facility. The Specification for Pressure Vessel Design and Fabrication requires that supports and anchors shall be designed to secure the buoyant unit in case the unit is empty and submerged to the level indicated in the Mechanical Data Sheet. The Mechanical Data Sheet indicates design basis event flood height of 0.92 ft (11") in Room L-0304F. It is noted that the drawings show that the TCO Unit housing is mounted on a steel frame skid. This skid is made up of multiple 6" H x 4" W tube steel transverse support members placed on two W8 (8" H) longitudinal sections, adding up to 14" height dimension above the floor slab that makes the bottom of TCO Unit more than the aforementioned flood height of 0.92 ft (11"). Therefore, as noted in the Mechanical Data Sheet, it precludes submergence of the TCO Unit's sensitive components and hence, it is not subject to buoyant forces for anchorage consideration. However, the TCO Unit is attached to skid (LVP-SKID-00002) frame which in turn is welded to the surface plates. And the surface plates are anchored to the floor slab with thru bolts to sustain other applicable design loads including seismic forces as shown in the reviewed listed Stress Analysis and Anchorage documents and related drawings.
	Plant Item system will withstand the effects of frost heave.	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 14, Structural Design Criteria.	The Structural Design Criteria document requires that all structural foundations extend into the surrounding soil below the 30 inch frost line in order to preclude frost heave. As shown on the referenced drawings, the TCO Unit is installed in the LAW facility at floor Elevation 48'-0", which is not subject to frost heave, hence, the TCO Unit is not subjected to any frost heave effects.

	Information Assessed	Source of Information	Assessment
Waste Characteristics	Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature).	System Design Description, Mechanical Data Sheet, and Corrosion Evaluation listed above under References; 24590-WTP-PER-PR-03-002, Rev. 4, Control of Toxic Vapors and Emissions from WTP Tank Systems and Miscellaneous Unit Systems; 24590-WTP-M4C-V11T-00004, Rev. C, Calculation of Hydrogen Generation Rates and Times to Lower Flammability Limit for WTP, including ECCN # 24590-WTP-M4E-V11T-00009; 24590-LAW-M4C-LOP-00001, Rev. 5, LAW Melter Offgas System Design Basis Flowsheets; CCN 280210, LAW Miscellaneous Treatment Unit Hydrogen Accumulation Documentation for the DWP Administrative Record.	The Mechanical Data Sheet presents the operating temperatures and pressures for the TCO Unit. The Corrosion Evaluation documents address the chemical composition of the offgas in order to select appropriate TCO Unit materials and specify the corrosion allowance. The System Design Description document identifies the offgas being handled by the TCO Unit as hazardous, but not as ignitable or flammable. The main function of the TCO Unit is to prevent the escape of toxic and hazardous gas vapors to the environment from the LAW offgas system. The TCO Unit design is required to provide an intact housing pressure boundary during normal and abnormal operations and during and after design level seismic events. Waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are appropriately addressed in the Control of Toxic Vapors and Emissions, Calculation of Hydrogen Generation Rates, Melter Offgas System Design Basis Flowsheets, and CCN 280210 documents. The System Design Description and the Control of Toxic Vapors and Emissions documents describe that the LAW TCO Unit remove volatile organic compounds (VOCs) and nitrogen oxides (NO_x) compounds from the LAW offgas LVP exhaust system. Review of the Calculation for Hydrogen Generation Rates, Melter Offgas System Design Basis Flowsheets, and CCN 280210 documents show that this miscellaneous TCO Unit does not pose any hydrogen generation or accumulation hazard.
	Plant Item is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	Corrosion Evaluation, Mechanical Data Sheet, and System Design Description listed above under References.	The Corrosion Evaluation documents and the Mechanical Data Sheet adequately demonstrate incorporation of identified waste characteristics into the TCO Unit design. Normal and abnormal operating conditions are discussed in the System Design Description document. The offgas passing thru the SCR catalyst unit is injected with ammonia vapors and C3 air from the ammonia/air dilution skid (LVP-SKID-00003) housing the dilution fans (LVP-FAN-00001/00002) and a mixing chamber.

	Information Assessed	Source of Information	Assessment
Compatibility	The waste types are compatible with each other.	System Design Description and Drawings listed above under References.	The System Design Description document and Process Flow Diagram drawings show LVP system exhausters draw gases from melters through TCO Unit to remove VOC and NO_x compounds from the offgas constituents. The System Design Description document lists various administrative controls in place, which are adequate to ensure that no waste type compatibility issues exist in handling or processing the offgas constituents.
Compatibility	Plant Item 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).	Corrosion Evaluation, Mechanical Data Sheet, Material Requisition, System Design Description, and Specifications listed above under References.	The material selection process included internal corrosion considerations relevant to the operating conditions of the TCO Unit. Based upon those considerations, various grades of stainless steel material were chosen for the TCO Unit components for compounds in direct contact with the offgas stream as documented in the Corrosion Evaluation documents for this equipment. The material selection is listed in the Mechanical Data Sheet under materials of construction. These material selections and corrosion allowance value of 0.010" were based upon a design life of 40 years per System Design Description document. As the TCO Unit operates in generally dry and actively ventilated conditions, therefore, external corrosion is not considered to be an issue. In order to prevent release of any gases leak testing and acceptance required per Material Requisition document will ensure pressure boundary integrity of the TCO Unit and that it will provide the intended service during its design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the Plant Item.	Corrosion Evaluation, Mechanical Data Sheet, and System Design Description listed above under References.	The Corrosion Evaluation documents and Mechanical Data Sheet specify a corrosion allowance value of 0.010" for all TCO Unit components. This corrosion allowance value is appropriate as the equipment operates under dry-air conditions and no condensation is expected. These recommendations are based upon stainless steel material characteristics and an intended design service life of 40 years as listed in System Design Description and Mechanical Data Sheet.

	Information Assessed	Source of Information	Assessment
Pressure Controls	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the Plant Item are exceeded.	System Design Description listed above under References.	The System Design Description document provides a discussion of Normal and Off-Normal operations of the LAW Secondary Offgas System. The installation of pressure monitors and controls instrumentation in the LVP system ensure to prevent over pressurization of the TCO Unit. The functionality of the TCO Unit and differential pressure monitoring instrument including periodic checking of the bypass valve interlock and actuator is performed to prevent any restrictions in the path of the offgas flow and hence prevention of over pressurization of any TCO Unit components.

Quarter Ending Sept 30, 2019 24590-LAW-PCN-ENV-19-001

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

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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 Low-Activity Waste (LAW) Secondary Offgas/Vessel Vent Process System Caustic Scrubber in Appendix 9.6 of the Dangerous Waste Permit (DWP)

Submitted by Co-Operator:

Robert D. Haggard 7/8/19
Robert D. Haggard Date

Reviewed by ORP Program Office:

for Thomas W. Fletcher 7/17/19
Thomas W. Fletcher Date

Quarter Ending Sept 30, 2019 24590-LAW-PCN-ENV-19-001

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

Description of Modification:

The purpose of this Class 1 prime modification is to replace Mechanical Data Sheet for the Low-Activity Waste (LAW) Secondary Offgas/Vessel Vent Process System Caustic Scrubber, in Appendix 9.6 of the Dangerous Waste Permit (DWP)

Appendix 9.6			
Replace:	24590-LAW-MKD-LVP-00011, Rev 6	With:	24590-LAW-MKD-LVP-00011, Rev 7

This modification requests Ecology approval and incorporation into the permit for the specific changes to this Mechanical Data Sheet. The document includes changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.). In addition, the mechanical data sheet includes changes associated with the resolution to comments on change documents since issuance of the last revision of the permitted document.

Significant changes incorporated on the Mechanical Data Sheet (24590-LAW-MKD-LVP-00011, Rev. 7) for the Low-Activity Waste (LAW) Secondary Offgas/Vessel Vent Process System Caustic Scrubber are summarized below:

- Incorporated SDDRs 24590-WTP-SDDR-MS-16-00043 and 24590-WTP-SDDR-MS-16-00073 by design change
- Incorporated SDDR 24590-WTP-SDDR-MS-16-00052 by reference
- Incorporated Seller data to update maximum operating volume, total volume, vessel weights, and packing
- Updated or corrected cyclic data including normal operating pressure typo for the water gauge to psig. conversion and nozzle temperature updates
- Revised or added notes to incorporate data supplied and/or verified by the Seller including but not limited to operating volume, total volume, vessel weights, and packing
- Added AEA note
- Updated nozzle schedule and notes to provide Seller wall thickness and nozzle elevation data based on final fabrication
- Updated or corrected Process Conditions to incorporate Seller data
- Updated Process Condition Notes to incorporate Seller data and process calculation information
- Updated Attachment 1 – References for Mechanical Data Sheet 24590-LAW-MKD-LVP-00011, Rev. 7

This PCN updates information in Appendix 9.6 to reflect current design. If the re-evaluation results in future design changes, the changes will be reviewed by Ecology in subsequent permit modifications.

In accordance with Permit Condition III.10.C.2.e, this permit modification includes redlined changes to Table 4E-2, updating the materials of construction and total volume for the LAW Caustic Scrubber consistent with the information provided in 24590-LAW-MKD-LVP-00011, Rev 7.

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

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

Quarter Ending Sept 30, 2019 24590-LAW-PCN-ENV-19-001

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class '1 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: ☑ Yes ☐ Denied (state reason below) Reason for denial:	Reviewed by Ecology: S. Dahl — Date: 8/29/19

River Protection Project Waste Treatment Plant	MECHANICAL DATASHEET **LAW Melter Offgas Caustic Scrubber**	Plant Item No. 24590-LAW-MK-LVP-SCB-00001	
		Datasheet No. 24590-LAW-MKD-LVP-00011	Rev. 7

Project:	RPP-WTP	P&ID	Ref 1
Project No:	24590		
Site:	DOE Hanford	Process Calculations	Ref 2; Ref 3
System:	LVP		
Building:	LAW		
Description	LAW Melter Offgas Caustic Scrubber		

General Data

Quality Level	Q	Fabrication Specification	Ref 8
Seismic Category	SC-III	Design Code	ASME Section VIII Division 1
Service/Contents	Melter offgas, air, water, caustic solution	Code Stamp	Yes
Design recirc. fluid density lb/ft^3	65.8 (Ref 3)	NB Registration	Yes
Max. Operating Volume gal	***145** (Note 21)	Wind Design	N/A
Total Volume gal	***4375**	Snow/Ash Design	N/A
Postweld Heat Treat	N/A	Equipment Qualification	Ref 11

Operating & Design Data (Ref 2, Note 3)

Inside Diameter inch	66 *	Corrosion/Erosion Allowance inch		0.040 (Ref 6; Note 23)
Length / Height inch	***339 15/32 (**Note 17**)**	Allowable Overall Differential Pressure (in wg)		16
	Vessel Max Operating	**Vessel Design**	**N01 Inlet Max Operating**	
Internal Pressure psig	0	15	0	
External Pressure psig	5.6	9.5 (Ref 26)	5.6	
Temperature ^{o}F	412	486 (Ref 4)	412	
Min. Design Metal Temp. ^{o}F	-20 (per ASME Section VIII Division 1)			

Materials of Construction (Ref 6)

Component	Material	Confinement
Top Head	SA-240 Type 316 (max 0.030% C; dual certified) (Note 12)	Primary (Ref 8)
Upper Shell	SA-240 Type 316 (max 0.030% C; dual certified) (Note 12)	Primary (Ref 8)
Lower Shell	UNS N10276 (Alloy C-276) (Note 12)	Primary (Ref 8)
Bottom Head	UNS N10276 (Alloy C-276) (Note 12)	Primary (Ref 8)
Vessel Supports	Note 19	N/A
Internals	UNS N10276 (Alloy C-276) / Type 316 (max 0.030% C; dual certified) (Note 12 and 20)	N/A
Pipe and nozzles	UNS N10276 (Alloy C-276) / Type 316 (max 0.030% C; dual certified) (Note 12)	Primary
Forgings / Bar stock	UNS N10276 (Alloy C-276) / Type 316 (max 0.030% C; dual certified) (Note 12)	Primary - when used for nozzles or for supports welded to the pressure boundary (Ref 8)
Gaskets for B16.5 flanges above the packing	Type 316 (max 0.030% C; dual certified) Spiral-Wound/B16.20 with graphite filler (Note 12)	Primary (Ref 8)
Gaskets for B16.5 flanges below the packing	UNS N10276 (Alloy C-276) Spiral-Wound/B16.20 with graphite filler (Note 12)	Primary (Ref 8)
Gasket for custom removable top head	Flexitallic FlexPro Style ZA, 316L SS with Thermiculite 845 facings	Primary (Ref 8)
Bolting for B16.5 nozzle and head flanges	SA-193, B7	N/A
Mounting base	Note 19	N/A
Packing	UNS N10276 (Alloy C-276) (notes 12 and 20)	N/A

Component	Material	Confinement
Mist Eliminator (demister) (Ref 21)	Brownian Diffusion "Flexifiber" mist eliminator (From Koch-Glitsch) Mat'l: Glass Fiber with Type 316 (max 0.030% C; dual certified) cage (Note 12)	N/A

Miscellaneous Data

Orientation	Vertical
Insulation Function	Personnel Protection (Ref 1, Ref 12, Note 6)
Insulation Thickness	4.5" (Ref 1, Ref 12)
Insulation Material	Mineral Fiber on shell, mineral fiber blanket on bottom head, and expanded perlite block or calcium silicate on top head (Ref 12 and Note 6)
External Finish	Mill finish with welds descaled and "as deposited"
Weight - *Note 1	Vessel: Dry ***38,606 lb** Vessel Operating: ***45,043 lb **** Vessel Test: ***65,260 lb *****
	Packing: dry ***2476 lb; Note 24** wet ***2889 lb; Note 24**
	HEME frame: ***4516 lb** HEME filters: dry ***1600 lb** wet ***3100 lb**
Internal Finish	Mill finish with welds descaled and ground smooth.
**	**Vessel Operating Weight includes insulation and wet filters/packing.**
***	**Vessel Test Weight does not include weight from internals (HEME frame, filters, and packing).**

Equipment Cyclic Data (Ref 13)

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

Design Life	40 Years			
Component Function and Life cycle Description	Ref 14			
Load Type	Min	Max	Number of Cycles	Comments
Design Pressure psig	-9.5 (Ref 26)	15	10	
Normal Operating Press. psig	-5.6 (Ref 2)	0	100	-156 in wg = -5.6 psig
Overall Operating Temp. °F	59	412	100	
Deleted				
Deleted				
Localized Features				
Demister Wash Operating Temp. for Nozzles N51-N54 and N51A-N54A, °F	59	122	4200	
Demister Wash Operating Press. for Nozzles N51-N54 and N51A-N54A, psig	-5.6 (Ref 2)	45 (Ref 25)	4200	
Packing Wash Operating Temp. for Nozzle N06 °F	59	***200**	4200	**Note 25**
Packing Wash Operating Press. for Nozzles N06, psig	-5.6 (Ref 2)	49 (Ref 25)	4200	
Cyclic Notes				
Cycle increase: The fatigue analyst shall increase the number of operational cycles given above by 10% to account for commissioning duty.				

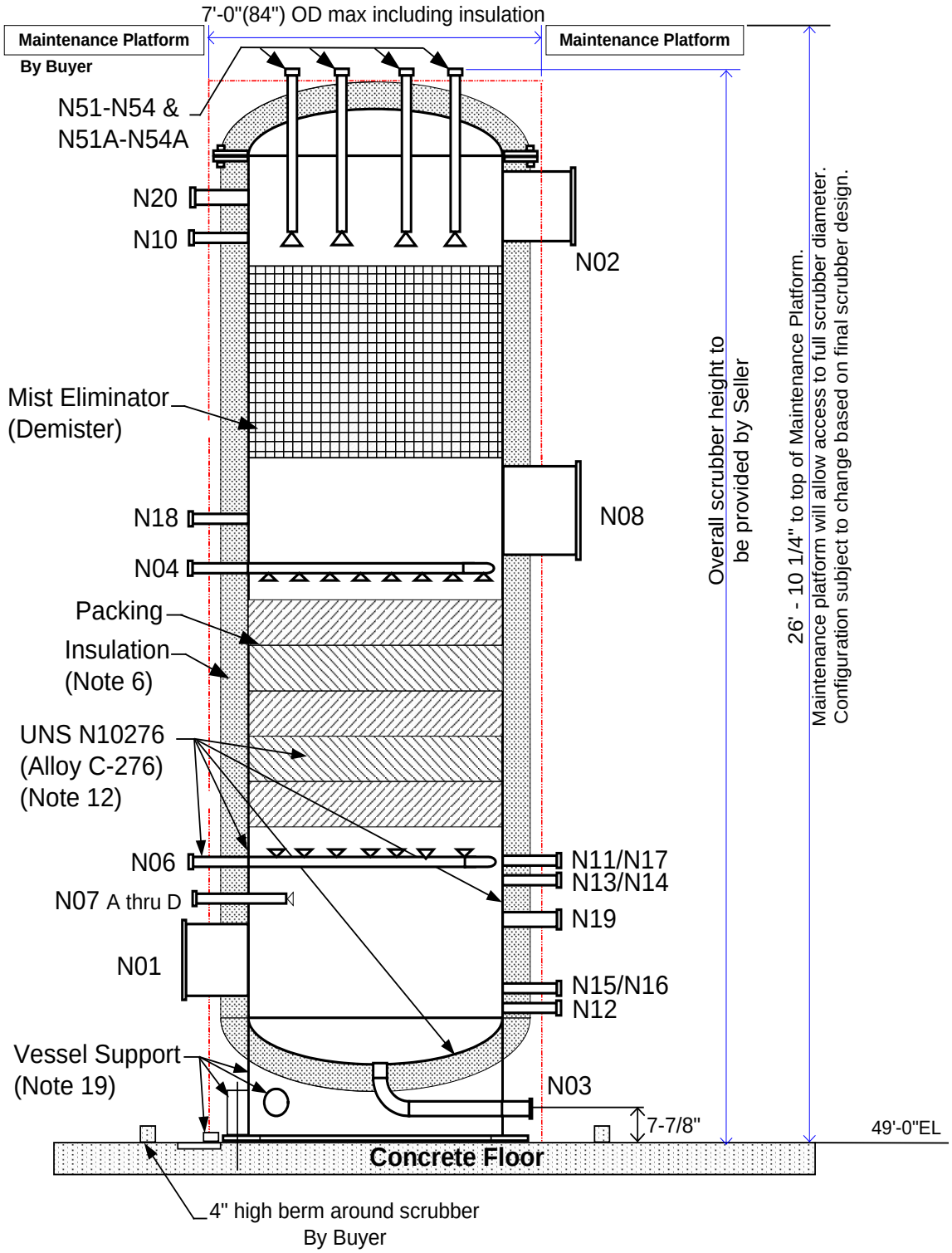
Notes

Note 1:	An asterisk (*) indicates data to be verified and/or supplied by the Seller. **Rev 7 of this MDS incorporates all data supplied and/or verified by the Seller on Completed Bechtel Datasheet 24590-QL-POA-MKAS-00003-05-00001 Rev 00E, and supersedes 24590-QL-POA-MKAS-00003-05-00001 Rev 00F. MDS Rev 7 also corrects the values provided by the Seller for the actual weights of dry and wet packing. See Note 24 regarding corrected packing weights. See Note 25 for clarification of temperature at N06.**
Note 2:	Deleted
Note 3:	Caustic Scrubber inlet and outlet conditions are taken from Ref 2. Stream Number LVP09 Catalyst Skid Discharge conditions are taken as scrubber inlet conditions at N01. Stream Number LVP18 Caustic Scrubber Discharge conditions are taken as scrubber outlet conditions at N02. **Some References, including Reference 2, were revised after LVP-SCB-00001 was fabricated. For configuration management, the current revision is listed in the Reference document Attachment to the MDS. Bounding values are used in MDS Process Conditions.**
Note 4:	Deleted
Note 5:	Deleted
Note 6:	Personnel Protection insulation will be supplied and installed by Buyer's Subcontractor. Insulation Support Ring shall be supplied and installed by Seller. See Ref 14, Attachment A for insulation support ring details. For weight calculation purposes, a bounding insulation density can be assumed to be 15 lbs/ft^3 (Ref 12).
Note 7:	See EQ Datasheet for environmental radiation data.
Note 8:	Deleted
Note 9:	Deleted
Note 10:	Deleted
Note 11:	Deleted
Note 12:	The lower portion of the scrubber including the nozzles, internal piping, structured packing and associated hardware may be subjected to operating temperatures in excess of 200°F, but bounded by the Design Temperature of 486°F. Therefore, per Ref 6, the lower portion shall be UNS N10276 (Alloy C-276) or UNS N06022 (Alloy C-22, including UNS N26022 for castings). Per Ref 21*, this higher temperature zone is considered to extend up to the top of the structured packing. The upper portion of the scrubber (above the structured packing) will be exposed to operating temperatures that are less than 200°F. Per Ref 2, normal and max operating temperatures above the packing are 122°F. Per Ref 6, acceptable materials are as follows: For welded components of the upper scrubber vessel, appurtenances, and internal components – Type 316 (max 0.030% C; dual certified) stainless steel is acceptable. For non-welded components of upper scrubber appurtenances, internal components, and fasteners – Type 316, Type 316L, or Type 316 (max 0.030%C; dual certified) stainless steel are acceptable.
Note 13:	For the purpose of design, fabrication and NDE per Ref 8, the design level of this vessel is L-1.
Note 14.	Contents of this document are Dangerous Waste Permit Affecting.
Note 15.	Deleted
Note 16.	Deleted.
Note 17.	Seller to provide new overall height resulting from removable head design.

Note 18.	All nozzle loads to be applied shall conform to the Nozzle Loads table provided in this datasheet. Note that these nozzle loads are contingent upon using an expansion joint on the N01 scrubber inlet nozzle and the N02 scrubber outlet nozzle (Ref 7). Do not apply nozzle loads to manways. Spares do require nozzle load application. Note: *V= vertical head nozzle - values are x = North/South, y = vertical, z = East/West (global coordinates), Vessel 0 deg defined as north **H = horizontal shell nozzle - values are per axes shown in Ref 8, Appendix A (local coordinates)
Note 19.	The vessel support system shall be designed by the Seller in accordance with ASME Section VIII, Division 1. Material of construction shall be Type 316 (max 0.030% C; dual certified) stainless steel. The following requirements shall apply if the Seller opts to use “skirt” type design: Material of construction shall be Type 316 (max 0.030% C; dual certified) stainless steel unless determined to be unacceptable due to excessive thermal stresses at the skirt-to-vessel junction. In such case, the skirt support material shall be UNS N10276 (Alloy C-276). Anchorage of support skirt/base ring assembly to facility floor shall be achieved by anchor bolts and anchor bolt chairs. See Equipment Specification (Ref 14) for further details. The skirt type vessel support shall be provided with two (2) 10" NPS inspection openings 90 degrees apart. Drainage shall be provided through vessel support mechanism or through grooves cut into the floor underneath the scrubber. Location of drainage holes to be at 90 degree angles and 1 square inch in area each. Drainage shall be at the floor interface. Inspection holes and drainage holes shall be located so that they do not interfere with the vessel mounting or the shear bars detailed in Ref 14.
Note 20.	The internal packing shall be designed to allow for replacement. Inspection access shall be provided through the 24 inch manway located in the vessel shell.
Note 21.	Max. operating volume is based on max. liquid height being at the bottom of offgas inlet nozzle N01.
Note 22.	Deleted
Note 23.	a. 0.040” corrosion allowance applies to surfaces wetted by process fluid, except for internal packing and mist eliminator filters. b. The Corrosion Evaluation (Ref 6) says that the packing and mist eliminator are considered consumable so no corrosion allowance is required. • The performance of the mist eliminator filters will be monitored during operation and are expected to require maintenance and replacement during the 40-year life of the plant. • The packing will be monitored during operation, and will potentially need replacement during the 40-year life of the plant. For the mist eliminator filters and the packing Seller shall: • provide a design that is accessible for maintenance and replacement • identify parameter(s) to be monitored that indicate need for maintenance and replacement • provide maintenance and replacement instructions This method of addressing corrosion provides no quantitative margin on material wear, but performance/condition monitoring is relied upon to indicate need for replacement to avoid impacting the safety functions identified on the Equipment Qualification Datasheet (Ref 11).

Note 24.	On Completed Bechtel Datasheet submittal 24590-QL-POA-MKAS-00003-05-00001 Rev 00E the Seller provided actual weights for dry packing and wet packing as 3,860 lb and 4273 lb, respectively. 3860 lb exceeds the 2287 lb design value given on assembly drawing submittal 24590-QL-POA-MKAS-00003-04-00050 by 1573 lb. The Buyer established a revised dry packing weight of 2476 lb by taking the actual shipping weight of the crates containing all the packing components as provided on the Material Receiving Report Ref 30, minus a conservatively low estimate of the weight of the shipping crates themselves. The wet packing weight is still determined as given in Process Calculation submittal Ref 21, by adding 413 lb of liquid holdup to the dry packing weight, for a wet packing weight of 2889 lb. The Vessel Operating Weight of 45,043 lb given by the Seller on the 05-00001 submittal includes the 4273 lb weight of wet packing, but does not need to be changed because 24590-LAW-MVC-LVP-00003 Section 7.5.6.1 has already successfully used a bounding value of 46,290 lb for Vessel Operating Weight.
Note 25.	Supplier's information from 24590-QL-POA-MKAS-00003-05-00001 Rev 00E is revised as follows. Nozzle 6 is located directly beneath the caustic scrubber packing. A nominal 200 GPM flow of caustic solution is continuously sprayed down through the packing. The caustic solution is predominantly water and the scrubber always operates at negative pressure, therefore the boiling point of the caustic solution is below 200ºF. Additionally, if this caustic solution flow drops significantly, a Safety interlock suspends the source of the high temperature offgas to the inlet of the caustic scrubber. Because of these two factors, the temperature of Nozzle 6 cannot exceed 200ºF.
Note 26.	Notice 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.

LAW Melter Offgas Caustic Scrubber



Nozzle Schedule

Nozzle	Service / Remark	Nominal Pipe Size (in) *	**Wall thickness (in) ***	Type	Facing	Angular Location (degrees) *	Nozzle Elevation (in) *
N01	Offgas Inlet	18	**5/8**	Horizontal	RF-WN	0	41.5
N02	Offgas Outlet	18	**5/8**	Horizontal	RF-WN	90	289.5
N03	Caustic Solution Return to Collection Tank / Scrubber Drain (Condensate Discharge)	8	**½**	Vertical	RF-WN	315	7.875
N04	Caustic Solution Supply (Condensate Recirculation)	3	**½**	Horizontal	RF-WN	90	142.25
N05A/ B	Deleted due to removable internals design; new configuration is N51/A - N54/A	-	-	-	-	-	-
N06	Packing Bottom Wash	2	**0.344**	Horizontal	RF-WN	270	65.5
N07A	Replaceable Quenching Offgas Spray Nozzle	3	**½**	Horizontal	RF-WN	330	41.5
N07B	Replaceable Quenching Offgas Spray Nozzle	3	**½**	Horizontal	RF-WN	345	**56.59**
N07C	Replaceable Quenching Offgas Spray Nozzle	3	**½**	Horizontal	RF-WN	15	**56.59**
N07D	Replaceable Quenching Offgas Spray Nozzle	3	**½**	Horizontal	RF-WN	30	41.5
N08	Manway	24	**½**	Horizontal	RF-WN	180	152.75
N09	Deleted	-	-	-	-	-	-
N10	Pressure Differential Transmitter across packing & demister (See Ref 15, Detail 8)	2	**0.344**	Horizontal	RF-WN	0	289.5
N11	Pressure Differential Transmitter across packing & demister (See Ref 15, Detail 8)	2	**0.344**	Horizontal	RF-WN	67.5	65.5
N12	Offgas Outlet Condensate Return to Scrubber	2	**0.344**	Horizontal	RF-WN	67.5	41.5
N13	Spare (Future) Level Transmitter (See Detail 8 of Ref 15), with blind flange, gaskets and bolts	2	**0.344**	Horizontal	RF-WN	202.5	65.5
N14	Level Transmitter (See Detail 8 of Ref 15)	2	**0.344**	Horizontal	RF-WN	90	65.5
N15	Spare (Future) Level Transmitter (See Detail 8 of Ref 15), with blind flange, gaskets and bolts	2	**0.344**	Horizontal	RF-WN	202.5	34.38
N16	Level Transmitter (See Detail 8 of Ref 15)	2	**0.344**	Horizontal	RF-WN	90	34.38

Nozzle	Service / Remark	Nominal Pipe Size (in) *	**Wall thickness (in) ***	Type	Facing	Angular Location (degrees) *	Nozzle Elevation (in) *
N17	Pressure Differential Transmitter (See Detail 8 of Ref 15) for Packing	2	**0.344**	Horizontal	RF-WN	315	65.5
N18	Pressure Differential Transmitter (See Detail 8 of Ref 15) for Packing	2	**0.344**	Horizontal	RF-WN	315	142.25
N19	Spare with blind flange, gaskets and bolts	3	**½**	Horizontal	RF-WN	150	41.5
N20	Spare with blind flange, gaskets and bolts	3	**½**	Horizontal	RF-WN	180	289.5
N21	Deleted due to removable top head	-	-	-	-	-	-
N51	Demister Wash Nozzles at Vessel Interface	1.5	**0.281**	Vertical	RF-WN	0	332.47
N52	Demister Wash Nozzles at Vessel Interface	1.5	**0.281**	Vertical	RF-WN	90	332.47
N53	Demister Wash Nozzles at Vessel Interface	1.5	**0.281**	Vertical	RF-WN	180	332.47
N54	Demister Wash Nozzles at Vessel Interface	1.5	**0.281**	Vertical	RF-WN	270	332.47
N51A	Demister Wash Nozzle Spray Lances at Process Service Water Interface	3/4	**0.218**	Vertical	RF-WN	0	339.47
N52A	Demister Wash Nozzle Spray Lances at Process Service Water Interface	3/4	**0.218**	Vertical	RF-WN	90	339.47
N53A	Demister Wash Nozzle Spray Lances at Process Service Water Interface	3/4	**0.218**	Vertical	RF-WN	180	339.47
N54A	Demister Wash Nozzle Spray Lances at Process Service Water Interface	3/4	**0.218**	Vertical	RF-WN	270	339.47

Nozzle Schedule Notes:

1. **(*)** Seller shall **determine nozzle wall thickness, taking into consideration all requirements stated in Ref 8. Seller shall** confirm size, **wall thickness**, angular location, and nozzle elevation of all nozzles. **MDS Rev 7 incorporates Seller's actual data.**
2. Nozzle requirements are as follows:
   N02 - shall extend 6 inches beyond the insulation surface
   N06 - shall extend 8 inches beyond the insulation surface
   Nozzles over 12 inches (excluding N02 and N08) shall extend 12 inches beyond the insulation surface. N08 shall extend 9 inches beyond the insulation surface.

Detail design requirements are as stated in Ref 15, Ref 16, and Ref 17.

Nozzle Loads (Ref 7, Note 18)

Nozzle	Load Type	Nozzle Loads for LVP-SCB-00001					
		Loads - lbs			Moments - ft-lbs		
		Fx	Fy	Fz	Mx	My	Mz
N01	Weight	500	1200	500	2000	3000	3000
	Seismic	6500	2500	2500	4000	3000	3000
	Thermal	6000	2000	2000	10000	3000	3000
N02	Weight	500	1200	500	2000	3000	3000
	Seismic	3000	2500	2500	10000	10000	10000
	Thermal	3000	2000	2000	3000	3000	3000
N03	Weight	333	534	333	1210	758	758
	Seismic	1180	790	1180	3567	5333	5333
	Thermal	1050	938	1410	1600	3197	3197
N04	Weight	47	85	47	117	73	73
	Seismic	420	400	420	1021	1528	1528
	Thermal	136	121	181	432	865	865
N06	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N08 (Manway)	Weight	0	0	0	0	0	0
	Seismic	0	0	0	0	0	0
	Thermal	0	0	0	0	0	0
N10	Weight	28	45	28	40	35	35
	Seismic	196	130	196	319	478	478
	Thermal	84	74	111	136	270	270
N11	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N12	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N13	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N14	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N15	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N16	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N17	Weight	34	56	34	46	29	29
	Seismic	244	162	244	398	597	597
	Thermal	104	92	138	169	337	337
N18	Weight	28	45	28	40	35	35
	Seismic	196	130	196	319	478	478
	Thermal	84	74	111	136	270	270
N19	Weight	71	113	71	180	112	112
	Seismic	491	327	491	1570	2350	2350
	Thermal	209	185	278	664	1330	1330
N20	Weight	54	85	54	135	84	84

Nozzle	Load Type	Nozzle Loads for LVP-SCB-00001					
		Loads - lbs			Moments - ft-lbs		
		Fx	Fy	Fz	Mx	My	Mz
	Seismic	420	260	420	1178	1763	1763
	Thermal	157	139	209	498	998	998

Nozzle	Load Type	Nozzle Loads for LVP-SCB-00001			
		Loads - lbs		Moments - ft-lbs	
		Axial	Resultant Lateral	Torsion	Resultant Bending
N07A	Normal (Weight + Thermal)	75	50	25	40
	Occasional (Weight + Thermal + Seismic)	100	100	65	75
N07B	Normal (Weight + Thermal)	75	50	25	40
	Occasional (Weight + Thermal + Seismic)	100	100	65	75
N07C	Normal (Weight + Thermal)	75	50	25	40
	Occasional (Weight + Thermal + Seismic)	100	100	65	75
N07D	Normal (Weight + Thermal)	75	50	25	40
	Occasional (Weight + Thermal + Seismic)	100	100	65	75
N51A	Normal (Weight + Thermal)	75	30	20	25
	Occasional (Weight + Thermal + Seismic)	185	120	40	85
N52A	Normal (Weight + Thermal)	75	30	20	25
	Occasional (Weight + Thermal + Seismic)	185	120	40	85
N53A	Normal (Weight + Thermal)	75	30	20	25
	Occasional (Weight + Thermal + Seismic)	185	120	40	85
N54A	Normal (Weight + Thermal)	75	30	20	25
	Occasional (Weight + Thermal + Seismic)	185	120	40	85

Process Conditions - Ref 2 unless noted otherwise				
Process Condition	**Operating**			**Remarks**
	Unit	**Normal**	**Max.**	
INLET OFFGAS, Nozzle N01				
Flow Type		Continuous	Continuous	
Phase		Gas	Gas	
Actual Flowrate	ACFM	8322	9803	
Temperature	ºF	370	412	
Pressure	Inches water gage	-112	-137	-137 in wg = -4.9 psig; **Note 3**
Volumetric Process Concentration				
N_2	Vol %	71.1	70	**Note 3**
O_2	Vol %	18.8	18	**Note 3**
H_2O	Vol %	10	12.4	**Note 3**
CO_2	Vol %	1	1	
Ar	Vol %	1	1	
Process Concentration				
Organic	lb/hr	6.20E-02	**2.05 E-01**	**Note 3**
H_2O	lb/hr	1.03E+03	1.28E+03	**Note 3**
CO	lb/hr	3.50E-01	1.20E+00	
CO_2	lb/hr	2.94E+02	3.71E+02	Ref 29
HCl	lb/hr	9.68E-02	5.21E-02	
HF	lb/hr	5.26E-03	2.19E-01	Ref 29
NH_3	ppmv	251	339	Ref 29
NO	lb/hr	6.58E-01	9.35E-01	
NO_2	lb/hr	8.73E-01	1.73E+00	
SO_2	lb/hr	6.95E-02	1.39E-01	**Note 3**
SO_3	lb/hr	1.39E-05	1.57E-05	Ref 29
OUTLET OFFGAS, Nozzle N02				
Flow Type		Continuous	Continuous	
Phase		Gas	Gas	
Actual Flow rate	ACFM	6894	8156	
Temperature	ºF	122	123	**Note 3**
Pressure	Inches water gage	-125	-156	-156 in wg = -5.6 psig
CONDENSATE DISCHARGE, Nozzle N03				
Flow Type		Continuous	Continuous	
Phase		Liquid	Liquid	
Actual Flow rate (note 7)	gal /min	200	200	
Pressure	Inches water gage	-112	-137	**-137 in wg = -4.9 psig; Note 3**
Viscosity	cP	0.43	0.43	
pH (note 7)				

Process Conditions - Ref 2 unless noted otherwise

Process Condition	Operating			Remarks
	Unit	Normal	Max.	
CONDENSATE RECIRCULATION, Nozzle N04				
Flow Type		Continuous	Continuous	
Phase		Liquid	Liquid	
Actual Flow rate (note 7)	gal/min	200	200	
Temperature	°F	122	123	Equilibrium with outlet offgas, Note 3
Pressure	psig	44	44	
Viscosity	cP	0.43	0.43	
pH (note 7)				
QUENCH INLET SPRAY, Nozzles N07A thru D (note 5)				
Actual Flow rate (liquid) per nozzle (note 7)	gal/min	1.5	2.2	
Liquid pressure (at vessel nozzle) (note 7)	psig	54	58	Ref 22, Ref 25
PSW wash supply temperature	°F	60	60	Ref 28
Actual Flow rate (air) per spray nozzle (note 7)	std ft^3/min	36	36	Ref 22
Air pressure (at vessel nozzle) (note 7)	psig	60	60	Ref 22
Demister Wash, Nozzles N51-N54 & N51A-N54A				
Wash Frequency (note 7)	Weeks	1	1	
Wash Duration (note 7)	Minutes	5	5	
Wash Flow Rate, per spray nozzle (note 7)	gal/min	4	4	
Wash Supply Press., at vessel nozzle (note 7)	psig	40	43	Ref 25
PSW wash supply temperature	°F	60	60	Ref 28
Packing Wash Lower, Nozzle N06				
Wash Frequency (note 7)	Weeks	1	1	
Wash Duration (note 7)	Minutes	5	5	
Wash Flow Rate, per spray nozzle (note 7)	gal/min	4	4	
Wash Supply Pressure, at vessel nozzle (note7)	psig	40	49	Ref 25
PSW wash supply temperature	°F	60	60	Ref 28

Design	Unit	Criteria
Design Basis minimum removal efficiency	%	97 (Ref 14)
Design Basis Component		SOx (SO_2 + SO_3)
Maximum Flooding	%	60 (Ref 14)
Packing Height Contingency	%	10

Process Condition Notes:

(1). Deleted
(2). Deleted
(3). **Due to use of bounding conditions, volumetric concentrations may add up to more than 100%. Also see Main Note 3.**
(4). Deleted
(5). Cooling duty from vaporization of process service water sprayed into scrubber column.
(6). Deleted
(7). Supplier to verify or supply for operating conditions. **Seller addressed Process Conditions in Ref 21 Process Calculation submittal.**

PROCESS WATER (PSW)			
PSW Source	Domestic water (DOW) provided by DOE. (Ref 19)		
Water Quality Summary: (Ref 20)			
Constituents -	Annual Average Value -	Seasonal / Design Average Value -	Units -
Carbon tetrachloride	< 1	N/A	µg/L
Methylene chloride	< 1	N/A	µg/L
Bromoform	< 0.5	< 0.5	µg/L
Bromodichloromethane	2.1	3.3	µg/L
Chloroform	37	61	µg/L
Dibromochloromethane	< 0.5	< 0.5	µg/L
Total trihalomethanes	43	65	µg/L
Bis(2-ethylhexyl) phthalate	< 1	N/A	µg/L
Metals -			
Arsenic	0.58	N/A	µg/L
Cadmium	0.026	N/A	µg/L
Chromium	0.12	N/A	µg/L
Lead	0.048	N/A	µg/L
Mercury	0.00033	N/A	µg/L
Iron	20	N/A	µg/L
Manganese	< 10	N/A	µg/L
Anions -			
Chloride	3.4	N/A	mg/L
Nitrate	0.11	0.14	mg/L as N
Sulfate	26	N/A	mg/L
Other Analyses -			
Total Dissolved Solids	100	120	mg/L
pH	7.0	N/A	S.U.
Radionuclides -			
Gross Alpha	0.51	N/A	pCi/L
Gross Beta	0.49	N/A	pCi/L
Tritium	154.7	N/A	pCi/L

River Protection Project Waste Treatment Plant	MECHANICAL DATASHEET LAW Melter Offgas Caustic Scrubber	Plant Item No. 24590-LAW-MK-LVP-SCB-00001	
		Datasheet No. 24590-LAW-MKD-LVP-00011	Rev. 7

Approvals

Rev	Description	Vessel Engr	System Engr	Checked	Approved	Date
7	Incorporated SDDRs by Design Change: 24590-WTP-SDDR-MS-16-00043, 24590-WTP-SDDR-MS-16-00073. Incorporated SDDR by Reference: 24590-WTP-SDDR-MS-16-00052. Incorporated EIEs: 24590-LAW-EIE-MS-15-0054 Rev 0 resulted in slight changes to the PSW supply pressures. 24590-WTP-EIE-PR-17-0001 Rev 0 resulted in no changes to MDS data. Other changes: Incorporated supplier data from Completed Bechtel Datasheet submittal 24590-QL-POA-MKAS-00003-05-00001 Rev 00E and supersedes Rev 00F. Corrected supplier data for packing actual weights and clarified justification for max temperature of N06, to support confirmation of calculation 24590-LAW-MVC-LVP-00003. Changed "affects" to "effects" in Rev 5 history to correct grammar. Updated Attachment 1 References and bounding process data. Combined Nozzle Schedule Note 3 into Nozzle Schedule Note 1. Moved Process Condition Notes to before PSW chart. None of the changes reduce margin.	Cathy Christianson Originator By: Cathy Christianson - mcchrist Org Name: LAW Mechanical Engineering Placed: Mar 22, 2018	Jason Willeford Reviewed No Comments By: Jason Willeford - jdwillef Org Name: Placed: Mar 22, 2018	Erik Kalarchik Checked By: Erik Kalarchik - emkalarc Org Name: BNI Placed: Mar 22, 2018	Jeanette Shoemaker or Carrie Roberts Carrie Roberts	3/22/18
6	The purpose of this revision is to update the revision of Ref 6 Corrosion Evaluation to support IQRPE. Other reference revisions are updated also. Incorporated SDDR 24590-WTP-SDDR-MS-15-00008 via change to Note 19. Changes to nozzle loads and nozzle elevations on this MDS rev have already been analyzed in the structural/seismic analysis, therefore this datasheet revision does not impact margin.	Cathy Christianson	Mike O'Neill	Jim Marsh	Prabhu Rajagopalan	7/30/15

Approvals

Safety Screening / Evaluation Required? If yes per 24590-WTP-GPP-SREG-002, E&NS signature required below.						Yes X	No
Rev	Description	System Engr	Vessel Engr	Checked	E&NS	Approved	Date
5	Revised Vessel Max Operating Temperature to align with Design Basis Flowsheet and not take credit for quenching or caustic recirculation **effects** on temperature; revised cyclic data; revised Notes; updated References; used PIBOD values where bounding to Ref 2 flowsheet values for offgas constituents; misc clarification changes. Changes that impact margin are addressed in calculations 24590-LAW-MEC-LVP-00003 Rev 1 and 24590-LAW-MKC-LVP-00004 Rev 1.	M. O'Neill	Cathy Cory AC	Paul Meeuwsen	J. Hinckley	Dan Cragin for P. Omel	9/25/13
4	Incorporate TCNs 24590-QL-MRA-MKAS-00003-T0009 and -T0010 - no rev bars shown. Rev bars shown for other changes: updated pressures & temperatures; updated insulation, nozzle locations, and diagram per DCN 24590-LAW-M6N-LVP-00092; added material requirement for top head gasket; updated bolting material for nozzle and top head flanges; updated cyclic data per ECCN 24590-WTP-MVE-50-00012; updated notes.	M. O'Neill	C. Cory	J. Marsh	D. Krahn	P. Omel	8/7/13
3	Incorporate TCNs 24590-QL-MRA-MKAS-00003-T0001, -T0003, -T0004, and -T0008 - no rev bars shown. Rev bars shown for all other changes: added Attachment 1 for References; revised corrosion allowance for internal components; clarified material req'd for lower section gaskets; updated cyclic data; revised Notes; updated sketch; revised service description of some nozzles; updated process conditions.	M. O'Neill	C. Priest	R. Flieger	D. Krahn	D. Mildon	9/26/12
2	Extensive revisions to Design, Operating and Process specifications per revised LAW Melter Offgas System Design Basis Flowsheets calc 24590-LAW-M4C-LOP-00001, Rev 2A. No change bars or revision triangles used to identify changes.	M. O'Neill	J. Czarnecki	Ray Peters	D. Krahn	J. Julyk	12/22/09

Safety Screening / Evaluation Required? If yes per 24590-WTP-GPP-SREG-002, E&NS signature required below.						Yes X	No
Rev	Description	System Engr	Vessel Engr	Checked	E&NS	Approved	Date
1	The data sheet was generally revised and up dated to incorporate information provided by the supplier. New information added: Equipment support changed to Leg Design, Ap= 2.5 for seismic design, nozzle loads, equipment cyclic data, caustic scrubber outline updated to add maint platform and upper lateral restraint, removed the embed layout arrangement, and added HEME & Packing wash.	P. Martinelli	D. Rickettson	D. Reinemann	D. Krahn	J. Julyk	5/10/07
0	Revised design temperature, pressure drop and process requirements.	S. Sourani	D. Pease	S. Sweeney	N/A	M. Hoffmann	3/17/05

Table 4E-2 LAW Vitrification Facility Miscellaneous Units (Systems and Sub-Systems)

No.	System/ Subsystem	Component Number/Location	Description	Material	Total Volume (US Gallons)
LAW Vitrification Facility					
1.	LOP	LOP-FCLR-00001 L-0112	Melter 1 Primary Film Cooler	Stainless Steel	NA
2.	LOP	LOP-FCLR-00002 L-0112	Melter 1 Standby Film Cooler	Stainless Steel	NA
3.	LOP	LOP-FCLR-00003 L-0112	Melter 2 Primary Film Cooler	Stainless Steel	NA
4.	LOP	LOP-FCLR-00004 L-0112	Melter 2 Standby Film Cooler	Stainless Steel	NA
5.	LOP	LOP-SCB-00001 L-0123	Melter 1 SBS	Ceramic Packing/Hastelloy	4,948
6.	LOP	LOP-SCB-00002 L-0124	Melter 2 SBS	Ceramic Packing/Hastelloy	4,948
7.	LOP	LOP-WESP-00001 L-0123	Melter 1 WESP	6% Molybdenum/Stainless Steel	N/A
8.	LOP	LOP-WESP-00002 L-0124	Melter 2 WESP	6% Molybdenum/Stainless Steel	N/A
9.	LMP	LMP-MLTR-00001 L-0112	LAW Melter 1	Stainless Steel/Alloys	1,860
10.	LMP	LMP-MLTR-00002 L-0112	LAW Melter 2	Stainless Steel/Alloys	1,860
11.	LVP	LVP-SCB-00001 L-0304F	Melter Offgas Caustic Scrubber	Hastelloy/ ~~Metal Intalox Packing/~~Stainless Steel	~~TBD~~4,375

Attachment 1 - References for Mechanical Datasheet 24590-LAW-MKD-LVP-00011 Rev **7** (for internal reference)

Ref#	Document number	Doc rev	Document Title **or Description**
1	24590-LAW-M6-LVP-00002002	1	P&ID-LAW - LAW Secondary Offgas / Vessel Vent Process System Caustic Scrubber LVP-SCB-00001
2	24590-LAW-M4C-LOP-00001	5	LAW Melter Offgas System Design Basis Flowsheets
3	24590-WTP-DB-PET-**17-001**	**0**	Process Inputs Basis of Design, page B-22, stream LVP17
4	24590-LAW-MEC-LVP-00003	1	Design Pressure and Design Temperature Calculation for LVP System**; including ECCN 24590-LAW-MEE-LVP-00005**
5	24590-WTP-GPG-M-050	2A	Pressure Vessel and Heat Exchanger Design
6	24590-LAW-N1D-LVP-00001	7	LVP-SCB-00001 - Corrosion Evaluation
7	CCN 263548	NA	Nozzle Design Loads for LAW LVP-SCB-00001 (This CCN Supersedes CCN 261004)
8	24590-WTP-3PS-MV00-T0001	5	Engineering Specification for Pressure Vessel Design and Fabrication
9	24590-WTP-3PS-MV00-T0002	3	Engineering Specification for Seismic Qualification Criteria for Pressure Vessels
10	24590-WTP-3PS-FB01-T0001	6	Engineering Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks
11	24590-LAW-MKQ-LVP-00001	2	Equipment Qualification Datasheet for LAW Melters Offgas Caustic Scrubber
12	24590-WTP-3PS-NN00-T0001	3	Thermal Insulation for Mechanical Systems
13	24590-WTP-MVC-50-00009	0	LAB, BOF, and LAW Vessel Cyclic Datasheet Inputs
14	24590-LAW-3PS-MKAS-T0001	2	Engineering Specification for LAW Melter Offgas Caustic Scrubber
15	24590-WTP-MV-M59T-00016001	3	Vessel Connections Standard Details Sheet 1 of 3
16	24590-WTP-MV-M59T-00016002	2	Vessel Connections Standard Details Sheet 2 of 3
17	24590-WTP-MV-M59T-00016003	1	Vessel Connections Standard Details Sheet 3 of 3
18	Deleted		
19	24590-WTP-DB-ENG-01-001	006	Basis of Design
20	CCN 075108	NA	Potable Water Quality for NLD Effluent Characterization
21	24590-QL-POA-MKAS-00003-06-00001	00**I**	Calculation - LAW Melter Offgas Caustic Scrubber Process
22	**24590-QL-POA-MKAS-00003-08-00003**	**00C**	**LAW Melter Offgas Caustic Scrubber Operating Instructions**
23	Deleted		
24	Deleted		
25	24590-LAW-M6C-PSW-00001	2	LAW Process Service Water Distribution Line Calculation
26	24590-LAW-MKC-LVP-00004	2	LAW Caustic Scrubber Process Operating Conditions and Design Requirements

Ref#	Document number	Doc rev	Document Title **or Description**
27	**Deleted**		
28	24590-BOF-M6C-PSW-00002	1	BOF PSW Design Pressure/Temperature Calculations for Pipeline and Valve List Support
29	24590-WTP-M4C-V11T-00012	2	Calculation of Process Stream Properties for the WTP, Attachment C
30	**24590-WTP-MRR-PROC-0030244**	**0**	**Premier Technology, Inc. – Corporate Headquarters / Material Receiving Report for Shipment Containing Packing and Filter Components**

Quarter Ending Sept 30, 2019

24590-BOF-PCN-ENV-19-002

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

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant

Replace the Balance of Facilities LAW Effluent Process Bldg. & LAW Effluent Drain Tank Bldg. General Arrangement Plan at Elev. 0'-0" and the Balance of Facilities LAW Effluent Utility Bldg. & LAW Effluent Electrical Bldg. General Arrangement Plan at Elev. 0'-0" in Appendix 13.4 of the Dangerous Waste Permit. This modification also requests the removal of Balance of Facilities LAW Effluent Utility Bldg. & LAW Effluent Electrical Bldg. General Arrangement Sections A & B from Appendix 13.4. General arrangement section drawings are no longer submitted for inclusion into the DWP.

Submitted by Co-Operator:		Reviewed by ORP Program Office:	
Robert D. Haggard	6/19/19 *Date*	Thomas W. Fletcher	7/8/19 *Date*

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

Description of Modification:

This Class [1]1 modification requests Ecology approval and incorporation into the permit the below referenced.

Appendix 13.4			
Replace:	24590-BOF-P1-25-00001, Rev 1, Balance of Facilities LAW Effluent Process Bldg. & LAW Effluent Drain Tank Bldg. General Arrangement Plan at Elev. 0'-0"	With:	24590-BOF-P1-25-00001, Rev 2, Balance of Facilities LAW Effluent Process Bldg. & LAW Effluent Drain Tank Bldg. General Arrangement Plan at Elev. 0'-0"
Replace:	24590-BOF-P1-26-00001, Rev 1, Balance of Facilities LAW Effluent Utility Bldg. & LAW Effluent Electrical Bldg. General Arrangement Plan at Elev. 0'-0"	With:	24590-BOF-P1-26-00001, Rev 2, Balance of Facilities LAW Effluent Utility Bldg. & LAW Effluent Electrical Bldg. General Arrangement Plan at Elev. 0'-0"
Remove	24590-BOF-P1-26-00002, Rev 0, Balance of Facilities LAW Effluent Utility Bldg. & LAW Effluent Electrical Bldg. General Arrangement Sections A & B		

This modification requests Ecology approval and incorporation into the permit for the specific changes to the general arrangement drawings. These documents include changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.). In addition, the general arrangement drawings include changes associated with the resolution to comments on change documents since the issuance of the last revision of the permitted documents. In accordance with Permit Condition III.10.C.2.e, this permit modification includes updates for inclusion in Appendix 13.4.

Significant changes to the General Arrangement Plan (24590-BOF-P1-25-00001, Rev. 2) for the Balance of Facilities LAW Effluent Process Bldg. & LAW Effluent Drain Tank Bldg. are summarized below:

- Incorporated drawing change notice 24590-BOF-P1N-25-00002, to update equipment, architectural, and structural changes in rooms E-0101A, E-0102, E-0102A, E-0103, and E-0107
- Incorporated 24590-BOF-P1N-25-00003 to update Bldg. 25 to add C1V-FCU, DEP-PMP-00042A/00042B, and AHU layout and remove Hold 3 on the drawing
- Incorporated 24590-WTP-FC-C-18-0291 to update Note 2 for DWP Floor and Liner Slope Information
- Update section cuts to show Agitator and Pump Stand with reference elevation

Significant changes to the General Arrangement Plan (24590-BOF-P1-26-00001, Rev. 2) for the Balance of Facilities LAW Effluent Utility Bldg. & LAW Effluent Electrical Bldg. are summarized below:

- Incorporated 24590-BOF-P1N-26-00007, deleted Fire Riser Room from Bldg. 27
- Incorporated 24590-BOF-P1N-26-00008 to update SDJ equipment location and stack background
- Updated Plan View of Building 27
- Updated LAW Effluent Process Building Boundary for Alignment with other buildings

This modification also requests the removal of 24590-BOF-P1-26-00002, Rev 0, Balance of Facilities LAW Effluent Utility Bldg. & LAW Effluent Electrical Bldg. General Arrangement Sections A & B from Appendix 13.4 as general arrangement section drawings are no longer submitted for inclusion in the DWP, and this drawing was never submitted with previous modifications for incorporation into the permit.

This PCN updates information in Appendix 13.4 to reflect current design. If the re-evaluation results in future design changes, the changes will be reviewed by Ecology in subsequent permit modifications.

Quarter Ending Sept 30, 2019

24590-BOF-PCN-ENV-19-002

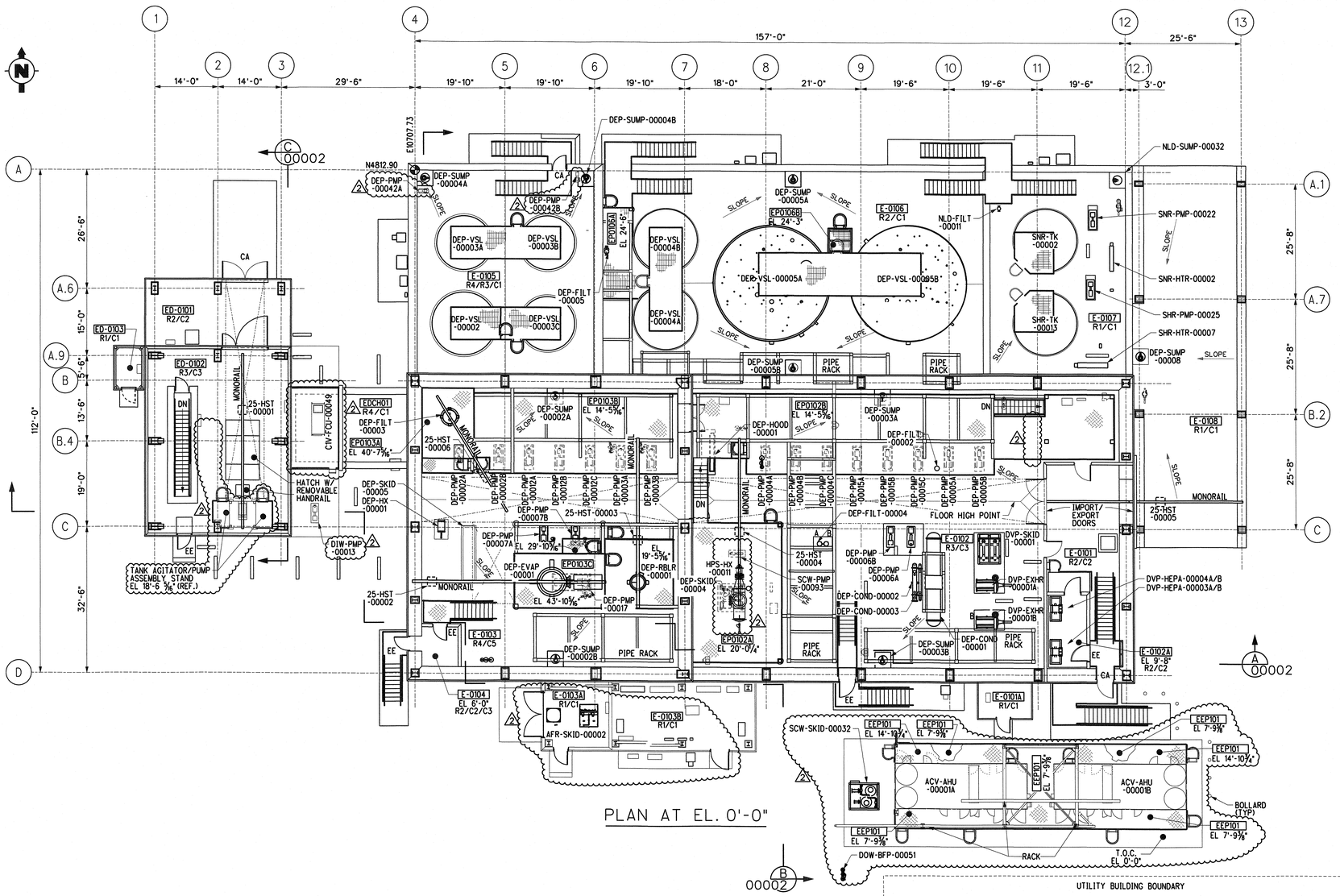
WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

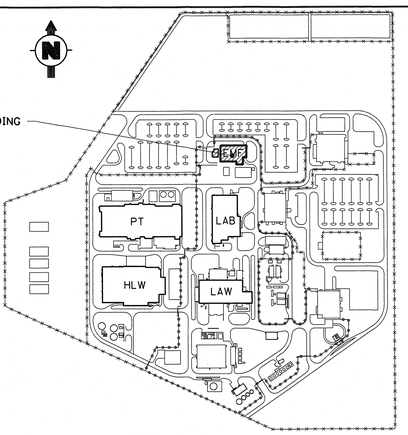
Enter relevant WAC 173-303-830, Appendix I Modification citation number:

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 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: ☑ Yes ☐ Denied (state reason below) Reason for denial:	Reviewed by Ecology: S. Dahl — Date: 8/29/19





KEY PLAN

GENERAL NOTES:

1. FOR REFERENCE, SEE PLOT PLAN DWG 24590-BOF-P1-50-00001.
2. REFER TO DRAWING No. 24590-BOF-C2-C12T-00002 FOR CONVERSIONS FROM LAW EFFLUENT PROCESS BLDG TO SITE ELEVATIONS.
3. THE RADIATION/CONTAMINATION CLASSIFICATIONS DEPICTED ON THE DRAWING ARE FOR DESIGN PURPOSES ONLY AND DO NOT NECESSARILY INDICATE HOW THE AREAS WILL BE POSTED (CONTROLLED) DURING RADIOACTIVE OPERATIONS.
4. IBC 2000 REQUIRES A MINIMUM OF 40'-0" SEPARATION OF BUILDINGS WITH NON-RATED WALLS. THIS APPLIES TO BUILDINGS 25, 26 AND 27.

NOTES:

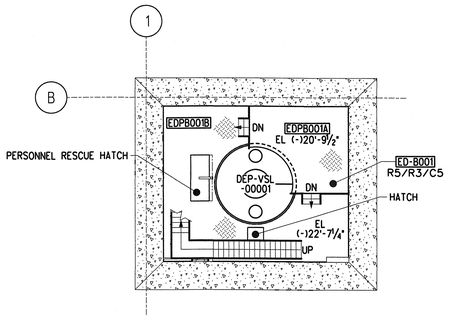
1. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
2. FLOOR/LINER SLOPE IS REQUIRED IN ROOMS WITH SUMPS. SLOPE IS TO BE A MINIMUM OF 1% TOWARD THE SUMP IN ROOMS WHICH PROVIDE DANGEROUS WASTE PERMIT (DWP) SECONDARY CONTAINMENT. (REFER TO 2459-BOF-PER-M-16-003). SLOPES TOWARD THE SUMP IN ROOMS WHICH DO NOT PROVIDE DWP SECONDARY CONTAINMENT SHALL BE ACCORDING TO THE ELEVATIONS SHOWN ON THE RESPECTIVE DESIGN DRAWINGS.
3. PLATFORMS, LANDINGS AND STAIRS IN E-0102, E-0102A, E-0103 AND ED-B001 WILL BE CHECKER PLATE.
4. FOR UTILITY BUILDING GENERAL ARRANGEMENT, SEE DRAWING 24590-BOF-P1-26-00001.

LEGEND:

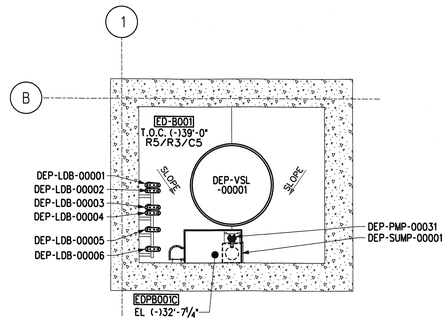
CA	CONTROLLED ACCESS
EE	EMERGENCY EXIT
P.O.S.	POINT OF SUPPORT
T.O.C.	TOP OF CONCRETE
T.O.S.	TOP OF STEEL
	EQUIPMENT REMOVAL/LAY DOWN AREA
	EMERGENCY SHOWER/EYEWASH (PLAN VIEW)
	CONCRETE
	GRATING
	CHECKER PLATE
	SUMP
	SUMP W/SUMP PUMP
	LADDER W/CAGE
E-XXXXX	LAW EFFLUENT PROCESS BLDG ROOM
EPXXXXX	LAW EFFLUENT PROCESS BLDG PLATFORM
EEPXXXXX	LAW EFFLUENT PROCESS BLDG EQUIPMENT PAD
EEPPXXXX	LAW EFFLUENT PROCESS BLDG EQUIPMENT PAD PLATFORM
ED-XXXXX	LAW EFFLUENT DRAIN TANK BLDG ROOM
ED-BXXXX	LAW EFFLUENT DRAIN TANK BLDG ROOM (BELOW GRADE)
EDPBXXXX	LAW EFFLUENT DRAIN TANK BLDG PLATFORM (BELOW GRADE)
EDCHXXX	LAW EFFLUENT DRAIN TANK BLDG CHASE
EE-XXXXX	LAW EFFLUENT ELECTRICAL BLDG ROOM
EU-XXXXX	LAW EFFLUENT UTILITY BLDG ROOM
EUPXXXXX	LAW EFFLUENT UTILITY BLDG PLATFORM

REVISION NOTES:

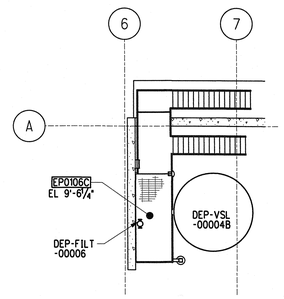
1. INCORPORATED: 24590-BOF-PIN-25-00002 WITH MODIFICATIONS, AND 24590-BOF-PIN-50-00014. DUE TO EXTENSIVE REVISION, REVISED ITEMS ARE NOT IDENTIFIED.
2. INCORPORATED DCN 24590-BOF-PIN-25-00003 DESIGN CHANGES IDENTIFIED, 24590-WTP-FC-C-18-0291 UPDATED NOTE 2 FOR DWP SLOPE STATEMENT, 24590-BOF-EIE-MS-17-0025 REV 0 - CONTENT WAS INCORPORATED IN REV 1 HOWEVER EIE WAS NOT LISTED - SCW VESSEL/PUMP. 24590-BOF-EIE-MS-18-0194 REV 0 - DELETE DOW-SHR-00171 BACKGROUND. 24590-WTP-EIE-SYSE-16-0082 REV 0 - CONTENT WAS INCORPORATED IN REV 1 HOWEVER EIE WAS NOT LISTED - ADHERENCE TO UPPER-TIER REQUIREMENTS. UPDATED ADR REVISION. HOLD LIST REMOVED. UPDATED SECTION CUTS, AGITATOR/PUMP STAND WITH REF ELEVATION.



PARTIAL PLAN AT EL. (-)22'-7 1/4"



PARTIAL PLAN AT EL. (-)39'-0"



PARTIAL PLAN BELOW EP0106A

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
2	SEE REVISION NOTE 2.					
1	SEE REVISION NOTE 1.	WTP	FJM	LAL	JM/SS	7/26/2017
0	ISSUED FOR DESIGN	JTC	SRH	LAL	JM/PP	3/4/2016

Originator: LAL 3/28/19
Checked: LAL
REVISION HISTORY

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 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.

ISSUED BY RPP/WTP PDC

PROJECT No.	24590	
SITE	HANFORD	
AREA	200E	
BUILDING No.	25,25A	
	BY	DATE
ORIGINATOR	J CENTER	3/3/2016
CHECKER	S HEINTZ	3/3/2016
APPROVER	J MCGRATH/P PORCARO	3/4/2016
REVIEWER	L LEYLAND	3/3/2016

ISSUE STAMP

CONTENT APPLICABLE TO ALARA? [X] YES [ ] NO
ADR NO. 24590-BOF-ADR-PL-15-0001 REV. 4

BECHTEL

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No: DE-AC27-01RV14136

BALANCE OF FACILITIES LAW EFFLUENT PROCESS BLDG & LAW EFFLUENT DRAIN TANK BLDG GENERAL ARRANGEMENT PLAN AT ELEV. 0'-0"

SCALE: 1"=10'-0"

24590-BOF-P1-25-00001

REV 2

"E" SIZE - 44x34
COMPUTER GENERATED - MANUAL DESIGN CHANGES NOT PERMITTED

R11947999

3/28/2019 10:34:38 AM

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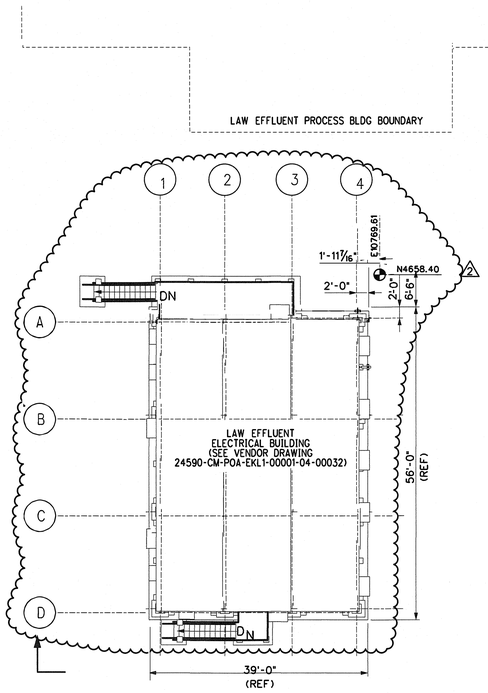
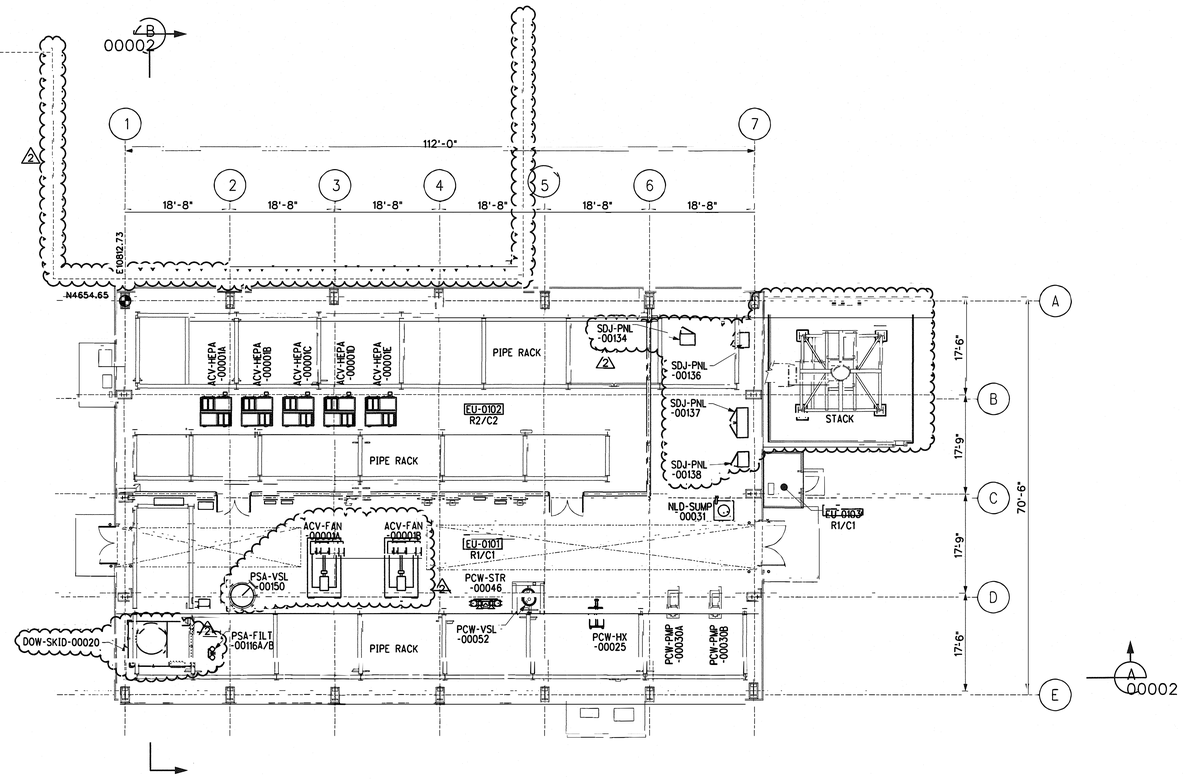
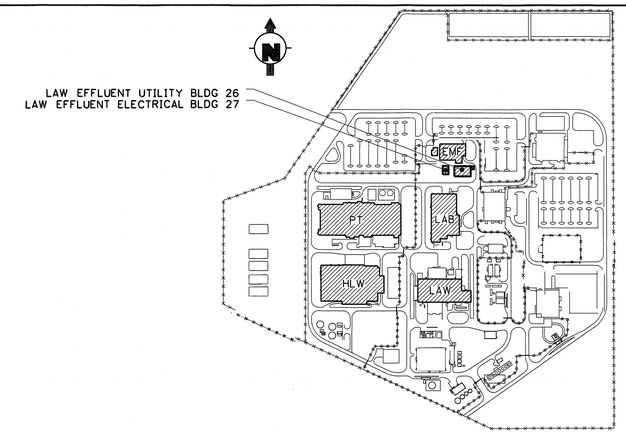
FORM E_SDN.DGN 02/2009



PLAN AT EL. 0'-0"
BUILDING 27



PLAN AT EL. 0'-0"
BUILDING 26



KEY PLAN

GENERAL NOTES:

1. FOR GENERAL NOTES AND LEGEND, SEE 24590-BOF-P1-25-00001.

NOTES:

1. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.

HOLDS:

1. NOT USED

REVISION NOTES:

1. INCORPORATED: 24590-BOF-PIN-25-00002 WITH MODIFICATIONS, AND 24590-BOF-PIN-50-00014. DUE TO EXTENSIVE REVISION, REVISED ITEMS ARE NOT IDENTIFIED.
2. INCORPORATED DCN 24590-BOF-PIN-26-00007 - BLDG 27 FIRE RISER ROOM DELETED.
24590-BOF-PIN-26-00008 - UPDATED SDJ EQUIPMENT AND STACK BACKGROUND.
24590-BOF-EIE-MS-18-0030 REV 0 - DELETE BSA EQUIPMENT.
24590-WTP-EIE-SYSE-16-0082 REV 0 - CONTENT WAS INCORPORATED IN REV 1.
UPDATED PLAN VIEW OF BUILDING 27.
UPDATED ADR REVISION.
HOLD LIST REMOVED.
UPDATED LAW EFFLUENT PROCESS BUILDING BOUNDARY FOR ALIGNMENT WITH OTHER BUILDINGS.

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
2	SEE REVISION NOTE 2.	Originator: LAL	Checked: LAL			3/28/19
1	SEE REVISION NOTE 1.	WTP	FJM	LAL	JM/SS	7/26/2017
0	ISSUED FOR DESIGN	JTC	SRH	LAL	JM/SS	3/7/2016

REVISION HISTORY

Please note that source, specialnuclear, 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 AEA, it has sole and exclusive responsibility and authority to regulate source, specialnuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

ISSUED BY ORIGINATOR		
	PROJECT No.	24590
	SITE	HANFORD
	AREA	200E
ISSUE STAMP	BUILDING No.	26,27

	BY	DATE
ORIGINATOR	J. CENTER	3/3/2016
CHECKER	S. HEINTZ	3/3/2016
APPROVER	S. SMITH/J. MCGRATH	3/7/2016
REVIEWER	L. LEYLAND	3/3/2016

CONTENT APPLICABLE TO ALARA? [X] YES [ ] NO
ADR NO. 24590-BOF-ADR-PL-15-0001 REV 4

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No: DE-AC27-01RV14136

BALANCE OF FACILITIES
LAW EFFLUENT UTILITY BLDG & LAW EFFLUENT ELECTRICAL BLDG
GENERAL ARRANGEMENT
PLAN AT ELEV. 0'-0"

SCALE: 1"=10'-0"

24590-BOF-P1-26-00001

REV 2