



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

3100 Port of Benton Blvd • Richland, WA 99354 • (509) 372-7950
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

August 8, 2019

19-NWP-123

Brian T. Vance, Manager
Office of River Protection
United States Department of Energy
PO Box 450, MSIN: H6-60
Richland, Washington 99354

Brian T. Vance, Acting Manager
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: H5-20
Richland, Washington 99352

Valerie McCain, Project Director
Bechtel National, Inc.
2435 Stevens Center Place, MSIN: H4-02
Richland, Washington 99354

Ty Blackford, President and CEO
CH2M HILL Plateau Remediation Company
PO Box 1600, MSIN: A7-01
Richland, Washington 99352

Robert E. Wilkinson, President
Mission Support Alliance, LLC
PO Box 650, MSIN: H1-30
Richland, Washington 99352

Michael H. Schlender,
Deputy Director for Operations
Pacific Northwest National Laboratory
PO Box 999, MSIN: K1-46
Richland, Washington 99352

John R. Eschenberg, President
Washington River Protection Solutions
PO Box 850, MSIN: H3-21
Richland, Washington 99352

Re: Transmittal of the Department of Ecology's Legal Copy of the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste* (Site-wide Permit), WA7890008967, Quarter Ending June 30, 2019 (8C.2019.Q2)

Reference: See page 4

Dear Addressees:

The Department of Ecology (Ecology) reviewed the United States Department of Energy's letter and enclosures (Reference). Ecology confirms that we approved or denied the Class 1 Modifications and concurred with the Class 1 Modifications listed in Reference 1 in the quarter ending June 30, 2019. Ecology incorporated the modifications into the Site-wide Permit.

The enclosed DVD contains a legal copy of the Site-wide Permit. All permitting and compliance work must be completed under the legal version of the Site-wide Permit.

Legal hard copies of the Site-wide Permit are on file at the locations listed below:

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

United States Department of Energy
Hanford Administrative Record
2440 Stevens Center Place
Richland, Washington 99354



A copy of the Site-wide Permit is available on the web at:

<https://fortress.wa.gov/ecy/nwp/permitting/hdwp/rev/8c/index.html>. Individuals can request copies of the Site-wide Permit on DVD by contacting Ecology's Resource Center at (509) 372-7950.

Portions of the Site-wide Permit contain Confidential Business Information or Official Use Only (OUO) documents. This information is not available for public review.

Ecology approved or denied the following Class ¹ Modifications and concurred with the Class 1 Modifications in the quarter ending June 30, 2019:

Hanford Site-wide (HFSW)

PCN-HFSW-2019-02

- Permit Attachment 6 (Reports and Records) – Class 1 Modification, concurred on June 25, 2019.

PCN-HFSW-2019-03

- Part I Standard and Part II General Facility Conditions – Class ¹ Modification, approved on April 23, 2019.

Ecology made additional modifications to the Part I Standard and Part II General Facility Conditions. We removed the modification dates from the List of Attachments. This will allow modifications to the Site-wide Permit Attachments without the need to modify the List of Attachments in the Part I Standard and Part II General Facility Conditions to reflect the modification date of the attachments.

242-A Evaporator

PCN-242-A-2019-01

- Unit-Specific Permit Conditions – Class 1 Modification, concurred on April 30, 2019.
- Chapter 7.0 (Contingency Plan) – Class 1 Modification, concurred on April 30, 2019.
 - The reference letter incorrectly identifies Addendum J as being modified.

325 Hazardous Waste Treatment Units

PCN-325-2019-01

- Unit-Specific Permit Conditions – Class 1 Modification, concurred on June 20, 2019.
- Addendum J (Contingency Plan) and Attachment to Addendum J (Building Emergency Procedure Applicability Matrix) – Class 1 Modification, concurred on June 20, 2019.

400 Area Waste Management Unit

PCN-400WMU-2019-01

- Unit-Specific Permit Conditions – Class 1 Modification, concurred on May 23, 2019.
- Addendum J (Contingency Plan) – Class 1 Modification, concurred on May 23, 2019.

Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility (LERF/ETF)

PCN-LERF/ETF-2019-01

- Unit-Specific Permit Conditions – Class 1 Modification, concurred on April 30, 2019.
- Addendum I (Inspection Requirements) – Class 1 Modification, concurred on April 30, 2019.
- Addendum J (Contingency Plan) – Class 1 Modification, concurred on April 30, 2019.

Waste Treatment and Immobilization Plant (WTP)

24590-LAB-PCN-ENV-19-001

- Appendix 11.4 (Laboratory Building General Arrangement Drawings) – Class ¹1 Modification, approved on June 13, 2019.

24590-LAW-PCN-ENV-17-007

- Appendix 9.2 (Low-Activity Waste Building Piping and Instrumentation Diagrams) and Appendix 9.9 (Low-Activity Waste Building Material Selection Documentation) Class ¹1 Modification, approved on June 12, 2019.
 - Ecology did not approve modifications to Appendix 9.6 as the proposed modification was superseded by 24590-LAW-PCN-ENV-18-005.

In addition, the Permittees submitted the entire 24590-LAW-PCN-ENV-17-007 modification package as OUO. The Hanford Facility RCRA Permit Modification Form and permit documents are marked OUO and are not available for public review until that designation is removed by the Permittees.

24590-WTP-PCN-ENV-19-002

- Appendix 1.4 (Interim Compliance Schedule – WTP Effluent Management Facility) – Class ¹1 Modification, approved on June 12, 2019.

24590-LAW-PCN-ENV-19-004

- Appendix 9.18 (Low-Activity Waste Building Operating Documents) – Class ¹1 Modification, approved on May 21, 2019.

24590-LAW-PCN-ENV-16-004

- Appendix 9.6 (Low-Activity Waste Building Mechanical Drawings) and Appendix 9.9 (Low-Activity Waste Building Material Selection Documentation) – Class ¹1 Modification, approved on May 20, 2019.

24590-BOF-PCN-ENV-18-001

- Appendix 13.6 (Mechanical Diagrams) – Class ¹1 Modification, approved on May 16, 2019.

24590-WTP-PCN-ENV-19-001

- Chapter 7.0 (Contingency Plan) – Class 1 Modification, concurred on April 30, 2019.
 - The reference letter does not identify Chapter 7.0 as being modified.
 - The reference letter identifies the Unit-Specific Permit Conditions as being modified. The Unit-Specific Permit Conditions were not modified this quarter.

24590-LAB-PCN-ENV-19-002

- Appendix 11.18 (High-Level Waste Building Operating Documents) – Class 1 Modification, approved on April 15, 2019.
 - The reference letter incorrectly identifies Appendix 11.8 as being modified.

24590-LAW-PCN-ENV-19-002

- Appendix 9.18 (Low-Activity Waste Building Operating Documents) – Class 1 Modification, Denied on April 15, 2019. An explanation of this denial is in Ecology's letter 19-NWP-057.

If there are any questions regarding this letter, please contact Jennifer Lisa Cantu, Site-wide Permit Quarterly Lead, at jennifer.cantu@ecy.wa.gov or (509) 372-7907.

Sincerely,



Suzanne Dahl
Dangerous Waste Permit Manager
Nuclear Waste Program

jc/sh
Enclosure

cc: See page 5

Reference: Letter 19-ESQ-0080, dated July 10, 2019, "Class 1 Modifications to the Hanford Facility Resource Conservation and Recovery Act Permit, Quarter Ending June 30, 2019"

Brian T. Vance, et al.
August 8, 2019
Page 5 of 5

19-NWP-123

cc electronic w/o enc:

Dave Bartus, EPA
David Einan, EPA
Mary Beth Burandt, USDOE
Duane Carter, USDOE
Joe Franco, USDOE
Lori Huffman, USDOE
Mostafa Kamal, USDOE
Christopher Kemp, USDOE
Tony McKarns, USDOE
Donna Yasek, BNI
Laura Cusack, CHPRC
Moussa Jaraysi, CHPRC

Curt Clement, MSA
Jon Perry, MSA
Darci Teel, MSA
ERWM Staff, YN
Michael Stephenson, PNNL
Jennie Stults, WRPS
Debra Alexander, Ecology
Jennifer Cantu, Ecology
Annette Carlson, Ecology
Suzanne Dahl, Ecology
Mandy Jones, Ecology
Stephanie Schleif, Ecology

cc w/enc, DVD:

Tim Hamlin, EPA
Tony McKarns, USDOE
Matt Johnson, CTUIR
Jack Bell, NPT
Alyssa Buck, Wanapum
Laurene Contreras, YN
Susan Leckband, HAB
Ken Niles, ODOE
John Fowler, ACHP
Robin Priddy, BCAA
Donald Redman, USACE
Trevor Fox, USFW
Mike Livingston, WDFW
John Martell, WDOH
John Wiesman, WDOH
Sonia Soelter, WSDA
Allyson Brooks, WSDAHP
Cindy Preston, WSDNR

BNI Correspondence Control
CHPRC Correspondence Control
Environmental Portal
Gonzaga University Foley Center Library
Hanford Facility Operating Record
MSA Correspondence Control
PNNL Correspondence Control
Portland State University Library,
Government Information
University of Washington Suzzallo Library,
Government Publications
USDOE-ORP Correspondence Control
USDOE Public Reading Room, CIC
USDOE-RL Correspondence Control
USEPA Region 10 Hanford Field Office
Correspondence Control
WRPS Correspondence Control

cc w/enc, DVD and hard copy:

Hanford Administrative Record: Hanford Site-wide Permit
NWP Central File

cc w/enc, hard copy:

NWP Library: Hanford Site-wide Permit

1
2
3 **DANGEROUS WASTE PORTION OF THE**
4 **RESOURCE CONSERVATION AND RECOVERY ACT PERMIT**
5 **FOR THE TREATMENT, STORAGE, AND DISPOSAL OF DANGEROUS WASTE**
6 **SIGNATURE PAGE FOR 8C.2019.Q2**
7

8 This Permit as modified on August 08, 2019, is the legal and current version of the Hanford Facility
9 Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8c for the
10 Treatment, Storage, and Disposal of Dangerous Waste. It will remain in effect unless modified, revoked
11 and reissued under Washington Administrative Code [\(WAC\) 173-303-830\(3\)](#), terminated under
12 [WAC 173-303-830\(5\)](#), or continued in accordance with [WAC 173-303-806\(7\)](#).

13 ISSUED BY:
14 **WASHINGTON STATE DEPARTMENT OF ECOLOGY**

15 

Date: 8/8/2019

16 Suzanne Dahl, Dangerous Waste Permit Manager
17 Nuclear Waste Program, Department of Ecology

1
2
3
4
5

This page intentionally left blank.

**HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT PERMIT,
DANGEROUS WASTE PORTION, REVISION 8C,
FOR THE TREATMENT, STORAGE, AND DISPOSAL OF DANGEROUS WASTE
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit or section of the permit will have a “**Last Modification Date**” which represents the last date the unit or section has been modified. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit. An individual unit change control log will be placed at the beginning of each unit so that changes to individual addendum of the unit are tracked and reflected.

Revision 8C last issue date **August 08, 2019**

Unit or Section	Last Modification Date	Modification Number
Attachments		
Permit Attachment 1 – Hanford Facility Agreement and Consent Order	11/03/2015	
Permit Attachment 2 – Hanford Facility Permit Legal Description & Operating Boundary	12/12/2018	8C.2018.Q4
Permit Attachment 3 – Security	04/01/2019	8C.2019.1F
Permit Attachment 4 – Hanford Emergency Management Plan	07/17/2014	
Permit Attachment 5 – Hanford Facility Personnel Training Program	09/30/2015	8C.2015.Q3
Permit Attachment 6 – Reports and Records	06/25/2019	8C.2019.Q2
Permit Attachment 7 – Policy on Remediation of Existing Wells and Acceptance Criteria for RCRA and CERCLA	06/1990	
Permit Attachment 8 – Hanford Well Maintenance and Inspection Plan, HNF-56398, Revision 2	12/15/2016	8C.2016.Q3
Permit Attachment 9 – Permit Applicability Matrix	12/12/2018	8C.2018.Q4
Permit Attachment 10 – Strategy for Handling and Disposing of Purgewater at the Hanford Site	09/30/2010	
Part I and II		
Part I Standard and Part II General Facility Conditions	04/23/2019	8C.2019.Q2
Part III Unit-Specific Conditions for Final Status Operations		
242-A Evaporator	04/30/2019	8C.2019.Q2

Unit or Section	Last Modification Date	Modification Number
325 Hazardous Waste Treatment Units	06/20/2019	8C.2019.Q2
400 Area Waste Management Unit	05/23/2019	8C.2019.Q2
Integrated Disposal Facility	08/21/2018	8C.2018.Q3
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	04/30/2019	8C.2019.Q2
Waste Treatment and Immobilization Plant	07/01/2019	8C.2019.2F
Part IV Unit Specific Conditions for Corrective Action		
100-NR-1	01/2007	
Part V Unit-Specific Conditions for Units Undergoing Closure		
276-BA Organic Storage Area	05/29/2019	8C.2019.5F
PUREX Storage Tunnels	02/28/2019	8C.2019.Q1
Waste Encapsulation and Storage Facility, Hot Cells A through F	07/19/2017	8C.2017.Q2
Part VI Unit-Specific Conditions for Units in Post-Closure		
183-H Solar Evaporation Basins	05/24/2017	8C.2017.1F
300 Area Process Trenches	03/15/2018	8C.2018.Q1



Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion

Revision 8C

For the Treatment, Storage, and Disposal of Dangerous Waste



Washington State Department of Ecology
Nuclear Waste Program

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48

For additional copies of this permit contact:

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354-1670
509-372-7950

The Department of Ecology is an equal-opportunity agency and does not discriminate on the basis of race, creed, color, disability, age, religion, national origin, sex, marital status, disabled-veteran status, Vietnam-era veteran status or sexual orientation.

For more information or if you have special accommodation needs, please contact the Nuclear Waste Program at (509) 372-7950.

Department of Ecology Headquarters telecommunications device for the deaf (TDD) number is: (360) 407-6006

**PART I STANDARD AND PART II GENERAL FACILITY CONDITIONS
DANGEROUS WASTE PORTION OF THE
RESOURCE CONSERVATION AND RECOVERY ACT PERMIT
FOR THE TREATMENT, STORAGE, AND DISPOSAL OF DANGEROUS WASTE
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
04/23/2019	PCN-HFSW-2019-03 (8C.2019.Q2)
04/01/2019	8C.2019.1F
03/14/2019	PCN-HFSW-2019-01 (8C.2019.Q1)
12/12/2018	PCN-1325-2016-02 (8C.2018.Q4)
12/12/2018	PCN-1301-2016-02 (8C.2018.Q4)
12/12/2018	PCN-HFSW-2016-02 (8C.2018.Q4)
09/18/2018	PCN-HFSW-2018-01 (8C.2018.Q3)
08/28/2018	PCN-HFSW-2018-02 (8C.2018.Q3)
07/09/2018	PCN-PWSTF-2016-01 (8C.2018.Q3)
06/14/2018	PCN-1324-2016-02 (8C.2018.Q2)
06/14/2018	PCN-1706KE-2016-01 (8C.2018.Q2)
11/01/2017	8C.2017.Q3
07/19/2017	8C.2017.Q2
04/26/2017	8C.2017.Q1
03/01/2017	8C.2016.Q4
12/15/2016	8C.2016.Q3
10/06/2016	8C.2016.6F

This page intentionally left blank.

1
2
3
4
5
6
7
8
9
10
11

**DANGEROUS WASTE PORTION OF THE
RESOURCE CONSERVATION AND RECOVERY ACT PERMIT
FOR THE TREATMENT, STORAGE, AND DISPOSAL OF DANGEROUS WASTE**

7 Washington State Department of Ecology
8 Nuclear Waste Program
9 3100 Port of Benton Boulevard
10 Richland, Washington 99354
11 Telephone: 509-372-7950

12 Issued in accordance with the applicable provisions of the Hazardous Waste Management Act,
13 [Chapter 70.105](#) Revised Code of Washington (RCW), and the regulations promulgated there under in
14 [Chapter 173-303](#) Washington Administrative Code (WAC).

15 **ISSUED TO:**

United States Department of Energy
Richland Operations Office
(Owner/Operator)
PO Box 550, MSIN: A7-50
Richland, Washington 99352
Telephone: (509) 376-7395

Mission Support Alliance
2490 Garlick, MSIN: H1-30
Richland, Washington 99354
Telephone: (509) 376-1310

Pacific Northwest National Laboratory
(Co-operator)
PO Box 999, MSIN: K1-46
Richland, Washington 99352
Telephone: (509) 375-5911

United States Department of Energy
Office of River Protection
(Owner/Operator)
PO Box 450, MSIN: H6-60
Richland, Washington 99352
Telephone: (509) 372-3062

Bechtel National, Inc.
(Co-Operator)
2435 Stevens Center Place, MSIN: H4-02
Richland, Washington 99354
Telephone: (509) 371-2335

Washington River Protection Solutions, LLC
(Co-operator)
PO Box 1500, MSIN: H6-63
Richland, Washington 99352
Telephone: (509) 372-9138

CH2M HILL Plateau Remediation Company
(Co-operator)
PO Box 1600, MSIN: H7-30
Richland, Washington 99352
Telephone: (509) 376-0556

1
2
3
4
5

This page intentionally left blank.

**DANGEROUS WASTE PORTION OF THE
RESOURCE CONSERVATION AND RECOVERY ACT PERMIT
FOR THE TREATMENT, STORAGE, AND DISPOSAL OF DANGEROUS WASTE**

1
2
3
4
5
6
7 **TABLE OF CONTENTS**

8 LIST OF ATTACHMENTS 9

9 INTRODUCTION 10

10 UNIT STATUS TABLE 13

11 DEFINITIONS..... 18

12 ACRONYMS 21

13 PART I STANDARD CONDITIONS 24

14 I.A Effect of Permit..... 24

15 I.B Personal and Property Rights..... 25

16 I.C Permit Actions 25

17 I.D Severability 25

18 I.E Duties and Requirements 26

19 I.F Signatory Requirement 31

20 I.G Confidential Information 31

21 I.H Documents to be Maintained at Facility Site..... 31

22 PART II GENERAL FACILITY CONDITIONS..... 32

23 II.A Facility Contingency Plan..... 32

24 II.B Preparedness and Prevention 32

25 II.C Personnel Training 33

26 II.D Waste Analysis..... 33

27 II.E Quality Assurance/Quality Control..... 34

28 II.F Ground Water and Vadose Zone Monitoring 35

29 II.G Siting Criteria 35

30 II.H Recordkeeping and Reporting 36

31 II.I Facility Operating Record..... 36

32 II.J Facility Closure..... 37

33 II.K Soil/Ground Water Closure Performance Standards..... 38

34 II.L Design and Operation of the Facility 39

35 II.M Security 40

36 II.N Receipt of Dangerous Wastes Generated Off-Site 40

Part I Standard and Part II General Facility Conditions

1 II.O General Inspection Requirements..... 41

2 II.P Manifest System 41

3 II.Q On-Site Transportation..... 42

4 II.R Equivalent Materials 42

5 II.S Land Disposal Restrictions 43

6 II.T Access and Information 43

7 II.U Mapping of Underground Piping..... 43

8 II.V Marking of Underground Piping..... 43

9 II.W Other Permits and/or Approvals 44

10 II.X Schedule Extensions 44

11 II.Y Corrective Action..... 44

12 II.Z Waste Minimization 48

13 II.AA Air Emission Standards for Process Vents..... 49

14 II.BB Air Emission Standards for Equipment Leaks..... 49

15 II.CC Air Emission Standards for Tanks, Surface Impoundments, and Containers 49

16 PART III UNIT-SPECIFIC CONDITIONS FOR FINAL STATUS OPERATIONS 49

17 PART IV UNIT SPECIFIC CONDITIONS FOR CORRECTIVE ACTION..... 49

18 PART V UNIT-SPECIFIC CONDITIONS FOR UNITS UNDERGOING CLOSURE 49

19 PART VI UNIT-SPECIFIC CONDITIONS FOR UNITS IN POST-CLOSURE..... 50

20 UNITS RETIRED FROM THE PERMIT 50

21

22

1
2
3
4

LIST OF ATTACHMENTS

5 The following listed documents are attached in their entirety. However, only those portions of the
6 attachments specified in Parts I through VI are enforceable conditions of this Permit and subject to the
7 permit modification requirements of Permit Condition [I.C.3](#). Changes to portions of the attachments,
8 which are not subject to the permit modification process, will be addressed in accordance with Permit
9 Conditions [I.E.8](#), [I.E.11](#), [I.E.13](#), [I.E.15](#), through [I.E.20](#), and [I.E.22](#). The Washington State Department of
10 Ecology (Ecology) has, as deemed necessary, modified specific language in these attachments. These
11 modifications are described in the conditions (Parts I through VI), and thereby supersede the language of
12 the attachment.

- 13 Attachment 1 Hanford Federal Facility Agreement and Consent Order, (as amended)
14 <https://www.hanford.gov/page.cfm/TriParty>
- 15 Attachment 2 Hanford Facility Permit Legal Description & Operating Boundary
- 16 Attachment 3 Security
- 17 Attachment 4 Hanford Emergency Management Plan
- 18 Attachment 5 Hanford Facility Personnel Training Program
- 19 Attachment 6 Reports and Records
- 20 Attachment 7 Policy on Remediation of Existing Wells and Acceptance Criteria for RCRA and
21 CERCLA, June 1990
- 22 Attachment 8 Hanford Well Maintenance and Inspection Plan
- 23 Attachment 9 Permit Applicability Matrix
- 24 Attachment 10 Strategy for Handling and Disposing of Purgewater at the Hanford Site, July 1990

INTRODUCTION

Where information regarding treatment, management, and disposal of the radioactive source, byproduct material, special nuclear material (as defined by the Atomic Energy Act of 1954, as amended) and/or the radionuclide component of mixed waste has been incorporated into this permit, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit or [Chapter 70.105 RCW](#).

Pursuant to [Chapter 70.105 RCW](#), the Hazardous Waste Management Act (HWMA) of 1976, as amended, [Chapter 70.105D RCW](#), the Model Toxics Control Act (MTCA), and regulations promulgated there under by the Washington State Department of Ecology (hereafter called Ecology), codified in [Chapter 173-303 WAC](#), Dangerous Waste Regulations, a Dangerous Waste Permit is issued to the United States Department of Energy (USDOE) - Richland Operations Office (RL) and Office of River Protection (ORP) [owner/operator], and its contractors [co-operators], Bechtel National, Incorporated (BNI), CH2M HILL Plateau Remediation Company (CHPRC), Mission Support Alliance, LLC (MSA), Pacific Northwest National Laboratory (PNNL), and Washington River Protection Solutions, LLC (WRPS) and hereafter called the Permittees, for the treatment, storage, and disposal of dangerous waste at the Hanford Facility.

This Dangerous Waste Permit, issued in conjunction with the United States Environmental Protection Agency's (EPA) Hazardous and Solid Waste Amendments Portion of the Resource Conservation and Recovery Act (RCRA) Permit for the Treatment, Storage, and Disposal (TSD) of Hazardous Waste (HSWA Permit), constitutes the RCRA Permit for the Hanford Facility. Use of the term "Permit" within the Dangerous Waste Permit will refer to the Dangerous Waste Permit, while use of the term "Permit" within the HSWA Permit, will refer to the HSWA Permit. Use of the same term in both the Dangerous Waste Permit and the HSWA Permit, will have the standard meaning associated with the activities addressed by the permit in which the term is used. Such meanings will prevail, except where specifically stated otherwise.

The Permittees will comply with all terms and conditions set forth in this Permit and those portions of the Attachments that have been specifically incorporated into this Permit. When the Permit and the Attachments (except Permit Attachment 1) conflict, the wording of the Permit will prevail. The Permit is intended to be consistent with the terms and conditions of the Hanford Federal Facility Agreement and Consent Order (HFFACO, Permit Attachment 1). The Permittees will also comply with all applicable state regulations, including [Chapter 173-303 WAC](#).

Applicable state regulations are those which are in effect on the date of issuance, or as specified in subsequent modifications of this Permit. In addition, applicable state regulations include any self-implementing statutory provisions and related regulations which, according to the requirements of the HWMA, as amended, or other law(s), are automatically applicable to the Permittees' dangerous waste management activities, notwithstanding the conditions of this Permit.

This Permit is based upon the Administrative Record, as required by [WAC 173-303-840](#). The Permittees' failure in the application, or during the Permit issuance process, to fully disclose all relevant facts, or the Permittees' misrepresentation of any relevant facts at any time, will be grounds for the termination or modification of this Permit and/or initiation of an enforcement action, including criminal proceedings. The Permittees will inform Ecology of any deviation from the Permit conditions, or changes in the information on which the application is based, which would affect either the Permittees' ability to comply, or actual compliance with the applicable regulations or the Permit conditions, or which alters any condition of this Permit in any way.

1 Ecology will enforce all conditions of this Permit for which the State of Washington is authorized, or
2 which are "state-only" provisions (i.e., conditions broader in scope or more stringent than the federal
3 RCRA program). Any challenges of any Permit condition may be appealed in accordance with
4 [WAC 173-303-845](#). In the event that any Permit condition is challenged by any Permittee under
5 [WAC 173-303-845](#), Ecology may stay any such Permit condition as it pertains to all Permittees, in
6 accordance with the same terms of any stay it grants to the challenging Permittee. If such a stay is
7 granted, it will constitute a "stay by the issuing agency" within the meaning of [RCW 43.21B.320](#)(1).

8 This Permit has been developed to allow a step-wise permitting process of the Hanford Facility to ensure
9 the proper implementation of the HFFACO. In order to accomplish this, this Permit consists of six (6)
10 parts.

11 **Part I, Standard Conditions**, contains conditions which are similar to those appearing in all dangerous
12 waste permits.

13 **Part II, General Facility Conditions**, combines typical dangerous waste permit conditions with those
14 conditions intended to address issues specific to the Hanford Facility. Where appropriate, the general
15 facility conditions apply to all final status dangerous waste management activities at the Facility. Where
16 appropriate, the general facility conditions also address dangerous waste management activities which
17 may not be directly associated with distinct TSD units, or which may be associated with many TSD units
18 (i.e., spill reporting, training, contingency planning, etc.). Part II also includes conditions that address
19 corrective action at solid waste management units and areas of concern.

20 **Part III, Unit-Specific Conditions for Operating Units**, contains those Permit requirements that apply
21 to each individual TSD unit operating under final status. Conditions for each TSD unit are found in a
22 chapter dedicated to that TSD unit. These unit-specific chapters contain references to Standard
23 Conditions (Part I) and General Conditions (Part II), as well as additional requirements which are
24 intended to ensure that each TSD unit is operated in an efficient and environmentally protective manner.
25 Additional requirements may also be added when an operating unit ceases operations and undergoes
26 closure.

27 **Part IV, Unit-Specific Conditions for Corrective Action**, contains Permit conditions for releases from
28 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs). For past practice units
29 identified in the HFFACO as either Comprehensive Environmental Response, Compensation, and
30 Liability Act (CERCLA) Past Practice units (CPP units) or combined Resource Conservation and
31 Recovery Act-Comprehensive Environmental Response, Compensation and Liability Act Past Practice
32 units (R-CPP units), the corrective action conditions are structured around reliance on, the investigation
33 and cleanup requirements established under the HFFACO. For TSD units identified in the HFFACO, the
34 corrective action conditions contemplate use of closure and post-closure processes to satisfy corrective
35 action.

36 **Part V, Unit-Specific Conditions for Units Undergoing Closure**, contains those requirements which
37 apply to those specific TSD units, included in this part, that are undergoing closure. In accordance with
38 Section 5.3 of the Action Plan of the HFFACO, all TSD units that undergo closure, irrespective of permit
39 status, will be closed pursuant to the authorized State Dangerous Waste Program in accordance with
40 [WAC 173-303-610](#). Requirements for each TSD unit undergoing closure are found in a chapter dedicated
41 to that TSD unit. These unit-specific chapters contain references to Standard Conditions (Part I) and
42 General Conditions (Part II), as well as additional requirements which are intended to ensure that each
43 TSD unit is closed in an efficient and environmentally protective manner.

1 **Part VI, Unit-Specific Conditions for Units in Post-Closure**, contains those requirements which apply
2 to those specific units in this part that have completed modified or landfill closure requirements, and now
3 only need to meet Post-Closure Standards. As set forth in Section 5.3 of the Action Plan of the
4 HFFACO, certain TSD units will be permitted for post-closure care pursuant to the authorized State
5 Dangerous Waste Program ([WAC 173-303](#)) and the Hazardous and Solid Waste Amendments.
6 Requirements for each unit undergoing post-closure care are found in a chapter, within this part, dedicated
7 to that unit. These unit specific chapters may contain references to Standard Conditions (Part I) and
8 General Conditions (Part II), as well as the unit specific conditions, all of which are intended to ensure the
9 unit is managed in an efficient, environmentally protective manner.

1
2
3
4

Unit Status Table

Permit Revision	Revision Date	Units Incorporated
Permit Revision 0	8/29/94	616 NDWSF, 305-B Storage Facility, 183-H SEB, 300 ASE, 2727-S, NRDWSF
Permit Revision 1	4/28/95	Simulated High-Level Waste Slurry, 218-E-9 Borrow Pit Demo Site, 200 W Area Ash Pit Demo Site, 2101-M Pond, 216-B-3 Expansion Ponds
Permit Revision 2	8/29/95	Hanford Patrol Academy Demolition Site, 105-DR Large Sodium Fire Facility, 304 Concretion Facility
Permit Revision 3	11/25/96	PUREX Storage Tunnels, 4843 Alkali Metal Storage Facility, 3718-F Alkali Metal Treatment & Storage Facility, 303-K Storage Facility, 300 APT
Permit Revision 4	1/28/98	LERF & 200 Area ETF, 242-A Evaporator, 325 HWTUs
Permit Revision 5	5/18/99	100 D Ponds, 1301-N & 1325-Liquid Waste Disposal Facility, 1324-N Surface Impoundment, 1324-NA Percolation Pond
Permit Revision 6	3/28/00	Permit Condition II.Y , Corrective Action
Permit Revision 7	2/27/01	Waste Treatment & Immobilization Plant, 300 Area WATS
Permit Revision 8	9/23/04	No new units, modification updates
Permit Revision 8A	3/6/06	Integrated Disposal Facility
Permit Revision 8B	1/2007	331-C Storage Unit, PFP Treatment Unit, 241-Z Treatment & Storage Tanks, 303-M Oxide Facility
Permit Revision 8C	8/2007	400 Area Waste Management Unit, 224-T TRUSAF
Permit Revision 8C (8C.2016.2F)	01/21/2016	FS-1 Outdoor Container Storage Area Closure
Permit Revision 8C (8C.2016.6F)	10/6/2016	207-A South Retention Basins
Permit Revision 8C (8C.2017.Q1)	04/26/2017	1706 KE Waste Treatment System
Permit Revision 8C (8C.2017.Q1)	04/26/2017	600 Area Purgewater Storage and Treatment Facility

5

Unit	Permit Revision		Comments/History
	Incorporated	Retired	
Part III, Operating Units			
616 Non-Radioactive Dangerous Waste Storage Facility	Rev. 6	Rev. 7	Closed, 9/5/01
242-A Evaporator	Rev. 4		
305-B Storage Facility	Rev. 0		Closed, 7/2/07
325 Hazardous Waste Treatment Units	Rev. 4		RLWT procedural closure, 9/04
LERF & 200 Area ETF	Rev. 4		
PUREX Storage Tunnels	Rev. 3		
Waste Treatment and Immobilization Plant	Rev. 7		Permitted unit under construction
Integrated Disposal Facility	Rev. 8A		
331-C Storage Unit	Rev. 8B	Rev. 8C	Closed, 7/22/11
400 Area Waste Management Unit	Rev. 8C		
Part IV, Corrective Action			
100-NR-1 Operable Unit	Rev. 6		
100-NR-2 Operable Unit	Rev. 6	Rev. 8C	Retired, 9/30/09
Part V, Undergoing Closure Units			
100-D Ponds	Rev. 5	Rev. 6	Closed, 8/9/99
105 DR Large Sodium Fire Facility	Rev. 2	Rev. 6	Closed, 7/1/04
1301-N Liquid Waste Disposal Facility	Rev. 5	Rev. 8C	Closed, 11/28/18
1324-N Surface Impoundment	Rev. 5	Rev. 8C	Closed, 04/25/17
1324-NA Percolation Pond	Rev. 5	Rev. 8C	Closed, 04/25/17
1325-N Liquid Waste Disposal Facility	Rev. 5	Rev. 8C	Closed, 11/28/18
200 West Area Ash Pit Demo Site	Rev. 1	Rev. 6	Closed, 11/28/95
2101-M Pond	Rev. 1	Rev. 6	Closed, 11/28/95
216-B-3 Expansion Ponds	Rev. 1	Rev. 6	Closed, 7/31/95
218-E-8 Borrow Demolition Site	Rev. 1	Rev. 6	Closed, 11/28/95
2727-S Storage Facility	Rev. 0	Rev. 6	Closed, 7/31/95
300 Area Solvent Evaporator	Rev. 0	Rev. 6	Closed, 7/31/95
300 Area Waste Acid Treatment System	Rev. 6	Rev. 8B	Closed, 1/21/05

Part I Standard and Part II General Facility Conditions

Unit	Permit Revision		Comments/History
	Incorporated	Retired	
303-K Storage Facility	Rev. 4	Rev. 6	Closed, 7/22/02
304 Concretion Facility	Rev. 2	Rev. 6	Closed, 1/21/96
311 Tanks (includes 300 Area WATS)	Rev. 6	Rev. 7	Closed, 5/20/02
3718-F Alkali Metal Treatment/Storage	Rev. 3	Rev. 6	Closed, 8/4/98
4843 Alkali Metal Storage Facility	Rev. 3	Rev. 6	Closed, 4/14/97
Hanford Patrol Academy Demo Site	Rev. 2	Rev. 6	Closed, 11/28/95
Simulated High Level Waste Slurry	Rev. 1	Rev. 6	Closed, 9/6/95
PFP Treatment Unit (HA-20MB)	Rev. 8B	Rev. 8B	Closed, 2/8/05
241-Z Treatment and Storage Tanks	Rev. 8B	Rev. 8B	Closed, 2/22/07
303-M Oxide Facility	Rev. 8B	Rev. 8B	Closed, 6/15/06
224-T Transuranic Waste Storage and Assay Facility	Rev. 8C	Rev. 8C	Closed, 11/12/08
FS-1 Outdoor Container Storage Area Closure	Rev. 8C	Rev.8C	Closed, 10/25/16
Waste Encapsulation and Storage Facility Hot Cells A through F	Rev. 8C		
207-A South Retention Basins	Rev. 8C	Rev. 8C	Closed, 05/18/17
1706 KE Waste Treatment System	Rev. 8C	Rev. 8C	Closed, 1/11/18
600 Area Purgewater Storage and Treatment Facility	Rev. 8C	Rev. 8C	Closed, 02/16/18
Part VI, Postclosure Units			
183-H Solar Evaporation Basin	Rev. 4		
300 Area Process Trenches	Rev. 3		
Procedurally Closed			
216-U-12 Crib	N/A	N/A	Closed, 7/19/07
221-T Test Facility	N/A	N/A	Closed, 2/22/99
2727-WA SRE Sodium Storage Bldg	N/A	N/A	Closed, 2/22/99
324 Pilot Plant	N/A	N/A	Closed, 6/9/97
332 Storage Facility	N/A	N/A	Closed, 4/21/97
437 Maintenance and Storage Facility	N/A	N/A	Closed, 9/11/03

Part I Standard and Part II General Facility Conditions

Unit	Permit Revision		Comments/History
	Incorporated	Retired	
Biological Treatment Test Facilities	N/A	N/A	Closed, 12/10/96
Physical/Chemical Treatment Test Facilities	N/A	N/A	Closed, 5/13/96
Sodium Storage/Sodium Reaction	N/A	N/A	Closed, 9/17/03
Thermal Treatment Test Facilities	N/A	N/A	Closed, 5/13/96
216-A-10	N/A	N/A	Closed, 5/14/10
To Be Incorporated			
216-A-29 Ditch			
216-A-36B Crib			
216-A-37-1 Crib			
216-B-3 Main Pond			
216-B-63 Trench			
216-S-10 Pond & Ditch			
222-S Dangerous & Mixed Waste TSD Unit			
241-CX Tank System			
Central Waste Complex			
Contact Handled Transuranic Mixed Waste Packaging and Interim Storage Facility			
DST System/204-AR Waste Unloading Station			
Grout Treatment Facility			
Hexone Storage & Treatment Facility			

Unit	Permit Revision		Comments/History
	Incorporated	Retired	
IHLW Interim Storage/Canister Storage Building			
Low-Level Burial Grounds			
Nonradioactive Dangerous Waste Landfill			
Single-Shell Tank System			
T Plant Complex			
Waste Encapsulation and Storage Facility			
Waste Receiving and Processing Facility			
Transition Under HFFACO Action Plan, Section 8 (Will not be incorporated into Permit)			
B Plant Complex			
PUREX Plant			

1
2
3
4

DEFINITIONS

5 Except with respect to those terms specifically defined below, all definitions contained in the HFFACO,
6 May 1989, as amended, and in [WAC 173-303-040](#) and other portions of [Chapter 173-303 WAC](#) are
7 hereby incorporated, in their entirety, by reference into this Permit. For terms defined in both
8 [Chapter 173-303 WAC](#) and the HFFACO, the definitions contained in [Chapter 173-303 WAC](#) will control
9 within this Permit. Nonetheless, this Permit is intended to be consistent with the HFFACO.

10 Where terms are not defined in the regulations, the Permit, or the HFFACO, a standard dictionary
11 reference, or the generally accepted scientific or industrial meaning of the terms will define the meaning
12 associated with such terms.

13 As used in this Permit, words in the masculine gender also include the feminine and neuter genders,
14 words in the singular include the plural, and words in the plural include the singular.

15 The following definitions apply throughout this Permit:

16 The term "**Area of Concern**" means any area of the Facility where a release of dangerous waste or
17 dangerous constituents has occurred, is occurring, is suspected to have occurred, or threatens to occur.

18 The term "**Contractor(s)**" means, unless specifically identified otherwise in this Permit, or Attachments,
19 Bechtel National, Inc. (BNI), CH2M HILL Plateau Remediation Company, Inc. (CHPRC), Mission
20 Support Alliance, LLC (MSA), Pacific Northwest National Laboratory (PNNL), and Washington River
21 Protection Solutions, LLC (WRPS).

22 The term "**Critical Systems**" as applied to determining whether a Permit modification is required, means
23 those specific portions of a TSD unit's structure, or equipment, whose failure could lead to the release of
24 dangerous waste into the environment, and/or systems which include processes which treat, transfer,
25 store, or dispose of regulated wastes. A list identifying the critical systems of a specific TSD unit may be
26 developed and included in Part III, V, and/or VI of this Permit. In developing a critical system list, or in
27 the absence of a critical system list, [WAC 173-303-830](#) Modifications will be considered.

28 The term "**Dangerous Constituent**" means any constituent identified in [WAC 173-303-9905](#) or
29 [40 CFR Part 264](#) Appendix IX, any constituent which caused a waste to be listed or designated as
30 dangerous under [Chapter 173-303 WAC](#), and any constituents within the meaning of hazardous substance
31 at [RCW 70.105D.020\(7\)](#).

32 The term "**Dangerous Waste**" means those solid wastes designated under [Chapter 173-303 WAC](#) as
33 dangerous or extremely hazardous waste. As used in the Permit, the phrase "dangerous waste" will refer
34 to the full universe of wastes regulated by [Chapter 70.105 RCW](#) and [Chapter 173-303 WAC](#) (including
35 dangerous waste, hazardous waste, extremely hazardous waste, mixed waste, and acutely hazardous
36 waste).

37 The term "**Days**" means calendar days, unless specifically identified otherwise. Any submittal,
38 notification, or recordkeeping requirement that would be due, under the Conditions of this Permit, on a
39 Saturday, Sunday, or federal, or state holiday, will be due on the following business day, unless
40 specifically stated otherwise in the Permit.

41 The term "**Director**" means the Director of the Washington State Department of Ecology, or a designated
42 representative. The Program Manager of the Nuclear Waste Program (with the address as specified on
43 page one [1] of this Permit) is a duly authorized and designated representative of the Director for
44 purposes of this Permit.

45 The term "**Ecology**" means the Washington State Department of Ecology (with the address as specified on
46 page one [1] of this Permit).

- 1 The term "**Facility**" means all contiguous land, structures, other appurtenances, and improvements on the
2 land used for recycling, reusing, reclaiming, transferring, storing, treating, or disposing of dangerous
3 waste. The legal and physical description of the Facility is set forth in Permit Attachment 2.
- 4 The term "**Facility**" for the purposes of corrective action under Permit Condition [II.Y](#), means all
5 contiguous property under the control of the Permittees and all property within the meaning of "facility"
6 at [RCW 70.105D.020](#)(3) as set forth in Permit Attachment 2.
- 7 The term "**HFFACO**" means the Hanford Federal Facility Agreement and Consent Order, as amended
8 (Commonly referred to as Tri-Party Agreement [TPA]).
- 9 The term "**Permittees**" means the United States Department of Energy (owner/operator), Bechtel
10 National, Inc. (Co-operator), CH2M HILL Plateau Remediation Company (Co-operator), Mission
11 Support Alliance, LLC (MSA), Pacific Northwest National Laboratory (Co-operator), Washington River
12 Protection Solutions, LLC (WRPS).
- 13 The term "**Permittees**" for purposes of corrective action under Permit Condition [II.Y](#) means only the
14 United States Department of Energy (owner/operator).
- 15 The term "**Raw Data**" means the initial value of analog or digital instrument output, and/or manually
16 recorded values obtained from measurement tools or personal observation. These values are converted
17 into reportable data (e.g., concentration, percent moisture) via automated procedures and/or manual
18 calculations.
- 19 The term "**RCRA Permit**" means the Dangerous Waste Portion of the RCRA Permit for the Treatment,
20 Storage, and Disposal of Dangerous Waste (Dangerous Waste Permit) issued by the Washington State
21 Department of Ecology, pursuant to [Chapter 70.105 RCW](#) and [Chapter 173-303 WAC](#), coupled with the
22 HSWA Portion of the RCRA Permit for the Treatment, Storage, and Disposal of Hazardous Waste (HSWA
23 Permit) issued by EPA, Region 10, pursuant to 42 U.S.C. 6901 et seq. and [40 CFR Parts 124](#) and [270](#).
- 24 The term "**Reasonable Times**" means normal business hours; hours during which production, treatment,
25 storage, construction, disposal, or discharge occurs, or times when Ecology suspects a violation requiring
26 immediate inspection.
- 27 The term "**Release**" means any intentional or unintentional spilling, leaking, pouring, emitting, emptying,
28 discharging, injecting, pumping, escaping, leaching, dumping, or disposing of dangerous constituents into
29 the environment and includes the abandonment or discarding of barrels, containers, and other receptacles
30 containing dangerous waste or dangerous constituents, and includes any releases within the meaning of
31 release at [RCW 70.105D.020](#)(20).
- 32 The term "**Significant Discrepancy**" in regard to a manifest or shipping paper, means a discrepancy
33 between the quantity or type of dangerous waste designated on the manifest, or shipping paper, and the
34 quantity or type of dangerous waste a TSD unit actually receives. A significant discrepancy in quantity is
35 a variation greater than ten (10) percent in weight for bulk quantities (e.g., tanker trucks, railroad tank
36 cars, etc.), or any variation in piece count for nonbulk quantities (i.e., any missing container or package
37 would be a significant discrepancy). A significant discrepancy in type is an obvious physical or chemical
38 difference which can be discovered by inspection or waste analysis (e.g., waste solvent substituted for
39 waste acid).
- 40 The term "**Solid Waste Management Unit (SWMU)**" means any discernible location at the Facility
41 where solid wastes have been placed at any time, irrespective of whether the location was intended for the
42 management of solid or dangerous waste, and includes any area at the Facility at which solid wastes have
43 been routinely and systematically released (for example through spills), and includes dangerous waste
44 treatment, storage, and disposal units.

Part I Standard and Part II General Facility Conditions

- 1 The term "**Unit**" or "**TSD unit**", as used in Parts I through VI of this Permit, means the contiguous area of
- 2 land on or in which dangerous waste is placed, or the largest area in which there is a significant likelihood
- 3 of mixing dangerous waste constituents in the same area. A TSD unit, for purposes of this Permit, is a
- 4 subgroup of the Facility which has been identified in a Hanford Facility Dangerous Waste Part A Form.

1
2
3
4**ACRONYMS**

ALARA	As Low As Reasonably Achievable
AMSF	Alkali Metal Storage Facility
APDS	Ash Pit Demolition Site
APP	Used to Denote Appendix Page Numbers
APT	Area Process Trenches
ARAR	Applicable, Relevant, and Appropriate Requirements
BNI	Bechtel National, Inc.
BPDS	Borrow Pit Demolition Site
CD/RR	Chemical Disposal/Recycle Request
CERCLA	Comprehensive Environmental Response Compensation and Liability Act of 1980 (as Amended by the Superfund Reauthorization Act of 1986)
CFR	Code of Federal Regulations
CHPRC	CH2M HILL Plateau Remediation Company
CIP	Construction Inspection Plan
CLARC	Cleanup Levels and Risk Calculations
CLP	Contract Laboratory Program
COC	Chemical Contaminants of Concern
CPP	CERCLA Past Practice
USDOE-RL	U.S. Department of Energy, Richland Operations Office
USDOE-ORP	U.S. Department of Energy, Office of River Protection
DQO	Data Quality Objective
DSC	Differential Scanning Colorimetry
EC	Emergency Coordinator
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERA	Expedited Response Action
ETF	200 Area Effluent Treatment Facility
HFFACO	Hanford Federal Facility Agreement and Consent Order
GW	Ground Water
HPADS	Hanford Patrol Academy Demolition Site
HSWA	Hazardous and Solid Waste Amendments of 1984

Part I Standard and Part II General Facility Conditions

HWMA	Hazardous Waste Management Act
ID	Identification
IRM	Interim Remedial Measure
LDR	Land Disposal Restrictions
LERF	Liquid Effluent Retention Facility
LSFF	105-DR Large Sodium Fire Facility
MSA	Mission Support Alliance, LLC
MTCA	Model Toxics Control Act
OSWER	Office of Solid Waste and Emergency Response
PNNL	Pacific Northwest National Laboratory
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act of 1976
RCW	Revised Code of Washington
ROD	Record of Decision
RPD	Relative Percent Difference
RPP	RCRA Past Practice
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SCD	Security Control Devices
SHLWS	Simulated High Level Waste Slurry
SOP	Standard Operating Procedure
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TSD	Treatment, Storage, and/or Disposal
USDOE	United States Department of Energy
U.S.C.	United States Code
WAC	Washington Administrative Code
WAP	Waste Analysis Plan
WRPS	Washington River Protection Solutions, LLC
WTP	Waste Treatment and Immobilization Plant
183-H	183-H Solar Evaporation Basins

Part I Standard and Part II General Facility Conditions

242-A	242-A Evaporator
300 APT	300 Area Process Trenches
300 ASE	300 Area Solar Evaporator
303-K	303-K Storage Facility
305-B	305-B Storage Facility
325 HWTUs	325 Hazardous Waste Treatment Units
616-NRDWSF	616 Nonradioactive Dangerous Waste Storage Facility

1

1 **PART I STANDARD CONDITIONS**

2 **I.A Effect of Permit**

3 The Permittees are authorized to treat, store, and dispose of dangerous waste in
4 accordance with the Conditions of this Permit and in accordance with the applicable
5 provisions of [Chapter 173-303 WAC](#) (including provisions of the Chapter as they have
6 been applied in the HFFACO). Any treatment, storage, or disposal of dangerous waste by
7 the Permittees at the Facility that is not authorized by this Permit, or by [WAC 173-303-](#)
8 [400](#) (including provisions of this regulation as they have been applied in the HFFACO),
9 for those TSD units not subject to this Permit, and for which a Permit is required by
10 [Chapter 173-303 WAC](#), is prohibited.

11 TSD units operating or closing under interim status will maintain interim status until that
12 TSD unit is incorporated into Part III, V, and/or VI of this Permit, or until interim status is
13 terminated under [WAC 173-303-805\(8\)](#). Interim status units will be incorporated into
14 this Permit through the Permit modification process.

15 The Conditions of this Permit will be applied to the Facility as defined by the Permit
16 Applicability Matrix (Permit Attachment 9).

17 **I.A.1** USDOE is responsible for activities which include, but are not limited to, the overall
18 management and operation of the Facility.

19 BNI is identified as a Permittee for activities subject to the Conditions of this Permit
20 where its agents, employees, or subcontractors have operational and/or management
21 responsibilities and control.

22 CHPRC is identified as a Permittee for activities subject to the Conditions of this Permit
23 where its agents, employees, or subcontractors have operational and/or management
24 responsibilities and control.

25 MSA is identified as a Permittee for activities subject to the Conditions of this Permit
26 where its agents, employees, or subcontractors have operational and/or management
27 responsibilities and control.

28 PNNL is identified as a Permittee for activities subject to the Conditions of this Permit
29 where its agents, employees, or subcontractors have operational and/or management
30 responsibilities and control.

31 WRPS is identified as a Permittee for activities subject to the Conditions of this Permit
32 where its agents, employees, or subcontractors have operational and/or management
33 responsibilities and control.

34 **I.A.2** Coordination with the HFFACO

35 Each TSD unit will have an application for a final status Permit or closure/post-closure
36 plan submitted to Ecology in accordance with the schedules identified in the HFFACO
37 Milestone M-20-00 or in accordance with [WAC 173-303-830](#). After completion of the
38 Permit application or closure/post-closure plan review, a final Permit decision will be
39 made pursuant to [WAC 173-303-840](#). Specific Conditions for each TSD unit will be
40 incorporated into this Permit in accordance with the Class 3 Permit modification
41 procedure identified in Permit Condition [I.C.3](#).

1 **I.B Personal and Property Rights**

2 This Permit does not convey property rights of any sort, or any exclusive privilege; nor
3 does it authorize any injury to persons or property, or any invasion of other private rights,
4 or any violation of federal, state, or local laws or regulations.

5 **I.C Permit Actions**

6 **I.C.1 Modification, Revocation, Reissuance, or Termination**

7 This Permit may be modified, revoked and reissued, or terminated by Ecology for cause
8 per [WAC 173-303-810](#)(7) as specified in [WAC 173-303-830](#)(3), (4), and (5).

9 **I.C.2 Filing of a Request**

10 The filing of a request for a Permit modification, or revocation and reissuance, or
11 termination, or a notification of planned changes, or anticipated noncompliance on the
12 part of the Permittees, will not stay any Permit condition [[WAC 173-303-810](#)(7)] except
13 as provided in [WAC 173-303-810](#)(2) under an emergency permit.

14 **I.C.3 Modifications**

15 **I.C.3.a** Except as provided otherwise by specific language in this Permit, the Permit modification
16 procedures of [WAC 173-303-830](#)(2), (3), and (4) will apply to modifications or changes
17 in design or operation of the Facility, or any modification or change in dangerous waste
18 management practices covered by this Permit.

19 **I.C.3.b** As an exception, the Permittees will provide notifications to Ecology required by
20 [WAC 173-303-830](#)(4)(a)(i)(A) on a quarterly basis. Each quarterly notification will be
21 submitted within ten (10) days of the end of the quarter, and provide the required
22 information for all such modifications put into effect during that reporting period.

23 **I.C.3.c** Quarterly reporting periods will be based upon the state Fiscal Year. For notifications
24 required by the Permittees to persons on the facility mailing list described in
25 [WAC 173-303-830](#)(4)(a)(i)(B), [-830](#)(4)(b)(ii), [-830](#)(4)(c)(ii), and [-830](#)(4)(e)(ii)(C), use of
26 appropriate HFFACO Community Relations Plan publications and/or list servers for
27 public involvement satisfy the notification requirements.

28 **I.D Severability**

29 **I.D.1 Effect of Invalidation**

30 The provisions of this Permit are severable, and if any provision of this Permit, or the
31 application of any provision of this Permit to any circumstance is contested and/or held
32 invalid, the application of such provision to other circumstances and the remainder of this
33 Permit will not be affected thereby. Invalidation of any state statutory or regulatory
34 provision which forms the basis for any Condition of this Permit does not affect the
35 validity of any other state statutory or regulatory basis for said Condition.

36 **I.D.2 Final Resolution**

37 In the event that a Condition of this Permit is stayed for any reason, the Permittees will
38 continue to comply with the related applicable and relevant interim status standards in
39 [WAC 173-303-400](#) until final resolution of the stayed Condition, unless Ecology
40 determines compliance with the related applicable and relevant interim status standards
41 would be technologically incompatible with compliance with other Conditions of this
42 Permit, which have not been stayed, or unless the HFFACO authorizes an alternative
43 action, in which case the Permittees will comply with the HFFACO.

1 **I.E Duties and Requirements**

2 **I.E.1** Duty to Comply

3 The Permittees will comply with all Conditions of this Permit, except to the extent and
4 for the duration such noncompliance is authorized by an emergency Permit issued under
5 [WAC 173-303-804](#). Any Permit noncompliance other than noncompliance authorized by
6 an emergency Permit constitutes a violation of [Chapter 70.105 RCW](#), as amended, and is
7 grounds for enforcement action, Permit termination, modification or revocation and
8 reissuance of the Permit, and/or denial of a Permit renewal application.

9 **I.E.2** Compliance Not Constituting Defense

10 Compliance with the terms of this Permit does not constitute a defense to any order
11 issued or any action brought under Section 3007, 3008, 3013, or 7003 of RCRA
12 (42 U.S.C. Sections 6927, 6928, 6934, and 6973), Section 104, 106(a) or 107 of the
13 Comprehensive Environmental Response, Compensation, and Liability Act of 1980
14 (CERCLA) [42 U.S.C. Sections 9604, 9606(a), and 9607], as amended by the Superfund
15 Amendments and Reauthorization Act of 1986 (42 U.S.C. 9601 et seq.), or any other
16 federal, state, or local law governing protection of public health, or the environment;
17 provided, however, that compliance with this Permit during its term constitutes
18 compliance at those areas subject to this Permit for the purpose of enforcement with
19 [WAC 173-303-140](#), [WAC 173-303-180](#), [WAC 173-303-280](#) through [-395](#), [WAC 173-303-](#)
20 [600 through -680](#), [WAC 173-303-810](#), and [WAC 173-303-830](#), except for Permit
21 modifications and those requirements not included in the Permit that become effective by
22 statute, or that are promulgated under [40 CFR Part 268](#) restricting the placement of
23 dangerous waste in or on the land.

24 **I.E.3** Duty to Reapply

25 If the Permittees wish to continue an activity regulated by this Permit after the expiration
26 date of this Permit, the Permittees must apply for, and obtain a new Permit, in accordance
27 with [WAC 173-303-806](#)(6).

28 **I.E.4** Permit Expiration and Continuation

29 This Permit, and all Conditions herein, will remain in effect beyond the Permit's
30 expiration date until the effective date of the new Permit, if the Permittees have submitted
31 a timely, complete application for renewal per [WAC 173-303-806](#) and, through no fault of
32 the Permittees, Ecology has not made a final Permit determination as set forth in
33 [WAC 173-303-840](#).

34 **I.E.5** Need to Halt or Reduce Activity Not a Defense

35 It will not be a defense in the case of an enforcement action that it would have been
36 necessary to halt or reduce the permitted activity in order to maintain compliance with the
37 Conditions of this Permit.

38 **I.E.6** Duty to Mitigate

39 In the event of noncompliance with the Permit, the Permittees will take all reasonable
40 steps to minimize releases to the environment, and will carry out such measures as are
41 reasonable to minimize or correct adverse impacts on human health and the environment.

- 1 **I.E.7** Proper Operation and Maintenance
- 2 The Permittees will at all times properly operate and maintain all facilities and systems of
- 3 treatment and control, which are installed or used by the Permittees, to achieve
- 4 compliance with the Conditions of this Permit. Proper operation and maintenance
- 5 includes effective performance, adequate funding, adequate operator staffing and
- 6 training, and adequate laboratory and process controls, including appropriate quality
- 7 assurance/quality control procedures. This provision requires the operation of backup or
- 8 auxiliary facilities, or similar systems only when necessary to achieve compliance with
- 9 the Conditions of the Permit.
- 10 **I.E.8** Duty to Provide Information
- 11 The Permittees will furnish to Ecology, within a reasonable time, any relevant
- 12 information which Ecology may request to determine whether cause exists for modifying,
- 13 revoking and reissuing, or terminating this Permit, or to determine compliance with this
- 14 Permit. The Permittees will also furnish to Ecology, upon request, copies of records
- 15 required to be kept by this Permit.
- 16 **I.E.9** Inspection and Entry
- 17 The Permittees will allow Ecology, or authorized representatives, upon the presentation
- 18 of Ecology credentials, to:
- 19 **I.E.9.a** During operating hours, and at all other reasonable times, enter and inspect the Facility or
- 20 any unit or area within the Facility, where regulated activities are located or conducted, or
- 21 where records must be kept under the Conditions of this Permit;
- 22 **I.E.9.b** Have access to, and copy, at reasonable times, any records that must be kept under the
- 23 Conditions of this Permit;
- 24 **I.E.9.c** Inspect at reasonable times any portion of the Facility, equipment (including monitoring
- 25 and control equipment), practices, or operations regulated or required under this Permit;
- 26 and,
- 27 **I.E.9.d** Sample or monitor, at reasonable times, for the purposes of assuring Permit compliance,
- 28 or as otherwise authorized by state law, as amended, for substances or parameters at any
- 29 location.
- 30 **I.E.10** Monitoring and Records
- 31 **I.E.10.a** Samples and measurements taken by the Permittees for the purpose of monitoring
- 32 required by this Permit will be representative of the monitored activity. Sampling
- 33 methods will be in accordance with [WAC 173-303-110](#) or [40 CFR 261](#), unless otherwise
- 34 specified in this Permit, or agreed to in writing by Ecology. Analytical methods will be
- 35 as specified in the most recently published test procedure of the documents cited in
- 36 [WAC 173-303-110\(3\)\(a\)](#) through (h), unless otherwise specified in this Permit, or agreed
- 37 to in writing by Ecology.
- 38 **I.E.10.b** The Permittees will retain at the TSD unit(s), or other locations approved by Ecology, as
- 39 specified in Parts III, V, and/or VI of this Permit, records of monitoring information
- 40 required for compliance with this Permit, including calibration and maintenance records
- 41 and all original strip chart recordings for continuous monitoring instrumentation, copies
- 42 of reports and records required by this Permit, and records of data used to complete the
- 43 application for this Permit for a period of at least ten (10) years from the date of the
- 44 sample, measurement, report, or application, unless otherwise required for certain

- 1 information by other Conditions of this Permit. This information may be retained on
2 electronic media.
- 3 **I.E.10.c** The Permittees will retain at the Facility, or other approved location, records of all
4 monitoring and maintenance records, copies of all reports and records required by this
5 Permit, and records of all data used to complete the application for this Permit, which are
6 not associated with a particular TSD unit, for a period of at least ten (10) years from the
7 date of certification of completion of post-closure care, or corrective action for the
8 Facility, whichever is later. This information may be retained on electronic media.
- 9 **I.E.10.d** The record retention period may be extended by request of Ecology at any time by
10 notification, in writing, to the Permittees, and is automatically extended during the course
11 of any unresolved enforcement action regarding this Facility to ten (10) years beyond the
12 conclusion of the enforcement action.
- 13 **I.E.10.e** Records of monitoring information shall include:
- 14 **I.E.10.e.i** The date, exact place and time of sampling or measurements;
- 15 **I.E.10.e.ii** The individual who performed the sampling or measurements and their affiliation;
- 16 **I.E.10.e.iii** The dates the analyses were performed;
- 17 **I.E.10.e.iv** The individual(s) who performed the analyses and their affiliation;
- 18 **I.E.10.e.v** The analytical techniques or methods used; and,
- 19 **I.E.10.e.vi** The results of such analyses
- 20 **I.E.11** Reporting Planned Changes
- 21 The Permittees will give notice to Ecology, as soon as possible, of any planned physical
22 alterations, or additions to the Facility subject to this Permit. Such notice does not
23 authorize any noncompliance with, or modification of, this Permit.
- 24 **I.E.12** Certification of Construction or Modification
- 25 **I.E.12.a** The Permittees may not commence treatment, storage, or disposal of dangerous wastes in
26 a new or modified portion of TSD units subject to this Permit until:
- 27 **I.E.12.b** The Permittees have submitted to Ecology, by certified mail, overnight express mail, or
28 hand delivery, a letter signed by the Permittees, and a registered professional engineer,
29 stating that the TSD unit has been constructed or modified in compliance with the
30 Conditions of this Permit; and,
- 31 **I.E.12.c** Ecology has inspected the modified or newly constructed TSD unit, and finds that it is in
32 compliance with the Conditions of this Permit; or
- 33 **I.E.12.d** Within fifteen (15) days of the date of receipt of the Permittees' letter, the Permittees have
34 not received notice from Ecology of its intent to inspect, prior inspection is waived, and
35 the Permittees may commence treatment, storage, and disposal of dangerous waste.
- 36 **I.E.13** Anticipated Noncompliance
- 37 The Permittees will give at least thirty (30) days advance notice to Ecology of any
38 planned changes in the Facility subject to this Permit, or planned activity which might
39 result in noncompliance with Permit requirements.
- 40 If thirty (30) days advance notice is not possible, then the Permittees will give notice
41 immediately after the Permittees become aware of the anticipated noncompliance. Such
42 notice does not authorize any noncompliance with, or modification of, this Permit.

- 1 **I.E.14** Transfer of Permits
- 2 **I.E.14.a** This Permit may be transferred to a new owner/operator only if it is modified, or revoked
3 and reissued, pursuant to [WAC 173-303-830\(3\)\(b\)](#). Unit-specific portion may be
4 transferred to a new Co-operator as a Class ¹ modification with prior approval of the
5 Department's director.
- 6 **I.E.14.b** Before transferring ownership or operation of the Facility during its operating life, the
7 owner/operator will notify the new owner/operator in writing, of the requirements of
8 [WAC 173-303-290\(2\)](#), [-600](#) and [-806](#), and this Permit.
- 9 **I.E.15** Immediate Reporting
- 10 **I.E.15.a** The Permittees will verbally report to Ecology any release of dangerous waste or
11 hazardous substances, or any noncompliance with the Permit which may endanger human
12 health or the environment. Any such information will be reported immediately after the
13 Permittees become aware of the circumstances.
- 14 **I.E.15.b** The immediate verbal report will contain all the information needed to determine the
15 nature and extent of any threat to human health and the environment, including the
16 following:
- 17 **I.E.15.b.i** Name, address, and telephone number of the Permittee responsible for the release or
18 noncompliant activity;
- 19 **I.E.15.b.ii** Name, location, and telephone number of the unit at which the release occurred;
- 20 **I.E.15.b.iii** Date, time, and type of incident;
- 21 **I.E.15.b.iv** Name and quantity of material(s) involved;
- 22 **I.E.15.b.v** The extent of injuries, if any;
- 23 **I.E.15.b.vi** An assessment of actual or potential hazard to the environment and human health, where
24 this is applicable;
- 25 **I.E.15.b.vii** Estimated quantity of released material that resulted from the incident; and,
- 26 **I.E.15.b.viii** Actions which have been undertaken to mitigate the occurrence.
- 27 **I.E.15.c** The Permittees will report, in accordance with Permit Conditions I.E.15.a and I.E.15.b,
28 any information concerning the release, or unpermitted discharge, of any dangerous waste
29 or hazardous substances that may cause an endangerment to drinking water supplies, or
30 ground or surface waters, or of a release, or discharge of dangerous waste, or hazardous
31 substances, or of a fire or explosion at the Facility, which may threaten human health or
32 the environment. The description of the occurrence and its cause will include all
33 information necessary to fully evaluate the situation and to develop an appropriate course
34 of action.
- 35 **I.E.15.d** For any release or noncompliance not required to be reported to Ecology immediately, a
36 brief account must be entered within two (2) working days, into the TSD Operating
37 Record, for a TSD unit, or into the Facility Operating Record, inspection log, or separate
38 spill log, for non-TSD units. This account must include: the time and date of the release,
39 the location and cause of the release, the type and quantity of material released, and a
40 brief description of any response actions taken or planned.
- 41 **I.E.15.e** All releases, regardless of location of release, or quantity of release, will be controlled
42 and mitigated, if necessary, as required by [WAC 173-303-145\(3\)](#).

- 1 **I.E.16** Written Reporting
- 2 Within fifteen (15) days after the time the Permittees become aware of the circumstances
- 3 of any noncompliance with this Permit, which may endanger human health or the
- 4 environment, the Permittees will provide to Ecology a written report. The written report
- 5 will contain a description of the noncompliance and its cause (including the information
- 6 provided in the verbal notification); the period of noncompliance including exact dates
- 7 and times; the anticipated time noncompliance is expected to continue, if the
- 8 noncompliance has not been corrected; corrective measures being undertaken to mitigate
- 9 the situation, and steps taken or planned to reduce, eliminate, and prevent recurrence of
- 10 the noncompliance.
- 11 **I.E.17** Manifest Discrepancy Report
- 12 **I.E.17.a** For dangerous waste received from outside the Facility, whenever a significant
- 13 discrepancy in a manifest is discovered, the Permittees will attempt to reconcile the
- 14 discrepancy. If not reconciled within fifteen (15) days of discovery, the Permittees will
- 15 submit a letter report in accordance with [WAC 173-303-370\(4\)](#), including a copy of the
- 16 applicable manifest or shipping paper, to Ecology.
- 17 **I.E.17.b** For dangerous waste which is being transported within the Facility (i.e., shipment of
- 18 on-site generated dangerous waste), whenever a significant discrepancy in the shipping
- 19 papers (see Permit Condition [II.Q.1](#)) is discovered, the Permittees will attempt to
- 20 reconcile the discrepancy. If not reconciled within fifteen (15) days of discovery, the
- 21 Permittees will note the discrepancy in the receiving unit's Operating Record.
- 22 **I.E.18** Unmanifested Waste Report
- 23 The Permittees will follow the provisions of [WAC 173-303-370](#) for the receipt of any
- 24 dangerous waste shipment from off-site. The Permittees will also submit a report in
- 25 accordance with [WAC 173-303-390\(1\)](#) to Ecology within fifteen (15) days of receipt of
- 26 any unmanifested dangerous waste shipment received from off-site sources.
- 27 **I.E.19** Other Noncompliance
- 28 The Permittees will report to Ecology all instances of noncompliance, not otherwise
- 29 required to be reported elsewhere in this Permit, at the time the Annual Dangerous Waste
- 30 Report is submitted.
- 31 **I.E.20** Other Information
- 32 Whenever the Permittees become aware that they have failed to submit any relevant facts
- 33 in a Permit application, closure plan, or post-closure plan, or submitted incorrect
- 34 information in a Permit application, closure plan, or post-closure plan, or in any report to
- 35 Ecology, the Permittees will promptly submit such facts or corrected information.
- 36 **I.E.21** Reports, Notifications, and Submissions
- 37 All written reports, notifications or other submissions, which are required by this Permit
- 38 to be sent, or given to the Director or Ecology, should be sent certified mail, overnight
- 39 express mail, or hand delivered, to the current address and telephone number shown
- 40 below. This address and telephone number may be subject to change.
- 41 Washington State Department of Ecology
- 42 Nuclear Waste Program
- 43 3100 Port of Benton Blvd
- 44 Richland, Washington 99354
- 45 Telephone: (509) 372-7950

1 Telephonic and oral reports/notifications also need to be provided to Ecology's Richland
2 Office.

3 Ecology will give the Permittees written notice of a change in address or telephone
4 number. It is the responsibility of the Permittees to ensure any required reports,
5 notifications, or other submissions are transmitted to the addressee listed in this
6 Condition. However, the Permittees will not be responsible for ensuring verbal and
7 written correspondence reaches a new address or telephone number until after their
8 receipt of Ecology's written notification.

9 **I.E.22 Annual Report**

10 The Permittees will comply with the annual reporting requirements of
11 [WAC 173-303-390](#)(2)(a) through (e), and (g).

12 **I.F Signatory Requirement**

13 All applications, reports, or information submitted to Ecology, which require
14 certification, will be signed and certified in accordance with [WAC 173-303-810](#)(12) and
15 (13). All other reports required by this Permit and other information requested by
16 Ecology will be signed in accordance with [WAC 173-303-810](#)(12).

17 **I.G Confidential Information**

18 The Permittees may declare as confidential any information required to be submitted by
19 this Permit, at the time of submission, in accordance with [WAC 173-303-810](#)(15).

20 **I.H Documents to be Maintained at Facility Site**

21 The Permittees will maintain at the Facility, or some other location approved by Ecology,
22 the following documents and amendments, revisions, and modifications to these
23 documents: (1) This Permit and all Attachments; and (2) The Hanford Facility Operating
24 Record.

25 All dangerous waste Part B permit applications, post closure permit applications, and
26 closure plan applications are maintained in the Administrative Record located at
27 2440 Stevens, Room 1101, Richland, Washington.

28 Other approved locations: (1) 700 Area, (2) Locations within the City of Richland under
29 control of one or more of the Permittees, (3) Administrative Record locations within the
30 Stevens Center complex, (4) Consolidated Information Center at Washington State
31 University, Tri-Cities. (5) Archived records at the National Archives and Records
32 Administration (NARA), Pacific Alaska Region, 6125 Sand Point Way NE, Seattle,
33 Washington, 98115-7999.

34 These documents will be maintained for ten (10) years after post-closure care or
35 corrective action for the Facility, whichever is later, has been completed and certified as
36 complete.

1 **PART II GENERAL FACILITY CONDITIONS**

2 **II.A Facility Contingency Plan**

3 **II.A.1** The Permittees will immediately carry out applicable provisions of the *Hanford*
4 *Emergency Management Plan* as provided in Permit Attachment 4, pursuant to
5 [WAC 173-303-360](#)(2), whenever there is an incident meeting the criteria of Permit
6 Attachment 4, Section 4.2. Enforceable portions of Permit Attachment 4, *Hanford*
7 *Emergency Management Plan* (DOE/RL-94-02) are identified in Permit Attachment 4,
8 Appendix A.

9 **II.A.2** The Permittees will comply with the requirements of [WAC 173-303-350](#)(4), as
10 provided in the *Hanford Emergency Management Plan* (Permit Attachment 4). The
11 *Hanford Emergency Management Plan* provides reference to the need for unit-specific
12 contingency documentation. Unit-specific contingency documentation for Part III,
13 TSD units is included in Part III of this Permit. Unit-specific contingency documentation
14 for Part V and VI TSD units required by this Permit condition is maintained in the
15 Hanford Facility Operating Record, Unit-Specific files.

16 **II.A.3** The Permittees will review and amend, if necessary, the applicable portions of the
17 *Hanford Emergency Management Plan*, as provided in Permit Attachment 4, pursuant to
18 [WAC 173-303-350](#)(5), and in accordance with the provisions of [WAC 173-303-830](#)(4).
19 The Permittees will be able to demonstrate how Amendments to the applicable portions
20 are controlled. The plan will be amended within a period of time agreed upon by
21 Ecology.

22 **II.A.4** The Permittees will comply with the requirements of [WAC 173-303-350](#)(3) and [-360](#)(1)
23 concerning the emergency coordinator, except the names and home telephone numbers
24 will be on file with the single point-of-contact, phone number (509) 373-3800 or
25 375-2400 (for PNNL units) as described in the *Hanford Emergency Management Plan*.

26 **II.A.5** The Permittees will comply with contingency planning requirements using a “One Plan”
27 contingency plan in accordance with [WAC 173-303-350](#)(2) and [WAC 173-303-](#)
28 [201](#)(9)(a).

29 **II.B Preparedness and Prevention**

30 **II.B.1** The Permittees will equip the Facility with the equipment specified in
31 [WAC 173-303-340](#)(1) as specified in the *Hanford Emergency Management Plan* (Permit
32 Attachment 4). Unit-specific preparedness and prevention provisions are included in
33 Parts III, V, and/or VI of this Permit.

34 **II.B.2** The Permittees will test and maintain the equipment specified in Permit Condition II.B.1
35 as necessary to assure proper operation in the event of emergency.

36 **II.B.3** The Permittees will maintain access to communications or alarms pursuant to
37 [WAC 173-303-340](#)(2), as provided in the *Hanford Emergency Management Plan* (Permit
38 Attachment 4) and unit-specific contingency plans.

39 **II.B.4** The Permittees will comply with [WAC 173-303-340](#)(4) and [WAC 173-303-355](#)(1)
40 pertaining to arrangements with local authorities.

41 **II.B.5** Based on the arrangements with local authorities required by [WAC 173-303-340](#)(4)
42 documented in Permit Attachment 4, Table 3-1, the Permittees will maintain the
43 Memorandums of Understanding to comply with [WAC 173-303-350](#)(4)(b). The Hanford
44 Facility Memorandums of Understanding with local authorities provides emergency

1 planning and coordination equivalent to submittal of the contingency plan to local
2 authorities

3 **II.C Personnel Training**

4 **II.C.1** The Permittees will conduct personnel training as required by [WAC 173-303-330](#). The
5 Permittees will maintain documents in accordance with [WAC 173-303-330](#)(2) and (3).
6 Training records may be maintained in the Hanford Facility Operating Record, or on
7 electronic data storage.

8 **II.C.2** All Hanford Facility personnel will receive general Facility training within six (6) months
9 of hire. This training will provide personnel with orientation of dangerous waste
10 management activities being conducted at the Hanford Facility. This training will
11 include:

12 **II.C.2.a** Description of emergency signals and appropriate personnel response;

13 **II.C.2.b** Identification of contacts for information regarding dangerous waste management
14 activities;

15 **II.C.2.c** Introduction to waste minimization concepts;

16 **II.C.2.d** Identification of contact(s) for emergencies involving dangerous waste; and

17 **II.C.2.e** Familiarization with the applicable portions of the *Hanford Emergency Management*
18 *Plan*.

19 **II.C.3** Description of training plans for personnel assigned to TSD units subject to this Permit
20 are delineated in the unit-specific Chapters in Parts III, V, and/or VI of this Permit.

21 **II.C.4** The Permittees will provide the necessary training to non-Facility personnel (i.e., visitors,
22 sub-contractors), as appropriate, for the locations of such personnel, and the activities that
23 will be undertaken. At a minimum, this training will describe dangerous waste
24 management hazards at the Facility.

25 **II.D Waste Analysis**

26 **II.D.1** All waste analyses required by this Permit will be conducted in accordance with a written
27 Waste Analysis Plan (WAP), or sampling and analysis plan (SAP). Operating TSD units
28 will have a WAP, which will be approved through incorporation of the TSD unit into
29 Part III of this Permit. Closing TSD units, and units in post-closure, should have a SAP
30 and, if necessary, a WAP, which will be approved through incorporation of the TSD unit
31 into Part V and/or VI of this Permit.

32 **II.D.2** Until a WAP is implemented in accordance with Permit Condition II.D.1., any unit(s)
33 identified in Parts III, V, and/or VI of this Permit, without a unit-specific WAP approved
34 by Ecology, will not treat, store, or dispose of dangerous waste, unless specified
35 otherwise by Ecology in writing.

36 **II.D.3** Each TSD unit WAP will include:

37 **II.D.3.a** The parameters for which each dangerous waste will be analyzed, and the rationale for
38 selecting these parameters; (i.e., how analysis for these parameters will provide sufficient
39 information on the waste properties to comply with [WAC 173-303-300](#)(1), (2), (3),
40 and (4);

41 **II.D.3.b** The methods of obtaining or testing for these parameters;

42 **II.D.3.c** The methods for obtaining representative samples of wastes for analysis (representative
43 sampling methods are discussed in [WAC 173-303-110](#)(2);

- 1 **II.D.3.d** The frequency with which analysis of a waste will be reviewed, or repeated, to ensure
2 that the analysis is accurate and current;
- 3 **II.D.3.e** The waste analyses which generators have agreed to supply;
- 4 **II.D.3.f** Where applicable, the methods for meeting the additional waste analysis requirements for
5 specific waste management methods, as specified in [WAC 173-303-140\(4\)\(b\)](#),
6 [WAC 173-303-395\(1\)](#), [WAC 173-303-630](#) through [173-303-670](#), and [40 CFR 264.1034](#),
7 [264.1063](#), [284\(a\)](#), and [268.7](#), for final status facilities;
- 8 **II.D.3.f.i** For off-site facilities, the procedures for confirming that each dangerous waste received
9 matches the identity of the waste specified on the accompanying manifest, or shipping
10 paper. This includes at least:
- 11 **II.D.3.f.i.a** The procedure for identifying each waste movement at the Facility; and,
- 12 **II.D.3.f.i.b** The method for obtaining a representative sample of the waste to be identified, if the
13 identification method includes sampling.
- 14 **II.D.3.f.ii** For surface impoundments exempted from Land Disposal Restrictions (LDR) under
15 [40 CFR 268.4\(a\)](#), incorporated by reference in [WAC 173-303-140\(2\)](#), the procedures and
16 schedules for:
- 17 **II.D.3.f.iii** The sampling of impoundment contents;
- 18 **II.D.3.f.iv** The analysis of test data; and
- 19 **II.D.3.f.v** The annual removal of residues that are not delisted under [40 CFR 260.22](#), or which
20 exhibit a characteristic of hazardous waste and either;
- 21 **II.D.3.f.v.a** Do not meet applicable treatment standards of [40 CFR Part 268](#), Subpart D; or
- 22 **II.D.3.f.v.b** Where no treatment standards have been established:
- 23 **II.D.3.f.v.b.1** Such residues are prohibited from land disposal under [40 CFR 268.32](#), or RCRA
24 Section 3004(d); or
- 25 **II.D.3.f.v.b.2** Such residues are prohibited from land disposal under [40 CFR 268.33\(f\)](#); and
- 26 **II.D.4** Should waste analysis be required by this Permit at a location on the Facility, other than
27 at a TSD unit, a SAP will be maintained by the Permittees, and made available upon
28 request from Ecology. Any SAP required by this Permit, not associated with a particular
29 TSD unit, will include the elements of Permit Conditions [II.D.3.a](#).
- 30 **II.E** **Quality Assurance/Quality Control**
- 31 **II.E.1** All WAPs and SAPs required by this Permit will include a quality assurance/quality
32 control (QA/QC) plan, or equivalent, to document all monitoring procedures to ensure
33 that all information, data, and resulting decisions are technically sound, statistically valid,
34 and properly documented in accordance with HFFACO Action Plan §6.5, Quality
35 Assurance, and reported/made available in accordance with HFFACO Action Plan §9.6,
36 Data Access and Delivery Requirements.
- 37 **II.E.2** The level of QA/QC for the collection, preservation, transportation, and analysis of each
38 sample required for implementation of this Permit may be based upon an Ecology-
39 approved Data Quality Objective (DQO) for the sample. These DQOs will be approved
40 by Ecology in writing or through incorporation of unit plans and Permits into Parts III, V,
41 and/or VI of this Permit.

II.F Ground Water and Vadose Zone Monitoring

The Permittees will comply with the ground water monitoring requirements of [WAC 173-303-645](#). This Condition will apply only to those wells the Permittees use for the ground water monitoring programs applicable to the TSD units incorporated into Parts III, V, and/or VI of this Permit. Where releases from TSD units subject to this Permit have been documented or confirmed by investigation, or where vadose zone monitoring is proposed for integration with ground water monitoring, the Permittees will evaluate the applicability of vadose zone monitoring. The Permittees will consult with Ecology regarding the implementation of these requirements. If agreed to by Ecology, integration of ground water and vadose zone monitoring, for reasons other than this Permit, may be accommodated by this Permit. Results from other investigation activities will be used whenever possible to supplement and/or replace sampling required by this Permit.

II.F.1 Purgewater Management

Purgewater will be handled in accordance with the requirements set forth in permit Attachment 10, *Purgewater Management Plan*.

II.F.2 Well Inspection and Maintenance**II.F.2.a** The Permittees will inspect the integrity of active resource protection wells as defined by [WAC 173-160-410](#)(13), subject to this Permit, at least once every five (5) years as specified in the *Hanford Well Maintenance and Inspection Plan* (Permit Attachment 8). These inspections will be recorded in the Operating Record.**II.F.2.b** The Permittees will evaluate resource protection wells subject to this Permit according to the *Hanford Well Maintenance and Inspection Plan* (Permit Attachment 8) and the *Policy on Remediation of Existing Wells and Acceptance Criteria for RCRA and CERCLA*, June 1990 (Permit Attachment 7). The Permittees will submit a permit modification request to Ecology to decommission or maintain wells as necessary to ensure compliance with [WAC 173-303-645](#)(8)(c). This permit modification request will include a schedule of compliance, which may incorporate by reference applicable schedule(s) in HFFACO Milestone M-24. For Wells to be decommissioned, this permit modification must also include a request for installation of replacement wells, if necessary, to ensure compliance with [WAC 173-303-645](#) requirements.**II.F.2.c** Ecology will receive a notice of intent (NOI) in writing at least seventy-two (72) hours before the Permittees decommission (excluding maintenance activities) any well subject to this Permit.**II.F.2.d** For wells subject to this Permit, the Permittees will achieve full compliance with [Chapter 173-160 WAC](#) and [Chapter 18.104 RCW](#) by replacing non-compliant wells subject to the permit with new wells under the schedule in HFFACO Milestone M-24, as amended, incorporated by reference into this Permit.**II.F.3 Well Construction**

All wells constructed pursuant to this Permit will be constructed in compliance with [Chapter 173-160 WAC](#).

II.G Siting Criteria

The Permittees will comply with the applicable notice of intent and siting criteria of [WAC 173-303-281](#) and [WAC 173-303-282](#), respectively.

- 1 **II.H Recordkeeping and Reporting**
- 2 The provisions of [WAC 173-303-620](#) are not applicable to the Hanford Facility because
- 3 the USDOE is both owner and operator of the Hanford Facility.
- 4 [WAC 173-303-620](#)(1)(c).
- 5 **II.I Facility Operating Record**
- 6 **II.I.1** The Permittees will maintain a written Facility Operating Record until ten (10) years after
- 7 post-closure, or corrective action is complete and certified for the Facility, whichever is
- 8 later. Except as specifically provided otherwise in this Permit, the Permittees will also
- 9 record all information referenced in this Permit in the Facility Operating Record within
- 10 seven (7) working days after the information becomes available. A TSD unit-specific
- 11 Operating Record will be maintained for each TSD unit at a location identified in
- 12 Parts III, V, and VI of this Permit. This information may be maintained on electronic
- 13 media. Each TSD unit-specific Operating Record will be included by reference in the
- 14 Facility Operating Record. Information required in each TSD unit-specific Operating
- 15 Record is identified on a unit-by-unit basis in Part III, V, or VI of this Permit. The
- 16 Facility Operating Record will include, but not be limited to, the following information.
- 17 **II.I.1.a** A description of the system(s) currently utilized to identify and map solid waste
- 18 management units and their locations. The description of the system(s) is required to
- 19 include an identification of on-site access to the system's data, and an on-site contact
- 20 name and telephone number. In addition to, or as part of, this system(s), the Permittees
- 21 will also maintain a list identifying active ninety (90)-day waste storage areas, and
- 22 dangerous waste satellite accumulation areas and their locations. The list will identify the
- 23 location, the predominant waste types managed at the area, and a date identifying when
- 24 the list was compiled. Maps will be provided by the Permittees upon request by Ecology;
- 25 **II.I.1.b** Records and results of waste analyses required by [WAC 173-303-300](#);
- 26 **II.I.1.c** An identification of the system(s) currently utilized to generate Occurrence Reports. The
- 27 identification of the system(s) is required to include a description, an identification of an
- 28 on-site location of hard-copy Occurrence Reports, an identification of on-site access to
- 29 the system's data, and an on-site contact name and telephone number;
- 30 **II.I.1.d** Copies of all unmanifested waste reports;
- 31 **II.I.1.e** The *Hanford Emergency Management Plan*, as well as summary reports, and details of all
- 32 incidents that require implementing the contingency plan, as specified in
- 33 [WAC 173-303-360](#)(2)(k);
- 34 **II.I.1.f** An identification of the system(s) currently utilized and being developed to record
- 35 personnel training records and to develop training plans. The identification of the
- 36 system(s) is required to include a description, an identification of on-site access to the
- 37 system's data, and an on-site contact name and telephone number;
- 38 **II.I.1.g** Preparedness and prevention arrangements made pursuant to [WAC 173-303-340](#)(4) and
- 39 documentation of refusal by state or local authorities that have declined to enter into
- 40 agreements in accordance with [WAC 173-303-340](#)(5);
- 41 **II.I.1.h** Reserved Condition;
- 42 **II.I.1.i** Reserved Condition;
- 43 **II.I.1.j** Documentation (e.g., waste profile sheets) of all dangerous waste transported to or from
- 44 any TSD unit subject to this Permit. This documentation will be maintained in the
- 45 receiving unit's Operating Record from the time the waste is received;

- 1 **II.I.1.k** An identification of the system(s) currently utilized to cross-reference waste locations to
 2 specific manifest document numbers. The identification of the system(s) is required to
 3 include a thorough description, an identification of an on-site location of a hard-copy data
 4 report, an identification of on-site access to the system's data, and an on-site contact
 5 name and telephone number;
- 6 **II.I.1.l** Reserved Condition;
- 7 **II.I.1.m** Annual Reports required by this Permit;
- 8 **II.I.1.n** An identification of all systems currently utilized to record monitoring information,
 9 including all calibration and maintenance records, and all original strip chart recordings
 10 for continuous monitoring instrumentation. The identification of systems will include a
 11 description of the systems. The descriptions will include a confirmation that the criteria
 12 of Permit Condition [I.E.10](#) is provided by the utilization of the system. The identification
 13 of the systems will also include an identification of on-site access to the system's data, an
 14 on-site contact name and telephone number;
- 15 **II.I.1.o** Reserved Condition;
- 16 **II.I.1.p** Summaries of all records of ground water corrective action required by
 17 [WAC 173-303-645](#);
- 18 **II.I.1.q** An identification of the system(s) currently being utilized and being developed to
 19 evaluate compliance with the Conditions of this Permit and with [Chapter 173-303 WAC](#).
 20 The identification of the system(s) will include a description of the system(s), an
 21 identification of on-site access to the system's data, and an on-site contact name and
 22 telephone number. The description of the system(s) will also include a definition of
 23 which portion(s) of the system(s) is accessible to Ecology;
- 24 **II.I.1.r** All deed notifications required by this Permit (to be included by reference);
- 25 **II.I.1.s** All inspection reports required by this Permit; and
- 26 **II.I.1.t** All other reports as required by this Permit, including design change documentation and
 27 nonconformance documentation.
- 28 **II.J** **Facility Closure**
- 29 **II.J.1** Final closure of the Hanford Facility will be achieved when closure activities for all TSD
 30 units have been completed, as specified in Parts III, IV, V, or VI of this Permit.
 31 Completion of these activities will be documented using either certifications of closure,
 32 in accordance with [WAC 173-303-610\(6\)](#), or certifications of completion of post-closure
 33 care, in accordance with [WAC 173-303-610\(11\)](#).
- 34 **II.J.2** The Permittees will close all TSD units as specified in Parts III, V, and/or VI of this
 35 Permit.
- 36 **II.J.3** The Permittees will submit a written notification of, or request for, a Permit modification
 37 in accordance with the provisions of [WAC 173-303-610\(3\)\(b\)](#), whenever there is a
 38 change in operating plans, facility design, or the approved closure plan. The written
 39 notification or request must include a copy of the amended closure plan for review, or
 40 approval, by Ecology.
- 41 **II.J.4** The Permittees will close the Facility in a manner that:
- 42 **II.J.4.a** Minimizes the need for further maintenance;

- 1 **II.J.4.b** Controls, minimizes or eliminates, to the extent necessary to protect human health and
 2 the environment, post-closure escape of dangerous waste, dangerous constituents,
 3 leachate, contaminated run-off, or dangerous waste decomposition products, to the
 4 ground, surface water, ground water, or the atmosphere; and
- 5 **II.J.4.c** Returns the land to the appearance and use of surrounding land areas to the degree
 6 possible, given the nature of the previous dangerous waste activity.
- 7 **II.J.4.d** Meets the requirements of [WAC 173-303-610\(2\)\(b\)](#).
- 8 **II.K** **Soil/Ground Water Closure Performance Standards**
- 9 **II.K.1** For purposes of Permit Condition II.K, the term "clean closure" shall mean the status of a
 10 TSD unit at the Facility which has been closed to the cleanup levels prescribed by
 11 [WAC 173-303-610\(2\)\(b\)](#), provided certification of such closure has been accepted by
 12 Ecology.
- 13 **II.K.2** The Permittees may close a TSD unit to background levels as defined in Ecology
 14 approved Hanford Site Background Documents, if background concentrations exceed the
 15 levels prescribed by Permit Condition II.K.1. Closure to these levels, provided the
 16 Permittees comply with all other closure requirements for a TSD unit as identified in
 17 Parts III, V, and/or VI of this Permit, shall be deemed as "clean closure".
- 18 **II.K.3** Except for those TSD units identified in Permit Conditions II.K.1, II.K.2, or [II.K.4](#), the
 19 Permittees may close a TSD unit to a cleanup level specified under Method C of
 20 [Chapter 173-340 WAC](#). Closure of a TSD unit to these levels, provided the Permittees
 21 comply with all other closure requirements for the TSD unit as specified in Parts III, V,
 22 and/or VI of the Permit, and provided the Permittees comply with Permit
 23 Conditions II.K.3.a through [II.K.3.c](#), shall be deemed as a "modified closure".
- 24 **II.K.3.a** For "modified closures", the Permittees shall provide institutional controls in accordance
 25 with [WAC 173-340-440](#) which restricts access to the TSD unit for a minimum of
 26 five (5) years following completion of closure. The specific details and duration of
 27 institutional controls shall be specified in Parts III, V, and/or VI of this Permit for a
 28 particular TSD unit.
- 29 **II.K.3.b** For "modified closures", the Permittees shall provide periodic assessments of the
 30 TSD unit to determine the effectiveness of the closure. The specific details of the
 31 periodic assessments shall be specified in Parts III, V, and/or VI of this Permit. The
 32 periodic assessments shall include, as a minimum, a compliance monitoring plan in
 33 accordance with [WAC 173-340-410](#) that will address the assessment requirements on a
 34 unit-by-unit basis. At least one (1) assessment activity shall take place after a period of
 35 five (5) years from the completion of closure, which will demonstrate whether the soils
 36 and ground water have been maintained at or below the allowed concentrations as
 37 specified in Parts III, V, or VI of this Permit. Should the required assessment activities
 38 identify contamination above the allowable limits as specified in Parts III, V, and/or VI,
 39 the TSD unit must be further remediated, or the requirements of [II.K.4](#) must be followed.
 40 Should the required assessment activities demonstrate that contamination has diminished,
 41 or remained the same, the Permittees may request that Ecology reduce, or eliminate the
 42 assessment activities and/or institutional controls.
- 43 **II.K.3.c** For "modified closures", the Permittees shall specify the particular activities required by
 44 this Condition in a Post-Closure Permit application.
- 45 **II.K.4** Any TSD unit for which Permit Conditions [II.K.1](#), [II.K.2](#), or [II.K.3](#), are not chosen as the
 46 closure option, closing the TSD unit as a landfill may be selected. Closure and

1 post-closure of the TSD unit as a landfill, must follow the procedures and requirements
2 specified in [WAC 173-303-610](#).

3 **II.K.5** The cleanup option selected shall be specified in Parts III, V, and/or VI of this Permit, and
4 shall be chosen with consideration of the potential future site use for that TSD unit/area.
5 Definitions contained within [Chapter 173-340 WAC](#) shall apply to Permit Condition [II.K](#).
6 Where definitions are not otherwise provided by this Permit, the HFFACO, or
7 [Chapter 173-303 WAC](#).

8 **II.K.6** Deviations from a TSD unit closure plan required by unforeseen circumstances
9 encountered during closure activities, which do not impact the overall closure strategy,
10 but provide equivalent results, shall be documented in the TSD unit-specific Operating
11 Record and made available to Ecology upon request, or during the course of an
12 inspection.

13 **II.K.7** Where agreed to by Ecology, integration of other statutorily or regulatory mandated
14 cleanups may be accommodated by this Permit. Results from other cleanup investigation
15 activities shall be used whenever possible to supplement and/or replace TSD unit closure
16 investigation activities. All, or appropriate parts of, multipurpose cleanup and closure
17 documents can be incorporated into this Permit through the Permit modification process.
18 Cleanup and closures conducted under any statutory authority, with oversight by either
19 Ecology or the EPA, which meet the equivalent of the technical requirements of Permit
20 Conditions [II.K.1](#) through [II.K.4](#), may be considered as satisfying the requirements of this
21 Permit.

22 **II.L Design and Operation of the Facility**

23 **II.L.1** Proper Design and Construction

24 The Permittees will design, construct, maintain, and operate the Facility to minimize the
25 possibility of a fire, explosion, or any unplanned sudden or non-sudden release of
26 hazardous substances to air, soil, ground water, or surface water, which could threaten
27 human health, or the environment.

28 **II.L.2** Design Changes, Nonconformance, and As-Built Drawings

29 **II.L.2.a** After completing the Permit modification process in Permit Condition [I.C.3](#), the
30 Permittees will conduct all construction subject to this Permit in accordance with the
31 approved designs, plans and specifications that are required by this Permit, unless
32 authorized otherwise in Permit Conditions II.L.2.b or [II.L.2.c](#). For purposes of Permit
33 Conditions II.L.2.b and [II.L.2.c](#), an Ecology construction inspector, or TSD unit manager,
34 are designated representatives of Ecology.

35 **II.L.2.b** During construction of a project subject to this Permit, changes to the approved designs,
36 plans and specifications will be formally documented. All design change documentation
37 will be maintained in the TSD unit-specific Operating Record and will be made available
38 to Ecology upon request or during the course of an inspection. The Permittees will
39 provide copies of design change documentation affecting any critical system to Ecology
40 within five (5) working days of initiating the design change documentation.
41 Identification of critical systems will be included by the Permittees in each TSD
42 unit-specific dangerous waste Permit application, closure plan or Permit modification, as
43 appropriate. Ecology will review a design change documentation modifying a critical
44 system, and inform the Permittees in writing within two (2) working days, whether the
45 proposed design change documentation, when issued, will require a Class 1, 2, or 3

1 Permit modification. If after two (2) working days Ecology has not responded, it will be
2 deemed as acceptance of the design change documentation by Ecology.

3 **II.L.2.c** During construction of a project subject to this Permit, any work completed which does
4 not meet or exceed the standards of the approved design, plans and specifications will be
5 formally documented with nonconformance documentation. All nonconformance
6 documentation will be maintained in the TSD unit-specific Operating Record and will be
7 made available to Ecology upon request, or during the course of an inspection. The
8 Permittees will provide copies of nonconformance documentation affecting any critical
9 system to Ecology within five (5) working days after identification of the
10 nonconformance. Ecology will review nonconformance documentation affecting a
11 critical system and inform the Permittees in writing, within two (2) working days,
12 whether a Permit modification is required for any nonconformance, and whether prior
13 approval is required from Ecology before work proceeds, which affects the
14 nonconforming item. If Ecology does not respond within two (2) working days, it will be
15 deemed as acceptance and no Permit modification will be required.

16 **II.L.2.d** Upon completion of a construction project subject to this Permit, the Permittees will
17 produce as-built drawings of the project which incorporate the design and construction
18 modifications resulting from all project design change documentation and
19 nonconformance documentation, as well as modifications made pursuant to
20 [WAC 173-303-830](#). The Permittees will place the drawings into the Operating Record
21 within twelve (12) months of completing construction, or within an alternate period of
22 time specified in a unit-specific Permit Condition in Part III or V of this Permit.

23 **II.L.2.e** Facility Compliance

24 The Permittees in receiving, storing, transferring, handling, treating, processing, and
25 disposing of dangerous waste, will design, operate, and/or maintain the Facility in
26 compliance with all applicable federal, state, and local laws and regulations.

27 **II.M Security**

28 The Permittees will comply with the security provisions of [WAC 173-303-310](#). The
29 Permittees may comply with the requirements of [WAC 173-303-310](#)(2) on a unit-by-unit
30 basis.

31 **II.N Receipt of Dangerous Wastes Generated Off-Site**

32 **II.N.1** Receipt of Off-Site Waste

33 The Permittees will comply with Permit Conditions II.N.2 and II.N.3 for any dangerous
34 wastes which are received from sources outside the United States, or from off-site
35 generators.

36 **II.N.2** Waste from Sources Outside the United States

37 The Permittees will meet the requirements of [WAC 173-303-290](#)(1) for waste received
38 from outside the United States.

39 **II.N.3** Notice to Generator

40 For waste received from off-site sources (except where the owner/operator is also the
41 generator), the Permittees will inform the generator in writing that they have the
42 appropriate Permits for, and will accept, the waste the generator is shipping, as required
43 by [WAC 173-303-290](#)(3). The Permittees will keep a copy of this written notice as part
44 of the TSD unit-specific Operating Record.

- 1 **II.O General Inspection Requirements**
- 2 **II.O.1** The Permittees will inspect the Facility to prevent malfunctions and deterioration,
3 operator errors, and discharges, which may cause or lead to the release of dangerous
4 waste constituents to the environment, or threaten human health. Inspections must be
5 conducted in accordance with the provisions of [WAC 173-303-320](#)(2). In addition to the
6 TSD unit inspections specified in Parts III, V, and/or VI, the following inspections will
7 also be conducted:
- 8 **II.O.1.a** The 100, 200 East, 200 West, 300, and 400 areas will be inspected annually.
- 9 **II.O.1.b** The Permittees will inspect the banks of the Columbia River, contained within the
10 Facility boundary, once a year. The inspection will be performed from the river, by boat,
11 and the inspectors will follow the criteria in Permit Condition II.O.1.c.
- 12 **II.O.1.c** The Permittees will visually inspect the areas identified in Permit Conditions II.O.1.a and
13 II.O.1.b for malfunctions, deterioration, operator errors, and discharges which may cause
14 or lead to the release of dangerous waste constituents to the environment, or that threaten
15 human health. Specific items to be noted are as follows:
- 16 **II.O.1.c.i** Remains of waste containers, labels, or other waste management equipment;
- 17 **II.O.1.c.ii** Solid waste disposal sites not previously identified for remedial action;
- 18 **II.O.1.c.iii** Uncontrolled waste containers (e.g., orphan drums);
- 19 **II.O.1.c.iv** Temporary or permanent activities that could generate an uncontrolled waste form; and
- 20 **II.O.1.c.v** Unpermitted waste discharges.
- 21 **II.O.1.d** The Permittees will notify Ecology at least seven (7) days prior to conducting these
22 inspections in order to allow representatives of Ecology to be present during the
23 inspections.
- 24 **II.O.2** If the inspection by the Permittees, conducted pursuant to Permit Condition II.O.1,
25 reveals any problems, the Permittees will take remedial action on a schedule agreed to by
26 Ecology.
- 27 **II.O.3** The inspection of high radiation areas will be addressed on a case-by-case basis in either
28 Part III of this Permit, or prior to the inspections required in Permit Condition II.O.1.
- 29 **II.P Manifest System**
- 30 **II.P.1** The Permittees will comply with the manifest requirements of [WAC 173-303-370](#) for
31 waste received from off-site and [WAC 173-303-180](#) for waste shipped off-site.
- 32 **II.P.2** Transportation of dangerous wastes along roadways, if such routes are not closed to
33 general public access at the time of transport, can be manifested pursuant to an alternate
34 tracking system as allowed by [WAC 173-303-180](#)(5). The alternate tracking system can
35 be a paper system or an electronic system. The roadways addressed by this condition are
36 a public or private right-of-way within or along the border of contiguous property where
37 the movement is under control of the USDOE. The alternate tracking system will consist
38 of documentation between the offering Hanford Facility location and the receiving
39 Hanford Facility location containing the following information:
- 40 **II.P.2.a** Hanford Facility offeror name, location, and telephone number;
- 41 **II.P.2.b** Hanford Facility receiver name, location, and telephone number;
- 42 **II.P.2.c** Description of waste;

- 1 **II.P.2.d** Number and type of containers;
- 2 **II.P.2.e** Total quantity of waste;
- 3 **II.P.2.f** Unit volume/weight;
- 4 **II.P.2.g** Dangerous waste number(s) or U.S. Department of Transportation hazard class; and
- 5 **II.P.2.h** Special handling instructions including emergency contacts.
- 6 **II.P.3** The Hanford Facility offeror and receiver will resolve any discrepancies of information
7 found related to Permit Conditions [II.P.2.a](#) through II.P.2.h.
- 8 **II.P.4** If the discrepancies cannot be resolved at the Hanford Facility receiving location, a new
9 Hanford Facility receiver location will be agreed upon, or the dangerous waste will be
10 returned to the offeror location. The documentation accompanying the movement of
11 dangerous waste will be updated to reflect the new receiving location.
- 12 **II.Q** **On-Site Transportation**
- 13 **II.Q.1** Documentation must accompany any on-site dangerous waste which is transported to or
14 from any TSD unit subject to this Permit, through or within the 600 Area, unless the
15 roadway is closed to general public access at the time of shipment. Waste transported by
16 rail or by pipeline is exempt from this Condition. This documentation will include the
17 following information, unless other unit-specified provisions are designated in Part III or
18 V of this Permit:
- 19 **II.Q.1.a** Generator's name, location, and telephone number;
- 20 **II.Q.1.b** Receiving TSD unit's name, location, and telephone number;
- 21 **II.Q.1.c** Description of waste;
- 22 **II.Q.1.d** Number and type of containers;
- 23 **II.Q.1.e** Total quantity of waste;
- 24 **II.Q.1.f** Unit volume/weight;
- 25 **II.Q.1.g** Dangerous waste number(s); and
- 26 **II.Q.1.h** Any special handling instructions.
- 27 **II.Q.2** All non-containerized solid, dangerous waste transported to or from TSD units, subject to
28 this Permit, will be covered to minimize the potential for material to escape during
29 transport.
- 30 **II.R** **Equivalent Materials**
- 31 **II.R.1** The Permittees may substitute an equivalent or superior product for any equipment or
32 materials specified in this Permit. Use of equivalent or superior products will not be
33 considered a modification of this Permit. A substitution will not be considered equivalent
34 unless it is at least as effective as the original equipment or materials in protecting human
35 health and the environment.
- 36 **II.R.2** The Permittees will place in the Operating Record (within seven [7] days after the change
37 is put into effect) the substitution documentation, accompanied by a narrative
38 explanation, and the date the substitution became effective. Ecology may judge the
39 soundness of the substitution.

- 1 **II.R.3** If Ecology determines that a substitution was not equivalent to the original, it will notify
2 the Permittees that the Permittees' claim of equivalency has been denied, of the reasons
3 for the denial, and that the original material or equipment must be used. If the product
4 substitution is denied, the Permittees will comply with the original approved product
5 specification, or find an acceptable substitution.
- 6 **II.S Land Disposal Restrictions**
- 7 Unless specifically identified otherwise in the HFFACO, the Permittees will comply with
8 all LDR requirements as set forth in [WAC 173-303-140](#).
- 9 **II.T Access and Information**
- 10 To the extent that work required by this Permit must be done on property not owned or
11 controlled by the Permittees, the Permittees must utilize their best efforts to obtain access
12 and information at these locations.
- 13 **II.U Mapping of Underground Piping**
- 14 **II.U.1** Reserved
- 15 **II.U.2** Reserved
- 16 **II.U.3** The Permittees will maintain piping maps for existing, newly identified, and/or new
17 dangerous waste underground pipelines (including active, inactive, and abandoned
18 pipelines, which contain or contained dangerous waste subject to the provisions of
19 [Chapter 173-303 WAC](#)) at the Hanford Facility. The maps will identify the origin,
20 destination, direction of flow, size, depth and type (i.e., reinforced concrete, stainless
21 steel, cast iron, etc.), of each pipe, and the location of their diversion boxes, valve pits,
22 seal pots, catch tanks, receiver tanks, and pumps, and utilize Washington State Plane
23 Coordinates, NAD 83(91), meters. If the type of pipe material is not documented on
24 existing drawings, the most probable material type will be provided. The maps will also
25 identify whether the pipe is active, inactive, or abandoned. The age of all pipes requiring
26 identification pursuant to this Condition will be documented in an Attachment to the
27 submittal. If the age cannot be documented, an estimate of the age of the pipe will be
28 provided based upon best engineering judgment. These maps need not include the pipes
29 within a fenced tank farm or within a building/structure. These maps will be compiled
30 using documented QA/QC control methods and procedures outlined in DOE/RL-96-50,
31 *Hanford Facility RCRA Permit Mapping and Marking of Dangerous Waste Underground*
32 *Pipelines Report*, September 1996. These maps and any Attachments will be maintained
33 in the Facility Operating Record and be updated annually as required by Permit
34 Condition II.U.4.
- 35 **II.U.4** Permittees will maintain current all maps required by Permit Condition II.U.3. These
36 maps will be updated to incorporate new or revised information available by March 30th
37 of each year. By September 30th of each year, the Permittees will submit to Ecology a
38 list of maps that have been updated. The updated maps (including any Attachments) and
39 the annual list submitted to Ecology will be maintained in the Facility Operating Record.
- 40 **II.V Marking of Underground Piping**
- 41 The Permittees will maintain marking of underground pipelines located outside the
42 200 East, 200 West, 300, 400, 100N, and 100K Areas. These pipelines will be marked at
43 the point they pass beneath an area fence, at their origin and destination, at any point they
44 cross an improved road, and every 100 meters along the pipeline corridor where

1 practicable. The markers will be labeled with a sign that reads "Buried Dangerous Waste
2 Pipe" and will be visible from a distance of fifteen (15) meters.

3 **II.W Other Permits and/or Approvals**

4 **II.W.1** The Permittees will be responsible for obtaining all other applicable federal, state, and
5 local permits authorizing the development and operation of the Facility. To the extent
6 that work required by this Permit must be done under a permit and/or approval pursuant
7 to other regulatory authority, the Permittees will use their best efforts to obtain such
8 permits.

9 **II.W.2** All other permits related to dangerous waste management activities are severable and
10 enforceable through the permitting authority under which they are issued.

11 **II.W.3** All air emissions from units subject to this Permit will comply with all applicable state
12 and federal regulations pertaining to air emission controls, including but not limited to,
13 [Chapter 173-400 WAC](#), General Regulations for Air Pollution Sources; [Chapter 173-460](#)
14 [WAC](#), Controls for New Sources of Toxic Air Pollutants; and [Chapter 173-480 WAC](#),
15 Ambient Air Quality Standards and Emission Limits for Radionuclides.

16 **II.X Schedule Extensions**

17 **II.X.1** The Permittees will notify Ecology in writing, as soon as possible, of any deviations or
18 expected deviations, from the schedules of this Permit. The Permittees will include with
19 the notification all information supporting their claim that they have used best efforts to
20 meet the required schedules. If Ecology determines that the Permittees have made best
21 efforts to meet the schedules of this Permit, Ecology will notify the Permittees in writing
22 by certified mail, that the Permittees have been granted an extension. Such an extension
23 will not require a Permit modification under Permit Condition [I.C.3](#). Should Ecology
24 determine that the Permittees have not made best efforts to meet the schedules of this
25 Permit, Ecology may take such action as deemed necessary.

26 Copies of all correspondence regarding schedule extensions will be kept in the Operating
27 Record.

28 **II.X.2** Any schedule extension granted through the approved change control process identified
29 in the HFFACO will be incorporated into this Permit. Such a revision will not require a
30 Permit modification under Permit Condition [I.C.3](#).

31 **II.Y Corrective Action**

32 In accordance with [WAC 173-303-646](#) and [WAC 173-303-815\(2\)\(b\)\(ii\)](#), the Permittees
33 must conduct corrective action, as necessary to protect human health and the
34 environment, for releases of dangerous waste and dangerous constituents from solid
35 waste management units and areas of concern at the Facility, including releases that have
36 migrated beyond the Facility boundary. The Permittees may be required to implement
37 measures within the Facility to address releases, which have migrated beyond the
38 Facility's boundary. As specified in permit conditions [II.Y.1.g](#), [II.Y.2.a.iii](#), and [II.Y.2.a.ii](#),
39 the Permittee's right to challenge Ecology's authority to impose corrective action with
40 respect to radionuclides, CPP Units (as identified under Permit Condition [II.Y.2.a](#)) and
41 selected solid waste management units not covered by the HFFACO at property currently
42 subleased to US Ecology, Inc. (as identified under Permit Condition [II.Y.3.a.i](#)), is
43 reserved until such time as Ecology chooses to impose corrective action in accordance
44 with the permit modification procedures of [WAC 173-303-830](#).

- 1 **II.Y.1** Compliance with [Chapter 173-340 WAC](#)
- 2 In accordance with [WAC 173-303-646](#), the Permittee must conduct corrective action
- 3 "as necessary to protect human health and the environment". To ensure that corrective
- 4 action will be conducted as necessary to protect human health and the environment,
- 5 except as provided in Permit Condition II.Y.2, the Permittee must conduct corrective
- 6 action in a manner consistent with the following provisions of [Chapter 173-340 WAC](#):
- 7 **II.Y.1.a** As necessary to select a cleanup action in accordance with [WAC 173-340-360](#) and
- 8 [WAC 173-340-350](#) State Remedial Investigation and Feasibility Study.
- 9 **II.Y.1.b** [WAC 173-340-360](#) Selection of Cleanup Actions.
- 10 **II.Y.1.c** [WAC 173-340-400](#) Cleanup Actions.
- 11 **II.Y.1.d** [WAC 173-340-410](#) Compliance Monitoring Requirements.
- 12 **II.Y.1.e** [WAC 173-340-420](#) Periodic Site Reviews.
- 13 **II.Y.1.f** [WAC 173-340-440](#) Institutional Controls.; and
- 14 **II.Y.1.g** [WAC 173-340-700](#) through [-760](#) Cleanup Standards, except that to the extent that
- 15 Ecology seeks to impose corrective action with respect to radionuclides regulated under
- 16 the provisions of the Atomic Energy Act, as amended, 42 U.S.C. § 2011 et seq., the
- 17 Permittees may challenge Ecology's authority to impose such corrective action through a
- 18 timely appeal of the Permit modification issued by Ecology without argument from
- 19 Ecology that such right has been waived by a failure to fully litigate that issue through an
- 20 appeal taken within thirty (30) days of the issuance of this Permit, and without argument
- 21 from the Permittees that such requirement fails to satisfy a cause for Permit modification
- 22 under [WAC 173-303-830](#)(3)(a).
- 23 **II.Y.2** Acceptance of Work Under Other Authorities or Programs and Integration with the
- 24 HFFACO.
- 25 Corrective action is necessary to protect human health and the environment for all units
- 26 identified in Appendix B and Appendix C of the HFFACO. Notwithstanding Permit
- 27 Condition II.Y.1, work under other cleanup authorities or programs, including work under
- 28 the HFFACO, may be used to satisfy corrective action requirements, provided it protects
- 29 human health and the environment.
- 30 **II.Y.2.a** For past practice units identified in Appendix C of the HFFACO, as amended, as CPP
- 31 Units, Ecology accepts work under the HFFACO, as amended, and under the CERCLA
- 32 program, as satisfying corrective action requirements to the extent provided for in, and
- 33 subject to the reservations and requirements of, Permit Conditions II.Y.2.a.i through
- 34 [II.Y.2.a.iv](#).
- 35 **II.Y.2.a.i** For any past practice unit identified in Appendix C of the HFFACO as a CPP unit, the
- 36 Permittee must comply with the requirements and schedules related to investigation and
- 37 cleanup of the CPP unit(s) developed and approved under the HFFACO, as amended.
- 38 The requirements and schedules related to investigation and cleanup of CPP units
- 39 currently in place under the HFFACO, as amended, and in the future developed and
- 40 approved under the HFFACO, as amended, are incorporated into this Permit by this
- 41 reference and apply under this Permit as if they were fully set forth herein. If the
- 42 Permittee is not in compliance with requirements of the HFFACO, as amended, that relate
- 43 to investigation or cleanup of CPP unit(s), Ecology may take action to independently
- 44 enforce the requirements as corrective action requirements under this Permit.

- 1 **II.Y.2.a.ii** For any past practice unit identified in Appendix C of the HFFACO as a CPP unit, in the
2 case of an interim Record of Decision (ROD), a final decision about satisfaction of
3 corrective action requirements will be made in the context of issuance of a final ROD.
- 4 **II.Y.2.a.iii** If EPA and Ecology, after exhausting the dispute resolution process under Section XXVI
5 of the HFFACO, cannot agree on requirements related to investigation or cleanup of CPP
6 unit(s), Ecology will notify the Permittees, in writing, of the disagreement and impose, in
7 accordance with the permit modification procedures of [WAC 173-303-830](#), a requirement
8 for the Permittees to conduct corrective action for the subject units(s) in accordance with
9 Permit Condition [II.Y.1](#). The Permittees may challenge Ecology's authority to impose
10 such corrective action requirements through a timely appeal of such Permit modification,
11 without argument from Ecology that the Permittee's right to raise such challenge has
12 been waived by a failure to fully litigate that issue through an appeal taken within thirty
13 (30) days of the issuance of this Permit, and without argument from the Permittee that
14 such requirement fails to satisfy a cause for Permit modification under
15 [WAC 173-303-830\(3\)\(a\)](#). Within 60 days of receipt of the above Permit modification, or
16 within some other reasonable period of time agreed to by Ecology and the Permittees, the
17 Permittees must submit for Ecology review and approval, a plan to conduct corrective
18 action in accordance with Permit Condition [II.Y.1](#) for the subject unit(s). The Permittee's
19 plan may include a request that Ecology evaluate work under another authority or
20 program. Approved corrective action plans under this Permit Condition will be
21 incorporated into this Permit in accordance with the Permit Modification Procedures of
22 [WAC 173-303-830](#).
- 23 **II.Y.2.a.iv** The Permittees must maintain information on corrective action for CPP units covered by
24 the HFFACO in accordance with Sections 9.0 and 10.0 of the HFFACO Action Plan.
25 In addition, the Permittees must maintain all reports and other information developed in
26 whole, or in part, to implement the requirements of Permit Condition [II.Y.2.a](#), including
27 reports of investigations and all raw data, in the Hanford Facility Operating Record in
28 accordance with Permit Condition [II.I](#). Information that is maintained in the Hanford Site
29 Administrative Record may be incorporated by reference into the Hanford Facility
30 Operating Record.
- 31 **II.Y.2.b** For past practice units identified in Appendix C of the HFFACO, as amended, as
32 R-CPP units, Ecology accepts work under the HFFACO, as amended, as satisfying
33 corrective action requirements to the extent provided for, and subject to the reservations
34 and requirements of, Permit Conditions II.Y.2.b.i through II.Y.2.b.ii.
- 35 **II.Y.2.b.i** For any past practice unit identified in Appendix C of the HFFACO, as amended, as an
36 R-CPP unit, the Permittees must comply with the requirements and schedules related to
37 investigation and cleanup of R-CPP units developed and approved under the HFFACO, as
38 amended. The requirements and schedules related to investigation and cleanup of
39 R-CPP units currently in place under the HFFACO, as amended, and in the future
40 developed and approved under the HFFACO, as amended, are incorporated into this
41 Permit by this reference and apply under this Permit as if they were fully set forth herein.
42 If the Permittee is not in compliance with requirements and schedules related to
43 investigation and cleanup of R-CPP units developed and approved under the HFFACO, as
44 amended, Ecology may take action to independently enforce the requirements as
45 corrective action requirements under this Permit.
- 46 **II.Y.2.b.ii** The Permittees must maintain information on corrective action for R-CPP units covered
47 by the HFFACO, as amended, in accordance with Sections 9.0 and 10.0 of the HFFACO
48 Action Plan. In addition, the Permittees must maintain all reports and other information

- 1 developed in whole, or in part, to implement the requirements of Permit
 2 Condition [II.Y.2.b](#), including reports of investigations and all raw data, in the Hanford
 3 Facility Operating Record in accordance with Permit Condition [II.I](#). Information that is
 4 maintained in the Hanford Site Administrative Record may be incorporated into the
 5 Hanford Facility Operating Record by reference.
- 6 **II.Y.2.c** For each TSD unit, when the Permittees submit a certification of closure or a certification
 7 of completion of post-closure care, or at an earlier time agreed to by Ecology and the
 8 Permittees, the Permittees must, at the same time, either:
- 9 **II.Y.2.c.i** Document that the activities completed under closure and/or post-closure satisfy the
 10 requirements for corrective action; or
- 11 **II.Y.2.c.ii** If the activities completed under closure and/or post-closure care do not satisfy corrective
 12 action requirements, identify the remaining corrective action requirements and the
 13 schedule under which they will be satisfied, if remaining corrective action requirements
 14 will be satisfied by work developed and carried out under the HFFACO provisions for
 15 R-CPP units or CPP units, a reference to the appropriate R-CPP or CPP process and
 16 schedule will suffice.
- 17 **II.Y.2.c.iii** Ecology will make final decisions as to whether the work completed under closure or
 18 post-closure care satisfies corrective action, specify any unit-specific corrective action
 19 requirements, and incorporate the decision into this Permit in accordance with the permit
 20 modification procedures of [WAC 173-303-830](#).
- 21 **II.Y.2.d** Notwithstanding any other condition in this Permit, Ecology may directly exercise any
 22 administrative or judicial remedy under the following circumstances:
- 23 **II.Y.2.d.i** Any discharge or release of dangerous waste, or dangerous constituents, which are not
 24 addressed by the HFFACO, as amended.
- 25 **II.Y.2.d.ii** Discovery of new information regarding dangerous constituents or dangerous waste
 26 management, including but not limited to, information about releases of dangerous waste
 27 or dangerous constituents which are not addressed under the HFFACO, as amended.
- 28 **II.Y.2.d.iii** A determination that action beyond the terms of the HFFACO, as amended, is necessary
 29 to abate an imminent and substantial endangerment to the public health, or welfare, or to
 30 the environment.
- 31 **II.Y.3** Releases of Dangerous Waste or Dangerous Constituents Not Covered By the HFFACO:
- 32 **II.Y.3.a** US Ecology
- 33 **II.Y.3.a.i** The following solid waste management units are not covered by the HFFACO:
- 34 **II.Y.3.a.i.a** US Ecology, Inc., SWMU 1: Chemical Trench.
- 35 **II.Y.3.a.i.b** US Ecology, Inc., SWMU 2-13: Low-Level Radioactive Waste Trenches 1 through 11A.
- 36 **II.Y.3.a.i.c** US Ecology, Inc., SWMU 17: Underground Resin Tank.
- 37 **II.Y.3.a.ii** Selected solid waste management units identified in Permit Condition II.Y.3.a.i are
 38 currently being investigated by US Ecology in accordance with the Comprehensive
 39 Investigation US Ecology – Hanford Operations Workplan. Following completion of this
 40 investigation and any closure required of such solid waste management unit under the
 41 authority of the Washington State Department of Health, or within one year of the
 42 effective date of this Permit Condition, whichever is earlier, Ecology will make a
 43 tentative decision as to whether additional investigation or cleanup is necessary to protect
 44 human health or the environment for the solid waste management units identified in

1 Permit Condition [II.Y.3.a.i](#), and publish that decision as a draft permit in accordance with
 2 [WAC 173-303-840](#)(10). Following the associated public comment period, and
 3 consideration of any public comments received during the public comment period,
 4 Ecology will publish as final Permit conditions under [WAC 173-303-840](#)(8) either:

5 **II.Y.3.a.ii.a** A decision that corrective action is not necessary to protect human health or the
 6 environment;

7 **II.Y.3.a.ii.b** An extension to the schedule established under Permit Condition [II.Y.3.a.ii](#), or

8 **II.Y.3.a.ii.c** A decision, that corrective action, in accordance with Permit Condition [II.Y.1](#), is
 9 necessary to protect human health or the environment.

10 **II.Y.3.a.iii** If Ecology decides under Permit Condition [II.Y.3.a.ii](#) that corrective action is necessary to
 11 protect human health or the environment, the Permittees may challenge Ecology's
 12 authority to impose such corrective action requirements through a timely appeal of such
 13 permit modification, without argument from Ecology that the right to raise such challenge
 14 has been waived by a failure to fully litigate that issue through an appeal taken within 30
 15 days of the issuance of this Permit, and with argument from the Permittees that such
 16 requirement fails to satisfy a cause for permit modification under
 17 [WAC 173-303-830](#)(3)(a). Within 180 days of receipt of the above Permit modification,
 18 the Permittees must submit, for Ecology review and approval, a plan to conduct
 19 corrective action in accordance with Permit Condition [II.Y.1](#). Approved corrective action
 20 plans under this condition will be incorporated into this Permit in accordance with the
 21 Permit Modification Procedures of [WAC 173-303-830](#).

22 **II.Y.3.b** Newly Identified Solid Waste Management Units and Newly Identified Releases of
 23 Dangerous Waste or Dangerous Constituents.

24 The Permittees must notify Ecology of all newly-identified solid waste management units
 25 and all newly-identified areas of concern at the Facility. For purposes of this condition, a
 26 'newly-identified' solid waste management unit or a 'newly-identified' area of concern is
 27 a unit or area not identified in the HFFACO, as amended, on the effective date of this
 28 condition and not identified by Permit Condition [II.Y.3.a](#).

29 Notification to Ecology must be in writing and must include, for each newly-identified
 30 unit or area, the information required by [WAC 173-303-806](#)(4)(a)(xxiii) and
 31 [WAC 173-303-806](#)(4)(a)(xxiv). Notification to Ecology must occur at least once every
 32 calendar year, in January, and must include all units and areas newly identified since the
 33 last notification, except that if a newly identified unit or area may present an imminent
 34 and substantial endangerment to human health or the environment, notification must
 35 occur within five days of identification of the unit or area. If information required by
 36 [WAC 173-303-806](#)(4)(a)(xxiii) or [WAC 173-303-806](#)(4)(a)(xxiv) is already included in
 37 the Waste Information Data System, it may be incorporated by reference into the required
 38 notification.

39 **II.Z Waste Minimization**

40 In accordance with [WAC 173-303-380](#)(1)(q), and Section 3005(h) of RCRA,
 41 42 U.S.C. 6925(h), the Permittee must place a certification in the Hanford Facility
 42 Operating Record, Unit-Specific Files on an annual basis that:

43 **II.Z.1.a** A program is in place to reduce the volume and toxicity of hazardous waste generated to
 44 the degree determined by the Permittee to be economically practicable; and,

1 **II.Z.1.b** The proposed method of treatment, storage or disposal is that practicable method
 2 currently available to the Permittee, which minimizes the present and future threat to
 3 human health and the environment.

4 **II.Z.2** The Permittee will maintain each such certification of waste minimization in the
 5 operating record as required by Permit Condition [II.I.1](#).

6 **II.AA Air Emission Standards for Process Vents**

7 The Permittees will comply with applicable requirements of [WAC 173-303-690](#) for
 8 process vents associated with Part III units performing specific separations processes
 9 unless exempted by [WAC 173-303-690](#)(1)(d). Threshold limits applied to process vents
 10 potentially requiring emission controls subject to [WAC 173-303-690](#) are evaluated based
 11 on the summation of applicable emission sources for the entire Hanford Facility. When
 12 the summed emissions fall below threshold limits in [40 CFR 264.1032](#)(a)(1), no emission
 13 control devices are required. If threshold limits in [40 CFR 264.1032](#)(a)(1) are predicted
 14 to be exceeded, the Permittees will notify Ecology to determine the appropriate course of
 15 action. Unit-specific information is contained in Part III of the Permit for applicable
 16 units.

17 **II.BB Air Emission Standards for Equipment Leaks**

18 The Permittees will comply with applicable requirements of [WAC 173-303-691](#) for
 19 certain equipment leaks associated with Part III units unless exempted by
 20 [WAC 173-303-691](#)(1)(e) or (f). Air emission standards apply to equipment that contacts
 21 or contains hazardous wastes with organic concentrations of at least 10 percent by
 22 weight. Unit-specific information is contained in Part III of the Permit for applicable
 23 units.

24 **II.CC Air Emission Standards for Tanks, Surface Impoundments, and Containers**

25 The Permittees shall comply with applicable requirements of [WAC 173-303-692](#) for
 26 containers, tanks, and surface impoundment areas associated with Part III units unless
 27 exempted by [WAC 173-303-692](#)(1)(b). Unit-specific information is contained in Part III
 28 of the Permit for applicable units.

29 **PART III UNIT-SPECIFIC CONDITIONS FOR FINAL STATUS OPERATIONS**

30 Operating Unit 2, PUREX Storage Tunnels

31 Operating Unit 3, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility

32 Operating Unit 4, 242-A Evaporator

33 Operating Unit 5, 325 Hazardous Waste Treatment Units

34 Operating Unit 10, Waste Treatment and Immobilization Plant

35 Operating Unit 11, Integrated Disposal Facility

36 Operating Unit 16, 400 Area Waste Management Unit

37 **PART IV UNIT SPECIFIC CONDITIONS FOR CORRECTIVE ACTION**

38 Corrective Action Unit 1, 100-NR-1

39 **PART V UNIT-SPECIFIC CONDITIONS FOR UNITS UNDERGOING CLOSURE**

40 Closure Unit 6, Waste Encapsulation and Storage Facility Hot Cells A through F

1 PART VI UNIT-SPECIFIC CONDITIONS FOR UNITS IN POST-CLOSURE

2 Post Closure Unit 1, 300 Area Process Trenches

3 Post Closure Unit 2, 183-H Solar Evaporation Basins

4 UNITS RETIRED FROM THE PERMIT

5 100 D Ponds (Closed 8/9/99)

6 105-DR Large Sodium Fire Facility (Closed 7/1/04)

7 100-NR-2 Operable Unit (9/30/09)

8 200 West Area Ash Pit Demolition Site (Closed 11/28/95)

9 2101-M Pond (Closed 11/28/95)

10 216-B-3 Expansion Ponds (Closed 7/31/95)

11 218-E-8 Borrow Pit Demolition Site (Closed 11/28/95)

12 224-T Transuranic Waste Storage and Assay Facility (Closed 11/12/08)

13 241-Z Treatment and Storage Tanks (Closed 2/22/07)

14 2727-S Nonradioactive Dangerous Waste Storage Facility (Closed 7/31/95)

15 300 Area Solvent Evaporator (Closed 7/31/95)

16 300 Area Waste Acid Treatment System (Closed 10/30/2005)

17 303-K Storage Facility (Closed 7/22/02)

18 303-M Oxide Facility (Closed 6/15/06)

19 304 Concretion Facility (Closed 1/21/96)

20 305-B Storage Facility (Closed 7/2/07)

21 3718-F Alkali Metal Treatment and Storage Facility Closure Plan (Closed 8/4/98)

22 4843 Alkali Metal Storage Facility Closure Plan (Closed 4/14/97)

23 Hanford Patrol Academy Demolition Site (Closed 11/28/95)

24 Plutonium Finishing Plant Treatment Unit (Closed 2/8/05)

25 Simulated High Level Waste Slurry Treatment and Storage Unit (Closed 10/23/95)

26 FS-1 Outdoor Container Storage Area (Closed 10/25/2016)

27 616 Non-Radioactive Dangerous Waste Storage Facility (Closed 9/5/01)

28 331-C Storage Unit (Closed 7/22/11)

29 207-A South Retention Basin (Closed 5/18/17)

30 1324-N Surface Impoundment & 1324-NA Percolation Pond (Closed 4/25/2017)

31 1706-KE Waste Treatment System Facility (Closed 1/11/18)

32 600 Area Purge Water Storage and Treatment Facility (Closed 2/16/18)

33 1301-N Liquid Waste Disposal Facility (Closed 11/28/18)

34 1325-N Liquid Waste Disposal Facility (Closed 11/28/18)

**PERMIT ATTACHMENT 6
REPORTS AND RECORDS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
06/25/2019	PCN-HFSW-2019-02 (8C.2019.Q2)
09/18/2018	PCN-HFSW-2018-01
09/30/2015	8C.2015.Q3

This page intentionally left blank.

1
2
3
4
5

**PERMIT ATTACHMENT 6
REPORTS AND RECORDS**

1
2
3
4
5

This page intentionally left blank.

1
2
3
4
5
6
7
8

**PERMIT ATTACHMENT 6
REPORTS AND RECORDS**

TABLE OF CONTENTS

6 REPORTS AND RECORDS 5

1
2
3
4
5

This page intentionally left blank.

1 **6 REPORTS AND RECORDS**

2 This Attachment identifies reports and record requirements as detailed in the Hanford Facility Resource
 3 Conservation and Recovery Act (RCRA) Permit (Permit), Condition II.I, Hanford Facility Operating
 4 Record (HFOR) and other Permit Conditions.

5

Permit Condition ¹	Records and/or Reports		HFOR		Type of Submittal		
			General File	Unit Specific File	Verbal ²	Transmittal Letter	Certified Package
I.C.3	Quarterly Notification of Class 1 Modifications	Unit		X		X	
		Facility	X				
	Class 2 Modifications with or without Temporary Authorization	Unit		X		X	X ⁵
		Facility	X				
	Class 3 Modifications with or without Temporary Authorization	Unit		X		X	X ⁵
		Facility	X				
I.E.10.b I.E.10.c II.I.1.n	Monitoring and Records	Unit		X			
		Facility	X				
I.E.11	Reporting Planned Changes	Unit		X	X		
		Facility	X				
I.E.12.i	Certification of Construction or Modification	Unit		X			X ³
I.E.13	Anticipated Noncompliance	Unit		X	X	X	
		Facility	X				
I.E.14	Transfer of Permits	Facility	X			X	
I.E.15.a I.E.15.c	Immediate Reporting	Unit		X	X		
		Facility	X				
I.E.15.d	Release or noncompliance not requiring immediate reporting	Unit		X			
		Facility	X				
I.E.16	Written Reporting	Unit		X		X	
		Facility	X				
I.E.17.a	Manifest Discrepancy Report	Unit		X		X	
		Facility	X				
I.E.17.b	Waste tracking form discrepancy report	Unit		X			
I.E.20	Other Information	Unit		X	X	X	
		Facility	X				

Permit Condition ¹	Records and/or Reports		HFOR		Type of Submittal		
			General File	Unit Specific File	Verbal ²	Transmittal Letter	Certified Package
I.H	Permit related documentation: Permit and all Attachments and modifications	Facility	X				
	Permit related documentation: Part B Permit Application, Closure Plan, Closure/Post Closure Plan, Post Closure Permit Application documentation	Unit		X			
II.I.1.a	Waste location	Unit		X			
		Facility	X				
II.I.1.b II.D	Waste Analysis	Unit		X			
		Facility	X				
II.I.1.c	Occurrence Reports	Unit		X			
		Facility	X				
II.I.1.d I.E.18	Unmanifested Waste Report	Unit		X		X ⁴	
		Facility	X				
II.I.1.e II.A (all)	Hanford Emergency Management Plan and incident records	Unit		X	X	X	
		Facility	X				
II.I.1.f II.C	Personnel Training records	Unit		X			
		Facility	X				
II.I.1.g II.B.4	Preparedness and Prevention arrangements	Facility	X				
II.I.1.j	Onsite transportation documentation	Unit		X			
II.I.1.k	Cross-reference of waste location to waste manifest numbers	Unit		X			
		Facility	X				
II.I.1.m	Annual Reports	Facility	X				
I.E.19	Annual Noncompliance Report	Facility	X			X	
I.E.22	Annual Dangerous Waste Report	Facility	X				X ⁵
II.F.2	Well Inspection and Maintenance	Unit		X		X	
		Facility	X				
II.I.1.p	Groundwater corrective action	Unit		X			
		Facility	X				

Permit Condition ¹	Records and/or Reports		HFOR		Type of Submittal		
			General File	Unit Specific File	Verbal ²	Transmittal Letter	Certified Package
II.I.1.q	Permit condition compliance evaluation system	Unit		X			
		Facility	X				
II.I.1.r	Deed notifications (reference only)	Unit		X			X ⁶
II.I.1.s II.O	Inspection records	Unit		X		X	
		Facility	X				
II.J.1	Closure certification	Unit		X			X ⁶
II.J.3	Notification of, or request for, a permit modification	Unit		X		X	
		Facility	X				
II.K.6	Closure plan deviation	Unit		X			
II.I.1.t II.L.2.b II.L.2.c	Engineering change notices and nonconformance reports	Unit		X		X	
II.L.2.d	As-built drawings	Unit		X			
II.N.2 II.N.3	Receipt of wastes generated offsite	Unit		X		X	
II.R	Equivalent Materials	Unit		X			
II.S	Land Disposal Restrictions records	Unit		X		X	
II.U	Mapping methodology report and underground pipeline maps	Facility	X			X	
II.X.1	Schedule Extensions	Unit		X		X	
		Facility	X				
II.Y.2.a.iv	Corrective Action	Unit		X			
II.Y.3.b	Solid Waste Management Units notification	Unit		X	X	X	
40 CFR 264.73(b)(9)	Waste minimization/pollution prevention	Unit		X			

¹Permit Condition, unless otherwise noted.

²Verbal reporting in accordance with time frames noted in the specified conditions.

³Certified by a registered professional engineer in accordance with [WAC 173-303-810\(14\)\(a\)\(i\)](#).

⁴Certification in accordance with Ecology Unmanifested Dangerous Waste Report form.

⁵Certified by Permittees in accordance with [WAC 173-303-810\(12\)](#).

⁶Certified in accordance with [WAC 173-303-610](#).

1
2
3
4
5

This page intentionally left blank.

242-A EVAPORATOR CHANGE CONTROL LOG

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have a “**Last Modification Date**” which represents the last date the portion of the unit has been modified. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Last modification to 242-A Evaporator **April 30, 2019**

Chapters	Last Modification Date	Modification Number
Unit-Specific Conditions	04/30/2019	PCN-242-A-2019-01 (8C.2019.Q2)
1.0 Part A Form	11/16/2017	8C.2017.5F
2.0 Reserved		
3.0 Waste Analysis Plan	04/09/2018	PCN-242-A-2017-02 (8C.2018.Q2)
4.0 Process Information	04/09/2018	PCN-242-A-2017-02 (8C.2018.Q2)
5.0 Reserved		
6.0 Procedures to Prevent Hazards	04/09/2018	PCN-242-A-2017-02 (8C.2018.Q2)
7.0 Contingency Plan	04/30/2019	PCN-242-A-2019-01 (8C.2019.Q2)
8.0 Personnel Training	09/30/2013	
9.0 Reserved		
10.0 Reserved		
11.0 Closure	09/30/2013	

This page intentionally left blank.

**242-A EVAPORATOR
OPERATING UNIT 4 UNIT-SPECIFIC CONDITIONS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
04/30/2019	PCN-242-A-2019-01 (8C.2019.Q2)
04/09/2018	PCN-242-A-2017-02 (8C.2018.Q2)
11/16/2017	8C.2017.5F
07/19/2017	8C.2017.Q2
04/26/2017	8C.2017.Q1
02/18/2016	8C.2015.Q4

This page intentionally left blank.

1
2
3
4
5

**OPERATING UNIT 4 UNIT-SPECIFIC CONDITIONS
242-A EVAPORATOR**

1
2
3
4
5

This page intentionally left blank.

1
2 **OPERATING UNIT 4 UNIT-SPECIFIC CONDITIONS**
3 **242-A EVAPORATOR**
4

5
6 **UNIT DESCRIPTION**

7 The 242-A Evaporator is a mixed waste treatment and storage unit consisting of a conventional
8 forced-circulation, vacuum evaporation system to concentrate mixed-waste solutions located in the
9 200 East Area.

10 This document sets forth the operating conditions for the 242-A Evaporator.

11 **III.4.A COMPLIANCE WITH UNIT SPECIFIC PERMIT CONDITIONS**

12 The Permittees shall comply with all requirements set forth in the Hanford Facility Resource
13 Conservation and Recovery Act (RCRA) Permit (Permit) as specified in Permit Attachment 9, Permit
14 Applicability Matrix, including all approved modifications. All chapters, subsections, figures, tables, and
15 appendices included in the following unit-specific Permit Conditions are enforceable in their entirety.

16 In the event that the Part III-Unit-Specific Conditions for Operating Unit 4, 242-A Evaporator conflict
17 with the Part I-Standard Conditions and/or Part II-General Facility Conditions of the Permit, the
18 unit-specific conditions for Operating Unit 4, 242-A Evaporator prevail.

19 **CHAPTERS SPECIFIC TO OPERATING UNIT GROUP 4:**

- 20 Chapter 1.0 Part A Form, dated November 16, 2017
21 Chapter 3.0 Waste Analysis Plan, dated April 9, 2018
22 Chapter 4.0 Process Information, dated April 9, 2018
23 Chapter 5.0 Groundwater Monitoring, (not applicable)
24 Chapter 6.0 Procedures to Prevent Hazards, dated April 9, 2018
25 Chapter 7.0 Contingency Plan, dated April 30, 2019
26 Chapter 8.0 Personnel Training, dated September 30, 2013
27 Chapter 11.0 Closure, dated September 30, 2013

28 **III.4.B COMPLIANCE WITH UNIT-SPECIFIC PERMIT CONDITIONS**

29 **III.4.B.1** Portions of permit attachment 4 (DOE/RL-94-02) that are not made enforceable by
30 inclusion in the applicability matrix for that document are not made enforceable by
31 reference in this document.

1
2
3
4
5

This page intentionally left blank.

**242-A EVAPORATOR
CHAPTER 7.0
CONTINGENCY PLAN
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
04/30/2019	PCN-242-A-2019-01 (8C.2019.Q2)
11/16/2017	8C.2017.5F
02/18/2016	8C.2015.Q4

This page intentionally left blank.

1
2
3
4
5

CHAPTER 7.0
CONTINGENCY PLAN

1
2
3
4
5

This page intentionally left blank.

CHAPTER 7.0
CONTINGENCY PLAN

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

TABLE OF CONTENTS

7.0 CONTINGENCY PLAN..... 5

7.1 Building Evacuation Routing (Building Layout) 7

7.2 Building Emergency Director (BED)..... 7

7.3 Implementation of the Contingency Plan..... 7

7.3.1 Protective Actions Responses..... 8

7.3.2 Response to Facility Operations Emergencies 9

7.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases 11

7.3.4 Incident Recovery and Restart of Operations..... 11

7.3.5 Incompatible Waste 11

7.3.6 Post Emergency Equipment Maintenance and Decontamination..... 12

7.4 Emergency Equipment 12

7.4.1 Fixed Emergency Equipment 12

7.4.2 Portable Emergency Equipment 12

7.4.3 Communications Equipment/Warning Systems 13

7.4.4 Personal Protective Equipment 13

7.4.5 Spill Control and Containment Supplies 13

7.4.6 Incident Command Post 13

7.5 Required Reports..... 14

7.6 Plan Location and Amendments..... 14

7.7 Facility/Building Emergency Response Organization 14

FIGURE

Figure 7.1. 242 A Evaporator Evacuation Routes 15

Figure 7.2. 242-A Evaporator Staging Areas 16

TABLE

Table 7.1 Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3)..... 5

1
2
3
4
5

This page intentionally left blank.

1 **7.0 CONTINGENCY PLAN**

2 The applicable [WAC 173-303](#) requirements for a contingency plan at 242-A Evaporator are satisfied in
3 the following documents: portions of the Hanford Facility Resource Conservation and Recovery Act
4 (RCRA) Permit (Permit) Attachment 4 *Hanford Emergency Management Plan* (DOE/RL-94-02) and this
5 Chapter.

6 The unit-specific building emergency plan also serves to satisfy a broad range of other requirements
7 [e.g., Occupational Safety and Health Administration standards ([29 CFR 1910](#)), *Toxic Substances Control*
8 *Act of 1976* ([40 CFR 761](#)), and U.S. Department of Energy Orders]. Therefore, revisions made to
9 portions of this unit-specific building emergency plan that are not governed by the requirements of
10 [WAC 173-303](#) will not be considered as a modification subject to [WAC 173-303-830](#) or Permit
11 Condition I.C.3.

12 [Table 7.1](#) identifies the sections of the unit-specific building emergency plan written to meet
13 [WAC 173-303-350\(3\)](#) contingency plan requirements identified in this Chapter. In addition, Section 12.0
14 of the unit-specific 242-A Evaporator building emergency plan is written to meet [WAC 173-303](#)
15 requirements identifying where copies of the *Hanford Emergency Management Plan* (DOE/RL-94-02)
16 and the building emergency plan are located and maintained on the Hanford Facility. Therefore, revisions
17 to Section 12.0 of the building emergency plan and the portions identified in [Table 7.1](#) are considered a
18 modification subject to [WAC 173-303-830](#) or Permit Condition I.C.3.

19

**Table 7.1 Hanford Facility Documents Containing Contingency Plan Requirements of
[WAC 173-303-350\(3\)](#)**

Requirement	Permit Attachment 4 Hanford Emergency Management Plan (DOE/RL-94-02)	Building Emergency Plan ¹ (RPP-27867)	Chapter 7.0
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360	X ² Section 1.3.4	X ² Sections 7.1, 7.2 through 7.2.5, and 7.3 Sections 4.0, 8.2, 8.3, 8.4, and 11.0	X ² Sections 7.3.1, 7.3.2, through 7.3.2.5, and 7.3.3 Sections 7.3, 7.3.4, 7.3.5, 7.3.6, and 7.5
-350(3)(b) - A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370(6) , Manifest system, reasons for not accepting dangerous waste shipments	X ² Section 1.3.4	X ^{2, 3} Section 7.2.5.1	X ^{2, 3} Section 7.3.2.5.1
-350(3)(c) - A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4) .	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3.1		

Table 7.1 Hanford Facility Documents Containing Contingency Plan Requirements of [WAC 173-303-350\(3\)](#)

Requirement	Permit Attachment 4 Hanford Emergency Management Plan (DOE/RL-94-02)	Building Emergency Plan ¹ (RPP-27867)	Chapter 7.0
<p>-350(3)(d) - A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810(14)(a)(I)), rather than as part of the permit application.</p>		<p>X¹ Sections 3.1 and 13.0</p>	<p>X⁴ Sections 7.2 and 7.7</p>
<p>-350(3)(e) - A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.</p>		<p>X Section 9.0</p>	<p>X Section 7.4</p>
<p>-350(3)(f) - An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.</p>	<p>X⁵ Figure 7.3 and Table 5.1</p>	<p>X⁶ Section 1.5</p>	<p>X⁶ Section 7.1</p>

An 'X' indicates requirement applies.

¹ Portions of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) not enforceable through Appendix A of that document are not made enforceable by reference in the building emergency plan.

² Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional descriptions of actions are required at the site level. If other credible scenarios exist or if emergency procedures at the unit are different, the description of actions contained in the building emergency plan will be used during an event by a building emergency director.

³ This requirement only applies to Treatment, Storage, and Disposal (TSD) units that receive shipment of dangerous or mixed waste defined as offsite shipments in accordance with [WAC 173-303](#).

⁴ Emergency Coordinator names and home telephone numbers are maintained separate from any contingency plan document on file in accordance with Permit Condition II.A.4 and are updated, at a minimum, monthly.

⁵ The Hanford Facility (site wide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

⁶ An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

1 **7.1 Building Evacuation Routing (Building Layout)**

2 [Figures 7.1](#) and [7.2](#) provide identification of the primary and secondary staging areas and a general layout
3 of the 242-A Evaporator. Alternate evacuation routes will be used on a case-by-case basis, based on the
4 type of event and meteorological conditions at the time of the event.

5 **7.2 Building Emergency Director (BED)**

6 Emergency response will be directed by the BED, as the Emergency Coordinator, until the Incident
7 Commander (IC) arrives. The Incident Command System (ICS) staff with supporting on call personnel
8 then fulfill the responsibilities of the Emergency Coordinator as discussed in [WAC 173-303-201](#)
9 (for dangerous waste generator locations) and in [WAC 173-303-360](#) (for permitted TSD facilities).

10 During events, facility personnel perform response duties under the direction of the BED. The Incident
11 Command Post (ICP) is managed by either the senior Hanford Fire Department member present on the
12 scene or senior Hanford Patrol member present on the scene (security events only). These individuals are
13 designated as the IC and as such, have the authority to request and obtain any resources necessary for
14 protecting people and the environment. The BED becomes a member of the ICP and functions under the
15 direction of the IC. In this role, the BED continues to manage and direct facility operations.

16 A listing of BEDs by title, work location, and work telephone numbers is contained in [Section 7.7](#),
17 Facility/Building Emergency Response Organization (ERO). The BED is on the premises (200 Area;
18 primary location is the Central Shift Office [274-AW]) or is available through an "on call" list 24 hours a
19 day. Names and home telephone numbers of the BEDs are available from the Patrol Operations Center
20 (POC) in accordance with Permit Condition II.A.4.

21 **7.3 Implementation of the Contingency Plan**

22 In accordance with [WAC 173-303-201](#)(14)(b) or [WAC 173-303-360](#)(2)(b), the BED ensures that trained
23 personnel identify the character, source, amount, and extent of the release, fire, or explosion to the extent
24 possible. Identification of waste can be made by activities that can include, but are not limited to, visual
25 inspection of involved containers, sampling activities in the field, reference to inventory records, or by
26 consulting with facility personnel. Samples of materials involved in an emergency might be taken by
27 qualified personnel and analyzed as appropriate. These activities must be performed with a sense of
28 immediacy and shall include available information.

29 The BED shall use the following guidelines to determine if an event has met the requirements of
30 [WAC 173-303-201](#)(14)(d) or [WAC 173-303-360](#)(2)(d):

- 31 1. The event involved an unplanned spill, release, fire, or explosion,
32 AND
33 2.a The unplanned spill or release involved a dangerous waste, or the material involved became a
34 dangerous waste as a result of the event (e.g., product that is not recoverable.),
35 OR
36 2.b The unplanned fire or explosion occurred at the 242-A Evaporator or transportation activity
37 subject to RCRA contingency planning requirements,
38 AND
39 3. Time urgent response from an emergency services organization was required to mitigate the
40 event or a threat to human health or the environment exists.

1 As soon as possible, after stabilizing event conditions, the BED shall determine, in consultation with the
2 site contractor environmental single point-of-contact (POC), if notification to the Washington State
3 Department of (Ecology) is needed to meet [WAC 173-303-201](#)(14)(d) or [WAC 173 303-360](#)(2)(d)
4 reporting requirements. If all of the conditions under 1, 2, and 3 are met, notifications are to be made to
5 Ecology. Additional information is found in Permit Attachment 4, *Hanford Emergency Management Plan*
6 (DOE/RL-94-02), Section 4.2.

7 If review of all available information does not yield a definitive assessment of the danger posed by the
8 incident, a worst-case condition will be presumed and appropriate protective actions and notifications will
9 be initiated. The BED is responsible for initiating any protective actions based on their best judgment of
10 the incident.

11 The BED must assess each incident to determine the response necessary to protect the personnel, facility,
12 and the environment. If assistance from Hanford Patrol, Hanford Fire Department, or ambulance units is
13 required, the Hanford Emergency Response Number (911 or 509-373-0911 if using a cell phone) must be
14 used to contact the POC and request the desired assistance.

15 **7.3.1 Protective Actions Responses**

16 Protective action responses are discussed in the following sections. The steps identified in the description
17 of actions do not have to be performed in sequence because of the unanticipated sequence of incident
18 events.

19 **7.3.1.1 Evacuation**

20 The objective of a facility evacuation order is to limit personnel exposure to hazardous materials or
21 dangerous/mixed waste by increasing the distance between personnel and the hazard. The scope of the
22 evacuation includes evacuation of the facility due to an event at the facility as well as evacuation of the
23 facility in response to a site evacuation order. Evacuation is directed by the BED when conditions
24 warrant and applies to all personnel not actively involved in the event response or in emergency plan
25 related activities.

26 The BED initiates the evacuation by directing an announcement be made to evacuate along with the
27 evacuation location over the public address system and facility radios. Personnel proceed to a
28 predetermined staging area (shown in [Figure 7.2](#)), or other safe upwind location, as determined by the
29 BED. The BED determines the operating configuration of the facility and identifies any additional
30 protective actions to limit personnel exposure to the hazard.

31 Emergency organization personnel or assigned operations personnel conduct a sweep of occupied
32 buildings to ensure that all personnel and visitors have evacuated. For an immediate evacuation,
33 accountability is performed at the staging area. The BED assigns personnel as accountability aides and
34 staging area managers with the responsibility to ensure that evacuation actions are taken at the
35 242-A Evaporator. All implementing actions executed by the aides/managers are directed by the
36 emergency response procedures. When evacuation actions are complete, the aides/managers provide a
37 status report to the BED. The BED provides status to the IC.

38 **7.3.1.2 Take Cover**

39 The objective of the take cover order is to limit personnel exposure to hazardous or dangerous/mixed
40 waste when evacuation is inappropriate or not practical. Evacuation might not be practical or appropriate
41 because of extreme weather conditions or the material release might limit the ability to evacuate safely
42 personnel.

1 The BED initiates the take cover by directing an announcement be made over the public address system
2 and facility radios, and, as conditions warrant, by activating the 200 Area take cover alarms by calling the
3 POC using 911 (509-373-0911 if using a cell phone). Actions to complete a facility take cover order are
4 directed by the emergency response procedure. Protective actions associated with operations include
5 configuring, or shutting down, the ventilation systems. Determination of additional take cover actions is
6 based on operating configuration, weather conditions, amount and duration of release, and other
7 conditions, as applicable to the event and associated hazard. As a minimum, personnel exposure to the
8 hazard is minimized. The BED assigns personnel as accountability aides with responsibility to ensure
9 that take cover actions are taken at all occupied buildings at the 242-A Evaporator. When take cover
10 actions are complete, the aides/managers provide the BED with a status report.

11 **7.3.2 Response to Facility Operations Emergencies**

12 Depending on the severity of the event, the BED reviews the site-wide procedures and 242-A Evaporator
13 emergency response procedure(s) and, as required, categorizes and/or classifies the event. If necessary,
14 the BED initiates area protective actions and Hanford Site ERO activation. The steps identified in the
15 following description of actions do not have to be performed in sequence because of the unanticipated
16 sequence of incident events.

17 **7.3.2.1 Loss of Utilities**

18 Upon loss of power, the evaporator fails to a safe configuration by dumping and draining the system to
19 Double-Shell Tank (DST) feed tank 241-AW-102. The 242-A Evaporator Control Room uninterruptible
20 power supply (UPS) provides temporary power to the MCS computer for process monitoring during
21 shutdown of the evaporator system. Personnel emergency equipment (fire alarm control panels,
22 emergency lighting, and exit lights) operate on backup battery power to support safe exit from the facility
23 if the emergency event warrants.

24 A case-by-case evaluation is required for each event to determine further loss of utility impacts. When a
25 BED determines a loss of utility impact, actions are taken to ensure dangerous and/or mixed waste is
26 being properly managed to the extent possible given event circumstances. As necessary, the BED will
27 stop operations and take appropriate actions until the utility is restored. If loss of utilities at the
28 242-A Evaporator results in a major process disruption/loss of plant control, notifications in
29 Section 7.3.2.2 are performed.

30 **7.3.2.2 Major Process Disruption/Loss of Plant Control**

31 Upon loss of the MCS, the Shift Manager is notified while an attempt is made to return the MCS to
32 service. If a dump of the vapor-liquid separator (C-A-1) vessel does occur, AW Tank Farm personnel are
33 notified of impending over pressurization of DST System feed tank 241-AW-102, and all personnel in the
34 AW Tank Farm evacuate to the change trailer. Non-essential personnel exit the 242-A Evaporator
35 Facility.

36 The system condition is assessed, and corrective actions are implemented. Operations are placed in
37 recirculation by securing the slurry pump and waste feed to the plant. Facility shutdown is accomplished
38 by performing manual, localized actions such as system isolation, equipment shutdown, etc.

39 **7.3.2.3 Pressure Release**

40 If mixed waste release occurs, perform actions identified in [Section 7.3.2.5](#).

41 **7.3.2.4 Fire and/or Explosion**

42 In the event of a fire, the discoverer activates a fire alarm; calls 911 (509-373-0911 if using a cell phone)
43 or verifies that 911 has been called. Automatic initiation of a fire alarm (by the smoke detectors, sprinkler
44 systems, or pull boxes) is also possible.

- 1 • Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit
2 and proceed to the designated staging area for accountability.
- 3 • On actuation of the fire alarm, ONLY if time permits, personnel should shut down equipment,
4 secure waste, and lock up classified materials (or hand carry them out). The alarm automatically
5 signals the Hanford Fire Department.
- 6 • The BED proceeds directly to the ICP, obtains all necessary information pertaining to the
7 incident, and sends a representative to meet Hanford Fire Department.
- 8 • The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- 9 • The BED informs the Hanford Site ERO as to the extent of the emergency (including estimates of
10 dangerous waste, mixed waste, or radioactive material quantities released to the environment).
- 11 • If operations are stopped in response to the fire, the BED ensures that systems are monitored for
12 leaks, pressure buildup, gas generation, and ruptures.
- 13 • Hanford Fire Department firefighters extinguish the fire as necessary.

14 NOTE: Following a fire and/or explosion, [WAC 173-303-640\(7\)](#) will be addressed for the
15 242-A Evaporator regarding fitness for use.

16 **7.3.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill**

17 Spills of hazardous materials, dangerous or mixed waste can result from many sources including process
18 leaks, container spills or leaks, damaged packages or shipments, or personnel error. Spills of mixed waste
19 are complicated by the need to deal with the extra hazards posed by the presence of radioactive materials.
20 Abnormal radiation actions also may be implemented if conditions are warranted. Timeframes for
21 specific responses may be affected by radiological conditions.

- 22 • The discoverer notifies the BED and initiates SWIM response:
 - 23 – Stops work
 - 24 – Warns others in the vicinity
 - 25 – Isolates the area
 - 26 – Minimizes the spill if possible
- 27 • The BED determines if emergency conditions exist requiring response from the Hanford Fire
28 Department, based on classification of the spill and injured personnel, and evaluates need to
29 perform additional protective actions.
- 30 • If the Hanford Fire Department resources are not needed, the spill is mitigated with resources
31 identified in Section 7.4 and proper notifications are made.
- 32 • If the Hanford Fire Department resources are needed, the BED calls 911 (509-373-0911 if using a
33 cell phone).
- 34 • The BED sends a representative to meet the Hanford Fire Department.
- 35 • The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- 36 • The BED informs the Hanford Site ERO as to the extent of the emergency (including estimates of
37 dangerous waste, mixed waste, or radioactive material quantities released to the environment).
- 38 • If operations are stopped in response to the spill, the BED ensures that systems are monitored for
39 leaks, pressure buildup, gas generation, and ruptures.
- 40 • Hanford Fire Department stabilizes the spill.

41 NOTE: For response to leaks or spills and disposition of leaking or unfit-for-use tank systems, refer to
42 [WAC 173-303-640\(7\)](#).

1 **7.3.2.5.1 Damaged or Unacceptable Shipments**

2 The 242-A Evaporator is designed to receive waste from the DST system through existing underground
3 piping. The 242-A Evaporator does not receive dangerous or mixed waste shipments that require
4 manifesting. The notifications required by [WAC 173-303-360\(2\)\(j\)](#) and the reporting requirements of
5 [WAC 173-303-640\(7\)\(d\)\(i\)](#) may be made via telephone conference.

6 **7.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases**

7 The BED, as part of the Incident Command System, takes the steps necessary to ensure that a secondary
8 release, fire, or explosion does not occur. The BED will take measures, where applicable, to stop
9 processes and operations, collect and contain released wastes, and remove or isolate containers. The BED
10 shall also monitor for leaks, pressure buildups, gas generation, or ruptures in valves, pipes or other
11 equipment, whenever this is appropriate.

12 **7.3.4 Incident Recovery and Restart of Operations**

13 A recovery plan is developed when necessary in accordance with Permit Attachment 4, *Hanford*
14 *Emergency Management Plan* (DOE/RL-94-02), Section 9.2. A recovery plan is needed following an
15 event where further risk could be introduced to personnel, the 242-A Evaporator, or the environment
16 through recovery action and/or to maximize the preservation of evidence.

17 If this plan was implemented according to [Section 7.3](#) of this plan, Ecology is notified before operations
18 can resume. The Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section
19 5.1 discusses different reports to outside agencies. This notification is in addition to those required
20 reports and includes the following statements:

- 21 a. There are no incompatibility issues with the waste and released materials from the incident.
- 22 b. All the equipment has been cleaned, fit for its intended use, and placed back into service.

23 The notification required by [WAC 173-303-201\(14\)\(j\)](#) or [WAC 173-303-360\(2\)\(j\)](#) may be made via
24 telephone conference. Additional information that Ecology requests regarding these restart conditions
25 will be included in the required 15-day report identified in [Section 7.5](#) of this plan.

26 For emergencies not involving activation of the Hanford Emergency Operations Center (EOC), the BED
27 ensures that conditions are restored to normal before operations are resumed. If the Hanford Site ERO
28 was activated and the emergency phase is complete, a special recovery organization could be appointed at
29 the discretion of RL to restore conditions to normal. This process is detailed in RL and contractor
30 emergency procedures. The makeup of this organization depends on the extent of the damage and the
31 effects. The onsite recovery organization will be appointed by the appropriate contractor's management.

32 **7.3.5 Incompatible Waste**

33 After an event, the BED or the onsite recovery organization ensures that no waste that might be
34 incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed.
35 Cleanup actions are taken by 242-A Evaporator personnel or other assigned personnel. Permit
36 Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.2.3, describes actions
37 to be taken.

38 Waste from cleanup activities is designated and managed as newly generated waste. Perform as
39 necessary, field checks for waste compatibility before storage. Incompatible wastes are not placed in the
40 same container. Containers of waste are placed in storage areas appropriate for their compatibility class.

41 If incompatibility of waste was a factor in the incident, the BED or the onsite recovery organization
42 ensures that the cause is corrected.

1 **7.3.6 Post Emergency Equipment Maintenance and Decontamination**

- 2 All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris.
 3 Decontaminated equipment is checked for proper operation before storage for subsequent use.
 4 Consumable and disposed materials are restocked. Used fire extinguishers are replaced.
 5 The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed.
 6 Depleted stocks of neutralizing and absorbing materials are replenished.

7 **7.4 Emergency Equipment**

8 Emergency resources and equipment for the 242-A Evaporator are presented in this section.

9 **7.4.1 Fixed Emergency Equipment**

Type	Location	Capability
Safety shower/eye wash station	<ul style="list-style-type: none"> • Aqueous makeup room (AMU) –south side. Next to truck load in airlock and chemical storage tank • Condenser room basement, SE corner • Condenser room 4th floor 	Assist in flushing chemicals/materials from body and/or eyes and face
Wet pipe sprinkler system	Located throughout the facility	Assist in the control of fire
Fire alarm pull boxes	Located throughout the facility	Activates the building fire alarm and notifies the Hanford Fire Department (HFD)
Emergency lighting (lanterns)	Located throughout the facility	Provide 1 hour of temporary lighting

10

11 **7.4.2 Portable Emergency Equipment**

Type	Location	Capabilities
General purpose fire extinguishers	Throughout the 242-A Evaporator Facility	Fire suppression for class A, B, C, fires
Halotron fire extinguishers	Two in the 242-A Evaporator Control Room	Suppress electrical fires

12

1 **7.4.3 Communications Equipment/Warning Systems**

Type	Location	Capability
Fire alarms	Located throughout the facility in halls, corridors, and locker rooms	Audible throughout the 242-A Evaporator Building
Hanford Site Area Siren	200 East Area utility poles the nearest one is located along 4 th street approximately 820 feet west of 241-AW Tank Farm	Provides warning to personnel to take cover or evacuate. This siren is identified in DOE/RL-94-02, Section 5.2.5.
Operations process alarms from MCS or hard wired alarm panels	242-A Evaporator Control Room	Audible in the 242-A Evaporator Control Room
Public address system (PAX)	Located throughout the 242-A Evaporator Building (except in pump and evaporator rooms)	Provides communications and public address capabilities
Portable Radios	242-A Evaporator Control Room	Communication to the 242-A Evaporator Control Room
Telephone	242-A Evaporator Control Room, office areas, AMU room, and condenser room.	Internal and external communications. Allows notification of outside resources (HFD, Hanford Patrol, etc.)

2

3 **7.4.4 Personal Protective Equipment**

Type	Location	Capability
Respirators	242-A Evaporator Control Room	Filtered or supplied air for recovery of known hazards

4

5 **7.4.5 Spill Control and Containment Supplies**

Type	Location	Capability
Spill kit	Survey area next to personnel protective equipment storage room (exterior wall to Aqueous Make-up room), wall mounted	Provides spill control materials

6

7 **7.4.6 Incident Command Post**

8 The IC determines the location of the ICP based on the event and may use the Hanford Fire Department
 9 Mobile Command Unit if necessary. 274-AW may be used by the BED for initial response management
 10 and may be used as the formal ICP as determined by the IC. Emergency resource materials are stored
 11 274-AW in the ICP.

1 **7.5 Required Reports**

2 Post incident written reports are required for certain incidents on the Hanford Site. The reports are
3 described in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02, Section 5.1).

4 Facility management must note in the TSD unit-specific operating record, the time, date, and details of
5 any incident that requires implementation of the contingency plan (refer to [Section 7.3](#) of this plan).
6 Within fifteen (15) days after the incident, a written report must be submitted to Ecology. The report must
7 include the elements specified in [WAC 173-303-201](#)(14)(k) or [WAC 173-303-360](#)(2)(k).

8 **7.6 Plan Location and Amendments**

9 A copy of this plan is maintained at the following locations:

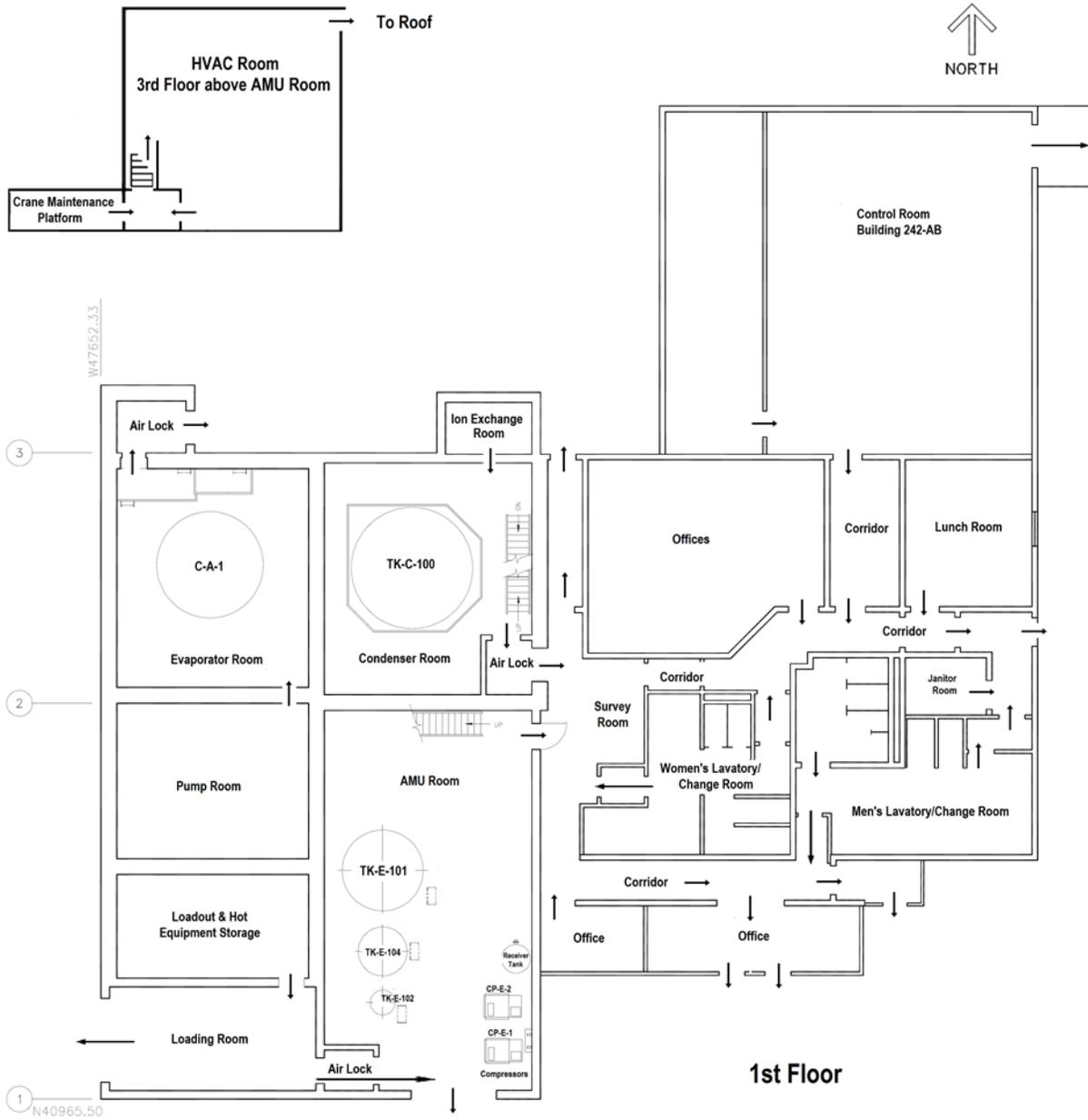
- 10 • 242-A Evaporator Shift Office
- 11 • Central Shift Office (274-AW)

12 This plan will be reviewed and immediately amended as necessary, in accordance with Permit
13 Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 14.3.1.1.

14 **7.7 Facility/Building Emergency Response Organization**

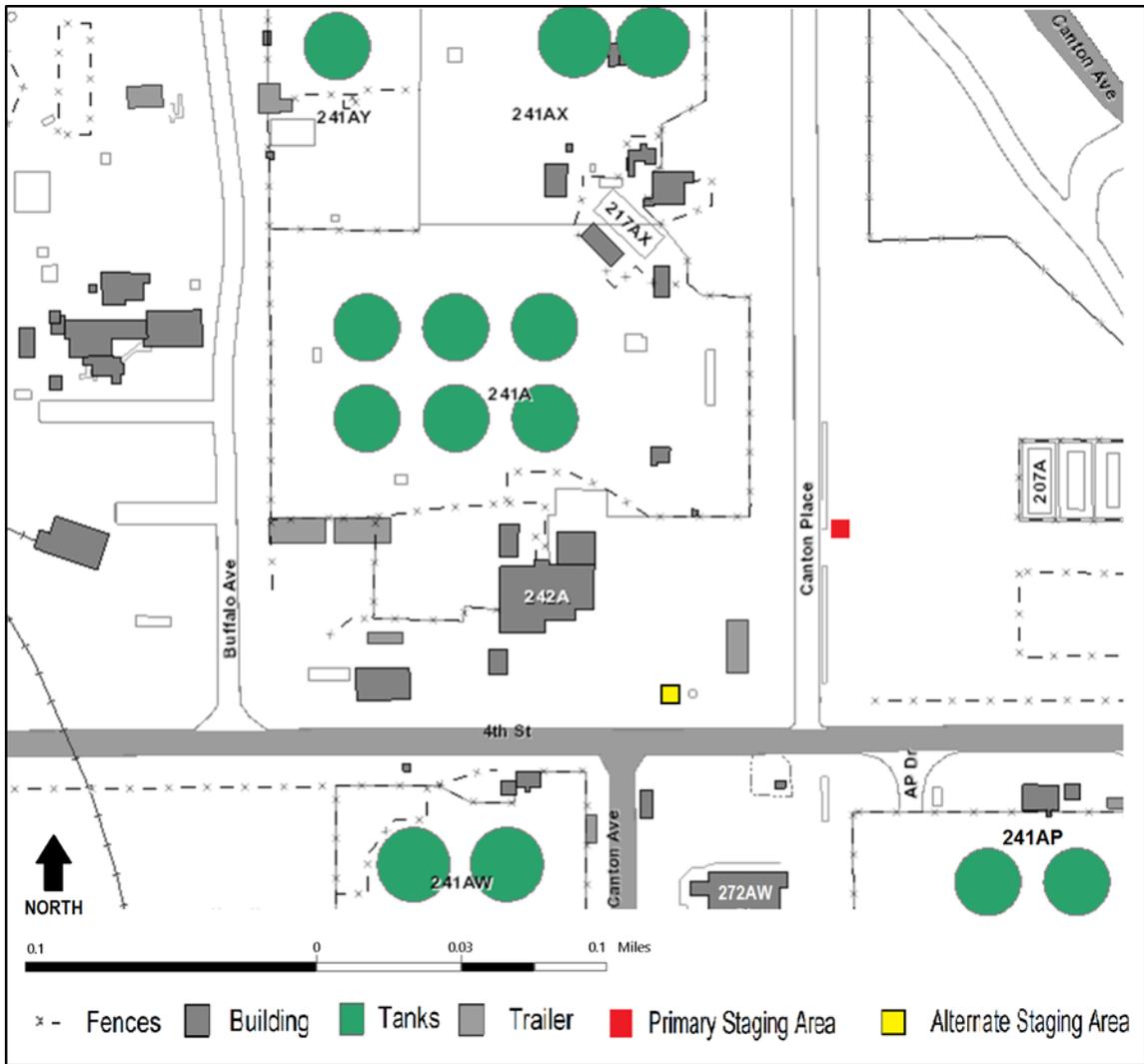
242-A Evaporator Building Emergency Directors			
	Title	Work Location	Work Phone
Primary	Central Shift Manager	200 Areas. Primary location is the Central Shift Office	373-2689
Alternate	Alternate BED	200 Areas	373-2689

15
16 Names and home telephone numbers of the BEDs are available from the POC (373-3800) in accordance
17 with Permit Condition II.A.4.



1
2

Figure 7.1. 242-A Evaporator Evacuation Routes



1
2

Figure 7.2. 242-A Evaporator Staging Areas

**325 HAZARDOUS WASTE TREATMENT UNITS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have a “**Last Modification Date**” which represents the last date the portion of the unit has been modified. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Last modification to 325 Hazardous Waste Treatment **June 20, 2019**

Addenda	Last Modification Date	Modification Number
Unit-Specific Conditions	06/20/2019	PCN-325-2019-01 (8C.2019.Q2)
A. Part A Form	07/2015	
B. Waste Analysis Plan	05/2014	
C. Process Information	05/2014	
D. Reserved		
E. Procedures to Prevent Hazards	05/2014	
F. Preparedness & Prevention	05/2014	
G. Personnel Training	04/26/2017	8C.2017.Q1
H. Closure Plan	05/23/2016	8C.2016.Q1
I. Inspection Requirements	05/2014	
J. Contingency Plan	06/20/2019	PCN-325-2019-01 (8C.2019.Q2)
Attachment to Addendum J – Building Emergency Procedure Applicability Matrix	06/20/2019	PCN-325-2019-01 (8C.2019.Q2)

This page intentionally left blank.

**325 HAZARDOUS WASTE TREATMENT UNITS
OPERATING UNIT GROUP 5 PERMIT CONDITIONS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
06/20/2019	PCN-325-2019-01 (8C.2019.Q2)
12/12/2018	PCN-325-2018-03 (8C.2018.Q4)
11/19/2018	PCN-325-2018-02 (8C.2018.Q4)
06/29/2018	8C.2018.1A (8C.2018.Q2)
06/11/2018	PCN-325-2018-01 (8C.2018.Q2)
02/20/2018	PCN-325-2017-01
04/26/2017	8C.2017.Q1
05/23/2016	8C.2016.Q1

This page intentionally left blank.

1
2
3
4
5

**OPERATING UNIT GROUP 5 PERMIT CONDITIONS
325 HAZARDOUS WASTE TREATMENT UNITS**

1
2
3
4
5

This page intentionally left blank.

1
2
3 **OPERATING UNIT GROUP 5 PERMIT CONDITIONS**
4 **325 HAZARDOUS WASTE TREATMENT UNITS**
5

6 **UNIT DESCRIPTION**

7 The 325 Hazardous Waste Treatment Units (HWTUs) store and treat dangerous and/or mixed waste in
8 containers and in a 1,218-liter tank. The 325 HWTUs consist of the Shielded Analytical Laboratory
9 (SAL) that includes Rooms 32, 200, 201, 202, and 203; the Cask Handling Area that includes portions of
10 Rooms 603 and 604A; the Truck Lock, Room 610; and the HWTU that includes Rooms 520, 524, and
11 528 of the 325 Building located in the south portion of the 300 Area. It also includes the nearby 3714 Pad
12 Area.

13 **LIST OF ADDENDA SPECIFIC TO OPERATING UNIT GROUP 5**

14 Addendum A Part A Form, dated August 2015
15 Addendum B Waste Analysis Plan, dated May 2014
16 Addendum C Process Information, dated May 2014
17 Addendum D Groundwater Monitoring, (Reserved)
18 Addendum E Procedures to Prevent Hazards, dated May 2014
19 Addendum F Preparedness and Prevention, dated May 2014
20 Addendum G Personnel Training, dated March 2017
21 Addendum H Closure Plan, dated March 2016
22 Addendum I Inspection Requirements, dated May 2014
23 Addendum J Contingency Plan, dated June 2019
24 Attachment to Addendum J Building Emergency Procedure Applicability Matrix, dated June 2019

25 **DEFINITIONS**

26 Reserved

27 **ACRONYMS**

28 Reserved

29 **III.5.A COMPLIANCE WITH UNIT-SPECIFIC PERMIT CONDITIONS**

30 **III.5.A.1** The Permittees will comply with all conditions in this Chapter and its addenda with
31 respect to dangerous and/or mixed waste management and dangerous waste management
32 units in 325 HWTUs, in addition to requirements in Permit Parts I and II.

33 **III.5.B GENERAL WASTE MANAGEMENT**

34 **III.5.B.1** The Permittees are authorized to accept dangerous and/or mixed waste that satisfies the
35 waste acceptance criteria in Addendum B according to the waste acceptance procedures
36 in Addendum B for storage in the 325 HWTUs.

37 **III.5.B.2** The Permittees are authorized to store and/or treat dangerous and/or mixed waste
38 physically located in the 325 HWTUs as of the effective date of this Permit, and wastes
39 accepted for storage or treatment pursuant to Permit Condition III.5.B.1.

- 1 **III.5.B.3** The Permittees will maintain the physical structure of the 325 HWTUs as documented in
2 Addendum C, Section C.1.4.1. [[Washington Administrative Code](#)
3 ([WAC](#)) 173-303-630(7)]
- 4 **III.5.B.4** The Permittees will conduct waste loading and unloading operations consistent with and
5 no less stringent than those practices described in Addendum F, Section F.2.1.
6 [[WAC](#) 173-303-395]
- 7 **III.5.C WASTE ANALYSIS**
- 8 **III.5.C.1** The Permittees will comply with requirements in Addendum B for waste analysis for all
9 dangerous and/or mixed waste managed at this unit. [[WAC](#) 173-303-300(5)]
- 10 **III.5.C.2** The Permittees will have an accurate and complete waste profile as described in
11 Addendum B, Section B.1.1.1.3 for every waste stream accepted by the 325 HWTUs.
12 [[WAC](#) 173-303-380(1)(a)(b)]
- 13 **III.5.C.3** The Permittees will place a copy of each waste profile required by Permit
14 Condition III.5.C.2 in the Hanford Facility Operating Record, 325 HWTUs file required
15 by Permit Condition II.I.1. [[WAC](#) 173-303-380(1)(a)(b)]
- 16 **III.5.C.4** The Permittees will comply with the requirements in Addendum C, Sections C.1.11, and
17 C.2.1.5, to prevent hazards from ignitable, reactive, or incompatible wastes.
18 [[WAC](#) 173-303-395(1)]
- 19 **III.5.C.5** The Permittees will make a copy of the waste profile required by Permit
20 Conditions III.5.C.2 available upon request. [[WAC](#) 173-303-380(1)(a) and (b)]
- 21 **III.5.D RECORDKEEPING AND REPORTING**
- 22 **III.5.D.1** The Permittees will place the following into the Hanford Facility Operating Record,
23 325 HWTUs file required by Permit Conditions II.I.1: [[WAC](#) 173-303-380]
- 24 **III.5.D.1.a** A description of and quantity of each dangerous and/or mixed waste accepted for storage
25 in the 325 HWTUs; [[WAC](#) 173-303-380(1)(a)]
- 26 **III.5.D.1.b** Records and results of any sampling or analysis of wastes accepted for storage at the
27 325 HWTUs, and from any other sampling and analysis required by Addendum B;
28 [[WAC](#) 173-303-380(1)(c)]
- 29 **III.5.D.1.c** Summary reports and details of all incidents that require implementation of Addendum J,
30 Contingency Plan according to the requirements of Permit Conditions [III.5.G.1](#);
31 [[WAC](#) 173-303-380(1)(d)]
- 32 **III.5.D.1.d** An inspection log, or a summary of such log, of inspections conducted pursuant to Permit
33 Conditions [III.5.H.1](#); [[WAC](#) 173-303-380(1)(e)]
- 34 **III.5.D.1.e** Records required by [WAC](#) 173-303-380(1)(k) and (o), incorporated by reference.
- 35 **III.5.E SECURITY**
- 36 **III.5.E.1** The Permittees will maintain security at the 325 HWTUs according to the requirements
37 in Addendum E, and in accordance with Permit Conditions II.M.
38 [[WAC](#) 173-303-310(2)(b)]
- 39 **III.5.E.2** The Permittees will post warning signs at all entrances to the 325 HWTUs.
40 [[WAC](#) 173-303-310(2)(a)]

- 1 **III.5.F PREPAREDNESS AND PREVENTION**
- 2 **III.5.F.1** The Permittees will comply with the Preparedness and Prevention requirements in
3 Addendum F. [[WAC 173-303-340](#)]
- 4 **III.5.G CONTINGENCY PLAN**
- 5 **III.5.G.1** The Permittee will comply with Addendum J, in addition to the requirements of Permit
6 Conditions II.A when applicable. Enforceable portions of Addendum J are identified in
7 Permit Addendum J, Page J-i. [[WAC 173-303-350](#)]
- 8 **III.5.H INSPECTIONS**
- 9 **III.5.H.1** The Permittee will perform inspections of the 325 HWTUs according to Addendum I,
10 Inspection Requirements. The inspection shall include:
- 11 **III.5.H.1.a** All monitoring equipment, safety and emergency equipment, security devices and
12 operating and structural equipment that help prevent, detect, or respond to hazards to the
13 public health or the environment. [[WAC 173-303-320\(2\)](#)]
- 14 **III.5.H.2** The inspection schedule required by Permit Conditions III.5.H.1 will provide the
15 frequency of inspection for specific items. The frequency should be based on the rate of
16 possible deterioration of equipment and the probability of an environmental or human
17 health incident. Areas subject to spills must be inspected daily when in use.
18 [[WAC 173-303-320\(2\)\(c\)](#)]
- 19 **III.5.H.3** The Permittee must remedy any problems revealed by inspections conducted pursuant to
20 Permit Conditions III.5.H.1, on a schedule that prevents hazards to the public health and
21 the environment. Where a hazard is imminent or has already occurred, remedial action
22 must be taken immediately. [[WAC 173-303-320\(3\)](#)]
- 23 **III.5.H.4** The Permittees will place a copy of the inspection requirements and schedule prepared
24 according to Permit Conditions III.5.H.1 in the Hanford Facility Operating Record,
25 325 HWTUs file required by Permit Conditions II.I.1. [[WAC 173-303-320\(2\)\(a\)](#)]
- 26 **III.5.H.5** The Permittee will keep an inspection log or summary of inspections conducted pursuant
27 to Permit Conditions III.5.H.1, including at a minimum the following:
- 28 **III.5.H.5.a** Date and time of the inspection;
- 29 **III.5.H.5.b** Printed name and the handwritten signature of the inspector;
- 30 **III.5.H.5.c** Notation of the observations made;
- 31 **III.5.H.5.d** An account of spills or discharges in accordance with Permit Conditions I.E.15.d, and the
32 date and description of any repairs or remedial actions taken.
- 33 **III.5.I TRAINING PLAN**
- 34 **III.5.I.1** The Permittee will include Addendum G training requirements in the written training plan
35 required by Permit Conditions II.C. [[WAC 173-303-330](#)]
- 36 **III.5.J OTHER GENERAL REQUIREMENTS**
- 37 **III.5.J.1** The Permittees will conduct waste management activities within 325 HWTUs authorized
38 by this Permit according to the requirements in Addendum F, Sections F.3.1, and F.3.2.
39 The Permittees will document compliance with these provisions in the Hanford Facility
40 Operating Record, 325 HWTUs file. [[WAC 173-303-395\(1\)\(a\)-\(c\)](#)]
- 41 **III.5.J.2** The Permittees will comply with the requirements of [WAC 173-303-395\(2\)](#), incorporated
42 by reference.

- 1 **III.5.K CLOSURE**
- 2 **III.5.K.1** The Permittees will close the 325 HWTUs in accordance with Addendum H, Closure
3 Plan. [[WAC 173-303-610\(4\)](#)]
- 4 **III.5.K.2** The Permittees will amend the Closure Plan in accordance with Permit Conditions II.J.3
5 and Addendum H. [[WAC 173-303-610\(3\)\(b\)](#)]
- 6 **III.5.K.3** The Permittees will provide Ecology with a Notice of Closure in accordance with
7 Addendum H. [[WAC 173-303-610\(3\)\(c\)](#)]
- 8 **III.5.L POST CLOSURE**
- 9 Reserved
- 10 **III.5.M CRITICAL SYSTEMS**
- 11 Reserved
- 12 **III.5.N RESERVED**
- 13 **III.5.O CONTAINERS**
- 14 **III.5.O.1** Container Storage Unit Standards
- 15 **III.5.O.1.a** The Permittees will maintain the integrity of container storage secondary containment as
16 documented in Addendum C, Sections C.1.4, and C.1.5, including all chemically resistant
17 coatings and sealants described in Addendum C, Section C.1.4.1, as necessary to ensure
18 any spills or releases do not migrate to the underlying concrete or soils.
- 19 **III.5.O.1.b** The Permittees will place documentation of any damage to and subsequent repairs of
20 chemically resistant coatings in the Hanford Facility Operating Record, 325 HWTUs file
21 required by Permit Conditions II.I.1. [[WAC 173-303-630\(7\)](#)]
- 22 **III.5.O.1.c** Within thirty (30) days of the effective date of this Permit, the Permittee will place
23 documentation in the Hanford Facility Operating Record, 325 HWTUs file identifying
24 the specific chemical resistant floor and wall coatings used for secondary containment in
25 the 325 HWTUs. This documentation will demonstrate that these materials are
26 impervious to the wastes managed in each of the 325 HWTUs cells to contain spills until
27 the collected material is detected and removed. [[WAC 173-303-630\(7\)\(a\)\(i\)](#)]
- 28 **III.5.O.2** Container Management Standards
- 29 **III.5.O.2.a** The Permittees are authorized to manage containerized wastes at the 325 HWTUs
30 according to the requirements of Addendum C, Section C.1.2. [[WAC 173-303-630\(2\)](#)]
- 31 **III.5.O.2.b** The Permittees will store containers according to the waste segregation and storage
32 arrangements specified in Addendum C, and the hazard class assigned as part of the
33 waste acceptance process required by Addendum B. [[WAC 173-303-630\(7\)](#),
34 [WAC 173-303-395\(2\)](#)]
- 35 **III.5.O.2.c** In addition to storage capacity limitations specified elsewhere in this Chapter, the
36 Permittees will ensure that the storage limits for flammable liquids, combustible liquids,
37 combustible fibers, flammable gasses and liquefied flammable gasses identified in
38 [WAC 173-303-630\(8\)\(b\)](#) are not exceeded at any time. In addition, the Permittees will
39 ensure the capacity limitation for explosive waste in [WAC 173-303-630\(8\)\(a\)](#) is not
40 exceeded at any time. [[WAC 173-303-630\(8\)](#)]

- 1 **III.5.O.2.d** The Permittees will label containers according to the requirements of Addendum C,
2 Section C.1.3. The Permittees will also ensure that:
- 3 **III.5.O.2.d.i** Container labels are not obscured or are otherwise unreadable;
- 4 **III.5.O.2.d.ii** Container labels are not obscured, removed, or otherwise unreadable in the course of
5 inspection;
- 6 **III.5.O.2.d.iii** Container labels are removed or completely obscured when the container to which they
7 are attached is rendered empty. [[WAC 173-303-630\(3\)](#)]
- 8 **III.5.O.2.e** The Permittees will ensure wastes are compatible with containers in which they are
9 managed and with other wastes stored at the 325 HWTUs according to the requirements
10 Addendum C, Section C.1.11, and Addendum F, Section F.3.2. [[WAC 173-303-630\(4\)](#),
11 [WAC 173-303-630\(9\)](#)]
- 12 **III.5.O.2.f** The Permittees will comply with the requirements for managing wastes in containers in
13 [WAC 173-303-630\(5\)\(a\)](#) and (b), incorporated by reference.
- 14 **III.5.O.2.g** The Permittees will ensure the physical arrangement and spacing of containers within the
15 325 HWTUs satisfies the following requirements. [[WAC 173-303-630\(5\)\(c\)](#)]
- 16 **III.5.O.2.g.i** The Permittees will comply with the requirements for waste stored in cells, storage
17 cabinets and shelves, as documented in Addendum C, Section C.1.2;
- 18 **III.5.O.2.g.ii** The Permittees will ensure the physical arrangement and spacing of drums that are stored
19 in the 325 HWTUs are stored in rows no more than two drums wide and with a
20 separation of at least thirty (30) inches between rows of drums to ensure that all drums
21 are readily accessible for movement and inspection. [[WAC 173-303-630\(5\)\(c\)](#),
22 [WAC 173-303-340\(3\)](#)]
- 23 **III.5.O.2.h** The Permittees will remove any accumulated liquids from container storage areas in the
24 325 HWTUs, including individual secondary containment systems (spill pallets, portable
25 booms, or other commercially available drum containment systems) that may be used to
26 ensure containers are not in contact with free liquids and to prevent overflow of the
27 container storage area secondary containment. [[WAC 173-303-630\(7\)](#)]
- 28 **III.5.O.2.i** The Permittees may treat wastes in containers via consolidation of wastes, decanting of
29 free liquids and addition of absorbents. Absorbents must satisfy the requirements of
30 [WAC 173-303-140\(4\)\(b\)\(iv\)](#), incorporated by reference, for wastes to be land disposed in
31 Washington. The Permittees may not use addition of absorbents for purposes of
32 changing the treatability group of a waste with respect to the land disposal restriction
33 standards of [40 Code of Federal Regulations 268](#), incorporated by reference by
34 [WAC 173-303-140](#).
- 35 **III.5.O.2.j** Waste stored in the SAL and the Cask Handling Area is exempt from [WAC 173-303-692](#),
36 as those units are used exclusively to manage mixed waste. The Permittees will comply
37 with the requirements for air emissions from containers in Addendum C, Section C.3 for
38 waste stored in the other portions of the 325 HWTUs. [[WAC 173-303-692](#)]
- 39 **III.5.O.3** Container Storage Inspection Requirements
- 40 **III.5.O.3.a** The Permittee will inspect the 325 HWTUs according to Addendum I, Inspection
41 Requirements. [[WAC 173-303-630\(6\)](#)]
- 42 **III.5.O.3.b** The Permittees will comply with the requirements of [WAC 173-303-395\(1\)\(d\)](#),
43 incorporated by reference. [[WAC 173-303-395\(1\)\(d\)](#)]

- 1 **III.5.P TANK SYSTEMS**
- 2 **III.5.P.1** The Permittees will develop, maintain, and follow a written schedule and requirements
3 for conducting integrity assessments. The schedule will meet the requirements of
4 Addendum C, Section C.2.1.1.2 and consideration of the following factors:
- 5 **III.5.P.1.a** Results of past integrity assessments;
- 6 **III.5.P.1.b** Age of the tank system(s);
- 7 **III.5.P.1.c** Materials of construction of each tank system, including any liners;
- 8 **III.5.P.1.d** Characteristics of the wastes managed by each tank system;
- 9 **III.5.P.1.e** Any other relevant factors. [[WAC 173-303-640\(2\)\(e\)](#)]
- 10 **III.5.P.2** The Permittees will maintain a copy of the schedule required by Permit
11 Condition III.5.P.1 in the Hanford Facility Operating Record, 325 HWTUs file, and
12 conduct periodic integrity assessments according to the schedules and requirements of the
13 schedule. If results of these assessments indicate a tank has structural deficiencies or
14 lacks integrity such that it may collapse, rupture or fail, the Permittees must follow the
15 requirements of [WAC 173-303-640\(7\)](#), incorporated by reference.
16 [[WAC 173-303-640\(2\)\(e\)](#)]
- 17 **III.5.P.3** If the findings of an integrity assessment conducted pursuant to Permit Condition III.5.P.1
18 indicate a tank has structural deficiencies or lacks integrity such that it may collapse,
19 rupture or fail, the Permittees will evaluate the waste acceptance criteria in Addendum B,
20 the applicable tank design and/or operating requirements in Addendum C, and any other
21 Permit requirements which may reasonably influence the integrity of the tank in question.
22 Based on this review, the Permittees will request the required Permit modifications in
23 accordance with Permit Conditions I.C.3 to minimize any adverse effects of future waste
24 management activities on the integrity of the tank. [[WAC 173-303-640\(2\)\(d\)](#),
25 [WAC 173-303-815\(2\)\(b\)](#)]
- 26 **III.5.P.4** Tank System Operating Requirements
- 27 **III.5.P.4.a** The Permittees will comply with the requirements of [WAC 173-303-640\(5\)\(a\)](#),
28 incorporated by reference.
- 29 **III.5.P.4.b** The Permittees will comply with the requirements of Addendum C, Section C.2.1.2.4.
30 [[WAC 173-303-640\(5\)\(b\)](#)]
- 31 **III.5.P.4.c** The Permittees will comply with the requirements of Addendum C, Section C.2.1.4.
32 [[WAC 173-303-640\(5\)\(d\)](#)]
- 33 **III.5.P.4.d** The Permittees will comply with the requirements of [WAC 173-303-640\(7\)](#), incorporated
34 by reference, in response to spills or leaks from tank systems at Operating Unit Group 5.
35 [[WAC 173-303-640\(5\)\(c\)](#)]
- 36 **III.5.P.4.e** The Permittees will comply with the requirements of [WAC 173-303-640\(10\)](#),
37 incorporated by reference.
- 38 **III.5.P.5** Tank System Inspection Requirement
- 39 **III.5.P.5.a** The Permittees will inspect the Operating Unit Group 5 tank systems authorized by
40 Permit Condition [III.5.B.2](#) according to Addendum I, Inspection Requirements.
41 [[WAC 173-303-640\(6\)\(a\)-\(c\)](#)]

- 1 **III.5.P.5.b** The Permittees will place documentation of inspections conducted pursuant to Permit
2 Condition [III.3.P.5.a](#) in the Hanford Facility Operating Record, 325 HWTUs file required
3 by Permit Condition II.I.1. These records will contain the following information:
4 [\[WAC 173-303-640\(6\)\(d\)\]](#)
- 5 **III.5.P.5.b.i** Date and time of the inspection
- 6 **III.5.P.5.b.ii** Printed name and the handwritten signature of the inspector
- 7 **III.5.P.5.b.iii** Notation of the observations made
- 8 **III.5.P.5.b.iv** Date and description of any repairs or remedial actions taken, and/or the scheduled date
9 for the repairs or remedial actions.
- 10 **III.5.P.5.c** The Permittees will remedy any problems revealed by the inspections required by
11 Permit Condition III.3.P.9, on a schedule that prevents hazards to the public health and
12 environment. Where a hazard is imminent or has already occurred, remedial action must
13 be taken immediately. [\[WAC 173-303-640\(6\)\(d\)\]](#)
- 14 **III.5.P.6** Approved Waste and Storage Limits
- 15 **III.5.P.6.a** Subject to conditions in Addendum C, the Permittees may store a maximum of
16 1,218 liters of dangerous and/or mixed waste in the tank system in the 325 HWTUs
17 (S02). A maximum of 1,218 liters per day of dangerous and/or mixed waste may be
18 treated in tanks in the 325 HWTUs (T01).
- 19 **III.5.P.6.b** The Permittees shall only store or treat in the SAL tank the following mixed waste listed
20 in the Dangerous and Mixed Waste Tank System:
- 21 **III.5.P.6.b.i** Dangerous and/or mixed waste generated by Pacific Northwest National Laboratory; or
- 22 **III.5.P.6.b.ii** Mixed waste generated at other Hanford Facility locations and mixed waste generated
23 from offsite facilities, which have been transferred and accepted by the 325 HWTUs
24 pursuant to the provisions in Addendum B, Waste Analysis Plan, and this Permit.
- 25 **III.5.P.7** Tank System Design and Construction
- 26 **III.5.P.7.a** Tank System Installation and Certification will be retained by the Permittees and made
27 available upon request.
- 28 **III.5.P.8** Integrity Assessments
- 29 **III.5.P.8.a** Results of the integrity assessments shall be included in the Hanford Facility Operating
30 Record, 325 HWTUs File until final closure and corrective action are complete and
31 certified.
- 32 **III.5.P.8.b** Any tank system, including its secondary containment system, found to be leaking, or
33 otherwise unfit for service, immediately shall be removed from service and the
34 Permittees shall comply with the requirements of [WAC 173-303-640\(7\)](#). Such a tank
35 system, including its secondary containment system, shall not be returned to service until
36 the Permittees have obtained the required certification.
- 37 **III.5.P.8.c** The Permittees shall maintain the integrity of all containment systems for tank systems.
- 38 **III.5.P.9** Tank Management Practices
- 39 **III.5.P.9.a** The Permittees shall not place mixed wastes or treatment reagents in the tank system if
40 these could cause the tank, its ancillary equipment, or a containment system to rupture,
41 leak, corrode, or otherwise fail.

1
2
3
4
5

This page intentionally left blank.

Document Owner/Approval PT Saueressig	Author PT Saueressig
Concurrence JS Beck	ML Hayden
TL VanArsdale	EG Damberg
USQ/USQT/USI Reviewer/No. PT Saueressig	RPL-2019-1625
Equip. Cat. NA	

Table of Contents

1.0	General Information.....	4
1.1	Facility Name.....	5
1.2	Facility Location.....	5
1.3	Owner/Operator	6
1.4	Facility Description	6
1.5	Hanford Site Emergency Sirens/Alarms.....	6
1.6	Coordination Activities with Local Emergency Responders.....	7
1.7	Deviations from Technical Safety Requirements	8
2.0	Purpose of the Building Emergency Procedure	9
2.1	Distribution.....	9
2.2	Acronyms.....	9
2.3	Making Changes to the Building Emergency Procedure.....	10
3.0	Building Emergency Response Organization	11
3.1	Emergency Telephone Numbers.....	11
3.2	Building Emergency Response Organization	12
3.3	Building Emergency Response Organization - Emergency Operations Center Interface	13
3.4	Building Emergency Directors and Alternates	14
3.5	Incident Command Post Communicator.....	16
3.6	Assisting Communicator.....	16
3.7	Incident Command Post Recorder	17
3.8	Management Support Group Lead.....	17
3.9	Management Support Group Liaison.....	17
3.10	Staging Area Supervisor	17
3.11	Zone Wardens.....	18
3.12	Facility Operations Specialist	18
3.13	Hazard Communicator.....	18
3.14	Radiological Hazard Assessors.....	19
3.15	Chemical Hazard Assessors.....	19
3.16	Individual Staff Member.....	19
3.17	PNNL Incident Manager.....	20
3.18	Facility Visitors	20
3.19	Supervisors/Managers.....	20

3.20	Unique Program Laboratory Expertise	20
3.21	Waste Management Staff.....	20
3.22	Environment, Safety, and Health Advisor	21
3.23	Line Management	21
3.24	New Staff Assigned to 325RPL.....	21
4.0	Implementation of the Building Emergency Procedure	22
5.0	Facility Hazards	24
5.1	Hazardous Materials	24
5.2	Physical (Industrial) Hazards.....	25
5.3	Dangerous (Hazardous) and Mixed Waste	25
5.4	Radioactive Materials	25
5.5	Criticality	25
6.0	Potential Emergency Conditions and Appropriate Response.....	26
6.1	Explosion/Fire/Fire Alarm.....	26
6.2	Hazardous Material/Dangerous or Mixed Waste Spill	28
6.3	Unusual, Irritating or Strong Odors	31
6.4	Potential Radiological Material Release.....	32
6.5	Criticality and Criticality Safety Limit Violations.....	33
6.6	Loss of Electrical Power/Reduced Ventilation	35
6.7	Natural Phenomena Events	36
6.8	Bomb Threats/Suspicious Objects	36
6.9	Active Shooter in the Building	38
6.10	Notice of a PNNL Lockdown	38
6.11	Declared Emergency in the 300 Area.....	38
7.0	Facility Take Cover – Shutdown of Heating, Ventilation, and Air-Conditioning System.....	39
8.0	Utility Disconnects.....	40
8.1	Electrical	40
8.2	Potable/Process Water	40
8.3	Gas Supplies	40
8.4	Steam	40
8.5	Air	40
8.6	Compressed Air	40
8.7	Ventilation	40
8.8	Fire Protection Supply Water	41
8.9	Dry Pipe Butterfly Valve (Riser 6).....	41
8.10	325RPL Ramp Sump Pump	41
8.11	325RPL Decontamination Shower and Sink	42
9.0	Termination, Incident Recovery, and Restart.....	43

9.1	Termination.....	43
9.2	Recovery.....	43
9.3	Restart.....	44
10.0	Emergency Equipment.....	46
10.1	Portable Emergency Equipment.....	46
10.2	Fire Control Equipment.....	46
10.3	Communications Equipment/Warning Systems.....	46
10.4	Personal Protective Equipment.....	47
10.5	Spill Control and Containment Supplies.....	47
11.0	Evacuation of Persons and Visitors.....	49
12.0	Emergency Action Levels.....	50
12.1	300 Area Protective Actions.....	50
	300 Area Offsite Protective Actions and Recommendations.....	51
12.2	325RPL Emergency Action Levels.....	51
13.0	References and Source Requirements.....	52
13.1	References (<i>as revised</i>).....	52
13.2	Source Requirements (<i>as amended</i>).....	52
13.3	Emergency Preparedness Checklists (<i>as revised</i>).....	53
14.0	Attachments.....	54
	Attachment 1 – Emergency Equipment and Evacuation Routes 1 st Floor.....	55
	Attachment 2 – Emergency Equipment and Evacuation Routes 2 nd Floor.....	56
	Attachment 3 – Emergency Equipment and Evacuation Routes Mezzanine and Basement.....	57
	Attachment 4 – Zone Warden Map – 1 st Floor.....	58
	Attachment 5 – Zone Warden Map – 2 nd Floor.....	59
	Attachment 6 – Zone Warden Map- Mezzanine and Basement.....	60
	Attachment 7 – 325RPL Staging Area Map.....	61
	Attachment 8 – 325RPL Alternate Staging Area.....	62
	Attachment 9 – Location of 325RPL in the 300 Area.....	63

1.0 General Information

The 325 Building/Radiochemical Processing Laboratory (325RPL) Building Emergency Procedure (BEP) has been designed to provide information necessary to minimize risks to personnel, facilities, programs, and the environment in the event of an emergency. This procedure applies to all resident staff, visitors, vendors, contractor, and subcontractor personnel. If an event is of a security nature (e.g., bomb threat, hostage situation, or other act of violence), security procedures may supersede this procedure and will be assessed on a case-by-case basis.

This facility contains both radioactive and hazardous materials in operations, storage, and handling. 325RPL poses a possible significant hazard to adjacent facilities, personnel, programs, and the environment.

This BEP includes the contingency plans and emergency procedures for dangerous (hazardous) waste management activities as referenced by the following Washington Administrative Codes (WAC):

- WAC-173-303-201, “Preparedness, Prevention, Emergency Procedures and Contingency Plans for Large Quantity Generators”
- [WAC-173-303-340, “Preparedness and Prevention”](#)
- [WAC-173-303-350, “Contingency Plan and Emergency Procedures”](#)
- [WAC-173-303-360, “Emergencies”](#)

This plan must be implemented whenever an emergency threatens human health and the environment.¹

Emergencies may arise from, but are not limited to, the following:

- fire
- explosion
- loss of service systems
- medical emergency
- bomb threats
- criticality
- criminal activity
- incidents at other facilities
- natural hazards or natural forces
- spill/release to the environment requiring assistance
- hazardous materials release.

Expected responses are those actions which are intended to minimize the effects of a situation while providing optimum protection to personnel. Expected responses include notification to the Pacific Northwest National Laboratory (PNNL) Security Operations Center (SOC), Building Manager (BM), Building Emergency Response Organization (BERO), and personnel in the facility. This procedure also provides plans for notifying personnel to take safe actions such as “take cover,” “evacuate,” or other actions dictated by an event. The procedure provides for formal notification and reporting.

Other emergency response agencies available to assist the 325RPL Building Emergency Director (BED) and Incident Commander (IC) from offsite are described in U.S. Department of Energy Richland Operations Office (DOE/RL) 94-02, *Hanford Emergency Management Plan*, Section 3.0. **[WAC 173-303-350 (3)(d)]**

¹ Section 1.0, Paragraph 4: Permit requirement, Class 1 Modification 03/31/16

The 325RPL BED and alternate BEDs will receive annual training from PNNL Emergency Preparedness (EP).

PNNL policy is to provide for the safety of its staff, contractor/subcontractor personnel, visitors, and members of the public in case of an emergency incident. PNNL line management has the responsibility to execute this policy and to see that all staff understands their own responsibilities and actions to be taken in an emergency. Every staff member is responsible for using the appropriate safety instructions and procedures and remaining alert to unsafe conditions or acts while performing his or her job. All personnel are responsible for responding to emergency conditions to minimize adverse impacts.

In the event of an emergency condition in the facility, members of the 325RPL BERO will perform his or her duties as described in this procedure. Specific emergency actions for response to events will be applicable as specified in this BEP. Those BERO members whose assistance is needed to mitigate a lesser event will be notified by telephone or personal contact by the 325RPL BED or delegate. Occupants of the facility who are not members of the BERO shall follow the standard PNNL Emergency Preparedness requirements in the [How Do I...?](#) (HDI) work control, [Basic Staff Practices](#).

BERO members will use checklists during an incident. 325RPL BERO checklists comply with DOE-0223 RLEP 1.1 and are updated by the EP Program as necessary, once changes have been received from the Hanford Site Emergency Preparedness Program.

The building fire alarm or criticality alarms are the primary means of evacuation and notification for full activation of the BERO. Emergency telephone numbers are listed in Section 0.

This procedure will be reviewed at least annually and amended if necessary or whenever any of the following occurs. [WAC-173-303-350(5)]

- The applicable regulations or the Hazardous Waste Treatment Unit (HWTU) permit is revised.
- The procedure fails in an emergency.
- The facility changes in a manner that materially increases or decreases the potential for fire, explosion, or release of hazardous waste or hazardous waste constituents, or in any way that changes the response necessary in an emergency.
- The emergency coordinating personnel list changes.
- The emergency equipment list changes.²

1.1 Facility Name

Name	325 Building/Radiochemical Processing Laboratory (325RPL)
Address	325 Cypress St., 300 Area, Richland, WA 99354
EPA Generator ID Number	WA 7890008967

1.2 Facility Location

325RPL is in the southern portion of the 300 Area, north of Cypress Street.

² Section 1.0, Paragraph 11: Permit Requirement, Class 1 Modification 09/30/15

1.3 Owner/Operator

325RPL is owned and operated by the DOE and co-operated by PNNL. The 325RPL Manager is the senior line manager in the 325RPL and has overall responsibility for all aspects of operations in the facility. The 325RPL BM reports directly to the 325RPL Manager and supports operations and maintenance in the facility. The 325RPL BM is also the primary 325RPL BED.

1.4 Facility Description

The 325RPL Complex, as referred to in this BEP, consists of the following:

- 325RPL (Building)
- 325RPL Filter Building
- East Storage Yard located east of the 325RPL
- North Storage Pad located north of the 325RPL.

The 325RPL houses laboratories and specialized facilities including general-purpose chemical laboratories, the High Level Radiochemistry Facility (HLRF), the Shielded Analytical Laboratory, fissionable material storage areas, and 325RPL HWTU. The general-purpose laboratories characterize fuel, single- and double-shell tank waste, environmental samples, fusion/tritium samples, and other wastes. The radiochemistry facility includes areas for gloveboxes, hot cells, cask handling, storage, and isolation of isotopes for unique applications like medical use. Analytical laboratory operations are conducted on small amounts of highly radioactive materials such as samples of single-shell tank waste. The HWTU treats hazardous, mixed, low-level radioactive, and transuranic waste.

The 325RPL Filter Building is located on the northwest corner of the main 325RPL building and houses the final stage high-efficiency particulate air filters and the main exhaust fans.

The East Storage Yard is a fenced enclosure adjacent to the east side of the 325RPL and is designated as an outdoor Radioactive Material Area (RMA).

The North Storage Pad is the foundation pad of the former 328 Building and will be designated as an outdoor RMA.

NOTE: Footnotes in this document note the provisions in the BEP that are subject to Resource Conservation and Recovery Act (RCRA) Permit# WA7890008967. These actions in the BEP implement RCRA permit requirements.

1.5 Hanford Site Emergency Sirens/Alarms³

NOTE: Some signals may not be applicable to the building; however, they may be heard in other parts of the Hanford Site. In the event of “take cover” alarm, the BERO will respond to the 325RPL lunchroom/lobby area for 325RPL BED direction.

³ Section 1.5: Permit Requirement, Class 1 Modification 03/31/16

Hanford Site Emergency Sirens/Alarms		
Signal	Meaning	Actions
Slow whoop followed by a voice message	Fire/Evacuation	Vacate building and proceed to staging area.
Steady tone on whistle, or siren	Area Evacuation	Vacate building and proceed to staging area. Personnel in vehicles shall proceed to the nearest occupied facility and report to the Staging Area Supervisor (SAS).
Wavering siren or short blasts on whistle or siren	Take Cover (Shelter)	Proceed to shelter or stay indoors. Close all exterior doors, turn off all intake ventilation (only if it can be done safely), and notify manager of whereabouts. Personnel in vehicles shall proceed to the nearest occupied facility and report to facility management. Staff should refrain from eating and drinking during a take cover event if physically able, until an appropriate evaluation of the event can be made.
AH-OO-GAH horn (howler) or flashing blue light (in high-noise areas)	Nuclear Criticality	Leave the building immediately (walk with purpose) through the closest exit, do NOT stop for a survey and get at least 15 feet of separation from the facility. Maintain a minimum of 15 feet distance during relocation to the primary staging area.
Variable color (red, amber) light with ringing bell or whistle	Airborne Radioactivity or Area Radiation Monitor	Stop work activities, immediately exit the area, and notify radiological control personnel.
Communicator Notification System (CNS), telephone call/text displayed from 375-2124	PNNL Emergency Communications	Lift receiver, say “HELLO,” listen to the message, and follow the actions designated.
Telephone Notification System	Hanford Site Emergency Communications	Lift receiver, say “HELLO,” listen to the message, and follow the actions designated. NOTE: This system is only applicable to facilities on the Hanford Site (i.e., 300/600 Areas).

1.6 Coordination Activities with Local Emergency Responders⁴

Interfaces and coordination with offsite agencies are in the planning, preparedness, response, and recovery elements of the Hanford Emergency Management Program. The DOE has developed and maintains agreements to formalize areas of understanding, cooperation, and support with offsite agencies. These agreements are applicable to all Hanford facilities, including the 325RPL. Summaries of these Memorandum of Agreements are given in DOE/RL 94-02, Table 3-1.

⁴ Section 1.6: Permit Requirement, Class 1 Modification 03/31/16

1.7 Deviations from Technical Safety Requirements

Emergency actions that depart from approved Technical Safety Requirements (TSR) may be taken when no actions consistent with the TSRs are immediately apparent, and when these actions are needed to protect workers, the public, or the environment from imminent and significant harm.

Such actions shall be approved, as a minimum, by the 325RPL BM, the 325RPL Manager, or the 325RPL BED. If emergency actions are taken, verbal notifications shall be made to the Pacific Northwest Site Office (PNSO) within two hours and by written reports to the DOE Headquarters within 24 hours. **[TSR AC 5.11]**

2.0 Purpose of the Building Emergency Procedure

This procedure describes the processes and information necessary in the event of an emergency for the 325RPL BERO members to react to the emergency and to perform the following actions:

- Maximize safety, minimize risk to life, and provide prompt efficient treatment for injured persons.
- Provide all members of the BERO with an understanding of their roles and responsibilities in the event of an emergency.
- Minimize the effects on the health and safety of personnel, property, the environment, programs, and the public.
- Provide prompt internal and external notifications to the responsible authorities.

2.1 Distribution

At a minimum, controlled document copies of this BEP will be located as follows:

- BED emergency response bag
- BM file
- 325RPL HWTU's Operating Records⁵
- Emergency Preparedness (EP) Program Office
- PNNL SOC
- Hanford Emergency Operations Center (EOC) (Hanford Site facilities only)
- Management Support Group (MSG) emergency response bags
- Alternate Incident Command Post (ICP).

2.2 Acronyms

[See PNNL Abbreviations & Acronyms](#)

325RPL	325 Building Radiochemical Processing Laboratory
BED	Building Emergency Director
BEP	Building Emergency Procedure
BERO	Building Emergency Response Organization
BM	Building Manager
CAA	Central Accumulation Area
CHA	Chemical Hazard Assessors
CNS	Communicator Notification System
CSM	Cognizant Space Manager
DOE	U.S. Department of Energy
DSA	Documented Safety Analysis
EAL	Emergency Action Levels
ECR	Environmental Compliance Representative
EIP	Emergency Information Posting
EOC	Emergency Operations Center
EP	Emergency Preparedness
EPA	Environmental Protection Agency (EPA Generator Identification Number)
ESM	electronic storage media
FOS	Facility Operations Specialist
FSR	Facility Services Representative

⁵ Section 2.1, Bullet 4: Permit Requirement, Class 1 Modification 03/31/16

HDI	How Do I?
HFD	Hanford Fire Department
HLRF	High Level Radiochemistry Facility
HWTU	Hazardous Waste Treatment Unit
IC	Incident Command
ICP	Incident Command Post
IM	Incident Manager
IOPS	Integrated Operations System
LA/LAI	Limited Area/Limited Area Island
MSG	Management Support Group
NA	Not Applicable
PCM	Personnel Contamination Monitor
PNNL	Pacific Northwest National Laboratory
PNSO	Pacific Northwest Site Office
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RHA	Radiological Hazard Assessor
RMA	Radiological Material Area
RPT	Radiological Protection Technician
SAA	Satellite Accumulation Area
SAS	Staging Area Supervisor
SME	Subject Matter Expert
SOC	Security Operations Center
TDP	Testing Designated Position
TNS	Telephone Notification System
TSD	Treatment Storage Disposal
TSR	Technical Safety Requirements
WAC	Washington Administrative Code

2.3 Making Changes to the Building Emergency Procedure

PNNL-MA-110, *PNNL Emergency Management Plan*, requires the BED to keep the EP program manager advised of any changes to the BEDs. This may be accomplished by memo or email. The Waste Management Subject Matter Expert is also required to be notified before any changes are made to the BEP.

To request revisions to this procedure, refer to ADM-001, *Document Management*.

3.0 Building Emergency Response Organization

3.1 Emergency Telephone Numbers

In the event of an emergency, specific detailed facility information may be needed. Knowledge of the building, utilities, and radiation hazards can be obtained from the staff listed in the following table. Contact the PNNL SOC at 375-2400 if unable to contact any of these staff members using the numbers provided. **[WAC-173-303-350(3)(d)]**

Any Emergency – PNNL Security Operations Center (SOC): 375-2400				
NOTE: With the appropriate approval, BED home addresses can be obtained at the PNNL SOC.				
Responsibility	Name	Office	Home	Cell
*BED⁶	Paul Saueressig	375-5352		619-3873
*BED1	Dan Wandler	375-5179		438-1053
*BED2	Eric Hanson	375-5351		713-0860
Additional Management Contacts				
Utility Operations Work Team Lead	TJ Vanderlinden	375-2829		521-8024
Nuclear Operations Work Team Lead	Don Cravens	375-5398		948-1053
Fire Protection Engineer	Karl Bohlander	371-7895		366-0188
Safety and Health Representative	Richard Davis	371-7776		521-0505
Lead MSG	Eric Damberg	371-7904		430-6226
EOC RPL Tech Representatives				
	Karl Pool	375-5246		947-4777
	Franciska Steen	375-5546		
	Don Bachand	375-5255		
Hazardous Waste Management Areas				
Satellite and Central Accumulation Areas	Chuck White	372-4497		551-6004
325 HWTUs TSD	Trevor VanArsdale	375-3814		531-6441
Environmental Compliance Representative	John Holland	375-5002		521-1211
Alternate ICP:	350 Building/Room 111	375-7565		
Environmental Support Contact (regulatory notifications only)		375-2400		375-2154
Hanford Fire Department		375-2400 or 373-0911		
Medical and First Aid		375-2400		
Hazardous Materials Response Team (Benton-Franklin County Hazardous Material Response Team)		375-2400		
Ambulance Services		375-2400		
Police Department		375-2400		
Hanford Patrol		373-3800		
PNNL Duty Officer(s) and PNNL Information Line		375-2154		
Off-Normal Event Reporting		375-2400		
Work-related injury/illness of a non-emergency nature: PNNL Occupational Health Clinic, LSB 1st Floor, Section E		371-7848		

* These are Testing Designated Positions (TDPs) per HDI Exhibit, Perform Substance Abuse Testing. Any changes to these positions require coordination through the TDP Administrator.

⁶Section 3.1, BED Information: Permit Requirement, Class 1 Modification 03/31/16. See Permit Condition II.A.4.

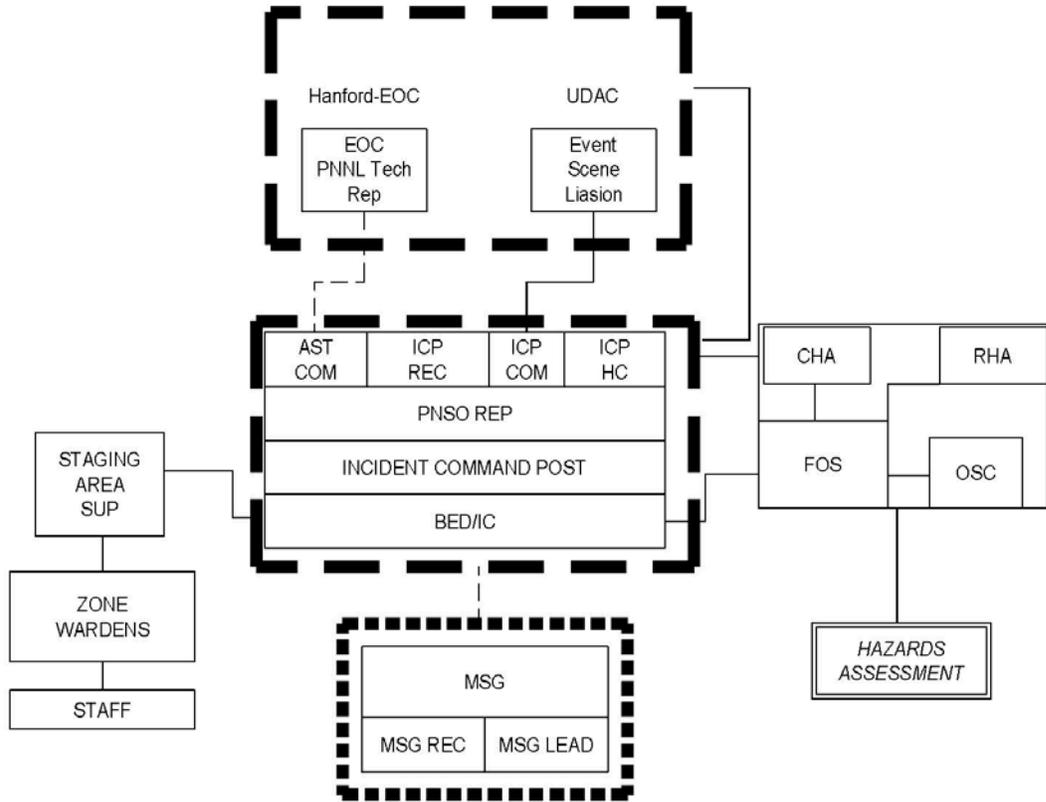
3.2 Building Emergency Response Organization

The 325RPL BERO is an emergency response organization with clearly defined responsibilities. The BERO consists of pre-designated and trained individuals assigned to emergency response activities associated with the 325RPL. In addition, other positions and personnel in the 325RPL have responsibilities associated with emergency responses, preparedness, and notifications.

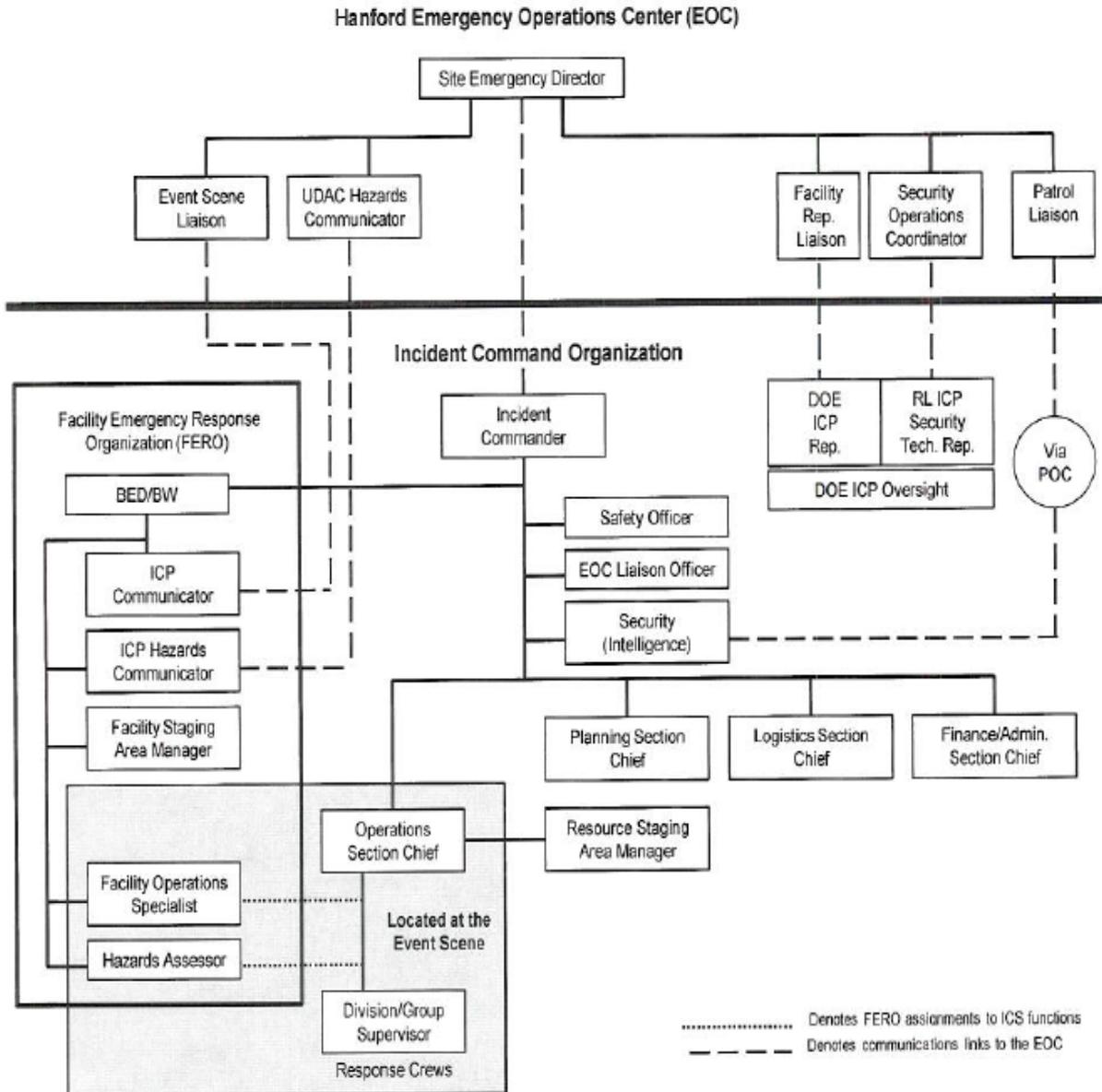
BERO Position	Primary Responder	1st Alternate	2nd Alternate
*Incident Command Post Communicator	Danny Schoepflin Work: 375-7216 Cell: 430-5437	Rick Hermann Work: 372-6903 Cell: 430-3288	Jake Bohlke Work: 375-5553 Cell: 303-9613
Assisting Communicator	Wayne Moore Work: 371-6689 Cell: 521-2263	Matt Kosmos Work: 375-2970 Cell: 492-1332	Troy Nietschmann Work: 372-4986 Cell: 919-270-3461
Chemical Hazards Assessor	Richard Davis Work: 371-7776 Cell: 521-0505	Jason Sweesy Work: 372-4122 Cell: 438-4974	Doug Falk Work: 371-7097 Cell: 308-9101
Incident Command Post Hazards Communicator	Bob Free Work: 375-5597 Cell: 521-5961	Marilyn Wirth Work: 372-4046 Cell: 724-413-1951	Terry Milham Work: 375-5007 Cell: 539-3910 Home: 627-0200
Radiological Hazards Assessor	Holly Black-Kania Work: 371-6930 Cell: 539-7283	Jenny Martin Work: 375-5006 Cell: 374-7581 Home: 628-0561	Tim Snider Work: 375-5355 Cell: 308-9799
Incident Command Post Recorder	Kathy Hall Work: 375-5346 Cell: 948-1213	Crystal Rosales Work: 375-5078	Rosie Garza Work: 375-5333
*Facility Operations Specialist	Dan Wandler Work: 375-5179 Cell: 438-1053	Matt Kosmos Work: 375-2970 Cell: 492-1332	Jake Bohlke Work: 375-5553 Cell: 303-9613
Staging Area Supervisor	Victor Saucedo Work: 375-5547 Cell: 396-8889	Katrina Walker Work: 375-2487	Kate Moran Work: 375-6554 Cell: 636-443-5583
PNSO Facility Representative	Derek Wright Work: 372-4100 Cell: 392-9872 Home: 803-640-3605	Jeff Carlson Work: 372-4750 Cell: 539-2044 Home: 582-9769	Rob Yasek Work: 372-4023 Cell: 554-4471 Home: 371-8105

** These are TDPs per HDI subject area Workplace Substance Abuse. Any changes to these positions require coordination through the TDP Administrator.*

3.3 Building Emergency Response Organization - Emergency Operations Center Interface



Legend			
AST	Assisting	IH	Industrial Hygenist
BED	Building Emergency Director	MSG	Management Support Group
CHA	Chemical Hazards Assessor	OSC	Operations Section Chief
COM	Communicator	REC	Recorder
CONT	Contractor	REP	Representative
EOC	Emergency Operations Center	RHA	Radiological Hazards Assessor
FOS	Facility Operations Specialist	SUP	Supervisor
HC	Hazards Communicator	UDAC	Unified Does Assessment Center
IC	Incident Commander		
ICP	Incident Command Post		



3.4 Building Emergency Directors and Alternates

The BED has the responsibility for the welfare and safety of the building personnel and for directing efforts to control, evaluate, and terminate the event if the building is the site of an event. The BED performs duties of the Emergency Coordinator as prescribed under WAC 173-303-360 until relieved by the IC and has the authority to commit the resources needed to carry out the BEP.

The BED manages facility operations and personnel during an emergency and is responsible for implementation of appropriate emergency procedures and their follow-up, 24 hours a day. The BED has

the authority to commit the resources necessary to carry out emergency plan activities.⁷ Activities include the following:

- directing configuration control over facility systems and components at the event scene
- activating the BERO
- assessing the event scene⁸
- allocating personnel to conduct facility-specific emergency response actions within the affected facility boundary (including acting as, or delegating duty as the Facility Operations Specialist (FOS) and taking appropriate protective actions in response to events occurring in other onsite geographic areas or adjacent facilities)
- categorizing the incident and notifying the PNNL Environmental Support Contact and/or the EOC Shift Office⁹
- communicating with the Environmental Protection and Regulatory Programs
- initiating activation of the MSG
- reviewing the Emergency Action Level (EAL) criteria (PNNL-EAL-325RPL, *Emergency Action Level Tables for the RPL*) and providing an initial EAL classification to the EOC Shift Office¹⁰
- directing implementation of initial preplanned area/site protective actions
- identifying an alternate staging area in the event of an extended building evacuation during adverse weather
- determining personnel accountability status
- performing the necessary steps in [EP-BED-325RPL, Building Emergency Director Checklist](#)
- verifying other BERO positions use checklists as appropriate
- verifying that preservation of evidence at the event scene is taken into consideration during the event
- developing and transmitting event reports to maintain accurate and complete records of events, decisions, and actions during an event
- verifying the appropriate alarms are sounded when necessary¹¹
- providing information and assistance to the responding agencies as requested to mitigate the event, including:
 - identifying the character, exact source, amount, and extent of any released materials
 - taking reasonable measures (e.g., stopping processes/operations, collecting/ containing released waste, removing/isolating containers) necessary to make sure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste

⁷ Section 3.4, Paragraphs 1 and 2: Permit Requirement, Class 1 Modification 09/30/15

⁸ Section 3.4, Paragraph 2, Bullet 3: Permit Requirement, Class 1 Modification 09/30/15

⁹ Section 3.4, Paragraph 2, Bullet 5: Permit Requirement, Class 1 Modification 09/30/15

¹⁰ Section 3.4, Paragraph 2, Bullet 8: Permit Requirement, Class 1 Modification 03/31/16

¹¹ Section 3.4, Paragraph 2, Bullet 16: Permit Requirement, Class 1 Modification 09/30/15

- monitoring for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment as appropriate¹²
- approving reentry and/or rescue operations
- arranging care for any injured persons and contacting their line management
- notifying the waste management subject matter expert (SME) of any planned changes to the BEP
- verifying hazardous spill/release events are logged in the HWTU operating records
- taking appropriate actions during adverse chemical conditions; see HDI Exhibit, [Respond to Spill or Adverse Chemical Condition](#)
- providing a thorough briefing to the Hanford Site emergency responder (e.g., Hanford Fire Department (HFD), Hanford Patrol)
- maintaining emergency equipment¹³
- verifying that the Environmental Support Contact will provide any necessary notifications to regulatory agencies, such as the Washington State Department of Ecology, and verifying that required written reports to regulatory agencies are completed within 15 days of event termination¹⁴
- performing an annual review and update of the 325RPL BEP
- planning, conducting, and documenting results of building emergency drills
- informing the EP program manager of any changes in 325RPL BEDs
- being thoroughly familiar with the following:
 - the 325RPL BEP
 - all operations and activities
 - locations and characteristics of waste handling
 - locations of all records
 - physical layout of the building and area of responsibility.¹⁵

3.5 Incident Command Post Communicator

The ICP Communicator conveys the event emergency classification to the EOC Shift Office by phoning the Patrol Operations Center at 911 or 373-0911 (cell) to initiate a conference telephone bridge between the Patrol Operations Center, EOC Shift Office, and ICP Communicator. This individual initiates and maintains a communication line between the Event Scene Liaison at the Hanford EOC and the ICP. As a precautionary measure, the BED makes sure that this position is staffed for all events. The ICP Communicator is responsible for completing [EP-ICPC, Incident Command Post Communicator Checklist for Hazardous Facilities](#).

3.6 Assisting Communicator

The Assisting Communicator provides assistance to the ICP Communicator as directed by:

¹² Section 3.4, Paragraph 2, Bullet 17: Permit Requirement, Class 1 Modification 09/30/15

¹³ Section 3.4, Paragraph 2, Bullet 24: Permit Requirement, Class 1 Modification 09/30/15

¹⁴ Section 3.4, Paragraph 2, Bullet 25: Permit Requirement, Class 1 Modification 03/31/16

¹⁵ Section 3.4, Paragraph 2, Bullet 29: Permit Requirement, Class 1 Modification 03/31/16

- keeping the IC and BED aware of all transmitted and received information
- maintaining a log of communications sent and received
- establishing and maintaining a communication line with the Technical Support Representative (376-1235) in the Hanford EOC and the ICP throughout the incident.

3.7 Incident Command Post Recorder

The ICP Recorder records, in a timeline format, event-related notifications and activities associated with the direction administered and information received at the ICP.

3.8 Management Support Group Lead

The MSG Lead assists the BED as requested.

NOTE: The MSG Lead function and alternates is a TDP in accordance with HDI Exhibit, [PNNL Workplace Substance Abuse Requirements and Protocol](#).

The MSG Lead convenes the appropriate staff to fill positions in the MSG as the incident requires. The MSG Lead notifies the PNNL Laboratory Director, other appropriate PNNL senior management, and PNSO. The MSG's purpose is to support the BED by being a resource for technical information, event mitigation strategies, event termination and recovery plans, and other support as directed or requested by the BED/IC. The coordination of support activities to the IC/ICP for a declared emergency on the Hanford Site is managed by the Hanford EOC.

A representative from PNSO has been established to coordinate with the MSG during large events. In smaller events, a PNSO Facility Representative coordinating with the BED will provide information and support to PNSO management regarding actions occurring at the event scene.

3.9 Management Support Group Liaison

The MSG Liaison reports to the ICP to facilitate communications between the BED/IC and the MSG. The MSG Liaison is responsible for the following:

- establishing phone communications with the MSG, as needed, to communicate with the MSG
- conveying BED/IC requests for MSG support to the MSG
- communicating information from the MSG to the BED, IC, and other appropriate BERO members.

3.10 Staging Area Supervisor

The SAS will direct all activities at the building staging area and is responsible for the following:

- assisting in personnel accountability by receiving the status of building occupancy from the Zone Wardens and then informing the BED of facility status with regard to personnel, or if help is needed to locate or account for missing personnel
- assisting in area evacuation and take cover
- assisting with communications
- supporting the BED as requested
- maintaining a log of their activities or assigning a recorder (also referred to as a scribe) to do so

- completing [EP-SAS-325RPL, RPL Staging Area Supervisor Checklist](#).

3.11 Zone Wardens

Zone Wardens provide the results of their accountability sweeps information to the BED via the SAS and assist in additional duties as determined by the BED. To accomplish this function, the Zone Wardens are responsible for the following:

- confirm that assigned zones have been vacated by staff and determine if aid and/or rescue is required
- aid those who need help in evacuating the building if it can be done safely
- report the occupancy status of the assigned zone and any additional observations to the SAS
- assist the SAS as requested
- maintain a familiarity with the BEP
- become knowledgeable of any staff in assigned zones that may require assistance in an emergency event.

NOTE: The function of the Zone Warden is to assist staff in evacuating the facility and reporting the occupancy status to the SAS. The function of Zone Wardens does not include search and rescue.

Zone Wardens should not enter any location in the facility where there are indications that a hazard may exist. The indications include such things as visible smoke, fire, unusual odors, local alarms, criticality alarms, spilled chemicals, and incapacitated personnel.

If a Zone Warden is not in the facility when the evacuation or take cover alarm is initiated, is a significant distance from their assigned zones, or has been isolated from their zone, they should report to the SAS at the staging area that their zone was not swept.

3.12 Facility Operations Specialist

The FOS is responsible for meeting emergency responders at the event scene and providing information on event status and initial actions that are underway. This position will serve under the direction of the BED and coordinate with the HFD or Hanford Patrol Operations Section Chiefs, upon their arrival, and will provide facility expertise to support Operations Section activities. The FOS is responsible for implementing [EP-FOS, Facility Operations Specialist \(FOS\) Checklist](#), and also maintains a log of activities, conversations, and directives given and received.

3.13 Hazard Communicator

The Hazard Communicator is a facility or process knowledgeable individual responsible for communicating data received from the Hazards Assessors to the Uniform Dose Assessment Center for further consequence assessment during DOE-declared emergencies. This position is staffed only during DOE-declared emergencies at the request of the BED/IC. The Hazard Communicator is responsible for the following:

- establishes and maintains an emergency response organization communication line with the Uniform Dose Assessment Center Hazards Communicator to provide incident scene radiological or chemical data as reported by the Hazard Assessors
- keeps the IC and BED aware of all transmitted and received information

- maintains a log, or assigns a scribe to record all activities, including the date and time information was received or the time when action was taken
- responds to requests for information from the Uniform Dose Assessment Center and assures that requests for information are relayed to the Hazards Assessor(s) for response
- implements the [EP-HazCom, Hazards Communicator Checklist](#).

3.14 Radiological Hazard Assessors

RHAs are responsible for coordinating and verifying accomplishment of radiological control functions throughout the event. This position coordinates with the Operations Section Chief at any location and supervises Radiological Protection Technologist (RPT) activities.

The RHA is responsible for implementing the checklist duties for non-declared RCRA emergencies and DOE-declared emergencies, as appropriate. See [EP-RHA, Radiological Hazard Assessors Checklist](#). In conjunction with Chemical Hazard Assessors (CHA), this RHAs make recommendations for personal protective equipment (PPE) to the HFD.

3.15 Chemical Hazard Assessors

This position may be staffed by an Industrial Hygienist assigned to support the HFD. CHAs provide technical expertise in chemical and toxicological hazard identification, evaluation, reactivity, and dispersion modeling to the HFD. The CHA may also serve as a chemical/decontamination safety officer, if so designated by the IC.

The 325RPL CHA initially reports to the ICP for an event briefing and then coordinates with the HFD Operations Section Chief; he/she provides technical support for non-radiological hazardous material response. Typically, the 325RPL Industrial Hygienist and the Industrial Hygienist assigned to the HFD, staff this position. In conjunction with the RHA, this individual will recommend PPE to the HFD.

When the CHA is activated to respond to an emergency, [EP-CHA, Chemical Hazard Assessors Checklist](#) must be completed.

3.16 Individual Staff Member

Individual staff members are responsible for the following:

- Announcing or activating the appropriate alarm, calling the PNNL SOC (375-2400), and notifying management upon observing an emergency.¹⁶
- Avoiding exposure to harmful and life-threatening conditions.
- During emergencies, if it can be done safely, securing classified documents and electronic storage media (ESM) before leaving Limited Areas (LAs). If this cannot be done safely: 1) take the classified documents and ESM, if time permits; 2) report to the staging area, and; 3) inform the BED and then call 375-2400 to report an incident of security concern.
- If evacuating due to a fire alarm and wearing special PPE or anti-contamination clothing, segregating oneself from others at the staging area until surveyed by a RPT.

¹⁶ Section 3.15, Bullet 1: Permit Requirement, Class 1 Modification 09/30/15

- Providing the BED with any information to assist in evaluating the emergency condition.
- Remaining at the staging area and follow the instructions of the BED and SAS.¹⁷
- Reading and understanding the Emergency Information Posting (EIP) and BEP.
- Knowing the location of the BEP on the 325RPL webpage and HDI Work Control, [Basic Staff Practices](#).
- Wearing an EP information card.
- Knowing the location of the nearest fire alarm pull box.
- Signing into the accountability log.

NOTE: When evacuating 325RPL due to a fire or a criticality alarm, all personnel are required to exit Radiological Control Areas without performing radiological exit surveys. Those personnel shall segregate themselves from others at the staging area until surveyed by RPTs.

3.17 PNNL Incident Manager

The PNNL IM is used during complex events, such as those affecting multiple PNNL-managed facilities and those extending over multiple days. The PNNL IM will assume responsibility for incident management. This includes managing the overall event on behalf of PNNL, overseeing BEDs, and coordinating with the PNNL MSG. The PNNL IM will most likely be activated by the MSG Lead. When activated to respond to an emergency, the [EP IM, Incident Manager Checklist](#) must be completed. Primary BEDs will continue to manage operations at their facilities, but the overall incident management and distribution of resources will be the responsibility of the PNNL IM.

3.18 Facility Visitors

The safety of building visitors is the responsibility of the facility host who shall assure that visitors are provided a safe and orderly evacuation. The facility host will report the visitor status to the SAS as soon as is practical after an evacuation. Visitors will sign into the accountability log.

3.19 Supervisors/Managers

Account for all staff members. Report missing or injured staff members to the SAS and if requested, assist the SAS.

3.20 Unique Program Laboratory Expertise

The technical knowledge of specific programs/laboratory activities are usually known by the laboratory occupant or program manager. When applicable, Cognizant Space Managers (CSMs), alternate CSMs, and team leads may be contacted in regard to emergencies or off normal events in assigned laboratories. Hazard Awareness Summaries containing this information are posted throughout the 325RPL Complex.

3.21 Waste Management Staff

Waste Management Staff oversee operations in hazardous waste management areas. Field Services Representatives (FSRs) co-manage satellite accumulation areas (SAAs) in research laboratories and support spaces. The FSR maintains a current list of SAAs. The FSR also manages the central

¹⁷ Section 3.15, Bullet 6: Permit Requirement, Class 1 Modification 09/30/15

accumulation areas (CAAs) in Rooms 201, 202 and 529. The FSR maintains an inventory of waste in each CAA. Treatment, Storage, and Disposal (TSD) areas consist of Rooms 32, 200, 201, 202, 203, 520, 524, 528, 610, 3714 Pad, and portions of Rooms 603 and 604A. Materials and Waste Operations Staff manage these areas and maintain a current inventory of waste.

3.22 Environment, Safety, and Health Advisor

The Worker Safety and Health Representative will provide guidance for establishing safety requirements for mitigation and recovery actions. This includes coordinating any support needed from other disciplines of the PNNL Environment, Health, Safety, and Security Directorate (i.e., Environmental Compliance Representatives (ECRs), Radiological Control, Hygiene, and FSRs). The ECRs and FSRs maintain familiarity with current hazardous waste management areas and provide support to the BED in case of an emergency.

The Environmental Support Contact will provide any necessary notifications to regulatory agencies such as the Washington State Department of Ecology and will transmit required written reports to regulatory agencies within 15 days of event termination¹⁸.

3.23 Line Management

The responsibilities of line management include the following activities:

- accounting for staff members
- reporting missing or injured staff members to the SAS
- assisting the SAS if requested
- performing the necessary actions addressed in HDI
- acting as a health advocate for injured or ill staff members
- keeping the BED informed of changes in programmatic activities that could affect an emergency event
- providing or verifying training for staff members
- providing training for unescorted visitors for whom he/she is responsible
- keeping the BED and Zone Wardens informed of staff members who may require assistance in an emergency event
- providing staff, who are residents in the 325RPL or are qualified Fissionable Material Handlers, with a Personal Nuclear Accident Dosimeter.

3.24 New Staff Assigned to 325RPL

325RPL personnel needing unescorted prox access need to have the required training assigned through IOPS. Personnel that do not have the required training need to be escorted. The required training course is 1280, *RPL General Employee Training*.

¹⁸ Section 3.22, Paragraph 2: Permit Requirement, Class 1 Modification 03/31/16

4.0 Implementation of the Building Emergency Procedure¹⁹

The decision to implement the BEP should be made whenever unusual or emergency conditions exist that require the response of facility or emergency personnel and the establishment of an ICP.

For events involving dangerous waste, the BED must use the following criteria to determine if an event is subject to the contingency plan implementation and notifications requirements of WAC 173-303-350 and WAC 173-303-360:

The event involves an unplanned spill, release, fire, or explosion,

AND

a. The unplanned spill or release involves a dangerous waste, or the material involved becomes dangerous waste as a result of the event (e.g., product that is not recoverable),

OR

b. The unplanned fire or explosion occurred at a facility or transportation activity subject to RCRA contingency planning requirements;

AND

The event could pose a threat to human health or the environment.

Based on evaluation of the event, the BED or alternate BED will implement the BEP to the extent necessary to protect human health and the environment. The BED has the authority to commit the resources necessary to carry out the actions required by the BEP.

The BED will direct that additional checklists identified in the BEP be initiated and completed. When the materials and quantities involved in the incident have been identified, it should be possible to evaluate the magnitude of the hazard.

During an emergency event, the BED will take all reasonable measures to assure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste in the facility. Measures include stopping processes and operations, collecting and containing released waste, and removing or isolating containers as appropriate.

In any emergency, priority is given to protection of the health and safety of persons in the immediate area. Containment and cleanup are secondary choices. When responding to minor spill events, onsite personnel will generally perform immediate cleanup of minor spill or releases using facility equipment. Remediation of such spills and releases would not normally constitute activation of the BEP. A spill or release of dangerous waste is considered 'minor' if **ALL** of the following are true:

- the spill is either contained, or if outside a secondary containment, is minor in quantity (generally less than 10 gallons of liquid or 100 pounds of solids)
- the composition of the material or waste is known and can be immediately determined from the label, manifest, Safety Data Sheet, or other records

¹⁹ Section 4.0, Permit Requirement, Class 1 Modification 03/31/16

- the spill does not threaten the health and safety of building occupants such that an area evacuation is necessary
- response personnel have appropriate training and equipment to expeditiously remediate the spill or release.

5.0 Facility Hazards

325RPL contains both radioactive and hazardous chemicals that pose a potential hazard to the public, adjacent facilities, personnel, programs, and the environment during an emergency. Because the location of hazardous materials and equipment within the facility can change on a frequent basis due to specific research needs, a variety of informational tools have been created and integrated into daily operations. Some of the tools available within the facility include the following:

- [Map Information Tool](#)
- Chemical Management System
- Radioactive Material Tracking System
- Integrated Waste Management System
- 325RPL Operating Envelope webpage
- Integrated Operations System (also known commonly as IOPS) which includes the Hazard Awareness Summaries for each hazardous space in the 325RPL Complex.

5.1 Hazardous Materials

325RPL contains the following hazardous materials:

- chemicals exhibiting one or more hazards (e.g., corrosives, oxidizers, flammable solids and liquids, and poisons).
- radioactive materials
- hazardous wastes, including listed wastes and wastes exhibiting one or more of the following characteristics: corrosivity, reactivity, ignitability, toxicity, and environmental persistence
- mixed wastes (i.e., wastes containing both radioactive and hazardous components).

Hazards associated with these materials vary depending on type, quantity, and concentration of the materials involved in the incident as well as the type of incident.

During an emergency, the PNNL Chemical Management System may be consulted to determine the identity and quantity of hazardous chemicals located in affected areas of the facility. The listing of hazardous waste satellite and central accumulation areas are available on the Integrated Waste Management System (IWMS) which is maintained by the Materials and Waste Operations organization and IWMS may also be consulted to identify the location and types of wastes (hazardous and mixed) located in the facility. The inventory of waste stored in the 325RPL HWTUs RCRA-permitted unit may be determined by consulting with the Materials and Waste Operations organization IWMS database.

Arrangements for local response agencies (fire, police, and medical and emergency response teams) are required to assist in pre-emergency planning. These arrangements include familiarization with the properties of hazardous waste handled at the facility and associated hazards. The Emergency Preparedness Office provides these coordination efforts with input from individual BEDs and others, as appropriate.

5.2 Physical (Industrial) Hazards

The 325RPL Building contains industrial hazards such as high-voltage equipment, high-temperature equipment, elevated work areas, and overhead hazards. Refer to the Integrated Operations System Hazard Awareness Summaries that are posted at the entrance to each space for specific details.

5.3 Dangerous (Hazardous) and Mixed Waste

See Section 5.0. Hazardous and mixed (hazardous and radioactive) waste is managed in satellite accumulation areas (SAAs), CAAs, and RCRA-permitted TSD areas in RPL. Waste in these areas may be radioactive, ignitable, corrosive, reactive or toxic. The current locations of areas that manage dangerous and mixed waste are maintained in the Integrated Waste Management System.

5.4 Radioactive Materials

See Section 5.0. The type and quantity of radioactive material present in a specific room is maintained in the Radioactive Material Tracking database.

5.5 Criticality

The 325RPL Building is a Hazard Category 2 non-reactor nuclear facility designed as a multi-purpose research facility. Fissionable materials are stored and used in various lab spaces (Criticality Safety Controlled Areas). Limits and controls for mitigating the criticality hazards are described in the posted Criticality Safety Specifications. A fissionable material line manager and fissionable material handler supervisor are assigned responsibility for each controlled area.

PNNL-DSA-325, *Radiochemical Processing Laboratory Documented Safety Analysis* (325RPL's Documented Safety Analysis [DSA]), analyzes various scenarios regarding potential criticality incidents and establishes a Nuclear Criticality Safety Program as a safety management program. The Nuclear Criticality Safety Program evaluates fissionable material handling and storage at the 325RPL and provides engineered features, limits, and administrative controls necessary to assure the possibility of a criticality event remains extremely unlikely.

The criticality safety risk of firefighting within each controlled area is evaluated and areas are posted with appropriate symbols when a limitation on the use of water or other extinguishing agents is warranted. These limitations are also identified within the HFD Pre-incident Plan.

A criticality accident at the 325RPL is a credible event. A Criticality Alarm System is maintained to mitigate the impact of an accidental criticality on facility staff and visitors through rapid notification and an immediate evacuation. The system is tested on a semi-annual basis.

6.0 Potential Emergency Conditions and Appropriate Response

6.1 Explosion/Fire/Fire Alarm²⁰

NOTE: During these events, it is likely that facility integrity may be compromised and that the facility will also experience a concurrent loss of electrical power and/or control of the building ventilation systems. If this is the case, refer to Section 6.2, Hazardous Material/Dangerous or Mixed Waste Spill and Section 6.6, Loss of Electrical Power/Reduced Ventilation for concurrent actions as appropriate.

If you are involved with, or are in close proximity to, an explosion, a fire (or discovery of a fire), or have indication that the fire alarm is sounding, perform the following:

6.1.1 Fire/Explosion

- 6.1.1.1 Sound the alarm by pulling the fire alarm pull box. See the guidance for the exception to this step below.

Exceptions to pulling the fire alarm:

- If the fire is occurring outside of the facility (e.g., at the ESY, NSP or the 3714 Pad) and pulling the fire alarm could result in building occupants evacuating the building into a hazard (i.e., building occupants exiting via the nearest exit and potentially via the fire or plume), consider the public address system in place of the fire alarm, or in addition to, as appropriate.
- or
- If a simple and safe action can be taken that will immediately and positively extinguish a small fire (e.g., pulling the plug on a malfunctioning lab instrument, isolating a fuel source such as quickly closing a valve that is immediately at hand, smothering the flame), then pulling the fire alarm pull box is not necessary, and the fire may be extinguished prior to calling the PNNL SOC at 375-2400.

NOTE: If appropriate, the BED will classify the event using the 325RPL EALs.

- 6.1.1.2 Evacuate the building through the nearest exit that can be safely used.

- 6.1.1.3 Once in a safe location, notify the PNNL SOC at 375-2400 and provide the following information (if known):

- nature and location of the event
- conditions of the event appear to be degrading, (i.e., the fire appears to be escalating or building structures are being compromised)
- your name and callback telephone number
- time event began or was discovered
- number and condition of any injured personnel
- names and amounts of any chemicals involved or that may be burning as a result of a fire.

²⁰ Section 6.1, Permit Requirement, Class 1 Modification 03/31/16

NOTE: The fire department can be notified directly by calling 911 or 373-0911 (cell). If the fire department was contacted using the cell option, also call the PNNL SOC at 375-2400 as soon as possible to initiate PNNL management notifications and emergency response.

- 6.1.1.4 If time permits, and without putting yourself in jeopardy, you may fight the fire under the following conditions:
- you have directed someone to pull the fire alarm pull box
 - you have verified that someone has called the PNNL SOC at 375-2400, 911, or 373-0911 (cell)
 - you are willing, able, and knowledgeable about the selection of the proper fire extinguisher and its use

NOTE: Fire extinguishers equipped with the glove piercing tips are for HFD use only.

- if the fire is in a hot cell, attempt to smother the fire, if smothering does not work then use the fire extinguishing system, if you are trained to do so
 - if the fire is in a glovebox, do not attempt to fight the fire using the gloves. Isolate supply air to the glovebox if safe to do so
 - if the fire is small, you know what material is burning, the fire does not involve significant quantities of hazardous materials and does not present a personnel exposure hazard to smoke or significant heat.
- 6.1.1.5 If you have chosen to fight the fire, and after the fire is believed to be out, call the PNNL SOC at 375-2400 and inform them of your actions.
- Unless there are significant amounts of smoke or fumes, remain in the proximity of the fire to verify that the fire does not re-flash.
 - In the event the fire re-flashes, perform the actions above starting with Step 6.1.1 but do not attempt to fight the fire on your own.

6.1.2 Fire Alarm

NOTE: If appropriate, the BED will classify the event using the 325RPL EALs.

- 6.1.2.1 If time permits, and without placing yourself in jeopardy, verify the following:
- equipment is shutdown or is in a safe configuration
 - nuclear and classified materials are secured.
- 6.1.2.2 Zone Wardens perform an accountability sweep of their assigned areas.
- 6.1.2.3 Evacuate the building through the nearest exit that can safely be used.
- 6.1.2.4 Assemble at the staging area located at the lower south parking lot, south end of Lane #9.
- Zone Wardens report the status of accountability sweeps to the SAS.
 - If classified materials (e.g., documents, ESM, or test materials) are removed from the LA or left unsecured within the LA:

- inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA
- call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event
- The SAS shall provide information to the BED concerning the classified material.
- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.

6.2 Hazardous Material/Dangerous or Mixed Waste Spill²¹

NOTE: If appropriate, the BED will classify the event using the 325RPL EALs.

6.2.1 Minor Spills

For minor spills or releases that are relatively small in size, perform the following:

NOTE: A spill or release of dangerous waste is considered minor if ALL of the following are true. If ANY of the following are NOT true, refer to Section 6.2.2:

- the spill or release either is contained or, if outside of a secondary containment, is minor in quantity (i.e., generally less than 10 gallons of liquid or 100 pounds of solids).
- the composition of the material or waste is known and can be immediately determined from the label, manifest, SDS, or other records.
- the spill or release does not threaten the health and safety of building occupants such that a building evacuation is necessary.
- response personnel have appropriate training and equipment to expeditiously remediate the spill or release.

6.2.1.1 Move personnel away from the substance.

6.2.1.2 Notify nearby personnel of the emergency.

6.2.1.3 Prevent personnel exposure by restricting access to the spill area by setting up barricades, closing doors, etc.

6.2.1.4 Notify the PNNL SOC at 375-2400 and provide the following:

- nature and location of the event
- names of chemicals involved, amounts, sources, and known hazards about the chemicals
- if the spill has been contained
- if any material has been released to the environment
- any corrective actions in progress

²¹ Section 6.2, Permit Requirement, Class 1 Modification 03/31/16

- names of anyone contaminated or injured in connection with the incident
- other hazards that may or may not be related to the spill
- time incident began or was discovered
- current status of the event (e.g., spill contained or not contained)
- name, location, and callback telephone number of the person reporting the incident.

6.2.1.5 Notify the BED, CSM, and the Safety and Health Representative.

6.2.1.6 Take steps to contain the spill or release *only* if:

- the identity of the substance is known.
- the hazards of the substance are known (e.g., flammable, toxic, radioactive, and corrosive material) and can either be controlled or do not present an immediate threat.
- appropriate PPE and control and cleanup supplies are readily available.
- the individuals performing the task have had training related to spill and leak control and can safely perform the actions without assistance, or assistance is readily available from other trained personnel.

6.2.1.7 Steps to contain the spill and/or release may include the following, as appropriate:

- build a containment of absorbent materials and restrict access to the affected area.
- tighten closures, tip the container to stop the leak, and use plugging, patching materials, or over packing.
- perform initial cleanup of the spill area by transferring contents to appropriate non-leaking containers using the appropriate procedures and tools.

6.2.2 Major Spill or Release or a Tank Spill

For a Major Spill or Release or a Tank Spill, Perform the Following Actions.

NOTE: If appropriate, the BED will classify the event using the 325RPL EALs.

6.2.2.1 If the spill or release threatens the health and safety of building occupants such that a building evacuation is necessary, initiate a building evacuation by pulling the fire alarm and perform the actions below. If a building evacuation is not necessary, continue at Section 6.2.2.2.

- Assemble at the staging area located at the lower south parking lot, south end of Lane #9.
- Zone Wardens report to the SAS.
- If classified materials (e.g., documents, ESM, or test materials) are removed from the LA or left unsecured within the LA:
 - inform the SAS that classified material has been left in an unsecured condition or has been removed from a LA
 - call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event

- SAS shall provide information to the BED concerning the classified material.
 - Personnel who are wearing PPE clothing, or are suspected of being contaminated, shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
 - Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.
- 6.2.2.2 Move personnel away from the substance.
- 6.2.2.3 Notify nearby personnel of the emergency.
- 6.2.2.4 Notify the PNNL SOC at 375-2400 and provide the following.
- name, location, and callback telephone number of the person reporting the incident
 - names of chemicals involved and amounts involved in the incident
 - location of incident (identify as closely as possible and include information about multiple building numbers)
 - time incident began or was discovered
 - where the materials involved are going or might go, such as into secondary containment, under doors, through air ducts, etc.
 - source and cause, if known
 - names of anyone contaminated or injured in connection with the incident
 - any corrective actions in progress
 - anyone else who the discoverer has contacted
 - any known hazards
 - location and time the chemical condition or spill occurred
 - if any material was released to the environment (e.g., to a stack or a sewer system)
 - the status of the situation.
- 6.2.2.5 Prevent personnel exposure (e.g., set up barricades).
- 6.2.2.6 Contact the CSM.
- 6.2.2.7 Notify the Safety and Health Representative.
- 6.2.2.8 Take steps to contain the spill *only* if:
- the identity of the substance is known
 - hazards of the substance are known (i.e., flammable, toxic, radioactive, or corrosive material) and can either be controlled or they do not present an immediate threat
 - appropriate protective equipment and control or cleanup supplies are readily available

- individuals performing the task have had training related to spill or leak control and can safely perform the actions without assistance, or assistance is readily available from other trained personnel.

6.2.2.9 Initiate actions to mitigate a tank spill or leak using trained personnel:

- stop the source of the leak if possible (e.g., by shutting valves or turning off pumps).
- prevent further additions of liquid to the tank.
- visually inspect the tank system to determine the source of the leak.
- remove as much of the liquid from the tank as is necessary to prevent further leakage within 24 hours or the earliest practicable time.
- remove any leakage contained in a secondary containment within 24 hours, or as soon as possible.
- prevent any further leakage or migration of the leak to soils or surface waters.

6.2.2.10 Notify the BED, the CSM, and the Safety and Health Representative of any pertinent information that you may have.

- Discoverer of the spill will provide a synopsis of the event and the actions taken to the BED, CSM, and the Safety and Health Representative.
- BED will direct spill event mitigation activities upon completion of the event briefing.

6.2.3 For Events that Involve Transportation and/or Damaged Packaging of Hazardous Material or Dangerous Waste that Arrives at the 325RPL:

6.2.3.1 DO NOT move the shipment.

6.2.3.2 Notify the BED, CSM, and the Safety and Health Representative.

- The receiver of the shipment or discoverer of the damaged package will provide a synopsis of the situation and the actions taken, if any, to the BED, CSM, and the Safety and Health Representative.

6.2.3.3 The BED will evaluate the event and initiate appropriate actions for minor events/spills per Section 6.2.1 or Section 6.2.2 as appropriate.

- Treat any release from the package as a hazardous material spill and perform response actions as appropriate.

6.3 Unusual, Irritating or Strong Odors²²

6.3.1 If an unusual odor is detected and the source is unknown, the type and location of the odor should be reported to the BED and the BED will determine the appropriate actions.

6.3.1.1 If the odor is determined to be potentially dangerous, then:

- Initiate a building evacuation by pulling the fire alarm.

²² Section 6.3, Permit Requirement, Class 1 Modification 03/31/16

- Assemble at the staging area located at the lower south parking lot, south end of Lane #9.
- Zone Wardens report to the SAS.
- If classified materials (e.g., documents, ESM, or test materials) are removed from the LA or left unsecured within the LA:
 - inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA
 - call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event.
 - SAS shall provide information to the BED concerning the classified material.
- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Zone Wardens and all staff are to remain at the staging area and must follow the instructions of the BED.

6.4 Potential Radiological Material Release

NOTE: If appropriate, the BED will classify the event using the 325RPL EALs.

NOTE: The RPT may provide radiological survey data in Becquerel's. A Becquerel is a SI unit of radioactivity equal to one disintegration per second. Conversion to disintegration per minute: multiply total Becquerel's by 60.

6.4.1 Area Radiation Monitor

- Stop work.
- Alert personnel in the area.
- Exit the Radiologically Controlled Area that is being monitored by the Area Radiation Monitor.
- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.4.2 Continuous Air Monitor or ALPHA Sentry Continuous Air Monitor

- Stop work.
- Alert personnel in the area.
- Exit the area being monitored by the continuous air monitor and move into a separate air space.
- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.4.3 Glove Box Differential Pressure Alarm

- Stop work.
- Alert personnel in the area.
- Exit the immediate area.

- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.4.4 Hot Cell Differential Pressure Alarm

- Stop work.
- Alert personnel in the area.
- Exit the immediate area.
- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.4.5 Stack Monitor Alarm

- Alert RPT (stack qualified) and BM.
- Stop work associated with release.
- Notify Effluent Management.
- Notify PNNL SOC at 375-2400.
- Notify BED, if not the BM.

6.5 Criticality and Criticality Safety Limit Violations

6.5.1 In the Event of a Potential Criticality Safety Limit Violation, Perform the Following:

The staff member discovering an actual or potential criticality safety limit violation shall follow the steps below (also described in the operating documents):

- Stop work immediately in the area without making any changes to present conditions.
- Verify that any fissionable materials or other equipment and materials close enough to interact with fissionable materials are not moved or disturbed.
- Immediately notify the BM. If not available, call the PNNL SOC at 375-2400 and state the problem.

6.5.1.1 Upon notification, the BM shall:

- call the PNNL SOC at 375-2400 and state the problem
- notify the Fissionable Material Line Manager and supervisor for the controlled area
- contact the Nuclear Criticality Safety Program Manager (509-539-9366) or Nuclear Safety and Facility Authorization Manager (509-947-2344) to obtain nuclear criticality safety program staff support.

6.5.1.2 Upon notification, the Fissionable Material Line Manager shall:

- verify that all work activities in the affected area are stopped
- post warning signs at appropriate locations requiring permission from the Fissionable Material Line Manager to enter the area.

- 6.5.1.3 Upon notification, the Nuclear Criticality Safety Program Manager shall:
- confirm whether a limit violation exists
 - determine if a second contingency still provides for prevention of criticality or other danger if limit has been violated.
- 6.5.1.4 Nuclear criticality safety violations are identified as a loss of documented controls in the *Event Classifiers Procedure*. The BM shall initiate the associated reporting, critique, and corrective action process defined in the HDI Workflow, [Report an Event or Unwanted Condition](#).
- 6.5.1.5 The Nuclear Criticality Safety Program Manager will assist the BM in developing a Recovery Plan based on a thorough review of the situation and potential hazards associated with the violation.
- 6.5.2 In the Event of a Criticality Alarm, Perform the Following:

NOTE: If appropriate, the BED will classify the event using the 325RPL EALs.

- 6.5.2.1 Leave the building immediately (walk with purpose) through the closest exit, DO NOT stop for a survey, and get at least 15 feet of separation from the facility. Maintain a minimum of 15 feet distance during relocation to the primary staging area.
- 6.5.2.2 Zone Wardens are also directed to leave the building immediately without performing accountability sweeps of their zones.

NOTE: Choose a path around barriers that will maximize your distance from the building but maintain at least 15 feet of separation from the facility. When past the obstacle, maintain the distance from the building and continue to the primary staging area. See Attachments 7 and 8, Staging Area Map and Alternate Staging Areas for suggested routes.

- 6.5.2.3 Proceed to the staging area along a path that does not take you closer to the building.
- 6.5.2.4 Assemble at the staging area located at the lower south parking lot, south end of Lane #9. Consider moving to the alternate staging area (350 Building).
- Initiate RCP-8.1.02, Quick Sort Survey of Personnel.
 - Immediately report any positive quick sort to the BED.
 - Zone Wardens report to the SAS.
 - If classified materials (e.g., documents, ESM, or test materials) are removed from the LA or left unsecured within the LA:
 - inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA
 - call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event
 - SAS shall provide information to the BED concerning the classified material.

- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Determine the radiation dose levels at the staging area and in the evacuated area following a criticality accident.
- Report dose rates and report findings to the BED.
- Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.
- Notify PNNL first responders supporting the Hanford Fire Department to set their Electronic Personal Dosimeters to 3 rem/hour rate to keep them far enough away from the criticality event location and to limit dose from a pulse.

6.5.2.5 Consider the following to support recovery plan and/or actions:

- responders wear full respirators or supplied air system to limit inhalation dose.
- electronic Personal Dosimeters should be set at the normal level of 100 mrem/hr total.
- provide shortest route for retrieval of Fixed Nuclear Accident Dosimeters.
- retrieve fixed nuclear accident dosimeters in order to reconstruct the dose of the accident.
- if fixed nuclear accident dosimeters are not retrievable, chemical reagents can be used.

6.6 Loss of Electrical Power/Reduced Ventilation

6.6.1 In the Event of a Loss of or a Significant Interruption to Building Electrical Power OR a Reduction in Ventilation Flow, Perform the Following:

6.6.1.1 Place laboratory or room in safe condition per the following:

- verify fume hoods and sashes are closed
- verify equipment is shutdown
- verify nuclear materials are secure
- verify that classified materials are secure
- verify all hazardous materials are secure
- verify that all equipment and heat generating devices inside of laboratory gloveboxes and inside of hot cells are shut down

6.6.1.2 If the building electrical power returns or standby power is still available:

- Assemble in the lunchroom.
- If classified materials (e.g., documents, ESM, or test materials) are removed from the LA or left unsecured within the LA:
 - inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA

- call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event
- SAS *shall* provide information to the BED concerning the classified material.
- Personnel exiting the Radiological Buffer Areas are expected to do so without surveying through the personnel contamination monitor (PCM).
- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Zone Wardens for Zones 2 and 8 are requested to activate the flashing red warning lights.
- Zone Wardens and all staff are to remain at the lunchroom and follow the instructions of the BED.
- Radiological surveys of the facility shall be performed prior to re-entry.

6.7 Natural Phenomena Events

NOTE: If appropriate, the BED will classify the event using the RPL EALs.

Natural phenomena events considered as having a probability of occurring and, as such, addressed in this procedure include seismic event/earthquake, volcanic eruption/ash fall, high wind/tornado, flood, and range fire.

If these events were to occur, Hanford Telephone Notification System messages will most likely be sent before, during, or immediately following the event. Regardless of the receipt of a phone message, the BED will direct activities within the facility in accordance with this procedure and provided by phone messages as appropriate.

Should it become necessary to evacuate the facility, the BED will report the evacuation to the PNNL SOC at 375-2400 and the EOC Shift Office at 376-2900.

6.8 Bomb Threats/Suspicious Objects

NOTE: If appropriate, the BED will classify the event using the RPL EALs.

- 6.8.1 If a Suspicious Object is Discovered, or the Placement of Such an Object is Observed, Perform the Following Actions:
- 6.8.1.1 Do not move, open, or otherwise disturb any suspicious objects.
 - 6.8.1.2 Notify the PNNL SOC at 375-2400 and the 325RPL BED using office telephones only.
 - 6.8.1.3 Evacuate the facility, taking the following actions. **DO NOT USE THE FIRE ALARM PULL BOX TO INITIATE THE EVACUATION** as frequencies can detonate devices.
 - Warn others in the immediate vicinity.
 - Leave the building immediately via the closest exit.
 - Zone Wardens are also directed to leave the building immediately without performing accountability sweeps of their zones.

- 6.8.1.4 Do NOT use cellular phones, radios, or other radio frequency generating equipment within 100 feet of 325RPL.
- 6.8.1.5 Assemble at the staging area located at the lower south parking lot, south end of Lane #9.
- Zone Wardens report to the SAS.
 - If classified materials (e.g., documents, ESM, or test materials) are removed from the LA or left unsecured within the LA:
 - inform the SAS that classified material has been left in an unsecured condition or has been removed from a LA
 - call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event
 - SAS shall provide information to the BED concerning the classified material.
 - Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
 - Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.
 - The staging area will be relocated a minimum of 300 feet away from the facility.

6.8.2 If a Telephone Bomb Threat is Received

- 6.8.2.1 Use the *PNNL Bomb Threat Card* to record the message exactly as dictated and attempt to obtain the following information:
- When will it go off?
 - Where is it is located?
 - What does it look like?
 - What kind is it?
 - Why was it was placed?
 - Who placed it?
 - How you know so much about it?
 - Where are you calling from?
 - What's your name and address?
- 6.8.2.2 Notify the PNNL SOC at 375-2400 and provide the information given by the caller.
- 6.8.2.3 Upon completion of the notifications to the PNNL SOC, also notify the 325RPL BED and provide the information obtained from the caller.

6.8.3 If a Written Bomb Threat is Received

- 6.8.3.1 Notify the PNNL SOC at 375-2400.

- 6.8.3.2 Provide the written bomb threat to the 325RPL BED who will forward it to the PNNL SME Safeguards and Security Management Official.

6.9 Active Shooter in the Building

6.9.1 When the Condition is Observed

- 6.9.1.1 RUN – Immediately try to get out of the facility to a safe location out of immediate sight of the building and call 375-2400.
- 6.9.1.2 HIDE – If evacuation is not possible or safe, take cover in an office with the door closed and lights off. Lock the door if possible and call 375-2400.
- 6.9.1.3 FIGHT – If the active shooter has confronted you and evacuation or taking cover is not possible, staff should take whatever actions are necessary to get to safety which may include fighting the intruder or other. This is a last resort step.
- 6.9.1.4 BED Response:
Public announcement (PA), if possible, depending on the situation.
- 6.9.1.5 Do not move any suspicious objects.
- 6.9.1.6 Provide emergency responders with appropriate information upon arrival.
- 6.9.1.7 Keep staff from entering the affected area.
- 6.9.1.8 Classify the event using the 325RPL EALs, if appropriate.
- 6.9.1.9 Activate the MSG by calling 375-2400 and requesting activation.
- 6.9.1.10 Request medical assistance, if necessary.

6.10 Notice of a PNNL Lockdown

6.10.1 When the Condition is Observed

- 6.10.1.1 Staff will be notified of a PNNL lockdown over the telephone through the CNS.
- 6.10.1.2 Immediately get behind a closed door if possible or hidden out of sight.
- 6.10.1.3 Place projects into safe shutdown mode.
- 6.10.1.4 Do not allow anyone into the facility.
- 6.10.1.5 Await further instructions via the CNS.

6.11 Declared Emergency in the 300 Area

- 6.11.1 Personnel will evacuate the facility or take cover as directed by the BED.

6.11.2 If the declared emergency originates in the 325RPL, the BED shall take actions that are in accordance with the BEP and inform and direct other 300 Area contractors and facility owners of the emergency declaration in accordance with their emergency procedures.

7.0 Facility Take Cover – Shutdown of Heating, Ventilation, and Air-Conditioning System

7.1.1 If Outside of the 325RPL, PERFORM the Following:

7.1.1.1 Take cover inside the nearest building.

7.1.1.2 If the building you take cover in is not the 325RPL, attempt to contact your Line Manager or Team Lead and have them report your whereabouts to the 325RPL SAS.

7.1.1.3 If unable to contact your management, report to the BERO for the building where you are located so your personal accountability may be made.

7.1.1.4 Follow directions provided by that building's emergency organization or BED.

7.1.2 If You Take Cover Inside the 325RPL, REMAIN INSIDE the 325RPL:

7.1.2.1 Assemble in the lunchroom.

7.1.2.2 Staff should refrain from eating and drinking during a take cover event, if physically able, until an appropriate evaluation of the event can be made.

7.1.2.3 The BED will direct the shutdown of the 325RPL heating and ventilation (H&V) as needed per SOP-325-003, *325RPL Building Heating, Ventilation and Air Conditioning Emergency Shutdown*.

7.1.2.4 If classified materials (e.g., documents, ESM, or test materials) are removed from the LA, or left unsecured within the LA:

- inform the SAS that classified material has been left in an unsecured condition, has been removed from the LA, and the status/location of the classified material
- call the PNNL SOC at 375-2400 and report the details surrounding the classified materials as a security event and provide details as necessary
- SAS shall provide information to the 325RPL BED concerning the classified material.

7.1.2.5 Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

7.1.2.6 Zone Wardens for Zones 2 and 8 are requested to activate the flashing red warning lights.

7.1.2.7 Zone Wardens, and all staff are to remain in the lunchroom and follow the instructions of the BED.

8.0 Utility Disconnects

Utility disconnects may be necessary under extreme emergency conditions. The 325RPL BED will determine if utility disconnects need to be disconnected/shut. Locations of the utility disconnects or valves are identified in Sections 8.1 through 8.11.

8.1 Electrical

The 325RPL main electrical control center switchgear is located on the second floor (northwest corner) in Room 904. Use extreme caution if disconnecting this power.

8.2 Potable/Process Water

The internal valves are located in the southwest corner of Room 22 in the basement. The external ground valve, SCW-1-VLV (blue cover, operating handle located in 325RPL Shop) is located outside at the southwest corner of the 325RPL Building.

8.3 Gas Supplies

The P-10 gas distribution system is located at the northeast end of the north gas cylinder dock. Turn cylinders off as directed by the 325RPL BED.

8.4 Steam

The high-pressure steam supply valves are located above the Power Operator's workstation entry door on the second floor east equipment room. Steam to the 325RPL may also be isolated using valves inside the Johnson Controls-operated 325B boiler house, if access to the 325RPL Building is not possible.

8.5 Air

The main air compressor may be isolated in one of two ways: by opening the electrical disconnect (S-DIS-074) for the main air compressor or by closing valve CA-186-VLV; both of the components are located adjacent to the main air compressor in the second floor mechanical room. If time permits, the preferred method of shutting down the main air compressor is to press the STOP pushbutton located on the front of the compressor.

8.6 Compressed Air

To remove all sources of compressed air, the standby compressor (located in the northwest corner of the basement) must also be isolated or shutdown in addition to isolating the main air compressor. Isolation of the standby compressor is accomplished by opening the electrical S-DIS-073 or closing valve CA-96-VLV; both components are located adjacent to the standby air compressor. If time permits, the preferred method of shutting down the standby air compressor is to place the control switch—located on the top of the compressor controller—in the OFF position.

8.7 Ventilation

The ventilation facility exhaust and supply fan controls are in the following locations:

- Power Operator's workstation (Room 900)

- Power Operator's METASYS workstations in any PNNL facility may be used to secure the 325RPL main supply and exhaust fans as well as a majority of the building H&V
- in the north part of the basement, west of the elevator
- additional exhaust fan controls are on the starter enclosure for each exhaust fan inside the 325RPL Filter Building.

External shutdown of the main exhaust and supply fans may be accomplished under extreme circumstances by removing both normal and standby electrical power from the building. A more controlled external shutdown of the main exhaust and supply fans is a complicated evolution involving multiple operating locations that must be accomplished in a specific sequence under supervision of 325RPL knowledgeable staff to prevent the risk of loss of building containment due to creation of a positive pressure inside the building.

8.8 Fire Protection Supply Water

Fire Suppression Supply Water Post Indicator Valves (red) for Risers 1 through 5 are located outside 325RPL in the following locations:

- Riser 1 PIV is located at the northwest corner of the 325RPL building
- Riser 2 PIV is located north of the 325RPL
- Riser 3 PIV is located at the southwest corner of the 325RPL building
- Riser 4 PIV is located southeast of the 325RPL-A annex
- Riser 5 PIV is located southeast of the 325RPL-A annex.

8.9 Dry Pipe Butterfly Valve (Riser 6)

The butterfly valve for the dry pipe fire suppression system on the north gas cylinder dock is located on the second floor in the east equipment room at the north wall. Suppression water for this system is supplied from Riser 2 and may be isolated external to 325RPL by shutting the PIV for Riser 2.

8.10 325RPL Ramp Sump Pump

Water runoff down the 325RPL basement truck ramp at the southwest corner of the building is collected in a sump at the bottom of the ramp. The associated sump pump empties the sump as needed to prevent it from overflowing into the 325RPL basement through the roll-up door. The sump pump discharges to the street in front of the 325RPL.

Potentially contaminated fire suppression water runoff from inside the 325RPL basement could also enter this sump and be pumped to the street in front of the building resulting in an unacceptable spread of contamination.

The local disconnect for the sump pump is located inside the south roll-up door on the east side of the door.

8.11 325RPL Decontamination Shower and Sink

A decontamination shower and sink are located in Room 426 with a tempered water supply for use as an emergency decontamination system. The contaminated water is routed to two 250-gallon storage tanks.

The system is designed with the drains directed to one of the two tanks. A high-level alarm activates locally when the selected tank reaches 66 percent volume. The high-level alarm is used to prevent overfilling of the tank. The water supply is manually isolated to allow valve alignment to the second tank for water receipt. The high-high alarm at 75 percent of the tank volume will automatically isolate water to the shower or sink. The tanks have a common overflow for upset conditions (i.e., automatic water isolation fails and improper valve alignment).

9.0 Termination, Incident Recovery, and Restart

9.1 Termination

The IC, in consultation with the 325RPL BED, will recommend termination of the event when conditions indicate that it is safe to do so. The [EP ECF, Event Closeout Form](#), should be completed before any recommendation is made to terminate a declared emergency.

9.2 Recovery

Depending on the circumstances of the event, a recovery team consisting of the IC, 325RPL BED, and appropriate SMEs, will develop and recommend a recovery plan for restoring the facility to operable status. Emphasis will be placed on the careful cleanup of released material and contaminated debris to minimize further risk to personnel, the public, or the environment while preserving evidence at the event scene. All waste materials generated by the cleanup will be containerized in drums or other appropriate containers and stored in an approved storage area pending characterization and determination of the final treatment and disposal requirements. The recovery plan will be reviewed and approved and must meet the requirements of PNNL-MA-110, the *PNNL Emergency Management Plan*, Section 11.0, Termination, Reentry, and Recovery.

The 325RPL BED is responsible for assuring that emergency equipment is clean and fit for its intended use prior to resumption of operations. Equipment used during an incident will be decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment will be checked for proper operation prior to storage for subsequent use. Consumables and disposed materials will be restocked and fire extinguishers will be recharged or replaced.

For emergency events involving the TSD, a satellite accumulation area or a central accumulation area, the recovery plan will include the appropriate notification of the Washington State Department of Ecology and appropriate local authorities of recovery actions taken prior to restart. The Environmental Support Contact will also provide a written report to the Department of Ecology within 15 days after the incident or within 30 days after the incident for a release from a tank system to the environment that does not result in an activation of the contingency plan.²³

NOTE: For classified events, recovery planning and activities will be the responsibility of the Recovery Director assigned at the Hanford EOC.

9.2.1 Emergency Decontamination Facilities

The 325RPL facility has decontamination capability as discussed in Section 8.1.1. Radiological control personnel are the only staff that may perform personnel decontamination.

If an evacuation of the 325RPL Building occurs and re-entry is not possible to decontaminate affected personnel, radiological control supervision may use the 3410 Building personnel decontamination facility located in Room 1601. In the event that the affected personnel are injured, they should be transported directly to a hospital. If large group decontamination facilities are required, request assistance from the HFD Mobile Decontamination Facility.

9.2.2 Emergency Radiological Exposure Guidelines

²³ Section 9.2, Paragraphs 1, 2, and 3: Permit requirement, Class 1 Modification 03/31/16

In extremely rare cases, emergency exposure to radiation may be required to rescue personnel or protect major property. Emergency exposure may be authorized in accordance with the provisions contained in 10 CFR 835, “Occupational Radiation Protection.” The dose limits for personnel performing these operations are listed in Table 9.1.

NOTE: Only RadWorker 2 trained staff are allowed to volunteer for receiving emergency radiological exposures.

The lens of the eye dose limit should be three times the listed values. The shallow dose limit to the skin of the whole body and the extremities is 10 times the listed values.

Table 9.1. Emergency Dose Limits

Dose Limit (Total Effective Dose Equivalent) in rem	Activity Performed	Conditions
5	All	NA
10	Protecting major property	Only on a voluntary basis where lower dose limit not practicable
25	Lifesaving or protection of large populations	Only on a voluntary basis where lower dose limit not practicable
> 25	Lifesaving or protection of large populations	Only on a voluntary basis to personnel fully aware of the risk involved

9.3 Restart

In most cases, [EP ECF, Event Closeout Form](#), will be sufficient for supporting recovery from an event and actions needed for resumption of normal operations. For complex events with significant facility damage or a need for incident staffing for more than 48 hours, a recovery plan and process will be required. Restart of the facility following complex emergencies will be conducted with a recovery plan developed using EPIP-3.0, *Recovery Plan* and led by a Recovery Director identified by the MSG. The recovery plan will be developed with support from both the 325RPL Manager and 325RPL BM.

The following documents should be consulted, used as reference, and implemented if needed.

- EPIP-3.0, *Recovery Plan*
- PNNL Guides for Post-Natural Phenomena Hazard Building Inspection
- PNNL-BCP, *Pacific Northwest National Laboratory Business Continuity Plan*

For severe damage to the facility due to natural phenomena (e.g., extreme weather conditions, seismic events, wildfires, or external flooding) or other causes (e.g., severe fire, physical attack, explosions, or events in neighboring facilities), the recovery plan shall describe the process for a systems engineering assessment and evaluation of the facility including environmental protection, mission critical and other essential systems (safety significant and equipment important to safety). The purpose of these assessments is to define actions needed to place the facility into a safe configuration within the safety basis requirements pending any resumption of operations.

Recovery for events that involve a container storage area within the HWTU require the container storage and containment system to be evaluated before restart.

If the event involved a tank system leak, repairs must be certified by an independent, qualified, registered, professional engineer.

Before operations are resumed in the facility, all emergency equipment used during the emergency shall be cleaned and restored to usable, operable condition.²⁴

²⁴ Section 9.3, Last three paragraphs: Permit Requirement, Class 1 Modification 09/30/15

10.0 Emergency Equipment²⁵

Support equipment available to assist in responding to an emergency can be found by referring to DOE/RL 94-02, Section 11.2, and the HFD emergency equipment listing in DOE/RL 94-02, Appendix C.

10.1 Portable Emergency Equipment

None

10.2 Fire Control Equipment

- Portable Class ABC fire extinguishers are located throughout the facility. Each Class ABC extinguisher is capable of suppressing fires involving ordinary combustible materials, flammable liquids, oils, paints, flammable gases, and fires involving electrical equipment. Class D fire extinguishers are located in areas vulnerable to Class D fires if reactive metals are stored there (e.g., dangerous waste storage room). Manual dry chemical fire extinguishers are installed in the Shielded Analytical Laboratory hot cells and are available outside the HLRF A and B hot cells. Fire extinguisher locations are identified on the floor plans (Attachments 1 through 3).
- Portable Class ABC fire extinguishers with piercing tips are located in each lab that contains a glovebox. These extinguishers are for the HFD use only; 325RPL staff have not been trained in their use. The piercing tipped fire extinguisher locations are identified on the floor plans (Attachments 1 through 3).
- 325RPL is equipped with an automatic fire detection, alarm, and suppression system. Five wet pipe sprinklers and one dry pipe sprinkler system provide automatic fire suppression.
- A Mobile Command Post Vehicle can be obtained from the HFD at 373-2230. The HFD Battalion Commander will approve and dispatch the vehicle.

10.3 Communications Equipment/Warning Systems

- **Fire Alarm Pull Boxes** are located throughout the facility. The primary locations are at all exits of the facility. All locations are shown on the floor plans (Attachments 1 through 3).
- **Hanford Site Telephone Notification System** is a component of the Hanford Emergency Notification System and designed to use the existing telephone system to notify employees. When the phone is answered, a recorded message will provide event information and inform staff of protective actions they are expected to take.
- **PNNL CNS** is a system that will allow emergency messages to be communicated quickly to all staff via the PNNL phone system, other subscribed phones (e.g., text or voice call to personal cell phones), and the PNNL email system. Phones at PNNL in offices, conference rooms, labs, and common areas such as lobbies, conference rooms, and lunchrooms are notified by the system. When the phone is answered, a recorded message will provide event information and inform staff of protective actions they are expected to take. This can be activated by having the BM, IM, or MSG Lead call 375-2400.
- A **Criticality Alarm System** is present in the building. The system is equipped with neutron-sensitive criticality detectors. The Criticality Alarm System alarms in locations where the expected dose from an accidental criticality may exceed 12-rads in free air. The system is tested and maintained in accordance with preventive maintenance procedures.

²⁵ Section 10, Permit Requirement, Class 1 Modification 03/31/16

NOTE: These systems are not considered emergency equipment and may not be available during all types of emergencies.

- Other non-emergency communications equipment installed in 325RPL include the following:
 - public address system (375-3700 on the VOIP phones)
 - public address system in the fire alarm control panel
 - commercial telephone system that may also be used to summon assistance during an emergency
 - handheld radios provided by the BED.

10.4 Personal Protective Equipment

Safety showers and eyewash units are installed at several locations throughout the facility including waste storage areas. All locations are shown on the floor plans (Attachments 1 through 3).

Personnel protective clothing and respiratory equipment is available in the facility for use during both routine and emergency operations. This equipment includes the following:

- chemically resistant suits, aprons, boots, and gloves
- protective glasses
- chemical goggles
- face shields
- full-face respirators with extra cartridges
- radiological clothing.

Kits containing a variety of radiation monitoring instruments, forms, and equipment are available for use in an emergency. PNNL maintains these kits, which contain protective apparel, instruments, and equipment for personnel decontamination and other immediate emergency needs. These supplies and equipment are only adequate to fulfill immediate needs during the initial stages of an emergency.

10.5 Spill Control and Containment Supplies

Spill supplies are located throughout the facility and are maintained by the CSMs. Additional spill kit materials can be obtained in Room 527. The amount of material maintained varies depending on the amount of waste being accumulated at the individual central accumulation area. The following emergency equipment is maintained in (or adjacent to) each of the hazardous waste central accumulation areas:

- commercially available granular absorbent (e.g. diatomaceous earth)
- absorbent pads
- commercially available acid neutralizer (e.g. granular sodium bicarbonate) – required in accumulation areas containing liquid acidic wastes
- commercially available caustic neutralizer (e.g. dilute boric acid solution) – required in accumulation areas containing liquid caustic wastes
- personal protective equipment, including the following:
 - safety glasses with side shields

- lab coats
- leather gloves
- chemical-resistant gloves (e.g., nitrile).

11.0 Evacuation of Persons and Visitors

- 325RPL occupants shall be aware of visitors that may require evacuation. Alternate housing for any staff that is sensitive to excessive hot or cold conditions (temporarily disabled) may be required due to emergency response actions.

NOTE: Alternate staging area – in the event of an extended building evacuation during adverse weather, the 350 Building, or other indoor locations deemed safe, may be used for housing staff at the discretion of the 325RPL BED.²⁶

- Facility and research management provide safety and emergency preparedness briefings for large visitor groups or tours. Individual visitors are briefed by their host.
- In all cases, the safety of building visitors is the responsibility of the host, who shall assure that visitors are provided a safe and orderly evacuation. The host shall verify that the visitor has signed in and report the visitor status to the appropriate Zone Warden as soon as practical, after the evacuation.

²⁶ Section 11, Note: Permit Requirement, Class 1 Modification 03/31/16

12.0 Emergency Action Levels

12.1 300 Area Protective Actions

300 Area Onsite Protective Actions		
Classification	Action	Implemented By
Alert	<ul style="list-style-type: none"> • Evacuate or shelter affected facility personnel. 	Facility
	<ul style="list-style-type: none"> • Shelter¹ 300 Area. • Initially restrict access at: <ul style="list-style-type: none"> - Route 4S at Milepost 19; - George Washington Way Extension (to 300 Area) intersection with George Washington Way; and - Horn Rapids intersection with Stevens Drive. (Roadblocks can be relocated based upon consequence assessment upon approval by the IC/SED.) 	POC (Quick Reaction Checklist)/EOC Shift Office
Site Area	<ul style="list-style-type: none"> • Evacuate or shelter affected facility personnel. 	Facility
	<ul style="list-style-type: none"> • Shelter¹ 300 Area. • Restrict access at: <ul style="list-style-type: none"> - Route 4S at Milepost 19; - George Washington Way Extension (to 300 Area) intersection with George Washington Way; and - Horn Rapids intersection with Stevens Drive. 	POC (Quick Reaction Checklist)/EOC Shift Office
	<ul style="list-style-type: none"> • Plan for subsequent 300 Area evacuation as required. 	Hanford EOC
<p>¹Automatic sheltering for entire areas will not be implemented during a seismic event. If a seismic event occurs, facility management will implement protective actions appropriate for their facility conditions. After a seismic event, site protective actions based upon incident assessment will be identified, planned, and communicated from Incident/Area Command and/or the Hanford EOC.</p>		
300 Area Onsite Protective Actions		
Classification	Action	Implemented By
General Emergency	<ul style="list-style-type: none"> • Evacuate or shelter affected facility personnel. 	Facility
	<ul style="list-style-type: none"> • Shelter¹ 300 Area, HAMMER, Patrol Training Academy, WTP Simulator Building, and Cold Test Facility. • Restrict access at: <ul style="list-style-type: none"> - Route 4S at Milepost 19; - George Washington Way Extension (to 300 Area) intersection with George Washington Way; and - Horn Rapids intersection with Stevens Drive. 	POC (Quick Reaction Checklist)/EOC Shift Office
	<ul style="list-style-type: none"> • Plan for subsequent 300 Area evacuation as required. 	Hanford EOC

300 Area Offsite Protective Actions and Recommendations		
Alert	<ul style="list-style-type: none"> • None 	N/A
Site Area Emergency	<ul style="list-style-type: none"> • Implement evacuation of Columbia River from White Bluffs Ferry Landing to Leslie Groves Park. 	Counties (RLEP 3.3)
General Emergency	<ul style="list-style-type: none"> • Implement evacuation of Columbia River from White Bluffs Ferry Landing to Leslie Groves Park. 	Counties (RLEP 3.3)
	<ul style="list-style-type: none"> • Shelter Sections 2A, 3C, and 5. 	Benton/Franklin Counties

12.2 325RPL Emergency Action Levels

The EAL Tables are published in RLEP 1.0 – Appendix 1-PNNL.325, and can be obtained from the 325RPL BM.

13.0 References and Source Requirements

13.1 References *(as revised)*

ADM-001, *Document Management*
EPIP-2.0, *Management Support Group Procedure*
EPIP-3.0, *PNNL Recovery Plan*
EPIP-7.0, *PNNL Active Shooter Response Procedure*
HDI Exhibit, [PNNL Workplace Substance Abuse Requirements and Protocol](#)
HDI Exhibit, [Respond to Spill or Adverse Chemical Condition](#)
HDI Work Control, [Basic Staff Practices](#)
HDI Workflow, [Report an Event or Unwanted Condition](#)
PNNL Guides for Post-Natural Phenomena Hazard Building Inspection
PNNL-DSA-325, *Radiochemical Processing Laboratory Documented Safety Analysis*
PNNL-MA-110, *PNNL Emergency Management Plan*
RCP-8.1.02, *Quick Sort Survey of Personnel*
RPL-PLN-701, *RPL Business Continuity Plan*
SOP-325-003, *325RPL Building Heating, Ventilation and Air Conditioning Emergency Shutdown*

13.2 Source Requirements *(as amended)*

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations*.
DOE/RL-94-02, *Hanford Emergency Management Plan*, U.S. Department of Energy Richland Operations Office.
DOE-0223, *RL Emergency Implementing Procedures – Applicable to PNNL-Managed Facilities on the Hanford Site*, U.S. Department of Energy Richland Office.
RCRA Site-Wide Permit WA7890008967, *Hanford Facility Dangerous Waste Permit*, Resource Conservation and Recovery Act of 1976.
ROD 12 WAC 173-303 *Dangerous Waste Regulations*
ROD 519, *DOE CRD O 151.1D, Comprehensive Emergency Management System*
ROD 878 *DOE CRD O 420.1C, Chg. 1 Facility Safety*
ROD 906 29 *CFR 1926 Safety and Health Regulations for Constructions*
ROD 1264 *Hanford Facility RCRA Permit Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion*
RLEP 1.0 – Appendix 1-PNNL.325.
WAC-173-303-340, "Preparedness and Prevention," *Washington Administrative Code*, Olympia, Washington. <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-340>.
WAC-173-303-350, "Contingency Plan and Emergency Procedures," *Washington Administrative Code*, Olympia, Washington. <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-350>.

WAC-173-303-360, "Emergencies," *Washington Administrative Code*, Olympia, Washington.
<http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-360>.

13.3 Emergency Preparedness Checklists (as revised)

[EP-BED-325RPL, Building Emergency Director Checklist](#)

[EP-CHA, Chemical Hazard Assessors Checklist](#)

[EP ECF, Event Closeout Form](#)

[EP-FOS, Facility Operations Specialist \(FOS\) Checklist](#)

[EP-HazCom, Hazards Communicator Checklist](#)

[EP-ICPC, Incident Command Post Communicator Checklist for Hazardous Facilities](#)

[EP IM, Incident Manager Checklist](#)

[EP EmerEvacReport, PNNL Emergency Evacuation Report Form](#)

[EP-RHA, Radiological Hazard Assessors Checklist](#)

[EP-SAS-325RPL, 325RPL Staging Area Supervisor Checklist](#)

14.0 Attachments

Attachment 1 – Emergency Equipment and Evacuation Routes – 1st Floor

Attachment 2 – Emergency Equipment and Evacuation Routes – 2nd Floor

Attachment 3 – Emergency Equipment and Evacuation Routes – Mezzanine and Basement

Attachment 4 – Zone Warden Map – 1st Floor

Attachment 5 – Zone Warden Map – 2nd Floor

Attachment 6 – Zone Warden Map – Mezzanine and Basement

Attachment 7 – 325RPL Staging Area Map

Attachment 8 – 325RPL Alternate Staging Area Map

Attachment 9 – Location of 325RPL in the 300 Area

Attachment 1 – Emergency Equipment and Evacuation Routes 1st Floor ²⁷

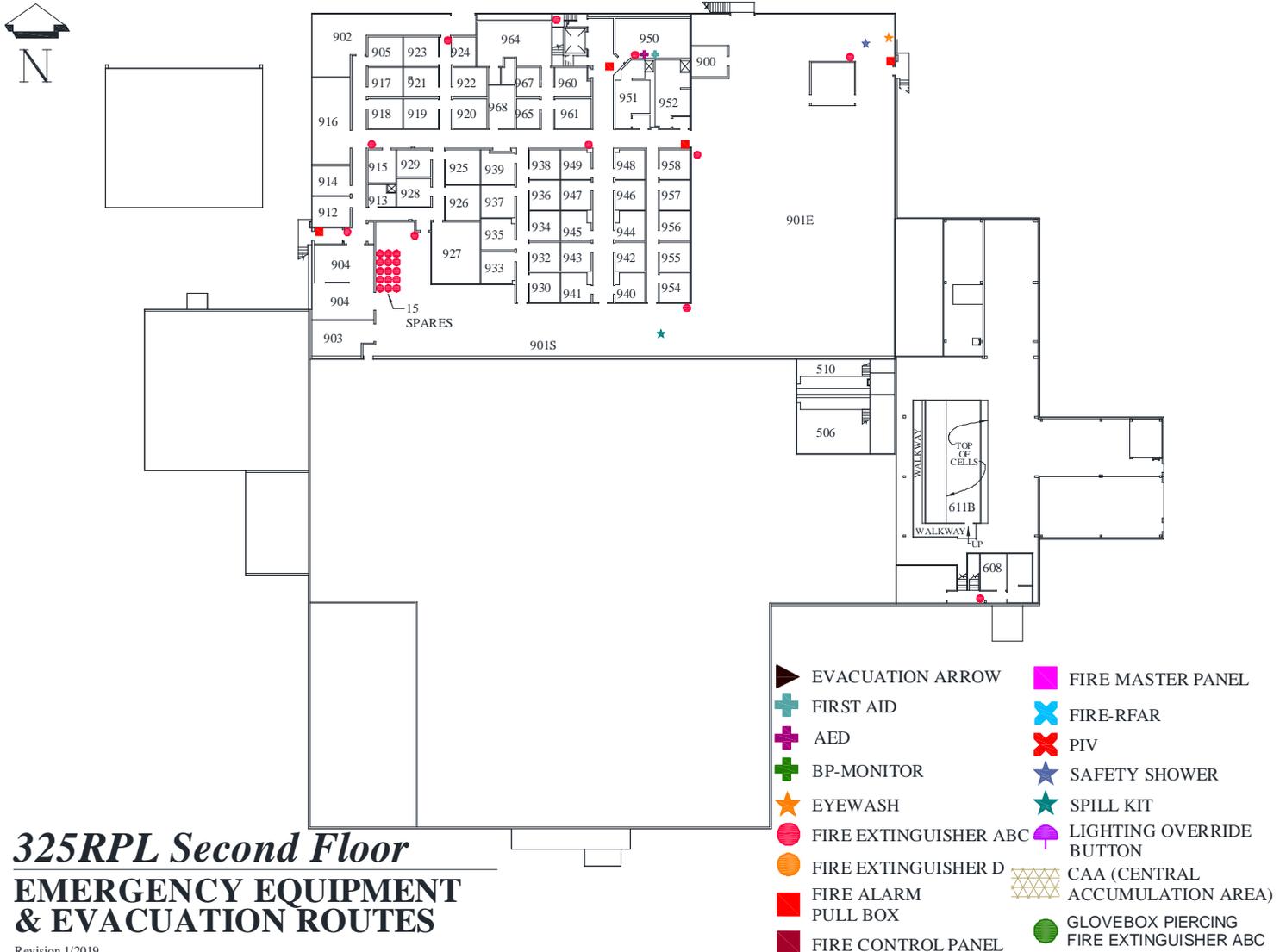


**325RPL First Floor
 EMERGENCY EQUIPMENT
 & EVACUATION ROUTES**

Revision 1/2019
 Jordan Fiskum * Campus Planning & Projects

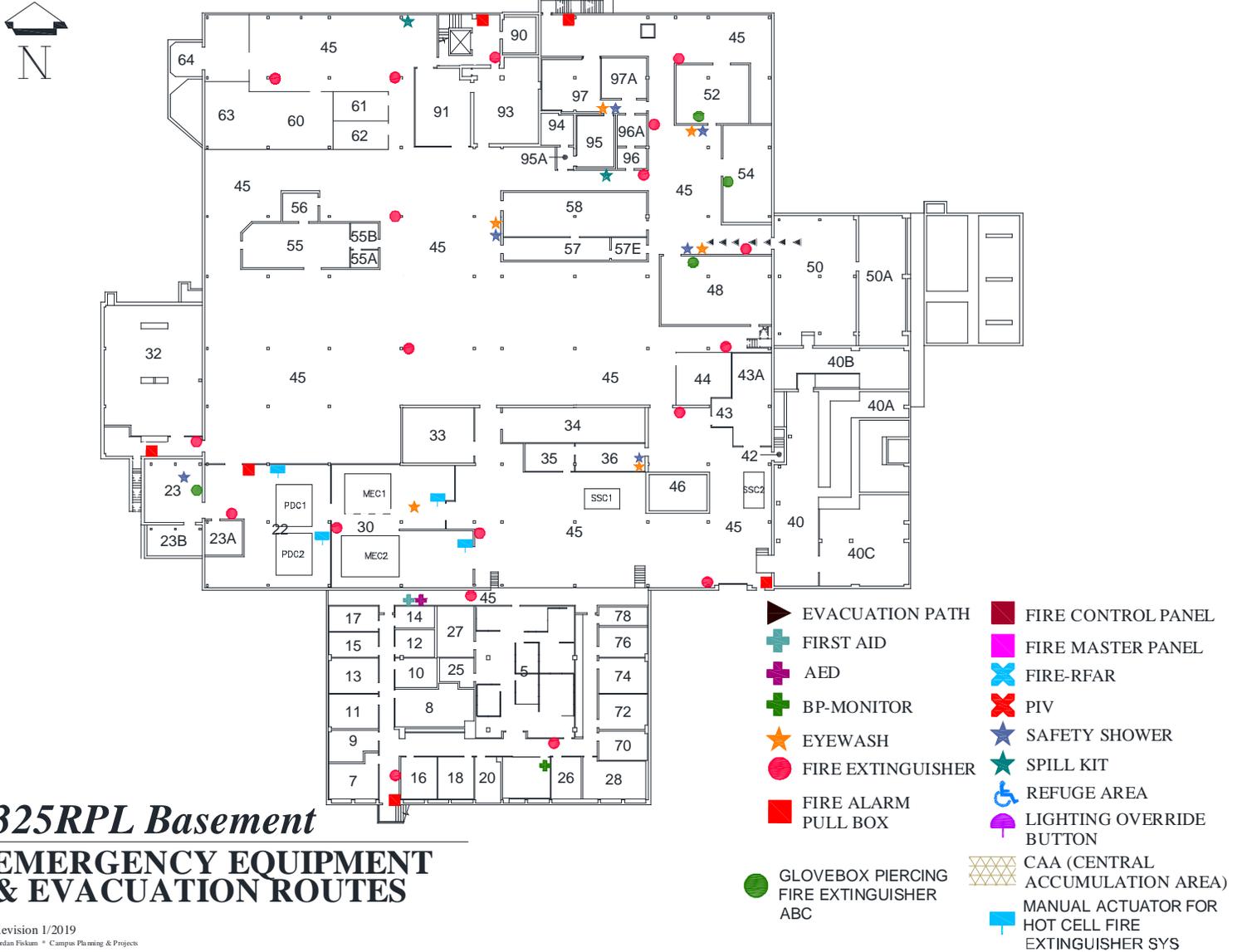
²⁷ Section 13.0, Attachment 1: Permit Requirement, Class 1 Modification 09/30/15

Attachment 2 – Emergency Equipment and Evacuation Routes 2nd Floor²⁸



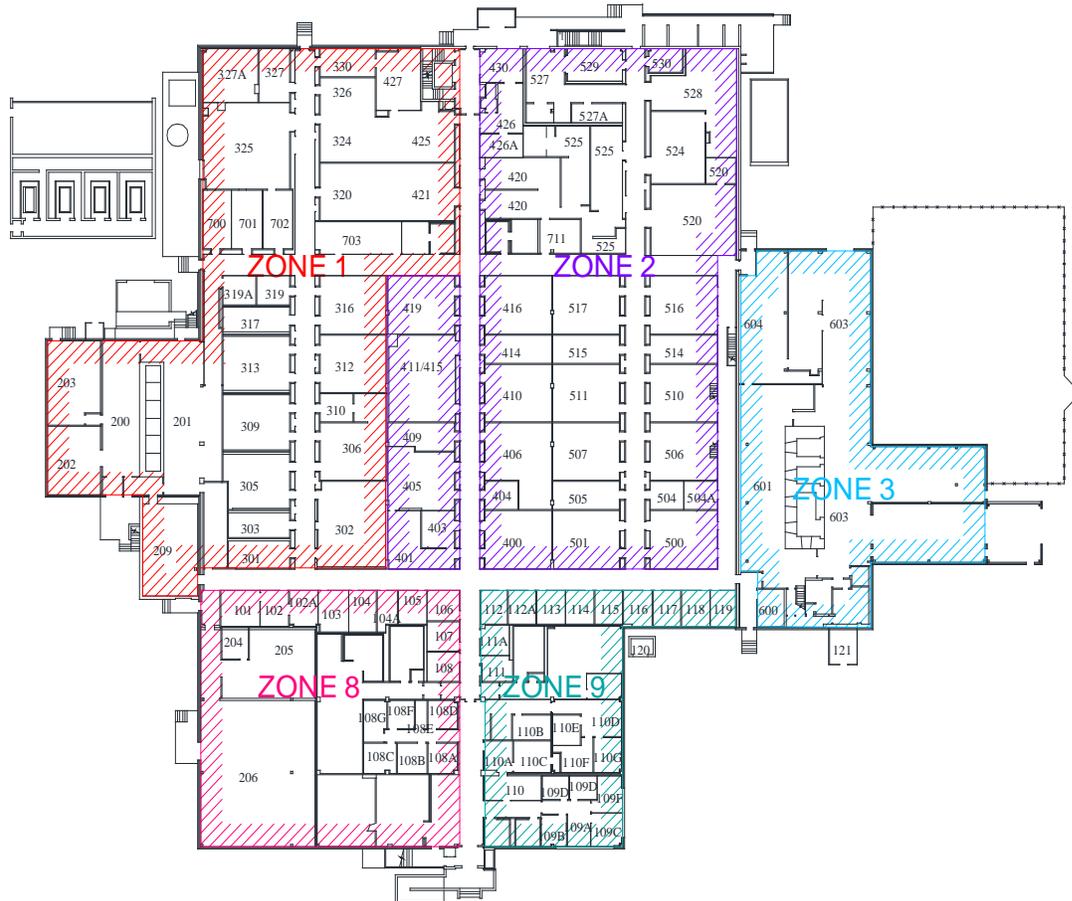
²⁸ Section 13.0, Attachment 2: Permit Requirement, Class 1 Modification 09/30/15.

Attachment 3 – Emergency Equipment and Evacuation Routes Mezzanine and Basement²⁹



²⁹ Section 13.0, Attachment 3: Permit Requirement, Class 1 Modification 09/30/15.

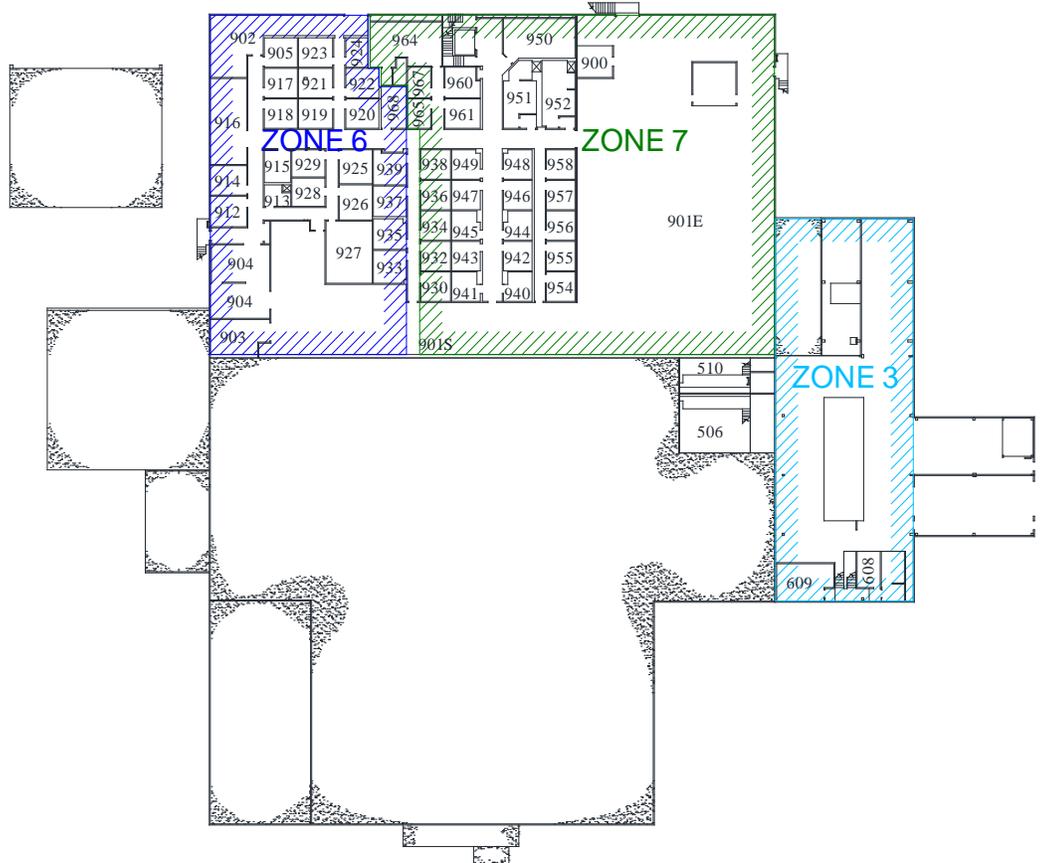
Attachment 4 – Zone Warden Map – 1st Floor



325RPL First Floor ZONE WARDEN MAP

Revision 12/2018
Jordan Fiskum * Campus Planning & Projects

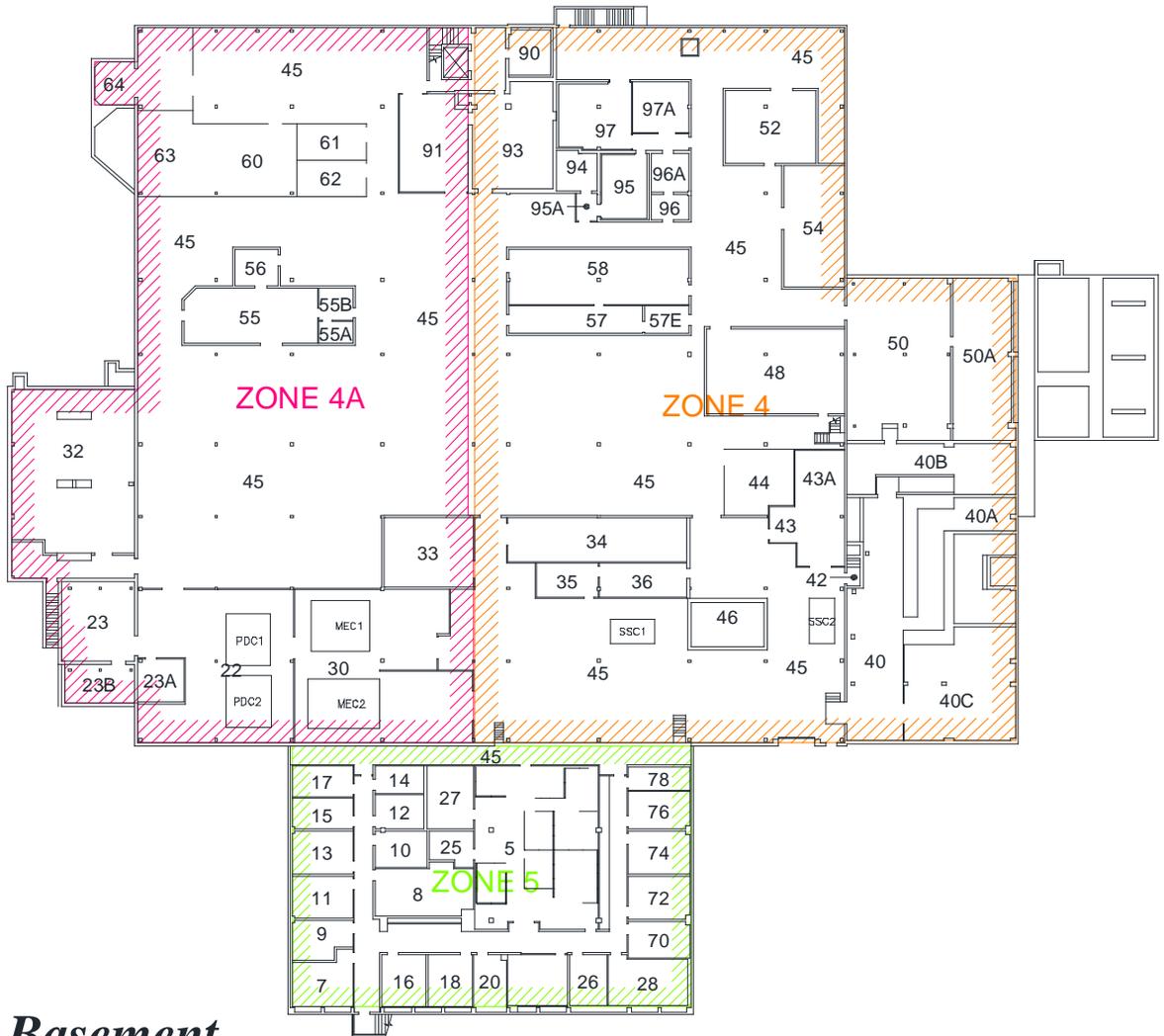
Attachment 5 – Zone Warden Map – 2nd Floor



325RPL Second Floor **ZONE WARDEN MAP**

Revision 12/2018
Jordan Fiskum • Campus Planning & Projects

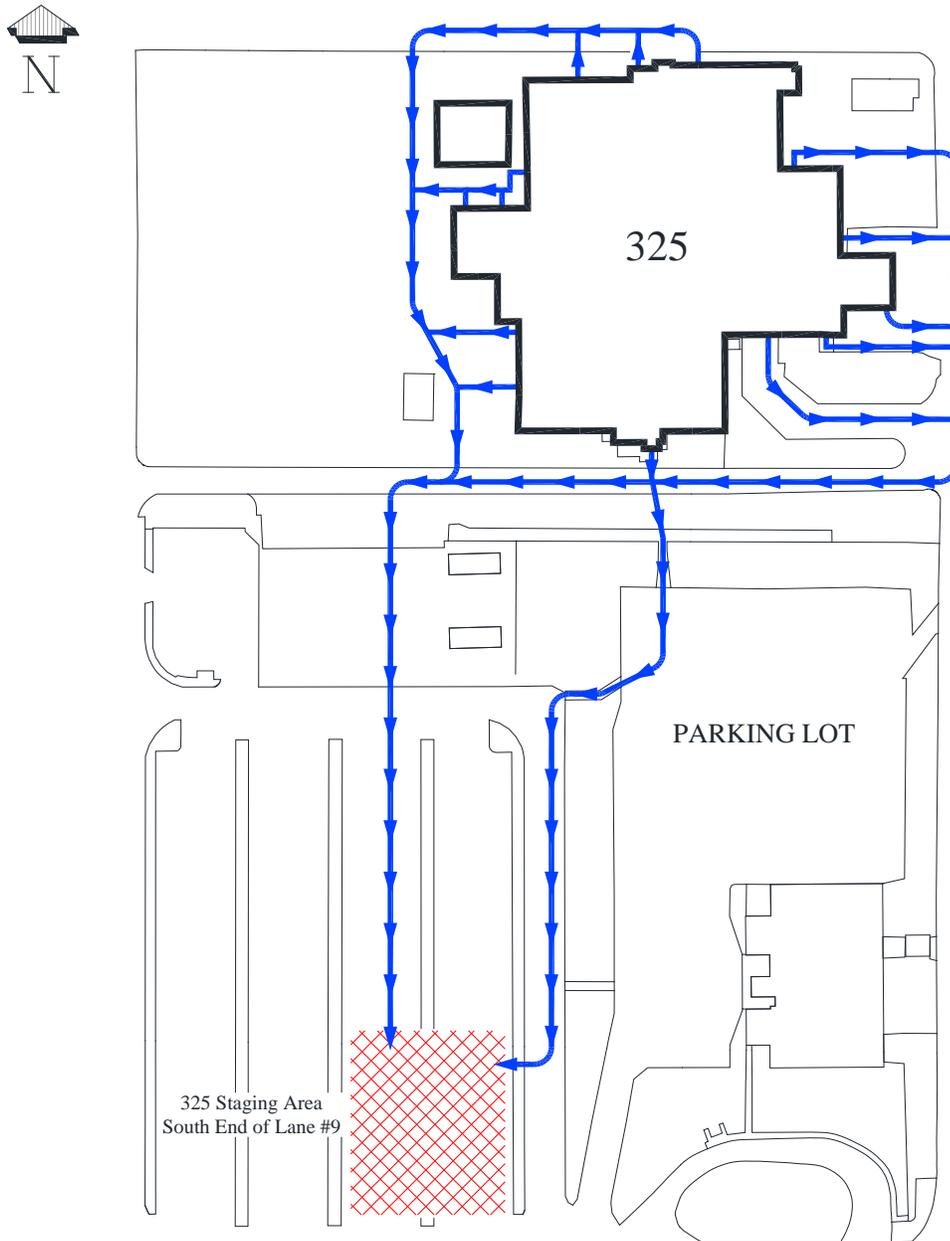
Attachment 6 – Zone Warden Map- Mezzanine and Basement



325RPL Basement ZONE WARDEN MAP

Revision 12/2018
Jordan Fiskum * Campus Planning & Projects

Attachment 7 – 325RPL Staging Area Map³⁰



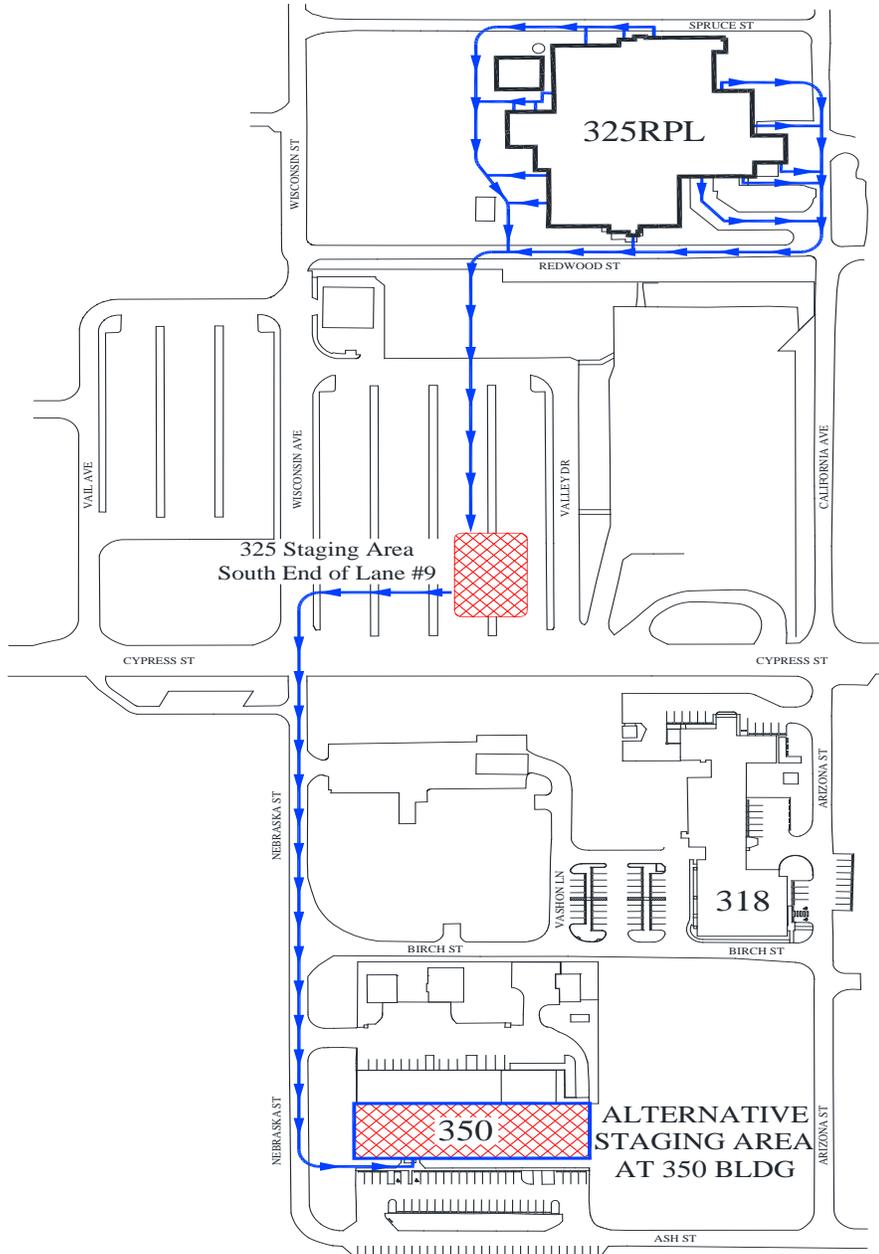
325RPL Building
**EMERGENCY EVACUATION
ROUTES & STAGING AREA**

Revision 12/2018

Jordan Fiskum * Campus Planning & Projects

³⁰ Section 13.0, Attachment 7: Permit Requirement, Class 1 Modification 03/31/16.

Attachment 8 – 325RPL Alternate Staging Area³¹



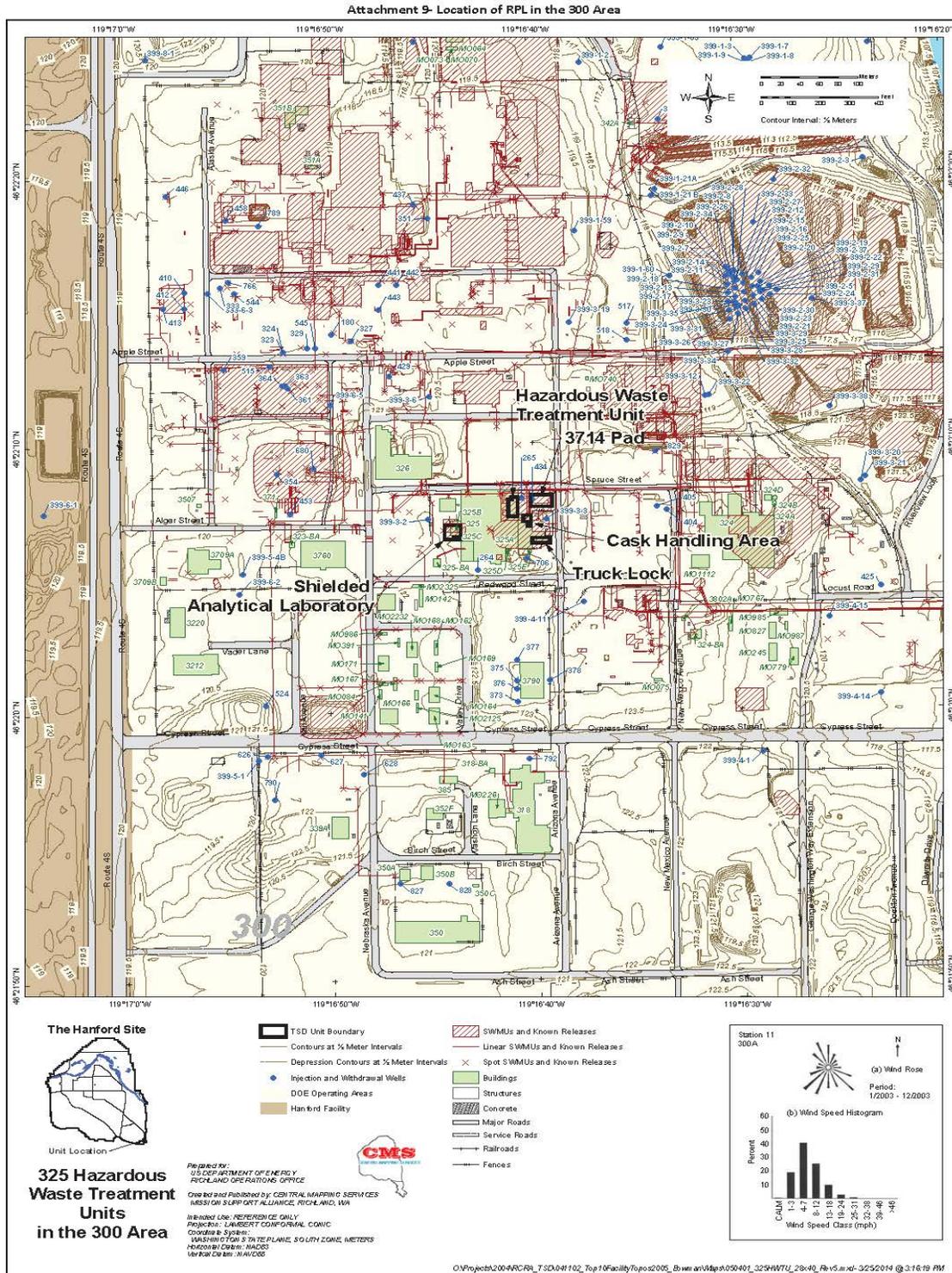
325RPL Building **EMERGENCY EVACUATION ROUTES & ALTERNATE STAGING AREA**

Revision 12/2018

Jordan Fiskum • Campus Planning & Projects

³¹ Section 13.0, Attachment 8: Permit Requirement, Class 1 Modification 03/31/16.

Attachment 9 – Location of 325RPL in the 300 Area



Procedure Revision History

Rev. #	Date	Description	Template-BEP, Rev 1
21	5/7/2019	<ul style="list-style-type: none"> Section 1.3: Deleted sentence, “The 325RPL Manager is part of the Nuclear Operations Division within the Facilities and Operations (F&O) Directorate.” Section 3.2 Table: Updated phone number for the ICP Communicator and updated the 1st and 2nd alternate post recorder. Step 5.3: Added the word “wastes” is missing in the last sentence. Step 6.2.1: The three bullets should be part of the note before 6.2.1.1. Step 6.1.2.7: Omitted the word “or”: should be “Steps to contain the spill and/or release...”. Added ROD 519, <i>DOE CRD O 151.1D, Comprehensive Emergency Management System</i> to section 13.2. Added exception for pulling fire alarm to Section 6.1.1.1: If the fire is occurring outside of the facility (e.g., at the ESY, NSP or the 3714 Pad) and pulling the fire alarm could result in building occupants evacuating the building into a hazard (i.e., building occupants exiting via the nearest exit and potentially via the fire or plume), consider the public address system in place of the fire alarm, or in addition to, as appropriate. 	
20	5/7/2019	<ul style="list-style-type: none"> Reformatted to BEP Rev. 1 Template. Added WAC-173-303-201 to Section 1.0. Section 2.3, corrected title of procedure (ADM-001, <i>Document Management</i>). Updated for new generator regulations. This included changing HWTU Permit Coordinator and the RCRA SME to the Waste Management SME. Updated for identification of RMT and IWMS as sources of information about hazards in the facility. Updated table in Section 3.1 with new personnel. Updated table in Section 3.2 with personnel and rearranged alternates. Broke out new section 3.21, Waste Management Staff responsibilities from Section 3.20 Unique Program Laboratory Expertise. Added FSR to section 3.22. Added tools to section 5.0: Radioactive Material Tracking System and Integrated Waste Management System. Corrected section number to 5.0 in Sections 5.2 and 5.3 and added more information. Updated section 5.3 to include Dangerous (Hazardous) waste and how it is managed. Updated section 5.4 to include details for radioactive material management. Deleted “Note 2” from step 6.5.2 because modeling of a criticality accident can be detected in the HLRF hot cells. Corrected terminology in section 9.2. Corrected terminology in section 10.5. Updated 325 Basemnt figures (Attachments 3 and 6) for modifications to the Quiet Suite. Removed 94A, 94B, 98 and egress arrows from 50A. 	

		<ul style="list-style-type: none"> • Updated figures (Attachments 1, 2 and 3) for location of emergency equipment and updated the reference to the 90-day storage areas to the Central Accumulation Areas (CAA). • Updated Attachments 1-8 with the correct building number (325RPL). • Updated HDI references and F&O documents referenced as needed.
10/15/2018	19	<ul style="list-style-type: none"> • Updated approvals on coversheet to remove JE Kinzer and add ML Hayden • Updated Section 1.0 for grammatical correction and to include criticality alarm as primary means of evacuation. • Removed Randy Thornhill and added Don Bachand as EOC tech rep in Section 3.1 • Updated Table in Section 3.2 with new BERO members. • Updated Figure (Emergency Operations Center Interface) in Section 3.3. • Updated phone number in Section 3.6 for Tech Rep in EOC. • Deleted last paragraph from Section 3.22. • Updated Section 3.23. • Corrected Section 5.5 to better describe that fissionable material is stored in Criticality Safety Control Areas. • Corrected phone numbers in Section 6.5.1.1. • Updated Attachment 8 to remove demolished 300 Area buildings. • Corrected references in Section 14.1. • Added ROD to Section 14.2.
12/19/17	18	<ul style="list-style-type: none"> • Updated Table in Section 3.1 for new MSG point of contact. • Updated Table in Section 3.2 with new BERO members. • Updated Section 8.9 to change valve type. • Section 2.1 deleted information webpage link. • Updated Concurrences
5/8/17	17	<ul style="list-style-type: none"> • Removed AD Haller from concurrence and added HT Tilden. • Changed title to Materials and Waste Management Manager. • Changed hazards on coversheet to “See Section 5.0, Facility Hazards” • Updated Nuclear Criticality Actions in the table contained in Section 1.5 to read, “Leave the building immediately (walk with purpose) through the closest exit, do NOT stop for a survey and get at least 15 feet of separation from the facility. Maintain a minimum of 15 feet distance during relocation to the primary staging area.” • Deleted Power Operator Office from Section 2.1 for distribution of BEP. • Updated information on personnel and phone numbers in the table in Section 3.1. • Updated information on personnel and phone numbers in the table in Section 3.2. • Deleted (paper or electronic) when signing into the accountability log in Section 3.16. • Revised terminology in Step 6.5.1.4, “Nuclear criticality safety violations are identified as a loss of documented controls...” • Revised Step 6.5.2.1 to reflect walk with purpose and get at least 15 feet of separation from the building.

		<ul style="list-style-type: none"> • Revised Note after Step 6.5.2.2 to reflect walk with purpose and get at least 15 feet of separation from the building. Also, changed the reference to Attachments 7 and 8. • Added new Section 8.7, Ventilation which was previously part of Section 8.6, Compressed Air. • Deleted last part of sentence of first paragraph “located in Room 94B” in Section 8.11, 325RPL Decontamination Shower/Sink. • Changed the public address system phone number from” #1234 on BM phone” to “375-3700 on the VOIP phone”. • Added footnote Section 1.0, Paragraph 4 which had inadvertently dropped off since Revision 15. • Updated Footnote 18 to reference its new location in Section 3.21 which had inadvertently been overlooked since Revision 15.
05/23/16	16	<p>Updated the following:</p> <ul style="list-style-type: none"> • Section 1.0 added that BERO members will use checklist and checklists are updated to changes received from the Hanford Site Emergency Preparedness Program. • Section 3.2 tables either added new personnel or switched order of primary and alternates. • Section 3.22 was changed so that PNNL staff member performing work in or having unescorted access approval into the 325RPL reviews the EIP annually. • Added new section 6.4.5, Stack Monitor Alarm with actions to be taken. • Added new section 6.5.2.5, for Criticality Actions to support recovery plan actions.

Approval History for: BEP-325RPL_R21, Building Emergency Procedure for 325RPL

Final Process State: APPROVED

Name	Activity Name	Date
<input checked="" type="checkbox"/> ACCEPTED Ellefson, Mark D	Review Concurrence 3	5/6/2019 1:32:51 PM
<input checked="" type="checkbox"/> ACCEPTED Beck, Jeremy S	Review Concurrence 1	5/6/2019 1:37:16 PM
<input checked="" type="checkbox"/> ACCEPTED Hayden, Melanie L	Review Concurrence 2	5/6/2019 2:28:23 PM
<input checked="" type="checkbox"/> ACCEPTED VanArsdale, Trevor L	Review Concurrence 5	5/6/2019 2:54:08 PM
<input checked="" type="checkbox"/> ACCEPTED Rohrig, David A	Review Concurrence 4	5/6/2019 4:01:46 PM
<input checked="" type="checkbox"/> ACCEPTED Saueressig, Paul T	Review Approval 1	5/7/2019 6:50:57 AM
<input checked="" type="checkbox"/> ACCEPTED Saueressig, Paul T	Unreviewed Safety Question/Issue Review	5/7/2019 9:26:10 AM

* All actions are stored digitally and viewable at <https://approvals.pnl.gov/ProcessView.aspx?pid=3449570>

Attachment to Addendum J Building Emergency Procedure Applicability Matrix

**325 Hazardous Waste Treatment Units
Location of Preparedness and Prevention, Contingency Planning, and Emergency Response
Information Required by WAC 173-303-340, -350, and -360, -630, and -640**

WAC Requirement WAC 173-303-XXX	Permit Attachment 4 <i>Hanford Emergency Management Plan,</i> DOE/RL-94-02¹	Addendum J, 325 Building Emergency Procedure²	Permit, Part III, Operating Unit Group 5, 325 HWTUs
-340(1)(a), internal communications and alarms	Table 5-1	Section 10.3	Addendum F, Sections F.1.1.1 and F.1.1.2
-340(1)(b), device capable of summoning emergency assistance		Section 10.3	Addendum F, Sections F.1.1.1 and F.1.1.2
-340(1)(c), fire extinguishing, spill control, and decontamination equipment	Section 11.2.8 (Hanford Fire Department)	Sections 10.2, 10.4 and 10.5	Addendum F, Sections F.1.1.3 and F.2.5
-340(1)(d), water supply			Addendum F, Sections F.1.1.3 and F.1.1.4
-340(1)(d), periodic testing and maintenance	Section 11.3 (communications and alarms)	Section 3.4, second paragraph, 24 th bullet	Addendum I, Sections I.1.1.2 and I.1.1.3
-340(2)(a), alarm availability		Section 10.3	Addendum F, Sections F.1.1.1 and F.1.1.2 Addendum C, Section C.1.2
-340(2)(b), immediate access to alarm by single person on premises		Section 10.3	Addendum F, Sections F.1.1.1 and F.1.1.2 Addendum C, Section C.1.2
-340(3), aisle space			Addendum F, Section F.1.2 Addendum C, Section C.1.2
-340(4), arrangements with local authorities	Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1	Section 1.6	Permit Condition II.B.4, Permit Condition II.I.1.g and Attachment 6
-340(5), records of local authorities declining to make advance arrangements			Permit Condition II.I.1.g and Attachment 6
-350(1), contingency plan and implementation	Sections 1.1 and 4.2	Section 1.0	
-350(2), contingency plan and "one plan"	Sections 1.1 and 4.2	Section 1.0	

¹ Current Revision

² Current Revision

-350(3)(a), descriptions of actions personnel must take		Section 3.4, first and second paragraphs (building emergency director), Section 3.15, first and sixth bullets (all facility staff), and Sections 6.1, 6.2, and 6.3 (specific actions for fires, explosions, releases, odors)	
-350(3)(b), actions for damaged waste shipments		Section 6.2.3	Addendum B, §B.2.2.1.1.2 (activation of plan for damaged shipment)
-350(3)(c), description of arrangements with local authorities	Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1	Section 1.6	
-350(3)(d), list of emergency coordinators		Section 3.1 ³	
-350(3)(e), list of emergency equipment	Section 11.2.8 (Hanford Fire Department)	Section 10 and Section 14, Attachments 1-3	Addendum F, Sections F.1.1.3 (emergency equipment) and F.2.5 (protective clothing)
-350(3)(f), evacuation signals and routes	Table 5-1 (signals), Figure 7-3 (routes)	Section 1.5 (signals), Section 14, Attachments 1, 2, 3, 7, and 8 (routes)	Addendum F, Section 1.1.1 (signals)
-350(4)(a), maintain copy at facility	Section 14.3.7 (copies of 94-02)	Section 2.1 (copies of 325 BEP)	Permit Condition II.I.1.e; Permit Attachment 6
-350(4)(b), provide copies to emergency response agencies	Section 14.3.7		
-350(5), amendment of plan	Section 14.3.1.1	Section 1.0	
-355(1), coordination with local agencies	Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1	Section 1.6	
-355(2), use of computer models	Sections 1.3.3.2 and 2.2.2.3.3	Section 3.4, 2 nd paragraph, 17 th bullet (use of UDAC)	
-360(1), designation of emergency coordinator	Sections 1.3.4 (Incident Command) and 2.2 (designated BED for the facility)	Section 3.4, 1 st paragraph and 2 nd paragraph, 29 th bullet	Addendum G, Section G.1 and Table G-1 (BED training)
-360(2)(a), activate alarms and notify agencies for assistance if needed	Sections 1.3.4 (incident command) and 2.2.1.1.3(b) (BED)	Section 3.4, 5 th , 8 th , and 16 th bullets	
-360(2)(b), immediately characterize any release of materials	Section 2.2.1.1.3(g)	Section 3.4, 17 th bullet	
-360(2)(c), concurrently assess	Sections 2.2.1.1.3(c), 4.2, 5.1.1, and 5.1.2	Section 3.4, 3 rd and 17 th bullets; Section 4 criteria	

³ This information is not required pursuant to Permit Condition II.A.4 and is included only in order to avoid modification to the complete Building Emergency Procedure.

health and environmental threat			
-360(2)(d)(i), notify local authorities if evacuation required	Sections 2.2.1.1.3(e) and 5.1.1.2	Section 3.4, 8 th bullet ⁴	
-360(2)(d)(ii) and (e), notify Ecology and EPA	Sections 4.2 and 5.1.2.1	Section 3.4, 25 th bullet	
-360(2)(f), measures to prevent occurrence, spread, or recurrence	Section 2.2.1.1.3(g)	Section 3.4, 17 th bullet	
-360(2)(g), monitoring during facility shutdown	Section 2.2.1.1.3(g)	Section 3.4, 17 th bullet	
-360(2)(h), provision for disposal of contaminated materials	Section 9.2.3	Section 9.2, first paragraph	Addendum F, Section 1.1.1.3 (management of contaminated water)
-360(2)(i)(i), prohibition of incompatible material	Section 9.2.3	Section 9.2, first and third paragraphs	Addendum F, Section 3.2 (management of incompatible wastes)
-360(2)(i)(ii), emergency equipment cleaned and fit for use	Section 11.2	Section 9.2, second paragraph and 9.3, last paragraph	
-360(2)(j), notification to Ecology prior to restart	Section 5.1.2.3	Section 3.4, 25 th bullet; Section 3.20, second paragraph, and Section 9.2, third paragraph	
-360(2)(k), 15-day reporting	Section 5.1.2.2	Section 3.4, 25 th bullet; Section 3.22, second paragraph, and Section 9.2, third paragraph	
-630(2), response to leaks from containers	Section 4.2	Section 3.4, 17 th bullet; Sections 4 and 6.2	Addendum C, Section C.1.2 (repackaging of waste if container leaks)
-640(7)(d)(ii) and -640(7)(f), response to and reports of tank leaks	Sections 5.1.2.2 and 5.1.2.3	Section 3.4, 25 th bullet; Section 3.20, second paragraph; Section 6.2; Section 9.2, third paragraph	Addendum C, Sections C.2.1.2.3 (non-emergency reporting) and C.2.1.2.4 (response to tank leaks)

⁴ Any emergency requiring offsite evacuation constitutes an operational emergency and would meet one or more of the PNNL emergency action levels criteria.

This page intentionally left blank.

**400 AREA WASTE MANAGEMENT UNIT
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have a “**Last Modification Date**” which represents the last date the portion of the unit has been modified. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Last modification to 400 Area Waste Management Unit **May 23, 2019**

Addenda	Last Modification Date	Modification Number
Unit-Specific Conditions	05/23/2019	PCN-400WMU-2019-01 (8C.2019.Q2)
A. Part A Form	06/30/2012	
B. Waste Analysis Plan	06/30/2012	
C. Process Information	12/31/2012	
D. Reserved		
E. Procedures to Prevent Hazards	08/25/2016	8C.2016.Q2
F. Preparedness & Prevention	09/30/2012	
G. Personnel Training	06/30/2013	
H. Closure Plan	06/30/2009	
I. Inspection Requirements	09/5/2012	
J. Contingency Plan	05/23/2019	PCN-400WMU-2019-01 (8C.2019.Q2)

This page intentionally left blank.

**400 AREA WASTE MANAGEMENT UNIT
PART III, OPERATING UNIT GROUP 16 PERMIT CONDITIONS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
05/23/2019	PCN-400WMU-2019-01 (8C.2019.Q2)
11/8/2018	PCN-400WMU-2018-01 (8C.2018.Q4)
08/25/2016	8C.2016.Q2

This page intentionally left blank.

1
2
3
4
5

**PART III, OPERATING UNIT GROUP 16 PERMIT CONDITIONS
400 AREA WASTE MANAGEMENT UNIT**

1
2
3
4
5

This page intentionally left blank.

1
2 **PART III, OPERATING UNIT GROUP 16 PERMIT CONDITIONS**
3 **400 AREA WASTE MANAGEMENT UNIT**
4

5
6 **UNIT DESCRIPTION**

7 The 400 Area Waste Management Unit (WMU) is in the Property Protected Area (PPA) at the Fast Flux
8 Test Facility (FFTF), in Hanford's 400 Area. The 400 Area WMU consists of two container storage
9 units:

- 10 • Fuel Storage Facility (FSF, Building 403). The FSF is a large steel-frame, metal-sided, high bay
11 building. Its dimensions are 34 x 27 x 12 meters (112 x 90 x 40 feet). The container storage unit
12 is on the ground-level floor. In it are two large steel boxes that store sodium-contaminated core
13 component pots (CCPs). The Permittees do not plan to store more mixed waste than is currently
14 stored in the facility; however, the FSF is physically capable of storing additional mixed waste.
15 They will store any additional wastes at the 400 Area WMU in the Interim Storage Area.
- 16 • Interim Storage Area, 4718 (ISA). The ISA consists of 156 x 247 meters (513 x 247 feet) totally
17 fenced area. This area is for aboveground dry cask storage of spent fuel. A concrete pad in the
18 ISA, which measures 27 x 37 meters (90 x 120 feet), was used for dry cask storage, but will not
19 necessarily be used for mixed waste management. The rest of the ISA surface is gravel. The ISA
20 is generally flat. However, it is graded to drain in accordance with the general drainage plan for
21 the FFTF PPA. Inside the ISA, there is also one building along the west fence line, and open on
22 the side. This building, Building 432A, is not authorized for mixed waste management.

23 The scale map in Addendum A shows the location of each storage unit. The only mixed waste stored in
24 these two container storage units is elemental sodium, and sodium potassium (D001, D003, and WSC2),
25 sodium hydroxide (D002), and potassium hydroxide (D002) and debris (e.g., piping, equipment, and
26 components) contaminated with elemental sodium, sodium potassium, sodium hydroxide, and potassium
27 hydroxide. The 400 Area WMU will not store, treat, or dispose of bulk metallic sodium or bulk sodium
28 hydroxide.

29 **LIST OF ADDENDA SPECIFIC TO OPERATING UNIT GROUP 16**

- 30 Addendum A Part A Form, dated June 30, 2012
31 Addendum B Waste Analysis Plan, dated June 30, 2012
32 Addendum C Process Information, dated December 31, 2012
33 Addendum D Groundwater Monitoring – Reserved
34 Addendum E Procedures to Prevent Hazards, dated June 30, 2016
35 Addendum F Preparedness and Prevention, dated September 30, 2012
36 Addendum G Personnel Training, dated June 30, 2013
37 Addendum H Closure Plan, dated June 30, 2009
38 Addendum I Inspection Requirements, dated September 5, 2012
39 Addendum J Contingency Plan, dated May 23, 2019

40 **DEFINITIONS**

41 The term "**CCP**" or **Core Component Pot** means one of 109 cylindrical containers, each containing
42 3.75 gallons of un-reacted sodium totaling 405 gallons, currently stored as mixed waste in the FFTF FSF.
43 The CCPs were previously filled with sodium and used in the FFTF Interim Decay Storage Vessel to
44 store spent FFTF Driver Fuel Assemblies under inert gas.

1 **ACRONYMS**

2	FFTF	Fast Flux Test Facility
3	CCP	Core Component Pot
4	PPA	Property Protected Area
5	ISA	Interim Storage Area
6	FSF	Fuel Storage Facility
7	WMU	Waste Management Unit

8 **III.16.A COMPLIANCE WITH UNIT-SPECIFIC PERMIT CONDITIONS**

9 **III.16.A.1** The Permittees will comply with all conditions in this Chapter and its addenda with
10 respect to dangerous waste management and dangerous waste management units in the
11 400 Area WMU, in addition to conditions in Permit Parts I and II.

12 **III.16.B GENERAL WASTE MANAGEMENT**

13 **III.16.B.1** The Permittees are authorized to accept, according to the waste acceptance procedure
14 documented in Addendum B, Section B.2, mixed debris generated from demolition and
15 decommissioning of the FFTF reactor system containing or contaminated with residual
16 elemental sodium and sodium hydroxide. The Permittee will store these wastes in the
17 ISA.

18 **III.16.B.2** The Permittees are authorized to store core component pots generated prior to the
19 effective date of this permit in two large metal boxes in the 400 Area WMU, FSF.

20 **III.16.B.3** The Permittees are authorized store mixed waste in the ISA up to a maximum capacity of
21 19,000 gallons.

22 **III.16.B.4** The Permittees will maintain the physical structure of dangerous waste management units
23 in the 400 Area WMU as documented in the Unit Description above and Addendum C,
24 Figures C.1 and C.2.

25 **III.16.B.5** The Permittees will maintain appropriate administrative controls and work practices to
26 ensure that only wastes specified in Permit Condition III.16.B.1, are received by the ISA
27 for storage, and that no co-mingling or cross-contamination of the waste stream specified
28 in Permit Condition III.16.B.1 with any other waste stream may occur.

29 **III.16.C WASTE ANALYSIS**

30 **III.16.C.1** The Permittees will have an accurate and complete waste profile for the waste stream
31 identified in Permit Condition III.16.B.1. This waste profile will be signed and dated
32 upon approval by the 400 Area WMU authorized representative.
33 [\[WAC 173-303-380\(1\)\(a\)\]](#)

34 **III.16.C.2** The Permittees will make a copy of the waste profile required by Permit
35 Condition III.16.C.1 available upon request. [\[WAC 173-303-815\(2\)\(b\)\(ii\)\]](#)

36 **III.16.D RECORDKEEPING AND REPORTING**

37 **III.16.D.1** The Permittees will place the following into the Hanford Facility Operating Record,
38 400 Area WMU File required by Permit Condition II.I.1. [\[WAC 173-303-380\]](#)

39 **III.16.D.2** Records required by [WAC 173-303-380\(1\)\(o\)](#), incorporated by reference.

- 1 **III.16.E SECURITY**
- 2 **III.16.E.1** The Permittees will post warning signs at all entrances to the FSF and the ISA specified
3 in Addendum E, Section E.1.1. [[WAC 173-303-310](#)(2)(a)]
- 4 **III.16.F PREPAREDNESS AND PREVENTION**
- 5 **III.16.F.1** The Permittees will comply with the Addendum F, Preparedness and Prevention
6 requirements specific to the 400 Area WMU. [[WAC 173-303-340](#)]
- 7 **III.16.G CONTINGENCY PLAN**
- 8 **III.16.G.1** The Permittees will comply with Addendum J, Contingency Plan in addition to the
9 requirements of Permit Condition II.A when applicable. [[WAC 173-303-350](#)]
- 10 **III.16.H INSPECTIONS**
- 11 **III.16.H.1** The Permittees will perform inspections of the 400 Area WMU according to
12 Addendum I, Inspection Plan for inspecting all monitoring equipment, safety and
13 emergency equipment, security devices, and operating and structural equipment that help
14 prevent, detect, or respond to hazards to the public health or the environment pursuant to
15 the requirements of [WAC 173-303-320](#). [[WAC 173-303-320](#)(2)]
- 16 **III.16.I TRAINING PLAN**
- 17 **III.16.I.1** The Permittees will include Addendum G unit-specific training requirements in the
18 written training plan required by Permit Condition II.C. [[WAC 173-303-330](#)]
- 19 **III.16.J OTHER GENERAL REQUIREMENTS**
- 20 **III.16.J.1** The Permittees will comply with the requirements of [WAC 173-303-395](#)(1)(a)-(c),
21 incorporated by reference, for prevention of reaction of ignitable, reactive, or
22 incompatible wastes.
- 23 **III.16.J.2 Land Disposal Restriction Requirements**
- 24 **III.16.J.2.a** The Permittees will ensure a schedule of compliance and any applicable associated work
25 requirements are included in the land disposal restrictions report required by the Hanford
26 Federal Facility Agreement and Consent Order (HFFACO) Milestone M-26, incorporated
27 by reference by Permit Condition II.O for treatment and/or acquisition of treatment
28 capacity for wastes which are or are expected to be stored in the 400 Area WMU
29 container storage units.
- 30 **III.16.K CLOSURE**
- 31 **III.16.K.1** The Permittees will close the 400 Area WMU Container Storage Units in accordance
32 with Addendum H, Closure Plan. [[WAC 173-303-610](#)(4)]
- 33 **III.16.L POST CLOSURE**
- 34 Reserved
- 35 **III.16.M CRITICAL SYSTEMS**
- 36 Reserved
- 37 **III.16.N RESERVED**
- 38 **III.16.O CONTAINERS**
- 39 **III.16.O.1** Container Management Standards

- 1 **III.16.O.1.a** The Permittees will ensure that all containers remain in good condition. If a container
2 holding mixed waste is not in good condition (e.g., severe rusting or corrosion, or
3 apparent structural defects), or if it begins to leak, the Permittee must transfer the waste
4 from the container to a container that is in good condition or place the leaking container
5 in an appropriate over-pack container. [[WAC 173-303-630\(2\)](#)]
- 6 **III.16.O.1.b** The Permittees shall ensure that all containers are constructed of carbon steel or stainless
7 steel, or other materials compatible with metallic sodium and sodium hydroxide.
8 [[WAC 173-303-630\(4\)](#)]
- 9 **III.16.O.1.c** The Permittees must remove spilled or leaked waste within secondary containment
10 pursuant to [WAC 173-303-630\(7\)\(a\)\(ii\)](#), incorporated by reference.
- 11 **III.16.O.1.d** Requirements for the Fuel Storage Facility
- 12 **III.16.O.1.e** The Permittee will maintain an inert gas (argon or nitrogen) cover within each large metal
13 box to prevent contact of the metallic sodium with the water vapor in the air and the
14 formation of free liquids.
- 15 **III.16.O.1.f** The Permittees will place large boxes stored in the FSF in drip pans to ensure a base free
16 of cracks or gaps, and ensure that the large boxes are elevated or otherwise protected
17 from contact with accumulated liquids.
- 18 **III.16.O.1.g** Requirements for the Interim Storage Area
- 19 **III.16.O.1.h** The Permittee may store wastes in the ISA in standard metal containers (e.g., 208-liter
20 drums), large metal boxes fabricated to accommodate the size and shape of a particular
21 component or debris, or unique components removed from FFTF that when closed in
22 accordance with [WAC 173-303-630\(5\)\(a\)](#) serve as a primary container.
- 23 **III.16.O.1.i** The Permittees will manage unique components stored in the ISA on the gravel surface
24 with sufficient open space between components and between components and the fence
25 line to accommodate inspections and movement of equipment.
- 26 **III.16.O.1.j** The Permittees will not place wastes in the open-sided structure (Building 432A) within
27 the ISA identified in the Unit Description above.

400 AREA WASTE MANAGEMENT UNIT
ADDENDUM J
CONTINGENCY PLAN
CHANGE CONTROL LOG

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
05/23/2019	PCN-400WMU-2019-01 (8C.2019.Q2)
05/23/2016	8C.2016.Q1

This page intentionally left blank.

1
2
3
4
5

**ADDENDUM J
CONTINGENCY PLAN**

1
2
3
4
5

This page intentionally left blank.

**ADDENDUM J
CONTINGENCY PLAN**

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

TABLE OF CONTENTS

- J CONTINGENCY PLAN 5
- J.1 Building Evacuation Routing (Building Layout)..... 7
- J.2 Building Emergency Director (BED) 7
- J.3 Implementation of the Plan..... 7
- J.3.1 Protective Action Responses..... 8
- J.3.2 Response to Facility Operations Emergencies..... 9
- J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases 11
- J.3.4 Incident Recovery and Restart of Operations 11
- J.3.5 Incompatible Waste 11
- J.3.6 Post Emergency Equipment Maintenance and Decontamination 12
- J.4 Emergency Equipment..... 12
- J.4.1 Fixed Emergency Equipment..... 12
- J.4.2 Portable Emergency Equipment 12
- J.4.3 Communications Equipment/Warning Systems 13
- J.4.4 Personal Protective Equipment 13
- J.4.5 Spill Control and Containment Supplies..... 14
- J.4.6 Incident Command Post..... 14
- J.5 Required Reports 14
- J.6 Plan Location and Amendments 14
- J.7 Building Emergency Organization Building Emergency Director 14

FIGURES

- Figure J.1. FFTF Primary Staging Area..... 15
- Figure J.2. FFTF Alternate Staging Area..... 16

TABLES

- Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173 303-350(3)..... 5

1
2
3
4
5

This page intentionally left blank.

1 **J CONTINGENCY PLAN**

2 The requirements for a contingency plan at the 400 Area Waste Management Unit (WMU) are satisfied in
3 the following documents: Portions of the Hanford Facility Resource Conservation and Recovery Act
4 (RCRA) Permit (Permit) Attachment 4 *Hanford Emergency Management Plan* (DOE/RL-94-02) and this
5 section.

6 The unit-specific building emergency plan also serves to satisfy a broad range of other requirements
7 [e.g., Occupational Safety and Health Administration standards ([29 CFR 1910](#)), *Toxic Substances Control*
8 *Act of 1976* ([40 CFR 761](#)), and U.S. Department of Energy Orders]. Therefore, revisions made to
9 portions of this unit-specific building emergency plan that are not governed by the requirements of
10 [WAC 173-303](#) will not be considered as a modification subject to [WAC 173-303-830](#) or Permit
11 Condition I.C.3.

12 [Table J.1](#) identifies the sections of the unit-specific building emergency plan written to meet
13 [WAC 173-303-350](#)(3) contingency plan requirements identified in this application. In addition,
14 Section 12.0 of the unit-specific 400 Area WMU building emergency plan is written to meet
15 [WAC 173-303](#) requirements identifying where copies of Permit Attachment 4, *Hanford Emergency*
16 *Management Plan* (DOE/RL-94-02) and the building emergency plan are located and maintained on the
17 Hanford Facility. Therefore, revisions to Addendum J require a permit modification subject to
18 [WAC 173-303-830](#) and/or Permit Condition I.C.3.

19

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of [WAC 173 303-350](#)(3)

Requirement	Permit Attachment 4 <i>Hanford Emergency Management Plan</i> (DOE/RL-94-02)	Building Emergency Plan ¹ (HNF-IP-0263-FFTF)	Addendum J
-350 (3)(a) - A description of the actions which facility personnel must take to comply with this section, WAC 173-303-201 and WAC 173-303-360	X ² Section 1.3.4	X ² Sections 7.1, 7.2 through 7.2.5, and 7.3 ³ Sections 4.0, 8.2, 8.3, 8.4, and 11.0	X ² Sections J.3.1 , J.3.2 through J.3.2.5 , and J.3.3 ³ Sections J.3 , J.3.4 , J.3.5 , J.3.6 , and J.5
-350 (3)(b) - A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370 (5), Manifest system, reasons for not accepting dangerous waste shipments	X ² Section 1.3.4	X ^{2,4} Section 7.2.5.1	X ^{2,4} Section J.3.2.6

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of [WAC 173 303-350\(3\)](#)

Requirement	Permit Attachment 4 <i>Hanford Emergency Management Plan</i> (DOE/RL-94-02)	Building Emergency Plan ¹ (HNF-IP-0263-FFTF)	Addendum J
-350(3)(c) - A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4) .	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1		
-350(3)(d) - A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-201(9)(b)(iv) and WAC 173-303-360(1) . Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810 (14)(a)(I)), rather than as part of the permit application.		X ⁵ Sections 3.1 and 13.0	X ⁵ Sections J.2 and J.7
-350(3)(e) - A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.		X Section 9.0	X Section J.4
-350(3)(f) - An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	X ⁶ Figure 7-3 and Table 5-1	X ⁷ Section 1.5	X ⁷ Section J.1

An 'X' indicates requirement applies.

¹ Portions of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) not enforceable through Appendix A of that document are not made enforceable by reference in the building emergency plan.

² Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional descriptions of actions are required at the site level. If other credible scenarios exist or if emergency procedures at the unit are different, the description of actions contained in the building emergency plan will be used during an event by a building emergency director.

³ Sections 7.1, 7.2 through 7.2.5, and 7.3 of the building emergency plan are those sections subject to the Class 2 "Changes in

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of [WAC 173 303-350\(3\)](#)

Requirement	Permit Attachment <i>4 Hanford Emergency Management Plan (DOE/RL-94-02)</i>	Building Emergency Plan ¹ (HNF-IP- 0263-FFTF)	Addendum J
-------------	--	--	------------

emergency procedures (i.e., spill or release response procedures)" described in [WAC 173-303-830](#), Appendix I, Section B.6.a.

⁴ This requirement only applies to treatment, storage and disposal (TSD) units that receive shipment of dangerous or mixed waste defined as offsite shipments in accordance with [WAC 173-303](#).

⁵ Emergency Coordinator names and home telephone numbers are maintained separate from any contingency plan document on file in accordance with Permit Condition II.A.4 and is updated, at a minimum, monthly.

⁶ The Hanford Facility (site wide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

⁷ An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

1

2 **J.1 Building Evacuation Routing (Building Layout)**

3 [Figures J.1](#) and [J.2](#) provide identification of the primary and secondary staging areas and a general layout
4 of the 400 Area WMU. Alternate evacuation routes will be used on a case-by-case basis based on
5 meteorological conditions at the time of the event.

6 **J.2 Building Emergency Director (BED)**

7 Emergency response will be directed by the BED until the Incident Commander (IC) arrives. The
8 incident command system (ICS) and staff, with supporting on-call personnel, fulfill the responsibilities of
9 the Emergency Coordinator as discussed in [WAC 173-303-201](#) (for dangerous waste generator locations)
10 and [WAC 173-303-360](#) (for permitted TSD units). During events, WMU personnel perform response
11 duties under the direction of the BED. The Incident Command Post (ICP) is managed by either, the
12 senior Hanford Fire Department member present or senior Hanford Patrol member present on the scene
13 (security events only). These individuals are designated as the IC and as such, have the authority to
14 request and obtain any resources necessary for protecting people and the environment.

15 The BED becomes a member of the ICP and functions under the direction of the IC. In this role, the BED
16 continues to manage and direct 400 Area WMU operations.

17 A listing of the BEDs by title, work location, and work telephone number is contained in [Section J.7](#). The
18 BED is on the premises or is available through an "on-call" list 24-hours-a-day. Names and home
19 telephone numbers of the BEDs are available from the Patrol Operations Center (POC) in accordance
20 with Permit Condition II.A.4.

21 **J.3 Implementation of the Plan**

22 In accordance with [WAC 173-303-201](#)(14)(b) or [WAC 173-303-360](#)(2)(b), the BED ensures that trained
23 personnel identify the character, source, amount, and areal extent of the release, fire, or explosion to the
24 extent possible. Identification of waste can be made by activities that can include, but are not limited to,
25 visual inspection of involved containers, sampling activities in the field, reference to inventory records, or
26 by consulting with facility personnel. Samples of materials involved in an emergency might be taken by
27 qualified personnel and analyzed as appropriate. These activities must be performed with a sense of
28 immediacy and shall include available information.

1 The BED shall use the following guidelines to determine if an event has met the requirements of
2 [WAC 173-303-201](#)(14)(d) or [WAC 173-303-360](#)(2)(d):

- 3 1. The event involved an unplanned spill, release, fire, or explosion,
4 AND
- 5 2.a The unplanned spill or release involved a dangerous waste, or the material involved became a
6 dangerous waste as a result of the event (e.g., product that is not recoverable),
7 OR
- 8 2.b The unplanned fire or explosion occurred at the 400 Area WMU or transportation activity
9 subject to RCRA contingency planning requirements,
10 AND
- 11 3. Time-urgent response from an emergency services organization was required to mitigate the
12 event, or a threat to human health or the environment exists.

13 As soon as possible after stabilizing event conditions, the BED shall determine, in consultation with the
14 site contractor environmental single-point-of-contact, if notification to the Washington State Department
15 of Ecology (Ecology) is needed to meet [WAC 173-303-201](#)(14)(d) or [WAC 173-303-360](#)(2)(d) reporting
16 requirements. If all of the conditions under 1, 2, and 3 are met, notifications are to be made to Ecology.
17 Additional information is found in Permit Attachment 4, *Hanford Emergency Management Plan*
18 (DOE/RL-94-02), Section 4.2.

19 If review of all available information does not yield a definitive assessment of the danger posed by the
20 incident, a worst-case condition will be presumed and appropriate protective actions and notifications will
21 be initiated. The BED is responsible for initiating any protective actions based on their best judgment of
22 the incident.

23 The BED must assess each incident to determine the response necessary to protect the personnel, facility,
24 and the environment. If assistance from Hanford Patrol, Hanford Fire Department, or ambulance units is
25 required, the Hanford Emergency Response Number (911 from site office phones/373-0911 from cellular
26 phones) must be used to contact the POC and request the desired assistance. To request other resources
27 or assistance from outside the 400 Area WMU, the POC business number is used (373-3800).

28 **J.3.1 Protective Action Responses**

29 Protective action responses are discussed in the following sections. The steps identified in the following
30 description of actions do not have to be performed in sequence because of the unanticipated sequence of
31 incident events.

32 **J.3.1.1 Evacuation**

33 When a Fast Flux Test Facility (FFTF) evacuation is ordered or the evacuation siren sounds, non-essential
34 employees will turn off office equipment, obtain car keys, and proceed to the staging area. Essential
35 personnel are those who have been previously designated as having an emergency response role, are
36 assigned to the on-shift Operations crew, or are utilized by the Emergency Response Organization during
37 the event (e.g., Radiological Control Technicians (RCT), Stationary Operating Engineers). Once at the
38 staging area, personnel will report to their prescribed location to allow for accountability. Personnel with
39 physical handicaps should have monitors assigned as necessary to assist them during an evacuation.

40 Personnel in protective clothing when an evacuation alarm sounds should make an effort to undress at the
41 normal undress area if safe to do so. These personnel must remain separated from others, and report to
42 the Contaminated Personnel staging sign located outside at the north end of 4713-B, next to the Tool Crib
43 door. A RCT will be dispatched to that location to survey personnel. If directed to the alternate staging
44 area, it is recommended that personnel remove and leave protective clothing in the parking lot prior to
45 entering their vehicle and upon arrival at the alternate staging area remain segregated from others and
46 notify staging area personnel of the situation.

1 Personnel performing significant plant operations when an evacuation is initiated shall place the
2 equipment in a stable configuration if safe to do so and then respond as appropriate to the evacuation.

3 The locations of the staging areas are shown on the illustrations in [Section J.1](#). Within each occupied
4 building the exits are clearly marked and evacuation routes to the staging area are maintained clear of
5 obstacles. The supervisor (or delegate) is responsible for ensuring accountability of personnel at the
6 Interim Storage Area (ISA) or Fuel Storage Facility (FSF).

7 The BED will normally contact the POC to inform them of the event and ensure that necessary onsite and
8 offsite protective actions are initiated. If additional transportation is needed for personnel, the BED may
9 coordinate for additional transportation through Richland Operations Office-Emergency Operations
10 Center (EOC).

11 **J.3.1.2 Take Cover**

12 The site area siren will sound to notify personnel of the need to take cover. Personnel shall respond to the
13 first take cover signal sounded. The BED will normally contact the POC to inform them of the event and
14 ensure that necessary onsite and offsite protective actions are initiated.

15 When the "Take Cover" Alarm is activated, personnel shall take cover in the nearest suitable (consider
16 water supply, bathroom facilities, size, etc.) building or trailer, halt work, and if able place equipment in a
17 safe condition. Close windows, exterior doors, interior doors, and/or window blinds for offices with
18 windows, and secure heating, ventilation, and air conditioning (HVAC). If possible, personnel should
19 move to interior hallways, and follow normal exit procedures from radiologically controlled areas in
20 preparation for evacuation.

21 **J.3.2 Response to Facility Operations Emergencies**

22 Depending on the severity of the event, the BED reviews the site-wide and FFTF emergency response
23 procedure(s) and, as required, categorizes and/or classifies the event. If necessary, the BED initiates area
24 protective actions and Hanford Site Emergency Response Organization activation. The steps identified in
25 the following description of actions do not have to be performed in sequence because of the unanticipated
26 sequence of incident events.

27 **J.3.2.1 Loss of Utilities**

28 A loss of utilities is not expected to lead to an emergency condition or require implementation of
29 protective actions.

30 A case-by-case evaluation is required for each event to determine loss of utility impacts. When a BED
31 determines a loss of utility impact, actions are taken to ensure dangerous and/or mixed waste is being
32 properly managed, to the extent possible given event circumstances. As necessary, the BED will stop
33 operations and take appropriate actions until the utility is restored.

34 **J.3.2.2 Major Process Disruption/Loss of Plant Control**

35 There are no process upsets or losses of plant control that can have any effect at FFTF (including the 400
36 Area WMU). The FFTF facility has been deactivated and is currently being operated in accordance with
37 the approved Surveillance & Maintenance Plan.

38 **J.3.2.3 Pressure Release**

39 There are no pressure containing systems at FFTF that would result in a potential emergency condition.

40 **J.3.2.4 Fire and/or Explosion**

41 In the event of a fire, the discoverer activates a fire alarm (pull box), calls 911 from site office
42 phones/373-0911 from cellular phones, or verifies that the Hanford Emergency Response Number (911 or
43 373-0911) has been called. Automatic initiation of a fire alarm (through the smoke detectors) is also
44 possible.

- 1 • Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit
2 and proceed to the designated staging area for accountability.
- 3 • On actuation of the fire alarm, ONLY if time permits, personnel should shut down equipment,
4 and secure waste. The alarm automatically signals the Hanford Fire Department.
- 5 • The BED proceeds directly to the ICP, obtains all necessary information pertaining to the
6 incident, and sends a representative to meet Hanford Fire Department.
- 7 • The BED provides a formal turnover to the IC, when the IC arrives at the ICP.
- 8 • The BED informs the Hanford Site Emergency Response Organization as to the extent of the
9 emergency (including estimates of dangerous waste, mixed waste or radioactive material
10 quantities released to the environment).
- 11 • If operations are stopped in response to the fire, the BED ensures that systems are monitored for
12 leaks, pressure buildup, gas generation, and ruptures.
- 13 • Hanford Fire Department firefighters extinguish the fire as necessary.

14 **J.3.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill**

15 Spills can result from many sources including container spills or leaks, damaged packages or shipments,
16 or personnel error. Spills of mixed waste are complicated by the need to deal with the extra hazards
17 posed by the presence of radioactive materials.

- 18 • The discoverer notifies the BED and initiates SWIMS response:
 - 19 • Stops work
 - 20 • Warns others in the vicinity
 - 21 • Isolates the area
 - 22 • Minimizes exposures to the hazards
 - 23 • Requests the BED Secure ventilation
- 24 • The BED determines if emergency conditions exist, requiring response from the Hanford Fire
25 Department based on classification of the spill and injured personnel, and evaluates the need to
26 perform additional protective actions.
- 27 • If the Hanford Fire Department resources are not needed, the spill is mitigated with resources
28 identified in [Section J.4](#) and proper notifications are made.
- 29 • If the Hanford Fire Department resources are needed, the BED calls 911 from the site
30 phones/373-0911 from cellular phones.
- 31 • The BED sends a representative to meet the Hanford Fire Department.
- 32 • The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- 33 • The BED informs the Hanford Site Emergency Response Organization as to the extent of the
34 emergency (including estimates of dangerous waste, mixed waste, or radioactive material
35 quantities released to the environment).
- 36 • If operations are stopped in response to the spill, the BED ensures that systems are monitored for
37 leaks, pressure buildup, gas generation, and ruptures.
- 38 • Hanford Fire Department stabilizes the spill.

39 **J.3.2.6 Damaged or Unacceptable Shipments**

40 During the course of receiving an onsite transfer of mixed waste at the 400 Area WMU, an unanticipated
41 event could be discovered resulting in a conformance issue concerning the waste. Damaged or
42 unacceptable shipments resulting from onsite transfers are not subject to [WAC 173-303-370](#); however,
43 conformance issues must be resolved in order to maintain proper records.

1 The following actions are taken to resolve the conformance issue:

- 2 • Operations management is notified of the damaged or unacceptable waste to be received.
- 3 • If the conformance issue results in a spill or release, actions described in [Section J.3.2.5](#) are taken.
- 4 • The generating organization is notified of the conformance issue.
- 5 • An operations representative, in conjunction with the generating organization, determines the
- 6 course of action to resolve the conformance issue.

7 **J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases**

8 The BED, as part of the ICP, takes the steps necessary to ensure that a secondary release, fire, or
9 explosion does not occur. The BED will take measures, where applicable, to stop processes and
10 operations; collect and contain released wastes and remove or isolate containers. The BED shall also
11 monitor for leaks, pressure buildups, gas generation, or ruptures in valves, pipes, or other equipment,
12 whenever this is appropriate.

13 **J.3.4 Incident Recovery and Restart of Operations**

14 A recovery plan is developed when necessary in accordance with Permit Attachment 4, *Hanford*
15 *Emergency Management Plan* (DOE/RL-94-02), Section 9.2. A recovery plan is needed following an
16 event where further risk could be introduced to personnel, the FFTF (including the 400 Area WMU), or
17 the environment through recovery action and/or to maximize the preservation of evidence.

18 If this plan was implemented according to [Section J.3](#), Ecology must be notified before operations can
19 resume. Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.1
20 discusses different reports to outside agencies. This notification is in addition to those required reports
21 and must include the following statements:

- 22 • There are no incompatibility issues with the waste and released materials from the incident.
- 23 • All the equipment has been cleaned, fit for its intended use, and placed back into service.

24 The notification required by [WAC 173-303-201\(14\)\(j\)](#) or [WAC 173-303-360\(2\)\(j\)](#) may be made via
25 telephone conference. Additional information that Ecology requests regarding these restart conditions
26 will be included in the required 15-day report identified in [Section J.5](#).

27 For emergencies not involving activation of the Hanford-EOC, the BED ensures that conditions are
28 restored to normal before operations are resumed. If the Hanford Site Emergency Response Organization
29 was activated and the emergency phase is complete, a special recovery organization could be appointed at
30 the discretion of the United States Department of Energy (DOE) to restore conditions to normal. This
31 process is detailed in DOE and contractor emergency procedures. The makeup of this organization
32 depends on the extent of the damage and its effects. The onsite recovery organization will be appointed
33 by the appropriate contractor's management.

34 **J.3.5 Incompatible Waste**

35 After an event, the BED or the onsite recovery organization ensures that no waste that might be
36 incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed.
37 Clean up actions are taken by 400 Area WMU personnel or other assigned personnel. Permit
38 Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.2.3, describes actions
39 to be taken.

40 Waste from cleanup activities is designated and managed as newly generated waste. A field check for
41 compatibility before storage is performed, as necessary. Incompatible wastes are not placed in the same
42 container. Containers of waste are placed in approved storage areas appropriate for their compatibility
43 class.

44 If incompatibility of waste was a factor in the incident, the BED or the onsite recovery organization
45 ensures that the cause is corrected.

1 **J.3.6 Post Emergency Equipment Maintenance and Decontamination**

2 All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris.
3 Decontaminated equipment is checked for proper operation before storage for subsequent use.
4 Consumables and disposed materials are restocked. Fire extinguishers are replaced.

5 The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed.
6 Depleted stocks of neutralizing and absorbing materials are replenished; protective clothing is cleaned or
7 disposed of and restocked, etc.

8 **J.4 Emergency Equipment**

9 Emergency resources and equipment for the FFTF (including the 400 Area WMU) are presented in this
10 section.

11 **J.4.1 Fixed Emergency Equipment**

12 None, refer to Section J.4.2.

13 **J.4.2 Portable Emergency Equipment**

Portable Emergency Equipment		
Type	Location	Capability
Fire Extinguisher	A fire extinguisher is available at the ISA pad (inside the locked fenced area on the South side of the ISA pad near the only gate) and at the FSF building (adjacent to the East entrance).	Portable Class D fire extinguishers are available for use to respond to fires at the FSF and the ISA.
Emergency Response Kit	An emergency response kit is maintained at the facility. Kit is located on the North side of Building 4710. All personnel entering the noted areas, regardless of the type of work being performed, must be made aware of the emergency kit location prior to entering the areas.	Boundary control, personal protective equipment (PPE) for response, first aid kit, and emergency lights.

14

1 **J.4.3 Communications Equipment/Warning Systems**

Communications Equipment		
Type	Location	Capability
Fire Alarm Continuously Ringing Bell Or Electronic Gong And Strobe or Area Siren	Fire alarm – at or near building exits in buildings 405; 491E, S, & W; 4621E & W; and 4703. Siren alert – The siren can be clearly heard by personnel at the ISA and by support personnel at the FSF when staff are in the building. When appropriate, personnel at the FSF and ISA will be notified of fire alarms at the 400 Area.	Alerts personnel of a potential fire or other emergency notifications in their area.
2-Way Radio/Cell Phone	At least one with personnel while in the TSD unit location.	Notify personnel to summon emergency assistance.
Argon pressure monitoring system	FFTF argon dewar pad located on a pad west of the main FFTF Plant.	Notify personnel of over or under pressure in the inert cover gas for piping and components containing sodium residuals.

Note: Site wide communications and warning systems are identified in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Table 5.1.

2 **J.4.4 Personal Protective Equipment**

Personal Protective Equipment		
Type	Location	Capability
Personal Protective Equipment	Personal Protective Equipment is available and will be staged when work is performed at the 400 Area WMU location.	Protection from various hazards (e.g. smoke, fumes, oxygen deficient atmosphere, chemicals, high airborne radioactivity, radiological contamination, insufficient lighting). PPE clothing can be based on specific job requirements.

1 **J.4.5 Spill Control and Containment Supplies**

Spill Kits And Spill Control Equipment		
Type	Location	Capability
Spill Control Materials <ul style="list-style-type: none"> • Absorbent materials • Bags • Step-off pads • Barrier tape • Rags • Scissors 	One spill kit will be located at the 400 Area WMU and will be clearly identified. All personnel entering either the ISA or FSF will be made aware of the location of the spill kit.	Control and mitigation of radioactive and chemical spills.

2 **J.4.6 Incident Command Post**

3 The ICPs can be identified in a fixed location or the IC can determine a location appropriate for the event.
 4 Emergency resource materials are stored at each location. The IC could activate the Hanford Fire
 5 Department Mobile Command Unit if necessary.

6 **J.5 Required Reports**

7 Post-incident written reports are required for certain incidents on the Hanford Site. The reports are
 8 described in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.1.

9 Facility management must note in the TSD-unit operating record, the time, date, and details of any
 10 incident, which requires implementation of the contingency plan. Within 15 days after the incident, a
 11 written report must be submitted to Ecology. The report must, at a minimum, include the elements
 12 specified in [WAC 173-303-201](#)(14)(k) or [WAC 173-303-360](#)(2)(k).

13 **J.6 Plan Location and Amendments**

14 Copies of this plan are maintained in following locations:

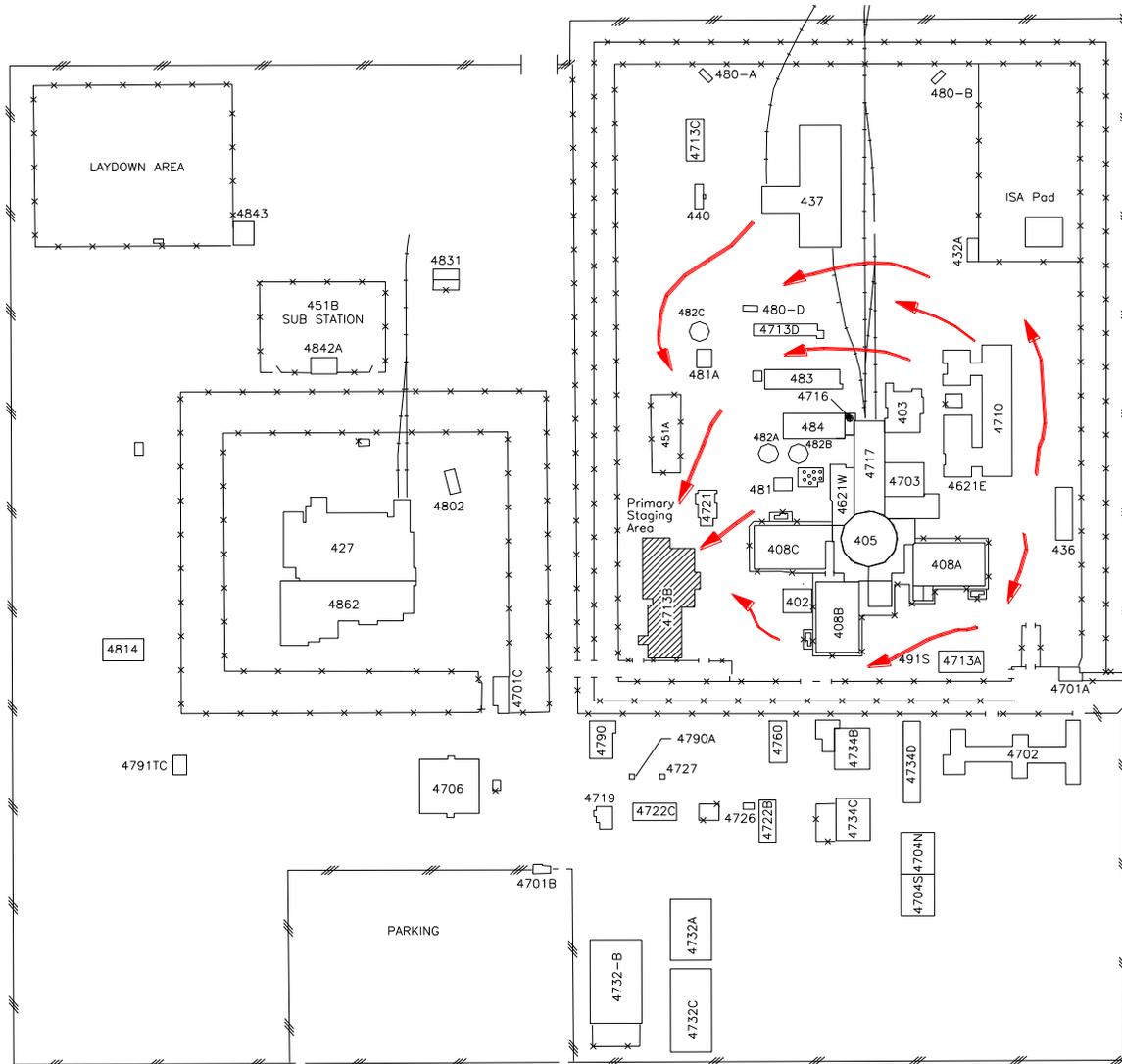
- 15 • MO-294

16 This plan will be reviewed and immediately amended as necessary, in accordance with Permit
 17 Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 14.3.1.1.

18 **J.7 Building Emergency Organization Building Emergency Director**

FFTF BEDs		
Title	Work Location	Work Phone
Facility Operations	MO 294	373-1355

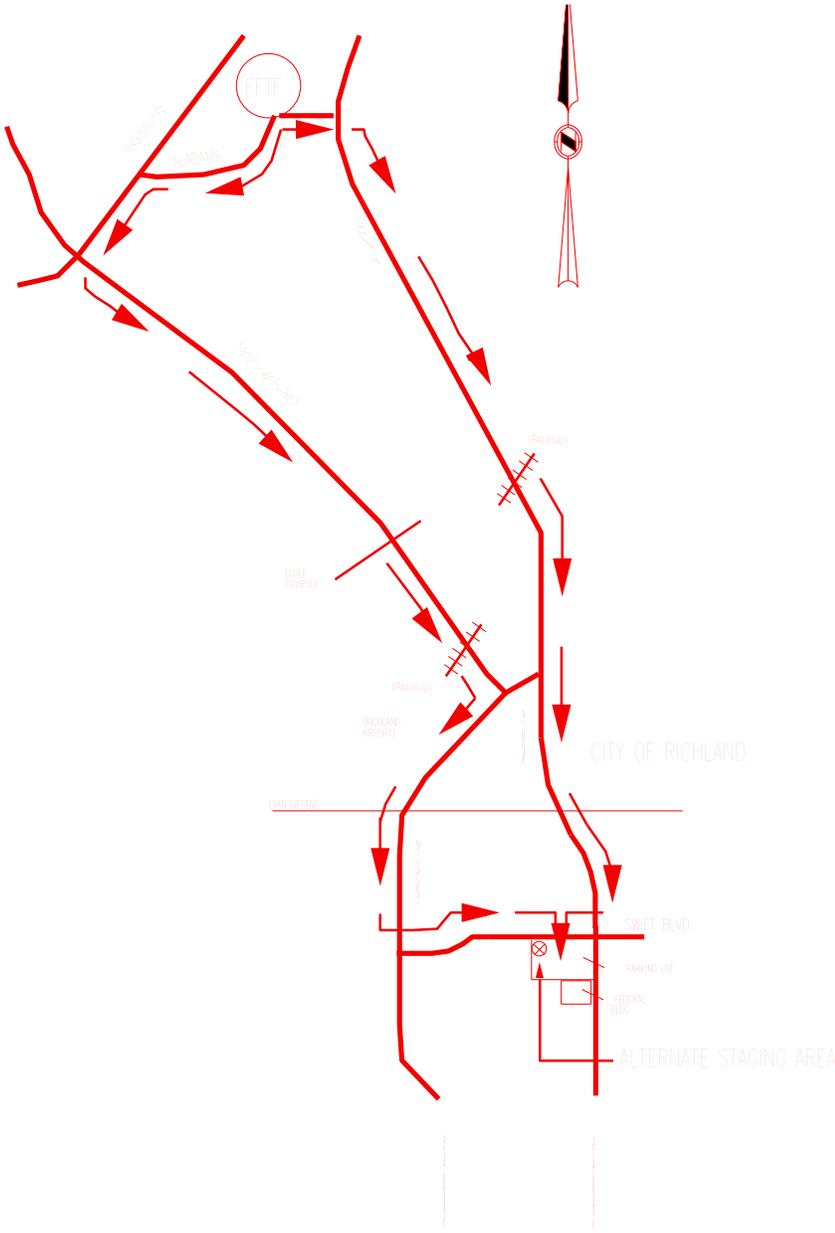
Names and home telephone numbers of the BEDs are available from the POC (373-3800) in accordance with Permit Condition II.A.4.



1

Figure J.1. FFTF Primary Staging Area

1



2

Figure J.2. FFTF Alternate Staging Area

**LIQUID EFFLUENT RETENTION FACILITY &
200 AREA EFFLUENT TREATMENT FACILITY
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have a “**Last Modification Date**” which represents the last date the portion of the unit has been modified. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Last modification to Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility
April 30, 2019

Addenda	Last Modification Date	Modification Number
Unit-Specific Conditions	04/30/2019	PCN-LERF/ETF-2019-01 (8C.2019.Q2)
A. Part A Form	10/25/2017	8C.2017.3F
B. Waste Analysis Plan	12/7/2018	PCN-LERF/ETF-2018-01 (8C.2018.Q4)
C. Process Information	12/7/2018	PCN-LERF/ETF-2018-01 (8C.2018.Q4)
D. Groundwater Monitoring Plan	01/23/2018	PCN-LERF/ETF-2017-01 (8C.2018.Q1)
E. Security Requirements	06/30/2011	
F. Preparedness and Prevention	01/23/2018	PCN-LERF/ETF-2017-02 (8C.2018.Q1)
G. Personnel Training	06/30/2015	
H. Closure Plan	10/25/2017	8C.2017.3F
I. Inspection Requirements	04/30/2019	PCN-LERF/ETF-2019-01 (8C.2019.Q2)
J. Contingency Plan	04/30/2019	PCN-LERF/ETF-2019-01 (8C.2019.Q2)

This page intentionally left blank.

**LIQUID EFFLUENT RETENTION FACILITY &
200 AREA EFFLUENT TREATMENT FACILITY
PART III, OPERATING UNIT GROUP 3 PERMIT CONDITIONS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
04/30/2019	PCN-LERF/ETF-2019-01 (8C.2019.Q2)
12/7/2018	PCN-LERF/ETF-2018-01 (8C.2018.Q4)
01/23/2018	PCN-LERF/ETF-2017-02 (8C.2018.Q1)
01/23/2018	PCN-LERF/ETF-2017-01 (8C.2018.Q1)
10/25/2017	8C.2017.3F
08/25/2016	8C.2016.Q2

This page intentionally left blank.

1
2
3
4
5
6

**PART III, OPERATING UNIT GROUP 3 PERMIT CONDITIONS
LIQUID EFFLUENT RETENTION FACILITY &
200 AREA EFFLUENT TREATMENT FACILITY**

1
2
3
4
5

This page intentionally left blank.

1
2 **PART III, OPERATING UNIT GROUP 3 PERMIT CONDITIONS**
3 **LIQUID EFFLUENT RETENTION FACILITY &**
4 **200 AREA EFFLUENT TREATMENT FACILITY**
5
6

7 **UNIT DESCRIPTION**

8 The Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (200 Area ETF)
9 consists of an aqueous waste treatment system that provides treatment, storage integral to the treatment
10 process, and storage of secondary wastes from the treatment process for a variety of aqueous mixed
11 waste. The 200 Area ETF is located in the 200 East Area. Aqueous wastes managed by the 200 Area
12 ETF include process condensate from the LERF and 200 Area ETF and other aqueous waste generated
13 from onsite remediation and waste management activities.

14 The LERF consists of three lined surface impoundments, or basins. Aqueous waste from LERF is
15 pumped to the 200 Area ETF for treatment in a series of process units, or systems, that remove or destroy
16 essentially all of the dangerous waste constituents. The treated effluent is discharged to a State-Approved
17 Land Disposal Site (SALDS) north of the 200 West Area, under the authority of a Washington State Waste
18 Discharge Permit Number ST0004500 (Ecology 2014) and 200 Area ETF Delisting ([40 Code of Federal](#)
19 [Regulations \(CFR\) 261](#), Appendix IX, Table 2). Construction of the LERF began in 1990. Waste
20 management operations began at LERF in April 1994. Construction of the 200 Area ETF began in 1992.
21 Waste management operations began at 200 Area ETF in November of 1995.

22 This Chapter provides unit-specific Permit conditions applicable to the dangerous waste management
23 units for LERF and 200 Area ETF.

24 **LIST OF ADDENDA SPECIFIC TO OPERATING UNIT GROUP 3**

- 25 Addendum A Part A Form, dated October 25, 2017
26 Addendum B Waste Analysis Plan, dated December 7, 2018
27 Addendum C Process Information, dated December 7, 2018
28 Addendum D Groundwater Monitoring, dated January 23, 2018
29 Addendum E Security Requirements, dated June 30, 2011
30 Addendum F Preparedness and Prevention, dated January 23, 2018
31 Addendum G Personnel Training, dated June 30, 2015
32 Addendum H Closure Plan, dated October 25, 2017
33 Addendum I Inspection Requirements, dated April 30, 2019
34 Addendum J Contingency Plan, dated April 30, 2019

35 **DEFINITIONS**

36 **Flow Equalization:** Flow equalization is the process by which concentrations of constituents are
37 homogenized through blending of the wastewater in the LERF Basins, resulting in a more uniform
38 loading of constituents prior to entering the appropriate treatment train.

39 **State and Federal Delisting Actions:** The state delisting action pursuant to Washington Administrative
40 Code ([WAC](#)) [173-303-910](#)(3), August 8, 2005, and the federal delisting action appearing in [40 CFR 261](#),
41 Appendix IX, Table 2 applicable to the United States, Department of Energy, Richland, Washington.

42 **ACRONYMS**

43 LERF and 200 Area ETF 200-Area Liquids Processing Facility

- 1 **III.3.A COMPLIANCE WITH UNIT-SPECIFIC PERMIT CONDITIONS**
- 2 **III.3.A.1** The Permittees will comply with all Permit Conditions in this Chapter and its Addendums
3 with respect to dangerous waste management and dangerous waste management units in
4 LERF and 200 Area ETF, in addition to requirements in Permit Part I and Part II.
- 5 **III.3.B GENERAL WASTE MANAGEMENT**
- 6 **III.3.B.1** The Permittees are authorized to accept dangerous and/or mixed waste for treatment in
7 dangerous waste management units that satisfies the waste acceptance criteria in Permit
8 Addendum B according to the waste acceptance procedures in Permit Addendum B.
9 [\[WAC 173-303-300\]](#)
- 10 **III.3.B.2** The Permittees are authorized to manage dangerous and/or mixed wastes physically
11 present in the dangerous waste management units in LERF and 200 Area ETF as of the
12 effective date of this Permit according to the requirements of Permit Condition III.3.B.1.
- 13 **III.3.B.3** The Permittees are authorized to treat and/or store dangerous/mixed waste in the
14 dangerous waste management units in LERF and 200 Area ETF according to the
15 following requirements:
- 16 **III.3.B.3.a** The Permittees are authorized to treat, and store as necessary in support of treatment,
17 dangerous waste in the 200 Area ETF tank systems identified in Permit Addendum C,
18 Section C.2, and Section C.4 according to the Permit Conditions of this Chapter.
- 19 **III.3.B.3.b** The Permittees are authorized to store and treat those dangerous and/or mixed waste
20 identified in Permit Addendum C, Section C.3, in containers according to the
21 requirements of this Chapter. All container management activities pursuant to this Permit
22 Condition will take place within the container storage areas or within the 200 Area ETF
23 process area identified in Permit Addendum C, Figures C.2 and C.3.
- 24 **III.3.B.3.c** Treatment in containers authorized by Permit Condition III.3.B.3.b is limited to decanting
25 of free liquids, and addition of sorbents to free liquids. The Permittees will ensure that
26 sorbents are compatible with wastes and the containers. Sorbents will be compliant with
27 the requirements of [WAC 173-303-140](#)(4)(b)(iv), incorporated by reference.
- 28 **III.3.B.3.d** The Permittees are authorized to treat aqueous waste in LERF Basins (Basins 42, 43
29 and 44) subject to the following requirements:
- 30 **III.3.B.3.d.1** Following treatment in a LERF Basin, aqueous wastes must be treated in 200 Area ETF
31 according to Permit Conditions III.3.B.3.a through c.; [\[40 CFR 268.4](#)(2)(iii), incorporated
32 by reference by [WAC 173-303-140](#)].
- 33 **III.3.B.3.d.2** The Permittees must ensure that for each basin, either supernatant is removed on a
34 flow-through basis, to meet the requirement of [40 CFR 268.4](#)(a)(2)(ii) incorporated by
35 reference by [WAC 173-303-140](#), or incoming waste is shown to not contain solids by
36 either: (1) sampling results showing the waste does not contain detectable solids, or (2)
37 filtering through a 10 micron filter; [\[WAC 173-303-815](#)(2)(b)(ii)].
- 38 **III.3.B.4** The Permittees will maintain the physical structure of the LERF and 200 Area ETF as
39 documented in the applicable sections of Permit Addendum C, Section C.2.
40 [\[WAC 173-303-630](#)(7), [WAC 173-303-640](#)(3), [WAC 173-303-640](#)(4)]
- 41 **III.3.B.5** The Permittees are authorized to use treated effluent for recycle/makeup water purposes
42 at the 200 Area ETF as outlined in Permit Addendum C, Section C.2.5.5, and the letters
43 dated August 19, 2005, EPA Region 10 to Keith A. Klein; and August 8, 2005,
44 Department of Ecology to Keith A. Klein. [\[WAC 173-303-815](#)(2)(b)(ii)]

- 1 **III.3.B.6** The Permittees will maintain and operate systems for the 200 Area ETF documented in
2 Permit Addendum C, Section C.2.5 as necessary for proper operation of the 200 Area
3 ETF, compliance with the conditions of this Permit, and protection of human health and
4 the environment. For purposes of this Permit Condition, the Monitor and Control System
5 documented in Permit Addendum C, Section C.2.5.1, is considered to include all
6 indicators, sensors, transducers, actuators and other control devices connected to but
7 remote from the centralized monitor and control system (MCS) computer.
- 8 **III.3.B.7** The Permittees must complete the following requirements prior to acceptance for
9 treatment in 200 Area ETF aqueous waste streams with listed waste numbers subject to
10 the requirements of the State and Federal delisting: [[WAC 173-303-815\(2\)\(b\)\(ii\)](#)].
- 11 **III.3.B.7.a** The Permittees will prepare a written waste processing strategy according to the
12 requirements of the State and Federal Delisting Actions Conditions (1)(a)(ii) and (1)(b),
13 incorporated by reference, and Permit Addendum B, Section B.2.2.2.
- 14 **III.3.B.7.b** The waste processing strategy required by Permit Condition III.3.B.7.a, must document
15 the proposed processing configuration for the 200 Area ETF, operating conditions for
16 each processing unit, and the expected treated effluent characteristics based on the
17 process model and treatability envelope data required by State and Federal Delisting
18 Conditions (1)(a)(ii) and (1)(b).
- 19 **III.3.B.7.c** The written waste processing strategy required by Permit Condition III.3.B.7.a must
20 demonstrate that the projected treated effluent characteristics satisfy the delisting
21 exclusion limits in State and Federal Delisting Condition (5) of the state and federal
22 delisting actions, and the discharge limits of the Discharge Permit Number ST0004500
23 (Ecology 2014).
- 24 **III.3.B.7.d** The Permittees will place a copy of the written waste processing strategy required by
25 Permit Condition III.3.B.7.a in the Hanford Facility Operating Record, LERF and
26 200 Area ETF file as part of the documentation of waste streams accepted for
27 management at the 200 Area ETF.
- 28 **III.3.B.8** Treatment of aqueous waste streams in the 200 Area ETF with listed waste numbers that
29 are subject to the requirements of the state and federal delisting actions must comply with
30 the requirements of State and Federal Delisting Condition (1)(c), incorporated by
31 reference. [[WAC 173-303-815\(2\)\(b\)\(ii\)](#)]
- 32 **III.3.B.9** The Permittees will manage treated effluent in the final verification tanks according to the
33 requirements of the State and Federal Delisting Conditions (3) and (5), incorporated by
34 reference. [[WAC 173-303-815\(2\)\(b\)\(ii\)](#)]
- 35 **III.3.B.10** The Permittees will manage treated effluent from the 200 Area ETF according to the
36 requirements of the Discharge Permit Number ST0004500 (Ecology 2014) and State and
37 Federal Delisting Condition (7). [[WAC 173-303-815\(2\)\(b\)\(ii\)](#)]
- 38 **III.3.B.11** The Permittees will ensure compliance with treatment standards ([40 CFR 268](#),
39 incorporated by reference by [WAC 173-303-140](#)) applicable to treated effluent prior to
40 discharge to the SALDS, the delisting criteria at [40 CFR 261](#), Appendix IX, Table 2, and
41 the corresponding state-approved delisting (dated August 8, 2005, all incorporated by
42 reference). Sampling and analysis necessary for these demonstrations must meet the
43 corresponding requirements in Permit Addendum B. [[WAC 173-303-140](#),
44 [WAC 173-303-815\(2\)\(b\)\(ii\)](#)]

- 1 **III.3.C WASTE ANALYSIS**
- 2 **III.3.C.1** The Permittees will comply with requirements in Permit Addendum B for sampling and
3 analysis of all dangerous and/or mixed waste required by conditions in this Chapter.
4 [[WAC 173-303-300](#)]
- 5 **III.3.C.2** The Permittees will have an accurate and complete waste profile as described in Permit
6 Addendum B, Section B.2.1.2, for every waste stream accepted for management in LERF
7 and 200 Area ETF dangerous waste management units. [[WAC 173-303-380](#)(1)(a),(b)]
- 8 **III.3.C.3** The Permittees will place a copy of each waste profile required by Permit
9 Condition III.3.C.2 in the Hanford Facility Operating Record, LERF and 200 Area ETF
10 file required by Permit Condition II.I.1.j. [[WAC 173-303-380](#)(1)(a),(b)]
- 11 **III.3.C.4** The Permittees will make a copy of the waste profile required by Permit
12 Condition III.3.C.2 available upon request. [[WAC 173-303-380](#)(1)(a),(b)]
- 13 **III.3.C.5** Records and results of waste analysis described in this Permit will be maintained in the
14 Hanford Facility Operating Record, LERF and 200 Area ETF file required by Permit
15 Condition II.I.1.b. [[WAC 173-303-380](#)(1)(a), (b)]
- 16 **III.3.D RECORDKEEPING AND REPORTING**
- 17 **III.3.D.1** The Permittees will place the following into the Hanford Facility Operating Record,
18 LERF and 200 Area ETF file required by Permit Condition II.I.1:
- 19 **III.3.D.1.a** Records required by [WAC 173-303-380](#)(1)(k), and -(o) incorporated by reference.
- 20 **III.3.D.1.b** Records and results of waste analysis, waste determinations (as required by [Subpart CC](#))
21 and trial tests required by [WAC 173-303-300](#), General waste analysis, and by
22 [40 CFR §264.1034](#), [§264.1063](#), [§264.1083](#), [§265.1034](#), [§265.1063](#), [§265.1084](#), [§268.4](#)(a),
23 and [§268.7](#); [[WAC 173-303-310](#)(2)].
- 24 **III.3.D.1.c** An inspection log, summarizing inspections conducted pursuant to Permit
25 Condition [III.3.H.1](#); [[WAC 173-303-380](#)(1)(e)].
- 26 **III.3.D.1.d** Records required by the State and Federal Delisting Condition (6), incorporated by
27 reference; [[WAC 173-303-815](#)(2)(b)(ii)].
- 28 **III.3.E SECURITY**
- 29 **III.3.E.1** The Permittees comply with the Security requirements specific to the LERF and 200 Area
30 ETF in Addendum E and Permit Attachment 3 as required by Permit Condition II.M.
31 [[WAC 173-303-310](#)(2)]
- 32 **III.3.F PREPAREDNESS AND PREVENTION**
- 33 **III.3.F.1** The Permittees will comply with the Preparedness and Prevention requirements specific
34 to LERF and 200 Area ETF in Addendum F. [[WAC 173-303-340](#)]
- 35 **III.3.G CONTINGENCY PLAN**
- 36 **III.3.G.1** The Permittees will comply with Addendum J, Contingency Plan, in addition to the
37 requirements of Permit Condition II.A when applicable. [[WAC 173-303-350](#)]
- 38 **III.3.H INSPECTIONS**
- 39 **III.3.H.1** The Permittees will comply with Addendum I in addition to the requirements of Permit
40 Condition II.X. [[WAC 173-303-320](#)]
- 41 **III.3.I TRAINING PLAN**

- 1 **III.3.I.1** The Permittees will include the training requirements described in Addendum G of this
2 Chapter specific to the dangerous waste management units and waste management
3 activities at LERF and 200 Area ETF into the written training plan required by Permit
4 Condition II.C.
- 5 **III.3.J GENERAL REQUIREMENTS**
- 6 **III.3.J.1** The Permittees will comply with the requirements of [WAC 173-303-395\(1\)](#), incorporated
7 by reference, for prevention of reaction of ignitable, reactive, or incompatible wastes.
- 8 **III.3.K CLOSURE**
- 9 **III.3.K.1** The Permittees will close dangerous waste management units in the LERF and 200 Area
10 ETF in accordance with Addendum H, Closure Plan, and Permit Condition II.J.
11 [[WAC 173-303-610\(3\)\(a\)](#)]
- 12 **III.3.L POST CLOSURE – RESERVED**
- 13 **III.3.M CRITICAL SYSTEMS – RESERVED**
- 14 **III.3.N RESERVED**
- 15 **III.3.O CONTAINERS**
- 16 **III.3.O.1** Container Storage and Treatment Unit Standards
- 17 **III.3.O.1.a** As part of or in addition to the requirements of Permit Condition [III.3.B.2](#), the Permittees
18 will ensure the integrity of container storage secondary containment and the chemically
19 resistant coating described in Addendum C, Section C.3.4.1 as necessary to ensure any
20 spills or releases to secondary containment do not migrate to the underlying concrete or
21 soils.
- 22 **III.3.O.1.a.1** Include documentation of any damage and subsequent repairs in the Hanford Facility
23 Operating Record, LERF and 200 Area ETF file required by Permit Condition II.I.I.
- 24 **III.3.O.2** Container Management Standards
- 25 **III.3.O.2.a** The Permittees will maintain and manage wastes in accordance with the requirements of
26 Addendum C, Section C.3.2. [[WAC 173-303-630\(2\)](#)]
- 27 **III.3.O.2.b** The Permittees will label containers in accordance with the requirements of
28 Addendum C, Section C.3.2, and Section C.3.3. [[WAC 173-303-630\(3\)](#)]
- 29 **III.3.O.2.c** The Permittees will comply with the requirements for managing wastes in containers in
30 [WAC 173-303-630\(5\)](#), incorporated by reference.
- 31 **III.3.O.2.d** The Permittees will ensure wastes are compatible with containers and with other wastes
32 stored or treated in containers within the 200 Area ETF according to the requirements of
33 Addendum C, Section C.3.1 and C.3.4.6. [[WAC 173-303-630\(4\)](#), [WAC 173-303-630\(9\)](#)]
- 34 **III.3.O.2.e** The Permittees may treat wastes in containers via decanting of free liquids and addition
35 of sorbents. The Permittees may not use addition of sorbents for purposes of changing
36 the treatability group of a waste with respect to the land disposal restriction standards of
37 [40 CFR 268](#), incorporated by reference by [WAC 173-303-140](#).
- 38 **III.3.O.2.f** The Permittees will remove any accumulated liquids from container storage areas in
39 200 Area ETF according to the requirements of Addendum C, Section C.3.4.5, to ensure
40 containers are not in contact with free liquids and to prevent overflow of the container
41 storage area secondary containment.

- 1 **III.3.O.2.g** The Permittees will comply with the requirements for air emissions from containers in
2 Addendum C, Section C.6.3.2. [[WAC 173-303-692](#)]
- 3 **III.3.O.2.h** The accumulation of liquid waste stored in the 2025-ED Load-In Station will not be
4 greater than the capacity of the containment pit and sump. [[WAC 173-303-630\(7\)\(b\)](#),
5 [WAC 173-303-630\(7\)\(c\)](#)]
- 6 **III.3.O.2.i** Containers with free liquids must be placed on spill pallets when placed in the Outdoor
7 Container Storage Area. [[WAC 173-303-630](#)]
- 8 **III.3.P TANK SYSTEMS**
- 9 **III.3.P.1** Tank System Requirements
- 10 **III.3.P.1.a** The Permittees will develop a schedule for conducting integrity assessments (IA). The
11 schedule will meet the requirements of Addendum C, Section C.4.1.5, and consideration
12 of the factors in [WAC 173-303-640\(2\)\(e\)](#) or [WAC 173-303-640\(3\)\(b\)](#) as applicable:
- 13 **III.3.P.1.b** The Permittees will maintain a copy of the schedule required by Permit
14 Condition III.3.P.1.a, in the Hanford Facility Operating Record, LERF and 200 Area ETF
15 file, and conduct periodic integrity assessments according to the schedule. The
16 Permittees will document results of integrity assessments conducted according to the IA
17 in the Hanford Facility Operating Record, LERF and 200 Area ETF file.
- 18 **III.3.P.1.c** If a tank system is found to be leaking, or is unfit for use, the Permittees must follow the
19 requirements of [WAC 173-303-640\(7\)](#), incorporated by reference.
20 [[WAC 173-303-640\(3\)\(b\)](#)]
- 21 **III.3.P.2** Tank System Operating Requirements
- 22 **III.3.P.2.a** The Permittees will comply with the requirements of [WAC 173-303-640\(5\)\(a\)](#),
23 incorporated by reference.
- 24 **III.3.P.2.b** The Permittees will comply with the requirements of Addendum C, Section C.4.4.2.
25 [[WAC 173-303-640\(5\)\(b\)](#)]
- 26 **III.3.P.2.c** The Permittees will comply with the requirements of Addendum C, Section C.4.5.
27 [[WAC 173-303-640\(5\)\(d\)](#)]
- 28 **III.3.P.2.d** The Permittees will comply with the requirements of [WAC 173-303-640\(7\)](#), incorporated
29 by reference, in response to spills or leaks from tanks systems at 200 Area ETF.
30 [[WAC 173-303-640\(5\)\(c\)](#)]
- 31 **III.3.P.2.e** The Permittees will ensure that the Waste Processing Strategy required by Permit
32 Condition [III.3.B.7.a](#), provides for the immediate treatment or blending of waste accepted
33 for management at the 200 Area ETF such that the resulting waste or mixture is no longer
34 reactive or ignitable when further managed in 200 Area ETF tank systems.
35 [[WAC 173-303-640\(9\)](#)]
- 36 **III.3.P.2.f** The Permittees will comply with the requirements of [WAC 173-303-640\(10\)](#),
37 incorporated by reference.
- 38 **III.3.Q SURFACE IMPOUNDMENTS**
- 39 **III.3.Q.1** The Permittees will maintain the three LERF Basins according to the requirements of
40 [WAC 173-303-650\(2\)\(f\)](#), incorporated by reference.
- 41 **III.3.Q.2** The Permittees will operate the LERF Basins according to the requirements of
42 Addendum C, Section C.5.3, and Addendum I, Section I.1.2.3.1 to prevent over-topping.
43 [[WAC 173-303-650\(2\)\(c\)](#)]

- 1 **III.3.Q.3** The Permittees will develop and maintain, and operate the LERF Basins to ensure that
2 any flow of waste into the impoundment can be immediately shut off in the event of
3 overtopping or liner failure. [[WAC 173-303-650\(2\)\(d\)](#)]
- 4 **III.3.Q.4** The Permittees will comply with the requirements of [WAC 173-303-650\(2\)\(g\)](#),
5 incorporated by reference.
- 6 **III.3.Q.5** The Permittees will comply with the requirements of [WAC 173-303-650\(4\)\(b\)](#),
7 incorporated by reference.
- 8 **III.3.Q.6** The Permittees will comply with the requirements of [WAC 173-303-650\(4\)\(c\)](#),
9 incorporated by reference. The certification required by this Permit Condition must be
10 provided to Ecology no later than seven calendar days after the date of the certification.
11 A copy of the certification will be placed in the Hanford Facility Operating Record,
12 LERF and 200 Area ETF file required by Permit Condition II.I.1.
13 [[WAC 173-303-650\(4\)\(c\)](#)]
- 14 **III.3.Q.7** The Permittees will comply with the requirements of [WAC 173-303-650\(5\)\(b\)](#),
15 incorporated by reference, in response to events in [WAC 173-303-650\(5\)\(a\)](#), incorporated
16 by reference.
- 17 **III.3.Q.8** The Permittees will comply with the requirements of [WAC 173-303-650\(5\)\(d\)](#) for any
18 LERF Basin that has been removed from service in accordance with Permit
19 Condition III.3.Q.7 that the Permittees will restore to service. [[WAC 173-303-650\(5\)\(d\)](#)]
- 20 **III.3.Q.9** The Permittees will close any LERF Basin removed from service in accordance with the
21 requirements of Permit Condition III.3.Q.7 or a basin that cannot be repaired or that the
22 Permittees will not to return to service. [[WAC 173-303-650\(5\)\(e\)](#)]
- 23 **III.3.Q.10** The Permittees will comply with the requirements of Addendum C, Section C.5.10 with
24 respect to management of ignitable or reactive wastes in the LERF Basins.
25 [[WAC 173-303-650\(7\)](#)]
- 26 **III.3.Q.11** The Permittees can place incompatible wastes and materials in the same LERF Basin
27 only if in compliance with the requirements of [WAC 173-303-395\(1\)\(b\)](#), (c).
28 [[WAC 173-303-650\(8\)](#)]
- 29 **III.3.Q.12** The Permittees will use the action leakage rate in Addendum C, Section C.5.8, for
30 operation of LERF Basins, and comply with the requirements of
31 [WAC 173-303-650\(10\)\(b\)](#). [[WAC 173-303-650\(10\)](#)]
- 32 **III.3.Q.13** The Permittees will comply with the requirements of [WAC 173-303-650\(11\)](#),
33 incorporated by reference.
- 34 **III.3.Q.14** The Permittees will comply with the requirements of [40 CFR 264, Subpart CC](#),
35 incorporated by reference by [WAC 173-303-692](#).
- 36 **III.3.R** **GROUNDWATER**
- 37 **III.3.R.1** The Permittees will comply with the requirements of Addendum D, Groundwater
38 Monitoring Plan. [[WAC 173-303-645](#)]
- 39 **III.3.R.2** All wells constructed pursuant to this Permit will be constructed in compliance with
40 [Chapter 173-160 WAC](#) incorporated by reference through [WAC 173-303-645\(8\)\(c\)](#).
- 41 **III.3.R.3** Maintain the Liquid Effluent Retention Facility Engineering Evaluation and
42 Characterization report in the Hanford Facility Operating Record, LERF and
43 200 Area ETF, which satisfies the requirements in [WAC 173-303-806](#) and [-645](#).

1
2
3
4
5

This page intentionally left blank.

**LIQUID EFFLUENT RETENTION FACILITY (LERF) &
200 AREA EFFLUENT TREATMENT FACILITY (ETF)
ADDENDUM I
INSPECTION REQUIREMENTS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
04/30/2019	PCN-LERF/ETF-2019-01 (8C.2019.Q2)
01/23/2018	PCN-LERF/ETF-2017-02 (8C.2018.Q1)
10/25/2017	8C.2017.3F
08/25/2016	8C.2016.Q2

This page intentionally left blank.

1
2
3
4
5

**ADDENDUM I
INSPECTION REQUIREMENTS**

1
2
3
4
5

This page intentionally left blank.

ADDENDUM I
INSPECTION REQUIREMENTS

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

TABLE OF CONTENTS

I. INSPECTION REQUIREMENTS 5

I.1 Inspection Plan..... 5

I.1.1 General Inspection Requirements 5

I.1.2 Specific Process Inspection Requirements 6

I.1.3 Inspection Log 8

I.1.4 Storage of Ignitable or Reactive Wastes 8

I.1.5 Instrumentation Monitoring 11

TABLES

Table I.1. Visual Inspection Schedule for the LERF and 200 Area ETF..... 9

Table I.2. Inspection Plan for Instrumentation Monitoring 11

1
2
3
4
5

This page intentionally left blank.

1 I. INSPECTION REQUIREMENTS

2 I.1 Inspection Plan

3 This addendum describes the method and schedule for inspections of the Liquid Effluent Retention
4 Facility (LERF) and 200 Area Effluent Treatment Facility (ETF). The purpose of inspections is to help
5 ensure that situations do not exist that might cause or lead to the release of dangerous and/or mixed waste
6 that could pose a threat to human health and the environment. Abnormal conditions identified by an
7 inspection will be corrected on a schedule that prevents hazards to workers, the public, and the
8 environment.

9 I.1.1 General Inspection Requirements

10 The content and frequency of inspections are described in this section. Inspection records are retained in
11 the Hanford Facility Operating Record, LERF and 200 Area ETF file, or other approved locations, in
12 accordance with Permit Condition II.I.1.

13 In certain areas of the 200 Area ETF, many inspections are performed remotely to maintain As Low As
14 Reasonably Achievable (ALARA) exposure. Monitoring instruments are connected to audible alarms and
15 visual indicators track alarm status. The monitoring system provides trending of selected monitoring
16 data, graphics, and equipment summary displays.

17 A preventive maintenance recall system is employed to direct preventive maintenance activities at the
18 LERF and 200 Area ETF. Equipment requiring maintenance is checked as indicated by the maintenance
19 history and the manufacturer's recommendations. The preventive maintenance of certain equipment
20 might not be possible if the LERF or the 200 Area ETF is in an operational mode. Thus, the preventive
21 maintenance could be performed slightly earlier or later than planned to minimize impact on operations.

22 Instrumentation at 200 Area ETF is calibrated regularly to ensure accuracy and reliability. All process
23 control instrumentation is calibrated on a schedule depending on previous calibration experience. An
24 instrument calibration and recall system is employed to manage calibrations.

25 I.1.1.1 Types of Problems

26 Key components of the LERF inspection program include the following areas:

- 27 • Structural integrity of the basins.
- 28 • Catch basin secondary containment system integrity.
- 29 • Evidence of release from basins.
- 30 • Safety, communications, and emergency equipment.

31 Key components of the 200 Area ETF inspection program include the following areas:

- 32 • Condition of tanks and ancillary piping.
- 33 • Condition of containers.
- 34 • Condition of the process control equipment.
- 35 • Condition of emergency equipment.
- 36 • Condition of secondary containment.

37 [Table I.1](#) and [Table I.2](#) provide a description of LERF and 200 Area ETF items to be inspected.

38 I.1.1.2 Frequency of Inspections

39 The frequency of inspections is based on the rate of possible deterioration of equipment and the
40 probability of a threat to human health or the environment.

41 The LERF and 200 Area ETF is inspected as indicated in [Table I.1](#) and [Table I.2](#).

1 **I.1.2 Specific Process Inspection Requirements**

2 The following sections describe the specific process inspections performed at LERF and 200 Area ETF.

3 **I.1.2.1 Container Inspections**

4 Containers are used at the 200 Area ETF to store solidified secondary waste, such as the powder waste
5 from the thin film dryer and maintenance and operations waste. When containers are being held in
6 container storage areas, the following inspection schedule is maintained:

- 7 • Daily visual inspection of container storage area for leaks, spills, accumulated liquids, and open
8 or improperly sealed containers.
- 9 • Weekly visual inspection of container labels to ensure labels are not obscured, removed, or
10 otherwise unreadable.
- 11 • Weekly visual inspection for deterioration of containers, containment systems, or cracks in
12 protective coating or foundations caused by corrosion, mishandling, or other factors.

13 Following the inspections, an inspection datasheet is signed and dated by the inspector and supervisor.

14 **I.1.2.2 Tank Inspections**

15 A description of the tank systems and ancillary equipment at the 200 Area ETF is given in Addendum C.
16 Inspections and frequencies are given in [Table I.1](#) and [Table I.2](#). This section includes a brief discussion
17 of the inspections.

18 **I.1.2.2.1 Overfill Protection**

19 Tanks that have the possibility of being overfilled have level instrumentation that alarms before the tanks
20 reach overflow. High tank level alarms annunciate in the 200 Area ETF Control Room, allowing
21 operating personnel to take immediate action to stop the vessels from overfilling. These alarms are
22 monitored continuously in the 200 Area ETF Control Room during solution transfers. When tank level
23 instrumentation is inoperable, the alternate controls discussed in Addendum C, Section C.4.4.2 are
24 followed to prevent tank overfilling.

25 **I.1.2.2.2 Visual Inspections**

26 Visual inspections of tanks and secondary containments are performed to check for leaks, signs of
27 corrosion or damage, and malfunctioning equipment. Inspections are performed on tanks, secondary
28 containment within the 200 Area ETF, surge tank, and verification tank, and associated secondary
29 containment.

30 **I.1.2.2.3 Secondary Containment Leak Detectors**

31 The surge tank and verification tank secondary containment systems have sloped floors that drain
32 solutions to sumps equipped with leak detectors that alarm in the 200 Area ETF Control Room. These
33 alarms are monitored continuously in the 200 Area ETF Control Room during 200 Area ETF processing
34 operations or during waste transfer, and at least daily when processing operations or waste transfers are
35 not occurring. If an alarm is activated, further investigation is performed to determine if the source is a
36 tank leak or other solution (i.e., precipitation).

37 **I.1.2.2.4 Integrity Assessments**

38 The initial integrity assessment was issued in 1995 (Addendum C). Consistent with the recommendations
39 of the integrity assessment, a periodic integrity assessment program was developed for the 200 Area ETF
40 tanks and is discussed in detail in Addendum C, Section C.4.1.5.

1 **I.1.2.2.5 Effluent Treatment Facility Piping**

2 The 200 Area ETF employs an extensive piping system. During inspections at the 200 Area ETF, any
3 aboveground piping is inspected visually for signs of leakage and for general structural integrity.
4 During the visual inspection, particular attention is paid to valves and fittings for signs of cracking,
5 deformation, and leakage.

6 **I.1.2.3 Surface Impoundments and Condition Assessment**

7 The following describes the surface impoundment inspections performed at LERF.

8 **I.1.2.3.1 Overtopping Control**

9 Under current operating conditions, 2 feet of freeboard is maintained at each LERF basin, which
10 corresponds to an operating level of 22.2 feet, or operating capacity of 7.8 million gallons. Level
11 indicators at each basin are monitored to confirm that this level is not exceeded.

12 Before an aqueous waste is transferred into a basin, administrative controls are implemented to ensure
13 overtopping will not occur during the transfer. The volume of feed to be transferred is compared to the
14 available volume in the receiving basin. The transfer is not initiated unless there is sufficient volume
15 available in the receiving basin or a cut-off level is established. The transfer into the basin would be
16 stopped when this cut-off level is reached.

17 The LERF basins also are provided with floating covers that are designed and constructed to prevent
18 overtopping by the introduction of precipitation and dust into the basins. Overtopping and flow control
19 also are discussed in Addendum C.

20 **I.1.2.3.2 Impoundment Contents**

21 The LERF basins are inspected weekly to assess whether the contents are escaping from a basin. Level
22 indicators are inspected weekly to check for unaccountable change in the level of the basins.

23 **I.1.2.3.3 Leak Detection**

24 The leachate detection, collection, and removal system is described in Addendum C. The leachate
25 collection sump pump is activated when the liquid level in the leachate sump reaches a preset level. A
26 flow meter/totalizer measures the amount of leachate removed. In addition, the timer on the leachate
27 pump tracks the cumulative pump run time. The leak rate through the primary liner can be determined
28 using one of two methods:

- 29 1. Measured as the leachate flow meter/totalizer readings (flow meters/totalizers are located on the
30 outflow line from the collection sumps in the bottom of the LERF basins) or
31 2. Calculated using the pump operating time readings multiplied by the pump flow rate (the pump
32 runs at a constant flow rate).

33 Calculations using either method are sufficient for compliance. If either the flow meter/totalizer or pump
34 operating time system is not functioning, this is identified as an abnormal condition (see [Section I.1](#)).

35 The LERF employs a double walled transfer piping between 242-A Evaporator and LERF and between
36 LERF and 200 Area ETF. The [WAC 173-303-650](#) regulations do not require a discussion of piping for
37 surface impoundments. However, for the purposes of comprehensive coverage of the LERF, inspections
38 and integrity assessments are performed on the piping system. Aqueous waste (e.g., process condensate)
39 is transferred from the 242-A Evaporator to the LERF via a buried pipeline. Likewise, aqueous waste is
40 transferred to the 200 Area ETF via buried pipelines. At the LERF dikes, aboveground piping serves to
41 transfer waste from one basin to another.

1 The buried pipelines normally are continuously monitored during transfers by a leak detection system
2 (Addendum C). Leak detection system alarms annunciate to the 200 Area ETF Control Room, which is
3 monitored continuously during waste transfers and daily when no waste is transferring. As an alternative
4 to continuous leak detection, the transfer lines can be inspected daily during transfers by opening the
5 secondary containment drain lines at the LERF catch basins (for 242-A Evaporator transfers to LERF)
6 and the surge tank sump (for LERF transfers to 200 Area ETF) to inspect for leakage. During the routine
7 inspections at LERF, the aboveground piping system is inspected for signs of leakage and for general
8 structural integrity. During the visual inspection, particular attention is paid to valves and fittings for
9 signs of cracking, deformation, and leakage.

10 **I.1.2.3.4 Dike Erosion**

11 The LERF basins and dikes are visually inspected weekly and after significant precipitation events for
12 run-on, run-off, cover integrity, erosion problems, or other signs of deterioration in the dikes from
13 precipitation, wind, burrowing mammals, or vegetation.

14 **I.1.2.3.5 Structural Integrity**

15 A written certification attesting to the structural integrity of the basin dikes, signed by a qualified,
16 registered professional engineer, is provided in Addendum C.

17 **I.1.2.3.6 Container Inspection**

18 Normal operation of the LERF does not involve the storage of dangerous waste in containers. Therefore,
19 the inspection requirements of this section normally are not applicable to the LERF. Any containerized
20 dangerous waste generated at LERF will be brought to the 200 Area ETF and managed in accordance
21 with [WAC 173-303-630](#) and is discussed in Addendum C.

22 **I.1.3 Inspection Log**

23 Observations made and deficiencies noted during an inspection are recorded on an inspection log
24 (round sheets, work packages, data sheets, electronic inspection logs, etc.). On completion, the inspection
25 log includes the inspector's printed name, handwritten or electronic signature, date, and time of
26 inspection; the inspection log is submitted for review and approval by LERF and 200 Area ETF
27 management or their designee. Once approved, the inspection log is kept in the Hanford Facility
28 Operating Record, LERF and 200 Area ETF files. Inspection records are retained in the Hanford Facility
29 Operating Record, LERF and 200 Area ETF files, or other approved locations, in accordance with Permit
30 Condition II.I.1. The inspection records are used to help determine any necessary corrective actions.
31 Problems identified during the inspections are prioritized and addressed in a timely fashion to mitigate
32 health risks to workers, maintain integrity of the TSD units, and prevent hazards to public health and the
33 environment.

34 If while performing an inspection, a leak or spill is discovered, facility operations responds per the
35 emergency response procedures action is taken to stop the leak and determine the cause. The waste is
36 removed from the secondary containment in a timely manner that prevents harm to human health and the
37 environment.

38 **I.1.4 Storage of Ignitable or Reactive Wastes**

39 The LERF could receive an aqueous waste that is designated reactive or ignitable. Any aqueous waste
40 exhibiting these characteristics is managed (e.g., through flow equalization in LERF) such that the waste
41 no longer exhibits the reactive or ignitable characteristics.

42 Though unlikely, the 200 Area ETF secondary wastes might have the characteristics of being reactive or
43 ignitable. A qualified inspector performs annual fire inspections of the 200 Area ETF using a checklist
44 developed specifically for facilities that handle dangerous and/or mixed waste.

Table I.1. Visual Inspection Schedule for the LERF and 200 Area ETF

Item	Inspection	Frequency
2025-ED Load-In Station		
Load-In Station tank system	Inspect area for leaks. Note any unusual noises or vibration from the system pumps. Inspect secondary containment system for signs of deterioration.	Daily
Main Treatment Train		
Surge tank system	Inspect area for leaks. Note any unusual noises or vibration from the system pumps. Inspect secondary containment system for signs of deterioration.	Daily
Rough filter	Inspect for leaks.	Daily
Ultraviolet oxidation system	Inspect module for leaks. Inspect peroxide storage tank, ancillary equipment for leaks.	Daily
pH adjustment tank	Inspect tank and ancillary equipment for leaks.	Daily
H ₂ O ₂ decomposer	Inspect tank and ancillary equipment for leaks.	Daily
Fine filter	Inspect module for leaks.	Daily
Degasification system	Inspect module for leaks. Note any unusual noises or vibration from the degasification blower.	Daily
Reverse osmosis system	Inspect tanks and ancillary equipment for leaks. Note any unusual noises or vibration from the system pumps.	Daily
Polishers	Inspect tanks and ancillary equipment for leaks.	Daily
Effluent pH adjustment tank	Inspect tank and ancillary equipment for leaks.	Daily
Verification tanks	Inspect tanks and ancillary equipment for leaks. Note any unusual noises or vibration from the system pumps. Inspect secondary containment system for signs of deterioration.	Daily
Secondary Treatment Train		
Secondary waste receiving tank	Inspect tank and ancillary equipment for leaks.	Daily
200 Area ETF evaporator	Inspect tank and equipment for leaks. Note any unusual noises or vibration from the system pumps or compressor.	Daily
Concentrate tank	Inspect tank and ancillary equipment for leaks.	Daily
Thin Film Dryer Room	Inspect piping and ancillary equipment for spills, leaks, and accumulated liquids (viewed through camera). Note any unusual noises or vibration from the system pumps or blower.	Daily ¹
Container handling	Inspect area for spills, leaks, accumulated liquids.	Daily
Container handling	Inspect for deterioration of containers and secondary containment, including corrosion and cracks in secondary containment foundation and coating. Inspect container labels to ensure that they are readable.	Weekly

¹If the camera system is inoperable, daily visual inspections will be performed or the Thin Film Dryer will be emptied and isolated as described in Addendum C, Section C.4.4.2, to prevent waste additions that could result in undetected leaks or spills in the Thin Film Dryer Room.

Table I.1. Visual Inspection Schedule for the LERF and 200 Area ETF

Item	Inspection	Frequency
Support Systems		
Vessel ventilation system	Inspect filters (HEPA and pre-filters), check vessel off gas pressures, system flow, and discharge temperatures.	Daily
Sump tank system	Inspect sump trenches for unexpected liquids, which indicate spills or leaks from process equipment.	Daily
Safety Systems		
Eye wash stations	Check status; check for adequate pressure.	Monthly
Safety showers	Check status; check for adequate pressure.	Monthly
Emergency Systems		
Fire extinguishers	Check for adequate charge.	Monthly
Emergency lighting	Test operability.	Monthly
Processing Area		
Uninterruptible power supply	Check output voltage and visually inspect battery pack for corrosion and leakage. Check indicator lights for fault conditions.	Annually
LERF (Surface Impoundment)		
LERF basins and dikes	Check the overtopping controls and integrity of the basins and dikes.	Weekly
LERF contents	Check basin level indicators for unaccountable changes in the level of the basins.	Weekly
Leak Detections	Determine the leak rate per wetted surface area.	Weekly
LERF basins and dikes	Check for run-on, run-off, cover integrity, erosion problems, and other signs of deterioration.	Weekly & After significant precipitation events
Ignitable and Reactive		
Ignitable and reactive waste	Storage in compliance with Hanford Site fire protection standards and WAC 173-303-630(8) .	Annually ²
Container Storage Areas Other Than Secondary Treatment Train		
Container Storage	Container labels to ensure labels are not obscured, removed, or otherwise unreadable.	Weekly
	Deterioration of containers, containment systems, or cracks in protective coating or foundations caused by corrosion, mishandling, or other factors.	Weekly
	Leaks, spills, accumulated liquids, and open or improperly sealed containers.	Daily

HEPA – High efficiency particulate air

²When waste management activities occur

1 **I.1.5 Instrumentation Monitoring**

2 Continuous monitoring applies to the electronic monitoring performed in the 200 Area ETF Control
 3 Room for this instrumentation during 200 Area ETF processing operations and/or 2025-E Load-In Station
 4 transfers. Data from alarms, leak detectors, and level transmitters are monitored daily in the 200 Area
 5 ETF Control Room when waste transfers are not occurring (see C.2.5.1). In cases where this
 6 instrumentation is out of service (e.g., calibration, power failures, or maintenance) daily visual inspections
 7 will be performed in accordance with [WAC 173-303-640](#), using the alternate methods discussed in
 8 Addendum C, Section C.1 for leak detection, Section C.4.3.1.2 for level inspection, and Section C.4.4.2
 9 for overfill prevention will be followed.

10 In the event the electronic leak detectors or level indicators for Sump Tank 1 or Sump Tank 2 are out of
 11 service, daily visual inspections will be performed each operating day ([WAC-173-303-640](#)).

12 Inspections pertaining to instrumentation monitoring is provided in [Table I.2](#).

13

Table I.2. Inspection Plan for Instrumentation Monitoring

Item	Inspection	Frequency
2025-ED Load-In Station		
Level alarm LSH-59A-003	Monitor liquid level in Load-In Tanks TK-1 to prevent overflow.	Continuously
Leak detector	Monitor for leakage in the Load-In Station tank pit sump.	Continuously
Main Treatment Train		
Leak detector LAH-20B009	Monitor for leakage in the surge tank drainage sump.	Continuously
Level alarm LAH-60A013	Monitor surge tank level to prevent overflow.	Continuously
Level alarm LAHL-60C-111	Monitor liquid levels in the pH adjustment tank to prevent overflow.	Continuously
Level alarm LAHL-60F-101	Monitor liquid levels in the first RO feed tank to prevent overflow.	Continuously
Level alarm LAHL-60F-201	Monitor liquid levels in the second RO feed tank to prevent overflow.	Continuously
Level alarms LAHL-60C-211	Monitor liquid levels in the effluent pH adjustment tank to prevent overflow.	Continuously
Level transmitter LAHX-60H001A/B/C	Monitor liquid level in verification tanks to prevent overflow.	Continuously
Leak detector LAH-20B010	Monitor for leakage in the verification tank drainage sump.	Continuously
Secondary Treatment Train		
Level alarm LAHL-60I-001A/B	Monitor liquid levels in secondary waste receiver tanks A and B to prevent overflow.	Continuously

Table I.2. Inspection Plan for Instrumentation Monitoring

Item	Inspection	Frequency
Level alarm LAHL-60J-001A/B	Monitor liquid levels in concentrate tanks A and B to prevent overflow.	Continuously
Level alarm LAHL-60I-107	Monitor liquid levels in the evaporator tank to prevent overflow.	Continuously
Level alarm LAHL-60J-036	Monitor liquid levels in the spray condenser tank to prevent overflow.	Continuously
Level alarm LAHL-60I-108	Monitor liquid levels in the distillate flash tank to prevent overflow.	Continuously
Level alarm LAH-60I-119	Monitor liquid levels in the entrainment separator tank to prevent overflow.	Continuously
Level alarm LAH-20B001	Monitor liquid level in Sump Tank 1 to prevent overflow.	Continuously
Level alarm LAH-20B002	Monitor liquid level in Sump Tank 2 to prevent overflow.	Continuously
Leak detector LAH-20B003	Monitor for leakage to Sump No. 1.	Continuously
Leak detector LAH-20B005	Monitor for leakage to Sump No. 2.	Continuously
Leak detector	Monitor for leakage from pipeline between 200 Area ETF and 2025-ED Load-In Station.	Continuously
Leak detector	Monitor for leakage from pipeline between 200 Area ETF and LERF.	Continuously
Leak detector	Monitor for leakage from pipeline between LERF and the 242-A Evaporator.	Continuously

**LIQUID EFFLUENT RETENTION FACILITY (LERF) &
200 AREA EFFLUENT TREATMENT FACILITY (ETF)
ADDENDUM J
CONTINGENCY PLAN
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
04/30/2019	PCN-LERF/ETF-2019-01 (8C.2019.Q2)
08/25/2016	8C.2016.Q2

This page intentionally left blank.

1
2
3
4
5

**ADDENDUM J
CONTINGENCY PLAN**

1
2
3
4
5

This page intentionally left blank.

**ADDENDUM J
CONTINGENCY PLAN**

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

TABLE OF CONTENTS

J. CONTINGENCY PLAN 5

J.1 Building Evacuation Routing..... 7

J.2 Building Emergency Director 7

J.3 Implementation of the Plan..... 7

J.3.1 Protective Actions Responses 8

J.3.2 Response to Facility Operations Emergencies 11

J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases 13

J.3.4 Incident Recovery and Restart of Operations 13

J.3.5 Incompatible Waste 13

J.3.6 Post Emergency Equipment Maintenance and Decontamination 14

J.4 Emergency Equipment..... 14

J.4.1 Fixed Emergency Equipment..... 14

J.4.2 Portable Emergency Equipment 14

J.4.3 Communications Equipment/Warning Systems 15

J.4.4 Personal Protective Equipment 15

J.4.5 Spill Control and Containment Supplies..... 15

J.4.6 Incident Command Post..... 16

J.5 Required Reports 16

J.6 Plan Location and Amendments 16

J.7 Facility/Building Emergency Response Organization..... 16

FIGURES

Figure J.1. Evacuation Routes from Building 2025E 9

Figure J.2. LERF and 200 Area ETF Site Plan 10

TABLE

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of
WAC 173-303-350(3) 5

1
2
3
4
5

This page intentionally left blank.

1 **J. CONTINGENCY PLAN**

2 The requirements for a contingency plan at the Liquid Effluent Retention Facility (LERF) and 200 Area
3 Effluent Treatment Facility (ETF) are satisfied in the following documents: portions of Hanford Facility
4 Permit (Permit) Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and this
5 Addendum.

6 The unit specific Building Emergency Plan also serves to satisfy a broad range of other requirements
7 [e.g., Occupational Safety and Health Administration standards ([29 Code of Federal Regulations \[CFR\]](#)
8 [1910](#)), *Toxic Substance Control Act of 1976* ([40 CFR 761](#)) and U.S. Department of Energy Orders].
9 Therefore, revisions made to portions of this unit specific Building Emergency Plan that are not governed
10 by the requirements of Washington Administrative Code ([WAC 173-303](#)) will not be considered as a
11 modification subject to [WAC 173-303-830](#) or Permit Condition I.C.3.

12 [Table J.1](#) identifies the sections of the unit specific Building Emergency Plan written to meet
13 [WAC 173-303-350\(3\)](#) contingency plan requirements. In addition, Section 12.0 of the unit specific
14 Building Emergency Plan is written to meet [WAC 173-303](#) requirements identifying where copies of
15 Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and the Building
16 Emergency Plan are located and maintained on the Hanford Facility. Therefore, revisions to Addendum J
17 require a modification subject to [WAC 173-303-830](#) and/or Permit Condition I.C.3.

**Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of
[WAC 173-303-350\(3\)](#)**

Requirement	Permit Attachment 4, <i>Hanford Emergency Management Plan</i> (DOE/RL-94-02)	Building Emergency Plan ¹ (HNF-IP-0263-ETF)	Part III, OU-3, LERF & 200 Area ETF, Addendum J
-350(3)(a) - A description of the actions, which facility personnel must take to comply with this section and WAC 173-303-360 .	X ² Section 1.3.4	X ² Sections 7.1, 7.2 through 7.2.5, and 7.3 ³ Sections 4.0 (1 st paragraph), 8.2, 8.3, 8.4, 11.0	X ² Sections J.3.1, J.3.2, through J.3.2.5, and J.3.3 ³ Sections J.3, J.3.4, J.3.5, J.3.6, and J.5
-350(3)(b) - A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370(5) , Manifest system, reasons for not accepting dangerous waste shipments.	X ² Section 1.3.4	X ^{2,4} Section 7.2.5.1	X ^{2,4} Section J.3.2.5.1
-350(3)(c) - A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4) .	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1		

**Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of
WAC 173-303-350(3)**

Requirement	Permit Attachment 4, <i>Hanford Emergency Management Plan</i> (DOE/RL-94-02)	Building Emergency Plan ¹ (HNF-IP-0263-ETF)	Part III, OU-3, LERF & 200 Area ETF, Addendum J
<p><u>-350(3)(d)</u> - A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under <u>WAC 173-303-360(1)</u>. Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by <u>WAC 173-303-810(14)(a)(I)</u>), rather than as part of the permit application.</p>		<p>X⁵ Section 3.1, 13.0</p>	<p>X⁵ Sections J.2 and J.7</p>
<p><u>-350(3)(e)</u> - A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.</p>		<p>X Section 9.0</p>	<p>X Section J.4</p>
<p><u>-350(3)(f)</u> - An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.</p>	<p>X⁶ Figure 7-3 and Table 5-1</p>	<p>X⁷ Section 1.5</p>	<p>X⁷ Section J.1</p>

An "X" indicates requirement applies.

¹Portions of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) not enforceable through Appendix A of that document are not made enforceable by reference in the Building Emergency Plan.

²Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions are required if at the site level. If other credible scenarios exist or if emergency procedures at the unit are different, the description of actions contained in the Building Emergency Plan will be used during an event by a building emergency director.

³Sections J.1, J.2 through J.2.5, and J.3 of the Building Emergency Plan are those sections subject to the Class 2 "Changes in emergency procedures (i.e., spill or release response procedures)" described in WAC 173-303-830, Appendix I, Section B.6.a.

⁴This requirement only applies to TSD units, which receive shipment of dangerous or mixed waste defined as off-site shipments in accordance with WAC 173-303.

⁵Emergency Coordinator names and home telephone numbers are maintained separate from any contingency plan document, on file in accordance with Permit Condition II.A.4 and are updated, at a minimum, monthly.

⁶The Hanford Facility (site-wide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

⁷An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

1 **J.1 Building Evacuation Routing**

2 [Figures J.1](#) and [J.2](#) provide identification of the primary and secondary staging areas and a general layout
3 of the building 2025-E and LERF and 200 Area ETF. Alternate evacuation routes will be used on a case-
4 by-case basis based on meteorological conditions at the time of the event.

5 **J.2 Building Emergency Director**

6 Emergency response will be directed by the Building Emergency Director (BED) until the Incident
7 Commander (IC) arrives. The Incident Command System and staff with supporting on-call personnel
8 fulfill the responsibilities of the Emergency Coordinator as discussed in [WAC 173-303-360](#).

9 During events, LERF and 200 Area ETF personnel perform response duties under the direction of the
10 BED. The Incident Command Post (ICP) is managed by the senior Hanford Fire Department official,
11 unless the event is determined to be primarily a security event, in which case the Hanford Fire
12 Department and Hanford Patrol will operate under a unified command system with Hanford Patrol
13 making all decisions pertaining to security. These individuals are designated as the IC and as such, have
14 the authority to request and obtain any resources necessary for protecting people and the environment.
15 The BED becomes a member of the ICP and functions under the direction of the IC. In this role, the BED
16 continues to manage and direct LERF and 200 Area ETF operations.

17 A listing of BEDs by title, work location, and work telephone numbers is contained in [Section J.7](#) of this
18 plan. The BED is on the premises or is available through an "on-call" list 24 hours a day. Names and
19 home telephone numbers of the BEDs are available from the Patrol Operations Center (POC) in
20 accordance with Permit Condition II.A.4.

21 **J.3 Implementation of the Contingency Plan**

22 In accordance with [WAC 173-303-201\(14\)\(b\)](#) or [WAC 173-303-360\(2\)\(b\)](#) the BED ensures that trained
23 personnel identify the character, source, amount, and areal extent of the release, fire, or explosion to the
24 extent possible. Identification of waste can be made by activities that can include, but are not limited to,
25 visual inspection of involved containers, sampling activities in the field, reference to inventory records, or
26 by consulting with facility personnel. Samples of materials involved in an emergency might be taken by
27 qualified personnel and analyzed as appropriate. These activities must be performed with a sense of
28 immediacy and shall include available information.

29 The BED shall use the following guidelines to determine if an event has met the requirements of
30 [WAC 173-303-201\(14\)\(d\)](#) or [WAC 173-303-360\(2\)\(d\)](#):

- 31 1. The event involved an unplanned spill, release, fire, or explosion,
32 AND
- 33 2.a The unplanned spill or release involved a dangerous waste, or the material involved became a
34 dangerous waste as a result of the event (e.g., product that is not recoverable.), or
- 35 2.b The unplanned fire or explosion occurred at the LERF and 200 Area ETF or transportation
36 activity subject to RCRA contingency planning requirements,
37 AND
- 38 3. Time urgent response from an emergency services organization was required to mitigate the
39 event or a threat to human health or the environment exists.

40 As soon as possible, after stabilizing event conditions, the BED shall determine, in consultation with the
41 site contractor environmental single point-of-contact, if notification to the Washington State Department
42 of Ecology (Ecology) is needed to meet [WAC 173-303-201\(14\)\(d\)](#) or [WAC 173-303-360\(2\)\(d\)](#) reporting
43 requirements. If all of the conditions under 1, 2, and 3 are met, notifications are to be made to Ecology.
44 Additional information is found in Permit Attachment 4, *Hanford Emergency Management Plan*,
45 (DOE/RL-94-02), Section 4.2.

1 If review of all available information does not yield a definitive assessment of the danger posed by the
2 incident, a worst-case condition will be presumed and appropriate protective actions and notifications will
3 be initiated. The BED is responsible for initiating any protective actions based on their best judgment of
4 the incident.

5 The BED must assess each incident to determine the response necessary to protect the personnel, facility,
6 and the environment. If assistance from Hanford Patrol, Hanford Fire Department, or ambulance units is
7 required, the Hanford Emergency Response Number (911 or 509-373-0911 if using a cell phone) must be
8 used to contact the POC and request the desired assistance. To request other resources or assistance from
9 outside the LERF and 200 Area ETF, the POC business number is used (373-3800).

10 **J.3.1 Protective Actions Responses**

11 Protective action responses are discussed in the following sections. The steps identified in the following
12 description of actions do not have to be performed in sequence because of the unanticipated sequence of
13 incident events.

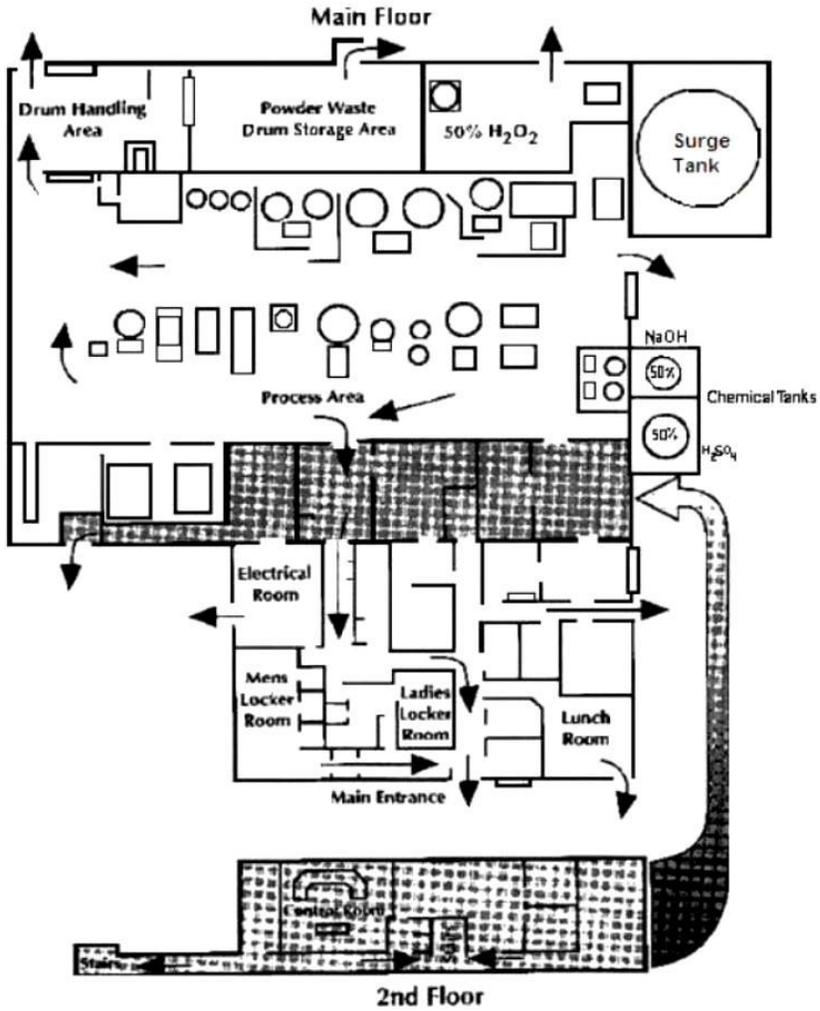
14 **J.3.1.1 Evacuation**

15 The objective of a facility evacuation order is to limit personnel exposure to hazardous materials or
16 dangerous/mixed waste by increasing the distance between personnel and the hazard. The scope of the
17 evacuation includes evacuation of the facility because of an event at the facility as well as evacuation of
18 the facility in response to a site evacuation order. Evacuation will be directed by the BED when
19 conditions warrant and will apply to all personnel not actively involved in the event response or
20 emergency plan related activities.

21 The BED will initiate the evacuation by directing an announcement be made to evacuate along with the
22 evacuation location over a public address system, facility radios, and, as conditions warrant, by activating
23 the 200 Area site evacuation alarms by calling the POC using 911 or 509-373-0911 if using a cell phone.
24 Personnel proceed to a predetermined staging area (shown in [Figure J.2](#)), or other safe upwind location, as
25 determined by the BED. The BED will determine the operating configuration of the facility and identify
26 any additional protective actions to limit personnel exposure to the hazard.

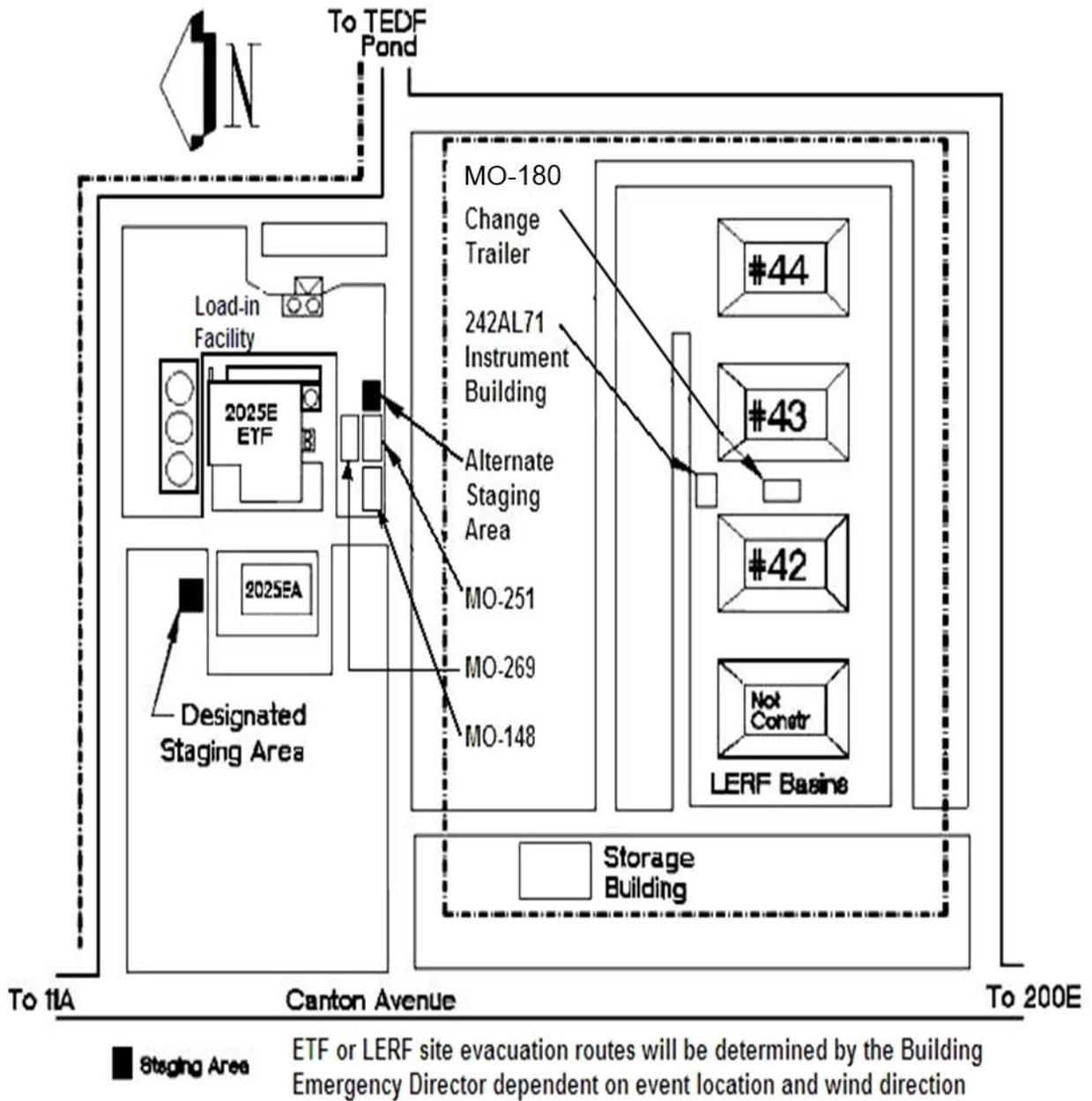
27 Emergency organization personnel or assigned operations personnel will conduct a sweep of occupied
28 buildings to ensure that all non-essential personnel and visitors have evacuated. For an immediate
29 evacuation, accountability will be performed at the staging area. The BED will assign personnel as
30 accountability aides and staging managers with the responsibility to ensure that evacuation actions are
31 taken at all occupied buildings at the LERF and 200 Area ETF. All implementing actions executed by the
32 aides/managers are directed by the emergency response procedures. When evacuation actions are
33 complete, the aides/managers will provide a status report to the BED. The BED will provide status to the
34 IC.

35



1
2

Figure J.1. Evacuation Routes from Building 2025E



1
2

Figure J.2. LERF and 200 Area ETF Site Plan

1 **J.3.1.2 Take Cover**

2 The objective of the take cover order is to limit personnel exposure to hazardous materials, or
3 dangerous/mixed waste when evacuation is inappropriate or not practical. Evacuation might not be
4 practical or appropriate because of extreme weather conditions or the material release might limit the
5 ability to evacuate safely personnel.

6 The BED will initiate the take cover by directing an announcement be made over the public address
7 system, facility radios, and, as conditions warrant, by activating the 200 Area site take cover alarms by
8 calling the POC using 911 (509-373-0911 if using a cell phone). Actions to complete a facility take-cover
9 will be directed by the emergency response procedure. Protective actions associated with operations
10 include configuring, or shutting down, the ventilation systems. Determination of additional take cover
11 response is based on plant operating configuration, weather conditions, amount and duration of release,
12 and other conditions, as applicable to the event and associated hazard. As a minimum, personnel
13 exposure to the hazard will be minimized. The BED will assign personnel as accountability aides with
14 responsibility to ensure that take-cover actions are taken at all occupied buildings at 200 Area ETF. All
15 implementing actions executed by the aides/managers are directed by the emergency response procedure.
16 When take cover actions are complete, the aides/manager will provide the BED with a status report.

17 **J.3.2 Response to Facility Operations Emergencies**

18 Depending on the severity of the following events, the BED reviews the site wide procedures and LERF
19 and 200 Area ETF emergency response procedure(s) and, as required, categorizes and/or classifies the
20 event. If necessary, the BED initiates area protective actions and Hanford Site Emergency Response
21 Organization activation. The steps identified in the following description of actions do not have to be
22 performed in sequence because of the unanticipated sequence of incident events.

23 **J.3.2.1 Loss of Utilities**

24 A case-by-case evaluation is required for each event to determine loss of utility impacts. When a BED
25 determines a loss of utility impact, actions are taken to ensure dangerous and/or mixed waste is being
26 properly managed, to the extent possible given event circumstances. As necessary, the BED will stop
27 operations and take appropriate actions until the utility is restored.

28 **J.3.2.2 Major Process Disruption/Loss of Plant Control**

29 The hazards assessment has determined that this occurrence does not pose significant risk to human
30 health or the environment.

31 **J.3.2.3 Pressure Release**

32 The hazards assessment has determined that a pressure release does not pose significant risk to human
33 health or the environment. Hazardous material release and dangerous/mixed waste releases are addressed
34 in Section J.2.5.

35 **J.3.2.4 Fire and/or Explosion**

36 In the event, of a fire, the discoverer activates a fire alarm (pull box); calls 911 (509-373-0911 if using a
37 cell phone) or verifies that the Hanford Emergency Response Number has been called. Automatic
38 initiation of a fire alarm (through the smoke detectors, and sprinkler systems) is also possible.

- 39
- 40 • Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit
and proceed to the designated staging area for accountability.
 - 41 • On actuation of the fire alarm, ONLY if time permits, personnel should shut down equipment,
42 secure waste, and lock up classified materials (or hand carry them out). The alarm automatically
43 signals the Hanford Fire Department.
 - 44 • The BED proceeds directly to the ICP, obtains all necessary information pertaining to the
45 incident, and sends a representative to meet Hanford Fire Department.
 - 46 • The BED provides a formal turnover to the IC when the IC arrives at the ICP.

- 1 • The BED informs the Hanford Site Emergency Response Organization as to the extent of the
2 emergency (including estimates of dangerous waste and mixed waste quantities released to the
3 environment).
- 4 • If operations are stopped in response to the fire, the BED ensures that systems are monitored for
5 leaks, pressure buildup, gas generation, and ruptures.
- 6 • Hanford Fire Department firefighters extinguish the fire as necessary.

7 Note: Following a fire and/or explosion, [WAC 173-303-640](#)(7) will be addressed for the 200 Area ETF
8 regarding fitness for use.

9 **J.3.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill**

10 Spills can result from many sources including process leaks, container spills or leaks, damaged packages
11 or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra
12 hazards posed by the presence of *Atomic Energy Act* materials. These controls include containment
13 berms, dedicated spill control sumps, remote gauges, and level indicators as well as spray shields on
14 chemical pipe flanges. WRPS procedures provide alarm response and maintenance actions for leak
15 detection equipment, surveillance of possible leak locations, and response actions for detected spills.

- 16 • The discoverer notifies BED and initiates SWIM response:
 - 17 Stops work
 - 18 Warns others in the vicinity
 - 19 Isolates the area
 - 20 Minimizes the exposure to the hazards
- 21 • If Operations are stopped, the BED ensures that the plant is put in a safe shutdown configuration.
- 22 • The BED determines if emergency conditions exist requiring response from the Hanford Fire
23 Department based on classification of the spill and injured personnel, and evaluates need to
24 perform additional protective actions.
- 25 • If the Hanford Fire Department resources are not needed, the spill is mitigated with resources
26 identified in Section J.4 of this plan and proper notifications are made.
- 27 • If the Hanford Fire Department resources are needed, the BED calls 911 (509-373-0911 if using a
28 cell phone).
- 29 • The BED sends a representative to meet the Hanford Fire Department.
- 30 • The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- 31 • The BED informs the Hanford Site Emergency Response Organization as to the extent of the
32 emergency (including estimates of dangerous waste and mixed waste quantities released to the
33 environment).
- 34 • If operations are stopped in response to the spill, the BED ensures that systems are monitored for
35 leaks, pressure buildup, gas generation, and ruptures.
- 36 • Hanford Fire Department stabilizes the spill.

37 Note: For response to leaks or spills and disposition of leaking or unfit-for-use tank systems, refer to
38 [WAC 173-303-640](#)(7).

39 **J.3.2.5.1 Damaged, or Unacceptable Shipments**

40 During the course of receiving an onsite transfer of dangerous and/or mixed waste at LERF and
41 200 Area ETF an unanticipated event could be discovered resulting in a conformance issue concerning the
42 waste. Damaged or unacceptable shipments resulting from onsite transfers are not subject to [WAC 173-](#)
43 [303-370](#) however conformance issues must be resolved in order to maintain proper records.

44 The following actions are taken to resolve the conformance issue:

- 1 • Operations management is notified of the damaged or unacceptable waste to be received.
- 2 • If the conformance issue results in a spill or release, actions described in [Section J.3.2.5](#) are taken.
- 3 • The generating organization is notified of the conformance issue.

4 An operations representative, in conjunction with the generating organization, determines the course of
5 action to resolve the conformance issue.

6 **J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases**

7 The BED, as part of the ICP, takes the steps necessary to ensure that a secondary release, fire, or
8 explosion does not occur. The BED will take measures, where applicable, to stop processes and
9 operations, collect and contain released waste, and remove or isolate containers. The BED shall also
10 monitor for leaks, pressure buildups, gas generation, or ruptures in valves, pipes, or other equipment,
11 whenever this is appropriate.

12 **J.3.4 Incident Recovery and Restart of Operations**

13 A recovery plan is developed when necessary in accordance with Permit Attachment 4, *Hanford*
14 *Emergency Management Plan*, (DOE/RL-94-02), Section 9.2. A recovery plan is needed following an
15 event where further risk could be introduced to personnel, the LERF and 200 Area ETF, or the
16 environment through recovery action and/or to maximize the preservation of evidence.

17 If this plan was implemented according to [Section J.3](#) of this plan, Ecology is notified before operations
18 can resume. Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 5.1
19 discusses different reports to outside agencies. This notification is in addition to those required reports
20 and includes the following statements:

- 21 • There are no incompatibility issues with the waste and released materials from the incident.
- 22 • All the equipment has been cleaned, fit for its intended use, and placed back into service.

23 The notification required by [WAC 173-303-201\(14\)\(j\)](#) or [WAC 173-303-360\(2\)\(j\)](#) may be made via
24 telephone conference. Additional information that Ecology requests regarding these restart conditions
25 will be included in the required 15-day report identified in Section J.5 of this plan.

26 For emergencies not involving activation of the Hanford Emergency Operations Center, the BED ensures
27 that conditions are restored to normal before operations are resumed. If the Hanford Site Emergency
28 Response Organization was activated and the emergency phase is complete, a special recovery
29 organization could be appointed at the discretion of RL to restore conditions to normal. This process is
30 detailed in RL and contractor emergency procedures. The makeup of this organization depends on the
31 extent of the damage and the effects. The onsite recovery organization will be appointed by the
32 appropriate contractor's management.

33 **J.3.5 Incompatible Waste**

34 After an event, the BED or the onsite recovery organization ensures that no waste that might be
35 incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed.
36 Cleanup actions are taken by LERF and 200 Area ETF personnel or other assigned personnel. Permit
37 Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 9.2.3, describes actions
38 to be taken.

39 Waste from cleanup activities is designated and managed as newly generated waste. A field check for
40 compatibility before storage is performed as necessary. Incompatible wastes are not placed in the same
41 container. Containers of waste are placed in storage areas appropriate for their compatibility class.

42 If incompatibility of wastes was a factor in the incident, the BED or the onsite recovery organization
43 ensures that the cause is corrected.

1 **J.3.6 Post Emergency Equipment Maintenance and Decontamination**

- 2 All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris.
 3 Decontaminated equipment is checked for proper operation before storage for subsequent use.
 4 Consumable and disposed materials are restocked. Used fire extinguishers are replaced.
 5 The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed.
 6 Depleted stocks of neutralizing and absorbing materials are replenished; protective clothing is cleaned or
 7 disposed of and restocked, etc.

8 **J.4 Emergency Equipment**

9 Emergency resources and equipment for the LERF and 200 Area ETF are presented in this section.

10 **J.4.1 Fixed Emergency Equipment**

Type	Location	Capability
Safety shower/eye wash stations (200 Area ETF only)	<ul style="list-style-type: none"> • 2025-E Rm 112 Laboratory • 2025-E Rm 122 Decon Station • 2025-E Rm 131, South Process Area • 2025-E Rm 134, Air Compressor Room • 2025-E Concentrated acid/caustic tank area (outside) • 2025-ED Load-In Station (outside) 	Assist in flushing chemicals/materials from the body and/or eyes and face of personnel.
Wet pipe sprinkler (200 Area ETF only)	Throughout building 2025-E except those areas protected by preactive sprinklers	Assist in the control of a fire.
Preactive sprinkler (200 Area ETF only)	200 Area ETF Control Room, communications room, electrical equipment room	Assist in the control of a fire. Maintained dry to prevent accidental damage to equipment
Fire alarm pull boxes (200 Area ETF only)	All high traffic areas in operations administration and support areas, truck bay, and process area	Activate the local fire alarm
E-lights	Throughout 200 Area ETF	1 hour temporary lighting

11 **J.4.2 Portable Emergency Equipment**

Type	Location	Capability
Fire extinguisher ABC type	Throughout 200 Area ETF (Administrative/Support areas), LERF, and TEDF	Fire suppression for Class A, B, and C fires
Fire extinguisher BC type	Throughout 200 Area ETF (process area and electrical room)	Fire suppression for Class B and C fires
Portable safety showers and Eye Wash Stations	As needed for special evolutions and maintenance	Assist in flushing chemicals/materials from the body and/or eyes and face of personnel.

1 **J.4.3 Communications Equipment/Warning Systems**

Type	Location	Capability
Fire alarms (200 Area ETF only)	Corridors, locker rooms, process area, drum storage, and truck bay	Audible throughout 200 Area ETF
Take cover/evacuation	Throughout the 200 Area ETF	Audible outside buildings and inside administrative buildings
Public address system (200 Area ETF Only)	Throughout the 200 Area ETF	Audible throughout 200 Area ETF
Portable radios	Operations and maintenance personnel	Communication to 200 Area ETF Control Room
Telephone	<ul style="list-style-type: none"> • 200 Area ETF: Control Room, 2025-E, 2025-EA offices, MO-148, MO-269, MO-251, 2025-EC-71. • LERF: MO-180 and 242AL71 instrument building, LERF Garage 242AL11 • TEDF: 225-E (pump house 1), 225W (pump house 2), 6653 (sample building), 6653-A (pump house 3) 	Internal and external communications. Allows notification of outside resources (POC, HFD, Hanford Patrol, etc).

2 Note: Sitewide communications and warning systems are identified in Permit Attachment 4, *Hanford*
3 *Emergency Management Plan*, (DOE/RL-94-02), Table 5.1.

4 **J.4.4 Personal Protective Equipment**

Type	Location	Capability
Acid suits	In the spill response cabinets in 2025E	Chemical protection for personnel during containment and isolation
Respirators	2025-E, 1 st Floor	Filtered air for recovery of known hazards

5 **J.4.5 Spill Control and Containment Supplies**

Type	Location	Capability
Spill bags, drums, carts, etc.	<ul style="list-style-type: none"> • 2025-E in process area • 2025-E upper level process area • 2025-E Rm 125A • 2025-ED Load-In Station • TEDF 6653 Disposal Building 	Support containment and cleanup of hazardous material spills
Spill response cabinet	<ul style="list-style-type: none"> • 2025-E Rm 122 • container storage CONEX East of 2025E building within the TSD unit boundary • outside southeast side of 2025E • TEDF 6653 Disposal Building • MO-180 Change Trailer 	Support equipment for spill response

1 **J.4.6 Incident Command Post**

2 The IC determines the location of the ICP based on the event and may use the Hanford Fire Department
3 Mobile Command Unit if necessary. The 200 Area ETF Control Room and the 2025-EA may be used by
4 the BED for initial response management and may be used as the formal ICP as determined by the IC.
5 Emergency resource materials are stored at each location.

6 **J.5 Required Reports**

7 Post incident, written reports are required for certain incidents on the Hanford Site. The reports are
8 described in Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 5.1.

9 Facility management must note in the Hanford Facility Operating Record, LERF & 200 Area ETF File,
10 the time, date and details of any incident that requires implementation of the contingency plan (refer to
11 [Section J.3](#)). Within 15 days after the incident, a written report must be submitted to Ecology. The report
12 must include the elements specified in [WAC 173-303-201\(14\)\(k\)](#) or [WAC 173-303-360\(2\)\(k\)](#).

13 **J.6 Plan Location and Amendments**

14 Copies of this plan are maintained at the following locations:

- 15 • 200 Area ETF Control Room
- 16 • Building 2025-EA ICP

17 This plan will be reviewed and immediately amended as necessary, in accordance with Permit
18 Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 14.3.1.1.

19 **J.7 Facility/Building Emergency Response Organization**

LERF and 200 Area ETF Building Emergency Directors		
Title	Work Location	Work Phone
Shift Operation Manager (SOM)	2025-E Building	373-9000 or 373-9500

20 Names and home telephone numbers of the BEDs are available from the POC (373-3800) in accordance
21 with Permit Condition II.A.4.

**WASTE TREATMENT AND IMMOBILIZATION PLANT
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have a “**Last Modification Date**” which represents the last date the portion of the unit has been modified. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Last modification to Waste Treatment and Immobilization Plant **June 12, 2019**

Chapters	Last Modification Date	Modification Number
Unit-Specific Conditions	06/12/2019	24590-WTP-PCN-ENV-19-002 (8C.2019.Q2)
1.0 Part A Form	08/30/2018	8C.2018.3F
2.0 Topographic Map	09/05/2017	8C.2017.6F
3.0 Waste Analysis Plan	06/2011	
3A Waste Treatment Plant Waste Analysis Plan	12/6/2018	24590-WTP-PCN-ENV-18-012 (8C.2018.Q4)
3B Quality Assurance Project Plan for Waste Analysis Plan	09/05/2017	8C.2017.6F
4.0 Process Information	10/01/2018	24590-WTP-PCN-ENV-18-003 (8C.2018.Q4)
4A Figures and Drawings	09/05/2017	8C.2017.6F
4C Compliance with Uniform Building Code Seismic Design Requirements	11/17/2008	
4D Pretreatment Facility	10/01/2018	24590-WTP-PCN-ENV-18-003 (8C.2018.Q4)
4E Low-Activity Waste Vitrification Facility	12/7/2018	24590-WTP-PCN-ENV-18-001 (8C.2018.Q4)
4F High-Level Waste Vitrification Facility	10/01/2018	24590-WTP-PCN-ENV-18-003 (8C.2018.Q4)
4G Direct-Feed Low-Activity Waste (Effluent Management Facility)	05/17/2018	8C.2018.2F
4H Analytical Laboratory	03/22/2019	24590-WTP-PCN-ENV-18-013 (8C.2019.Q1)
4I Balance of Facilities	09/05/2017	8C.2017.6F
5.0 Reserved		
6.0 Procedures to Prevent Hazards	09/05/2017	8C.2017.6F
6A Inspection Plan	04/05/2018	8C.2018.1F
7.0 Contingency Plan	04/30/2019	24590-WTP-PCN-ENV-19-001 (8C.2019.Q2)
8.0 Personnel Training	04/05/2018	8C.2018.1F
9.0 Reserved		
10.0 Reserved		
11.0 Closure Plan	09/05/2017	8C.2017.6F
11A Sampling and Analysis Plan for Closure of WTP Facility	05/23/2016	8C.2016.Q1
12.0 Reporting and Recordkeeping	08/2011	

**WASTE TREATMENT AND IMMOBILIZATION PLANT
CHANGE CONTROL LOG**

Appendices	Last Modification Date	Modification Number
Appendices 1: WTP Interim Compliance Schedule	06/12/2019	24590-WTP-PCN-ENV-19-002 (8C.2019.Q2)
Appendices 2: Critical Systems for the WTP	09/05/2017	8C.2017.6F
Appendices 3: Reserved		
Appendices 4: Reserved		
Appendices 5: Reserved		
Appendices 6: Risk Assessment	01/28/2016	8C.2016.1F
Appendices 7: WTP Documents Applicable to all Regulated Areas	10/01/2018	24590-WTP-PCN-ENV-18-003 (8C.2018.Q4)
Appendices 8: Pretreatment Facility	07/06/2017	8C.2017.2F
Appendices 9: Low-Activity Waste Building	05/21/2019	24590-LAW-PCN-ENV-19-004 (8C.2019.Q2)
Appendices 10: High-Level Waste Building	02/01/2018	8C.2017.Q4
Appendices 11: Laboratory Building	04/15/2019	24590-LAB-PCN-ENV-19-002 (8C.2019.Q2)
Appendices 12: Balance of Facilities	07/06/2017	8C.2017.2F
Appendices 13: Effluent Management Facility	05/16/2019	24590-BOF-PCN-ENV-18-001 (8C.2019.Q2)

**WASTE TREATMENT AND IMMOBILIZATION PLANT
PART III, OPERATING UNIT GROUP 10 – SPECIFIC CONDITIONS
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
03/22/2019	24590-WTP-PCN-ENV-18-013 (8C.2019.Q1)
01/31/2019	24590-WTP-PCN-ENV-18-011 (8C.2019.Q1)
12/7/2018	24590-WTP-PCN-ENV-18-001 (8C.2018.Q4)
10/16/2018	24590-LAW-PCN-ENV-18-005 (8C.2018.Q4)
09/13/2018	24590-LAW-PCN-ENV-17-013 (8C.2018.Q3)
08/30/2018	8C.2018.3F
06/08/2018	24590-LAW-PCN-ENV-17-006 (8C.2018.Q2)
06/07/2018	24590-WTP-PCN-ENV-18-002 (8C.2018.Q2)
05/18/2018	24590-LAW-PCN-ENV-17-012 (8C.2018.Q2)
05/17/2018	8C.2018.2F
05/15/2018	24590-LAB-PCN-ENV-14-001 (8C.2018.Q2)
04/05/2018	8C.2018.1F
03/08/2018	24590-LAW-PCN-ENV-16-008 (8C.2018.Q1)
03/06/2018	24590-LAW-PCN-ENV-17-005 (8C.2018.Q1)
02/14/2018	24590-LAW-PCN-ENV-17-011 (8C.2018.Q1)
02/01/2018	8C.2017.Q4
11/28/2017	8C.2017.8F
11/01/2017	8C.2017.Q3
09/05/2017	8C.2017.6F
07/06/2017	8C.2017.2F
03/01/2017	8C.2016.Q4
12/15/2016	8C.2016.Q3
12/1/2016	8C.2016.7F

This page intentionally left blank.

1
2
3
4
5

**PART III, OPERATING UNIT GROUP 10 – SPECIFIC CONDITIONS
WASTE TREATMENT AND IMMOBILIZATION PLANT**

1
2
3
4
5

This page intentionally left blank.

1
2
3
4
5

**PART III, OPERATING UNIT GROUP 10 – SPECIFIC CONDITIONS
WASTE TREATMENT AND IMMOBILIZATION PLANT**

6 The Waste Treatment and Immobilization Plant (WTP) is the operating treatment and storage unit
7 designed to treat the mixed (radioactive and dangerous) waste currently stored in underground tanks at the
8 Hanford Site. Once the mixed waste is received at the WTP, it will be separated into high-level and
9 low-activity waste streams in the Pretreatment (PT) Building. The waste streams are then transferred to
10 either the High-Level Waste (HLW) Building or the Low-Activity Waste (LAW) Building, mixed with
11 glass forming additives and heated to 950-1250° C in melters, and then poured into containers. As the
12 containerized waste cools, it is immobilized in the glass matrix. Once the waste is immobilized, the
13 container is finished (i.e. provided with a lid and decontaminated), and then transported from the WTP for
14 disposal.

15 **III.10.A COMPLIANCE WITH APPROVED PERMIT**

16 The Permittees shall comply with all requirements set forth in the Hanford Facility Resource
17 Conservation and Recovery Act (RCRA) Dangerous Waste Permit including all approved modification.
18 All chapters, subsection, files, tables, addendums, and appendices included in the following Unit-Specific
19 Conditions are enforceable in their entirety. In the event that a Unit-Specific Condition conflicts with
20 Permit Conditions in Parts I or II of this Permit, the Unit-Specific Conditions shall prevail.

21 Where information regarding treatment, management, and disposal of the radioactive source, byproduct
22 material, special nuclear material (as defined by the Atomic Energy Act of 1954, as amended) and/or the
23 radionuclide component of mixed waste has been incorporated into this permit, it is not incorporated for
24 the purpose of regulating the radiation hazards of such components under the authority of this permit and
25 chapter [70.105 Revised Code of Washington](#). In the event of any conflict between Permit Condition
26 III.10.A and any statement relating to the regulation of source, special nuclear, and byproduct material
27 contained in portions of the permit application that are incorporated into this permit, Permit Condition
28 III.10.A will prevail.

29 **OPERATING UNIT GROUP 10**

30	Chapter 1	Part A Form, Revision 3
31	Chapter 2	Topographic Map
32	Chapter 3	Waste Analysis Plan
33		Appendix 3A Waste Treatment Plant Waste Analysis Plan
34		Appendix 3B Quality Assurance Project Plan for Waste Analysis Plan
35	Chapter 4	Process Information
36		Chapter 4A Engineering Figures
37		Chapter 4C §RPP-WTP Compliance with Uniform Building Code Seismic Design
38		Chapter 4D Pretreatment Facility (PTF)
39		Chapter 4E Low-Activity Waste (LAW) Vitrification Facility
40		Chapter 4F High-Level Waste (HLW) Vitrification Facility
41		Chapter 4G Direct-Feed Low-Activity Waste (Effluent Management Facility)
42		Chapter 4H Analytical Laboratory (LAB)

1	Chapter 4I	Balance of Facilities (BOF)
2	Chapter 5	Groundwater Monitoring (RESERVED)
3	Chapter 6	Procedures to Prevent Hazards
4	Chapter 6A	Inspection Plan
5	Chapter 7	Contingency Plan
6	Chapter 8	Personnel Training
7	Chapter 11	Closure
8	Chapter 11.A	Sampling and Analysis Plan for Closure of WTP Facility
9	Chapter 12	Reporting and Recordkeeping
10	Appendix 1.0	WTP Interim Compliance Schedule
11	Appendix 1.0, §1.1	WTP Facility Interim Compliance Schedule
12	Appendix 1.0, §1.2	WTP Pretreatment Facility Interim Compliance Schedule
13	Appendix 1.0, §1.3	WTP Low-Activity Waste Facility Interim Compliance Schedule
14	Appendix 1.0, §1.4	WTP Effluent Management Facility Interim Compliance Schedule
15	Appendix 1.0, §1.5	WTP High-Level Waste Facility Interim Compliance Schedule
16	Appendix 2.0	Critical Systems
17	Appendix 3.0	RESERVED
18	Appendix 4.0	RESERVED
19	Appendix 5.0	RESERVED
20	Appendix 6.0	Risk Assessment
21	Appendix 6.0, §6.1	Environmental Risk Assessment Work Plan for the Hanford Tank Waste
22		Treatment and Immobilization Plant 07/30/2003
23	Appendix 6.0, §6.1.1	Final Work Plan for Screening Level Risk Assessment for the RPP-WTP
24		04/28/2000
25	Appendix 6.0, §6.1.2	Ecology/EPA Technical Comments on Hanford River Protection Privatization
26		Project Review of BNFL Final Work Plan for Screening Level Risk Assessment
27		for RPP-WTP
28	Appendix 6.0, §6.2	Final Risk Assessment Work Plan
29	Appendix 6.0, §6.2.1	Supplement 1 – Constituents of Potential concerns for the WTP Air and
30		Dangerous Waste Permits
31	Appendix 6.0, §6.2.2	Supplement 2 – Integrated Emissions Baseline Report for the Hanford Tank
32		Waste Treatment and Immobilization Plant
33	Appendix 6.0, §6.2.3	Supplement 3 – Estimated Organic Emissions from Process Cells
34	Appendix 6.0, §6.2.4	Supplement 4 – Chemical Parameters and Toxicological Inputs for the
35		Environmental Risk Assessment for the Hanford Tank Waste Treatment and
36		Immobilization Plant

1	Appendix 6.0, §6.2.5	Supplement 5 – Hanford Tank Waste Treatment and Immobilization Plant Risk
2		Assessment Air Quality Modeling Protocol
3	Appendix 6.0, §6.3	Pre-Demonstration Test Risk Assessment Report (RESERVED)
4	Appendix 6.0, §6.4	Final Risk Assessment (RESERVED)
5	Appendix 7.0	WTP Documents Applicable to All Regulated Areas
6	Appendix 7.0, §7.1	Process Flow Diagrams
7	Appendix 7.0, §7.2	Piping and Instrumentation Diagrams & Related Documents
8	Appendix 7.0, §7.3	System Description Documentation (Administrative Record)
9	Appendix 7.0, §7.4	General Arrangement Drawings (RESERVED)
10	Appendix 7.0, §7.5	Civil, Structural, and Architectural Criteria and Typical Design Details
11	Appendix 7.0, §7.6	Mechanical Drawings (RESERVED)
12	Appendix 7.0, §7.7	Specifications
13	Appendix 7.0, §7.8	Engineering Calculations (RESERVED)
14	Appendix 7.0, §7.9	Material Selection Documentation
15	Appendix 7.0, §7.10	Critical Systems Equipment/Instrument List (RESERVED)
16	Appendix 7.0, §7.11	Independent, Qualified, Registered Professional Engineer (IQRPE) Reports
17	Appendix 7.0, §7.12	Installation Plans
18	Appendix 7.0, §7.13	Instrument Control Logic and Narrative Description
19	Appendix 7.0, §7.14	Descriptions of Instrument Installation and Testing Procedures (RESERVED)
20	Appendix 7.0, §7.15	Operating Documents
21	Appendix 8.0	Pretreatment Building
22	Appendix 8.0, §8.1	Process Flow Diagrams
23	Appendix 8.0, §8.2	Piping and Instrumentation Diagrams
24	Appendix 8.0, §8.3	System Description Documentation (Administrative Record)
25	Appendix 8.0, §8.4	General Arrangement Drawings
26	Appendix 8.0, §8.5	Civil, Structural, and Architectural Criteria and Typical Design Details
27	Appendix 8.0, §8.6	Mechanical Drawings
28	Appendix 8.0, §8.7	Specifications
29	Appendix 8.0, §8.8	Engineering Calculations
30	Appendix 8.0, §8.9	Material Selection and Corrosion Evaluation Documentation
31	Appendix 8.0, §8.10	Critical Systems Equipment/Instrument List
32	Appendix 8.0, §8.11	Independent, Qualified, Registered Professional Engineer (IQRPE) Reports
33	Appendix 8.0, §8.12	Installation Plans (RESERVED)
34	Appendix 8.0, §8.13	Instrument Control Logic and Narrative Description
35	Appendix 8.0, §8.14	Descriptions of Instrument Installation and Testing Procedures (RESERVED)

1	Appendix 8.0, §8.15	Demonstration Test Plan (RESERVED)
2	Appendix 8.0, §8.16	Demonstration Test Report (RESERVED)
3	Appendix 8.0, §8.17	Treatment Effectiveness Report (RESERVED)
4	Appendix 8.0, §8.18	Operating Documents
5	Appendix 9.0	Low-Activity Waste (LAW) Building
6	Appendix 9.0, §9.1	Process Flow Diagrams
7	Appendix 9.0, §9.2	Piping and Instrumentation Diagrams
8	Appendix 9.0, §9.3	System Description Documentation (Administrative Record)
9	Appendix 9.0, §9.4	General Arrangement Drawings
10	Appendix 9.0, §9.5	Civil, Structural, and Architectural Criteria and Typical Design Details
11	Appendix 9.0, §9.6	Mechanical Drawings
12	Appendix 9.0, §9.7	Specifications
13	Appendix 9.0, §9.8	Engineering Calculations
14	Appendix 9.0, §9.9	Material Selection and Corrosion Evaluation Documentation
15	Appendix 9.0, §9.10	Critical Systems Equipment /Instrument List
16	Appendix 9.0, §9.11	Independent, Qualified, Registered Professional Engineer (IQRPE) Reports
17	Appendix 9.0, §9.12	Installation Plans (RESERVED)
18	Appendix 9.0, §9.13	Instrument Control Logic, and Narrative Description
19	Appendix 9.0, §9.14	Descriptions of Instrument Installation and Testing Procedures (RESERVED)
20	Appendix 9.0, §9.15	Demonstration Test Plan
21	Appendix 9.0, §9.16	Demonstration Test Report (RESERVED)
22	Appendix 9.0, §9.17	Treatment Effectiveness Report (RESERVED)
23	Appendix 9.0, §9.18	Operating Documents
24	Appendix 10.0	High Level Waste (HLW) Building
25	Appendix 10.0, §10.1	Process Flow Diagrams
26	Appendix 10.0, §10.2	Piping and Instrumentation Diagrams
27	Appendix 10.0, §10.3	System Description Documentation (Administrative Record)
28	Appendix 10.0, §10.4	General Arrangement Drawings
29	Appendix 10.0, §10.5	Civil, Structural, and Architectural Criteria and Typical Design Details
30	Appendix 10.0, §10.6	Mechanical Drawings
31	Appendix 10.0, §10.7	Specifications
32	Appendix 10.0, §10.8	Engineering Calculations
33	Appendix 10.0, §10.9	Material Selection and Corrosion Evaluation Documentation
34	Appendix 10.0, §10.10	Critical Systems Equipment/Instrument List
35	Appendix 10.0, §10.11	Independent, Qualified, Registered Professional Engineer (IQRPE) Reports

- 1 Appendix 10.0, §10.12 Installation Plans (RESERVED)
- 2 Appendix 10.0, §10.13 Instrument Control Logic and Narrative Description
- 3 Appendix 10.0, §10.14 Descriptions of Instrument Installation and Testing Procedures (RESERVED)
- 4 Appendix 10.0, §10.15 Demonstration Test Plan (RESERVED)
- 5 Appendix 10.0, §10.16 Demonstration Test Report (RESERVED)
- 6 Appendix 10.0, §10.17 Treatment Effectiveness Report (RESERVED)
- 7 Appendix 10.0, §10.18 Operating Documents
- 8 Appendix 11.0 Laboratory Building
- 9 Appendix 11.0, §11.1 Process Flow Diagrams
- 10 Appendix 11.0, §11.2 Piping and Instrumentation Diagrams
- 11 Appendix 11.0, §11.3 System Description Documentation (RESERVED)
- 12 Appendix 11.0, §11.4 General Arrangement Drawings
- 13 Appendix 11.0, §11.5 Civil, Structural, and Architectural Criteria and Typical Design Details
- 14 Appendix 11.0, §11.6 Mechanical Drawings
- 15 Appendix 11.0, §11.7 Specifications (RESERVED)
- 16 Appendix 11.0, §11.8 Engineering Calculations
- 17 Appendix 11.0, §11.9 Material Selection and Corrosion Evaluation Documentation
- 18 Appendix 11.0, §11.10 Critical Systems Equipment/Instrument List
- 19 Appendix 11.0, §11.11 Independent, Qualified, Registered Professional Engineer (IQRPE) Reports
- 20 Appendix 11.0, §11.12 Installation Plans (RESERVED)
- 21 Appendix 11.0, §11.13 Instrument Control Logic and Narrative Description
- 22 Appendix 11.0, §11.14 Descriptions of Instrument Installation and Testing Procedures (RESERVED)
- 23 Appendix 11.0, §11.15 Operating Documents (RESERVED)
- 24 Appendix 11.0, §11.16 Demonstration Test Report (RESERVED)
- 25 Appendix 11.0, §11.17 Treatment Effectiveness Report (RESERVED)
- 26 Appendix 11.0, §11.18 Operating Documents
- 27 Appendix 12.0 Balance of Facilities
- 28 Appendix 12.0, §12.1 Process Flow Diagrams (RESERVED)
- 29 Appendix 12.0, §12.2 Piping and Instrumentation Diagrams
- 30 Appendix 12.0, §12.3 System Description Documentation (RESERVED)
- 31 Appendix 12.0, §12.4 General Arrangement Drawings
- 32 Appendix 12.0, §12.5 Civil, Structural, and Architectural Criteria and Typical Design Details
- 33 Appendix 12.0, §12.6 Mechanical Drawings (RESERVED)
- 34 Appendix 12.0, §12.7 Specifications (RESERVED)
- 35 Appendix 12.0, §12.8 Engineering Calculations (RESERVED)

1	Appendix 12.0, §12.9	Material Selection and Corrosion Evaluation Documentation (RESERVED)
2	Appendix 12.0, §12.10	Critical Systems Equipment/Instrument List (RESERVED)
3	Appendix 12.0, §12.11	Independent, Qualified, Registered Professional Engineer (IQRPE) Reports
4		(RESERVED)
5	Appendix 12.0, §12.12	Installation Plans (RESERVED)
6	Appendix 12.0, §12.13	Instrument Control Logic and Narrative Description (RESERVED)
7	Appendix 12.0, §12.14	Descriptions of Instrument Installation and Testing Procedures (RESERVED)
8	Appendix 12.0, §12.15	Demonstration Test Plan (RESERVED)
9	Appendix 12.0, §12.16	Demonstration Test Report (RESERVED)
10	Appendix 12.0, §12.17	Treatment Effectiveness Report (RESERVED)
11	Appendix 12.0, §12.18	Operating Documents
12	Appendix 13.0, §13.0	Effluent Management Facility
13	Appendix 13.0, §13.1	Process Flow Diagrams
14	Appendix 13.0, §13.2	Piping & Instrumentation Diagrams
15	Appendix 13.0, §13.3	System Description Documentation (RESERVED)
16	Appendix 13.0, §13.4	General Arrangement Drawings
17	Appendix 13.0, §13.5	Civil, Structural, and Architectural Criteria and Typical Design Details
18		(RESERVED)
19	Appendix 13.0, §13.6	Mechanical Drawings (RESERVED)
20	Appendix 13.0, §13.7	Specifications (RESERVED)
21	Appendix 13.0, §13.8	Engineering Calculations (RESERVED)
22	Appendix 13.0, §13.9	Material Selection and Corrosion Evaluation Documentation (RESERVED)
23	Appendix 13.0, §13.10	Critical Systems Equipment/Instrument List (RESERVED)
24	Appendix 13.0, §13.11	Independent, Qualified, Registered Professional Engineer (IQRPE) Reports
25	Appendix 13.0, §13.12	Installation Plans (RESERVED)
26	Appendix 13.0, §13.13	Instrumentation Control Logic and Narrative Description
27	Appendix 13.0, §13.14	Description of Instrument Installation and Testing Procedures (RESERVED)
28	Appendix 13.0, §13.15	Demonstration Test Plan (RESERVED)
29	Appendix 13.0, §13.16	Demonstration Test Report (RESERVED)
30	Appendix 13.0, §13.17	Treatment Effectiveness Report (RESERVED)
31	Appendix 13.0, §13.18	Operating Documents

1 Facility-Specific Definitions

2 The following definitions are specific to the WTP Unit:

3 **Ash:** refers to the particulate matter (PM) that will be measured in the off-gas during the Environmental
4 Performance Demonstration Test (EPDT) in accordance with U.S. Environmental Protection Agency
5 (EPA) Method 5. The regulatory limit for ash is established in III.10.H.1.b.ii.

6 **Batch:** refers to waste staged in one Double Shell Tank (DST) designated as mixed waste for transfer to
7 the WTP Unit for treatment.

8 **Continuous monitoring system:** means using a device which continuously samples the regulated
9 parameter specified on Permit Tables III.10.H.F, III.10.I.F, III.10.J.F, and III.10.K.F, with the exception
10 of pressure, without interruption, evaluates the detector response at least once every fifteen (15) seconds
11 and computes and records the average value at least every sixty (60) seconds, except during allowable
12 periods of calibration and except as defined otherwise by the Continuous Emissions Monitoring System
13 (CEMS) Performance Specifications in Appendix B, [40 CFR Part 60](#). For the parameter pressure, the
14 term “continuous monitoring system” (CMS) means using a device that continuously samples the
15 pressure without interruption and evaluates the detector response without averaging at least once each
16 second and records the value at least every sixty (60) seconds.

17 **Cascade event:** means when additional waste feed cut-off parameter set points deviate outside the limits
18 specified in Permit Tables III.10.H.F, III.10.I.F, III.10.J.F, and III.10.K.F after waste feed is cut-off, but
19 while waste or waste residues are being managed in HLW and LAW.

20 **Critical System:** as applied to determining whether a Permit Modification is required, means those
21 specific portions of a Treatment, Storage, and Disposal (TSD) unit’s structure, or equipment, whose
22 failure could lead to the release of dangerous waste into the environment, and/or systems which include
23 processes which treat, transfer, store, or dispose of regulated wastes. A list identifying the critical systems
24 for the WTP is included in Appendix 2.

25 **Dangerous and/or mixed waste management unit:** means dangerous and/or mixed waste management
26 units, areas, systems, and sub-systems as detailed in Permit Tables III.10.D.A, III.10.E.A through D,
27 III.10.F.A, III.10.G.A, III.10.H.A, III.10.I.A, III.10.J.A, III.10.K.A, III.10.M.A, and III.10.E.R through
28 III.10.E.T.

29 **Demonstration Test (DT):** test conducted to show compliance with performance standards applicable to
30 the LAW and HLW melters, also referred to as the EPDT.

31 **“Dioxin/furan” and “dioxins and furans:** means tetra-, penta-, hexa-, hepta-, and octa-chlorinated
32 dibenzo dioxins and furans.

33 **Effluent Management Facility (EMF) Vitrification System:** is defined as specified on Permit Tables
34 III.10.M.A and III.10.E.R through III.10.E.T.

35 **HLW Vitrification System:** is defined as specified on Permit Tables III.10.J.A and B, and III.10.K.A
36 and B.

37 **Hourly rolling average (HRA):** will mean the arithmetic mean of the sixty (60) most recent one-minute
38 readings recorded by the CMS.

39 **LAW Vitrification System:** is defined as specified on Permit Tables III.10.H.A and B, and III.10.I.A
40 and B.

41 **Mode of operation:** means operation of the LAW Vitrification System or the HLW Vitrification System
42 within set limits for each operating parameter specified in Permit Tables III.10.H.D and F (for LAW) and
43 Permit Tables III.10.I.D and F (for HLW).

- 1 **One-minute average:** means the average of detector responses calculated at least every sixty (60)
2 seconds from responses obtained at least every fifteen (15) seconds.
- 3 **Permittees:** means the United States Department of Energy (owner/operator) and Bechtel National, Inc.
4 (Co-operator).
- 5 **Pretreatment Plant Miscellaneous Unit Systems:** is defined as specified on Permit Tables III.10.G.A
6 and B.
- 7 **Primary sump:** means any pit or reservoir that meets the Washington Administrative Code
8 [\(WAC\) 173-303-040](#) definition of “tank,” and those troughs/trenches connected to it, that serve to collect
9 dangerous/hazardous waste, deliberately introduced from treatment activities for transport to TSD
10 facilities. Primary sumps are equipped with an additional liner, leak detector, and waste removal
11 capability. A typical primary sum design is shown in Figure 4A-128 in Chapter 4A.
- 12 **Rolling average:** means the average of all one-minute averages over the averaging period.
- 13 **Secondary sump:** means any pit or reservoir that meets the [WAC 173-303-040](#) definition of “tank,” and
14 those troughs/trenches connected to it, that serve to collect dangerous/hazardous waste from spills, leaks,
15 overflows, or decontamination activities for transport to TSD facilities.
- 16 **Secondary mixed waste stream:** means treatment residues and materials derived from the treatment of
17 mixed waste which continue to designate as a dangerous, extremely hazardous, or acutely hazardous
18 waste and contains a radioactive component.
- 19 **Simulant:** a material used during the shakedown, demonstration test, and post-demonstration testing
20 described in the EPDT in Appendix 9.15 which serves as a required surrogate for Tank Farm Waste.
- 21 **Standard operating procedure (SOP):** will mean a written description of the procedures by which a
22 process, equipment, etc. will be operated. An SOP may be written by the manufacturer and/or the
23 Permittees.
- 24 **Successful completion of the demonstration test:** will mean operations including a minimum of three
25 test runs without significant interruptions (i.e., once initiated, each test run must be continuous, and the
26 samples have been preserved and maintained intact, and one in which sampling of exhaust gas was
27 representative of the LAW Vitrification System or HLW Vitrification System Operations, whichever is
28 applicable, and adequate to achieve evaluation of principal organic dangerous constituents (PODCs)
29 destruction and removal efficiency (DRE) to 99.99%).
- 30 **Toxic equivalents (TEQ):** refer to the sum of the weighted potencies of 7 polychlorinated dibenzo-p-
31 dioxins (PCDDs), 10 polychlorinated dibenzofurans (PCDFs), and 12 dioxin-like (coplanar)
32 polychlorinated biphenyl (PCBs), relative to a reference compound, 2, 3, 7, 8 – tetrachlorodibenzo-p-
33 dioxin (2, 3, 7, 8 – TCDD).
- 34 **Pre-process:** means prior to introduction into a dangerous or mixed waste management unit at the WTP
35 Unit.
- 36 **In-process:** means duration of a waste in a dangerous or mixed waste management unit at the WTP Unit.
- 37 **Post-process:** means prior to the introduction into a subsequent dangerous or mixed waste management
38 unit at the WTP Unit or prior to shipment from the WTP Unit.
- 39 **Receipt of dangerous and/or mixed waste:** for the purpose of this Permit, this term generally refers to
40 the receipt of Tank Farm Waste but other materials that are processed (e.g. listed spiking materials) may
41 also require proper management as dangerous waste based on characterization.

- 1 **Vendor information:** means documentation prepared by a vendor (e.g., catalog cut sheets) for plant
2 items that are routinely manufactured and stocked by vendors (i.e., items that are considered "off the
3 shelf") and are not being procured in accordance with Permittees' engineering drawings and
4 specifications. Documentation such as catalog cut sheets will be annotated to specify selected items
5 which meet Permittee's procurement requirements equipment specification. Documentation associated
6 with "one of a kind", custom items, and commercial grade items (e.g., bulk pipe, valves) that will be
7 procured in accordance with the Permittees engineering drawings and specifications is not considered
8 vendor information. Changes to the drawings and specifications may require a permit modification.
- 9 **Vitrification System Shutdown:** means emergency and planned shutdowns of the vitrification system as
10 defined in the operating procedure(s).
- 11 **Vitrification System Startup:** means startup of the vitrification system as defined in operating
12 procedure(s).

1 **FACILITY-SPECIFIC ACRONYMS**

2 The following acronyms are specific to the WTP Unit:

3	AWFCO	Automatic Waste Feed Cut-off
4	CDR	Construction Deficiency Report
5	CEMS	Continuous Emissions Monitoring System
6	CMS	Continuous Monitoring System
7	CNP	Cesium Nitric Acid Recovery Process System
8	CRP	Cesium Resin Addition Process System
9	CPE	Cathodic Protection Electrical System
10	CXP	Cesium Ion Exchange Process System
11	DEP	Direct Feed LAW EMF Process System
12	DFETP	Dioxin and Furan Emission Test Plan
13	DRE	Destruction and Removal Efficiency
14	Dscf	Dry standard cubic feet
15	DT	Demonstration Test
16	EMF	Effluent Management Facility
17	EPDT	Environmental Performance Demonstration Test
18	ERP	Emergency Response Plan
19	FEP	Waste Feed Evaporation Process System
20	FRP	Waste Feed Receipt Process System
21	HCP	HLW Concentrate Receipt Process System
22	HDH	HLW Canister Decontamination Handling System
23	HEH	HLW Canister Export Handling System
24	HEME	High Efficiency Mist Eliminator
25	HEPA	High Efficiency Particulate Air Filter
26	HFH	HLW Filter Cave Handling System
27	HFP	HLW Melter Feed Process System
28	HLP	HLW Lag Storage and Feed Blending Process System
29	HLW	High-level Waste
30	HMH	HLW Melter Handling System
31	HMP	HLW Melter Process System
32	HOP	HLW Vit Primary Offgas Treatment System
33	HPH	HLW Canister Pour Handling System
34	HSH	HLW Melter Cave Support Handling System
35	IHLW	Immobilized High-Level Waste (Glass)
36	ILAW	Immobilized Low-Activity Waste (Glass)
37	IQRPE	Independent, qualified, registered, professional engineer
38	LAB	WTP Laboratory Building
39	LAW	Low Activity Waste
40	LCP	LAW Concentrate Receipt Process System
41	LEH	LAW Container Export Handling System

1	LFH	LAW Canister Finishing Handling System
2	LFP	LAW Melter Feed Process System
3	LMH	LAW Melter Handling System
4	LMP	LAW Melter Process System
5	LOP	LAW Primary Offgas Process System
6	LPH	LAW Container Pour Handling System
7	LSH	LAW Melter Equipment Support Handling System
8	LSM	Locally Shielded Melter
9	LVP	LAW Secondary Offgas/Vessel Vent Process System
10	NCR	Nonconformance Report
11	PFH	Pretreatment Filter Cave Handling System
12	PIH	Pretreatment In-Cell Handling System
13	PJV	Pulse Jet Ventilation System
14	PODC	Principal Organic Dangerous Constituents
15	PTF	Pretreatment Building
16	PVP	Pretreatment Vessel Vent Process System
17	PVV	Process Vessel Vent System
18	PWD	Plant Wash and Disposal System
19	RDP	Spent Resin and Dewatering Process System
20	RDTP	Revised Demonstration Test Plan
21	RLD	Radioactive Liquid Waste Disposal System
22	RPP-WTP	River Protection Project-Waste Treatment Plant
23	RWH	Radioactive Solid Waste Handling System
24	SBS	Submerged Bed Scrubber
25	TCP	Treated LAW Evaporation Process System
26	TLP	Treated LAW Evaporation System
27	TOC	Total Organic Carbon
28	TXP	Technetium Ion Exchange Process System
29	TEP	Technetium Eluant Recovery Process System
30	UFP	Ultrafiltration Process System
31	WESP	Wet Electrostatic Precipitator
32	WTP	River Protection Project – Waste Treatment and Immobilization Project
33		(also known as the Waste Treatment Plant and Vitrification Plant)
34	6% Mo	Six Percent Molybdenum Alloy
35	304L	ASTM A240 Grade 304L Stainless Steel
36	316L	ASTM A240 Grade 316L Stainless Steel

1 **III.10.A COMPLIANCE WITH APPROVED PERMIT**

2 **III.10.B STANDARD CONDITIONS AND GENERAL FACILITY CONDITIONS**

3 In addition to the conditions in this chapter, the Permittees must comply with all the applicable portions of
 4 the Dangerous Waste Permit for the Hanford Facility. In the event that a Unit-Specific Condition for the
 5 WTP Unit in Permit Conditions III.10.C through III.10.M conflicts with a general condition in Permit
 6 Conditions I and II of this permit, the Unit-Specific Condition will apply to the WTP Unit.

7 **III.10.C UNIT-SPECIFIC CONDITIONS FOR THE WTP UNIT**

8 **III.10.C.1 RESERVED**

9 **III.10.C.2 General Waste Management**

10 **III.10.C.2.a** Treatment or storage of dangerous waste or mixed waste in any new or modified portion
 11 of the facility may commence when the Permittees have submitted to Ecology, by
 12 certified mail, or hand delivery, a letter signed by the Permittees and a registered
 13 professional engineer stating that the facility has been constructed or modified in
 14 compliance with the Permit in accordance with [WAC 173-303-810](#)(14)(a); and

15 **III.10.C.2.a.i** The Permittee has received a Permit modification approval pursuant to Permit
 16 Conditions III.10.C.2.e and III.10.C.2.f, or III.10.C.2.g, and

17 **III.10.C.2.a.ii** Ecology has inspected the modified or newly constructed facility and finds it is in
 18 compliance with the conditions of the Permit, or

19 **III.10.C.2.a.iii** Within fifteen days, of the date of submission of the Permittees' letter, Ecology has
 20 not notified the Permittees of intent to inspect.

21 **III.10.C.2.b** The Permittees are authorized to accept the dangerous and/or mixed waste specified in
 22 Operating Unit Group 10, Chapter 1 (Part A Form), and Chapter 3 (Waste Analysis Plan
 23 [WAP]).

24 **III.10.C.2.c** All dangerous and/or mixed waste must be managed only in areas authorized for
 25 dangerous and/or mixed waste management under the Permit conditions, except as
 26 allowed under [WAC 173-303-200](#). The authorized dangerous and/or mixed waste
 27 management areas of the WTP Unit are specified in Conditions III.10.D through
 28 III.10.M.

29 **III.10.C.2.d** Dangerous and/or mixed waste may be transferred from dangerous waste management
 30 units within the WTP operating unit to an on-site dangerous waste management unit or an
 31 off-site permitted TSD Facility using the manifest/tracking system required by Permit
 32 Condition II.N.

33 **III.10.C.2.e** Permit modifications pursuant to this Permit for dangerous and/or mixed waste at the
 34 request of the Permittees must be done according to the three tiered modification system
 35 specified in [WAC 173-303-830](#)(4) and Condition I.C.3. The Permit modification request
 36 must include page changes to the Permit, attachments, and permit application supporting
 37 documentation necessary to incorporate the proposed permit modification.

38 **III.10.C.2.f** In addition to other requirements in [WAC 173-303-830](#), within forty-five (45) days of a
 39 permit change (i.e., permit modification) being put into effect or approved, the Permittees
 40 will provide copies of the Permit attachments to incorporate the change (if not already
 41 reflected in the change pages submitted in the original permit modification request). This
 42 submittal does not require re-certification in accordance with [WAC 173-303-810](#)(13).

43 **III.10.C.2.g** Permit modifications pursuant to Operating Unit Group 10, Appendix 1.0 will be
 44 prepared and issued pursuant to [WAC 173-303-830](#)(3)(a)(ii) and [WAC 173-303-840](#).

- 1 **III.10.C.2.h** The Permittees must complete Compliance Schedule interim requirements as specified in
 2 Operating Unit Group 10, Appendix 1.0. If an interim requirement is not completed as
 3 specified, the Permittees will, within 14 days, notify Ecology in writing of its
 4 non-compliance. The notification will include the following:
- 5 **III.10.C.2.h.i** A description of any portion of the interim requirement completed;
- 6 **III.10.C.2.h.ii** Summaries of any problems affecting timely completion of the interim requirement;
- 7 **III.10.C.2.h.iii** A description of the plans for completing the remaining portion of the interim
 8 requirement, including any alternatives;
- 9 **III.10.C.2.h.iv** Projected interim requirement completion date.
- 10 **III.10.C.2.i** RESERVED
- 11 **III.10.C.2.j** RESERVED
- 12 **III.10.C.2.k** RESERVED
- 13 **III.10.C.2.l** During demonstration testing of the LAW Vitrification System and HLW Vitrification
 14 System, pursuant to Permit Sections III.10.H and J, processing of materials in the LAW
 15 and HLW Vitrification Systems that would designate as dangerous waste are fully subject
 16 to the requirements of this Permit, excluding the glass formers and simulant, transferred
 17 from the melter feed system as identified in Tables III.10.H.A and III.10.J.A, respectively.
 18 This exclusion does not apply to mixed waste.
- 19 **III.10.C.2.m** The Facility Owner will ensure WTP input is provided to the risk budget tool developed
 20 in accordance with permit condition III.11.I.5.
- 21 **III.10.C.2.n** The Permittees will submit the following reports, based on the August 2006 mass balance
 22 submitted to Ecology (DOE Letter 06-ESQ-081), for Ecology's review and
 23 comment/resolution. Updated information to the August 2006 Mass Balance may be
 24 used if available and mutually agreed upon by the Permittees and Ecology. The reports
 25 will describe all of the treatment approaches identified in Permit Conditions III.10.C.2.n.i
 26 through III.10.C.2.n.v, and will be included in the Administrative Record.
- 27 **III.10.C.2.n.i** By June 30, 2010, the Permittees will perform an assessment that projects mixed
 28 waste constituents and the concentrations that are expected to be contained in each
 29 secondary mixed waste stream anticipated to be generated;
- 30 **III.10.C.2.n.ii** By June 30, 2010, the Permittees will identify appropriate Land Disposal Restrictions
 31 (LDR) treatment standards for each mixed waste stream identified in Permit
 32 Condition III.10.C.2.n.i;
- 33 **III.10.C.2.n.iii** By June 30, 2010, the Permittees will identify which mixed waste streams that, from
 34 a qualitative risk perspective, reasonably may cause or may significantly contribute
 35 to an exceedance of applicable environmental standards at a disposal facility; and
- 36 **III.10.C.2.n.iv** By June 30, 2010, the Permittees will, for the mixed waste streams identified in
 37 Permit Condition III.10.C.2.n.iii, identify potential treatment approaches that mitigate
 38 their environmental impacts;
- 39 **III.10.C.2.n.v** By December 31, 2015, or 12 months prior to cold commissioning of the facility
 40 producing the waste, whichever is earlier, the Permittees will, for the mixed waste
 41 streams identified in Permit Condition III.10.C.2.n.iii, select appropriate treatment
 42 approaches that mitigate their environmental impacts.

- 1 **III.10.C.2.o** The facility owner will evaluate all waste streams generated at the WTP for potential
 2 exceedances of applicable environmental standards and will ensure all mixed and
 3 dangerous waste streams generated at the WTP will not cause an exceedance of
 4 applicable environmental standards at an appropriate disposal facility on-site and is
 5 subject to the following requirements:
- 6 **III.10.C.2.o.i** Immobilized Low-Activity Waste (ILAW) glass will be engineered to be compliant
 7 with the disposal facility Waste Acceptance Criteria (WAC). The waste feed and
 8 ILAW glass recipes will be verified to be compliant with the permitted glass
 9 formulations (including planning for pertinent operating parameters) prior to
 10 vitrification.
- 11 **III.10.C.2.o.ii** Treatment methods for secondary waste streams projected to be generated by the
 12 WTP that are slated for disposal at the Hanford Site will be engineered to ensure that
 13 treated secondary wastes will comply with the on-site disposal facility WAC and
 14 applicable LDRs prior to generation. Prior to treatment, secondary wastes must be
 15 evaluated to ensure that selected treatment methods are still appropriate and continue
 16 to comply with the on-site disposal facility WAC and applicable LDRs; and
- 17 **III.10.C.2.o.iii** On a case-by-case basis, for any WTP mixed waste that does not meet the WAC for
 18 the disposal facility, Ecology will approve or deny acceptance of that waste into the
 19 disposal facility. This decision will be based on the disposal facility's WAC and
 20 compliance with [WAC 173-303-140](#).
- 21 **III.10.C.3 Waste Analysis**
- 22 **III.10.C.3.a** RESERVED
- 23 **III.10.C.3.b** RESERVED
- 24 **III.10.C.3.c** The Permittees are responsible for obtaining accurate information for each waste stream.
 25 Inaccurate waste analysis information provided by the generating site (or unit) is not a
 26 defense for noncompliance by the Permittees with conditions of this Permit.
- 27 **III.10.C.3.d** Records and results of waste analyses conducted under the WAP will be maintained in
 28 accordance with Permit Condition II.I.1. The WTP Unit operating record will include,
 29 but not be limited to, information requirements for monitoring in Permit Conditions
 30 I.E.10.
- 31 **III.10.C.3.e** Prior to the initial receipt of dangerous and/or mixed waste in the WTP Unit, the
 32 Permittees will submit to Ecology for review and approval a revised WAP and Quality
 33 Assurance Program Plan (QAPP) pursuant to Conditions III.10.C.2.e and III.10.C.2.f, and
 34 the Compliance Schedule in Operating Unit Group 10, Appendix 1.0. The revised WAP
 35 and QAPP will include:
- 36 **III.10.C.3.e.i** All the elements listed in [WAC 173-303-300](#)(5), and Permit Condition II.D.1.
- 37 **III.10.C.3.e.ii** Requirements that characterization will be performed on the waste feed prior to
 38 transfer to the WTP Unit in conformance with the regulatory data quality objectives
 39 identified in the Regulatory Data Quality Objective (DQO) Optimization Report
 40 (24590-WTP-RPT-MGT-04-001, Rev 0), or any other parameters, and the rationale for
 41 selecting these parameters. Requirements that the following analyses, at a minimum,
 42 will be conducted on each new batch prior to waste transfer to the WTP Unit, in
 43 accordance with the methods under [WAC 173-303-110](#): Ammonia, pH, metals,
 44 organic acids, mercury, cyanide, volatiles, semi-volatiles, PCBs/pesticides, anions,
 45 Total Organic Carbon (TOC), and compatibility (ASTM Method D5058-90).

- 1 For the purposes of this Permit Condition, a “new batch” is one that has been
 2 sampled and analyzed in accordance with the Regulatory DQO Optimization Report
 3 (24590-WTP-RPT-MGT-04-001, Rev 0), and has received no further additions.
 4 Further additions require the Permittees to resample and reanalyze, unless an
 5 exception is approved by Ecology on a case-by-case basis. Only mixed waste
 6 meeting the definition of “new batch”, or granted an exception as discussed above,
 7 are authorized for transfer to the WTP Unit. Water additions for the purposes of
 8 waste transfer are not considered additions for the purposes of this Permit Condition.
- 9 **III.10.C.3.e.iii** Identify and include operating parameters to be monitored/controlled and limitations
 10 for these parameters for pre-process, in-process, and post-process operations
 11 addressing on a unit specific basis treatment effectiveness, as specified in Tables
 12 III.10.E.E through H and S, III.10.G.C, III.10.H.C, III.10.I.C, III.10.J.C, III.10.K.C,
 13 waste compatibility, safe operation, and compatibility with unit materials of
 14 construction. Amend the sampling, analysis, and Quality Assurance/Quality Control
 15 (QA/QC) procedures to include these parameters and the monitoring frequency.
- 16 **III.10.C.3.e.iv** Requirements that the Permittees will, for Type I (primary) sumps if liquids are
 17 detected, and for Type II (secondary) sumps, as defined in Operating Unit Group 10,
 18 Chapter 4, if liquid levels are outside normal operating parameters, either collect the
 19 liquid and return to the treatment process, or designate the sump contents for proper
 20 management and disposal prior to removal.
- 21 **III.10.C.3.e.v** For ILAW containers and Immobilized High-Level Waste (IHLW) canisters, a
 22 description of the procedures used for removal of mixed dangerous waste from
 23 exterior container surfaces, including a description of how contamination removal
 24 will be measured.
- 25 **III.10.C.3.e.vi** Requirement that wastes generated at the WTP Unit meet the receiving authorized
 26 TSD Facility waste acceptance criteria prior to a waste stream transfer.
- 27 **III.10.C.3.e.vii** The frequency with which analysis of each waste will be reviewed, or repeated, to
 28 ensure that the analysis is accurate and current, including requirements and criteria
 29 for reevaluation of the sampling and analysis frequency for all waste streams.
- 30 **III.10.C.3.e.viii** Documentation demonstrating methods for obtaining samples of wastes are
 31 representative as discussed in [WAC 173-303-110\(2\)](#).
- 32 **III.10.C.3.e.ix** Where applicable, the methods for meeting the additional waste analysis
 33 requirements for specific waste management methods, as specified in
 34 [WAC 173-303-140\(4\)](#), [173-303-395\(1\)](#), [173-303-630](#) through [173-303-695](#).
- 35 **III.10.C.3.e.x** For waste transferred from other permitted TSDs, the procedures for confirming that
 36 each dangerous waste received matches the identity of the waste specified on the
 37 accompanying waste profile documentation. This includes the procedure for
 38 identifying each waste movement at the facility.
- 39 **III.10.C.4 Recordkeeping**
- 40 **III.10.C.4.a** The unit specific portion of the Hanford Facility Operating Record will include the
 41 documentation specified in Permit Attachment 6, Permit Condition II.I, (applicable to the
 42 WTP Unit), and other documentation specified in Operating Unit Group 10. Permit
 43 Attachment 6 provides a list of required records, and the methods of submittal for the
 44 facility and each unit group.

- 1 **III.10.C.5 Procedure to Prevent Hazards**
- 2 **III.10.C.5.a** The Permittees will design, construct, and operate the WTP Unit in compliance with
3 Operating Unit Group 10, Chapter 6, Section 6.1.
- 4 **III.10.C.5.b** The WTP Unit fire protection systems will be constructed to the applicable codes listed in
5 Operating Unit Group 10, Chapter 6, Section 6.3.1.4. Prior to the initial receipt of
6 dangerous and/or mixed waste in the WTP Unit, the Permittees will update Operating
7 Unit Group 10, Chapter 6, Sections 6.3, 6.4, and 6.5 to be consistent with design details,
8 and resubmit for approval as a permit modification pursuant to Permit Conditions
9 III.10.C.2.e and III.10.C.2.f, and Operating Unit Group 10, Appendix 1.0. In addition to
10 the stand-by diesel generator for the LAW and HLW melters, updated Section 6.4.4 will
11 include descriptions of the essential loads and critical systems supplied with back-up,
12 un-interruptible, and standby power.
- 13 **III.10.C.5.c** The Permittees will inspect the WTP Unit to prevent malfunctions and deterioration,
14 operator errors, and discharges that may cause or lead to the release of dangerous waste
15 constituents to the environment, or a threat to human health. Inspections must be
16 conducted in accordance with the WTP Unit Inspection Plan, Operating Unit Group 10,
17 Chapter 6, Section 6.2, and Chapter 6A. Prior to the receipt of dangerous and/or mixed
18 waste in the WTP Unit, the Permittees will update and resubmit to Ecology for review
19 and approval Chapter 6, Section 6.2 and the Inspection Plan in Chapter 6A as a permit
20 modification pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f, and
21 Compliance Schedule in Operating Unit Group 10, Appendix 1.0. The revised schedule
22 will include, but not be limited to the requirements in [WAC 173-303-320\(2\)](#) and
23 III.10.C.5.c.i through v below.
- 24 **III.10.C.5.c.i** Detailed dangerous and/or mixed waste management unit specific and general
25 inspection schedules and description of procedures pursuant to [WAC 173-303-](#)
26 [395\(1\)\(d\)](#), [173-303-630\(6\)](#), [173-303-640\(4\)\(a\)\(i\)](#) and (6), [173-303-670\(7\)\(b\)](#) in
27 accordance with [173-303-680\(3\)](#), and [173-303-695](#). The inspection schedule will be
28 presented in the form of a table that includes a description of the inspection
29 requirements, inspection frequency, and types of problems to look for during the
30 inspections.
- 31 **III.10.C.5.c.ii** The proposed locations (scaled drawing with layout) and capabilities of camera(s)
32 (i.e., zoom angles, field of view, etc.) to be used for remote inspections.
- 33 **III.10.C.5.c.iii** Schedule and program description for performing integrity assessments as specified
34 in Permit Conditions III.10.E.9.e.i, III.10.G.10.e.i, III.10.H.5.e.i, III.10.I.1.a.v,
35 III.10.J.5.e.i, and III.10.K.1.a.v.
- 36 **III.10.C.5.c.iv** Inspection schedules for leak detection system and control instrumentation to include,
37 but not limited to, valves pressure devices, flow devices, measuring devices, as
38 specified in Permit Conditions III.10.E.9.e.xi, III.10.F.3.c, and III.10.G.10.e.xii, and
39 Permit Conditions III.10.H.5.f.xvi, and III.10.J.5.f.xvi.
- 40 **III.10.C.5.c.v** Inspection schedule will include inspections for all dangerous and/or mixed waste
41 management units specified in Permit Sections III.10.D, E, F, G, H, I, J, and K.
- 42 **III.10.C.5.d** The Permittees will equip the WTP Unit with the equipment specified in Operating Unit
43 Group 10, Chapter 6, as required by Permit Condition II.B.1.
- 44 **III.10.C.5.e** The Permittees will test and maintain the equipment specified in Operating Unit
45 Group 10, Chapter 6 and Chapter 6A, as necessary, to assure proper operation in the
46 event of emergency.

- 1 **III.10.C.5.f** The Permittees will maintain access to communications or alarms as provided in the
2 Contingency Plan, Operating Unit Group 10, Chapter 7 and Permit Condition II.B.2.
- 3 **III.10.C.6 Contingency Plan**
- 4 **III.10.C.6.a** The Permittees will immediately carry out applicable provisions of Permit Condition
5 II.A.1 and the Contingency Plan, Operating Unit Group 10, Chapter 7 whenever there is a
6 release of dangerous and/or mixed waste or dangerous waste constituents, or other
7 emergency circumstance, any of which threatens human health or the environment.
- 8 **III.10.C.6.b** Prior to the initial receipt of dangerous and/or mixed waste in the WTP Unit, the
9 Permittees will update the Contingency Plan, Operating Unit Group 10, Chapter 7, to be
10 consistent with design details and [WAC 173-303-350\(3\)](#), incorporated by reference, and
11 resubmit as a permit modification pursuant to Permit Conditions III.10.C.2.e and
12 III.10.C.2.f, in compliance with [WAC 173-303-350\(5\)\(c\)](#), and Operating Unit Group 10,
13 Appendix 1.0.
- 14 **III.10.C.6.c** After initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
15 will review and amend, if necessary, the applicable portions of the Contingency Plan,
16 Operating Unit Group 10, Chapter 7 in accordance with the provision of [WAC 173-303-
17 350\(5\)](#). Chapter 7 will be amended as a permit modification pursuant to Permit
18 Conditions III.10.C.2.e and III.10.C.2.f.
- 19 **III.10.C.6.d** RESERVED
- 20 **III.10.C.6.e** RESERVED
- 21 **III.10.C.7 Personnel Training**
- 22 **III.10.C.7.a** Prior to the initial receipt of dangerous and/or mixed waste in the WTP Unit, the
23 Permittees will update and resubmit, to Ecology for review and approval, the Training
24 Program description in Operating Unit Group 10, Chapter 8 as a permit modification
25 pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f, and Compliance Schedule in
26 Operating Unit Group 10, Appendix 1.0. The revised Training Program description will
27 include but not be limited to:
- 28 **III.10.C.7.a.i** Detailed unit specific and general Training Program descriptions as required to
29 demonstrate compliance with [WAC 173-303-330](#) and to include:
- 30 **III.10.C.7.a.i.A** Job titles and descriptions for each dangerous waste management position
31 (e.g. waste designator, waste operator, laboratory technician, etc.);
- 32 **III.10.C.7.a.i.B** Outline of the training program updated to discuss initial, refresher, and on-the-
33 job training; correlated to each dangerous waste management position;
- 34 **III.10.C.7.a.i.C** Table 8-1 in Operating Unit Group 10, Chapter 8, updated to include the type and
35 amount of introductory, refresher, and on-the-job training required for each
36 dangerous waste management position [[WAC 173-303-806\(4\)\(a\)\(xii\)](#)].
- 37 **III.10.C.7.a.ii** Sufficient detail to document that the training and qualification program for all
38 categories of personnel whose activities may reasonably be expected to directly affect
39 emissions from the LAW, HLW, and EMF Systems, except control room operators, is
40 appropriately consistent with [40 CFR 63.1206\(c\)\(6\)\(ii\)](#), and for control room
41 operators, is appropriately consistent with [40 CFR 63.1206\(c\)\(6\)\(i\)](#) and
42 [63.1206\(c\)\(6\)\(iii\)](#) through [63.1206\(c\)\(6\)\(vi\)](#) [[WAC 173-303-680\(2\)](#)].

- 1 **III.10.C.7.b** The Permittees will ensure that the LAW, HLW, and EMF Systems are operated and
2 maintained, at all times, by persons who are trained and qualified to perform these and
3 any other duties that may reasonably be expected to directly affect emissions from the
4 LAW, HLW, and EMF Systems [[WAC 173-303-680\(2\)](#)].
- 5 **III.10.C.7.c** The Permittees will conduct personnel training in accordance with the approved
6 description of the WTP Dangerous Waste Training Plan, Operating Unit Group 10,
7 Chapter 8, pursuant to [WAC 173-303-330](#). The Permittees will maintain documents in
8 accordance with Permit Condition II.C.1 and [WAC 173-303-330\(2\)](#) and (3).
- 9 **III.10.C.7.d** RESERVED
- 10 **III.10.C.7.e** The Permittees will submit, under separate cover, the actual detailed WTP Dangerous
11 Waste Training Plan in accordance with the Compliance Schedule in Operating Unit
12 Group 10, Appendix 1.0. The WTP Dangerous Waste Training Plan will be reviewed for
13 compliance with the outline of the training program in Operating Unit Group 10,
14 Chapter 8 and requirements of [WAC 173-303-330](#). The Training Plan will be
15 incorporated into the Administrative Record.
- 16 **III.10.C.8 Closure**
- 17 **III.10.C.8.a** The Permittees must conduct closure of the WTP Unit according to the Closure Plan in
18 Operating Unit Group 10, Chapter 11, and Permit Condition III.10.C.8. The Closure Plan
19 will be modified according to provisions of Permit Condition I.C.3.
- 20 **III.10.C.8.b** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
21 will update and resubmit the Closure Plan, Operating Unit Group 10, Chapter 11 for
22 approval as a permit modification pursuant to Permit Condition III.10.C.2.g, to be
23 consistent with design details and schedule described in Operating Unit Group 10,
24 Appendix 1.0. The updated Closure Plan must be consistent with the closure
25 performance standards specified in [WAC 173-303-610\(2\)\(a\)-\(b\)](#), [WAC 173-340](#) and, in
26 addition for Containment Buildings, consistent with [40 CFR 264.1102\(b\)](#) as referenced
27 by [WAC 173-303-695](#).
- 28 **III.10.C.8.c** The Permittees will submit, for Ecology review and approval, an update to the Closure
29 Plan, Operating Unit Group 10, Chapter 11, including all documentation required by
30 Permit Condition II.D, within one hundred eighty (180) days prior to commencing partial
31 closure, as a permit modification pursuant to Permit Conditions III.10.C.2.e and
32 III.10.C.2.f.
- 33 **III.10.C.8.d** One hundred eighty (180) days prior to commencing final closure of Operating Unit
34 Group 10, the Permittees must submit to Ecology, for review and approval, a revised
35 Closure Plan, including all documentation required by Permit Condition II.D, as a permit
36 modification pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f.
- 37 **III.10.C.8.e** RESERVED
- 38 **III.10.C.8.f** To achieve clean closure, the Permittees will remove dangerous waste, dangerous waste
39 constituents, and dangerous waste residues throughout the closing unit and throughout
40 any areas affected by releases from the closing unit to concentrations that do not exceed
41 numeric cleanup levels determined using residential exposure assumptions according to
42 the Model Toxics Control Act (MTCA) Regulations, [Chapter 173-340 WAC](#) and all
43 structures, equipment, bases, liners, and other materials containing or contaminated with
44 dangerous waste, constituents, or residues have met specific waste removal and
45 decontamination standards approved by Ecology, in accordance with [WAC 173-303-](#)
46 [610\(2\)\(b\)\(i\)-\(ii\)](#).

- 1 **III.10.C.8.g** RESERVED
- 2 **III.10.C.8.h** Documentation supporting the Independent Registered Professional Engineer’s
3 certification of closure must be submitted to Ecology with the closure certification
4 required by [WAC 173-303-610](#)(6). In addition to the items in Operating Unit Group 10,
5 Chapter 11, the documentation must include the following and other information Ecology
6 may request.
- 7 **III.10.C.8.h.i** Sampling procedures that were followed;
- 8 **III.10.C.8.h.ii** Soil and concrete locations that were sampled;
- 9 **III.10.C.8.h.iii** Sample labeling and handling procedures that were followed, including chain of
10 custody procedures;
- 11 **III.10.C.8.h.iv** Description of procedures that were followed to decontaminate concrete or metal to
12 meet the clean closure standards approved by Ecology, in accordance with the closure
13 performance standards of [WAC 173-303-610](#)(2)(a)(ii) and in a manner that minimizes
14 or eliminates post-closure escape of dangerous waste constituents, or to achieve a
15 “clean debris surface” as specified in [40 CFR 268.45](#), Table 1, concrete surfaces, as
16 incorporated by reference in [WAC 173-303-140](#). [[WAC 173-303-610](#)(2)(b)(ii)].
- 17 **III.10.C.8.h.v** Laboratory and field data, including supporting QA/QC summary;
- 18 **III.10.C.8.h.vi** Report that summarizes closure activities;
- 19 **III.10.C.8.h.vii** Copy of all field notes taken by the independent registered professional engineer; and
- 20 **III.10.C.8.h.viii** Copy of all contamination survey results.
- 21 **III.10.C.9 Critical Systems**
- 22 **III.10.C.9.a** The WTP Unit critical systems, as defined in the definition section of Operating Unit 10
23 and are identified in Operating Unit Group 10, Appendix 2.0.
- 24 **III.10.C.9.b** As the design proceeds, Ecology will modify this Permit for reasons described in the
25 [WAC 173-303-830](#)(3) to add additional systems to the Critical Systems in Operating Unit
26 Group 10, Appendix 2.0.
- 27 **III.10.C.9.c** The Permittees will conduct all construction subject to this Permit in accordance with the
28 approved designs, plans, and specifications that are required by this Permit, except as
29 specified in Conditions III.10.C.9.d or III.10.C.9.e. For purposes of Conditions
30 III.10.C.9.d and III.10.C.9.e, the Ecology representative will be an Ecology construction
31 inspector, project manager, or other designated representative of Ecology.
- 32 **III.10.C.9.d** The Permittees will submit a nonconformance report (NCR) or construction deficiency
33 report (CDR) to the Ecology representative (s), as applicable, within seven (7) calendar
34 days of the Permittees becoming aware of incorporation of minor nonconformance or
35 construction deficiency from the approved designs, plans, and specifications into the
36 construction of critical systems, as defined in the Hanford Site-wide Permit definition
37 section. Such minor nonconformance or construction deficiency will be defined, for the
38 purposes of this Permit Condition, as nonconformance or construction deficiency that is
39 necessary to accommodate proper construction and the substitution or the use of
40 equivalent or superior materials or equipment that do not substantially alter the Permit
41 Conditions or reduce the capacity of the facility to protect human health or the
42 environment. Such minor nonconformance or construction deficiency will not be
43 considered a modification of this Permit. If Ecology determines that the nonconformance
44 or construction deficiency is not minor, it will notify the Permittees in writing that a

- 1 permit modification is required for the deviation and whether prior approval is required
2 from Ecology before work proceeds which affect the nonconforming or construction
3 deficiency item.
- 4 **III.10.C.9.e** The Permittees will formally document, with a NCR or CDR, as applicable, incorporation
5 of minor nonconformance or construction deficiency from the approved designs, plans,
6 and specifications into the construction of non-critical systems subject to this Permit.
7 Such minor nonconformance or construction deficiency will not be considered a
8 modification of this Permit. All NCR's and CDR's will be maintained in the WTP Unit
9 Operating Record and will be made available to Ecology upon request or during the
10 course of an inspection. If Ecology determines that the nonconformance or construction
11 deficiency is not minor, it will notify the Permittees in writing that a permit modification
12 is required for the deviation and whether prior approval is required from Ecology before
13 work proceeds which affect the nonconforming or construction deficiency item.
- 14 **III.10.C.9.f** For each Critical System identified in Operating Unit Group 10, Appendix 2.0, the
15 Permittees will submit to Ecology for review and approval, following the schedule in
16 Operating Unit Group 10, Appendix 1.0, the information identified in Permit Conditions
17 III.10.D.10, III.10.E.9, III.10.F.7, III.10.G.10, III.10.H.5, III.10.J.5, and III.10.M.9.
18 Information Ecology determines to incorporate into the Permit will follow the Permit
19 Condition III.10.C.2.g process, unless stated otherwise within the specific permit
20 condition. Information Ecology determines necessary to support design basis will be
21 incorporated into the Administrative Record.
- 22 **III.10.C.9.g** Upon completion of the WTP Unit construction subject to this Permit, the Permittees will
23 produce as-built drawings of the project which incorporate the design and construction
24 modifications resulting from all change documentation as well as modifications made
25 pursuant to Permit Conditions III.10.C.2.e, III.10.C.2.f, and III.10.C.2.g. The Permittees
26 will place the as-built drawings into the operating record within twelve (12) months of
27 completing construction.
- 28 **III.10.C.9.h** The Permittees will formally document changes to approved designs, plans, and
29 specifications with design change documentation [e.g., Design Change Notice (DCN),
30 Field Change Request (FCR), Field Change Notice (FCN), Specification Change Notice
31 (SCN), and Supplier Deviation Disposition Request (SDDR)]. All design change
32 documentation will be maintained in the WTP Unit-specific Operating Record and will be
33 made available to Ecology upon request or during the course of an inspection. For any
34 design change documentation affecting any critical systems, the Permittees will provide
35 copies to Ecology within seven (7) calendar days. Identification of critical systems will
36 be included by the Permittees in each WTP Unit-specific dangerous waste permit
37 application, closure plan, or permit modification, as appropriate. If Ecology determines
38 that the design change is not minor, it will notify the Permittees in writing that a permit
39 modification is required for the design change and whether prior approval is required
40 from Ecology before work affected by the design change may proceed.
- 41 **III.10.C.9.i** Ventilation system duct work is not required to be doubly contained within the WTP Unit.
42 However, upon discovery of accumulation of liquids within the duct work, a compliance
43 plan will be submitted within sixty (60) days of discovery to correct the problem.
- 44 **III.10.C.10 Equivalent Materials**
- 45 **III.10.C.10.a** If certain equipment, materials, and administrative information (such as names, phone
46 numbers, addresses, formatting) are specified in this Permit, the Permittees may use
47 equivalent or superior substitutes. Use of such equivalent or superior items within the

limits (e.g., ranges, tolerances, and alternatives) already clearly specified in sufficient detail in Operating Unit Group 10, are not considered a Permit modification. However, the Permittees must place documentation of the substitution, accompanied by a narrative explanation and the date the substitution became effective in the operating record within seven (7) days of putting the substitution into effect, and submit documentation of the substitution to Ecology, for approval. Upon review of the documentation of the substitution, if deemed necessary, Ecology may require the Permittees to submit a permit modification in accordance with Permit Conditions III.10.C.2.e and III.10.C.2.f.

III.10.C.10.b If Ecology determines that a substitution was not equivalent to the original, they will notify the Permittees that the Permittees' claim of equivalency has been denied, of the reasons for the denial, and that the original material or equipment must be used. If the product substitution is denied, the Permittees will comply with the original approved product specification, find an acceptable substitution, or apply for a permit modification in accordance with Permit Conditions III.10.C.2.e and III.10.C.2.f.

III.10.C.11 Risk Assessment

III.10.C.11.a The Permittees will submit a permit modification pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f, in accordance with Operating Unit Group 10, Appendix 1.0, to Ecology to incorporate revisions to the Environmental Risk Assessment Work Plan, Appendix 6.1. The revised document will be submitted for incorporation into Appendix 6.2 as the Final Risk Assessment Workplan. The Permittee will make revisions in consultation with Ecology to address the comments documented in Operating Unit Group 10, Appendix 6.1 and updated to address the following:

III.10.C.11.a.i EPA guidance for performance of Human Health and Ecological Risk Assessments for Hazardous Waste Combustion Facilities current at the time of the submittal, assuming both residential and non-residential use scenarios;

III.10.C.11.a.ii Toxicity data current at the time of the submittal;

III.10.C.11.a.iii Compounds newly identified or updated emissions data from current waste characterization and emission testing;

III.10.C.11.a.iv Air modeling updated to include stack gas parameters based on most current emissions testing and WTP Unit design;

III.10.C.11.a.v Physical/transport properties of constituents, current at the time of the submittal;

III.10.C.11.a.vi Process Description based on most current WTP Unit design;

III.10.C.11.a.vii Emissions data and all supporting calculations based on most current WTP Unit; and

III.10.C.11.a.viii Update of receptor locations based on land use or land use zoning changes, if any.

III.10.C.11.b Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees will submit for Ecology review and approval as a permit modification pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f, a Pre-Demonstration Test Risk Assessment Report as Appendix 6.3. The Pre-Demonstration Test Risk Assessment Report will address and include the following:

III.10.C.11.b.i Direct and indirect human health and ecological risk assessments performed pursuant to the Final Risk Assessment Work Plan in Permit Condition III.10.C.11.a.

III.10.C.11.b.ii Submittal of projected stack emissions data for Tables III.10.G.D, III.10.H.E, and III.10.J.E and;

- 1 **III.10.C.11.b.iii** Submittal of the Basis and Assumptions (for incorporation into Appendix 6.3) for
 2 these emissions, including but not limited to, projected operating conditions,
 3 feed-rates, and treatment effectiveness, consistent with information provided and
 4 approved pursuant to Permit Conditions III.10.G.6, III.10.G.10, III.10.H.1,
 5 III.10.H.5, III.10.J.1, and III.10.J.5.
- 6 **III.10.C.11.c** Within ninety (90) days of Ecology approval of the Demonstration Report(s) submitted
 7 pursuant to Permit Condition III.10.H.3.d.i, the Permittees will submit a Final Risk
 8 Assessment Report as Operating Unit Group 10, Appendix 6.4, incorporating the
 9 emission test results from the Demonstration Report(s). The Final Risk Assessment
 10 Report will be prepared in accordance with the Final Risk Assessment Work Plan in
 11 Appendix 6.2, (as approved pursuant to Permit Condition III.10.C.11.a), except the
 12 following updates are hereby incorporated. The Permittees will also submit with this
 13 Final Risk Assessment Report, Permit Tables III.10.G.D and III.10.I.E and Operating
 14 Unit Group 10, Appendix 6.4 (Basis and Assumptions) updated to incorporate the
 15 emissions data from this Final Risk Assessment Report(s), as a permit modification
 16 pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f.
- 17 **III.10.C.11.c.i** Toxicity data current at the time of the submittal;
- 18 **III.10.C.11.c.ii** Compounds newly identified or updated emissions data from current waste
 19 characterization and emission testing;
- 20 **III.10.C.11.c.iii** Air modeling updated to include stack gas parameters based on most current
 21 emissions testing;
- 22 **III.10.C.11.c.iv** Physical/transport properties of constituents current at the time of the submittal;
- 23 **III.10.C.11.c.v** Update of receptor locations based on land use or land use zoning changes, if any;
- 24 **III.10.C.11.c.vi** Process description based on current WTP Unit design;
- 25 **III.10.C.11.c.vii** Emissions data and all supporting calculations based on current WTP Unit; and
- 26 **III.10.C.11.c.viii** Data from final risk assessment report pursuant to Permit Condition III.10.C.11.d, if
 27 available first, or simultaneously.
- 28 **III.10.C.11.d** Within ninety (90) days of Ecology approval of the Demonstration Report(s) submitted
 29 pursuant to Permit Condition III.10.J.3.d.i, the Permittees will submit a Final Risk
 30 Assessment Report as Operating Unit Group 10, Appendix 6.4, incorporating the
 31 emission test results from the Demonstration Report(s). The Final Risk Assessment
 32 Report will be prepared in accordance with the Final Risk Assessment Work Plan in
 33 Appendix 6.2, (as approved by Ecology pursuant to Permit Condition III.10.C.11.a),
 34 except the following updates are hereby incorporated. The Permittees will also submit
 35 with this Final Risk Assessment Report, Permit Tables III.10.G.D and III.10.K.E and
 36 Operating Unit Group 10, Appendix 6.4 (Basis and Assumptions) updated to incorporate
 37 the emissions data from this Final Risk Assessment Report, as a permit modification
 38 pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f.
- 39 **III.10.C.11.d.i** Toxicity data current at the time of the submittal;
- 40 **III.10.C.11.d.ii** Compounds newly identified or updated emissions data from current waste
 41 characterization and emission testing;
- 42 **III.10.C.11.d.iii** Air modeling updated to include stack gas parameters based on most current
 43 emissions testing;
- 44 **III.10.C.11.d.iv** Physical/transport properties of constituents current at the time of the submittal;

- 1 **III.10.C.11.d.v** Update of receptor locations based on land use or land use zoning changes, if any;
- 2 **III.10.C.11.d.vi** Process description based on current WTP Unit design;
- 3 **III.10.C.11.d.vii** Emissions data and all supporting calculations based on current WTP Unit; and
- 4 **III.10.C.11.d.viii** Data from final risk assessment report pursuant to Permit Condition III.10.C.11.c, if
5 available first, or simultaneously.
- 6 **III.10.C.11.e** The Final Risk Assessment Report(s) required by Permit Conditions III.10.C.11.c and
7 III.10.C.11.d may be combined, or provided separately, as appropriate.
- 8 **III.10.C.12 RESERVED**
- 9 **III.10.C.13 Remote Data Access**
- 10 Onsite, unrestricted, twenty-four (24) hour access to key WTP Unit operating data and
11 emissions monitoring data will be provided to Ecology. This onsite, unrestricted access
12 will include providing and maintaining for Ecology only use a computer terminal and
13 printer with access to key WTP Unit operating data bases and emissions monitoring data
14 bases. This terminal will be equipped with all necessary software and hardware to
15 monitor, retrieve, and trend this data. Additional remote access will be provided on
16 Ecology request if security concerns can be addressed.
- 17 **III.10.C.14 Interim Period of Operation during Post Demonstration Test Period prior to
18 receiving Ecology approval of the complete Demonstration Test Reports
19 and the Final Risk Assessment Report**
- 20 **III.10.C.14.a** During this Interim Period of Operation, the Permittees are authorized to treat dangerous
21 waste and mixed waste feed meeting the waste acceptance criteria of the WAP in
22 Chapter 3, subject to the following conditions:
- 23 **III.10.C.14.a.i** RESERVED
- 24 **III.10.C.14.a.ii** Obtain receipt of Ecology's approval for the HLW Vitrification System according to
25 Permit condition III.10.J.3.d.iii, prior to receiving dangerous or mixed waste feed into
26 the HLW Vitrification System
- 27 **III.10.C.14.a.iii** Accept and treat up to 3 million gallons of Hanford tank waste feed in WTP.
- 28 **III.10.C.15 Support Systems**
- 29 **III.10.C.15.a** Mechanical Handling Systems
- 30 **III.10.C.15.a.i** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, in
31 accordance with the Compliance Schedule, as specified in Operating Unit Group 10,
32 Appendix 1.0, engineering information as specified below, for incorporation into
33 Appendices 9.6, 9.10, 10.6, and 10.10, or into the Administrative Record where
34 noted.
- 35 A. System Descriptions for each Mechanical Handling system identified in
36 Permit Table III.10.C.A, for incorporation into the Administrative Record
37 (Compliance Schedule Item 36).
- 38 B. Mechanical Handling Diagrams and Mechanical Handling Data Sheets for the
39 following pieces of equipment (Compliance Schedule Item 37):
- 40 a. HDH-CRN-00005
- 41 b. HEH-CRN-00003
- 42 c. HPH-CRN-00001

- 1 d. HPH-CRN-00002
- 2 e. HSH-CRN-00001
- 3 f. HSH-CRN-00014
- 4 g. LEH-CRN-00003
- 5 h. LPH-CRN-00002
- 6 i. HEH-CRN-00001

7 C. Permit Condition III.10.C.15.a does not require:

- 8 a. Additional submittals beyond those described in Permit Condition
- 9 III.10.C.15.a;
- 10 b. Independent, Qualified, Registered, Professional Engineer (IQRPE)
- 11 reports for equipment identified in III.10.C.15.a.i(B);
- 12 c. Installation inspections for equipment identified in III.10.C.15.a.i(B); and
- 13 d. Other inspection, verification, operability, maintenance, or records
- 14 management beyond that which is specified elsewhere in this permit, for
- 15 equipment identified in III.10.C.15.a.i(B), or by conditions
- 16 III.10.C.15.a.ii and III.10.C.15.a.iii.

17 **III.10.C.15.a.ii** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f,
18 prior to initial receipt of dangerous waste and/or mixed waste in the WTP Unit,
19 engineering information as identified below for incorporation into Appendices 9.13,
20 9.18, 10.13, and 10.18.

- 21 A. Equipment instrument logic narrative description related to safe operation of
- 22 equipment covered by III.10.C.15.a.i(B), including but not limited to
- 23 allowed travel path for bridge and trolley, upper and lower hook travel limits,
- 24 two-blocking prevention, hook load limits, wire rope misreeling, and
- 25 overspeed protection (Compliance Schedule Item 38).
- 26 B. Descriptions of operational procedures demonstrating appropriate controls
- 27 and practices are in place to ensure equipment covered by III.10.C.15.a.i(B)
- 28 will be operated in a safe and reliable manner that will not result in damage
- 29 to regulated tank systems, miscellaneous unit systems, or canisters of
- 30 vitrified waste (Compliance Schedule Item 39).

31 **III.10.C.15.a.iii** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the
32 Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, the
33 following for incorporation into Chapter 4: Updated Narrative Description and
34 figures for all Mechanical Handling Systems identified in Permit Table III.10.C.A, to
35 include but not limited to travel path, fail safe conditions, fail safe logic control,
36 safety features and controls that minimize the potential for release of
37 dangerous/mixed waste during normal operations, and lifting and/or load capabilities
38 of each crane specified in III.10.C.15.a.i(B).

Tables III.10.C.A – Mechanical Handling Systems

Pretreatment Building	
Pretreatment Filter Cave Handling System	PFH
Pretreatment In-Cell Handling System	PIH
Radioactive Solid Waste Handling System	RWH
Low-Activity Waste Building	
Radioactive Solid Waste Handling System	RWH
LAW Melter Equipment Support Handling System	LSH
LAW Container Pour Handling System	LPH
LAW Container Finishing Handling System	LFH
LAW Melter Handling System	LMH
LAW Canister Export Handling System	LEH
High-Level Waste Building	
HLW Melter Cave Support Handling System	HSH
HLW Canister Export Handling System	HEH
HLW Filter Cave Handling System	HFH
HLW Canister Pour Handling System	HPH
HLW Canister Decontamination Handling System	HDH
HLW Melter Handling System	HMH
Radioactive Solid Waste Handling System	RWH

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

III.10.C.16 Secondary Containment Devices

III.10.C.16.a According to [WAC 173-303-640\(4\)\(d\)](#), WTP tank systems and miscellaneous units, regulated as tank systems in accordance with [WAC 173-303-680](#), may utilize secondary containment that include one or more of the following devices;

- A liner (external to the tank);
- A vault installed with chemical resistant water stops at all joints, in compliance with [WAC 173-303-640\(4\)\(e\)\(ii\)\(C\)](#), and an impermeable interior coating or lining that is compatible with the stored waste and will prevent the migration of waste into the concrete, in compliance with [WAC 173-303-640\(4\)\(e\)\(ii\)\(D\)](#);
- A double walled tank;
- An equivalent device approved by the department.

III.10.C.16.a.i Special protective coating systems, as defined in the *Engineering Specification for Field Applied Special Protective Coatings for Secondary Containment Areas* and incorporated into Appendix 7.7, have been approved by Ecology for use as equivalent devices on a case-by-case basis, allowable under [WAC 173-303-640\(4\)\(d\)\(iv\)](#).

III.10.C.16.a.ii The secondary containment areas located in Table III.10.C.B are approved to use special protective coating systems as an equivalent device.

- 1 **III.10.C.16.a.iii** Approved special protective coating systems satisfy containment requirements found
 2 in permit conditions III.10.E.5.h, III.10.G.5.i, III.10.H.1.a.xxii, III.10.I.1.a.xvi, and
 3 III.10.K.1.a.xvi.
- 4 **III.10.C.16.a.iv** Fully welded stainless steel liners or chemical resistant water stops are not required
 5 when an equivalent device is approved for use, with the exception of concrete
 6 secondary containment for regulated tanks located in outdoor areas, which must be
 7 provided with chemical resistant water stops when the approved special protective
 8 coating system is used.
- 9 **III.10.C.16.a.v** Fully welded stainless steel liners are considered a liner external to the tank
 10 (otherwise defined as an external liner system), as described in [WAC 173-303-](#)
 11 [640\(4\)\(d\)\(i\)](#) and are designed and operated in accordance with [WAC 173-303-](#)
 12 [640\(4\)\(e\)\(i\)](#).
- 13 **III.10.C.16.a.vi** Revisions to Table III.10.C.B will be submitted to Ecology for review and approval
 14 pursuant to permit conditions III.10.C.2.e and III.10.C.2.f.
 15

Table III.10.C.B – Secondary Containment Locations Approved for Equivalent Device Use

Row Number	Room Number	Room/Area Description	Building	Elevation (feet)	Additional Requirements
1.	P-0105	Bulge area	PTF	0	Daily visual inspection ^c
2.	P-0105A	Bulge area	PTF	0	Daily visual inspection ^c
3.	P-0105B	Bulge area	PTF	0	Daily visual inspection ^c
4.	P-0105C	Bulge area	PTF	0	Daily visual inspection ^c
5.	P-B005	Fire water collection pit	PTF	-19	Daily visual inspection ^c
6.	P-0304	Waste feed evaporation room	PTF	56	Daily visual inspection ^c
7.	P-0325	Treated LAW evaporation room	PTF	56	Daily visual inspection ^c
8.	P-0320	Ion exchange evaporator	PTF	56	Daily visual inspection ^c
9.	P-0430	CNP evaporator condenser room	PTF	77	Portable, impermeable berm ^a Daily visual inspection ^c
10.	P-0110F	CXP C3/C5 process enclosure	PTF	0	Portable, impermeable berm ^a Continuous leak detection ^b
11.	P-0110H	TLP C3/C5 process enclosure	PTF	0	Portable, impermeable berm ^a Continuous leak detection ^b
12.	P-0116A	TCP C3/C5 process enclosure	PTF	0	Portable, impermeable berm ^a Continuous leak detection ^b

Table III.10.C.B – Secondary Containment Locations Approved for Equivalent Device Use

Row Number	Room Number	Room/Area Description	Building	Elevation (feet)	Additional Requirements
13.	L-0218	Caustic scrubber blow down pump room	LAW	28	Daily visual inspection ^c
14.	L-0304F	Caustic scrubber (LVP-SCB-0001) area	LAW	48	Daily visual inspection ^c
15.	H-B039A	Bogie maintenance/canister rinse room	HLW	-21	Daily visual inspection ^c

Footnotes:

^a Requires the use of a portable, impermeable berm or a similar device at the base of all doors.

^b Requires the use of continuous leak detection, in accordance with Permit Conditions III.10.E.5.b and III.10.G.5.c.

^c Inspections of all secondary containment areas will occur in accordance with the WTP Inspection Schedule, Operating Unit Group 10, Addendum E in this Permit.

- 1
- 2 **III.10.D CONTAINERS**
- 3 **III.10.D.1 Container Storage Areas and Storage Limits**
- 4 **III.10.D.1.a** The Permittees may store dangerous and/or mixed waste meeting the waste acceptance
5 criteria for containerized waste in the WAP, Operating Unit Group 10, Chapter 3,
6 (as approved pursuant to Permit Conditions III.10.C.3 and III.10.C.2), for storage in
7 dangerous and/or mixed waste container storage units identified in Permit Tables
8 III.10.D.A through C.
- 9 **III.10.D.1.b** The Permittees may store containerized dangerous and mixed waste only in container
10 storage areas listed in Permit Tables III.10.D.A (as approved/modified pursuant to Permit
11 Condition III.10.D.10), in accordance with Permit Section III.10.D, and in accordance
12 with Operating Unit Group 10, Chapters 1.0 and 4.0, and Appendices 9.4, 9.5, 9.7, 9.8,
13 9.9, 9.18, 10.4, 10.5, 10.7, 10.8, 10.9, 10.18, 12.4, 12.5, 12.7, 12.8, 12.9, and 12.15, as
14 approved pursuant to Permit Conditions III.10.D.10.b through d. The Permittees will
15 limit the total volume of waste to quantities specified for the individual container storage
16 areas listed in Permit Table III.10.D.A.
- 17 **III.10.D.1.c** The Permittees must maintain a free volume (i.e., free volume = total capacity of
18 containment system minus volume occupied by equipment and containers within
19 containment systems) within containment systems identified in Permit Tables III.10.D.B
20 and III.10.D.C (as approved/modified pursuant to Permit Condition III.10.D.10), equal to
21 ten percent (10%) of the total volume of dangerous and mixed waste stored within the
22 containment system, or the volume of the largest container stored within the containment
23 system, whichever is greater.
- 24 **III.10.D.1.d** The Permittees will maintain documentation in the operating record for each container
25 storage area listed in Permit Table III.10.D.A (as approved/modified pursuant to Permit
26 Condition III.10.D.10), in accordance with [WAC 173-303-380](#).
- 27 **III.10.D.1.e** For the purpose of determining compliance with container storage area capacity limits
28 and containment system requirements, every waste container will be considered to be
29 full.
- 30 **III.10.D.1.f** RESERVED

- 1 **III.10.D.2 Container Storage Areas Design and Construction**
- 2 **III.10.D.2.a** The Permittees will construct container storage areas identified in Permit Tables
3 III.10.D.A through III.10.D.C, as specified in all applicable drawings and specifications
4 in Operating Unit Group 10, Appendices 9.4, 9.5, 9.7, 9.8, 9.9, 10.4, 10.5, 10.7, 10.8,
5 10.9, 12.4, 12.5, 12.7, 12.8, and 12.9, as approved pursuant to Permit Condition
6 III.10.D.10.b.
- 7 **III.10.D.2.b** RESERVED
- 8 **III.10.D.2.c** All container storage areas identified in Permit Tables III.10.D.A through III.10.D.C
9 (as approved/modified pursuant to Permit Condition III.10.D.10), must be constructed to
10 protect containers from contact with accumulated liquids (e.g., leaks, spills, precipitation,
11 fire water, liquids from damaged or broken pipes) [[WAC 173-303-630](#)(7)(a)(i) and
12 [WAC 173-303-630](#)(7)(c)(ii)].
- 13 **III.10.D.2.d** Modifications to approved design, plans, and specifications for the container storage
14 areas identified in Permit Tables III.10.D.A through III.10.D.C must be made in
15 accordance with Permit Conditions III.10.C.2.e, f, and g, or III.10.C.9.d, e, and h.
- 16 **III.10.D.3 Container Storage Area Installation**
- 17 **III.10.D.3.a** RESERVED
- 18 **III.10.D.3.b** The Permittees will obtain and place in the WTP Unit operating record, within thirty (30)
19 days of completion of each container storage area identified in Permit Tables III.10.D.A,
20 through III.10.D.C (as approved/modified pursuant to Permit Condition III.10.D.10),
21 written statements by a qualified installation inspector or a registered professional
22 engineer, attesting that these areas were installed in compliance with [WAC 173-303-](#)
23 [630](#)(7)(a), (b), and (c) [[WAC 173-303-630](#)(7), [WAC 173-303-806](#)(4)(b)(i)].
- 24 **III.10.D.4 Container Management Practices**
- 25 **III.10.D.4.a** RESERVED
- 26 **III.10.D.4.b** The Permittees will manage all waste in container storage areas identified in Permit
27 Tables III.10.D.A through III.10.D.C (as approved/modified pursuant to Permit Condition
28 III.10.D.10), in accordance with procedures described in Operating Unit Group 10,
29 Chapter 4, Appendices 9.18, 10.18, and 12.15, as approved pursuant to Permit Condition
30 III.10.D.10.c, and the following conditions:
- 31 **III.10.D.4.b.i** The operating records and waste tracking procedures will indicate all times at which
32 containerized dangerous and mixed waste were removed from and returned to
33 designated staging, storage, segregation, and treatment areas as approved pursuant to
34 Permit Condition III.10.D.10.c.vi ([WAC 173-303-380](#)).
- 35 **III.10.D.4.b.ii** The physical arrangement (i.e., spacing) of dangerous and mixed waste containers
36 will be as specified in [WAC 173-303-630](#)(5)(c), except for the ILAW containers and
37 IHLW waste canisters, which must be as described in Operating Unit Group 10,
38 Chapter 4, Sections 4E.1.2.1, 4F.1.2.1, as updated pursuant to Permit Condition
39 III.10.D.10.c.i.
- 40 **III.10.D.4.b.iii** All container storage areas must be operated to protect containers from contact with
41 accumulated liquids resulting from leaks, spills, or precipitation [[WAC 173-303-](#)
42 [630](#)(7)(a)(i) and (c)(ii)].

- 1 **III.10.D.4.b.iv** At all times, the Permittees will place and store ignitable and/or reactive dangerous
2 and/or mixed waste in accordance with the procedures described in Operating Unit
3 Group 10, Appendix 8.18, 9.18, 10.18, 11.18, 12.18, and 13.18 as approved pursuant
4 to Permit Condition III.10.D.10.c.xi.
- 5 **III.10.D.4.b.v** At all times, the Permittees will place and store incompatible dangerous and/or mixed
6 waste in accordance with the procedures described in Operating Unit Group 10,
7 Appendix 8.18, 9.18, 10.18, 11.18, 12.18, and 13.18 as approved pursuant to Permit
8 Condition III.10.D.10.c.xii.
- 9 **III.10.D.4.b.vi** At all times, storage containers holding dangerous and/or mixed waste that contain
10 free liquids and/or exhibit either the characteristic of ignitability or reactivity as
11 described in [WAC 173-303-090](#)(5) or (7), must be provided with a containment
12 system in accordance with [WAC 173-303-630](#)(7)(a)(i) through (iii) [[WAC 173-303-](#)
13 [630](#)(7)(c)].
- 14 **III.10.D.4.b.vii** At all times, containers holding dangerous and/or mixed waste in container storage
15 areas must be closed, except when it is necessary to add or remove waste
16 [[WAC 173-303-630](#)(5)(a)].
- 17 **III.10.D.4.b.viii** At all times, containers holding dangerous and/or mixed waste must not be opened,
18 handled, or stored in a manner which may rupture the container or cause it to leak
19 [[WAC 173-303-630](#)(5)(b)].
- 20 **III.10.D.4.b.ix** A storage container holding a dangerous and/or mixed waste that is incompatible, as
21 defined in [WAC 173-303-040](#), with any waste or other materials stored nearby in
22 other containers, piles, open tanks, or surface impoundments must be separated from
23 the other waste or materials or protected from them by means of a dike, berm, or
24 wall. [[WAC 173-303-630](#)(9)(c)].
- 25 **III.10.D.4.b.x** If a container holding dangerous and/or mixed waste is not in good condition
26 (e.g., exhibits severe rusting, apparent structural defects, or any other condition that
27 could lead to container rupture or leakage) or is leaking, the Permittees will manage
28 the container in accordance with procedures described in Operating Unit Group 10,
29 Appendices 8.15, 9.18, 10.18, 11.15, and 12.15, as approved pursuant to Permit
30 Condition III.10.D.10.c.viii [[WAC 173-303-630](#)(2)].
- 31 **III.10.D.4.b.xi** RESERVED
- 32 **III.10.D.4.b.xii** The Permittees will ensure that all containers used for dangerous and/or mixed waste
33 management, are made of or lined with materials which will not react with and are
34 otherwise compatible with the waste to be stored [[WAC 173-303-630](#)(4)].
- 35 **III.10.D.4.b.xiii** Except for lab packs assembled in compliance with [WAC 173-303-161](#) requirements,
36 the Permittees will not place incompatible wastes, or incompatible wastes and
37 materials, in the same container, unless [WAC 173-303-395](#)(1)(b) is complied with
38 [[WAC 173-303-630](#)(9)(a)].
- 39 **III.10.D.4.b.xiv** The Permittees will not place dangerous and/or mixed waste in an unwashed
40 container that previously held an incompatible waste or material [[WAC 173-303-](#)
41 [630](#)(9)(b)].

- 1 **III.10.D.5 Identification of Containers and Container Storage Areas**
- 2 **III.10.D.5.a** Pursuant to [WAC 173-303-630](#)(3), the Permittees will ensure that all dangerous and/or
3 mixed waste containers (except as otherwise specified in Operating Unit Group 10,
4 Chapter 4, Sections 4D.1.3, 4E.1.3, 4F.1.3, 4H.1.3, 4I.1.3, as updated pursuant to Permit
5 Condition III.10.D.10.c.i, for containers of ILAW and IHLW) are labeled in a manner that
6 adequately identifies the major risk(s) associated with the contents. For purposes of
7 container labeling, major risk(s) could include but are not limited to the following:
- 8 **III.10.D.5.a.i** PERSISTENT (if a WP01 or WP02 waste code);
- 9 **III.10.D.5.a.ii** TOXIC (if a WT01, WT02, or D waste code other than D001, D002, or D003);
- 10 **III.10.D.5.a.iii** IGNITABILITY (if a D001 and other waste codes);
- 11 **III.10.D.5.a.iv** CORROSIVE (if a D002 and other waste codes);
- 12 **III.10.D.5.a.v** REACTIVE (if a D003 and other waste codes).
- 13 **III.10.D.5.b** For all dangerous and mixed waste containers (except as otherwise specified in Operating
14 Unit Group 10, Chapter 4, Sections 4D.1.3, 4E.1.3, 4F.1.3, 4H.1.3, 4I.1.3, as updated
15 pursuant to Permit Condition III.10.D.10.c.i, for containers of ILAW and canisters of
16 IHLW), the Permittees will ensure that:
- 17 **III.10.D.5.b.i** Labels are not obscured or otherwise unreadable;
- 18 **III.10.D.5.b.ii** Waste containers are oriented so as to allow inspection of the labels identified in
19 Permit Conditions III.10.D.5.a and III.10.D.5.b, the container tracking number, and,
20 to the extent possible, any labels which the generator placed upon the container; and
- 21 **III.10.D.5.b.iii** Empty dangerous and mixed waste containers, as defined by [WAC 173-303-160](#)(2),
22 must have their dangerous and/or mixed waste labels destroyed or otherwise removed
23 immediately upon being rendered empty.
- 24 **III.10.D.5.c** The Permittees will post entrances and access points to all ILAW containers and IHLW
25 canister storage areas, and any other areas where containers of ILAW and IHLW are
26 handled, with signs that, in addition to meeting the requirements of [WAC 173-303-](#)
27 [310](#)(2)(a), clearly identify the major risk(s) associated with the containers of ILAW and
28 IHLW.
- 29 **III.10.D.6 Containment Systems**
- 30 Containerized dangerous and mixed waste, and other materials that are incompatible, will
31 not be staged, segregated, or stored within the same containment system as identified in
32 Permit Table III.10.D.C, as approved/modified pursuant to Permit Condition III.10.D.10
33 (e.g., metal pan, concrete berm, portable containment system) [[WAC 173-303-630](#)(9)(c)].
- 34 **III.10.D.6.a** The integrity of containment systems identified in Permit Table III.10.D.C
35 (as approved/modified pursuant to Permit Condition III.10.D.10) must be maintained so
36 that cracks, gaps, loss of integrity, deterioration, corrosion, or erosion of containment
37 pads, joints in containment pads, berms, curbs, trenches, sumps, and coatings are repaired
38 in accordance with Operating Unit Group 10, Chapter 6, as approved/modified pursuant
39 to Permit Conditions III.10.D.10.c.vii, III.10.C.5.b, and III.10.C.5.c [[WAC 173-303-320](#),
40 [WAC 173-303-630](#)(7)(a)(i)].
- 41 **III.10.D.6.b** An impermeable coating, as specified in Operating Unit Group 10, Appendices 9.4, 9.5,
42 9.7, 9.8, 9.9, 10.4, 10.5, 10.7, 10.8, 10.9, 12.4, 12.5, 12.7, 12.8, and 12.9 will be
43 maintained for all concrete containment systems and will meet the following performance
44 standards [[WAC 173-303-630](#)(7)(a)]:

- 1 **III.10.D.6.b.i** The coating must seal the containment system surface such that no cracks, seams, or
2 other pathways through which liquid could migrate are present;
- 3 **III.10.D.6.b.ii** The coating must be of adequate thickness and strength to withstand the normal
4 operation of equipment and personnel within the given area such that degradation or
5 physical damage to the coating or lining can be identified and remedied before waste
6 could migrate from the containment system; and
- 7 **III.10.D.6.b.iii** The coating must be compatible with the waste managed in the containment system.
- 8 **III.10.D.6.c** The Permittees must inspect all containment systems specified in Permit Table III.10.D.C
9 in accordance with the inspection schedules and requirements in Operating Unit
10 Group 10, Chapter 6, as approved/modified pursuant to Permit Conditions
11 III.10.D.10.c.vii and III.10.C.5.c, and take the following actions if liquid is detected in
12 these containment systems:
- 13 **III.10.D.6.c.i** Remove the liquid from the containment system in accordance with procedures
14 described in Operating Unit Group 10, Chapter 6, (as modified pursuant to Permit
15 Conditions III.10.C.5.b and III.10.C.5.c), Permit Condition III.10.C.6.a, and
16 Operating Unit Group 10, Chapter 7 (as modified pursuant to Permit Condition
17 III.10.C.6.b and III.10.C.6.c). The liquid removed from containment systems will be
18 managed as dangerous and/or mixed waste, except for liquids from the
19 Non-Radioactive Dangerous Waste Container Storage Area which will be managed as
20 dangerous waste, unless the Permittees demonstrate through designation,
21 (in accordance with [WAC 173-303-070](#), incorporated by reference), that the liquid is
22 no longer dangerous.
- 23 **III.10.D.6.c.ii** Determine the source of the liquid.
- 24 **III.10.D.6.c.iii** If the source of the liquid is determined to be a leak in a container, the Permittees
25 must follow the procedures specified in Permit Condition III.10.D.4.b.x.
- 26 **III.10.D.6.c.iv** The Permittees must take action to ensure the incident that caused liquid to enter the
27 containment system will not reoccur.
- 28 **III.10.D.6.c.v** The Permittees will document in the WTP Unit operating record actions/procedures
29 taken to comply with i through iv above in accordance with [WAC 173-303-630\(6\)](#).
- 30 **III.10.D.6.c.vi** The Permittees will notify and report releases to the environment to Ecology in
31 accordance with Permit Condition III.10.C.6.a.
- 32 **III.10.D.7 Inspections**
- 33 **III.10.D.7.a** The Permittees will inspect the container storage areas in accordance with the Inspection
34 Schedules in Operating Unit Group 10, Chapter 6 of this Permit, as modified pursuant to
35 Permit Condition III.10.C.5.c.
- 36 **III.10.D.7.b** The inspection data for the container storage areas will be recorded, and the records will
37 be placed in the WTP Unit operating record in accordance with Permit Condition
38 III.10.C.4.
- 39 **III.10.D.8 Recordkeeping ([WAC 173-303-380](#))**
- 40 For the container storage areas, the Permittees will record and maintain in the WTP Unit
41 operating record, all monitoring, recording, maintenance, calibration, test data, and
42 inspection data compiled under the conditions of this Permit, in accordance with Permit
43 Condition III.10.C.4 and III.10.C.5.

- 1 **III.10.D.9 Closure**
- 2 The Permittees will close the container storage areas identified in Permit Tables
- 3 III.10.D.A through III.10.D.C in accordance with Operating Unit Group 10, Chapter 11
- 4 of this Permit, as approved pursuant to Permit Condition III.10.C.8.
- 5 **III.10.D.10 Compliance Schedules**
- 6 **III.10.D.10.a** All information identified for submittal to Ecology in III.10.D.10.b through III.10.D.10.d
- 7 of this compliance schedule must be signed in accordance with requirements in
- 8 [WAC 173-303-810](#)(12).
- 9 **III.10.D.10.b** The Permittees will submit to Ecology, consistent with the schedule described in
- 10 Operating Unit Group 10, Appendix 1.0, for review and approval, prior to construction of
- 11 container storage area and associated containment systems as identified in Permit Tables
- 12 III.10.D.A and III.10.D.B respectively, engineering information as specified below, for
- 13 incorporation into Operating Unit Group 10, Appendices 9.4, 9.5, 9.7, 9.8, 9.9, 10.4, 10.5,
- 14 10.7, 10.8, 10.9, 12.4, 12.5, 12.7, 12.8, and 12.9 of this Permit. In order to incorporate
- 15 engineering information specified below into Operating Unit Group 10, Appendices 9.4,
- 16 9.5, 9.7, 9.8, 9.9, 10.4, 10.5, 10.7, 10.8, 10.9, 12.4, 12.5, 12.7, 12.8, and 12.9, Permit
- 17 Condition III.10.C.2.g process will be followed. At a minimum, container storage area
- 18 and containment system drawings and specifications will show the following pursuant to
- 19 [WAC 173-303-806](#)(4)(b):
- 20 **III.10.D.10.b.i** Design drawings (General Arrangement Drawings - in plan) and specifications
- 21 including references to specific building codes (e.g., Uniform Building Code,
- 22 American Society of Civil Engineers) for each container storage areas' foundation
- 23 and associated containment system. These items should show basic design
- 24 parameters and dimensions, and location of the container storage areas and associated
- 25 containment systems; how containment system design promotes positive drainage
- 26 control (such as a locked drainage valve) to prevent release of contaminated liquids
- 27 and so that uncontaminated liquids can be drained promptly for convenience of
- 28 operation; capacity of the containment system relative to the volume of the largest
- 29 container to be stored; how the base underlying the containers is sloped (i.e., floor
- 30 slopes to sumps) or the containment system is otherwise designed and operated to
- 31 drain and remove liquids resulting from leaks, spills, or other liquids, or how
- 32 containers are kept from contact with standing liquids in the containment system
- 33 (i.e., elevated or are otherwise protected); for container storage areas without
- 34 associated containment systems, a description of how the storage area is designed or
- 35 operated to drain and remove liquids or how containers are kept from contact with
- 36 standing liquids;
- 37 **III.10.D.10.b.ii** Containment systems materials selection documentation (including, but not limited to,
- 38 materials of construction, coatings and liner materials for concrete portions of
- 39 containment systems);
- 40 **III.10.D.10.b.iii** Sketches, drawings, or data demonstrating compliance with [WAC 173-303-630](#)(8)
- 41 (location of buffer zone and containers holding ignitable or reactive waste) and
- 42 [WAC 173-303-630](#)(9)(c) (location of incompatible waste), where applicable;
- 43 **III.10.D.10.b.iv** Submit Permit Table III.10.D.B completed to provide for all containment systems,
- 44 the information as specified in each column heading, consistent with information to
- 45 be provided in III.10.D.10.b.i through iii above.

- 1 **III.10.D.10.c** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
 2 will update and submit to Ecology, consistent with the schedule described in Operating
 3 Unit Group 10, Appendix 1.0, for review and approval, the following, as specified below,
 4 for incorporation into Operating Unit Group 10, Chapter 4, and Appendices 9.18, 10.18,
 5 and 12.15, except Permit Condition III.10.D.10.c.vii, which will be incorporated into
 6 Operating Unit Group 10, Chapter 6. In order to incorporate the following information
 7 (specified below) into Operating Unit Group 10, Appendix 9.18, 10.18, and 12.18, Permit
 8 Condition III.10.C.2.g will be followed. All information provided under this permit
 9 condition must be consistent with information provided pursuant to Permit Conditions
 10 III.10.D.10.b, III.10.D.10.c, and III.10.D.10.d as approved by Ecology, and will include
 11 at a minimum, the following information as required pursuant to [WAC 173-303-630](#) and
 12 [WAC 173-303-340](#):
- 13 **III.10.D.10.c.i** Operating Unit Group 10, Chapter 4, Narrative Descriptions, updated;
- 14 **III.10.D.10.c.ii** Descriptions of procedures for addition and removal of waste from containers;
- 15 **III.10.D.10.c.iii** Descriptions of procedures for opening and closing of containers, including any
 16 inspections performed prior to opening;
- 17 **III.10.D.10.c.iv** Descriptions of procedures for handling and transport of containers within the WTP
 18 Unit;
- 19 **III.10.D.10.c.v** Description of the tracking system used to track containers throughout the WTP Unit
 20 pursuant to [WAC 173-303-380](#). The tracking system, at a minimum, will do the
 21 following:
- 22 A. Track the location of containers within the WTP Unit;
- 23 B. Track which containers have been shipped off-facility and/or off-site, and to
 24 where they have been shipped;
- 25 C. For containers intended for transport off-site, include information in
 26 accordance with the requirements specified in [WAC 173-303-190](#)(3)(b);
- 27 D. Record the date container is placed in the container storage area;
- 28 E. Record the nature of the waste in any given container, including dangerous
 29 waste designation codes, any associated LDR treatment requirements, and
 30 the major risk(s) associated with the waste (as described in Permit Conditions
 31 III.10.D.5.a and III.10.D.5.c).
- 32 **III.10.D.10.c.vi** Descriptions of procedures for container spacing, stacking, and labeling pursuant to
 33 [WAC 173-303-630](#)(3), [WAC 173-303-630](#)(5)(c), [WAC 173-303-340](#)(3),
 34 [WAC 173-303-630](#)(6);
- 35 **III.10.D.10.c.vii** Descriptions of procedures for investigating container storage areas and investigating
 36 and repairing containment systems [[WAC 173-303-320](#), [WAC 173-303-630](#)(6)];
- 37 **III.10.D.10.c.viii** Descriptions of procedures for responding to damaged (e.g., severe rusting, apparent
 38 structural defects) or leaking containers [[WAC 173-303-630](#)(2)];
- 39 **III.10.D.10.c.ix** Descriptions of operational procedures demonstrating how accumulated liquids can
 40 be analyzed and removed from containment systems to prevent overflow
 41 [[WAC 173-303-806](#)(4)(b)(i)(E)];
- 42 **III.10.D.10.c.x** For portable containment systems, vendor information, design drawings, or sketches
 43 showing the following information. These items will include as a minimum basic
 44 design parameters, dimensions, and materials of construction; how the design
 45 promotes positive drainage control (such as a locked drainage valve) to prevent

- 1 release of contaminated liquids and so that uncontaminated liquids can be drained
2 promptly for convenience of operation; how the base underlying the containers is
3 sloped (i.e., floor slopes to sumps) or the containment system is otherwise designed
4 and operated to drain and remove liquids resulting from leaks, spills, or other liquids,
5 or how containers are kept from contact with standing liquids in the containment
6 system (i.e., elevated or are otherwise protected); and capacity of the containment
7 system relative to the volume of the largest container to be stored;
- 8 **III.10.D.10.c.xi** Where ignitable and reactive waste are stored or otherwise managed in containers, a
9 description of the procedures used to ensure compliance with [WAC 173-303-](#)
10 [630](#)(8)(a) and (b);
- 11 **III.10.D.10.c.xii** Where incompatible waste are stored or otherwise managed in containers, a
12 description of the procedures used to ensure compliance with [WAC 173-303-](#)
13 [630](#)(9)(a) and (b), and [173-303-395](#)(1)(b) and (c);
- 14 **III.10.D.10.c.xiii** Submit Permit Table III.10.D.C completed to provide for all portable containment
15 systems, the information as specified in each column heading, consistent with
16 information to be provided in III.10.D.10.c.i through xii above;
- 17 **III.10.D.10.c.xiv** Test procedures and results or other documentation or information to show that the
18 waste do not contain free liquids, as applicable.
- 19 **III.10.D.10.d** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
20 will submit to Ecology, consistent with the schedule described in Operating Unit
21 Group 10, Appendix 1.0, for review and approval, completed Permit Tables III.10.D.A,
22 III.10.D.B, and III.10.D.C, for incorporation into Operating Unit Group 10, Chapter 4,
23 and Appendices 8.18, 9.18, and 10.18 of this Permit. In order to incorporate the
24 information into Operating Unit Group 10, Chapter 4, and Appendices 8.18, 9.18, and
25 10.18 of this Permit, Permit Condition III.10.C.2.g process will be followed.
- 26 **III.10.D.10.e** The Permittees will submit to Ecology, consistent with the schedule described in
27 Operating Unit Group 10, Appendix 1.0, for review and submittal to the Administrative
28 Record, a gap analysis that identifies:
- 29 **III.10.D.10.e.i** Changes to projected operating conditions that result from the redesign of PTF and
30 HLW (Interim Compliance Schedule Item WTP-47).
- 31 **III.10.D.10.e.ii** Changes to projected operating conditions that result from DFLAW operations
32 (Interim Compliance Schedule Item WTP-48).

Table III.10.D.A – Container Storage/Containment Building Areas Description

Dangerous and Mixed Waste Container Storage Areas	Maximum Capacity Gallons (Solids)(ft³)^d	Maximum Operating Volume (Liquid)^e
HLW Vitrification Plant		
IHLW Canister Storage Cave ^a (Room H-0132)	163,599 gal. (21,870 ft ³)	NA
HLW East Corridor El. 0' (Rooms HC-0108/09/10)	183,721 gal. (24,560 ft ³)	NA
HLW Loading Area (Room H-0130)	142,204 gal. (19,010 ft ³)	NA
Other Areas		
Non-Radioactive Dangerous Waste Container Storage Area ^b	56,104 gal. (7,500 ft ³)	RESERVED
Failed Melter Storage Facility (Building 32) ^f	403,947 gal. (54,000 ft ³)	RESERVED
Lab Waste Management Area (Rooms A-0139, A-0139A/B/C/D)	139,586 gal. (18,660 ft ³)	RESERVED
Containment Buildings/ Container Storage	Maximum Capacity Gallons (Solids)(ft³)^d	Maximum Operating Volume (Liquid)^e
Pretreatment Plant		
P-0123 Pretreatment Hotcell Containment Building	RESERVED	RESERVED
Pretreatment Maintenance Containment Building	RESERVED	RESERVED
PM0124 Hotcell Crane Maintenance Area	RESERVED	RESERVED
P-0121A Spent Resin Dewatering	RESERVED	RESERVED
P-0421A General Filter Room	RESERVED	RESERVED
P-0122A Waste Packaging Area	RESERVED	RESERVED
P-0123A Remote Decontamination Maintenance Cave	RESERVED	RESERVED
P-0124 C3 Workshop	RESERVED	RESERVED
P-0124A C3 Workshop	RESERVED	RESERVED
P-0125 Filter Cask Airlock	RESERVED	RESERVED
P-0125A Filter Cask Area	RESERVED	RESERVED
P-0128A MSM Repair Area	RESERVED	RESERVED
P-0128 Temporary Storage Room	RESERVED	RESERVED

Table III.10.D.A – Container Storage/Containment Building Areas Description

Dangerous and Mixed Waste Container Storage Areas	Maximum Capacity Gallons (Solids)(ft³)^d	Maximum Operating Volume (Liquid^e)
P-0223 Pretreatment Filter Package Maintenance Containment Building		
P-0335 Pretreatment Filter Cave Room	RESERVED	RESERVED
P-0335A Decon Chamber	RESERVED	RESERVED
P-0431A General Filter Room	RESERVED	RESERVED
LAW Vitrification Plant		
L-0112 LAW LSM Gallery Containment Building	RESERVED	RESERVED
LAW Container Finishing Containment Building	RESERVED	RESERVED
L-0109B Swabbing Area Line 2	RESERVED	RESERVED
L-0109C Decontamination Area Line 2	RESERVED	RESERVED
L-0109D Inert Fill Area Line 2	RESERVED	RESERVED
L-0115B Swabbing Area Line 1	RESERVED	RESERVED
L-0115C Decontamination Area Line 1	RESERVED	RESERVED
L-0115D Inert Fill Area Line 1	RESERVED	RESERVED
L-0109E Container Monitoring/Export Area	RESERVED	RESERVED
L-0115E Container Monitoring/Export Area	RESERVED	RESERVED
L-0119B LAW Consumable Import/Export Containment Building	RESERVED	RESERVED
L-0226A LAW C3 Workshop Containment Building	RESERVED	RESERVED
LAW Pour Cave Containment Building	RESERVED	RESERVED
L-B015A Melter 1 Pour Cave	RESERVED	RESERVED
L-B013C Melter 1 Pour Cave	RESERVED	RESERVED
L-B013B Melter 2 Pour Cave	RESERVED	RESERVED
L-B011C Melter 2 Pour Cave	RESERVED	RESERVED
L-B011B Future Melter 3 Pour Cave	RESERVED	RESERVED
L-B009B Future Melter 3 Pour Cave	RESERVED	RESERVED
LAW Buffer Container Containment Building	RESERVED	RESERVED

Table III.10.D.A – Container Storage/Containment Building Areas Description

Dangerous and Mixed Waste Container Storage Areas	Maximum Capacity Gallons (Solids)(ft³)^d	Maximum Operating Volume (Liquid^e)
L-B025C Container Buffer Store	RESERVED	RESERVED
L-B025D Container Rework	RESERVED	RESERVED
HLW Vitrification Plant		
HLW Melter Cave 1 Containment Building	RESERVED	RESERVED
H-0117 Melter Cave 1		
H-0116B Melter Cave 1 C3/C5 Airlock		
H-0310A Melter Cave 1 Equipment Decon Pit		
HLW Melter Cave 2 Containment Building	RESERVED	RESERVED
H-0106 Melter Cave 2		
H-0105B Melter Cave 2 C3/C5 Airlock		
H-0304A Melter Cave 2 Equipment Decon Pit		
H-0136 IHLW Canister Handling Cave Containment Building	RESERVED	RESERVED
H-0133 IHLW Canister Swab and Monitoring Cave Containment Building	RESERVED	RESERVED
HLW C3 Workshop Containment Building	RESERVED	RESERVED
H-0311A C3 Workshop		
H-0311B C3 MSM Maintenance Workshop		
H-0104 HLW Filter Cave Containment Building	RESERVED	RESERVED
H-B032 HLW Pour Tunnel 1 Containment Building	RESERVED	RESERVED
H-B005A HLW Pour Tunnel 2 Containment Building	RESERVED	RESERVED
HLW Waste Handling Area Containment Building	RESERVED	RESERVED
H-0410B E&I Room		
H0411 Waste Handling Room		
HLW Drum Swabbing and Monitoring Area Containment Building	RESERVED	RESERVED

Table III.10.D.A – Container Storage/Containment Building Areas Description

Dangerous and Mixed Waste Container Storage Areas	Maximum Capacity Gallons (Solids)(ft³)^d	Maximum Operating Volume (Liquid)^e
H-0126A Crane Maintenance Room		
H-0126B Swabbing and Monitoring Area		
H-B028 Cask Transfer Tunnel		

^a Capacity is for immobilized glass waste storage.

^b Capacity is for dangerous and/or mixed waste storage.

^c All material within the containment systems will be considered waste for the purposes of calculating free volume, where free volume is the amount of space available in containment systems (i.e., free volume = total capacity of containment systems [which includes total capacity of portable containment systems] minus volume occupied by equipment and containers within containment systems).

^d Gallons converted to cubic feet using a conversion factor of 1 gallon (liquid) x 0.134 = 1 ft³ (rounded to the nearest whole number).

^e Location and capacities of containers stored within portable containment systems specified on Permit Table III.10.D.C are limited to the dangerous and mixed waste container storage areas and capacities specified above.

^f The dimension for height (H) is based on the height of the largest waste container stored in the area (i.e., LAW container is 7.5 ft., HLW canister is 15 ft., melters are assumed to be 16 ft., and a B-25 box is 5 ft. – stacked a maximum of two high is 10ft).

1

Table III.10.D.B – Container Storage Area Containment Systems

Container Storage Areas	Permanent Containment System Description – Drawing #s	Permanent Containment System Sump/Floor Drain ID #	Permanent Containment System Dimensions^a (ft) & Materials of Construction	Permanent Containment System Capacity (gal) (relative to 10% of the volume of all containers within the container storage area, or 100% of the volume of the largest container, whichever is greater)
Failed Melter Storage Facility (Building 32)	24590-BOF-P1-32-00001	N/A	45' x 75" x 16' ^b	403,947 gal. (54,000 ft ³)

^a Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

^b The dimension for height (H) is based on the height of the largest waste container stored in the area (i.e., LAW container is 7.5 ft., HLW canister is 15 ft., melters are assumed to be 16 ft., and a B-25 box is 5 ft. – stacked a maximum of two high is 10 ft).

2

Table III.10.D.C – Container Storage Area Portable Containment Systems^a

Portable Containment System Description – Specifications and Vendor Information	Portable Containment System Container Storage Area(s) Location(s)	Portable Containment System Dimensions ^b (ft) & Materials of Construction	Portable Containment System Capacity (gal) (relative to 10% of the volume of all containers managed within the portable containment system, or 100% of the volume of the largest container, whichever is greater)
RESERVED	RESERVED	RESERVED	RESERVED

^a Location and capacities of containers stored within portable containment systems specified on this Permit Table are limited to the dangerous and mixed waste container storage areas and capacities specified in Permit Table III.10.D.A.

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

III.10.E TANK SYSTEMS

III.10.E.1 Approved Waste and Storage Limits

III.10.E.1.a The Permittees may store in tank systems all dangerous and/or mixed waste listed in the Part A Forms, Operating Unit Group 10, Chapter 1 of this Permit and in accordance with the WAP, Operating Unit Group 10, Chapter 3 as approved pursuant to Permit Condition III.10.C.3 of this Permit. Total tank system dangerous and/or mixed waste storage at the Facility will not exceed the volume(s) specified in the Part A Form 3 Permit Application, Chapter 1 of this permit.

III.10.E.1.b The Permittees may store and manage dangerous and/or mixed waste only in approved tank systems listed in Permit Tables III.10.E.A through D, I, K, M, O, and R as approved/modified pursuant to Permit Condition III.10.E.9, in accordance with Permit Section III.10.E of this Permit, and in accordance with Operating Unit Group 10, Chapter 1 and 4, and Operating Unit Group 10, Appendices 8.1 through 8.15, 9.1 through 9.14, 9.18, 10.1 through 10.14, 10.18, 11.1 through 11.15, and 13.1 through 13.18 of this Permit, as approved pursuant to Permit Conditions III.10.E.9.b through e. The Permittees will limit the total volume of waste to quantities specified for the individual units listed in Permit Tables III.10.E.A through D, I, K, M, O, and R.

III.10.E.1.c The Permittees will manage ignitable and reactive, and incompatible waste in accordance with [WAC 173-303-395](#)(1). Any tank system specified in Permit Tables III.10.E.A through D and III.10.E, I, K, M, O, and S as approved/modified pursuant to Permit Condition III.10.E.9, in which ignitable, reactive, or incompatible waste are managed will meet the requirements specified in [WAC 173-303-640](#)(9) and (10).

III.10.E.1.d The Permittees will ensure all certifications required by specialists (e.g., independent qualified registered professional engineer; independent corrosion expert; independent qualified installation inspector; etc.) use the following statement or equivalent pursuant to Permit Condition III.10.C.10 of this Permit:

“I, (Insert Name) have (choose one or more of the following: overseen, supervised, reviewed, and/or certified) a portion of the design or installation of a new tank system or component located at (address), and owned/operated by (name(s)). My duties were:

(e.g., installation inspector, testing for tightness, etc.), for the following tank system components (e.g., the tank, venting piping, etc.), as required by the Dangerous Waste Regulations, namely, [WAC 173-303-640\(3\)](#) (applicable paragraphs (i.e., (a) through (g)).

“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.”

III.10.E.1.e In all future permit submittals, the Permittees will include tank names with the tank designation (e.g., Process Condensate Vessels located in the RLD System are designated V45028A and V45028B, respectively).

III.10.E.2 Tank System Design and Construction

III.10.E.2.a The Permittees will construct the tank systems identified in Permit Tables III.10.E.A through D, I, K, M, O, and R as approved/modified pursuant to Permit Condition III.10.E.9, as specified in Operating Unit Group 10, Appendices 8.1 through 8.14, 9.1 through 9.14, 10.1 through 10.14, 11.1 through 11.14, and 13.1 through 13.14 of this Permit, as approved pursuant to Permit Conditions III.10.E.9.b, III.10.E.9.c, and III.10.E.9.d.

III.10.E.2.b The Permittees will construct all secondary containment systems identified in Permit Tables III.10.E.A through D, and I through S, as approved/modified pursuant to Permit Condition III.10.E.9, as specified in Operating Unit Group 10, Appendices 8.2, 8.4 through 8.15, 9.2, 9.4 through 9.14, 9.18, 10.2, 10.4 through 10.14, 10.18, 11.2, 11.4 through 11.14, 11.18, and 13.2, 13.4 through 13.14, and 13.18 of this Permit, as approved pursuant to Permit Conditions III.10.E.9.b, III.10.E.9.c, and III.10.E.9.d.

III.10.E.2.c Modifications to approved design, plans, and specifications in Operating Unit Group 10 of this Permit for the WTP Unit Tank Systems will be allowed only in accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g, III.10.C.9.d, e, and h.

III.10.E.2.d The Permittees will maintain construction access to the internal portions of installed tanks with pulse jet mixers until Ecology has provided written approval of the tank system designs for wear allowance pursuant to [WAC 173-303-640\(3\)\(a\)](#).

III.10.E.2.d.i The Permittees will not install the following tanks in the WTP Unit until Ecology has provided written approval of the tank system designs for wear allowance pursuant to [WAC 173-303-640\(3\)\(a\)](#):

- Plant Wash Vessel, PWD-VSL-00044.
- Acidic Waste Vessel, RLD-VSL-00007.
- Plant Wash and Drains Vessel, RLD-VSL-00008.
- HLW Feed Receipt Vessel, HLP-VSL-00022.
- HLW Lag Storage Vessels, HLP-VSL-00027A and HLP-VSL-00027B.
- HLW Feed Blend Vessel, HLP-VSL-00028.
- Ultrafiltration Feed Preparation Vessels, UFP-VSL-00001A and UFP-VSL-00001B.
- Ultrafiltration Feed Vessels, UFP-VSL-00002A and UFP-VSL-00002B.

- 1 **III.10.E.2.d.ii** Except where exempted in writing by Ecology on the basis that wear allowance
 2 provisions will not be affected, fabrication and assembly of the following tanks and
 3 their internal components will be suspended until Ecology has provided written
 4 approval of the tank system designs for wear allowance pursuant to [WAC 173-303-](#)
 5 [640\(3\)\(a\)](#).
- 6 • HLW Feed Receipt Vessel, HLP-VSL-00022.
 - 7 • HLW Lag Storage Vessels, HLP-VSL-00027A and HLP-VSL-00027B.
 - 8 • HLW Feed Blend Vessel, HLP-VSL-00028.
 - 9 • Ultrafiltration Feed Vessels, UFP-VSL-00002A and UFP-VSL-00002B.
- 10 **III.10.E.3 Tank System Installation and Certification**
- 11 **III.10.E.3.a** The Permittees must ensure that proper handling procedures are adhered to in order to
 12 prevent damage to the system during installation. Prior to covering, enclosing, or placing
 13 a new tank system or component in use, an independent qualified installation inspector or
 14 an independent qualified registered professional engineer, either of whom is trained and
 15 experienced in the proper installation of tank systems or components, must inspect the
 16 system for the presence of any of the following items:
- 17 **III.10.E.3.a.i** Weld breaks;
 - 18 **III.10.E.3.a.ii** Punctures;
 - 19 **III.10.E.3.a.iii** Scrapes of protective coatings;
 - 20 **III.10.E.3.a.iv** Cracks;
 - 21 **III.10.E.3.a.v** Corrosion;
 - 22 **III.10.E.3.a.vi** Other structural damage or inadequate construction/installation.
- 23 All discrepancies must be remedied before the tank system is covered, enclosed, or
 24 placed in use [[WAC 173-303-640\(3\)\(c\)](#)].
- 25 **III.10.E.3.b** For tank systems or components that are placed underground and that are back-filled, the
 26 Permittees must provide a backfill material that is a non-corrosive, porous, homogeneous
 27 substance. The backfill must be installed so that it is placed completely around the tank
 28 and compacted to ensure that the tank and piping are fully and uniformly supported
 29 [[WAC 173-303-640\(3\)\(d\)](#)].
- 30 **III.10.E.3.c** The Permittees must test for tightness all new tanks and ancillary equipment prior to
 31 these components being covered, enclosed, or placed into use. If a tank system is found
 32 not to be tight, all repairs necessary to remedy the leak(s) in the system must be
 33 performed prior to the tank system being covered, enclosed, or placed in use
 34 [[WAC 173-303-640\(3\)\(e\)](#)].
- 35 **III.10.E.3.d** The Permittees must ensure ancillary equipment is supported and protected against
 36 physical damage and excessive stress due to settlement, vibration, expansion, or
 37 contraction [[WAC 173-303-640\(3\)\(f\)](#)].
- 38 **III.10.E.3.e** The Permittees must provide the type and degree of corrosion protection recommended
 39 by an independent corrosion expert, based on the information provided in Operating Unit
 40 Group 10, Appendices 8.9, 8.11, 9.9, 9.11, 10.9, 10.11, 11.9, 11.11, and 13.11 of this
 41 Permit, as approved pursuant to Permit Conditions III.10.E.9.b.i, III.10.E.9.b.iv,
 42 III.10.E.9.b.v, III.10.E.9.c.i, III.10.E.9.c.iv, III.10.E.9.c.v, III.10.E.9.d.i, III.10.E.9.d.iv,
 43 and III.10.E.9.d.v or other corrosion protection if the Ecology believes other corrosion

1 protection is necessary to ensure the integrity of the tank system during use of the tank
 2 system. The installation of a corrosion protection system that is field fabricated must be
 3 supervised by an independent corrosion expert to ensure proper installation
 4 [[WAC 173-303-640\(3\)\(g\)](#)].

5 **III.10.E.3.f** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
 6 will obtain, and keep on file in the WTP Unit operating record, written statements by
 7 those persons required to certify the design of the tank system and supervise the
 8 installation of the tank system in accordance with the requirements of [WAC 173-303-](#)
 9 [640\(3\)\(b\)](#), (c), (d), (e), (f), and (g), attesting that each tank system and corresponding
 10 containment system listed in Permit Tables III.10.E.A through D and III.10.E.I through S,
 11 as approved/modified pursuant to Permit Condition III.10.E.9, were properly designed
 12 and installed, and that repairs, pursuant to [WAC 173-303-640\(3\)\(c\)](#) and (e) were
 13 performed [[WAC 173-303-640\(3\)\(a\)](#) [WAC 173-303-640\(3\)\(h\)](#)].

14 **III.10.E.3.g** The independent tank system installation inspection and subsequent written statements
 15 will be certified pursuant to Permit Condition III.10.E.1.d, comply with all requirements
 16 of [WAC 173-303-640\(3\)\(h\)](#) and will consider, but not be limited to, the following tank
 17 system installation documentation:

18 **III.10.E.3.g.i** Field installation report with date of installation;

19 **III.10.E.3.g.ii** Approved welding procedures;

20 **III.10.E.3.g.iii** Welder qualifications and certification;

21 **III.10.E.3.g.iv** Hydro-test reports, as applicable, in accordance with the American Society of
 22 Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Division 1,
 23 American Petroleum Institute (API) Standard 620, or Standard 650 as applicable;

24 **III.10.E.3.g.v** Tester credentials;

25 **III.10.E.3.g.vi** Field inspector credentials;

26 **III.10.E.3.g.vii** Field inspector reports;

27 **III.10.E.3.g.viii** Field waiver reports; and

28 **III.10.E.3.g.ix** Non-compliance reports and corrective action (including field waiver reports) and
 29 repair reports.

30 **III.10.E.4 Integrity Assessments**

31 **III.10.E.4.a** The Permittees will ensure periodic integrity assessments are conducted on the WTP Unit
 32 Tank Systems listed in Permit Tables III.10.E.A through D, I, K, M, O, and R as
 33 approved/modified pursuant to Permit Condition III.10.E.9, over the term of this Permit
 34 as specified in [WAC 173-303-640\(3\)\(b\)](#), following the description of the integrity
 35 assessment program and schedule in Operating Unit Group 10, Chapter 6 of this Permit,
 36 as approved pursuant to Permit Conditions III.10.E.9.e.i and III.10.C.5.c. Results of the
 37 integrity assessments will be included in the WTP Unit operating record until ten (10)
 38 years after post-closure, or corrective action is complete and certified, whichever is later.

39 **III.10.E.4.b** The Permittees will address problems detected during the tank integrity assessments
 40 specified in Permit Condition III.10.E.4.a following the integrity assessment program in
 41 Operating Unit Group 10, Chapter 6 of this Permit, as approved pursuant to Permit
 42 Conditions III.10.E.9.e.i and III.10.C.5.c.

- 1 **III.10.E.4.c** The Permittees must immediately and safely remove from service any Tank System or
2 secondary containment system which through an integrity assessment is found to be
3 “unfit for use” as defined in [WAC 173-303-040](#), following Permit Conditions
4 III.10.E.5.i.i through iv, vi, and vii. The affected tank system or secondary containment
5 system must be either repaired or closed in accordance with Permit Condition
6 III.10.E.5.i.v. [[WAC 173-303-640\(7\)\(e\)](#) and (f), [WAC 173-303-640\(8\)](#)].
- 7 **III.10.E.5 Tank Management Practices**
- 8 **III.10.E.5.a** No dangerous and/or mixed waste will be managed in the WTP Unit Tank System unless
9 the operating conditions, specified under Permit Condition III.10.E.5 are complied with.
- 10 **III.10.E.5.b** The Permittees will install and test all process and leak detection system
11 monitoring/instrumentation, as specified in Permit Tables III.10.E.E through H, and S as
12 approved/modified pursuant to Permit Condition III.10.E.9, in accordance with Operating
13 Unit Group 10, Appendices 8.1, 8.2, 8.14, 9.1, 9.2, 9.14, 10.1, 10.2, 10.14, 11.1, 11.2,
14 11.14, and 13.1, 13.2, and 13.14 of this Permit, as approved pursuant to Permit
15 Conditions III.10.E.9.e.ix and III.10.E.9.d.x.
- 16 **III.10.E.5.c** The Permittees will not place dangerous and/or mixed waste, treatment reagents, or other
17 materials in the WTP Unit Tank System if these substances could cause the tank system
18 to rupture, leak, corrode, or otherwise fail [[WAC 173-303-640\(5\)\(a\)](#)].
- 19 **III.10.E.5.d** The Permittees will operate the WTP Unit Tank System to prevent spills and overflows
20 using the description of controls and practices as required under [WAC 173-303-640\(5\)\(b\)](#)
21 described in Permit Condition III.10.C.5, and Operating Unit Group 10, Appendices 8.16,
22 9.18, 10.18, 11.18, and 13.18 of this Permit, as approved pursuant to Permit Condition
23 III.10.E.9.e.iv. [[WAC 173-303-640\(5\)\(b\)](#), [WAC 173-303-806\(4\)\(c\)\(ix\)](#)].
- 24 **III.10.E.5.e** For routinely non-accessible WTP Unit Tank Systems, as specified in Operating Unit
25 Group 10, Chapter 4 of this Permit, as updated pursuant to Permit Condition
26 III.10.E.9.e.vi, the Permittees will mark all routinely non-accessible tank system access
27 points with labels or signs to identify the waste contained in the tanks. The label, or sign,
28 must be legible at a distance of at least fifty (50) feet and must bear a legend that
29 identifies the waste in a manner which adequately warns employees, emergency response
30 personnel, and the public of the major risk(s) associated with the waste being stored or
31 treated in the tank system(s). For the purposes of this Permit condition, “routinely
32 non-accessible” means personnel are unable to enter these areas while waste is being
33 managed in them [[WAC 173-303-640\(5\)\(d\)](#)].
- 34 **III.10.E.5.f** For all tank systems not addressed in Permit Condition III.10.E.5.e, the Permittees will
35 mark all these tank systems holding dangerous and/or mixed waste with labels or signs to
36 identify the waste contained in the tank. The labels, or sign, must be legible at a distance
37 of at least fifty (50) feet, and must bear a legend that identifies the waste in a manner
38 which adequately warns employees, emergency response personnel, and the public of the
39 major risk(s) associated with the waste being stored or treated in the tank system(s)
40 [[WAC 173-303-640\(5\)\(d\)](#)].
- 41 **III.10.E.5.g** The Permittees will ensure that the secondary containment systems for the WTP Unit
42 Tank Systems listed in Permit Tables III.10.E.A through D, I, K, M, O, and R as
43 approved/modified pursuant to Permit Condition III.10.E.9, are free of cracks or gaps to
44 prevent any migration of dangerous and/or mixed waste or accumulated liquid out of the
45 system to the soil, ground water, or surface water at any time that waste is in the tank
46 system. Any indication that a crack or gap may exist in the containment systems will be
47 investigated and repaired in accordance with Operating Unit Group 10, Appendices 8.18,

- 1 9.18, 10.18, 11.18, and 13.18 of this Permit, as approved pursuant to Permit Condition
 2 III.10.E.9.e.v [[WAC 173-303-320](#), [WAC 173-303-640\(4\)\(b\)\(i\)](#), [WAC 173-303-](#)
 3 [640\(4\)\(e\)\(i\)\(C\)](#), [WAC 173-303-640\(6\)](#), and [WAC 173-303-806\(4\)\(c\)\(vii\)](#)].
- 4 **III.10.E.5.h** An impermeable coating, as specified in Operating Unit Group 10, Appendices 8.4, 8.5,
 5 8.7, 8.9, 8.11, 8.12, 9.4, 9.5, 9.7, 9.9, 9.11, 9.12, 10.4, 10.5, 10.7, 10.9, 10.11, 10.12, 11.4,
 6 11.5, 11.7, 11.9, 11.11, 11.12, and 13.4, 13.5, 13.7, 13.9, 13.11 and 13.12 of this Permit,
 7 as approved pursuant to Permit Condition III.10.E.9.b.v, will be maintained for all
 8 concrete containment systems and concrete portions of containment systems for each
 9 WTP Unit Tank System listed in Permit Tables III.10.E.A through D, I through K, M
 10 through O, and R through T as approved/modified pursuant to Permit Condition
 11 III.10.E.9. Concrete containment systems that do not have a liner and have construction
 12 joints, must meet the requirements of [WAC 173-303-640\(4\)\(e\)\(ii\)\(C\)](#) and [-806\(4\)\(c\)\(vii\)](#).
 13 The coating will prevent migration of any dangerous and/or mixed waste into the
 14 concrete. All coatings will meet the following performance standards:
- 15 **III.10.E.5.h.i** The coating must seal the containment surface such that no cracks, seams, or other
 16 avenues through which liquid could migrate are present;
- 17 **III.10.E.5.h.ii** The coating must be of adequate thickness and strength to withstand the normal
 18 operation of equipment and personnel within the given area such that degradation or
 19 physical damage to the coating or lining can be identified and remedied before
 20 dangerous and/or mixed waste could migrate from the system; and
- 21 **III.10.E.5.h.iii** The coating must be compatible with the dangerous and/or mixed waste, treatment
 22 reagents, or other materials managed in the containment system [[WAC 173-303-](#)
 23 [640\(4\)\(e\)\(ii\)\(D\)](#), [WAC 173-303-806\(4\)\(c\)\(vii\)](#)].
- 24 **III.10.E.5.i** The Permittees will inspect all secondary containment systems for WTP Unit Tank
 25 Systems listed in Permit Tables III.10.E.A through D, I through K, M through O, and R
 26 through T as approved/modified pursuant to Permit Condition III.10.E.9, in accordance
 27 with the Inspection Plan specified in Operating Unit Group 10, Chapter 6A of this Permit,
 28 as approved pursuant to Permit Conditions III.10.E.9.e.v and III.10.C.5, and take the
 29 following actions if a leak or spill of dangerous and/or mixed waste is detected in these
 30 containment systems [[WAC 173-303-320](#), [WAC 173-303-640\(5\)\(c\)](#), [WAC 173-303-](#)
 31 [640\(6\)](#), [WAC 173-303-640\(7\)](#), [WAC 173-303-806\(4\)\(a\)\(v\)](#)]:
- 32 **III.10.E.5.i.i** Immediately and safely stop the flow of dangerous and/or mixed waste into the tank
 33 system or secondary containment system, in accordance with procedures based on all
 34 applicable safety analysis documentation;
- 35 **III.10.E.5.i.ii** Determine the source of the dangerous and/or mixed waste;
- 36 **III.10.E.5.i.iii** Remove the waste from the secondary containment area pursuant to [WAC 173-303-](#)
 37 [640\(7\)\(b\)](#). The waste removed from containment areas of WTP Unit Tank Systems
 38 will be managed as dangerous and/or mixed waste;
- 39 **III.10.E.5.i.iv** If the cause of the release was a spill that has not damaged the integrity of the tank
 40 system, the Permittees may return the tank system to service pursuant to
 41 [WAC 173-303-640\(7\)\(e\)\(ii\)](#). In such a case, the Permittees will take action to ensure
 42 the incident that caused liquid to enter the containment systems of these tank systems
 43 will not reoccur [[WAC 173-303-320\(3\)](#)];

- 1 **III.10.E.5.i.v** If the source of the dangerous waste and/or mixed waste is determined to be a leak
 2 from a primary WTP Unit Tank System, or the system is unfit for use as determined
 3 through an integrity assessment or other inspection, the Permittees must comply with
 4 the requirements of [WAC 173-303-640\(7\)](#) and take the following actions
 5 [[WAC 173-303-640\(5\)\(c\)](#)]:
- 6 A. Close the tank system according to procedures in [WAC 173-303-640\(7\)\(e\)\(i\)](#),
 7 and Operating Unit Group 10, Chapter 11 of this Permit, as approved
 8 pursuant to Permit Condition III.10.C.8; or
 - 9 B. Repair and re-certify (in accordance with [WAC 173-303-810\(13\)\(a\)](#) as
 10 modified pursuant to Permit Condition III.10.E.1.d) the tank system in
 11 accordance with Operating Unit Group 10, Appendices 8.18, 9.18, 10.18,
 12 11.18, and 13.18 of this Permit, as approved pursuant to Permit Condition
 13 III.10.E.9.e.v before the tank system is placed back into service
 14 [[WAC 173-303-640\(7\)\(e\)](#) and (f), and [WAC 173-303-806\(4\)\(c\)\(vii\)](#)];
- 15 **III.10.E.5.i.vi** The Permittees will document in the operating record actions/procedures taken to
 16 comply with III.10.E.5.i.i through v above in accordance with [WAC 173-303-](#)
 17 [640\(6\)\(d\)](#);
- 18 **III.10.E.5.i.vii** The Permittees will notify and report releases to the environment to Ecology in
 19 accordance with [WAC 173-303-640\(7\)\(d\)](#).
- 20 **III.10.E.5.j** If liquids (e.g., dangerous and/or mixed waste leaks and spills, precipitation, fire water
 21 liquids from damaged or broken pipes) cannot be removed from the secondary
 22 containment system within twenty-four (24) hours, Ecology will be verbally notified
 23 within twenty-four (24) hours of discovery. The notification will provide the information
 24 in A, B, and C listed below. The Permittees will provide Ecology with a written
 25 demonstration within seven (7) business days, identifying at a minimum [[WAC 173-303-](#)
 26 [640\(4\)\(c\)\(iv\)](#), [WAC 173-303-640\(7\)\(b\)\(ii\)](#), [WAC 173-303-806\(4\)\(c\)\(vii\)](#)]:
- 27 A. Reasons for delayed removal;
 - 28 B. Measures implemented to ensure continued protection of human health and
 29 the environment;
 - 30 C. Current actions being taken to remove liquids from secondary containment.
- 31 **III.10.E.5.k** The Permittees will operate the WTP Unit Tank System in accordance with Operating
 32 Unit Group 10, Chapter 4 as updated pursuant to Permit Condition III.10.E.9.e.vi and
 33 Appendices 8.18, 9.18, 10.18, 11.18, and 13.18 of this Permit, as approved pursuant to
 34 Permit Condition III.10.E.9.e, and the following:
- 35 **III.10.E.5.k.i** The Permittees will operate the WTP Unit Tank System in order to maintain the
 36 systems and process parameters listed in Permit Tables III.10.E.E through H, as
 37 approved/modified pursuant to Permit Condition III.10.E.9, within the operating trips
 38 and operating ranges specified in Permit Tables III.10.E.E through H, and consistent
 39 with assumptions and basis which are reflected in Operating Unit Group 10,
 40 Appendix, 6.3. as approved pursuant to Permit Condition III.10.C.11.b
 41 [[WAC 173-303-815\(2\)\(b\)\(ii\)](#) and [WAC 173-303-640\(5\)\(b\)](#)]. For the purposes of this
 42 permit condition, Operating Unit Group 10, Appendix 6.3 will be superseded by
 43 Appendix 6.4 upon its approval pursuant to either Permit Conditions III.10.C.11.c or
 44 III.10.C.11.d;

- 1 **III.10.E.5.k.ii** The Permittees will calibrate/function test the instruments listed on Permit Tables
2 III.10.E.E through H and S in accordance with Operating Unit Group 10, Appendices
3 8.18, 9.18, 10.18, 11.18, and 13.18 of this Permit, as approved pursuant to Permit
4 Condition III.10.E.9.e.xi.
- 5 **III.10.E.5.l** Tank systems that have the potential for formation and accumulation of hydrogen gases
6 must be operated to maintain hydrogen levels below the lower explosive limit
7 [[WAC 173-303-815](#)(2)(b)(ii)].
- 8 **III.10.E.5.m** For each tank system holding dangerous waste which are acutely or chronically toxic by
9 inhalation, operate the system to prevent escape of vapors, fumes or other emissions into
10 the air [[WAC 173-303-640](#)(5)(e), [WAC 173-303-806](#)(4)(c)(xii)].
- 11 **III.10.E.6 Inspections** [[WAC 173-303-640](#)(6)]
- 12 **III.10.E.6.a** The Permittees will inspect the WTP Unit Tank Systems in accordance with the
13 Inspection Plan in Operating Unit Group 10, Chapter 6A of this Permit, as modified
14 pursuant to Permit Condition III.10.C.5.c.
- 15 **III.10.E.6.b** The inspection data for the WTP Unit Tank Systems will be recorded, and the records
16 will be placed in the WTP Unit operating record, in accordance with Permit Condition
17 III.10.C.4.
- 18 **III.10.E.7 Recordkeeping** ([WAC 173-303-380](#))
- 19 For the WTP Unit Tank Systems, the Permittees will record and maintain in the WTP
20 Unit operating record, all monitoring, calibration, recording, maintenance, test data, and
21 inspection data compiled under the conditions of this Permit, in accordance with Permit
22 Conditions III.10.C.4 and III.10.C.5.
- 23 **III.10.E.8 Closure**
- 24 The Permittees will close the WTP Unit Tank Systems in accordance with Operating Unit
25 Group 10, Chapter 11 of this Permit, as approved pursuant to Permit Condition III.10.C.8.
- 26 **III.10.E.9 Compliance Schedule**
- 27 **III.10.E.9.a** All information identified for submittal to Ecology in b. through e. of this compliance
28 schedule must be signed and certified in accordance with requirements in [WAC 173-303-](#)
29 [810](#)(12), as modified in accordance with Permit Condition III.10.E.1.d [[WAC 173-303-](#)
30 [806](#)(4)].
- 31 **III.10.E.9.b** The Permittees will submit to Ecology, pursuant to Permit Condition [III.10.C.9.f](#), prior to
32 construction of each secondary containment and leak detection system for the WTP Unit
33 Tank System (per level, per WTP Unit building and outside the WTP Unit buildings) as
34 identified in Permit Tables III.10.E.A through D, J, L, N, P, and S engineering
35 information as specified below, for incorporation into Operating Unit Group 10,
36 Appendices 8.4, 8.5, 8.7, 8.8, 8.9, 8.11, 8.12, 9.4, 9.5, 9.7, 9.8, 9.9, 9.11, 9.12, 10.4, 10.5,
37 10.7, 10.8, 10.9, 10.11, 11.4, 11.5, 11.7, 11.8, 11.9, 11.11, and 13.4, 13.5, 13.7, 13.8, 13.9
38 and 13.11 of this Permit. At a minimum, engineering information specified below will
39 show the following as required pursuant to [WAC 173-303-640](#) (the information specified
40 below will include dimensioned engineering drawings and information on sumps and
41 floor drains):
- 42 **III.10.E.9.b.i** IQRPE Reports (specific to foundation, secondary containment, and leak detection
43 system) will include review of design drawings, calculations, and other information
44 on which the certification report is based and will include as applicable, but not
45 limited to, review of such information described below. Information (drawings,

1 specifications, etc.) already included in Operating Unit Group 10, Appendices 8.0
2 through 11.0 of this Permit, may be included in the report by reference and should
3 include drawing and document numbers. IQRPE Reports will be consistent with the
4 information separately provided in Permit Conditions III.10.E.9.b.ii through ix below.
5 The IQRPE Report(s) (specific to foundation, secondary containment and leak
6 detection system) for the LAW and HLW buildings (-21 foot elevation only) will be
7 submitted with the first IQRPE Report for tanks, identified in Permit Condition
8 III.10.E.9.c.i [[WAC 173-303-640\(3\)\(a\)](#), [WAC 173-303-806\(4\)\(c\)\(i\)](#)];

9 **III.10.E.9.b.ii** Design drawings (General Arrangement Drawings in plan) and specifications for the
10 foundation, secondary containment, including, liner installation details, and leak
11 detection methodology [Note: leak detection systems for areas where daily, direct, or
12 remote visual inspection is not feasible, will be continuous in accordance with
13 [WAC 173-303-640\(4\)\(e\)\(iii\)\(C\)](#)]. These items should show the dimensions, volume
14 calculations, and location of the secondary containment system, and should include
15 items such as floor/pipe slopes to sumps, tanks, floor drains [[WAC 173-303-](#)
16 [640\(4\)\(b\)](#) through (f), [WAC 173-303-640\(3\)\(a\)](#), [WAC 173-303-806\(4\)\(c\)\(i\)](#)];

17 **III.10.E.9.b.iii** The Permittees will provide the design criteria (references to codes and standards,
18 load definitions, and load combinations, materials of construction, and
19 analysis/design methodology) and typical design details for the support of the
20 secondary containment system. This information will demonstrate the foundation
21 will be capable of providing support to the secondary containment system, resistance
22 to pressure gradients above and below the system, and capable of preventing failure
23 due to settlement, compression, or uplift [[WAC 173-303-640\(4\)\(c\)\(ii\)](#),
24 [WAC 173-303-806\(4\)\(c\)\(vii\)](#)];

25 **III.10.E.9.b.iv** A description of materials and equipment used to provide corrosion protection for
26 external metal components in contact with soil, including factors affecting the
27 potential for corrosion as required under [WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#)
28 [[WAC 173-303-806\(4\)\(c\)\(v\)](#)];

29 **III.10.E.9.b.v** Secondary containment/foundation and leak detection system materials selection
30 documentation (including, but not limited to, concrete coatings and water stops, and
31 liner materials as applicable) [[WAC 173-303-806\(4\)\(c\)\(i\)](#)];

32 **III.10.E.9.b.vi** Detailed description of how the secondary containment for each tank system will be
33 installed in compliance with [WAC 173-303-640\(3\)\(c\)](#) [[WAC 173-303-806\(4\)\(c\)\(vi\)](#)];

34 **III.10.E.9.b.vii** Submit Permit Tables III.10.E.J, N, and S completed to provide for all secondary
35 containment sumps and floor drains, the information as specified in each column
36 heading, consistent with information to be provided in Permit Conditions
37 III.10.E.9.b.i through vi above;

38 **III.10.E.9.b.viii** Documentation that secondary containment and leak detection systems will not
39 accumulate hydrogen gas levels above the lower explosive limit and in accordance
40 with Appendix 7.15 for incorporation into the Administrative Record [[WAC 173-303-](#)
41 [340](#)].

42 **III.10.E.9.b.ix** A detailed description of how tank system design provides access for conducting
43 future tank integrity assessments [[WAC 173-303-640\(3\)\(b\)](#), [WAC 173-303-](#)
44 [806\(4\)\(c\)\(vi\)](#)];

- 1 **III.10.E.9.c** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
2 installation of each tank as identified in Permit Tables III.10.E.A through D, and I, K, M,
3 O, and R engineering information as specified below, for incorporation into Operating
4 Unit Group 10, Appendices 8.1 through 8.9, 8.11 through 8.14, 9.1 through 9.9, 9.11
5 through 9.14, 10.1 through 10.9, 10.11 through 10.14, 11.1 through 11.9, 11.11 through
6 11.14, 13.1 through 13.9, and 13.11 through 13.14 of this Permit. Tanks will include
7 primary sumps. At a minimum, engineering information specified below will show the
8 following as required pursuant to [WAC 173-303-640](#) (the information specified below
9 will include dimensioned engineering drawings):
- 10 **III.10.E.9.c.i** IQRPE Reports (specific to tanks) will include review of design drawings,
11 calculations, and other information on which the certification report is based and will
12 include as applicable, but not limited to, review of such information described below.
13 Information (drawings, specifications, etc.) already included in Operating Unit Group
14 10, Appendices 8.0 through 13.0 of this Permit, may be included in the report by
15 reference and should include drawing and document numbers. The IQRPE Reports
16 will be consistent with the information separately provided in Permit Conditions
17 III.10.E.9.c.ii through xii below and the IQRPE Report specified in Permit Condition
18 III.10.E.9.b.i [[WAC 173-303-640](#)(3)(a), [WAC 173-303-806](#)(4)(c)(i)];
- 19 **III.10.E.9.c.ii** Design drawings (General Arrangement Drawings in plan, Process Flow Diagrams,
20 Piping and Instrumentation Diagrams [including pressure control systems],
21 Mechanical Drawings) and specifications, and other information, specific to tanks
22 (to show location and physical attributes of each tank) [[WAC 173-303-640](#)(3)(a),
23 [WAC 173-303-806](#)(4)(c)(i) through (iv)];
- 24 **III.10.E.9.c.iii** The Permittees will provide the design criteria (references to codes and standards,
25 load definitions, and load combinations, materials of construction, and
26 analysis/design methodology) and typical design details for the support of the tank(s).
27 Structural support calculations specific to off-specification, non-standard, and field
28 fabricated tanks will be submitted for incorporation into the Administrative Record
29 [[WAC 173-303-640](#)(3)(a), [WAC 173-303-806](#)(4)(c)(i)];
- 30 **III.10.E.9.c.iv** A description of materials and equipment used to provide corrosion protection for
31 external metal components in contact with water, including factors affecting the
32 potential for corrosion as required under [WAC 173-303-640](#)(3)(a)(iii)(B)
33 [[WAC 173-303-806](#)(4)(c)(v)];
- 34 **III.10.E.9.c.v** Tank materials selection documentation (e.g., physical and chemical tolerances)
35 [[WAC 173-303-640](#)(3)(a), [WAC 173-303-806](#)(4)(c)(i)];
- 36 **III.10.E.9.c.vi** Tank vendor information (including, but not limited to required performance
37 warranties, as available), consistent with information submitted under ii. above, will
38 be submitted for incorporation into the Administrative Record [[WAC 173-303-640](#),
39 and [WAC 173-303-806](#)(4)(c)];
- 40 **III.10.E.9.c.vii** System Descriptions related to tanks will be submitted for incorporation into the
41 Administrative Record;
- 42 **III.10.E.9.c.viii** Mass balance for each projected operating condition, including assumptions and
43 formulas used to complete the mass balance, so that they can be independently
44 verified, and will be submitted for incorporation into the Administrative Record;
- 45 **III.10.E.9.c.ix** A detailed description of how the tanks will be installed in compliance with
46 [WAC 173-303-640](#)(3)(c), (d), and (e) [[WAC 173-303-806](#)(4)(c)(vi)];

- 1 **III.10.E.9.c.x** Submit Permit Tables III.10.E.I, K, M, O, and R completed to provide for all primary
2 containment sumps and floor drains, the information as specified in each column
3 heading, consistent with information to be provided in Permit Conditions
4 III.10.E.9.c.i through ix;
- 5 **III.10.E.9.c.xi** Documentation that tanks are designed to prevent the accumulation of hydrogen gas
6 levels above the lower explosive limit for incorporation into the Administrative
7 Record [[WAC 173-303-340](#)];
- 8 **III.10.E.9.c.xii** Documentation that tanks are designed to prevent escape of vapors and emissions of
9 acutely or chronically toxic (upon inhalation) Extremely Hazardous Waste limit and
10 in accordance with Appendix 7.15 for incorporation into the Administrative Record
11 [[WAC 173-303-640](#)(5)(e), [WAC 173-303-806](#)(4)(c)(xii)];
- 12 **III.10.E.9.d** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
13 installation of ancillary equipment for each tank system, as identified in Permit Tables
14 III.10.E.A, through D, I through K, M through O, and R through T not addressed in
15 Permit Condition III.10.E.9.c, engineering information as specified below, for
16 incorporation into Operating Unit Group 10, Appendices 8.1 through 8.9, 8.11 through
17 8.14, 9.1 through 9.9, 9.11 through 9.14, 10.1 through 10.9, 10.11 through 10.14, 11.1
18 through 11.9, 11.11 through 11.14, 13.1 through 13.9, and 13.11 through 13.14 of this
19 Permit. At a minimum, engineering information specified below will show the following
20 as required pursuant to [WAC 173-303-640](#) (the information specified below will include
21 dimensioned engineering drawings):
- 22 **III.10.E.9.d.i** IQRPE Reports (specific to ancillary equipment) will include a review of design
23 drawings, calculations, and other information as applicable, on which the certification
24 report is based. The reports will include, but not be limited to, review of such
25 information described below. Information (drawings, specifications, etc.) already
26 included in Operating Unit Group 10, Appendix 8.0 through 13.0 of this Permit, may
27 be included in the report by reference and should include drawing and document
28 numbers. The IQRPE Reports will be consistent with the information provided
29 separately in Permit Conditions III.10.E.9.d.ii through xiii below and the IQRPE
30 Reports specified in Permit Conditions III.10.E.9.b and III.10.E.9.c [[WAC 173-303-](#)
31 [640](#)(3)(a), [WAC 173-303-806](#)(4)(c)(i)];
- 32 **III.10.E.9.d.ii** Design drawings (Process Flow Diagrams, Piping and Instrumentation Diagrams
33 [including pressure control systems], etc.) specifications (including required
34 performance warranties), and other information specific to ancillary equipment (these
35 drawings should include all equipment such as pipe, valves, fittings, pumps,
36 instruments, etc.) [[WAC 173-303-640](#)(3)(a), [WAC 173-303-806](#)(4)(c)(i), (iii), (iv)];
- 37 **III.10.E.9.d.iii** The Permittees will provide the design criteria (references to codes and standards,
38 load definitions, and load combinations, materials of construction, and
39 analysis/design methodology) and typical design details for the support of the
40 ancillary equipment [[WAC 173-303-640](#)(3)(a), [WAC 173-303-640](#)(3)(f),
41 [WAC 173-303-806](#)(4)(c)(i)];
- 42 **III.10.E.9.d.iv** A description of materials and equipment used to provide corrosion protection for
43 external metal components in contact with soil and water, including factors affecting
44 the potential for corrosion as required under [WAC 173-303-640](#)(3)(a)(iii)(B)
45 [[WAC 173-303-806](#)(4)(c)(v)];
- 46 **III.10.E.9.d.v** Materials selection documentation for ancillary equipment (e.g., physical and
47 chemical tolerances) [[WAC 173-303-640](#)(3)(a), [WAC 173-303-806](#)(4)(c)(i)];

- 1 **III.10.E.9.d.vi** Vendor information, consistent with information submitted under ii above, will be
2 submitted for incorporation into the Administrative Record [[WAC 173-303-640](#), and
3 [WAC 173-303-806\(4\)\(c\)](#)];
- 4 **III.10.E.9.d.vii** Tank, ancillary equipment, and leak detection system instrument control logic
5 narrative description (e.g., descriptions of fail-safe conditions, etc.);
- 6 **III.10.E.9.d.viii** System Descriptions related to ancillary equipment and system descriptions related to
7 leak detection systems, for incorporation into the Administrative Record;
- 8 **III.10.E.9.d.ix** A detailed description of how the ancillary equipment will be installed and tested
9 [[WAC 173-303-640\(3\)\(c\)](#) through (e), [WAC 173-303-640\(4\)\(b\)](#) and (c), and
10 [WAC 173-303-806\(4\)\(c\)\(vi\)](#)];
- 11 **III.10.E.9.d.x** For process monitoring, control, and leak detection system instrumentation for the
12 WTP Unit Tank System as identified in Permit Tables III.10.E.E through H, and R
13 through S, a detailed description of how the process monitoring, control, and leak
14 detection system instrumentation will be installed and tested [[WAC 173-303-](#)
15 [640\(3\)\(c\)](#) through (e), [WAC 173-303-640\(4\)\(b\)](#) and (c), [WAC 173-303-](#)
16 [806\(4\)\(c\)\(vi\)](#)];
- 17 **III.10.E.9.d.xi** Mass balance for projected normal operating condition used in developing the
18 process and instrumentation diagrams, including assumptions and formulas used to
19 complete the mass balance, so that they can be independently verified, for
20 incorporation into the Administrative Record;
- 21 **III.10.E.9.d.xii** Documentation that ancillary equipment is designed to prevent the accumulation of
22 hydrogen gas levels above the lower explosive limit for incorporation into the
23 Administrative Record [[WAC 173-303-340](#)].
- 24 **III.10.E.9.d.xiii** Leak detection system documentation (e.g. vendor information, etc.) consistent with
25 information submitted under Permit Condition III.10.E.9.c.ii and Permit Conditions
26 III.10.E.9.d.ii, vii, viii and x above, will be submitted for incorporation into the
27 Administrative Record.
- 28 **III.10.E.9.e** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
29 will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, the following as
30 specified below for incorporation into Operating Unit Group 10, Appendices 8.18, 9.18,
31 10.18, 11.18, and 13.18 of this Permit, except Permit Condition III.10.E.9.e.v, which will
32 be incorporated into Operating Unit Group 10, Chapter 6 of this Permit. All information
33 provided under this permit condition must be consistent with information provided
34 pursuant to Permit Conditions III.10.E.9.b, c, d, and e, III.10.C.3.e, and III.10.C.11.b, as
35 approved by Ecology.
- 36 **III.10.E.9.e.i** Integrity assessment program and schedule for all WTP Unit tanks will address the
37 conducting of periodic integrity assessments on all WTP Unit tanks over the life of
38 the tank, in accordance with III.10.E.9.b.ix and [WAC 173-303-640\(3\)\(b\)](#), and
39 descriptions of procedures for addressing problems detected during integrity
40 assessments. The schedule must be based on past integrity assessments, age of the
41 tank system, materials of construction, characteristics of the waste, and any other
42 relevant factors [[WAC 173-303-640\(3\)\(b\)](#), [WAC 173-303-806\(4\)\(c\)\(vi\)](#)];

- 1 **III.10.E.9.e.ii** Detailed plans and descriptions, demonstrating the leak detection system is operated
 2 so that it will detect the failure of either the primary or secondary containment
 3 structure or the presence of any release of dangerous and/or mixed waste, or
 4 accumulated liquid in the secondary containment system within twenty-four (24)
 5 hours [[WAC 173-303-640\(4\)\(c\)\(iii\)](#)]. Detection of a leak of at least 0.1 gallons per
 6 hour within twenty-four (24) hours is defined as being able to detect a leak within
 7 twenty-four (24) hours. Any exceptions to this criteria must be approved by Ecology
 8 [[WAC 173-303-640\(4\)\(c\)\(iii\)](#), [WAC 173-303-806\(4\)\(c\)\(vii\)](#)];
- 9 A. Dangerous waste pipe penetrations that require a penetration seal in
 10 accordance with the International Building Code (IBC) and DOE-STD-1066,
 11 DOE Standard for Fire Protection Design Criteria, or to meet ventilation
 12 sealing requirements identified in Table III.10.E.Q, are not required to meet
 13 the 0.1 gallons per hour within twenty-four (24) hours leak detection rate for
 14 those sections of piping that are in contact with approved silicone or
 15 equivalent low-permeability seal material.
 - 16 B. Piping on either side of the penetration seal must meet the requirements of
 17 III.10.E.9.e.ii.
 - 18 C. Revisions (including additions or deletions to Table III.10.E.Q will be
 19 submitted to Ecology for review and approval pursuant to Conditions
 20 III.10.C.2.e and III.10.C.2.f. Addition of penetration seal locations to Table
 21 III.10.E.Q will be approved by Ecology prior to installation of the
 22 penetration seals.

23 **Table III.10.E.Q – Tank System Penetration Seal Locations**

Facility	Room No	Orientation	Discipline	Penetration Sequence No
Reserved	Reserved	Reserved	Reserved	Reserved

- 24
- 25 **III.10.E.9.e.iii** Detailed operational plans and descriptions, demonstrating that spilled or leaked
 26 waste and accumulated liquids can be removed from the secondary containment
 27 system within twenty-four (24) hours [[WAC 173-303-806\(4\)\(c\)\(vii\)](#)];
- 28 **III.10.E.9.e.iv** Descriptions of operational procedures demonstrating appropriate controls and
 29 practices are in place to prevent spills and overflows from tanks or containment
 30 systems in compliance with [WAC 173-303-640\(5\)\(b\)\(i\)](#) through (iii) [[WAC 173-303-](#)
 31 [640\(5\)\(b\)](#), [WAC 173-303-806\(4\)\(c\)\(ix\)](#)];
- 32 **III.10.E.9.e.v** Description of procedures for investigation and repair of tank systems
 33 [[WAC 173-303-320](#), [WAC 173-303-640\(6\)](#), [WAC 173-303-640\(7\)\(e\)](#) and (f),
 34 [WAC 173-303-806\(4\)\(a\)\(v\)](#), [WAC 173-303-806\(4\)\(c\)\(vii\)](#)];
- 35 **III.10.E.9.e.vi** Updated Chapter 4, Narrative Descriptions, Tables and Figures as identified in Permit
 36 Tables III.10.E.A through D (as modified pursuant to Permit Condition
 37 III.10.E.9.e.xii) and updated to identify routinely non-accessible tank systems;
- 38 **III.10.E.9.e.vii** Description of procedures for management of ignitable and reactive, and
 39 incompatible dangerous and/or mixed waste in accordance with [WAC 173-303-](#)
 40 [640\(9\)](#) and (10) [[WAC 173-303-806\(4\)\(c\)\(x\)](#)].

- 1 **III.10.E.9.e.viii** A description of the tracking system used to track dangerous and/or mixed waste
2 throughout the WTP Unit Tank System, pursuant to [WAC 173-303-380](#).
- 3 **III.10.E.9.e.ix** Permit Tables III.10.E.E through H, and R through S, will be completed for WTP
4 Unit Tank System process and leak detection system monitors and instruments
5 (to include but not limited to: instruments and monitors measuring and/or controlling
6 flow, pressure, temperature, density, pH, level, humidity, and emission) to provide the
7 information as specified in each column heading. Process and leak detection system
8 monitors and instruments for critical systems as specified in Operating Unit
9 Group 10, Appendix 2.0 and as updated pursuant to Permit Condition III.10.C.9.b
10 and for operating parameters as required to comply with Permit Condition
11 III.10.C.3.e.iii will be addressed. Process monitors and instruments for non-waste
12 management operations (e.g., utilities, raw chemical storage, non-contact cooling
13 waters, etc.) are excluded from this permit condition.
- 14 **III.10.E.9.e.x** Supporting documentation for operating trips and expected operating range as
15 specified in Permit Tables III.10.E.E through H, and R through S, as approved
16 pursuant to Permit Condition III.10.E.9.e.ix.
- 17 **III.10.E.9.e.xi** Documentation of process and leak detection instruments and monitors (as listed in
18 Permit Tables III.10.E.E through H, and R through S) for the WTP Unit Tank
19 Systems are to include but not be limited to the following:
- 20 A. Procurement specifications.
- 21 B. Location used.
- 22 C. Range, precision, and accuracy.
- 23 D. Detailed descriptions of calibration/functionality test procedures (e.g.,
24 method number [ASTM]) or provide a copy of manufacturer's recommended
25 calibration procedures.
- 26 E. Calibration/functionality test, inspection, and routine maintenance schedules
27 and checklists, including justification for calibration, inspection and
28 maintenance frequencies, criteria for identifying instruments found to be
29 significantly out of calibration, and corrective action to be taken for
30 instruments found to be significantly out of calibration (e.g., increasing
31 frequency of calibration, instrument replacement, etc.).
- 32 F. Equipment instrument control logic narrative description (e.g., descriptions
33 of failsafe conditions, etc.), as identified in Permit Tables III.10.E.E through
34 H, and R through S, not addressed in Permit Condition III.10.E.9.d.
- 35 **III.10.E.9.e.xii** Permit Tables III.10.E.A through D, and R amended as follows:
- 36 A. Under column 1, update and complete list of dangerous and/or mixed waste
37 tank systems, including plant items that comprise each system (listed by item
38 number).
- 39 B. Under column 2, update and complete system designations.
- 40 C. Under column 3, replace the 'reserved' with the Operating Unit Group 10,
41 Appendices 8.0, 9.0, 10.0, and 11.0, subsections specific to tank systems as
42 listed in column 1.
- 43 D. Under column 4, update and complete list of narrative description tables and
44 figures.
- 45 E. Under column 5, update and complete maximum capacity, for each tank.

- 1 **III.10.E.9.e.xiii** Permit Tables III.10.E.I, K, M, O, and S amended as follows:
- 2 A. Under column 1, replace the 'reserved' with the updated and complete list of
- 3 sump numbers and room location.
- 4 B. Under column 2, replace the 'reserved' with the updated and complete
- 5 maximum sump capacities in gallons.
- 6 C. Under column 3, replace the 'reserved' with the updated and complete sump
- 7 dimensions and materials of construction.
- 8 D. Under column 4, replace the 'reserved' with the updated and complete list of
- 9 engineering descriptions (drawing numbers, specifications, etc.).

1
2
3
4
5

This page intentionally left blank.

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>Waste Feed Receipt Process System</u></p> <p>FRP-VSL-00002A (Waste Feed Receipt Vessel)</p> <p>FRP-VSL-00002B (Waste Feed Receipt Vessel)</p> <p>FRP-VSL-00002C (Waste Feed Receipt Vessel)</p> <p>FRP-VSL-00002D (Waste Feed Receipt Vessel)</p>	FRP	<p><u>24590-PTF</u></p> <p>-M2-FRP-P0001</p> <p>-M2-FRP-P0002</p> <p>-M2-FRP-P0003</p> <p>-M2-FRP-P0004</p> <p>-M5-V17T-00003</p> <p>-M6-FRP-00001001</p> <p>-M6-FRP-00001002</p> <p>-M6-FRP-00002001</p> <p>-M6-FRP-00002002</p> <p>-M6-FRP-00003001</p> <p>-M6-FRP-00003002</p> <p>-M6-FRP-00003003</p> <p>-M6-FRP-00003004</p> <p>-M6-FRP-00003005</p> <p>-M6-FRP-00005001</p> <p>-M6-FRP-00005002</p> <p>-M6-FRP-00005003</p> <p>-M6-FRP-00005004</p> <p>-M6-FRP-00005005</p> <p>-M6-FRP-00005006</p> <p>-M6-FRP-00005007</p> <p>-M6-FRP-00005008</p> <p>-M6-FRP-00006001</p> <p>-M6-FRP-00006002</p>	<p>Section 4D.2.1; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2, and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>FRP-VSL-00002A = 472,900</p> <p>FRP-VSL-00002B = 472,900</p> <p>FRP-VSL-00002C = 472,900</p> <p>FRP-VSL-00002D = 472,900</p>

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-FRP-00006003 -M6-FRP-00006004 -M6-FRP-00006005 -M6-FRP-00006006 -M6-FRP-00006007 -M6-FRP-00006008 -M6-FRP-00007001 -M6-FRP-00007002 -M6-FRP-00007003 -M6-FRP-00007004 -M6-FRP-00007005 -M6-FRP-00007006 -M6-FRP-00007007 -M6-FRP-00007008 -M6-FRP-00008001 -M6-FRP-00008002 -M6-FRP-00008003 -M6-FRP-00008004 -M6-FRP-00008005 -M6-FRP-00008006 -M6-FRP-00008007 -M6-FRP-00009001 -M6-FRP-00010001 -M6-FRP-00020001 -M6-FRP-00020002		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-FRP-00020003 -M6-FRP-00020004 -M6-FRP-00020005 -M6-FRP-00020006 -M6-FRP-00020007 -MVD-FRP-00005 -MVD-FRP-00006 -MVD-FRP-00007 -MVD-FRP-00008 -N1D-FRP-00001 -P1-P01T-00001 -P1-P01T-00002 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>Waste Feed Evaporation Process System</u> FEP-VSL-00005 (Waste Feed Evaporator Condensate Vessel) FEP-VSL-00017A (Waste Feed Evaporator Feed Vessel)	FEP	<u>24590-PTF</u> -3PS-MEVV-T0001 -M5-V17T-00004001 -M6-FEP-00001001 -M6-FEP-00001002 -M6-FEP-00001003 -M6-FEP-00001004	Section 4D.2.2; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2, and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	FEP-VSL-00005 = 5,022 FEP-VSL-00017A = 85,496 FEP-VSL-00017B = 85,496

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
FEP-VSL-00017B (Waste Feed Evaporator Feed Vessel)		-M6-FEP-00003001 -M6-FEP-00003002 -M6-FEP-00006001 -M6-FEP-00006002 -M6-FEP-00006003 -M6-FEP-00006004 -M6-FEP-00006005 -M6-FEP-00007001 -M6-FEP-00007002 -M6-FEP-00007003 -M6-FEP-00007004 -M6-FEP-00007005 -M6-FEP-00008001 -M6-FEP-00008002 -MVD-FEP-P0001 -MVD-FEP-P0002 -MVD-FEP-00003 -MV-FEP-P0001 -MV-FEP-P0002 -N1D-FEP-00002 -N1D-FEP-P0003 -P1-P01T-00001 -P1-P01T-P0002 -P1-P01T-00003		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		<u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>Ultrafiltration Process System</u> UFP-VSL-00001A (Ultrafiltration Feed Preparation Vessel) UFP-VSL-00001B (Ultrafiltration Feed Preparation Vessel) UFP-VSL-00002A (Ultrafiltration Feed Vessel) UFP-VSL-00002B (Ultrafiltration Feed Vessel) UFP-VSL-00062A (Ultrafilter Permeate Collection Vessel) UFP-VSL-00062B (Ultrafilter Permeate Collection Vessel) UFP-VSL-00062C (Ultrafilter Permeate Collection Vessel)	UFP	<u>24590-PTF</u> -M5-V17T-00009 -M5-V17T-00011 -M6-UFP-00001001 -M6-UFP-00001002 -M6-UFP-00001003 -M6-UFP-00001004 -M6-UFP-00001005 -M6-UFP-00001006 -M6-UFP-00001007 -M6-UFP-00002001 -M6-UFP-00002002 -M6-UFP-00002003 -M6-UFP-00002004 -M6-UFP-00002005 -M6-UFP-00002006 -M6-UFP-00002007 -M6-UFP-00002008 -M6-UFP-00003001 -M6-UFP-00003002	Section 4D.2.3; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	UFP-VSL-00001A = 75,594 UFP-VSL-00001B = 75,594 UFP-VSL-00002A = 39,629 UFP-VSL-00002B = 40,378 UFP-VSL-00062A = 34,700 UFP-VSL-00062B = 34,700 UFP-VSL-00062C = 34,700 UFP-FILT-00001A = 474 UFP-FILT-00001B = 474 UFP-FILT-00002A = 474

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
UFP-FILT-00001A (Ultrafilter)		-M6-UFP-00003003		UPF-FILT-00002B = 474
UFP-FILT-00001B (Ultrafilter)		-M6-UFP-00003004		UPF-FILT-00003A = 474
UFP-FILT-00002A (Ultrafilter)		-M6-UFP-00003005		UPF-FILT-00003B = 474
UFP-FILT-00002B (Ultrafilter)		-M6-UFP-00003006		UPF-FILT-00004A = 380
UFP-FILT-00003A (Ultrafilter)		-M6-UFP-00003007		UPF-FILT-00004B = 380
UFP-FILT-00003B (Ultrafilter)		-M6-UFP-00003008		UPF-FILT-00005A = 380
UFP-FILT-00004A (Ultrafilter)		-M6-UFP-00004001		UPF-FILT-00005B = 380
UFP-FILT-00004B (Ultrafilter)		-M6-UFP-00004002		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00004003		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00005001		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00005002		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00005003		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00005004		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00005005		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00005006		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00005007		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00006001		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00006002		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00006003		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00006004		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00006005		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00006006		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00006007		
UFP-FILT-00005B (Ultrafilter)		-M6-UFP-00007001		
UFP-FILT-00005A (Ultrafilter)		-M6-UFP-00007002		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-UFP-00007003 -M6-UFP-00007004 -M6-UFP-00007005 -M6-UFP-00007006 -M6-UFP-00007007 -M6-UFP-00009001 -M6-UFP-00009002 -M6-UFP-00009003 -M6-UFP-00009004 -M6-UFP-00009005 -M6-UFP-00009006 -M6-UFP-00010001 -M6-UFP-00010002 -M6-UFP-00010003 -M6-UFP-00010004 -M6-UFP-00010005 -M6-UFP-00010006 -M6-UFP-00010007 -M6-UFP-00011001 -M6-UFP-00011002 -M6-UFP-00011003 -M6-UFP-00011004 -M6-UFP-00011005 -M6-UFP-00015001 -M6-UFP-00015002		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-UFP-00016001 -M6-UFP-00017001 -M6-UFP-00021001 -M6-UFP-00021002 -M6-UFP-00022001 -M6-UFP-00022002 -M6-UFP-00027001 -M6-UFP-00027002 -M6-UFP-00027003 -M6-UFP-00027004 -M6-UFP-00027005 -M6-UFP-00027006 -M6-UFP-00027007 -MLD-UFP-P0007 -MVD-UFP-00001 -MVD-UFP-00014 -MVD-UFP-00015 -MVD-UFP-00002 -MVD-UFP-00005 -MVD-UFP-00006 -MVD-UFP-00007 -MV-UFP-00001001 -MV-UFP-00001002 -MV-UFP-00001003 -MV-UFP-00002001		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-MV-UFP-00002002 -MV-UFP-00002003 -MV-UFP-00003 -MV-UFP-00004 -MV-UFP-P0005 -MV-UFP-P0006 -MV-UFP-P0007 -MV-UFP-00016 -MV-UFP-00017 -MV-UFP-00018 -MV-UFP-00028 -MV-UFP-00029 -MV-UFP-00030 -MV-UFP-00031 -N1D-UFP-P0001 -N1D-UFP-P0002 -N1D-UFP-00003 -N1D-UFP-P0004 -N1D-UFP-P0005 -N1D-UFP-P0008 -N1D-UFP-00009 -P1-P01T-00001 <u>24590-WTP</u> -3PS-G000-T0002		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<p><u>HLW Lag Storage and Feed Blending Process System</u></p> <p>HLP-VSL-00022 (HLW Feed Receipt Vessel)</p> <p>HLP-VSL-00027A (HLW Lag Storage Vessel)</p> <p>HLP-VSL-00027B (HLW Lag Storage Vessel)</p> <p>HLP-VSL-00028 (HLW Feed Blend Vessel)</p>	HLP	<p><u>24590-PTF</u></p> <p>-M5-V17T-00007 -M5-V17T-00008 -M6-HLP-00001001 -M6-HLP-00001002 -M6-HLP-00001003 -M6-HLP-00001004 -M6-HLP-00002001 -M6-HLP-00002002 -M6-HLP-00003001 -M6-HLP-00003002 -M6-HLP-00003003 -M6-HLP-00005001 -M6-HLP-00005002 -M6-HLP-00005003 -M6-HLP-00005004 -M6-HLP-00005005 -M6-HLP-00005006 -M6-HLP-00005007 -M6-HLP-00006001 -M6-HLP-00006002 -M6-HLP-00006003</p>	Section 4D.2.4; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	<p>HLP-VSL-00022 = 268,800</p> <p>HLP-VSL-00027A = 127,260</p> <p>HLP-VSL-00027B = 127,260</p> <p>HLP-VSL-00028 = 142,200</p>

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-HLP-00006004 -M6-HLP-00006005 -M6-HLP-00006006 -M6-HLP-00006007 -M6-HLP-00007001 -M6-HLP-00007002 -M6-HLP-00007003 -M6-HLP-00007004 -M6-HLP-00007005 -M6-HLP-00007006 -M6-HLP-00007007 -M6-HLP-00009001 -M6-HLP-00009002 -M6-HLP-00009003 -M6-HLP-00010001 -M6-HLP-00010002 -M6-HLP-00010003 -M6-HLP-00027001 -M6-HLP-00027002 -M6-HLP-00027003 -M6-HLP-00027004 -M6-HLP-00027005 -M6-HLP-00027006 -M6-HLP-00028004 -M6-HLP-00028005		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-HLP-00028006 -MVD-HLP-00006 -MVD-HLP-00007 -MVD-HLP-00008 -MVD-HLP-00009 -MV-HLP-00003001 -MV-HLP-00004 -MV-HLP-00005 -MV-HLP-00006 -N1D-HLP-00001 -N1D-HLP-P0003 -N1D-HLP-00007 -N1D-HLP-00010 -P1-P01T-00001 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0003		
<u>Cesium Ion Exchange Process System</u> CXP-VSL-00004 (Cesium Ion Exchange Feed)	CXP	<u>24590-PTF</u> -M5-V17T-00012001 -M5-V17T-00012002 -M5-V17T-00013 -M5-V17T-00025 -M6-CXP-00001002	Section 4D.2.5; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	CXP-VSL-00004 = 10,633 CXP-VSL-00026A = 38,000 CXP-VSL-00026B = 38,000

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p>CXP-VSL-00026A (Cesium Ion Exchange Treated LAW Collection Vessel)</p> <p>CXP-VSL-00026B (Cesium Ion Exchange Treated LAW Collection Vessel)</p> <p>CXP-VSL-00026C (Cesium Ion Exchange Treated LAW Collection Vessel)</p> <p>CXP-IXC-00001 (Cesium Ion Exchange Column)</p> <p>CXP-IXC-00002 (Cesium Ion Exchange Column)</p> <p>CXP-IXC-00003 (Cesium Ion Exchange Column)</p> <p>CXP-IXC-00004 (Cesium Ion Exchange Column)</p>		<p>-M6-CXP-00001003</p> <p>-M6-CXP-00001004</p> <p>-M6-CXP-00001006</p> <p>-M6-CXP-00001007</p> <p>-M6-CXP-00002001</p> <p>-M6-CXP-00002002</p> <p>-M6-CXP-00003001</p> <p>-M6-CXP-00003002</p> <p>-M6-CXP-00003003</p> <p>-M6-CXP-00005001</p> <p>-M6-CXP-00005002</p> <p>-M6-CXP-00005003</p> <p>-M6-CXP-00005004</p> <p>-M6-CXP-00007</p> <p>-M6-CXP-000100001</p> <p>-M6-CXP-000100002</p> <p>-M6-CXP-000100003</p> <p>-M6-CXP-000100004</p> <p>-M6-CXP-00011001</p> <p>-M6-CXP-00011002</p> <p>-M6-CXP-00011003</p> <p>-M6-CXP-00011004</p> <p>-M6-CXP-00011005</p> <p>-M6-CXP-00011006</p> <p>-M6-CXP-00011007</p>		<p>CXP-VSL-00026C = 38,000</p> <p>CXP-IXC-00001 = 680</p> <p>CXP-IXC-00002 = 680</p> <p>CXP-IXC-00003 = 680</p> <p>CXP-IXC-00004 = 680</p>

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-CXP-00012001 -M6-CXP-00012002 -M6-CXP-00012003 -M6-CXP-00012004 -M6-CXP-00013 -MV-CXP-P0002 -MV-CXP-P0008 -MV-CXP-P0009 -MV-CXP-P0010 -MVD-CXP-P0015 -MVD-CXP-P0021 -MVD-CXP-P0022 -MVD-CXP-P0023 -N1D-CXP-P0003 -N1D-CXP-P0007 -P1-P01T-00001 -P1-P01T-00002 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>Cesium Nitric Acid Recovery Process System</u></p> <p>CNP-VSL-00001 (Cesium Evaporator Eluant Lute Pot)</p> <p>CNP-VSL-00003 (Eluate Contingency Storage Vessel)</p> <p>CNP-VSL-00004 (Cesium Evaporator Recovered Nitric Acid Vessel)</p>	<p>CNP</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00014</p> <p>-M6-CNP-00001001</p> <p>-M6-CNP-00001002</p> <p>-M6-CNP-00001003</p> <p>-M6-CNP-00002001</p> <p>-M6-CNP-00002002</p> <p>-M6-CNP-00002003</p> <p>-M6-CNP-00003001</p> <p>-M6-CNP-00003002</p> <p>-M6-CNP-00003003</p> <p>-M6-CNP-00003004</p> <p>-M6-CNP-00004</p> <p>-M6-CNP-00005</p> <p>-MV-CNP-P0001</p> <p>-MV-CNP-P0002</p> <p>-MV-CNP-P0005</p> <p>-MVD-CNP-P0003</p> <p>-MVD-CNP-P0007</p> <p>-MVD-CNP-P0010</p> <p>-N1D-CNP-P0006</p> <p>-N1D-CNP-P0009</p> <p>-N1D-CNP-P0011</p> <p>-P1-P01T-00001</p>	<p>Section 4D.2.6; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>CNP-VSL-00001 = 109</p> <p>CNP-VSL-00003 = 21,713</p> <p>CNP-VSL-00004 = 11,115</p>

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>Treated LAW Concentrate Storage Process System</u></p> <p>TCP-VSL-00001 (Treated LAW Concentrate Storage Vessel)</p>	<p>TCP</p>	<p><u>24590-PTF</u> -M5-V17T-00006 -M6-TCP-00001001 -M6-TCP-00001002 -M6-TCP-00001003 -M6-TCP-00002001 -M6-TCP-00002002 -M6-TCP-00002003 -M6-TCP-00002004 -M6-TCP-00002005 -MV-TCP-P0002 -MVD-TCP-P0002 -N1D-TCP-P0001 -P1-P01T-00001</p> <p><u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003</p>	<p>Section 4D.2.12; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>TCP-VSL-00001 = 146,740</p>
<p><u>Treated LAW Evaporation Process System</u></p> <p>TLP-VSL-00002 (Treated LAW Evaporator Condensate Vessel)</p>	<p>TLP</p>	<p><u>24590-PTF</u> -3PS-MEVV-T0001 -M5-V17T-00005 -M6-TLP-00001 -M6-TLP-00002001</p>	<p>Section 4D.2.11; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>TLP-VSL-00002 = 2,227</p> <p>TLP-VSL-00009A = 130,010</p> <p>TLP-VSL-00009B = 130,010</p>

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
TLP-VSL-00009A (LAW SBS Condensate Receipt Vessel) TLP-VSL-00009B (LAW SBS Condensate Receipt Vessel)		-M6-TLP-00002002 -M6-TLP-00002003 -M6-TLP-00002004 -M6-TLP-00003001 -M6-TLP-00003002 -M6-TLP-00003003 -M6-TLP-00003004 -M6-TLP-00005001 -M6-TLP-00005002 -M6-TLP-00005003 -M6-TLP-00005004 -M6-TLP-00005005 -M6-TLP-00006001 -M6-TLP-00006002 -M6-TLP-00006003 -M6-TLP-00006004 -M6-TLP-00006005 -MVD-TLP-P0001 -MVD-TLP-P0002 -MVD-TLP-00004 -MV-TLP-P0001 -MV-TLP-P0002 -N1D-TLP-P0001 -N1D-TLP-P0006 -P1-P01T-00001		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-P1-P01T-00002 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>Spent Resin and Dewatering Process System</u> RDP-VSL-00002A (Spent Resin Slurry Vessel) RDP-VSL-00002B (Spent Resin Slurry Vessel) RDP-VSL-00002C (Spent Resin Slurry Vessel) RDP-VSL-00004 (Spent Resin Dewatering Moisture Separation Vessel)	RDP	<u>24590-PTF</u> -3PS-MWD0-TP003 -M5-V17T-00020 -M6-RDP-00001001 -M6-RDP-00001002 -M6-RDP-00001003 -M6-RDP-00001004 -M6-RDP-00001005 -M6-RDP-00002 -M6-RDP-00006 -MVD-RDP-P0005 -MVD-RDP-P0006 -MVD-RDP-P0007 -MVD-RDP-P0008 -MV-RDP-P0001 -MV-RDP-P0002 -MV-RDP-P0003 -P1-P01T-00001	Section 4D.2.13; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	RDP-VSL-00002A = 15,230 RDP-VSL-00002B = 15,230 RDP-VSL-00002C = 15,230 RDP-VSL-00004 = 101

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		<u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>Pretreatment Plant Radioactive Liquid Waste Disposal System</u> RLD-TK-00006A (Process Condensate Tank) RLD-TK-00006B (Process Condensate Tank) RLD-VSL-00017A (Alkaline Effluent Vessel) RLD-VSL-00017B (Alkaline Effluent Vessel)	RLD	<u>24590-PTF</u> -M5-V17T-00022003 -M5-V17T-00022004 -M6-RLD-00001001 -M6-RLD-00001002 -M6-RLD-00001003 -M6-RLD-00001004 -M6-RLD-00002001 -M6-RLD-00002002 -M6-RLD-00002003 -M6-RLD-00003001 -M6-RLD-00003002 -M6-RLD-00003003 -M6-RLD-00004 -M6-RLD-00005 -M6-RLD-00006 -M6-RLD-00007001 -MVD-RLD-P0005 -MVD-RLD-P0006 -MV-RLD-P0001	Section 4D.2.16; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	RLD-TK-00006A = 343,734 RLD-TK-00006B = 343,734 RLD-VSL-00017A = 34,340 RLD-VSL-00017B = 34,340

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-MV-RLD-P0002 -N1D-RLD-P0002 -P1-P01T-00001 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>Pretreatment Plant Wash and Disposal System</u> PWD-VSL-00015 (Acidic/Alkaline Effluent Vessel) PWD-VSL-00016 (Acidic/Alkaline Effluent Vessel) PWD-VSL-00033 (Ultimate Overflow Vessel) PWD-VSL-00043 (HLW Effluent Transfer Vessel) PWD-VSL-00044 (Plant Wash Vessel)	PWD	<u>24590-PTF</u> -M5-V17T-00022001 -M5-V17T-00022002 -M6-PWD-00001 -M6-PWD-00002001 -M6-PWD-00002002 -M6-PWD-00003001 -M6-PWD-00003002 -M6-PWD-00003003 -M6-PWD-00003004 -M6-PWD-00005 -M6-PWD-00006 -M6-PWD-00007 -M6-PWD-00008 -M6-PWD-00009 -M6-PWD-00010	Section 4D.2.15; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	PWD-VSL-00015 = 119,150 PWD-VSL-00016 = 119,150 PWD-VSL-00033 = 41,650 PWD-VSL-00043 = 41,650 PWD-VSL-00044 = 103,024 PWD-VSL-00046 = 4,982

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
PWD-VSL-00046 (C3 Floor Drain Collection Vessel)		-M6-PWD-00011 -M6-PWD-00012 -M6-PWD-00014 -M6-PWD-P0018 -M6-PWD-P0019 -M6-PWD-00020001 -M6-PWD-00020002 -M6-PWD-00020003 -M6-PWD-00020004 -M6-PWD-00020005 -M6-PWD-00020006 -M6-PWD-00021001 -M6-PWD-00021002 -M6-PWD-00021003 -M6-PWD-00021004 -M6-PWD-00021005 -M6-PWD-00021006 -M6-PWD-00023001 -M6-PWD-00023002 -M6-PWD-00023003 -M6-PWD-00023004 -M6-PWD-00023005 -M6-PWD-00024001 -M6-PWD-00024002 -M6-PWD-00024003		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-PWD-00024004 -M6-PWD-00024005 -M6-PWD-00024006 -M6-PWD-00024007 -M6-PWD-00025001 -M6-PWD-00025002 -M6-PWD-00025003 -M6-PWD-00025004 -M6-PWD-00026 -M6-PWD-00029 -M6-PWD-00033 -M6-PWD-00041 -M6-PWD-00043 -M6-PWD-00044 -M6-PWD-00046 -M6-PWD-00050 -M6-PWD-00051 -M6-PWD-00057 -M6-PWD-00058001 -M6-PWD-00058002 -MVD-PWD-P0001 -MVD-PWD-00002 -MVD-PWD-P0003 -MVD-PWD-P0010 -MVD-PWD-P0011		

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-MVD-PWD-P0012 -MV-PWD-P0001001 -MV-PWD-P0001002 -MV-PWD-P0003001 -MV-PWD-P0003002 -MV-PWD-P0005 -MV-PWD-P0006 -MV-PWD-P0007 -MV-PWD-P0010 -N1D-PWD-P0001 -N1D-PWD-00002 -N1D-PWD-P0003 -N1D-PWD-P0005 -N1D-PWD-P0006 -P1-P01T-00001 -P1-P01T-00006		
<p><u>Pretreatment Vessel Vent Process System</u></p> <p>PVP-VSL-00001 (Vessel Vent HEME Drain Collection Vessel)</p>	PVP	<p><u>24590-PTF</u></p> -M5-V17T-00021001 -M5-V17T-00021002 -M5-V17T-00021004 -M6-PVP-00002 -M6-PVP-00004001 -M6-PVP-00004002 -M6-PVP-00017001 -M6-PVP-00017002	Section 4D.4.2; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	PVP-VSL-00001 = 1,969

Table III.10.E.A – Pretreatment Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	System Designation	Engineering Description (Drawing Nos., Specifications Nos., etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-PVP-00017003 -M6-PVP-00018001 -M6-PVP-00018002 -MVD-PVP-P0001 -MV-PVP-P0002 -N1D-PVP-P0002 -P1-P01T-00001 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>Pretreatment In-Cell Handling System</u> PIH-TK-00001 (Decontamination Soak Tank)	PIH	<u>24590-PTF</u> -M6-PIH-00001001 -M6-PIH-00001002 -P1-P01T-00001 <u>24590-WTP</u> -3PS-HD00-T0001	Section 4.D.2.14; Tables 4D-1 and 4D-3; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	PIH-TK-00001 = 1504

Table III.10.E.B – LAW Vitrification Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>LAW Concentrate Receipt Process System</u></p> <p>LCP-VSL-00001 (LAW Melter 1 Concentrate Receipt Vessel)</p> <p>LCP-VSL-00002 (LAW Melter 2 Concentrate Receipt Vessel)</p>	<p>LCP</p>	<p><u>24590-LAW</u></p> <p>-M5-V17T-00001</p> <p>-M5-V17T-00002</p> <p>-M6-LCP-00001002</p> <p>-M6-LCP-00001003</p> <p>-M6-LCP-00002003</p> <p>-M6-LCP-00002004</p> <p>-MV-LCP-P0001</p> <p>-MV-LCP-P0002</p> <p>-MVD-LCP-P0004</p> <p>-MVD-LCP-P0005</p> <p>-N1D-LCP-P0001</p> <p>-P1-P01T-00002</p>	<p>Section 4E.2.1; Tables 4E-1 and 4E-3; and Figures 4A-1 and 4A-3 of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>LCP-VSL-00001 = 18,130</p> <p>LCP-VSL-00002 = 18,130</p>
<p><u>LAW Melter Feed Process System</u></p> <p>LFP-VSL-00001 (Melter 1 Feed Preparation Vessel)</p> <p>LFP-VSL-00002 (Melter 1 Feed Vessel)</p> <p>LFP-VSL-00003 (Melter 2 Feed Preparation Vessel)</p>	<p>LFP</p>	<p><u>24590-LAW</u></p> <p>-M5-V17T-00001</p> <p>-M5-V17T-00002</p> <p>-M6-LFP-00001001</p> <p>-M6-LFP-00001002</p> <p>-M6-LFP-00001003</p> <p>-M6-LFP-00001004</p> <p>-M6-LFP-00001005</p> <p>-M6-LFP-00001006</p> <p>-M6-LFP-00003001</p> <p>-M6-LFP-00003002</p>	<p>Section 4E.2.1; Tables 4E-1 and 4E-3; and Figures 4A-1 and 4A-3 of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>LFP-VSL-00001 = 9,123</p> <p>LFP-VSL-00002 = 9,123</p> <p>LFP-VSL-00003 = 9,123</p> <p>LFP-VSL-00004 = 9,123</p>

Table III.10.E.B – LAW Vitrification Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
LFP-VSL-00004 (Melter 2 Feed Vessel)		-M6-LFP-00003003 -M6-LFP-00003004 -M6-LFP-00003005 -M6-LFP-00003006 -MV-LFP-P0001 -MV-LFP-P0002 -MV-LFP-P0004 -MV-LFP-P0005 -MVD-LFP-P0007 -MVD-LFP-P0008 -MVD-LFP-P0010 -MVD-LFP-P0011 -P1-P01T-00002 -N1D-LFP-00004 -N1D-LFP-00006		
<u>LAW Secondary Off-gas/Vessel Vent Process System</u> LVP-TK-00001 (LAW Caustic Collection Tank)	LVP	<u>24590-LAW</u> -M5-V17T-00011 -P1-P01T-00004 -MT-LVP-00005001 -MTD-LVP-00001 -N1D-LVP-00002	Section 4E.4.2.2; Tables 4E-1 and 4E-3; and Figures 4A-1 and 4A-3 of Operating Unit Group 10, Chapter 4 of this Permit.	LVP-TK-00001 = 14,232
<u>LAW Primary Off-gas Process System</u>	LOP	<u>24590-LAW</u> -M5-V17T-P0007 -M5-V17T-P0008	Section 4E.4.2.1; Tables 4E-1 and 4E-3; and Figures 4A-1 and 4A-3 of Operating Unit Group 10, Chapter 4 of this Permit.	LOP-VSL-00001 = 9,056

Table III.10.E.B – LAW Vitrification Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
LOP-VSL-00001 (LAW Melter 1 SBS Condensate Vessel) LOP-VSL-00002 (LAW Melter 2 SBS Condensate Vessel)		-M6-LOP-00001002 -M6-LOP-00002002 -MV-LOP-P0001 -MV-LOP-P0002 -MVD-LOP-00004 -MVD-LOP-00005 -N1D-LOP-P0002 -P1-P01T-00002		LOP-VSL-00002 = 9,056
<p><u>LAW Vitrification Plant Radioactive Liquid Waste Disposal System</u></p> RLD-VSL-00003 (Plant Wash Vessel) RLD-VSL-00004 (C3/C5 Drains/Sump Collection Vessel) RLD-VSL-00005 (SBS Condensate Collection Vessel)	RLD	<p><u>24590-LAW</u></p> -M5-V17T-00014 -M6-RLD-00001001 -M6-RLD-00001002 -M6-RLD-00001003 -M6-RLD-00001004 -M6-RLD-00001005 -M6-RLD-00001006 -M6-RLD-00002001 -M6-RLD-00002002 -M6-RLD-00002003 -M6-RLD-00002004 -M6-RLD-00002005 -M6-RLD-00003001 -M6-RLD-00003002 -M6-RLD-00003003	Section 4E.2.3; Tables 4E-1 and 4E-3; and Figures 4A-1 and 4A-3 of Operating Unit Group 10, Chapter 4 of this Permit.	RLD-VSL-00003 = 25,680 RLD-VSL-00004 = 7,675 RLD-VSL-00005 = 25,670

Table III.10.E.B – LAW Vitrification Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-MVD-RLD-00001 -MVD-RLD-00006 -MVD-RLD-00007 -MV-RLD-P0001 -MV-RLD-P0002 -MV-RLD-P0003 -P1-P01T-00001 -P1-P01T-00002 -N1D-RLD-00001 -N1D-RLD-00002 -N1D-RLD-00005		

Table III.10.E.C – HLW Vitrification Plant Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>HLW Concentrate Receipt Process System</u></p> <p>The HCP System has ancillary equipment only</p>	HCP	<p><u>24590-HLW</u> -M5-V17T-P0001 -M6-HCP-00001001 -M6-HCP-00002001</p>	Section 4F.2.1; Tables 4F-4; Figures 4A-1 and 4A-4 of Operating Unit Group 10, Chapter 4 of this Permit.	
<p><u>HLW Melter Feed Process System</u></p> <p>HFP-VSL-00001 (Melter 1 Feed Preparation Vessel)</p>	HFP	<p><u>24590-HLW</u> -3YD-HFP-00001^a -M5-V17T-00001 -P1-P01T-00002 -M6-HFP-00001001 -M6-HFP-00001002 -M6-HFP-00001003 -M6-HFP-00001004 -M6-HFP-00007001</p> <p><u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003</p>	Section 4F.2.1; Tables 4F-4; Figures 4A-1, 4A-4 and 4A-53 of Operating Unit Group 10, Chapter 4 of this Permit.	HFP-VSL-00001 = 8,311
<p><u>Melter Feed Process System cont.</u></p> <p>HFP-VSL-00002 (Melter 1 Feed Vessel)</p>	HFP	<p><u>24590-HLW</u> -3YD-HFP-00001^a -M5-V17T-P0001 -P1-P01T-00002 -M6-HFP-00002001</p>	Section 4F.2.1; Tables 4F-1 and 4F-3; Figures 4A-1, 4A-4 and 4A-53 of Operating Unit Group 10, Chapter 4 of this Permit.	HFP-VSL-00002 = 8,311

Table III.10.E.C – HLW Vitrification Plant Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-M6-HFP-00002002 -M6-HFP-00002003 -M6-HFP-00008001 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>Melter Feed Process System cont.</u> HFP-VSL-00005 (Melter 2 Feed Preparation Vessel)	HFP	<u>24590-HLW</u> -3YD-HFP-00001 ^a -M5-V17T-P0001 -P1-P01T-00002 -M6-HFP-20001001 -M6-HFP-20001002 -M6-HFP-20001003 -M6-HFP-20001004 -M6-HFP-20007001 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003	Section 4F.2.1; Tables 4F-1 and 4F-3; Figures 4A-1, 4A-4 and 4A-53 of Operating Unit Group 10, Chapter 4 of this Permit.	HFP-VSL-00005 = 8,311

Table III.10.E.C – HLW Vitrification Plant Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>Melter Feed Process System cont.</u></p> <p>HFP-VSL-00006 (Melter 2 Feed Vessel)</p>	HFP	<p><u>24590-HLW</u></p> <p>-3YD-HFP-00001^a</p> <p>-M5-V17T-P0001</p> <p>-P1-P01T-00002</p> <p>-M6-HFP-20002001</p> <p>-M6-HFP-20002002</p> <p>-M6-HFP-20002003</p> <p>-M6-HFP-20008001</p> <p><u>24590-WTP</u></p> <p>-3PS-G000-T0002</p> <p>-3PS-MV00-T0001</p> <p>-3PS-MV00-T0002</p> <p>-3PS-MV00-T0003</p>	Section 4F.2.1; Tables 4F-1 and 4F-3; Figures 4A-1, 4A-4 and 4A-53 of Operating Unit Group 10, Chapter 4 of this Permit.	HFP-VSL-00006 = 8,311
<p><u>Melter Off-gas Treatment Process System</u></p> <p>HOP-VSL-00903 (Melter 1 SBS Condensate Receiver Vessel)</p> <p>HOP-VSL-00904 (Melter 2 SBS Condensate Receiver Vessel)</p>	HOP	<p><u>24590-HLW</u></p> <p>-3YD-HOP-00001^a</p> <p>-M5-V17T-P0003</p> <p>-M5-V17T-P20003</p> <p>-M6-HOP-00004</p> <p>-M6-HOP-00006001</p> <p>-M6-HOP-00006002</p> <p>-M6-HOP-20004</p> <p>-M6-HOP-20006001</p> <p>-M6-HOP-20006002</p>	Section 4F.4.2; Tables 4F-1 and 4F-3; Figures 4A-1 and 4A-4 C1-1 and C1-4 of Operating Unit Group 10, Chapter 4 of this Permit.	<p>HOP-VSL-00903 = 9891</p> <p>HOP-VSL-00904 = 9891</p>

Table III.10.E.C – HLW Vitrification Plant Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-MVD-HOP-P0001 -MVD-HOP-P0012 -MV-HOP-P0001 -MV-HOP-P0003 -N1D-HOP-P0009 -P1-P01T-00001 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<u>HLW Canister Decontamination Handling System</u> HDH-VSL-00001 (Canister Rinse Vessel) HDH-VSL-00002 (Canister Decon Vessel 1) HDH-VSL-00003 (Waste Neutralization Vessel) HDH-VSL-00004 (Canister Decon Vessel 2)	HDH	<u>24590-HLW</u> -M5-V17T-00006 -M6-HDH-00001001 -M6-HDH-00002001 -M6-HDH-00002002 -M6-HDH-00002003 -M6-HDH-20001001 -M6-HDH-20001002 -M0-HDH-P0012001 -M0-HDH-P0012002 -MV-HDH-00003 -MVD-HDH-00003	Section 4F.2.4; Tables 4F-1 and 4F-3; Figures 4A-1 and 4A-4 of Operating Unit Group 10, Chapter 4 of this Permit.	HDH-VSL-00001 = 3314 HDH-VSL-00002 = 630 HDH-VSL-00003 = 5315 HDH-VSL-00004 = 630

Table III.10.E.C – HLW Vitrification Plant Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-MVD-HDH-00006 -MVD-HDH-P0009 -N1D-HDH-00003 -N1D-HDH-P0005 -N1D-HDH-P0007 -P1-P01T-00001 -P1-P01T-00002 -3YD-HDH-00002 ^a <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		
<p><u>HLW Melter Cave Support Handling System</u></p> <p>HSH-TK-00001 (Decontamination Tank Melter Cave 1)</p> <p>HSH-TK-00002 (Decontamination Tank Melter Cave 2)</p>	<p>HSH</p>	<p><u>24590-HLW</u></p> <p>-M6-HSH-00004001 -M6-HSH-20004001 -M6-HSH-20004002 -M0-HSH-P0072 -N1D-HSH-P0001 -P1-P01T-00002</p> <p><u>24590-WTP</u></p> <p>-3PS-HD00-T0001</p>	<p>Section 4F.2.4; Tables 4F-1 and 4F-4; Figures 4A-1 and 4A-4 of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>HSH-TK-00001 = 4,000</p> <p>HSH-TK-00002 = 4,000</p>

Table III.10.E.C – HLW Vitrification Plant Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>HLW Vitrification Plant Radioactive Liquid Waste Disposal System</u></p> <p>RLD-VSL-00002 (Off-gas Drains Collection Vessel)</p> <p>RLD-VSL-00007 (Acidic Waste Vessel)</p> <p>RLD-VSL-00008 (Plant Wash & Drain Vessel)</p>	<p>RLD</p>	<p><u>24590-HLW</u></p> <p>-3YD-RLD-00001^a</p> <p>-M5-V17T-P0007001</p> <p>-M5-V17T-P0007002</p> <p>-M6-RLD-00001001</p> <p>-M6-RLD-00001002</p> <p>-M6-RLD-00001003</p> <p>-M6-RLD-00002001</p> <p>-M6-RLD-00002002</p> <p>-M6-RLD-00002003</p> <p>-M6-RLD-00002004</p> <p>-M6-RLD-00006</p> <p>-M6-RLD-00007</p> <p>-M6-RLD-00014</p> <p>-MV-RLD-00002</p> <p>-MV-RLD-P0003</p> <p>-MV-RLD-00025001</p> <p>-MV-RLD-00025002</p> <p>-MV-RLD-00025003</p> <p>-MV-RLD-00025004</p> <p>-MVD-RLD-00005</p> <p>-MVD-RLD-00007</p> <p>-MVD-RLD-00008</p> <p>-N1D-RLD-P0001</p> <p>-N1D-RLD-P0006</p>	<p>Section 4H.2.1; Tables 4-4 and 4-6; Figures C1-1 and C1-4 of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>RLD-VSL-00002 = 334</p> <p>RLD-VSL-00007 = 18,145</p> <p>RLD-VSL-00008 = 13,774</p>

Table III.10.E.C – HLW Vitrification Plant Tank Systems Description

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
		-N1D-RLD-P0013 -P1-P01T-00001 -P1-P01T-00002 <u>24590-WTP</u> -3PS-G000-T0002 -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003		

^a System Descriptions are maintained in the Administrative Record, and are listed here for information only.

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

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<p><u>Radioactive Liquid Waste Disposal System</u></p> <p>RLD-VSL-00164 (Laboratory Area Sink Drain Collection Vessel)</p> <ul style="list-style-type: none"> • RLD-LT-6202 • RLD-EDUC-00002A/B/C • RLD-SUMP-00041 • RLD-LT-6211 • RLD-PMP-00182A/B • RLD-SUMP-00045 • RLD-TWDVC-00003 • RLD-LT-6212 • RLD-LDB-00005/6/7/8/11 <p>RLD-VSL-00165 (Hotcell Drain Collection Vessel)</p> <ul style="list-style-type: none"> • RLD-LT-6104 • RLD-EDUC-00003A/B/C/D/E/F/G/H • RLD-SUMP-00042 • RLD-LT-6115 • RLD-PMP-00183A • RLD-SUMP-00043A • RLD-TWDVC-00002A 	<p>RLD</p>	<p><u>24590-LAB</u></p> <p>-3ZD-RLD-00001^a</p> <p>-M5-V17T-00029</p> <p>-M6-RLD-00001001</p> <p>-M6-RLD-00001002</p> <p>-M6-RLD-00001003</p> <p>-M6-RLD-00001004</p> <p>-M6-RLD-00002001</p> <p>-M6-RLD-00002003</p> <p>-M6-RLD-00006001</p> <p>-M6-RLD-00006002</p> <p>-M6-RLD-00006003</p> <p>-M6-RLD-00007001</p> <p>-M6-RLD-00007002</p> <p>-M6-RLD-00008001</p> <p>-M6-RLD-00008002</p> <p>-MVD-RLD-00164</p> <p>-MVD-RLD-P0165</p> <p>-N1D-RLD-P0002</p> <p>-N1D-RLD-P0003</p> <p>-P1-60-00007</p> <p>-P1-60-00008</p> <p><u>24590-WTP</u></p> <p>-3PS-G000-T0002</p>	<p>Section 4H.2.1; Table 4H-3 of Operating Unit Group 10, Chapter 4H of this Permit.</p>	<p>RLD-VSL-00164 = 3,200</p> <p>RLD-VSL-00165 = 9,090</p>

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

Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
<ul style="list-style-type: none"> • RLD-LT-6116 • RLD-PMP-00183B • RLD-SUMP-00043B • RLD-TWDVC-00002B • RLD-LT-6124 • RLD-SUMP-00044 • RLD-TWDVC-00001 • RLD-LT-6123 • RLD-LDB-00002/4/9 		<p>-3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003</p> <p>24590-CM-POA-MVA0-00010-01-02 24590-QL-POC-MVA0-00008-01-00001</p>		

^a System Descriptions are maintained in the Administrative Record, and are listed here for information only.

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
PWD-SUMP-00071 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00040 ^a	Not Applicable	Bubbler Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00001 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00001A ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00002 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00002A ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00003 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00004 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
PWD-SUMP-00005 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00006 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00007 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00008 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00009 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00010 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00011 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00012 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
PWD-SUMP-00013 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00026 ^c	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00026 ^b	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00028 ^c	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00028 ^b	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00029 ^c	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00029 ^b	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00031 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
PWD-SUMP-00032 ^c	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00032 ^b	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00033 ^c	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00033 ^b	Not Applicable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00034 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00035 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00036 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-SUMP-00037 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
RLD-SUMP-00003 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PVP-BULGE-00001	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PVP-BULGE-00002	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
TCP-BULGE-00004	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
DIW-BULGE-00001	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
DIW-BULGE-00002	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
CRP-BULGE-00001	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
CXP-BULGE-00004	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
UFP-BULGE-00001	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
UFP-BULGE-00002	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
UFP-BULGE-00005	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
UFP-BULGE-00006	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00001	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00002	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00003	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00004	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
PWD-LDB-00005	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00006	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00007	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00008	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00009	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00010	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00011	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00012	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
PWD-LDB-00013	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00014	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00015	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00016	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00017	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00018	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
PWD-LDB-00019	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-LDB-00012	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
RLD-LDB-00013	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
ASX Sampler 00013 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
ASX Sampler 00017 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
ASX Sampler 00019 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
ASX Sampler 00020 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

Table III.10.E.E – Pretreatment Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
ASX Sampler 00025 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Locator (including P&ID designator) is located on Permit Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems Including Sumps and Floor Drains.

^b Locator (including P&ID designator) is located on Permit Table III.10.E.I – Pretreatment Plant Tank Systems Primary Containment Systems.

^c Leak detection instruments for secondary containment to a primary containment sump.

Table III.10.E.F – LAW Vitrification Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
RLD-SUMP-00028 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-SUMP-00029 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-SUMP-00030 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-SUMP-00031 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-SUMP-00032 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-SUMP-00035 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-SUMP-00036 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
LVP-FD-00001 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.F – LAW Vitrification Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
Melter 1 Encasement Assembly Drain	Not Applicable	Conductivity Cable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
Melter 2 Encasement Assembly Drain	Not Applicable	Conductivity Cable	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
ASX Sampler 00012 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
ASX Sampler 00013 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
		RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
		RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Locator (including P&ID designator) is located on Permit Table III.10.E.L – LAW Vitrification Plant Tank Systems Secondary Containment Systems Including Sumps and Floor Drains.

Table III.10.E.G – HLW Vitrification Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
HCP-SUMP-00001 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RLD-SUMP-00001 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HOP-SUMP-00003 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HOP-SUMP-00008 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HDH-SUMP-00001 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HDH-SUMP-00002 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HDH-SUMP-00003 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HFP-SUMP-00002 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HFP-SUMP-00005 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HSH-SUMP-00003 ^a	Not Applicable	Bubbler	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HSH-SUMP-00007 ^a	Not Applicable	Bubbler	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HSH-SUMP-00008 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED

Table III.10.E.G – HLW Vitrification Plant Tank System Process and Leak Detection System Instruments and Parameters

Tank System Name and Locator (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
HSH-SUMP-00009 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HPH-SUMP-00001 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HPH-SUMP-00003 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
HPH-SUMP-00005 ^a	Not Applicable	Radar Leak Detector	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
ASX Sampler 00028 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
ASX Sampler 00029 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
ASX Sampler 00042 Lower Containment Drain	Not Applicable	Thermal Dispersion Level Switch	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	Not Applicable	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Locator (including P&ID designator) is located on Permit Table III.10.E.N – HLW Vitrification Plant Tank Systems Secondary Containment Systems Including Sumps, and Floor Drains.

Table III.10.E.H – Laboratory Tank System Process and Leak Detection System Instruments and Parameters

Instrument/ Monitor Tag Number	Type and Location	Monitored Parameter	Measurement or Display Range	Expected Operating Range	Failure State	Accuracy	Numerical Set Point	Control Function	Calibration Method and Frequency
Lab Area Sink Drain Collection Vessel (RLD-VSL-00164) in A-B003 (see 24590-LAB-M6-RLD-00002001)									
RLD-LT-6202	Radar level transmitter/ A-0160	Liquid level in RLD-VSL-00164	0 to 104-inches	35.5 to 51-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-VSL-00164 to PCJ	Non-calibratable
RLD-LI-6202A	Graphic display level indicator/ Control room	Liquid level in RLD-VSL-00164	0 to 3,200 gallons	1,018 to 1,578 gallons	Alarm as “bad quality”, hold last good value	NA	NA	Display liquid level in control room, provides notifications	NA
RLD-LSHH-6202A	Level interlock/soft ware	Overfill prevention	NA	NA	Will cause protective interlocks to trip	NA	High-high liquid level = 2,248 gallons (70-inches)	Close RLD-YV-6210 and RLD-YV-6216 at Level HH set point	NA
C3 Vessel Cell Sump (RLD-SUMP-00041) in A-B003 (see 24590-LAB-M6-RLD-00002001)									
RLD-LT-6211	Radar level transmitter/ A-0160	Liquid level in RLD-SUMP-00041	0 to 75-inches	1.74 to 10-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-SUMP-00041 to PCJ	Non-calibratable
RLD-LI-6211	Graphic display level indicator/ Control room	Liquid level in RLD-SUMP-00041	0 to 75-inches	1.74 to 10-inches	NA	NA	NA	Display liquid level in control room, provides notifications	NA
RLD-LKY-6211	Graphic display leak rate indicator/ Control room	Rate of liquid level change (LKY) in RLD-SUMP-00041	NA	NA	NA	NA	High leak rate = 2.4 gallons per day	Display control room high leak rate alarm	NA

Table III.10.E.H – Laboratory Tank System Process and Leak Detection System Instruments and Parameters

Instrument/ Monitor Tag Number	Type and Location	Monitored Parameter	Measurement or Display Range	Expected Operating Range	Failure State	Accuracy	Numerical Set Point	Control Function	Calibration Method and Frequency
C3 Leak Detection Box (RLD-LDB-00005) in A-B003 (see 24590-LAB-M6-RLD-00007001)									
RLD-LSH-6215	Thermal level switch/ A-0160	Liquid level in RLD-LDB-00005	NA	NA	NA	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable
RLD-LAH-6215	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA
C3 Leak Detection Box (RLD-LDB-00006) in A-B003 (see 24590-LAB-M6-RLD-00007001)									
RLD-LSH-6701	Thermal level switch/ A-0160	Liquid level in RLD-LDB-00006	NA	NA	NA	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable
RLD-LAH-6701	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA
C3 Leak Detection Box (RLD-LDB-00007) in A-B003 (see 24590-LAB-M6-RLD-00007001)									
RLD-LSH-6702	Thermal level switch/ A-0160	Liquid level in RLD-LDB-00007	NA	NA	NA	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable
RLD-LAH-6702	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA
C3 Leak Detection Box (RLD-LDB-00008) in A-B003 (see 24590-LAB-M6-RLD-00007001)									
RLD-LSH-6703	Thermal level switch/ A-0160	Liquid level in RLD-LDB-00008	NA	NA	NA	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable

Table III.10.E.H – Laboratory Tank System Process and Leak Detection System Instruments and Parameters

Instrument/ Monitor Tag Number	Type and Location	Monitored Parameter	Measurement or Display Range	Expected Operating Range	Failure State	Accuracy	Numerical Set Point	Control Function	Calibration Method and Frequency
RLD-LAH-6703	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA
C3 Leak Detection Box (RLD-LDB-00011) in A-B003 (see 24590-LAB-M6-RLD-00007001)									
RLD-LSH-6704	Thermal level switch/ A-0160	Liquid level in RLD-LDB-00011	NA	NA	NA	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable
RLD-LAH-6704	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA
C3 Pump Pit Sump (RLD-SUMP-00045) in A-B002 (see 24590-LAB-M6-RLD-00002003)									
RLD-LT-6212	Radar level transmitter/ A-0160	Liquid level in RLD-SUMP-00045	0 to 15-inches	0 to 1.25-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-SUMP-00045 to PCJ	Non-calibratable
RLD-LI-6212	Graphic display level indicator/ Control room	Liquid level in RLD-SUMP-00045	0 to 15-inches	0 to 1.25-inches	NA	NA	High liquid level = 1.25-inches	Display liquid level in control room, provides notifications	NA
Hotcell Drain Collection Vessel (RLD-VSL-00165) in A-B004 (see 24590-LAB-M6-RLD-00001001)									
RLD-LT-6104	Radar level transmitter/ A-0167	Liquid level in RLD-VSL-00165	0 to 100-inches	21 to 43-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-VSL-00164 to PCJ	Non-calibratable
RLD-LI-6104A	Graphic display level indicator/ Control room	Liquid level in RLD-VSL-00165	0 to 9,090 gallons	1,258 to 3,829 gallons	Alarm as “bad quality”, hold last good value	NA	NA	Display liquid level in control room, provides notifications	NA

Table III.10.E.H – Laboratory Tank System Process and Leak Detection System Instruments and Parameters

Instrument/ Monitor Tag Number	Type and Location	Monitored Parameter	Measurement or Display Range	Expected Operating Range	Failure State	Accuracy	Numerical Set Point	Control Function	Calibration Method and Frequency
RLD-LSHH-6104A	Level interlock/software	Overfill prevention	NA	NA	Will cause protective interlocks to trip	NA	High-high liquid level = 4,609 gallons (50-inches)	Close RLD-YV-6511, RLD-YV-6802, and RLD-YV-6102 at Level HH set point	NA
C5 Vessel Cell Sump (RLD-SUMP-00042) in A-B004 (see 24590-LAB-M6-RLD-00001001)									
RLD-LT-6115	Radar level transmitter/A-0167	Liquid level in RLD-SUMP-00042	0 to 66-inches	1.74 to 10-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-SUMP-00041 to PCJ	Non-calibratable
RLD-LI-6115	Graphic display level indicator/Control room	Liquid level in RLD-SUMP-00042	0 to 66-inches	1.74 to 10-inches	NA	NA	NA	Display liquid level in control room, provides notifications	NA
RLD-LKY-6115	Graphic display leak rate indicator/Control room	Rate of liquid level change (LKY) in RLD-SUMP-00042	NA	NA	NA	NA	High leak rate = 2.4 gallons per day	Display control room high leak rate alarm	NA
C5 Pump Pit Sump (RLD-SUMP-00043A) A-B007 (see 24590-LAB-M6-RLD-00001002)									
RLD-LT-6116	Radar level transmitter/A-0167	Liquid level in RLD-SUMP-00043A	0 to 75-inches	0 to 1.25-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-SUMP-00043A to PCJ	Non-calibratable
RLD-LI-6116	Graphic display level indicator/Control room	Liquid level in RLD-SUMP-00043A	0 to 75-inches	0 to 1.25-inches	NA	NA	High liquid level = 1.25-inches	Display liquid level in control room, provides notifications	NA

Table III.10.E.H – Laboratory Tank System Process and Leak Detection System Instruments and Parameters

Instrument/ Monitor Tag Number	Type and Location	Monitored Parameter	Measurement or Display Range	Expected Operating Range	Failure State	Accuracy	Numerical Set Point	Control Function	Calibration Method and Frequency
C5 Pump Pit Sump (RLD-SUMP-00043B) in A-B005 (see 24590-LAB-M6-RLD-00001003)									
RLD-LT-6124	Radar level transmitter/ A-0167	Liquid level in RLD-SUMP-00043B	0 to 15-inches	0 to 1.25-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-SUMP-00043B to PCJ	Non-calibratable
RLD-LI-6124	Graphic display level indicator/ Control room	Liquid level in RLD-SUMP-00043B	0 to 15-inches	0 to 1.25-inches	NA	NA	High liquid level = 1.25-inches	Display liquid level in control room, provides notifications	NA
C5 Piping Pit Sump (RLD-SUMP-00044) in A-B006 (see 24590-LAB-M6-RLD-00001004)									
RLD-LT-6123	Radar level transmitter/ A-0167	Liquid level in RLD-SUMP-00044	0 to 24-inches	0 to 1.25-inches	NA	± 0.4-inch	NA	Transmit liquid level in RLD-SUMP-00044 to PCJ	Non-calibratable
RLD-LI-6123	Graphic display level indicator/ Control room	Liquid level in RLD-SUMP-00044	0 to 24-inches	0 to 1.25-inches	NA	NA	High liquid level = 1.25-inches	Display liquid level in control room, provides notifications	NA
C5 Leak Detection Box (RLD-LDB-00002) in A-B004 (see 24590-LAB-M6-RLD-00008001)									
RLD-LSH-6120	Thermal level switch/ A-0167	Liquid level in RLD-LDB-00002	NA	NA	NA	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable
RLD-LAH-6120	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA
C5 Leak Detection Box (RLD-LDB-00004) in A-B004 (see 24590-LAB-M6-RLD-00008001)									
RLD-LSH-6118	Thermal level switch/ A-0167	Liquid level in RLD-LDB-00004	NA	<RESERVED>	<RESERVED>	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable

Table III.10.E.H – Laboratory Tank System Process and Leak Detection System Instruments and Parameters

Instrument/ Monitor Tag Number	Type and Location	Monitored Parameter	Measurement or Display Range	Expected Operating Range	Failure State	Accuracy	Numerical Set Point	Control Function	Calibration Method and Frequency
RLD-LAH-6118	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA
C5 Leak Detection Box (RLD-LDB-00009) in A-B004 (see 24590-LAB-M6-RLD-00008001)									
RLD-LSH-6801	Thermal level switch/ A-0167	Liquid level in RLD-LDB-00009	NA	NA	NA	±0.25-inch	NA	Detect liquid in leak detection box	Non-calibratable
RLD-LAH-6801	Graphic alarm display/ Control room	Presence or absence of liquid	On/off	NA	NA	NA	High liquid level = 0.5-inch	Indicate presence or absence of liquid	NA

Table III.10.E.I – Pretreatment Plant Tank Systems Primary^a Containment Sump Systems

Sump I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions^b (feet) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
PWD-SUMP-00026 P-0123 (Hotcell El. 0)	RESERVED	RESERVED	RESERVED
PWD-SUMP-00028 P-0123 (Hotcell El. 0)	RESERVED	RESERVED	RESERVED
PWD-SUMP-00029 P-0123 (Hotcell El. 0)	RESERVED	RESERVED	RESERVED
PWD-SUMP-00032 P-0123A (Maintenance Cave, El. 0)	RESERVED	RESERVED	RESERVED
PWD-SUMP-00033 P-0123A (Maintenance Cave, El. 0)	RESERVED	RESERVED	RESERVED

^a Primary sumps are defined in Permit Section III.10.C, and must comply with dangerous waste tank system requirements for tanks as described in [WAC-173-303-640](#).

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-SUMP-00071 P-B005 (Pit-19, El. -19')	60	Dry Sump	30" Dia x 18" Deep Epoxy	<u>24590-PTF</u> -M6-PWD-00041 -P1-P01T-00006
PWD-SUMP-00040 P-B002 (Pit-45, El. -45')	233.7	Dry Sump	60" x 30" x 30" Stainless Steel	<u>24590-PTF</u> -M6-PWD-00012 -P1-P01T-00006
PWD-SUMP-00001 P-0108B (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00008 -P1-P01T-00001
PWD-SUMP-00001A P-0108C (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00010 -P1-P01T-00001
PWD-SUMP-00002 P-0108A (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00008 -P1-P01T-00001
PWD-SUMP-00002A P-0108 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00010 -P1-P01T-00001
PWD-SUMP-00003 P-0106 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00008 -P1-P01T-00001

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions ^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-SUMP-00004 P-0104 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00008 -P1-P01T-00001
PWD-SUMP-00005 P-0102A (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00008 -P1-P01T-00001
PWD-SUMP-00006 P-0102 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00008 -P1-P01T-00001
PWD-SUMP-00007 P-0109 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00009 -P1-P01T-00001
PWD-SUMP-00008 P-0111 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00009 -P1-P01T-00001
PWD-SUMP-00009 P-0112 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00009 -P1-P01T-00001
PWD-SUMP-00010 P-0113 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00009 -P1-P01T-00001

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions ^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-SUMP-00011 P-0114 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00009 -P1-P01T-00001
PWD-SUMP-00012 P-0117 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00009 -P1-P01T-00001
PWD-SUMP-00013 P-0117A (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00014 -P1-P01T-00001
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
PWD-SUMP-00031 P-0119 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00010 -P1-P01T-00001
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
PWD-SUMP-00034 P-0121A (Spent Resin Dewatering, El. 0')	75	Dry Sump	30" Dia. x 27" Deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00012
PWD-SUMP-00035 P-0122A (Waste Packaging Area, El. 0')	75	Dry Sump	30" Dia. x 27" Deep Stainless Steel	<u>24590-PTF</u> -M6-PWD-00012

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-SUMP-00036 P-0118 (El. 0')	75	Dry Sump	30" Dia. By ~27" deep Stainless Steel	24590-PTF -M6-PWD-P0012 -P1-P01T-00001
PWD-SUMP-00037 P-0124A	7.5		30" Dia. x 27" Deep Stainless Steel	24590-PTF -M6-PWD-00012
RLD-SUMP-00003 P-0150 (Radioactive Liquid Waste Disposal Area, El. 0', Outdoor)	583	Dry Sump	78" x 48" x 36" Deep Epoxy coating	24590-PTF -M6-RLD-00002003
PVP-ZY-00037-S11B-03, P-0105 (PVP-BULGE-00001, El. 0')			3" Stainless Steel	24590-PTF -M6-PVP-00017002
PVP-ZY-00036-S11B-03, P-0101A (PVP-BULGE-00002, El. 0')			3" Stainless Steel	24590-PTF -M6-PVP-00018002
TCP-ZF-00032-S11B-03 Drain Line, P-0116 (TCP-BULGE-00004, El. 0')	N/A	N/A	3" Stainless Steel	24590-PTF -M6-TCP-00001002
DIW-ZF-01511-S11B-03 Drain Line, P-0320 (DIW-BULGE-00001, El. 56')	N/A	N/A	3" Stainless Steel	24590-PTF -M6-DIW-00004001
DIW-ZF-01510-S11B-03, P-0320 Drain Line (DIW-BULGE-00002, El. 56')	N/A	N/A	3" Stainless Steel	24590-PTF -M6-DIW-00004001

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions ^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-FD-00005 PWD-ZF-03000-S11B-06 P-0123 (Hotcell, El.0')	939	N/A	6" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00011
PWD-FD-00006 PWD-ZF-03001-S11B-06 P-0123 (Hotcell, El.0')	939	N/A	6" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00011
PWD-FD-00435 P-0105		NA	3" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00349 P-0105		NA	6" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00436 P-0105		NA	3" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00438 P-0105A		NA	6" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00348 P-0105A		NA	6" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00437 P-0105B		NA	3" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-347 P-0105B		NA	6" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-346 P-0105C		NA	4" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00044

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-FD-00293 P-0426 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00298 P-0425 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00309 P-0402 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00310 P-0402 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00311 P-0402 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00312 P-0402 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00376 P-0415 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00377 P-0415 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00378 P-0415 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00379 P-0415 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00380 P-0415A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-FD-00381 P-0415A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00382 P-0415A Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00383 P-0415A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00557 P-0430 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00559 P-0430 Drain, El. 77'	665	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00561 P-0430 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00563 P-0411 Drain, El. 77'	665	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00564 P-0411 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00565 P-0410 Drain, El. 77'	665	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00566 P-0410 Drain, El. 77'	665	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00571 P-0410 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-FD-00572 P-0410 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00573 P-0410 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00574 P-0410 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00575 P-0410 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00576 P-0410 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00583 P-0422A Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00584 P-0422A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00589 P-0402 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00590 P-0423 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00591 P-0423 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00592 P-0423 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-FD-00593 P-0423 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00594 P-0423 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00595 P-0431A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00596 P-0431A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00597 P-0431A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00598 P-0431A Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00599 P-0431A Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00600 P-0431A Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00604 P-0431A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00605 P-0431A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00606 P-0431A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-FD-00607 P-0431A Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00629 P-0425 Drain, El. 77'	655	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00630 P-0425 Drain, El. 77'	140	N/A	8" Dia 304L	<u>24590-PTF</u> -M6-PWD-00044
CRP-ZF-00002-S11B-03, P-0317 Drain Line (CRP- BULGE-00001 drain, El. 56')	N/A	N/A	3" Stainless Steel	<u>24590-PTF</u> -M6-CRP-00003001
CXP-ZF-00012-S11B-03 Drain Line, P-0317 (CXP-BULGE- 00004, El. 56')	N/A	N/A	3" Stainless Steel	<u>24590-PTF</u> -M6-CXP-00003003
UFP-ZF-00043-S11B-03 Drain Line, P-0301 (UFP-BULGE- 00001, El. 56')	N/A	N/A	3" Stainless Steel	<u>24590-PTF</u> -M6-UFP-00016001
UFP-ZF-00042-S11B-03 Drain Line, P-0301 (UFP-BULGE- 00002, El. 56')	N/A	N/A	3" Stainless Steel	<u>24590-PTF</u> -M6-UFP-00017001
UFP-ZY-00002-S11B-03 Drain Line, P-0311 (UFP-BULGE- 00005, El. 56')	N/A	N/A	3" Stainless Steel	<u>24590-PTF</u> -M56-UFP-00031001
UFP-ZY-00001-S11B-03 Drain Line, P-0311A (UFP-BULGE- 00006, El. 56')	N/A	N/A	3" Stainless Steel	<u>24590-PTF</u> -M6-UFP-00032001

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-LDB-00001 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00002 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00003 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00004 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00005 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00006 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00007 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00008 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-LDB-00009 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00010 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00011 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00050
PWD-LDB-00012 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051
PWD-LDB-00013 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051
PWD-LDB-00014 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051
PWD-LDB-00015 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051
PWD-LDB-00016 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
PWD-LDB-00017 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051
PWD-LDB-00018 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051
PWD-LDB-00019 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 24" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00051
RLD-LDB-00012 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 34" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00058001 and 00058002
RLD-LDB-00013 P-B001 (Inter Facility Transfer Line Tunnel, El.-45')	6	N/A	8" Dia. x 34" Length Stainless Steel	<u>24590-PTF</u> -M6-PWD-00058001 and 00058002
ASX Sampler 00017 Lower Containment Trough/Dam (P-0311B, El. 56')	N/A	N/A	3" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00007
ASX Sampler 00019 Lower Containment Trough/Dam (P-0302, El. 56')	N/A	N/A	3" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00007
ASX Sampler 00020 Lower Containment Trough/Dam (P-0301, El. 56')	N/A	N/A	3" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00007

Table III.10.E.J – Pretreatment Plant Tank Systems Secondary Containment Systems, Including Sumps, Leak Detection Boxes, Bulges, Autosamplers, and Floor Drains

Sump, Bulge or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing No.'s, Specifications No.'s, etc.)
ASX Sampler 00025 Lower Containment Trough/Dam (P-0307, El. 56')	N/A	N/A	3" Dia. Stainless Steel	<u>24590-PTF</u> -M6-PWD-00007

^a Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

Note #1: These are special cases due to their location in equipment berms. The capacity for these drain lines is based on a unique bounding case for liquid spillage.

1

Table III.10.E.K – LAW Vitrification Plant Tank Systems Primary^a Containment Sump Systems

Sump I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions^b (feet) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
RESERVED	RESERVED	RESERVED	RESERVED

^a Primary sumps are defined in Permit Section III.10.C, and must comply with dangerous waste tank system requirements for tanks as described in [WAC-173-303-640](#).

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

2

Table III.10.E.M – HLW Vitrification Plant Tank Systems Primary^a Containment Sump Systems

Sump I.D.# & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions ^b (feet) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
RESERVED	RESERVED	RESERVED	RESERVED

^a Primary sumps are defined in Permit Section III.10.C, and must comply with dangerous waste tank system requirements for tanks as described in [WAC-173-303-640](#).

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

1

Table III.10.E.N – HLW Vitrification Plant Tank Systems Secondary Containment Systems, Including Sumps, Autosamplers, and Floor Drains

Sump or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type	Sump or Drain Line Dimensions ^a (inches) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
HCP-SUMP-00001 H-B014 (Wet Process Cell, El. -21')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00015001 -P1-P01T-00001
RLD-SUMP-00001 H-B014 (Wet Process Cell, El. -21')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00015001 -P1-P01T-00001
HOP-SUMP-00003 H-B021 (SBS Drain Collection Cell 1, El. -21')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00015001 -P1-P01T-00001
HOP-SUMP-00008 H-B005 (SBS Drain Collection Cell 2, El. -21')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-20004001 -P1-P01T-00001
HDH-SUMP-00001 H-B039B (Canister Rinse Tunnel, El. -16.5')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00016001 -P1-P01T-00001

**Table III.10.E.N – HLW Vitrification Plant Tank Systems Secondary Containment Systems,
Including Sumps, Autosamplers, and Floor Drains**

Sump or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type	Sump or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
HDH-SUMP-00002 H-B039A (Canister Rinse Bogie Maintenance Room, El. -16')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00016001 -P1-P01T-00001
HDH-SUMP-00003 H-B035 (Canister Decon Cave, El. -16')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00004002 -P1-P01T-00001
HFP-SUMP-00002 H-0117 (Melter Cave 1, El. 5')	50	Dry Sump	20.5" x 20.5" x 16" Stainless Steel	<u>24590-HLW</u> -M6-RLD-00008002 -P1-P01T-00002
HFP-SUMP-00005 H-0106 (Melter Cave 2, El. 5')	50	Dry Sump	20.5" x 20.5" x 16" Stainless Steel	<u>24590-HLW</u> -M6-RLD- 20005001 -P1-P01T-00002
HSH-SUMP-00003 H-0117 (Melter Cave 1, El. 3')	50	Dry Sump	20.5" x 20.5" x 16" Stainless Steel	<u>24590-HLW</u> -M6-RLD-00008002 -P1-P01T-00002
HSH-SUMP-00007 H-0106 (Melter Cave 2, El. 3')	50	Dry Sump	20.5" x 20.5" x 16" Stainless Steel	<u>24590-HLW</u> -M6-RLD-20005001 -P1-P01T-00002
HSH-SUMP-00008 H-310A (Melter 1 Equip. Decon. Pit Area, El. 0')	50	Dry Sump	30" x 24" x 16" Stainless Steel	<u>24590-HLW</u> -M6-RLD-00003001 -P1-P01T-00002
HSH-SUMP-00009 H-0304A (Melter 2 Equip. Decon. Pit Area, El. 0')	50	Dry Sump	30" x 24" x 16" Stainless Steel	<u>24590-HLW</u> -M6-RLD-20003001 -P1-P01T-00002

**Table III.10.E.N – HLW Vitrification Plant Tank Systems Secondary Containment Systems,
Including Sumps, Autosamplers, and Floor Drains**

Sump or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type	Sump or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
HPH-SUMP-00001 H-0136 (Canister Handling Cave, El. -3')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00016001
HPH-SUMP-00005 H-0136 (Canister Handling Cave, El. -3')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00004001
HPH-SUMP-00003 H-B032 (Pour Tunnel 1, El. -21')	75	Dry Sump	30" Dia. x 18" Deep Stainless Steel	<u>24590-HLW</u> -M6-RLD-00016001
RLD-ZF-03330-S11B-03 H-B021 (SBS Drain Collection Cell 1)	N/A	N/A	Line Size Pipe Dia 3" 316L Stainless Steel	<u>24590-HLW</u> -M6-RLD-00015001
RLD-ZF-03447-S11B-03 H-B005 (SBS Drain Collection Cell 2)	N/A	N/A	Line Size Pipe Dia 3" 316L Stainless Steel	<u>24590-HLW</u> -M6-RLD-20004001
RLD-FD-0186 H-0308 (Melter 1 - Active Services Cell, El. 37')	N/A	N/A	Line Size Pipe Dia 6" Stainless Steel	<u>24590-HLW</u> -M6-RLD-00015001
RLD-FD-0187 H-0302 (Melter 2 - Active Services Cell, El. 37')	N/A	N/A	Line Size Pipe Dia 6" Stainless Steel	<u>24590-HLW</u> -M6-RLD-20004001
ASX Sampler 00028 Lower Containment Trough/Dam (H-0305A, El. 37')	N/A	N/A	3" Dia. Stainless Steel	<u>24590-HLW</u> -M6-RLD-00002002

Table III.10.E.N – HLW Vitrification Plant Tank Systems Secondary Containment Systems, Including Sumps, Autosamplers, and Floor Drains

Sump or Drain Line I.D. # & Room Location	Maximum Sump (gallons) Capacity	Sump Type	Sump or Drain Line Dimensions ^a (inches) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
ASX Sampler 00029 Lower Containment Trough/Dam (H-0315, El. 37')	N/A	N/A	3" Dia. Stainless Steel	<u>24590-HLW</u> -M6-RLD-00002002
ASX Sampler 00042 Lower Containment Trough/Dam (H-0318, El. 37')	N/A	N/A	3" Dia. Stainless Steel	<u>24590-HLW</u> -M6-RLD-00002002
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

1

Table III.10.E.O – Laboratory Tank Systems Primary^a Containment Sump Systems

Sump I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions ^b (feet) & Materials of Construction	Engineering Description (Drawing Nos., Specifications Nos., etc.)
RESERVED	RESERVED	RESERVED	RESERVED

^a Primary sumps are defined in Permit Section III.10.C, and must comply with dangerous waste tank system requirements for tanks as described in [WAC-173-303-640](#).

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

2

Table III.10.E.R – EMF Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DEP-VSL-00001 ED-B001 Low-point drain vessel	DEP	24590-BOF -M5-V17T-00011 -M6-DEP-00001001 -M6-DEP-00001002 -MVD-DEP-00002 -N1D-DEP-00001 -P1-25-00001 -3PS-MVSC-T0002 24590-CM-POA-MVSC-00005-07-00001 (Sheet 3 of 23, Sheet 4 of 23)	Section 4G.2.1; Table 4G-1	18,000
DEP-VSL-00002 E-0105 Evaporator feed vessel	DEP	24590-BOF -M5-V17T-00011 -M6-DEP-00002002 -MVD-DEP-00003 -N1D-DEP-00002 -P1-25-00001 -3PS-MVSC-T0002 24590-CM-POA-MVSC-00005-07-00002 (Sheet 3 of 18, Sheet 4 of 18)	Section 4G.2.2; Table 4G-1	42,300

Table III.10.E.R – EMF Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DEP-VSL-00003A E-0105 Evaporator feed vessel	DEP	24590-BOF -M5-V17T-00013 -M6-DEP-00005001 -MVD-DEP-00004 -N1D-DEP-00003 -P1-25-00001 -3PS-MVSC-T0002 24590-CM-POA-MVSC-00005-07-00003 (Sheet 3 of 18, Sheet 4 of 18)	Section 4G.2.3; Table 4G-1	14,900
DEP-VSL-00003B E-0105 Evaporator feed vessel	DEP	24590-BOF -M5-V17T-00013 -M6-DEP-00005002 -MVD-DEP-00004 -N1D-DEP-00003 -P1-25-00001 -3PS-MVSC-T0002 24590-CM-POA-MVSC-00005-07-00004 (Sheet 3 of 18, Sheet 4 of 18)	Section 4G.2.3; Table 4G-1	14,900

Table III.10.E.R – EMF Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DEP-VSL-00003C E-0105 Evaporator feed vessel	DEP	24590-BOF -M5-V17T-00013 -M6-DEP-00005003 -MVD-DEP-00004 -N1D-DEP-00003 -P1-25-00001 -3PS-MVSC-T0002 24590-CM-POA-MVSC-00005-07-00005 (Sheet 3 of 18, Sheet 4 of 18)	Section 4G.2.3; Table 4G-1	14,900
DEP-VSL-00004A E-0106 Overhead sampling vessel	DEP	Reserved	Section 4G.2.4; Table 4G-1	40,800
DEP-VSL-00004B E-0106 Overhead sampling vessel	DEP	Reserved	Section 4G.2.4; Table 4G-1	40,800
DEP-VSL-00005A E-0106 Process condensate lag storage vessel	DEP	Reserved	Section 4G.2.5; Table 4G-1	127,260
DEP-VSL-00005B E-0106 Process condensate lag storage vessel	DEP	Reserved	Section 4G.2.5; Table 4G-1	127,260

Table III.10.E.R – EMF Plant Tank Systems Description

Dangerous and/or Mixed Waste Tank Systems Name	Unit Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DEP-FILT-00003 E-0103 Evaporator feed pre-filter	DEP	24590-BOF -M5-V17T-00011 -M6-DEP-0002004 -P1-25-00001 -3PS-MLF0-T0002 24590-CM-POA-MLF0-00005-08-00001 24590-CM-POA-MLF0-00005-05-00004 (Sheet 1 of 3)	Section 4G.3.6; Table 4G-1	NA

Table III.10.E.S – EMF Plant Tank Systems Secondary Containment Systems, including Sumps, Leak Detection Boxes, Drain Lines, and Floor Drains

Sump/Leak Detection Box, or Floor Drain/Line I.D. # and Room #	Maximum Sump/Leak Detection Box Capacity (gallons)	Sump/Leak Detection Box Level Detection Type	Sump, Leak Detection Box or Floor Drain/Line Dimensions (approximate) and Materials of Construction	Piping and Instrumentation Diagram Number
Effluent Management Facility				
Sumps				
DEP-SUMP-00001 ED-B001	~58	Radio Frequency (RF) Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00001002
DEP-SUMP-00002A E-0103	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009001
DEP-SUMP-00002B E-0103	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009001
DEP-SUMP-00003A E-0102	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009004
DEP-SUMP-00003B E-0102	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009004
DEP-SUMP-00004A E-0105	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009002
DEP-SUMP-00004B E-0105	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009002
DEP-SUMP-00005A E-0106	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009005
DEP-SUMP-00005B E-0106	~58	RF Capacitance	24 in. Dia. x 30 in. Length 304L SS	24590-BOF -M6-DEP-00009005

Table III.10.E.S – EMF Plant Tank Systems Secondary Containment Systems, including Sumps, Leak Detection Boxes, Drain Lines, and Floor Drains

Sump/Leak Detection Box, or Floor Drain/Line I.D. # and Room #	Maximum Sump/Leak Detection Box Capacity (gallons)	Sump/Leak Detection Box Level Detection Type	Sump, Leak Detection Box or Floor Drain/Line Dimensions (approximate) and Materials of Construction		Piping and Instrumentation Diagram Number
Leak Detection Boxes					
DEP-LDB-00001 ED-B001	~7	Conductivity Switch	8 in. Dia. x 41 in. Length 316L SS		24590-BOF -M6-DEP-00011001
DEP-LDB-00002 ED-B001	~7	Conductivity Switch	8 in. Dia. x 41 in. Length 316L SS		24590-BOF -M6-DEP-00011001
DEP-LDB-00003 ED-B001	~7	Conductivity Switch	8 in. Dia. x 41 in. Length 316L SS		24590-BOF -M6-DEP-00011001
DEP-LDB-00004 ED-B001	~7	Conductivity Switch	8 in. Dia. x 41 in. Length 316L SS		24590-BOF -M6-DEP-00011001
DEP-LDB-00005 ED-B001	~7	Conductivity Switch	8 in. Dia. x 41 in. Length 316L SS		24590-BOF -M6-DEP-00011001
DEP-LDB-00006 ED-B001	~7	Conductivity Switch	8 in. Dia. x 41 in. Length 316L SS		24590-BOF -M6-DEP-00011001
Drain Lines					
BOF-DEP-ZS-20282-W11A-011/02-01 ED-CH01	NA	NA	4 in. Dia. 316L SS	Containment pipe	24590-BOF -M6-DEP-00001001
			1 ½ in. Dia. AL6XN	Process pipe	
BOF-DEP-ZS-20236-W31A-02-01 ED-CH01	NA	NA	4 in. Dia. Carbon Steel	Containment pipe	24590-BOF -M6-DEP-00001001
			2 in. Dia. 316L SS	Process pipe	

Table III.10.E.S – EMF Plant Tank Systems Secondary Containment Systems, including Sumps, Leak Detection Boxes, Drain Lines, and Floor Drains

Sump/Leak Detection Box, or Floor Drain/Line I.D. # and Room #	Maximum Sump/Leak Detection Box Capacity (gallons)	Sump/Leak Detection Box Level Detection Type	Sump, Leak Detection Box or Floor Drain/Line Dimensions (approximate) and Materials of Construction		Piping and Instrumentation Diagram Number
BOF-DEP-ZS-20245-W11A-04-01ED-CH01	NA	NA	6 in. Dia. 3166 SS	Containment pipe	24590-BOF -M6-DEP-00001001
			4 in. Dia. AL6XN	Process pipe	
BOF-DEP-ZS-20231-W31A-03-01 ED-CH01	NA	NA	6 in. Dia. Carbon Steel	Containment pipe	24590-BOF -M6-DEP-00001001
			3 in. Dia. 316L SS	Process pipe	
BOF-DEP-ZS-20242-W31A-10-01 ED-CH01	NA	NA	14 in. Dia. Carbon Steel	Containment pipe	24590-BOF -M6-DEP-00001001
			10 in. Dia. 316L SS	Process pipe	
BOF-DEP-ZS-20249-W31A-03-01 ED-CH01	NA	NA	6 in. Dia. Carbon Steel	Containment pipe	24590-BOF -M6-DEP-00001001
			3 in. Dia. 316L SS	Process pipe	
BOF-DEP-ZS-20225-W31A-02-01 ED-CH01	NA	NA	4 in. Dia. Carbon steel	Containment pipe	24590-BOF -M6-DEP-00001002
			2 in. Dia. 316L SS	Process pipe	
BOF-DEP-ZS-20219-W31A-02-01	NA	NA	4 in. Dia. Carbon steel	Containment pipe	24590-BOF -M6-DEP-00001002

Table III.10.E.S – EMF Plant Tank Systems Secondary Containment Systems, including Sumps, Leak Detection Boxes, Drain Lines, and Floor Drains

Sump/Leak Detection Box, or Floor Drain/Line I.D. # and Room #	Maximum Sump/Leak Detection Box Capacity (gallons)	Sump/Leak Detection Box Level Detection Type	Sump, Leak Detection Box or Floor Drain/Line Dimensions (approximate) and Materials of Construction		Piping and Instrumentation Diagram Number
ED-CH01			2 in. Dia. 316L SS	Process pipe	
BOF-DEP-ZS-20222-W31A-02-01 ED-CH01	NA	NA	4 in. Dia. Carbon Steel	Containment pipe	24590-BOF -M6-DEP-00001002
			2 in. Dia. 316L SS	Process pipe	
BOF-DEP-ZS-20252-W11A-03-01 ED-CH01	NA	NA	6 in. Dia. 316L SS	Containment pipe	24590-BOF -M6-DEP-00010001
			3 in. Dia. AL6XN	Process pipe	
BOF-DEP-ZS-20265-W31A-03-01 ED-CH01	NA	NA	6 in. Dia. Carbon Steel	Containment pipe	24590-BOF -M6-DEP-00002006
			3 in. Dia. 316L SS	Process pipe	
BOF-DEP-ZY-00181-W31A-03-01 ED-CH01	NA	NA	6 in. Dia. Carbon Steel	Containment pipe	24590-BOF -M6-DEP-00001001
			3 in. Dia. 316L SS	Process pipe	
BOF-DEP-WU-00008-W31A-03-01 ED-CH01	NA	NA	6 in. Dia. Carbon steel	Containment pipe	24590-BOF -M6-DEP-00001001
			3 in. Dia. 316L SS	Process pipe	

Table III.10.E.S – EMF Plant Tank Systems Secondary Containment Systems, including Sumps, Leak Detection Boxes, Drain Lines, and Floor Drains

Sump/Leak Detection Box, or Floor Drain/Line I.D. # and Room #	Maximum Sump/Leak Detection Box Capacity (gallons)	Sump/Leak Detection Box Level Detection Type	Sump, Leak Detection Box or Floor Drain/Line Dimensions (approximate) and Materials of Construction		Piping and Instrumentation Diagram Number
BOF-DVP-GV-00026-W31A-03-01 ED-CH01	NA	NA	6 in. Dia. Carbon steel	Containment pipe	24590-BOF -M6-DEP-00001001
			3 in. Dia. 316L SS	Process pipe	

Table III.10.E.T – EMF Plant Secondary Containment Rooms/Areas

Room/Area	Approximate Room/Area Dimensions (L x W, in feet)	Miscellaneous Treatment Units or Tanks in Room/Area (Largest Plant Item)	Volume of Largest Plant Item in Room/Area (US Gallons)	Minimum Secondary Containment Height (feet)
E-0102 east evaporator process area	62 ft x 94 ft 6 in.	Process condensate lag storage vessel	127,260	4 ft 6 in.
E-0103 west evaporator process area	62 ft x 56 ft 6 in.	Evaporator feed vessel	42,300	3 ft 5 in.
ED-B001 low-point drain vessel area	28 ft x 33 ft	Low-point drain vessel	18,000	4 ft 2 in.
E-0105 evaporator feed vessel area	45 ft 6 in. x 39 ft	Evaporator feed vessel	42,300	5 ft 2 in.
E-0106 process condensate lag storage vessel area	45 ft 6 in. x 84 ft 4 in.	Process condensate lag storage vessel	127,260	6 ft 10 in.

1

1
2
3
4
5

This page intentionally left blank.

- 1 **III.10.F CONTAINMENT BUILDING UNITS**
- 2 **III.10.F.1 Containment Building Units and Storage Limits**
- 3 **III.10.F.1.a** Approved Waste and Storage Limits
- 4 **III.10.F.1.a.i** The Permittees may store and treat, in containment building units listed in Permit
5 Table III.10.F.A, as modified by Permit Condition III.10.F.7.d.iv, all dangerous and
6 mixed waste listed in the Part A Forms, Operating Unit Group 10, Chapter 1 of this
7 Permit, except for those wastes outside the waste acceptance criteria specified in the
8 WAP, Operating Unit Group 10, Chapter 3, as approved pursuant to Permit Condition
9 III.10.C.3. Total dangerous and mixed waste storage at the containment building
10 units will not exceed the sum of the capacities in column 7 of Permit Table III.10.F.A,
11 as modified pursuant to Permit Condition III.10.F.7.d.iv.
- 12 **III.10.F.1.a.ii** The Permittees may place and store dangerous and mixed waste only in the
13 containment building units listed in Permit Table III.10.F.A, as modified pursuant to
14 Permit Condition III.10.F.7.d.iv, in accordance with Permit Condition III.10.F, and in
15 accordance with Operating Unit Group 10, Chapters 1.0 and 4.0, and Operating Unit
16 Group 10, Appendices 8.1, 8.2, 8.4 through 8.10, 8.13, 8.15, 9.1, 9.2, 9.4 through
17 9.10, 9.13, 9.18, 10.1, 10.2, 10.4 through 10.10, 10.13, and 10.18 of this Permit, as
18 approved pursuant to Permit Conditions III.10.F.7.c and III.10.F.7.d. The Permittees
19 will limit the volume of dangerous and mixed waste to quantities specified for the
20 individual areas listed in column 7 of Permit Table III.10.F.A, as modified pursuant to
21 Permit Condition III.10.F.7.d.iv.
- 22 **III.10.F.1.b** The Permittees will manage any ignitable, reactive, or incompatible waste in these units
23 in accordance with [WAC 173-303-395](#)(1). Any containment building units specified in
24 Permit Table III.10.F.A in which ignitable, reactive, or incompatible waste are managed
25 will meet the requirements specified in [WAC 173-303-640](#)(9) and (10), in accordance
26 with [WAC 173-303-680](#)(2).
- 27 **III.10.F.1.c** The Permittees must maintain documentation in the operating record of the description
28 and quantity of dangerous waste in each containment building unit listed in Permit Table
29 III.10.F.A, as modified pursuant to Permit Condition III.10.F.7.d.iv, in accordance with
30 [WAC 173-303-380](#).
- 31 **III.10.F.1.d** The Permittees will ensure all certifications required by specialists (e.g., independent
32 qualified registered professional engineer, etc.) use the following statement or equivalent
33 pursuant to Permit Condition III.10.C.10:
- 34 “I, (Insert Name) have (choose one or more of the following: overseen, supervised,
35 reviewed, and/or certified) a portion of the design or installation of a new containment
36 building unit or component located at (address), and owned/operated by (name(s)). My
37 duties were: (e.g., design engineer, etc.), for the following containment building unit
38 components (e.g., the venting piping, etc.), as required by the Resource Conservation and
39 Recovery Act (RCRA) regulation(s), namely, [40 CFR 264.1101](#)(c)(2) in accordance with
40 [WAC 173-303-695](#)).
- 41 “I certify under penalty of law that I have personally examined and am familiar with the
42 information submitted in this document and all attachments and that, based on my inquiry
43 of those individuals immediately responsible for obtaining the information, I believe that
44 the information is true, accurate, and complete. I am aware that there are significant
45 penalties for submitting false information, including the possibility of fine and
46 imprisonment.”

- 1 **III.10.F.2 Containment Building Unit Design and Construction**
- 2 **III.10.F.2.a** The Permittees will design and construct the containment building units identified in
3 Permit Table III.10.F.A, as modified pursuant to Permit Condition III.10.F.7.d.iv, as
4 specified in Operating Unit Group 10, Appendices 8.1, 8.2, 8.4 through 8.10, 8.13, 8.15,
5 9.1, 9.2, 9.4 through 9.10, 9.13, 9.18, 10.1, 10.2, 10.4 through 10.10, 10.13, and 10.18 of
6 this Permit, as approved in accordance with Permit Condition III.10.F.7.a and
7 [WAC 173-303-695](#).
- 8 **III.10.F.2.b** The Permittees will design and construct all applicable containment building units'
9 secondary containment systems for each unit listed in Permit Table III.10.F.A, as
10 specified in Operating Unit Group 10, Appendices 8.4 through 8.9, 8.15, 9.4 through 9.9,
11 9.18, 10.4 through 10.9, and 10.18 of this Permit, as approved in accordance with Permit
12 Condition III.10.F.7.a and [WAC 173-303-695](#).
- 13 **III.10.F.2.c** Modifications to approved design plans and specifications, in Operating Unit Group 10,
14 Appendices 8.1, 8.2, 8.4 through 8.10, 8.13, 8.15, 9.1, 9.2, 9.4 through 9.10, 9.13, 9.18,
15 10.1, 10.2, 10.4 through 10.10, 10.13, and 10.18 of this permit, for the containment
16 building units will be allowed only in accordance with Permit Conditions III.10.C.2.e and
17 III.10.C.2.f, or III.10.C.2.g, III.10.C.9.d, and III.10.C.9.e.
- 18 **III.10.F.3 Containment Building Unit Management Practices**
- 19 **III.10.F.3.a** The Permittees will manage all dangerous and mixed waste in containment building units
20 in accordance with procedures described in Operating Unit Group 10, Appendices 8.15,
21 9.18, 10.18 and Chapter 4 of this Permit, as approved pursuant to Permit Condition
22 III.10.F.7.d.iv.
- 23 **III.10.F.3.b** The Permittees will follow the description of operating procedures described in Operating
24 Unit Group 10, Appendices 8.15, 9.18, 10.18 and Chapter 4, of this permit, as approved
25 pursuant to Permit Condition III.10.F.7.d.iv and Permit Condition III.10.F.3, and as
26 specified below:
- 27 **III.10.F.3.b.i** Maintain the primary barrier to be free of significant cracks, gaps, corrosion, or other
28 deterioration that could cause dangerous and mixed waste to be released from the
29 primary barrier;
- 30 **III.10.F.3.b.ii** Maintain the level of stored/treated dangerous and mixed waste within the
31 containment building unit walls so that the height of the wall is not exceeded;
- 32 **III.10.F.3.b.iii** Take measures to prevent the tracking of dangerous and mixed waste out of the unit
33 by personnel or by equipment used in handling the waste. An area must be
34 designated to decontaminate equipment and any rinsate must be collected and
35 properly managed;
- 36 **III.10.F.3.b.iv** Maintain the containment building unit at all times to prevent the spread of airborne
37 dangerous and/or mixed waste contamination into less contaminated or
38 uncontaminated areas. All air pollution control devices for exhaust from containment
39 building unit must be properly maintained and operational when storing or treating
40 dangerous and mixed waste in the containment building units;
- 41 **III.10.F.3.b.v** Collect and remove liquids and waste to minimize hydraulic head on the containment
42 system at the earliest practicable time.

- 1 **III.10.F.3.c** The Permittees will inspect the containment building units per requirements in the
 2 Operating Unit Group 10, Appendix 6A of this permit, as approved pursuant to Permit
 3 Condition III.10.C.5, [40 CFR 264.1101\(c\)\(4\)](#), in accordance with [WAC 173-303-695](#) and
 4 [WAC 173-303-320](#) and record in the Facility's operating record, at least once every seven
 5 (7) days, data gathered from monitoring equipment and leak detection equipment as well
 6 as the containment building unit and area immediately surrounding the containment
 7 building unit to detect signs of releases of dangerous and mixed waste.
- 8 **III.10.F.3.d** Throughout the active life of the containment building unit, if the Permittees detects a
 9 condition that could lead to or has caused a release of dangerous and/or mixed waste, the
 10 Permittees must repair the condition promptly, in accordance with the following
 11 procedures:
- 12 **III.10.F.3.d.i** Upon detection of a condition that has led to the release of dangerous and/or mixed
 13 waste (e.g., upon detection of leakage from the primary barrier) the Permittees must:
- 14 A. Enter a record of the discovery in the facility operating record;
 15 B. Immediately remove the portion of the containment building unit affected by
 16 the condition from service;
 17 C. Determine what steps must be taken to repair the containment building unit,
 18 remove any leakage from the secondary collection system, and establish a
 19 schedule for accomplishing the cleanup and repairs; and
 20 D. Within seven (7) days after the discovery of the condition, notify Ecology of
 21 the condition, and within fourteen (14) working days, provide a written
 22 notice to Ecology with a description of the steps taken to repair the
 23 containment building unit, and the schedule for accomplishing the work.
- 24 **III.10.F.3.d.ii** Ecology will review the information submitted, make a determination regarding
 25 whether the containment building unit must be removed from service completely or
 26 partially until repairs and cleanup are complete, and notify the Permittees of the
 27 determination and underlying rationale in writing.
- 28 **III.10.F.3.d.iii** Upon completing all repairs and cleanup the Permittees must notify Ecology in
 29 writing and provide verification, signed by an independent qualified registered
 30 professional engineer, that repairs have been completed according to the written
 31 notice submitted in accordance with Permit Condition III.10.F.3.d.i.D.
- 32 **III.10.F.4 Inspections [\[WAC 173-303-640\(6\)\]](#)**
- 33 **III.10.F.4.a** The Permittees will inspect the containment building units in accordance with the
 34 Inspection Plan in Operating Unit Group 10, Chapter 6 of this Permit, as modified
 35 pursuant to Permit Condition III.10.C.5.c.
- 36 **III.10.F.4.b** The inspection data for the containment building units will be recorded, and the records
 37 will be placed in the WTP Unit operating record, in accordance with Permit Condition
 38 III.10.C.4.
- 39 **III.10.F.5 Recordkeeping [\(WAC 173-303-380\)](#)**
- 40 For the containment building units, the Permittees will record and maintain in the WTP
 41 Unit operating record, all monitoring, calibration, recording, maintenance, test data, and
 42 inspection data compiled under the conditions of this Permit, in accordance with Permit
 43 Conditions III.10.C.4 and III.10.C.5.

- 1 **III.10.F.6 Closure**
- 2 The Permittees will close the containment building units in accordance with Operating
3 Unit Group 10, Chapter 11 of this Permit, as approved pursuant to Permit Condition
4 III.10.C.8.
- 5 **III.10.F.7 Compliance Schedule**
- 6 **III.10.F.7.a** All information identified for submittal to Ecology in Permit Conditions III.10.F.7.b
7 through e of this compliance schedule must be signed in accordance with requirements in
8 [WAC 173-303-810](#)(12), as modified in accordance with Permit Condition III.10.F.1.d
9 [[WAC 173-303-806](#)(4)].
- 10 **III.10.F.7.b** Prior to initial receipt of dangerous and/or mixed waste, the Permittees will submit to
11 Ecology a certification by an independent qualified registered professional engineer that
12 the containment building units design meets the requirements of Permit Conditions
13 III.10.F.1 and III.10.F.2 in accordance with Permit Condition III.10.F.7.a. The
14 certification will also be stored in the WTP Unit operating record. For containment
15 buildings units in Permit Table III.10.F.A, as modified pursuant to Permit Condition
16 III.10.F.7.d.iv, identified as allowed to manage free liquids, the certification will include
17 an additional demonstration that the containment building meets the requirements
18 specified in [40 CFR 264.1101](#)(b), in accordance with [WAC 173-303-695](#).
- 19 **III.10.F.7.c** The Permittees submit to Ecology pursuant to Permit Condition III.10.C.9.f, prior to
20 construction of the containment building unit containment system, and as appropriate,
21 leak detection system for each containment building unit (per level, per WTP Unit
22 building) as identified in Permit Condition III.10.F.1, Permit Tables III.10.F.A,
23 engineering information as specified below, for incorporation, as appropriate, into
24 Operating Unit Group 10, Appendices 8.1, 8.2, 8.3, 8.4 through 8.10, 8.13, 8.15, 9.1, 9.2,
25 9.4 through 9.10, 9.13, 9.18, 10.1, 10.2, 10.4 through 10.10, 10.13, and 10.18 of this
26 Permit. At a minimum, engineering information specified below will show the following
27 as required in accordance with [WAC 173-303-695](#) (the information specified below will
28 include dimensioned engineering drawings showing floors, walls, and ceilings/roof of the
29 containment building units and other information on floor drains and sumps):
- 30 **III.10.F.7.c.i** Design drawings (General Arrangement Drawings in plan) and specifications for the
31 foundation, containment, including liner/coating installation details and leak
32 detection methodology, as appropriate [[40 CFR 264.1101](#)(a)(1) and (b), in accordance
33 with [WAC 173-303-695](#)].
- 34 **III.10.F.7.c.ii** The Permittees provide the design criteria (references to codes and standards, load
35 definitions and load combinations, materials of construction, and analysis/design
36 methodology) and typical design details for the support of the containment system.
37 This information demonstrate the foundation will be capable of providing support to
38 the secondary containment system, resistance to pressure gradients above and below
39 the system, and capable of preventing failure due to settlement, compression, or uplift
40 [[40 CFR 264.1101](#)(a)(2) in accordance with [WAC 173-303-695](#), in accordance with
41 [WAC 173-303-695](#)].
- 42 **III.10.F.7.c.iii** The Permittees provide documentation addressing how coatings will withstand the
43 movement of personnel, waste, and equipment during the operating life of the
44 containment building per [40 CFR 264.1101](#)(a)(2), (a)(4), and (b) in accordance with
45 [WAC 173-303-695](#).

- 1 **III.10.F.7.c.iv** Containment/foundation and, as appropriate, for leak detection systems, materials
2 selection documentation (including, but not limited to, concrete coatings and water
3 stops, and liner materials as applicable [e.g. physical and chemical tolerances])
4 [[40 CFR 264.1101](#)(a)(4) and (b) in accordance with [WAC 173-303-695](#)].
- 5 **III.10.F.7.c.v** A detailed description of how the containment/foundation and, as appropriate, leak
6 detection systems, will be installed.
- 7 **III.10.F.7.c.vi** Submit Permit Tables III.10.F.B and III.10.F.C, completed to provide for all
8 secondary containment sumps and floor drains, the information as specified in each
9 column heading, consistent with the information to be provided in i. through viii.
- 10 **III.10.F.7.c.vii** A detailed description of how fugitive emissions will be controlled such that any
11 openings (e.g., doors, windows, vents, cracks, etc.) exhibit no visible emissions
12 [[40 CFR 264.1101](#)(c)(1)(iv) in accordance with [WAC 173-303-695](#)].
- 13 **III.10.F.7.c.viii** Prior to installation, the Permittees will submit coating vendor information specific to
14 containment buildings for incorporation into the Administrative Record
15 [[40 CFR 264.1101](#)(a)(4) and (b) in accordance with [WAC 173-303-695](#)].
- 16 **III.10.F.7.c.ix** Prior to installation, leak detection system documentation (e.g. vendor information,
17 etc.) consistent with information submitted under i. above, will be submitted for
18 incorporation into the Administrative Record;
- 19 **III.10.F.7.c.x** Prior to installation, the Permittees will submit leak detection system instrumentation
20 control logic narrative description (e.g., descriptions of fail-safe conditions, etc.);
- 21 **III.10.F.7.c.xi** Prior to installation, system descriptions related to leak detection systems will be
22 submitted for incorporation into the Administrative Record;
- 23 **III.10.F.7.c.xii** For leak detection system instrumentation for containment buildings as identified in
24 Permit Tables III.10.F.D, a detailed description of how the leak detection system
25 instrumentation will be installed and tested [[40 CFR 264.1101](#)(b)(3) in accordance
26 with [WAC 173-303-695](#)] will be submitted prior to installation.
- 27 Information pertaining to leak detection systems in Permit Conditions III.10.F.7.c.ix
28 through xii. Will be submitted pursuant to Permit Conditions III.10.E.9.d.vii, viii, x,
29 and xiii.
- 30 **III.10.F.7.d** Prior to initial receipt of dangerous and mixed waste, in the WTP Unit, the Permittees
31 will submit the following, as specified below, for incorporation into Operating Unit
32 Group 10. The information specified below into Operating Unit Group 10, and
33 incorporated pursuant to Permit Condition III.10.C.2.g will be followed:
- 34 **III.10.F.7.d.i** Independent qualified registered professional engineer certification documentation
35 consistent with the information provided in III.10.F.7.b and III.10.F.7.c for
36 incorporation in the Administrative Record. The certification must be maintained in
37 the WTP Unit Operating Record [[40 CFR 264.1101](#)(c)(2)];
- 38 **III.10.F.7.d.ii** Updated Chapter 4, Sections 4D.1, 4E.1, 4F.1, 4H.1, 4I.1, and the figures for
39 containment building units identified in Permit Table III.10.F.A (as modified pursuant
40 to Permit Condition III.10.F.7.d.iv, consistent with Operating Unit Group 10,
41 Appendices 8.1, 8.2, 8.4 through 8.10, 8.13, 8.15, 9.1, 9.2, 9.4 through 9.10, 9.13,
42 9.18, 10.1, 10.2, 10.4 through 10.10, 10.13, and 10.18, as approved pursuant Permit
43 Conditions III.10.F.7.a through d);
- 44 **III.10.F.7.d.iii** Description of operating procedures demonstrating compliance with
45 [40 CFR 264.1101](#)(c) and (d) in accordance with [WAC 173-303-695](#);

- 1 **III.10.F.7.d.iv** Permit Table III.10.F.A, amended as follows:
- 2 A. Under column 1, update and complete list of dangerous and mixed waste
- 3 containment building units including room location and number.
- 4 B. Under column 2, update unit dimensions.
- 5 C. Under column 3, replace the ‘Reserved’ with the Operating Unit Group 10,
- 6 Appendices 8.0, 9.0, and 10.0, subsections specific to containment building
- 7 units as listed in column 1.
- 8 D. Under column 4, update and complete list of narrative description, tables,
- 9 and figures.
- 10 E. Under column 5, replace the ‘Reserved’ to indicate if container storage is
- 11 used in each containment building units (Yes or No) consistent with Permit
- 12 Table III.10.D.A updated pursuant to Permit Condition III.10.D.10.d.
- 13 F. Under column 6, replace the ‘Reserved’ to indicate if tank storage is used in
- 14 each containment building units (Yes or No) consistent with Permit Tables
- 15 III.10.E.A-D, updated pursuant to Permit Condition III.10.E.9.e.vi.
- 16 G. Under column 7, replace the ‘Reserved’ with the maximum operating volume
- 17 for each containment building unit, to include the container storage capacity
- 18 specified in Permit Table III.10.D.A, tank capacity specified in Permit Tables
- 19 III.10.E.A-D and update the total capacity for the containment building units.
- 20 H. Under column 8, update the status of each containment building unit.
- 21 **III.10.F.7.d.v** Permit Table III.10.F.D will be completed for Containment Building leak detection
- 22 system instrumentation and parameters to provide the information as specified in
- 23 each column heading. Leak detection system monitors and instruments for critical
- 24 systems as specified in Operating Unit Group 10, Appendix 2.0 and as updated
- 25 pursuant to Permit Condition III.10.C.9.b will be addressed.
- 26 **III.10.F.7.e** All information provided under Permit Condition III.10.F.7.d must be consistent with
- 27 information provided pursuant to Permit Conditions III.10.F.7.a through d, as approved
- 28 by Ecology.

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units ^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas ^b	Tank Systems ^c	Containment Building Capacity (cu ft)	Manage Free Liquids
Pretreatment Plant							
P-0123 Pretreatment Hotcell Containment Building	350 x 51 x 52	RESERVED	Section 4D.3.1; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
Pretreatment Maintenance Containment Building							
PM0124 Hotcell Crane Maintenance Mezzanine	27 x 51 x 33	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0121A Spent Resin Dewatering	28 x 18 x 28	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0122A Waste Packaging Area	26 x 51 x 28	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0123A Remote Decontamination Maintenance Cell	55 x 51 x 52	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0124 C3 Workshop	(24 x 24 x 16) + (34 x 24 x 15)	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas^b	Tank Systems^c	Containment Building Capacity (cu ft)	Manage Free Liquids
P-0124A C3 Workshop	(73 + 15 × 15) + (16 × 15 + 15)	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0125 Cask Lidding Airlock & Equipment Chase	24 × 20 × 28	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0125A Cask Lidding Room	28 × 18 × 25	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0128A MSM Repair Area	24 × 18 × 28	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0128 MSM Testing Room	24 × 17 × 27	RESERVED	Section 4D.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0223 Spent Filter Drum Handling Area Containment Building	54 x 18 x 26	RESERVED	Section 4D.3.3; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
P-0335 Filter Cave Containment Building	198 x 51 x 52	RESERVED	Section 4D.3.4; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas^b	Tank Systems^c	Containment Building Capacity (cu ft)	Manage Free Liquids
P-0431A General Filter Rm	RESERVED	RESERVED	Section 4D.3.5; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
LAW Vitrification Plant							
L-0112 LAW LSM Gallery Containment Building	150 x 62 x 24	RESERVED	Section 4E.3.1; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	Yes
LAW Container Finishing Containment Building		RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
L-0109B Swabbing Area Line 2	21 x 15 x 24	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-0109C Decontamination Area Line 2	18 x 15 x 24	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-0109D Inert Fill Area Line 2	55 x 15 x 24	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas^b	Tank Systems^c	Containment Building Capacity (cu ft)	Manage Free Liquids
L-0115B Swabbing Area Line 1	21 × 15 × 24	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-0115C Decontamination Area Line 1	18 × 15 × 24	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-0115D Inert Fill Area Line 1	55 × 15 × 24	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-0109E Container/Monitoring/Export Area	19 × 18 × 14	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-0115E Container/Monitoring/Export Area	19 × 18 × 14	RESERVED	Section 4E.3.2; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-0119B LAW Consumable Import/Export Containment Building	30 x 28 x 17	RESERVED	Section 4E.3.3; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	Yes
L-226A LAW C3 Workshop Containment Building	34 x 22 x 19	RESERVED	Section 4E.3.4; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas^b	Tank Systems^c	Containment Building Capacity (cu ft)	Manage Free Liquids
LAW Pour Cave Containment Building		RESERVED	Section 4E.3.5; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-B015A Melter 1 Pour Cave	16.5 × 20 x 23	RESERVED	Section 4E.3.5; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-B013C Melter 1 Pour Cave	16.5 × 20 x 23	RESERVED	Section 4E.3.5; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-B013B Melter 2 Pour Cave	16.5 × 20 x 23	RESERVED	Section 4E.3.5; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-B011C Melter 2 Pour Cave	16.5 × 20 x 23	RESERVED	Section 4E.3.5; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-B011B Future Melter 3 Pour Cave	16.5 × 20 x 23	RESERVED	Section 4E.3.5; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units ^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas ^b	Tank Systems ^c	Containment Building Capacity (cu ft)	Manage Free Liquids
L-B009B Future Melter 3 Pour Cave	16.5 x 20 x 23	RESERVED	Section 4E.3.5; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
LAW Buffer Container Containment Building		RESERVED	Section 4E.3.6; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-B025C Container Buffer Store	22 x 22 x 23	RESERVED	Section 4E.3.6; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
L-B025D Container Rework	22 x 14 x 23	RESERVED	Section 4E.3.6; Table 4E-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
HLW Vitrification Plant							
HLW Melter Cave 1 Containment Building: H-0117 Melter Cave 1 H-0116B Melter Cave 1 C3/C5 Airlock H-0310A Melter Cave 1 Equipment Decon Pit	75 x 32 x 54 24 x 25 x 54 20 x 9 x 10	RESERVED	Section 4F.3.1; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units ^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas ^b	Tank Systems ^c	Containment Building Capacity (cu ft)	Manage Free Liquids
HLW Melter Cave 2 Containment Building: H-0106 Melter Cave 2 H-0105B Melter Cave 2 C3/C5 Airlock H-0304A Melter Cave 2 Equipment Decon Pit	75 x 32 x 54 24 x 25 x 54 20 x 9 x 10	RESERVED	Section 4F.3.1; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
H-0136 IHLW Canister Handling Cave Containment Building	18 x 140 x 54	RESERVED	Section 4F.3.2; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
H-0133 IHLW Canister Swab and Monitoring Cave Containment Building	41 x 11 x 54	RESERVED	Section 4F.3.3; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
HLW C3 Workshop Containment Building: H-0311A C3 Workshop H-0311B MSM Maintenance Workshop	19 x 30 x 22 58 x 69 x 22	RESERVED	Section 4F.3.4; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
H-0104 HLW Filter Cave Containment Building	105 x 36 x 36	RESERVED	Section 4F.3.5; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No

Table III.10.F.A – Containment Building Unit Description

Mixed Waste Containment Building Units^a & Systems	Dimensions (L x W x H) (in feet)	Unit Description	Narrative Description and Figures	Container Storage Areas^b	Tank Systems^c	Containment Building Capacity (cu ft)	Manage Free Liquids
H-B032 HLW Pour Tunnel 1 Containment Building	85 x 11 x 30	RESERVED	Section 4F.3.6; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
H-B005A HLW Pour Tunnel 2 Containment Building	85 x 11 x 30	RESERVED	Section 4F.3.6; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	No
HLW Waste Handling Area Containment Building: H-0410B E&I Room H-0411 Waste Handling Room	17 x 20 x 10 25 x 54 x 10	RESERVED	Section 4F.3.8; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED
HLW Drum Swabbing and Monitoring Area: H-0126A Crane Maintenance Room H-0126B Swabbing and Monitoring Room H-028 Cask Import/Export Room	15 x 20 x 31 30 x 18 x 31 15 x 45 x 43	RESERVED	Section 4F.3.7; Table 4D-5; and Fig. 4A-59 (Sheets 1-2) of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED	RESERVED	RESERVED	RESERVED

^a Containment Building Units include associated process systems and equipment.

^b Requirements pertaining to the containers in the Containment Building Units are specified in Section III.10.D of this Permit.

^c Requirements pertaining to the tanks in the Containment Building Units are specified in Section III.10.E of this Permit.

Table III.10.F.B – Containment Building Primary^a Containment Sump Systems

Sump I.D. # & Room Location	Maximum Capacity (gallons)	Dimensions^b (feet) & Materials of Construction	Maximum Allowable Liquid Height (inches)	Secondary Containment Volume (gallons)	Unit Description Drawings
PWD-SUMP-00026 P-0123 (El. 0')	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
PWD-SUMP-00028 P-0123 (El. 0')	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
PWD-SUMP-00029 P-0123 (El. 0')	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
PWD-SUMP-00032 P-0123A	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
PWD-SUMP-00033 P-0123A (El. 0')	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Primary sumps are defined in Permit Section III.10.C, and must comply with dangerous waste tank system requirements for tanks as described in [WAC-173-303-640](#).

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

1

Table III.10.F.C – Containment Building Secondary Containment Systems Including Sumps and Floor Drains

Sump or Drain Line I.D. # & Room Location	Maximum Sump (gallons) or Drain Line (gallons per minute) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawing Nos., Specifications No.'s, etc.)
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

2

Table III.10.F.D – Containment Building Leak Detection System Instrumentation and Parameters

Containment Building Locator and Name (including P&ID)	Type of Leak Detection Instrument	Location of Leak Detection Instrument (Tag No.)	Leak Detection Instrument Range	Expected Range	Fail States	Leak Detection Instrument Accuracy	Leak Detection Instrument Calibration Method No. and Range
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Locator (including P&ID designator) is located on Permit Table III.10.F.C – Containment Building Secondary Containment Systems Including Sumps and Floor Drains.

1 **III.10.G PRETREATMENT PLANT MISCELLANEOUS UNIT SYSTEMS**

2 Unless otherwise noted in Permit Table III.10.G.A, for purposes of Permit Section
 3 III.10.G, where reference is made to [WAC 173-303-640](#), the following substitutions
 4 apply: substitute the terms “Pretreatment Plant Miscellaneous Unit System(s)” for “tank
 5 system(s),” “miscellaneous unit(s)” for “tank(s),” “equipment” for “ancillary equipment,”
 6 and “miscellaneous unit(s) or equipment of a Pretreatment Plant Miscellaneous Unit
 7 System” for “component(s)” in accordance with [WAC 173-303-680](#). Miscellaneous unit
 8 systems, exempt from the [WAC-173-303-640](#) requirements in Permit Section III.10.G are
 9 noted as exempt in Permit Table III.10.G.A.

10 **III.10.G.1 Waste and Storage Limits**

11 **III.10.G.1.a** The Permittees may process, in the Pretreatment Plant Miscellaneous Unit Systems listed
 12 in Permit Table III.10.G.A, as approved/modified pursuant to Permit Condition
 13 III.10.G.10, all dangerous and mixed waste listed in the Part A Forms, Operating Unit
 14 Group 10, Chapter 1 of this Permit, and in accordance with in the WAP, Operating Unit
 15 Group 10, Chapter 3 of this Permit, as approved pursuant to Permit Condition III.10.C.3.
 16 Total Pretreatment Plant Miscellaneous Unit dangerous and mixed waste storage at the
 17 Facility will not exceed the limits specified in Permit Table III.10.G.A.

18 **III.10.G.1.b** The Permittees may process dangerous and mixed waste only in approved Pretreatment
 19 Plant Miscellaneous Unit Systems listed in Permit Table III.10.G.A in accordance with
 20 Permit Section III.10.G and in accordance with Operating Unit Group 10, Chapters 1.0
 21 and 4.0 of this Permit, and Operating Unit Group 10, Appendices 8.1 through 8.15 of this
 22 Permit, as approved pursuant to Permit Conditions III.10.G.10.b through e. The
 23 Permittees will limit the total volume of wastes to quantities specified for the individual
 24 miscellaneous units listed in Permit Table III.10.G.A.

25 **III.10.G.1.c** The Permittees will manage ignitable and reactive, and incompatible waste in accordance
 26 with [WAC 173-303-395](#)(1). Any Pretreatment Plant Miscellaneous Unit System
 27 specified in Permit Tables III.10.G.A and III.10.G.B in which ignitable, reactive or
 28 incompatible waste are managed will meet the requirements specified in [WAC 173-303-](#)
 29 [640](#)(9) and (10), in accordance to [WAC 173-303-680](#).

30 **III.10.G.1.d** The Permittees will ensure all certifications required by specialists (e.g., independent
 31 qualified registered professional engineer; independent corrosion expert; independent
 32 qualified installation inspector; etc.) use the following statement or equivalent pursuant to
 33 Permit Condition III.10.C.10:

34 “I, (Insert Name) have (choose one or more of the following: overseen, supervised,
 35 reviewed, and/or certified) a portion of the design or installation of a new miscellaneous
 36 unit system or component located at (address), and owned/operated by (name(s)). My
 37 duties were: (e.g., installation inspector, testing for tightness, etc.), for the following
 38 miscellaneous unit system components (e.g., the venting piping, etc.), as required by the
 39 Dangerous Waste Regulations, namely, [WAC 173-303-640](#)(3) (applicable paragraphs
 40 (i.e., (a) through (g)) in accordance with [WAC 173-303-680](#)).

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

- 1 **III.10.G.1.e** In all future narrative permit submittals, the Permittees will include miscellaneous unit
2 system names with the unit designation (e.g., Waste Feed Evaporator Separator Vessels
3 are designated V11002A and V11002B, respectively).
- 4 **III.10.G.2** **Miscellaneous Unit Systems Design and Construction** [[WAC 173-303-640](#), in
5 accordance with [WAC 173-303-680\(2\)](#) and [WAC 173-303-340](#)].
- 6 **III.10.G.2.a** The Permittees will construct the Pretreatment Plant Miscellaneous Unit Systems
7 identified in Permit Table III.10.G.A, as specified in Operating Unit Group 10,
8 Appendices 8.1 through 8.14 of this Permit, as approved pursuant to Permit Conditions
9 III.10.G.10.b, III.10.G.10.c, and III.10.G.10.d.
- 10 **III.10.G.2.b** The Permittees will construct secondary containment systems for the Pretreatment Plant
11 Miscellaneous Unit Systems identified in Permit Tables III.10.G.A and III.10.G.B, as
12 specified in Operating Unit Group 10, Appendices 8.2, 8.4 through 8.14 of this Permit, as
13 approved pursuant to Permit Conditions III.10.G.10.b, III.10.G.10.c, and III.10.G.10.d.
- 14 **III.10.G.2.c** Modifications to approved design, plans, and specifications in Operating Unit Group 10
15 of this Permit for the Pretreatment Plant Miscellaneous Unit Systems will be allowed
16 only in accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g, III.10.C.9.d,
17 e, and h.
- 18 **III.10.G.3** **Miscellaneous Unit System Installation and Certification** [[WAC 173-303-640](#),
19 in accordance with [WAC 173-303-680\(2\)](#) and (3), and [WAC 173-303-340](#)].
- 20 **III.10.G.3.a** The Permittees must ensure that proper handling procedures are adhered to in order to
21 prevent damage to Pretreatment Plant Miscellaneous Unit Systems during installation.
22 Prior to covering, enclosing, or placing a new Pretreatment Plant Miscellaneous Unit
23 System(s) or component(s) in use, an independent qualified installation inspector or an
24 independent qualified registered professional engineer, either of whom is trained and
25 experienced in the proper installation of similar systems or components, must inspect the
26 system for the presence of any of the following items:
- 27 **III.10.G.3.a.i** Weld breaks;
- 28 **III.10.G.3.a.ii** Punctures;
- 29 **III.10.G.3.a.iii** Scrapes of protective coatings;
- 30 **III.10.G.3.a.iv** Cracks;
- 31 **III.10.G.3.a.v** Corrosion;
- 32 **III.10.G.3.a.vi** Other structural damage or inadequate construction/installation;
- 33 **III.10.G.3.a.vii** All discrepancies must be remedied before the Pretreatment Plant Miscellaneous Unit
34 Systems are covered, enclosed, or placed in use [[WAC 173-303-640\(3\)\(c\)](#) in
35 accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 36 **III.10.G.3.b** For Pretreatment Plant Miscellaneous Unit Systems or components that are placed
37 underground and that are back-filled, the Permittees must provide a backfill material that
38 is a non-corrosive, porous, homogeneous substance. The backfill must be installed so
39 that it is placed completely around the miscellaneous unit and compacted to ensure that
40 the miscellaneous unit and piping are fully and uniformly supported [[WAC 173-303-](#)
41 [640\(3\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#) and (3)].

- 1 **III.10.G.3.c** The Permittees must test for tightness all new Pretreatment Plant Miscellaneous Units
2 and equipment, prior to being covered, enclosed, or placed into use. If the Pretreatment
3 Plant Miscellaneous Unit Systems are found not to be tight, all repairs necessary to
4 remedy the leak(s) in the system must be performed prior to the Pretreatment Plant
5 Miscellaneous Units Systems being covered, enclosed, or placed in use [[WAC 173-303-
640\(3\)\(e\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 7 **III.10.G.3.d** The Permittees must ensure Pretreatment Plant Miscellaneous Unit Systems equipment is
8 supported and protected against physical damage and excessive stress due to settlement,
9 vibration, expansion, or contraction [[WAC 173-303-640\(3\)\(f\)](#)], in accordance with
10 [WAC 173-303-680\(2\)](#) and (3)].
- 11 **III.10.G.3.e** The Permittees must provide the type and degree of corrosion protection recommended
12 by an independent corrosion expert, based on the information provided in Operating Unit
13 Group 10, Appendices 8.9 and 8.11 as approved pursuant to Permit Conditions
14 III.10.G.10.b.i, III.10.G.10.b.iv, III.10.G.10.b.v, III.10.G.10.c.i, III.10.G.10.c.iv,
15 III.10.G.10.c.v, and III.10.G.10.d.i, III.10.G.10.d.iv, III.10.G.10.d.v, or other corrosion
16 protection if Ecology believes other corrosion protection is necessary to ensure the
17 integrity of the Pretreatment Plant Miscellaneous Unit Systems during use of the
18 Pretreatment Plant Miscellaneous Unit Systems. The installation of a corrosion
19 protection system that is field fabricated must be supervised by an independent corrosion
20 expert to ensure proper installation [[WAC 173-303-640\(3\)\(g\)](#)], in accordance with
21 [WAC 173-303-680\(2\)](#) and (3)].
- 22 **III.10.G.3.f** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
23 will obtain, and keep on file in the WTP Unit operating record, written statements by
24 those persons required to certify the design of the Pretreatment Plant Miscellaneous Unit
25 Systems and supervise the installation of the Pretreatment Plant Miscellaneous Unit
26 Systems, as specified in [WAC 173-303-640\(3\)\(b\)](#), (c), (d), (e), (f), and (g), in accordance
27 with [WAC 173-303-680](#), attesting that each Pretreatment Plant Miscellaneous Unit
28 System and corresponding containment system listed in Permit Tables III.10.G.A and
29 III.10.G.B, as approved/modified pursuant to Permit Condition III.10.G.10, were
30 properly designed and installed, and that repairs, in accordance with [WAC 173-303-
31 640\(3\)\(c\)](#) and (e), were performed [[WAC 173-303-640\(3\)\(a\)](#), [WAC 173-303-640\(3\)\(h\)](#)], in
32 accordance with [WAC 173-303-680\(3\)](#)].
- 33 **III.10.G.3.g** The independent Pretreatment Plant Miscellaneous Unit System installation inspection
34 and subsequent written statements will be certified in accordance with [WAC 173-303-
35 810\(13\)\(a\)](#) as modified pursuant to Permit Condition III.10.G.1.d, comply with all
36 requirements of [WAC 173-303-640\(3\)\(h\)](#), in accordance with [WAC 173-303-680](#), and
37 will consider, but not be limited to, the following miscellaneous unit system installation
38 documentation:
- 39 **III.10.G.3.g.i** Field installation report with date of installation;
- 40 **III.10.G.3.g.ii** Approved welding procedures;
- 41 **III.10.G.3.g.iii** Welder qualifications and certification;
- 42 **III.10.G.3.g.iv** Hydro-test reports, as applicable, in accordance with the American Society of
43 Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Division 1,
44 American Petroleum Institute (API) Standard 620, or Standard 650 as applicable;
- 45 **III.10.G.3.g.v** Tester credentials;
- 46 **III.10.G.3.g.vi** Field inspector credentials;

- 1 **III.10.G.3.g.vii** Field inspector reports;
- 2 **III.10.G.3.g.viii** Field waiver reports; and
- 3 **III.10.G.3.g.ix** Non-compliance reports and corrective action (including field waiver reports) and
4 repair reports.
- 5 **III.10.G.4 Integrity Assessments** [[WAC 173-303-340](#) and [WAC 173-303-640](#), in
6 accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 7 **III.10.G.4.a** The Permittees will ensure periodic integrity assessments are conducted on the
8 Pretreatment Plant Miscellaneous Unit Systems listed in Permit Table III.10.G.A, as
9 approved/modified pursuant to Permit Condition III.10.G.10, over the term of this Permit
10 in accordance with [WAC 173-303-680\(2\)](#) and (3) as specified in [WAC 173-303-](#)
11 [640\(3\)\(b\)](#), following the description of the integrity assessment program and schedule in
12 Operating Unit Group 10, Addendum E of this Permit, as approved pursuant to Permit
13 Conditions III.10.G.10.e.i and III.10.C.5.c. Results of the integrity assessments will be
14 included in the WTP Unit operating record until ten (10) years after post-closure, or
15 corrective action is complete and certified, whichever is later.
- 16 **III.10.G.4.b** The Permittees will address problems detected during Pretreatment Plant Miscellaneous
17 Unit Systems integrity assessments specified in Permit Condition III.10.G.4.a following
18 the integrity assessment program in Operating Unit Group 10, Addendum E of this
19 Permit, as approved pursuant to Permit Conditions III.10.G.10.e.i and III.10.C.5.c.
- 20 **III.10.G.4.c** The Permittees must immediately and safely remove from service any Pretreatment Plant
21 Miscellaneous Unit System or secondary containment system which through an integrity
22 assessment is found to be “unfit for use” as defined in [WAC 173-303-040](#), following
23 Permit Condition III.10.G.5.j.i through iv, and vi. The affected Pretreatment Plant
24 Miscellaneous Unit or secondary containment system must be either repaired or closed in
25 accordance with Permit Condition III.10.G.5.j.v [[WAC 173-303-640\(7\)\(e\)](#) and (f) and
26 [WAC 173-303-640\(8\)](#)], in accordance with [WAC 173-303-680\(3\)](#)].
- 27 **III.10.G.5 Miscellaneous Unit Management Practices**
- 28 **III.10.G.5.a** No dangerous and/or mixed waste will be managed in the Pretreatment Plant
29 Miscellaneous Unit Systems unless the operating conditions, specified under Permit
30 Condition III.10.G.5, are complied with.
- 31 **III.10.G.5.b** The Permittees will install and test all process and leak detection system
32 monitoring/instrumentation, as specified in Permit Table III.10.G.C, as
33 approved/modified pursuant to Permit Condition III.10.G.10, in accordance with
34 Operating Unit Group 10, Appendices 8.1, 8.2, and 8.14 of this Permit, as approved
35 pursuant to Permit Condition III.10.G.10.d.x.
- 36 **III.10.G.5.c** The Permittees will not place dangerous and/or mixed waste, treatment reagents, or other
37 materials in the Pretreatment Plant Miscellaneous Unit Systems if these substances could
38 cause the systems to rupture, leak, corrode, or otherwise fail [[WAC 173-303-640\(5\)\(a\)](#)], in
39 accordance with [WAC 173-303-680\(2\)](#)].
- 40 **III.10.G.5.d** The Permittees will operate the Pretreatment Plant Miscellaneous Unit Systems to
41 prevent spills and overflows using the description of controls and practices, as required
42 under [WAC 173-303-640\(5\)\(b\)](#), described in Permit Condition III.10.C.5, and Operating
43 Unit Group 10, Appendix 8.18 of this Permit, as approved pursuant to Permit Condition
44 III.10.G.10.e.iv [[WAC 173-303-640\(5\)\(b\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and
45 (3) and [WAC 173-303-806\(4\)\(c\)\(ix\)](#)].

- 1 **III.10.G.5.e** For routinely non-accessible Pretreatment Plant Miscellaneous Unit Systems, as specified
2 in Operating Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit
3 Condition III.10.G.10.e.vi, the Permittees will mark all routinely non-accessible
4 Pretreatment Plant Miscellaneous Unit System access points with labels or signs to
5 identify the waste contained in the units. The label, or sign, must be legible at a distance
6 of at least fifty (50) feet and must bear a legend which identifies the waste in a manner
7 which adequately warns employees, emergency response personnel, and the public of the
8 major risk(s) associated with the waste being stored or treated in the miscellaneous unit
9 system(s). For the purposes of this Permit condition, “routinely non-accessible” means
10 personnel are unable to enter these areas while waste is being managed in them
11 [[WAC 173-303-640\(5\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#)].
- 12 **III.10.G.5.f** For all Pretreatment Plant Miscellaneous Unit Systems not addressed in Permit Condition
13 III.10.G.5.e, the Permittees will mark all these miscellaneous unit systems holding
14 dangerous and/or mixed waste with labels or signs to identify the waste contained in the
15 unit. The labels, or sign, must be legible at a distance of at least fifty (50) feet, and must
16 bear a legend which identifies the waste in a manner which adequately warns employees,
17 emergency response personnel, and the public of the major risk(s) associated with the
18 waste being stored or treated in the miscellaneous unit system(s) [[WAC 173-303-](#)
19 [640\(5\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#)].
- 20 **III.10.G.5.g** The Permittees will ensure that the secondary containment systems for Pretreatment Plant
21 Miscellaneous Unit Systems listed in Permit Tables III.10.G.A and III.10.G.B, as
22 approved/modified pursuant to Permit Condition III.10.G.10, are free of cracks or gaps to
23 prevent any migration of dangerous and/or mixed waste or accumulated liquid out of the
24 system to the soil, ground water, or surface water at any time waste is in the Pretreatment
25 Plant Miscellaneous Units System. Any indication that a crack or gap may exist in the
26 containment systems will be investigated and repaired in accordance with Operating Unit
27 Group 10, Appendix 8.18 of this Permit, as approved pursuant to Permit Condition
28 III.10.G.10.e.v [[WAC 173-303-640\(4\)\(b\)\(i\)](#), [WAC 173-303-640\(4\)\(e\)\(i\)\(C\)](#), and
29 [WAC 173-303-640\(6\)](#) in accordance with [WAC 173-303-680\(2\)](#) and (3), [WAC 173-303-](#)
30 [806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-320](#)].
- 31 **III.10.G.5.i** An impermeable coating, as specified in Operating Unit Group 10, Appendices 8.4,
32 8.5,8.7, 8.9, 8.11, and 8.12 of this Permit, as approved pursuant to Permit Condition
33 III.10.G.10.b.v of this Permit, will be maintained for all concrete containment systems
34 and concrete portions of containment systems for each Pretreatment Plant Miscellaneous
35 Unit System listed in Permit Tables III.10.G.A and III.10.G.B, as approved/modified
36 pursuant to Permit Condition III.10.G.10 [concrete containment systems that do not have
37 a liner pursuant to [WAC-173-303-640\(4\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680\(2\)](#),
38 and have construction joints, will meet the requirements of [WAC 173-303-](#)
39 [640\(4\)\(e\)\(ii\)\(C\)](#), in accordance with [WAC 173-303-680\(2\)](#)]. The coating will prevent
40 migration of any dangerous and mixed waste into the concrete. All coatings will meet the
41 following performance standards:
- 42 **III.10.G.5.i.i** The coating must seal the containment surface such that no cracks, seams, or other
43 avenues through which liquid could migrate are present;
- 44 **III.10.G.5.i.ii** The coating must be of adequate thickness and strength to withstand the normal operation
45 of equipment and personnel within the given area such that degradation or physical
46 damage to the coating or lining can be identified and remedied before dangerous and
47 mixed waste could migrate from the system; and

- 1 **III.10.G.5.i.iii** The coating must be compatible with the dangerous and mixed waste, treatment reagents,
2 or other materials managed in the containment system [[WAC 173-303-640\(4\)\(e\)\(ii\)\(D\)](#)],
3 in accordance with [WAC 173-303-680\(2\)](#) and (3) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)].
- 4 **III.10.G.5.j** The Permittees will inspect all secondary containment systems for the Pretreatment Plant
5 Miscellaneous Unit Systems listed in Permit Tables III.10.G.A and III.10.G.B, as
6 approved/modified pursuant to Permit Condition III.10.G.10, in accordance with the
7 Inspection Plan specified in Operating Unit Group 10, Chapter 6 of this Permit, as
8 approved pursuant to Permit Conditions III.10.G.10.e.i and III.10.C.5.c, and take the
9 following actions if a leak or spill of dangerous and/or mixed waste is detected in these
10 containment systems [[WAC 173-303-640\(5\)\(c\)](#) and [WAC 173-303-640\(6\)](#)], in accordance
11 with [WAC 173-303-680\(2\)](#) and (3), [WAC 173-303-320](#), and [WAC 173-303-](#)
12 [806\(4\)\(i\)\(i\)\(B\)](#)]:
- 13 **III.10.G.5.j.i** Immediately and safely stop the flow of dangerous and/or mixed waste into the
14 miscellaneous unit system or secondary containment system;
- 15 **III.10.G.5.j.ii** Determine the source of the dangerous and/or mixed waste;
- 16 **III.10.G.5.j.iii** Remove the waste from the containment area in accordance with [WAC 173-303-680\(2\)](#)
17 and (3), as specified in [WAC 173-303-640\(7\)\(b\)](#). The dangerous and/or mixed waste
18 removed from containment areas of miscellaneous unit systems will be, as a minimum,
19 managed as dangerous and/or mixed waste;
- 20 **III.10.G.5.j.iv** If the cause of the release was a spill that has not damaged the integrity of the
21 miscellaneous unit system, the Permittees may return the miscellaneous unit system to
22 service in accordance with [WAC 173-303-680\(2\)](#) and (3), as specified in [WAC 173-303-](#)
23 [640\(7\)\(e\)\(ii\)](#). In such a case, the Permittees will take action to ensure the incident that
24 caused liquid to enter the containment system will not reoccur [[WAC 173-303-320\(3\)](#)];
- 25 **III.10.G.5.j.v** If the source of the dangerous and/or mixed waste is determined to be a leak from the
26 primary Pretreatment Plant Miscellaneous Unit System into the secondary containment
27 system, or the system is unfit for use as determined through an integrity assessment or
28 other inspection, the Permittees must comply with the requirements of [WAC 173-303-](#)
29 [640\(7\)](#), and take the following actions:
- 30 A Close the miscellaneous unit following procedures in [WAC 173-303-640\(7\)\(e\)\(i\)](#)
31 and in accordance with [WAC 173-303-680](#), and Operating Unit Group 10,
32 Chapter 11 of this Permit, as approved pursuant to Permit Condition III.10.C.8;
33 or
- 34 B. Repair and re-certify (in accordance with [WAC 173-303-810\(13\)\(a\)](#), as modified
35 pursuant to Permit Condition III.10.G.1.d) the Pretreatment Plant Miscellaneous
36 Unit System in accordance with Operating Unit Group 10, Appendix 8.18 of this
37 Permit, as approved pursuant to Permit Condition III.10.G.10.e.v before the
38 Pretreatment Plant Miscellaneous Unit System is placed back into service
39 [[WAC 173-303-640\(7\)\(e\)\(iii\)](#) and [WAC 173-303-640\(7\)\(f\)](#)], in accordance with
40 [WAC 173-303-680](#)].
- 41 **III.10.G.5.j.vi** The Permittees will document, in the operating record, actions/procedures taken to
42 comply with i. through v. above, as specified in [WAC 173-303-640\(6\)\(d\)](#) and in
43 accordance with [WAC 173-303-680\(2\)](#) and (3).
- 44 **III.10.G.5.j.vii** In accordance with [WAC 173-303-680\(2\)](#) and (3), the Permittees will notify and report
45 releases to the environment to Ecology as specified in [WAC 173-303-640\(7\)\(d\)](#).

- 1 **III.10.G.5.k** If liquids (e.g., Dangerous and/or mixed waste leaks and spills, precipitation, fire water,
2 liquids from damaged or broken pipes) cannot be removed from the secondary
3 containment system within twenty-four (24) hours, Ecology will be verbally notified
4 within twenty-four (24) hours of discovery. The notification will provide the information
5 in A., B., and C. listed below. The Permittees will provide Ecology with a written
6 demonstration, within seven (7) business days, identifying at a minimum [[WAC 173-303-
7 640\(4\)\(c\)\(iv\)](#) and [WAC 173-303-640\(7\)\(b\)\(ii\)](#)], in accordance with [WAC 173-303-680\(3\)](#)
8 and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)]:
- 9 A. Reasons for delayed removal.
- 10 B. Measures implemented to ensure continued protection of human health and the
11 environment.
- 12 C. Current actions being taken to remove liquids from secondary containment.
- 13 **III.10.G.5.l** The Permittees will operate the Pretreatment Plant Miscellaneous Unit Systems in
14 accordance with Operating Unit Group 10, Chapter 4 as updated pursuant to Permit
15 Condition III.10.G.10.e.vi and Appendix 8.18 of this Permit, as approved pursuant to
16 Permit Condition III.10.G.10.e, and the following:
- 17 **III.10.G.5.l.i** The Permittees will operate the Pretreatment Plant Miscellaneous Unit Systems in order
18 to maintain the systems and process parameters listed in Permit Table III.10.G.C as
19 approved/modified pursuant to Permit Condition III.10.G.10, within the operating trips
20 and operating ranges specified in Permit Table III.10.G.C, and consistent with
21 assumptions and basis which are reflected in Operating Unit Group 10, Appendix 6.3, as
22 approved pursuant to Permit Condition III.10.C.11.b [[WAC 173-303-815\(2\)\(b\)\(ii\)](#) and
23 [WAC 173-303-680\(2\)](#) and (3)]. For the purposes of this Permit Condition, Operating
24 Unit Group 10, Appendix 6.3. will be superseded by Appendix 6.4. upon its approval
25 pursuant to either Permit Conditions III.10.C.11.c or III.10.C.11.d.
- 26 **III.10.G.5.l.ii** The Permittees will calibrate/function test the instruments listed in Permit Table
27 III.10.G.C, in accordance with Operating Unit Group 10, Appendix 8.18, as approved
28 pursuant to Permit Condition III.10.G.10.e.xii.
- 29 **III.10.G.5.m** For any portion of the Pretreatment Plant Miscellaneous Unit Systems which have the
30 potential for formation and accumulation of hydrogen gases, the Permittees will operate
31 the portion to maintain hydrogen levels below the lower explosive limit [[WAC 173-303-
32 815\(2\)\(b\)\(ii\)](#)].
- 33 **III.10.G.5.n** For each miscellaneous unit holding dangerous waste which are acutely or chronically
34 toxic by inhalation, the Permittees will operate the system to prevent escape of vapors,
35 fumes, or other emissions into the air [[WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#) and [WAC 173-303-
36 640\(5\)\(e\)](#)], in accordance with [WAC 173-303-680](#)].
- 37 **III.10.G.6 Air Emissions**
- 38 **III.10.G.6.a** Treatment effectiveness, feed-rates, and operating rates for dangerous and mixed waste
39 systems and sub-systems contained in the Pretreatment Plant (as specified in Permit
40 Tables III.10.E.A, III.10.F.A, and III.10.G.A, as approved/modified pursuant to Permit
41 Conditions III.10.E.9, III.10.F.5, III.10.G.10, respectively) will be as specified in Permit
42 Sections III.10.E, III.10.F, and III.10.G, and consistent with the assumptions and basis
43 reflected in Operating Unit Group 10, Appendix 6.3 of this Permit, as approved pursuant
44 to Permit Condition III.10.C.11.b. For the purposes of this permit condition, Operating
45 Unit Group 10, Appendix 6.3 will be superseded by Appendix 6.4, upon its approval,

- 1 pursuant to either Permit Condition III.10.C.11.c or III.10.C.11.d [[WAC 173-303-680](#)(2)
2 and (3), and [WAC 173-303-815](#)(2)(b)(ii)].
- 3 **III.10.G.6.b** Compliance with Permit Condition III.10.G.6.a of this Permit will be regarded as
4 operating within the emission limits specified in Permit Table III.10.G.D, as approved
5 pursuant to Permit Conditions III.10.C.11.b, III.10.C.11.c, or III.10.C.11.d of this Permit.
- 6 **III.10.G.6.c** All air pollution control devices and capture systems in the Pretreatment Plant
7 Miscellaneous Unit Systems will be maintained and operated at all times in a manner so
8 as to minimize the emissions of air contaminants and to minimize process upsets.
9 Procedures for ensuring that the above equipment is properly operated and maintained so
10 as to minimize the emission of air contaminants and process upsets will be established.
- 11 **III.10.G.6.d** The Permittees will ensure that for all dangerous and/or mixed waste areas, systems, and
12 units contained in the Pretreatment Plant (as specified in Permit Tables III.10.E.A,
13 III.10.F.A, and III.10.G.A, as approved pursuant to Permit Conditions III.10.E.9.e.xii,
14 III.10.F.7.d.iv, and III.10.G.10.e.ix, respectively), the Pretreatment Vessel Vent Process
15 System specified in Permit Table III.10.G.A.i will be in operation prior to waste being
16 introduced into these dangerous and/or mixed waste areas, systems, and units contained
17 in the Pretreatment Building. At any time the Pretreatment Vessel Vent Process System
18 ceases to operate or produces insufficient vacuum to recover emissions from the areas,
19 systems, or units, the Permittees will not commence new treatment activities within the
20 dangerous and mixed waste areas, systems, or units contained in the Pretreatment
21 Building, and take measures to minimize evolution of emissions from on-going
22 treatment, and will not receive new dangerous and/or mixed waste shipments into the
23 Pretreatment Building. The Permittees will not re-commence new treatment activities
24 until the Pretreatment Vessel Vent Process System is operational and producing sufficient
25 vacuum to recover emissions.
- 26 **III.10.G.7 Inspections** [[WAC 173-303-680](#)(3)]
- 27 **III.10.G.7.a** The Permittees will inspect the Pretreatment Plant Miscellaneous Unit Systems in
28 accordance with the Inspection Plan in Operating Unit Group 10, Chapter 6A of this
29 Permit, as modified in accordance with Permit Condition III.10.C.5.c.
- 30 **III.10.G.7.b** The inspection data for Pretreatment Plant Miscellaneous Unit Systems will be recorded,
31 and the records will be placed in the WTP Unit operating record for the Pretreatment
32 Plant Miscellaneous Unit Systems, in accordance with Permit Condition III.10.C.4.
- 33 **III.10.G.8 Recordkeeping**
- 34 The Permittees will record and maintain in the WTP Unit operating record for the
35 Pretreatment Plant Miscellaneous Unit Systems, all monitoring, calibration, maintenance,
36 test data, and inspection data compiled under the conditions of this Permit, in accordance
37 with Permit Conditions III.10.C.4 and III.10.C.5.
- 38 **III.10.G.9 Closure**
- 39 The Permittees will close the Pretreatment Plant Miscellaneous Unit Systems in
40 accordance with Operating Unit Group 10, Chapter 11, as approved pursuant to Permit
41 Condition III.10.C.8.

- 1 **III.10.G.10 Compliance Schedule**
- 2 **III.10.G.10.a** All information identified for submittal to Ecology in a. through e. of this compliance
3 schedule must be signed and certified in accordance with requirements in [WAC 173-303-](#)
4 [810\(12\)](#), as modified in accordance with Permit Condition III.10.G.1.d [[WAC 173-303-](#)
5 [806\(4\)](#)].
- 6 **III.10.G.10.b** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
7 construction of each secondary containment and leak detection system for the
8 Pretreatment Plant Miscellaneous Unit Systems (per level) as identified in Permit Tables
9 III.10.G.A and III.10.G.B, engineering information as specified below, for incorporation
10 into Operating Unit Group 10, Appendices 8.2, 8.4, 8.5, 8.7, 8.8, 8.9, 8.11, and 8.12 of
11 this Permit. At a minimum, engineering information specified below will show the
12 following as described in [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#)
13 (the information specified below will include dimensioned engineering drawings and
14 information on sumps and floor drains):
- 15 **III.10.G.10.b.i** IQRPE Reports (specific to foundation, secondary containment, and leak detection
16 system) will include review of design drawings, calculations, and other information
17 on which the certification report is based and will include as applicable, but not
18 limited to, review of such information described below. Information (drawings,
19 specifications, etc.) already included in Operating Unit Group 10, Appendix 8.0 of
20 this Permit may be included in the report by reference and should include drawing
21 and document numbers. IQRPE Reports will be consistent with the information
22 separately provided in ii. through ix. below [[WAC 173-303-640\(3\)\(a\)](#), in accordance
23 with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 24 **III.10.G.10.b.ii** Design drawings (General Arrangement Drawings, in plan) and specifications for the
25 foundation, secondary containment, including, liner installation details, and leak
26 detection methodology [Note: leak detection systems for areas where daily, direct, or
27 remote visual inspection is not feasible, will be continuous in accordance with
28 [WAC 173-303-640\(4\)\(e\)\(iii\)\(C\)](#)]. These items should show the dimensions, volume
29 calculations, and location of the secondary containment system, and should include
30 items such as floor/pipe slopes to sumps, tanks, floor drains [[WAC 173-303-](#)
31 [640\(4\)\(b\)](#) through (f) and [WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-](#)
32 [303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 33 **III.10.G.10.b.iii** The Permittees will provide the design criteria (references to codes and standards,
34 load definitions, and load combinations, materials of construction, and
35 analysis/design methodology) and typical design details for the support of the
36 secondary containment system. This information will demonstrate the foundation
37 will be capable of providing support to the secondary containment system, resistance
38 to pressure gradients above and below the system, and capable of preventing failure
39 due to settlement, compression, or uplift [[WAC 173-303-640\(4\)\(c\)\(ii\)](#), in accordance
40 with [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 41 **III.10.G.10.b.iv** A description of materials and equipment used to provide corrosion protection for
42 external metal components in contact with soil, including factors affecting the
43 potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#), in accordance with
44 [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];

- 1 **III.10.G.10.b.v** Secondary containment/foundation and leak detection systems materials selection
2 documentation (including, but not limited to, concrete coatings and water stops, and
3 liner materials), as applicable [[WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 4 **III.10.G.10.b.vi** Detailed description of how the secondary containment for each miscellaneous unit
5 system will be installed in compliance with [WAC 173-303-640\(3\)\(c\)](#), in accordance
6 with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B);
- 7 **III.10.G.10.b.vii** Submit Permit Table III.10.G.B completed to provide for all secondary containment
8 sumps and floor drains, the information as specified in each column heading,
9 consistent with information to be provided in i through vi above;
- 10 **III.10.G.10.b.viii** Documentation that secondary containment and leak detection systems will not
11 accumulate hydrogen gas levels above the lower explosive limit for incorporation
12 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#),
13 and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 14 **III.10.G.10.b.ix** A detailed description of how miscellaneous unit design provides access for
15 conducting future miscellaneous unit integrity assessments [[WAC 173-303-640\(3\)\(b\)](#)
16 and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)].
- 17 **III.10.G.10.c** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
18 installation of each Pretreatment Plant Miscellaneous Unit System as identified in Permit
19 Tables III.10.G.A and III.10.G.B, engineering information as specified below, for
20 incorporation into Operating Unit Group 10, Appendix 8.1 through 8.18 of this Permit.
21 At a minimum, engineering information specified below will show the following as
22 required pursuant to [WAC 173-303-640](#) and in accordance with [WAC 173-303-680](#)
23 (the information specified below will include dimensioned engineering drawings):
- 24 **III.10.G.10.c.i** IQRPE Reports (specific to miscellaneous unit) will include review of design
25 drawings, calculations, and other information on which the certification report is
26 based and will include as applicable, but not limited to, review of such information
27 described below. Information (drawings, specifications, etc.) already included in
28 Operating Unit Group 10, Appendix 8.0 of this Permit may be included in the report
29 by reference and should include drawing and document numbers. The IQRPE
30 Reports will be consistent with the information separately provided in ii. through xi.
31 below and the IQRPE Report specified in Permit Condition III.10.G.10.b.i
32 [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#) and
33 [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 34 **III.10.G.10.c.ii** Design drawings (General Arrangement Drawings in plan, Process Flow Diagrams,
35 Piping and Instrumentation Diagrams [including pressure control systems], and
36 Mechanical Drawings) and specifications, and other information specific to
37 miscellaneous units (to show location and physical attributes of each miscellaneous
38 unit), [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#) and
39 [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 40 **III.10.G.10.c.iii** Miscellaneous unit design criteria (references to codes and standards, load
41 definitions, and load combinations, materials of construction, and analysis/design
42 methodology) and typical design details for the support of the miscellaneous unit(s).
43 Structural support calculations specific to off-specification, non-standard, and field
44 fabricated miscellaneous units will be submitted for incorporation into the
45 Administrative Record [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-
46 680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];

- 1 **III.10.G.10.c.iv** A description of materials and equipment used to provide corrosion protection for
2 external metal components in contact with water, including factors affecting the
3 potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#), in accordance with
4 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 5 **III.10.G.10.c.v** Miscellaneous unit materials selection documentation (e.g., physical and chemical
6 tolerances) [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#) and
7 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 8 **III.10.G.10.c.vi** Miscellaneous unit vendor information (including, but not limited to, required
9 performance warranties, as available), consistent with information submitted under ii.
10 above, will be submitted for incorporation into the Administrative Record
11 [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#), [WAC 173-303-](#)
12 [806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 13 **III.10.G.10.c.vii** System Description related to miscellaneous units will be submitted for incorporation
14 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)
15 through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)].
- 16 **III.10.G.10.c.viii** Mass and energy balance for normal projected operating conditions used in
17 developing the Piping and Instrumentation Diagrams and the Process Flow Diagrams,
18 including assumptions and formulas used to complete the mass and energy balance,
19 so that they can be independently verified for incorporation into the Administrative
20 Record [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-](#)
21 [806\(4\)\(i\)\(v\)](#)];
- 22 **III.10.G.10.c.ix** A detailed description of how the miscellaneous unit will be installed in compliance
23 with [WAC 173-303-640\(3\)\(c\)](#), (d), and (e), in accordance with [WAC 173-303-680](#)
24 and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#);
- 25 **III.10.G.10.c.x** Documentation that miscellaneous units are designed to prevent the accumulation of
26 hydrogen gas levels above the lower explosive limit for incorporation into the
27 Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#), and
28 [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 29 **III.10.G.10.c.xi** Documentation that miscellaneous units are designed to prevent escape of vapors and
30 emissions of acutely or chronically toxic (upon inhalation) Extremely Hazardous
31 Waste, for incorporation into the Administrative Record [[WAC 173-303-640\(5\)\(e\)](#), in
32 accordance with [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 33 **III.10.G.10.d** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
34 installation of equipment as identified in Permit Tables III.10.G.A and III.10.G.B, not
35 addressed in Permit Condition III.10.G.10.c, engineering information as specified below
36 for incorporation into Operating Unit Group 10, Appendices 8.1 through 8.14 of this
37 Permit. At a minimum, engineering information specified below will show the following
38 as required pursuant to [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#)
39 (the information specified below will include dimensioned engineering drawings):
- 40 **III.10.G.10.d.i** IQRPE Reports (specific to equipment) will include a review of design drawings,
41 calculations, and other information as applicable, on which the certification report is
42 based. The reports will include, but not be limited to, review of such information
43 described below. Information (drawings, specifications, etc.) already included in
44 Operating Unit Group 10, Appendix 8.0 of this Permit may be included in the report
45 by reference and should include drawing and document numbers. The IQRPE
46 Reports will be consistent with the information provided separately in ii through xiii

- 1 below and the IQRPE Reports specified in Permit Conditions III.10.G.10.b and
2 III.10.G.10.c, [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#)
3 and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 4 **III.10.G.10.d.ii** Design drawings (Process Flow Diagrams, Piping and Instrumentation Diagrams
5 [including pressure control systems]) specifications and other information specific to
6 equipment (these drawings should include all equipment such as pipe, valves,
7 fittings, pumps, instruments, etc.) [[WAC 173-303-640\(3\)\(a\)](#), in accordance with
8 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 9 **III.10.G.10.d.iii** The Permittees will provide the design criteria (references to codes and standards,
10 load definitions, and load combinations, materials of construction, and
11 analysis/design methodology) and typical design details for the support of the
12 equipment [[WAC 173-303-640\(3\)\(a\)](#) and [WAC 173-303-640\(3\)\(f\)](#), in accordance
13 with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 14 **III.10.G.10.d.iv** A description of materials and equipment used to provide corrosion protection for
15 external metal components in contact with soil and water, including factors affecting
16 the potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#), in accordance with
17 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 18 **III.10.G.10.d.v** Materials selection documentation for equipment (e.g., physical and chemical
19 tolerances) [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#) and
20 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 21 **III.10.G.10.d.vi** Vendor information (including, but not limited to, required performance warranties,
22 as available), consistent with information submitted under ii. above, for equipment
23 will be submitted for incorporation into the Administrative Record [[WAC 173-303-](#)
24 [640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)
25 through (B), and [WAC 173-303-806\(4\)\(i\)\(iv\)](#)];
- 26 **III.10.G.10.d.vii** Miscellaneous unit, equipment, and leak detection system instrument control logic
27 narrative description (e.g., descriptions of fail-safe conditions, etc.) [[WAC 173-303-](#)
28 [680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)].
- 29 **III.10.G.10.d.viii** System Descriptions related to equipment and system descriptions related to leak
30 detection systems, for incorporation into the Administrative Record [[WAC 173-303-](#)
31 [680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 32 **III.10.G.10.d.ix** A detailed description of how the equipment will be installed and tested
33 [[WAC 173-303-640\(3\)\(c\)](#) through (e) and [WAC 173-303-640\(4\)\(b\)](#) and (c), in
34 accordance with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 35 **III.10.G.10.d.x** For process monitoring, control, and leak detection system instrumentation for the
36 WTP Unit Miscellaneous Unit Systems as identified in Permit Table III.10.G.C, a
37 detailed description of how the process monitoring, control, and leak detection
38 system instrumentation will be installed and tested [[WAC 173-303-640\(3\)\(c\)](#) through
39 (e), [WAC 173-303-640\(4\)\(b\)](#) and (c), [WAC 173-303-806\(4\)\(c\)\(vi\)](#), and
40 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 41 **III.10.G.10.d.xi** Mass and energy balance for projected normal operating conditions, used in
42 developing the Piping and Instrumentation Diagrams and Process Flow Diagrams,
43 including assumptions and formulas used to complete the mass and energy balance,
44 so that they can be independently verified, for incorporation into the Administrative
45 Record [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-](#)
46 [806\(4\)\(i\)\(v\)](#)];

- 1 **III.10.G.10.d.xii** Documentation that miscellaneous units are designed to prevent the accumulation of
2 hydrogen gas levels above the lower explosive limit for incorporation into the
3 Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(A\)](#), and
4 [WAC 173-303-806\(4\)\(i\)\(v\)](#)].
- 5 **III.10.G.10.d.xiii** Leak detection system documentation (e.g. vendor information, etc.) consistent with
6 information submitted under Permit Condition III.10.G.10.c.ii and Permit Conditions
7 III.10.G.10.d.ii, vii, viii, and x above, will be submitted for incorporation into the
8 Administrative Record.
- 9 **III.10.G.10.e** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
10 will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, the following as
11 specified below for incorporation into Operating Unit Group 10, Appendix 8.18, except
12 Permit Condition III.10.G.10.e.i, which will be incorporated into Operating Unit
13 Group 10, Chapter 6, of this Permit. All information provided under this permit
14 condition must be consistent with information provided pursuant to Permit Conditions
15 III.10.G.10.b, c, d, and e, III.10.C.3.e, and III.10.C.11.b, as approved by Ecology.
- 16 **III.10.G.10.e.i** Integrity assessment program and schedule for the Pretreatment Plant Miscellaneous
17 Unit Systems will address the conducting of periodic integrity assessments on the
18 Pretreatment Plant Miscellaneous Unit Systems over the life of the systems, as
19 specified in Permit Condition III.10.G.10.b.ix and [WAC 173-303-640\(3\)\(b\)](#), in
20 accordance with [WAC 173-303-680](#), and descriptions of procedures for addressing
21 problems detected during integrity assessments. The schedule must be based on past
22 integrity assessments, age of the system, materials of construction, characteristics of
23 the waste, and any other relevant factors [[WAC 173-303-640\(3\)\(b\)](#), in accordance
24 with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 25 **III.10.G.10.e.ii** Detailed plans and descriptions, demonstrating the leak detection system is operated
26 so that it will detect the failure of either the primary or secondary containment
27 structure or the presence of any release of dangerous and/or mixed waste or
28 accumulated liquid in the secondary containment system within twenty-four (24)
29 hours [WAC 173-303-640\(4\)\(c\)\(iii\)](#). Detection of a leak of at least 0.1 gallons per
30 hour within twenty-four (24) hours is defined as being able to detect a leak within
31 twenty-four (24) hours. Any exceptions to this criteria must be approved by
32 Ecology in accordance with [WAC 173-303-680](#), [WAC 173-303-640\(4\)\(c\)\(iii\)](#), and
33 [WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 34 **III.10.G.10.e.iii** Detailed operational plans and descriptions, demonstrating that spilled or leaked
35 waste and accumulated liquids can be removed from the secondary containment
36 system within twenty-four (24) hours [[WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 37 **III.10.G.10.e.iv** Descriptions of operational procedures demonstrating appropriate controls and
38 practices are in place to prevent spills and overflows from the Pretreatment Plant
39 Miscellaneous Unit Systems, or containment systems, in compliance with
40 [WAC 173-303-640\(5\)\(b\)\(i\)](#) through (iii), in accordance with [WAC 173-303-680](#)
41 [[WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 42 **III.10.G.10.e.v** Description of procedures for investigation and repair of the Pretreatment Plant
43 Miscellaneous Unit Systems [[WAC 173-303-640\(6\)](#) and [WAC 173-303-640\(7\)\(e\)](#)
44 and (f), in accordance with [WAC 173-303-680](#), [WAC 173-303-320](#), [WAC 173-303-](#)
45 [806\(4\)\(a\)\(v\)](#), and [WAC 173-303-806\(4\)\(i\)\(B\)](#)];

- 1 **III.10.G.10.e.vi** Updated Chapter 4, Narrative Descriptions, Tables and Figures as identified in Permit
2 Tables III.10.G.A and III.10.G.B, as modified pursuant to Permit Condition
3 III.10.G.10.e.ix, and updated to identify routinely non-accessible Pretreatment Plant
4 Miscellaneous Unit Systems [[WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)
5 through (B)];
- 6 **III.10.G.10.e.vii** Descriptions of procedures for management of ignitable and reactive, and
7 incompatible dangerous and/or mixed waste, in accordance with [WAC 173-303-](#)
8 [640\(9\)](#) and (10), in accordance with [WAC 173-303-680](#) and [WAC 173-303-](#)
9 [806\(4\)\(i\)\(i\)\(B\)](#).
- 10 **III.10.G.10.e.viii** A description of the tracking system used to track dangerous and/or mixed waste
11 generated throughout the Pretreatment Plant Miscellaneous Unit Systems, pursuant to
12 [WAC 173-303-380](#).
- 13 **III.10.G.10.e.ix** Permit Table III.10.G.A, amended as follows [[WAC 173-303-680](#) and [WAC 173-303-](#)
14 [806\(4\)\(i\)\(i\)\(A\)](#) through (B)]:
- 15 A. Under column 1, update and complete list of dangerous and mixed waste
16 Pretreatment Plant Miscellaneous Unit Systems, including plant items which
17 comprise each system (listed by item number).
 - 18 B. Under column 2, update and complete system designations.
 - 19 C. Under column 3, replace the 'Reserved' with the Operating Unit Group 10,
20 Appendix 8.0 subsections specific to miscellaneous unit systems as listed in
21 column 1.
 - 22 D. Under column 4, update and complete list of narrative description tables and
23 figures.
 - 24 E. Under column 5, update and complete maximum operating volume for each
25 miscellaneous unit, as applicable.
 - 26 F. Permit Table III.10.G.A.i, amended as follows:
 - 27 1. Under column 1, update and complete list of plant items that comprise
28 the Pretreatment Plant Vessel Vent System (listed by item number).
 - 29 2. Under column 2, update and complete designations.
 - 30 3. Under column 3, replace the 'Reserved' with the Operating Unit Group
31 10, Appendix 8.0, subsections (e.g., 9.1, 9.2, etc.) specific to systems as
32 listed in column 1.
 - 33 4. Under column 4, update and complete list of narrative description tables
34 and figures.
- 35 **III.10.G.10.e.x** Permit Table III.10.G.C will be completed for Pretreatment Plant Miscellaneous Unit
36 System process and leak detection system monitors and instruments (to include, but
37 not be limited to: instruments and monitors measuring and/or controlling flow,
38 pressure, temperature, density, pH, level, humidity, and emissions) to provide the
39 information as specified in each column heading. Process and leak detection system
40 monitors and instruments for critical systems as specified in Operating Unit
41 Group 10, Appendix 2.0 and as updated pursuant to Permit Condition III.10.C.9.b
42 and for operating parameters as required to comply with Permit Condition
43 III.10.C.3.e.iii will be addressed. Process monitors and instruments for non-waste
44 management operations (e.g., utilities, raw chemical storage, non-contact cooling
45 waters, etc.) are excluded from this permit condition [[WAC 173-303-680](#),
46 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];

- 1 **III.10.G.10.e.xi** Supporting documentation for operating trips and expected operating range as
2 specified in Permit Table III.10.G.C, as approved pursuant to Permit Condition
3 III.10.G.10.e.x [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), [WAC 173-303-](#)
4 [806\(4\)\(i\)\(iv\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 5 **III.10.G.10.e.xii** Documentation of process and leak detection instruments and monitors (as listed in
6 Permit Table III.10.G.C) for the Pretreatment Plant Miscellaneous Unit Systems to
7 include, but not be limited to, the following [[WAC 173-303-680](#), [WAC 173-303-](#)
8 [806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)]:
- 9 A. Procurement Specifications.
- 10 B. Location used.
- 11 C. Range, precision, and accuracy.
- 12 D. Detailed descriptions of calibration/functionality test procedures
13 (e.g., method number [ASTM]) or provide a copy of manufacturer's
14 recommended calibration procedures.
- 15 E. Calibration/functionality test, inspection, and routine maintenance schedules
16 and checklists, including justification for calibration, inspection and
17 maintenance frequencies, criteria for identifying instruments found to be
18 significantly out of calibration, and corrective action to be taken for
19 instruments found to be significantly out of calibration (e.g., increasing
20 frequency of calibration, instrument replacement, etc.).
- 21 F. Equipment instrument control logic narrative description (e.g., descriptions
22 of fail-safe conditions, etc.) [[WAC 173-303-680\(2\)](#), [WAC 173-303-](#)
23 [806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)].

1
2
3
4
5

This page intentionally left blank.

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description ^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
<p><u>Waste Feed Evaporation Process System</u></p> <p>FEP-SEP-00001A (Waste Feed Evaporator Separator Vessel)</p> <p>FEP-SEP-00001B (Waste Feed Evaporator Separator Vessel)</p>	<p>FEP</p>	<p><u>24590-PTF</u></p> <p>-3PS-MEVV-T0001</p> <p>-M5-V17T-00004001</p> <p>-M5-V17T-00004002</p> <p>-M6-FEP-00001001</p> <p>-M6-FEP-00001002</p> <p>-M6-FEP-00001003</p> <p>-M6-FEP-00002001</p> <p>-M6-FEP-00002002</p> <p>-M6-FEP-00002003</p> <p>-M6-FEP-00003001</p> <p>-M6-FEP-00003002</p> <p>-M6-FEP-00004001</p> <p>-M6-FEP-00004002</p> <p>-M6-FEP-00004003</p> <p>-M6-FEP-00005001</p> <p>-MVD-FEP-P0001</p> <p>-MVD-FEP-P0002</p> <p>-MVD-FEP-00003</p> <p>-MVD-FEP-00006</p> <p>-MVD-FEP-00007</p> <p>-MV-FEP-P0001</p> <p>-MV-FEP-P0002</p> <p>-N1D-FEP-00002</p> <p>-N1D-FEP-P0003</p> <p>-P1-P01T-00001</p>	<p>Section 4D.2.2.; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>FEP-SEP-00001A = 14,512</p> <p>FEP-SEP-00001B = 14,512</p>

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description ^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
		-P1-P01T-00002		
<p><u>Waste Feed Evaporation Process System (Cont.)</u></p> <p>FEP-COND-00001A (Waste Evaporator Primary Condenser)</p> <p>FEP-COND-00001B (Waste Evaporator Primary Condenser)</p> <p>FEP-COND-00002A (Waste Evaporator Intercondenser)</p> <p>FEP-COND-00002B (Waste Evaporator Intercondenser)</p> <p>FEP-COND-00003A (Waste Evaporator Aftercondenser)</p> <p>FEP-COND-00003B (Waste Evaporator Aftercondenser)</p>	FEP	<p><u>24590-PTF</u></p> <p>-3PS-MEVV-T0001</p> <p>-M5-V17T-00004001</p> <p>-M5-V17T-00004002</p> <p>-M6-FEP-00003002</p> <p>-M6-FEP-00005001</p> <p>-MED-FEP-P0003</p> <p>-MED-FEP-P0004</p> <p>-MED-FEP-P0005</p> <p>-MED-FEP-P0006</p> <p>-MED-FEP-P0007</p> <p>-MED-FEP-P0008</p> <p>-N1D-FEP-P0008</p> <p>-N1D-FEP-00009</p> <p>-N1D-FEP-00010</p> <p>-P1-P01T-00001</p> <p>-P1-P01T-00002</p>	<p>Section 4D.2.2.; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	N/A

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
<p><u>Waste Feed Evaporation Process System (Cont.)</u></p> <p>FEP-RBLR-00001A (Waste Feed Evaporator Reboiler)</p> <p>FEP-RBLR-00001B (Waste Feed Evaporator Reboiler)</p>	<p>FEP</p>	<p><u>24590-PTF</u> -3PS-MEVV-T0001 -M5-V17T-00004001 -M5-V17T-00004002 -MED-FEP-00010 -N1D-FEP-P0008 -P1-P01T-00001 -P1-P01T-00002</p>	<p>Section 4D.2.2.; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>N/A</p>
<p><u>Cesium Nitric Acid Recovery Process System</u></p> <p>CNP-EVAP-00001 (Cesium Evaporator Separator Vessel)</p>	<p>CNP</p>	<p><u>24590-PTF</u> -3PS-MEVV-T0002 -M5-V17T-00014 -M6-CNP-00001001 -M6-CNP-00001002 -M6-CNP-00001003 -M6-CNP-00002001 -M6-CNP-00002002 -M6-CNP-00002003 -M6-CNP-00008001 -M6-CNP-00008002 -M6-CNP-00010001 -M6-CNP-00010002 -MV-CNP-P0001 -MV-CNP-P0002 -MV-CNP-P0005 -MVD-CNP-P0003</p>	<p>Section 4D.2.6.; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>CNP-EVAP-00001 = RESERVED</p>

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description ^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
		-MVD-CNP-P0010 -MVD-CNP-00006 -N1D-CNP-P0005 -N1D-CNP-P0006 -N1D-CNP-P0009 -N1D-CNP-P0011 -P1-P01T-00001 -P1-P01T-00002 -P1-P01T-00003 -P1-P01T-00004		
<p><u>Cesium Nitric Acid Recovery Process System (Cont.)</u></p> <p>CNP-HX-00001 (Cesium Evaporator Concentrate Reboiler)</p>	CNP	<p><u>24590-PTF</u></p> -3PS-MEVV-T0002 -M5-V17T-P0014 -M6-CNP-00001001 -M6-CNP-00001002 -M6-CNP-00001003 -M6-CNP-00002001 -M6-CNP-00002002 -M6-CNP-00002003 -M6-CNP-00008 -MED-CNP-00003 -MED-CNP-00004 -MED-CNP-00010 -P1-P01T-00001 -P1-P01T-00002 -P1-P01T-00003	Section 4D.2.6.; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	N/A

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description ^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
		-P1-P01T-00004		
<p><u>Cesium Nitric Acid Recovery Process System (Cont.)</u></p> <p>CNP-DISTC-00001 (Cesium Evaporator Nitric Acid Rectifier Column)</p>	CNP	<p><u>24590-PTF</u></p> <p>-M5-V17T-00014 -M6-CNP-00010001 -N1D-CNP-00001 -P1-P01T-00003 -3PS-MEVV-T0002</p>	Section 4D.2.6.; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	RESERVED
<p><u>Cesium Nitric Acid Recovery Process System (Cont.)</u></p> <p>CNP-HX-00002 (Cesium Evaporator Primary Condenser)</p> <p>CNP-HX-00003 (Cesium Evaporator Inter-Condenser)</p> <p>CNP-HX-00004 (Cesium Evaporator After-Condenser)</p>	CNP	<p><u>24590-PTF</u></p> <p>-M5-V17T-00014 -M6-CNP-00001001 -M6-CNP-00001002 -M6-CNP-00001003 -M6-CNP-00002001 -M6-CNP-00002002 -M6-CNP-00002003 -M6-CNP-00008001 -M6-CNP-00010001 -MED-CNP-00003 -MED-CNP-00004 -MED-CNP-00005 -MED-CNP-00010 -N1D-CNP-P0002 -N1D-CNP-P0003 -N1D-CNP-P0012 -P1-P01T-00001 -P1-P01T-00002</p>	Section 4D.2.6; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	<p>N/A</p> <p>N/A</p> <p>N/A</p>

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description ^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
		-P1-P01T-00003 -P1-P01T-00004 -3PS-MEVV-T0002		
<p><u>Treated LAW Evaporation Process System</u></p> <p>TLP-SEP-00001 (Treated LAW Evaporator Separator Vessel)</p>	TLP	<p><u>24590-PTF</u></p> -3PS-MEVV-T0001 -M5-V17T-00005 -M6-TLP-00001 -M6-TLP-00002001 -M6-TLP-00002002 -M6-TLP-00002003 -M6-TLP-00002004 -M6-TLP-00003001 -M6-TLP-00003002 -M6-TLP-00003003 -M6-TLP-00003004 -M6-TLP-00005001 -M6-TLP-00005002 -M6-TLP-00005003 -M6-TLP-00005004 -M6-TLP-00005005 -M6-TLP-00006001 -M6-TLP-00006002 -M6-TLP-00006003 -M6-TLP-00006004 -M6-TLP-00006005 -MVD-TLP-P0001	Section 4D.2.11; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	TLP-SEP-00001 = 13,359

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description ^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
		-MVD-TLP-P0002 -MVD-TLP-00004 -MVD-TLP-00005 -MV-TLP-P0001 -MV-TLP-P0002 -N1D-TLP-P0001 -N1D-TLP-P0005 -N1D-TLP-P0006 -P1-P01T-00001 -P1-P01T-00002 -P1-P01T-00003		
<p><u>Treated LAW Evaporation Process System (Cont.)</u></p> <p>TLP-COND-00001 (Treated LAW Primary Condenser)</p> <p>TLP-COND-00002 (Treated LAW Inter-condenser)</p> <p>TLP-COND-00003 (Treated LAW After-condenser)</p>	<p>TLP</p>	<p><u>24590-PTF</u></p> <p>-3PS-MEVV-T0001 -M5-V17T-00005 -M6-TLP-00002001 -M6-TLP-00002002 -M6-TLP-00002003 -M6-TLP-00002004 -M6-TLP-00003001 -M6-TLP-00003002 -M6-TLP-00003003 -M6-TLP-00003004 -M6-TLP-00005001 -M6-TLP-00005002 -M6-TLP-00005003 -M6-TLP-00005004</p>	<p>Section 4D.2.11; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>	<p>N/A</p>

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description ^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
		-M6-TLP-00005005 -M6-TLP-00006001 -M6-TLP-00006002 -M6-TLP-00006003 -M6-TLP-00006004 -M6-TLP-00006005 -MED-TLP-P0001 -MED-TLP-00002 -MED-TLP-00003 -MV-TLP-P0001 -MV-TLP-P0002 -N1D-TLP-P0002 -N1D-TLP-P0003 -P1-P01T-00001 -P1-P01T-00002 -P1-P01T-00003		
<p><u>Treated LAW Evaporation Process System (Cont.)</u></p> <p>TLP-RBLR-00001 (Treated LAW Evaporator Reboiler)</p>	TLP	<p><u>24590-PTF</u></p> -3PS-MEVV-T0001 -M5-V17T-00005 -MV-TLP-P0001 -MV-TLP-P0002 -N1D-TLP-P0011 -P1-P01T-00001 -P1-P01T-00002 -P1-P01T-00003	Section 4D.2.11; Table 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.	N/A

Table III.10.G.A – Pretreatment Plant Miscellaneous Unit Systems

Miscellaneous Unit System Description^a	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables, & Figures	Maximum Capacity (gallons)
<p><u>Spray Decontamination and Sizing System</u></p> <p>PIH-TTBL-00001 (Spray Decontamination Turntable)</p> <p>PIH-TTBL-00002 (Remote Repair Turntable)</p> <p>PIH-BENCH-00003 (Size Reduction Table)</p> <p>This miscellaneous unit is exempt from the requirements of WAC-173-303-640.</p>	<p>PIH</p>	<p>RESERVED</p>	<p>Section 4D.3.2.1; Table 4D-2; and Figure 4A-128 of Operating Unit 10, Chapter 4 of this Permit.</p>	<p>N/A</p>
<p><u>Hotcell Waste Management Unit</u></p> <p><u>Hotcell Floor</u></p> <p>This miscellaneous unit is exempt from the requirements of WAC-173-303-640.</p>	<p>NA</p>	<p>RESERVED</p>	<p>Section 4D.3.1; Table 4D-2; and Figure 4A-128 of Operating Unit 10, Chapter 4 of this Permit.</p>	<p>RESERVED</p>

^a The Pretreatment Vessel Vent Process (PVP), Process Vessel Vent Systems (PVV), Pulse Jet Mixer Exhaust System (PJV), and Pretreatment Treated LAW Evaporator Separator Vessel System (TLP) specified in Permit Table III.10.G.A.i is shared between the Pretreatment Plant Miscellaneous Unit Systems. Any references in this Permit to the individual Pretreatment Plant Miscellaneous Unit Systems are also a reference to the Pretreatment Vessel Vent Process (PVP), Process Vessel Vent Systems (PVV), Pulse Jet Mixer Exhaust System (PJV), and Pretreatment Treated LAW Evaporator Separator Vessel System (TLP) Systems. Any reference in this Permit to Permit Table III.10.G.A is also a reference to Permit Table III.10.G.A.i.

Table III.10.G.A.i – Pretreatment Plant Vessel Vent Systems Associated with Pretreatment Plant Miscellaneous Unit Systems

Description	Designation	Description Drawings	Narrative Description, Tables & Figures
<p><u>Pretreatment Vessel Vent Process System</u></p> <p>PVP-SCB-00002 (Vessel Vent Caustic Scrubber)</p>	<p>PVP</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001 -M5-V17T-00021004 -M6-PVP-00002 -M6-PVP-00017001 -M6-PVP-00017002 -M6-PVP-00017003 -M6-PWD-00044 -MKD-PVP-00002 -MVD-PVP-P0001 -MV-PVP-P0002 -N1D-PVP-P0001 -P1-P01T-00003 -P1-P01T-00004</p>	<p>Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Pretreatment Vessel Vent Process System (Cont.)</u></p> <p>PVP-HEME-00001A (Vessel Vent HEME, Mist eliminator)</p> <p>PVP-HEME-00001B (Vessel Vent HEME, Mist Eliminator)</p> <p>PVP-HEME-00001C (Vessel Vent HEME, Mist Eliminator)</p>	<p>PVP</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001 -M5-V17T-00021004 -P1-P01T-00001 -P1-P01T-00002 -P1-P01T-00003 -P1-P01T-00004</p>	<p>Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.G.A.i – Pretreatment Plant Vessel Vent Systems Associated with Pretreatment Plant Miscellaneous Unit Systems

Description	Designation	Description Drawings	Narrative Description, Tables & Figures
<p><u>Pretreatment Vessel Vent Process System (Cont.)</u></p> <p>PVP-HX-00002 (Vessel Vent Scrubbing Liquid Cooler)</p>	<p>PVP</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001 -M6-PVP-00017001 -M6-PVP-00017002 -M6-PVP-00017003 -P1-P01T-00002 -P1-P01T-00003 -P1-P01T-00004</p>	<p>Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Pretreatment Vessel Vent Process System (Cont.)</u></p> <p>PVP-OXID-00001 (Vessel Vent VOC Oxidizer Unit)</p>	<p>PVP</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001 -M5-V17T-00021004 -M6-PVP-00017001 -M6-PVP-00017002 -M6-PVP-00017003 -M6-PVP-000018001 -M6-PVP-000018002 -N1D-PVP-P0002 -P1-P01T-00001 -P1-P01T-00002 -P1-P01T-00003 -P1-P01T-00004</p>	<p>Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Pretreatment Vessel Vent Process System (Cont.)</u></p> <p>PVP-CLR-00001 (Vessel Vent Aftercooler)</p>	<p>PVP</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001 -M5-V17T-00021004 -P1-P01T-00001 -P1-P01T-00002</p>	<p>Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.G.A.i – Pretreatment Plant Vessel Vent Systems Associated with Pretreatment Plant Miscellaneous Unit Systems

Description	Designation	Description Drawings	Narrative Description, Tables & Figures
		-P1-P01T-00003 -P1-P01T-00004	
<p><u>Pretreatment Vessel Vent Process System (Cont.)</u></p> <p>PVP-ADBR-00001A (Vessel Vent Carbon Bed Absorber)</p> <p>PVP-ADBR-00001B (Vessel Vent Carbon Bed Absorber)</p>	PVP	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001</p> <p>-M5-V17T-00021004</p> <p>-P1-P01T-00001</p> <p>-P1-P01T-00002</p> <p>-P1-P01T-00003</p> <p>-P1-P01T-00004</p>	Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>Pretreatment Vessel Vent Process System (Cont.)</u></p> <p>PVP-FILT-00001 (Vessel Vent Adsorber Outlet Filter)</p>	PVP	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001</p> <p>-M5-V17T-00021004</p> <p>-P1-P01T-00002</p> <p>-P1-P01T-00003-P1-P01T-00004</p>	Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>Process Vessel Vent System</u></p> <p>PVV-HEPA-00001A (Vessel Vent Primary HEPA Filter)</p> <p>PVV-HEPA-00001B (Vessel Vent Primary HEPA Filter)</p> <p>PVV-HEPA-00002A (Vessel Vent Secondary HEPA Filter)</p>	PVV	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001</p> <p>-P1-P01T-00002</p>	Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.G.A.i – Pretreatment Plant Vessel Vent Systems Associated with Pretreatment Plant Miscellaneous Unit Systems

Description	Designation	Description Drawings	Narrative Description, Tables & Figures
PVV-HEPA-00002B (Vessel Vent Secondary HEPA Filter)			
<p><u>Process Vessel Vent System (Cont.)</u></p> <p>PVV-FAN-00001A (Vessel Vent Exhaust Fan)</p> <p>PVV-FAN-00001B (Vessel Vent Exhaust Fan)</p>	PVV	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021001</p> <p>-M5-V17T-00021004</p> <p>-P1-P01T-00002</p> <p>-P1-P01T-00003</p> <p>-P1-P01T-00004</p>	Section 4D.4.2; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>Pretreatment Pulse Jet Mixer Exhaust Vent System</u></p> <p>PJV-HEPA-00001A (PJV Primary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00001B (PJV Primary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00001C (PJV Primary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00001D (PJV Primary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00001E (PJV Primary Exhaust HEPA Filter)</p>	PJV	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021002</p> <p>-M6-PJV-00001</p> <p>-M6-PJV-00002</p> <p>-M6-PJV-00004001</p> <p>-N1D-PJV-P0001</p> <p>-P1-P01T-00001</p>	Section 4D.4.3; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.G.A.i – Pretreatment Plant Vessel Vent Systems Associated with Pretreatment Plant Miscellaneous Unit Systems

Description	Designation	Description Drawings	Narrative Description, Tables & Figures
<p>PJV-HEPA-00001F (PJV Primary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00001G (PJV Primary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00002A (PJV Secondary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00002B (PJV Secondary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00002C (PJV Secondary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00002D (PJV Secondary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00002E (PJV Secondary Exhaust HEPA Filter)</p> <p>PJV-HEPA-00002F (PJV Secondary Exhaust HEPA Filter)</p>			

Table III.10.G.A.i – Pretreatment Plant Vessel Vent Systems Associated with Pretreatment Plant Miscellaneous Unit Systems

Description	Designation	Description Drawings	Narrative Description, Tables & Figures
<p><u>Pretreatment Pulse Jet Mixer Exhaust Vent System (Cont.)</u></p> <p>PJV-FAN-00001A (PJV Exhaust Fan)</p> <p>PJV-FAN-00001B (PJV Exhaust Fan)</p> <p>PJV-FAN-00001C (PJV Exhaust Fan)</p>	<p>PJV</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021002</p> <p>-M6-PJV-00001</p> <p>-M6-PJV-00002</p> <p>-M6-PJV-00004001</p> <p>-N1D-PJV-P0001</p> <p>-P1-P01T-00001</p>	<p>Section 4D.4.3; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Pretreatment Pulse Jet Mixer Exhaust Vent System (Cont.)</u></p> <p>PJV-DMST-00002A (PJV Demister)</p> <p>PJV-DMST-00002B (PJV Demister)</p> <p>PJV-DMST-00002C (PJV Demisters)</p>	<p>PJV</p>	<p><u>24590-PTF</u></p> <p>-M5-V17T-00021002</p> <p>-M6-PJV-00001</p> <p>-M6-PJV-00002</p> <p>-M6-PJV-00004001</p> <p>-N1D-PJV-P0001</p> <p>-P1-P01T-00003</p>	<p>Section 4D.4.3; Table 4F-2, 4D-2; and Figures 4A-1, 4A-2 and 4A-2A of Operating Unit Group 10, Chapter 4 of this Permit.</p>

^a The Pretreatment Vessel Vent Process (PVP), Process Vessel Vent Systems (PVV), and Pulse Jet Mixer Exhaust System (PJV) specified in Permit Table III.10.G.A.i are shared between the Pretreatment Plant Miscellaneous Unit Systems. Any references in this Permit to the individual Pretreatment Plant Miscellaneous Unit Systems are also a reference to the PVP, PVV, and PJV Systems. Any reference in this Permit to Permit Table III.10.G.A is also a reference to Permit Table III.10.G.A.i.

Table III.10.G.B – Pretreatment Plant Miscellaneous Unit Secondary Containment Systems Including Sumps, Bulges, and Floor Drains

Sump, Bulge or Floor Drain I.D. # & Room Location	Maximum Sump/Bulge (gallons), or Drain Line (gallons per minute) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawings No.'s, Specification No.'s etc.)
PVP-ZY-00037-S11B-03, P-0105 (PVP-BULGE-00001, El. 0')			3" Stainless Steel	<u>24590-PTF</u> -M6-PVP-00017002
PVP-ZY-00036-S11B-03, P-0101A (PVP-BULGE-00002, El. 0')			3" Stainless Steel	<u>24590-PTF</u> -M6-PVP-00018002
PVP-ZY-00056-S11B-03, P-0302 (PVP-BULGE-00014, El. 56')			3" Stainless Steel	<u>24590-PTF</u> -M6-PVP-00017003
PWD-FD-00323P-0304 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00324 P-0304 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00325 P-0304 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00326 P-0304 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00327 P-0304 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00044
PWD-FD-00512 P-0320 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00513 P-0320 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00514 P-0320 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00043

Table III.10.G.B – Pretreatment Plant Miscellaneous Unit Secondary Containment Systems Including Sumps, Bulges, and Floor Drains

Sump, Bulge or Floor Drain I.D. # & Room Location	Maximum Sump/Bulge (gallons), or Drain Line (gallons per minute) Capacity	Sump Type/Nominal Operating Volume (gallons)	Sump, Bulge or Drain Line Dimensions^a (inches) & Materials of Construction	Engineering Description (Drawings No.'s, Specification No.'s etc.)
PWD-FD-00515 P-0325 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00516 P-0325 Drain, El. 56'	140	N/A	6" Dia 316L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00517 P-0325 Drain, El. 56'	655	N/A	8" Dia 316L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00557 P-0430 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
PWD-FD-00561 P-0430 Drain, El. 77'	140	N/A	6" Dia 304L	<u>24590-PTF</u> -M6-PWD-00043
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

Table III.10.G.C. – Pretreatment Plant Miscellaneous Unit System Process and Leak Detection Instruments and Parameters

Miscellaneous Unit System Locator and Name (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Operating Trips (Description & Numerical Limits)	Instrument Calibration Method No. and Range
PVP-BULGE-00001 ^a	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
PVP-BULGE-00014 ^a	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^a Sump locator (including P&ID designator) is located on Permit Table III.10.G.B – Pretreatment Plant Miscellaneous Unit Secondary Containment Systems Including Sumps, Bulges, and Floor Drains.

1

Table III.10.G.D. – Pretreatment Plant Miscellaneous Unit Systems Estimated Emission Rates

Chemicals	CAS Number	Emission Rates (grams/second)
RESERVED	RESERVED	RESERVED

2

1 **III.10.H LAW VITRIFICATION SYSTEM – SHORT TERM MISCELLANEOUS THERMAL**
 2 **TREATMENT UNIT-SHAKEDOWN, DEMONSTRATION TEST, AND POST**
 3 **DEMONSTRATION TEST**

4 For purposes of Permit Section III.10.H, where reference is made to [WAC 173-303-640](#),
 5 the following substitutions apply: substituting the terms “LAW Vitrification System” for
 6 “tank system(s),” “sub-system(s)” for “tank(s),” “sub-system equipment” for “ancillary
 7 equipment,” and “sub-system(s) or sub-system equipment of a LAW Vitrification
 8 System” for “component(s)” in accordance with [WAC 173-303-680](#).

9 **III.10.H.1 General Conditions During Shakedown, Demonstration Test, and Post-**
 10 **Demonstration Test for LAW Vitrification System**

11 **III.10.H.1.a** Construction and Maintenance [[WAC 173-303-640](#), in accordance with [WAC 173-303-](#)
 12 [680](#)(2) and (3), and [WAC 173-303-340](#)].

13 **III.10.H.1.a.i** The Permittees will construct the LAW Vitrification System (listed in Permit Tables
 14 III.10.H.A and B, as approved/modified pursuant to Permit Condition III.10.H.5) as
 15 specified in Permit Condition III.10.H.1 and Operating Unit Group 10, Chapter 4 of
 16 this Permit, and Operating Unit Group 10, Appendices 9.1 through 9.15 and 9.17 of
 17 this Permit, as approved pursuant to Permit Conditions III.10.H.5.a through d, and
 18 III.10.H.5.f.

19 **III.10.H.1.a.ii** The Permittees will construct all containment systems for the LAW Vitrification
 20 System as specified in Operating Unit Group 10, Chapter 4 of this Permit, and
 21 Operating Unit Group 10, Appendices 9.2 and 9.4 through 9.14 of this Permit, as
 22 approved pursuant to Permit Conditions III.10.H.5.a through d.

23 **III.10.H.1.a.iii** The Permittees will ensure all certifications required by specialists (e.g., independent
 24 qualified registered professional engineer, independent corrosion expert, independent
 25 qualified installation inspector, etc.) use the following statement or equivalent
 26 pursuant to Permit Condition III.10.C.10:

27 “I, (Insert Name) have (choose one or more of the following: overseen, supervised,
 28 reviewed, and/or certified) a portion of the design or installation of a new LAW
 29 Vitrification System or component located at (address), and owned/operated by
 30 (name(s)). My duties were: (e.g., installation inspector, testing for tightness, etc.), for
 31 the following LAW Vitrification System components (e.g., the venting piping, etc.),
 32 as required by the Dangerous Waste Regulations, namely, [WAC 173-303-640](#)(3)
 33 (applicable paragraphs (i.e., (a) through (g)) in accordance with [WAC 173-303-680](#)).

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

40 **III.10.H.1.a.iv** The Permittees must ensure that proper handling procedures are adhered to in order
 41 to prevent damage to the LAW Vitrification System during installation. Prior to
 42 covering, enclosing, or placing the new LAW Vitrification System or component in
 43 use, an independent qualified installation inspector or an independent qualified
 44 registered professional engineer, either of whom is trained and experienced in the
 45 proper installation of similar systems or components, must inspect the system for the
 46 presence of any of the following items:

- 1 A. Weld breaks.
- 2 B. Punctures.
- 3 C. Scrapes of protective coatings.
- 4 D. Cracks.
- 5 E. Corrosion.
- 6 F. Other structural damage or inadequate construction/installation.
- 7 All discrepancies must be remedied before the LAW Vitrification System is covered,
8 enclosed, or placed in use [[WAC 173-303-640\(3\)\(c\)](#)], in accordance with
9 [WAC 173-303-680\(2\)](#) and (3)].
- 10 **III.10.H.1.a.v** For the LAW Vitrification System or components that are placed underground and
11 that are back-filled, the Permittees must provide a backfill material that is a
12 non-corrosive, porous, homogeneous substance. The backfill must be installed so
13 that it is placed completely around the LAW Vitrification System and compacted to
14 ensure that the LAW Vitrification System is fully and uniformly supported
15 [[WAC 173-303-640\(3\)\(d\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 16 **III.10.H.1.a.vi** The Permittees must test for tightness the LAW Vitrification System or components,
17 prior to being covered, enclosed, or placed into use. If the LAW Vitrification System
18 or components are found not to be tight, all repairs necessary to remedy the leak(s) in
19 the system must be performed prior to the LAW Vitrification System being covered,
20 enclosed, or placed in use [[WAC 173-303-640\(3\)\(e\)](#)], in accordance with
21 [WAC 173-303-680\(2\)](#) and (3)].
- 22 **III.10.H.1.a.vii** The Permittees must ensure the LAW Vitrification System equipment is supported
23 and protected against physical damage and excessive stress due to settlement,
24 vibration, expansion, or contraction [[WAC 173-303-640\(3\)\(f\)](#)], in accordance with
25 [WAC 173-303-680\(2\)](#) and (3)].
- 26 **III.10.H.1.a.viii** The Permittees must provide the type and degree of corrosion protection
27 recommended by an independent corrosion expert, based on the information provided
28 in Operating Unit Group 10, Appendices 9.9 and 9.11 of this Permit, as approved
29 pursuant to Permit Conditions III.10.H.5.b.i, III.10.H.5.b.iv, III.10.H.5.b.v,
30 III.10.H.5.c.i, III.10.H.5.c.iv, III.10.H.5.c.v, III.10.H.5.d.i, III.10.H.5.d.iv, and
31 III.10.H.5.d.v, or other corrosion protection if Ecology believes other corrosion
32 protection is necessary to ensure the integrity of the LAW Vitrification System during
33 use of the LAW Vitrification System. The installation of a corrosion protection
34 system that is field fabricated must be supervised by an independent corrosion expert
35 to ensure proper installation [[WAC 173-303-640\(3\)\(g\)](#)], in accordance with
36 [WAC 173-303-680\(2\)](#) and (3)].
- 37 **III.10.H.1.a.ix** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the
38 Permittees will obtain and keep on file in the WTP Unit operating record, written
39 statements by those persons required to certify the design of the LAW Vitrification
40 System and supervise the installation of the LAW Vitrification System, as specified in
41 [WAC 173-303-640\(3\)\(b\)](#), (c), (d), (e), (f), and (g), in accordance with [WAC 173-303-](#)
42 [680](#), attesting that the LAW Vitrification System and corresponding containment
43 system listed in Permit Tables III.10.H.A and III.10.H.B, as approved/modified
44 pursuant to Permit Condition III.10.H.5, were properly designed and installed, and
45 that repairs, in accordance with [WAC 173-303-640\(3\)\(c\)](#) and (e) were performed
46 [[WAC 173-303-640\(3\)\(a\)](#) and [WAC 173-303-640\(3\)\(h\)](#)], in accordance with
47 [WAC 173-303-680\(3\)](#)].

- 1 **III.10.H.1.a.x** The independent LAW Vitrification System installation inspection and subsequent
 2 written statements will be certified in accordance with [WAC 173-303-810\(13\)\(a\)](#), as
 3 modified pursuant to Permit Condition III.10.H.1.a.iii, comply with all requirements
 4 of [WAC 173-303-640\(3\)\(h\)](#) in accordance with [WAC 173-303-680](#), and will consider,
 5 but not be limited to, the following LAW Vitrification System installation
 6 documentation:
- 7 A. Field installation report with date of installation.
 - 8 B. Approved welding procedures.
 - 9 C. Welder qualification and certifications.
 - 10 D. Hydro-test reports, as applicable, in accordance with the American Society of
 11 Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII,
 12 Division 1; American Petroleum Institute (API) Standard 620, or Standard
 13 650, as applicable.
 - 14 E. Tester credentials.
 - 15 F. Field inspector credentials.
 - 16 G. Field inspector reports.
 - 17 H. Field waiver reports.
 - 18 I. Non-compliance reports and corrective action (including field waiver
 19 reports) and repair reports.
- 20 **III.10.H.1.a.xi** The Permittees will ensure periodic integrity assessments are conducted on the LAW
 21 Vitrification System, listed in Permit Table III.10.H.A, as approved/modified
 22 pursuant to Permit Condition III.10.H.5, over the term of this Permit in accordance
 23 with [WAC 173-303-680\(2\)](#) and (3) as specified in [WAC 173-303-640\(3\)\(b\)](#),
 24 following the description of the integrity assessment program and schedule in
 25 Operating Unit Group 10, Chapter 6 of this Permit, as approved pursuant to Permit
 26 Conditions III.10.H.5.e.i and III.10.C.5.c. Results of the integrity assessments will be
 27 included in the WTP Unit operating record until ten (10) years after post-closure, or
 28 corrective action is complete and certified, whichever is later.
- 29 **III.10.H.1.a.xii** The Permittees will address problems detected during the LAW Vitrification System
 30 integrity assessments specified in Permit Condition III.10.H.1.a.xi following the
 31 integrity assessment program in Operating Unit Group 10, Chapter 6 of this Permit,
 32 as approved pursuant to Permit Conditions III.10.H.5.e.i and III.10.C.5.c.
- 33 **III.10.H.1.a.xiii** All process monitors/instruments, as specified in Permit Table III.10.H.F, as
 34 approved/modified pursuant to Permit Condition III.10.H.5, will be equipped with
 35 operational alarms to warn of deviation, or imminent deviation from the limits
 36 specified in Permit Table III.10.H.F.
- 37 **III.10.H.1.a.xiv** The Permittees will install and test all process and leak detection system
 38 monitors/instrumentation as specified in Permit Tables III.10.H.C and III.10.H.F, as
 39 approved/modified pursuant to Permit Condition III.10.H.5, in accordance with
 40 Operating Unit Group 10, Appendices 9.1, 9.2, and 9.14 of this Permit, as approved
 41 pursuant to Permit Conditions III.10.H.5.d.x and III.10.H.5.f.xvi.
- 42 **III.10.H.1.a.xv** Except during periods of LAW Vitrification System startup and shutdown, no
 43 dangerous and/or mixed waste will be treated in the LAW Vitrification System unless
 44 the operating conditions, specified under Permit Condition III.10.H.1.c are complied
 45 with.

- 1 **III.10.H.1.a.xvi** The Permittees will not place dangerous and/or mixed waste, treatment reagents, or
 2 other materials in the LAW Vitrification System if these substances could cause the
 3 subsystem, subsystem equipment, or the containment system to rupture, leak,
 4 corrode, or otherwise fail [[WAC 173-303-640](#)(5)(a), in accordance with
 5 [WAC 173-303-680](#)(2)]. This condition is not applicable to corrosion of LAW
 6 Vitrification System sub-system or sub-system equipment that are expected to be
 7 replaced as part of normal operations (e.g., melters).
- 8 **III.10.H.1.a.xvii** The Permittees will operate the LAW Vitrification System to prevent spills and
 9 overflows using controls and practices as required under [WAC 173-303-640](#)(5)(b)
 10 described in Permit Condition III.10.C.5 and Operating Unit Group 10, Appendix
 11 9.18 of this Permit, as approved pursuant to Permit Condition III.10.H.5.e
 12 [[WAC 173-303-640](#)(5)(b), in accordance with [WAC 173-303-680](#)(2) and (3), and
 13 [WAC 173-303-806](#)(4)(c)(ix)].
- 14 **III.10.H.1.a.xviii** For routinely non-accessible LAW Vitrification System sub-systems, as specified in
 15 Operating Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit
 16 Condition III.10.H.5.e.vi, the Permittees will mark all routinely non-accessible LAW
 17 Vitrification System sub-systems access points with labels, or signs, to identify the
 18 waste contained in each LAW Vitrification System sub-system. The label, or sign,
 19 must be legible at a distance of at least fifty (50) feet, and must bear a legend which
 20 identifies the waste in a manner which adequately warns employees, emergency
 21 response personnel, and the public of the major risk(s) associated with the waste
 22 being stored or treated in the LAW Vitrification System sub-systems. For the
 23 purposes of this permit condition, “routinely non-accessible” means personnel are
 24 unable to enter these areas while waste is being managed in them [[WAC 173-303-](#)
 25 [640](#)(5)(d), in accordance with [WAC 173-303-680](#)(2)].
- 26 **III.10.H.1.a.xix** For all LAW Vitrification System sub-systems not addressed in Permit Condition
 27 III.10.H.1.a.xviii, the Permittees will mark all these LAW Vitrification System
 28 sub-systems holding dangerous and/or mixed waste with labels, or signs, to identify
 29 the waste contained in the LAW Vitrification System sub-systems. The labels, or
 30 signs, must be legible at a distance of at least fifty (50) feet, and must bear a legend
 31 which identifies the waste in a manner which adequately warns employees,
 32 emergency response personnel, and the public of the major risk(s) associated with the
 33 waste being stored or treated in the LAW Vitrification System sub-systems
 34 [[WAC 173-303-640](#)(5)(d), in accordance with [WAC 173-303-680](#)(2)].
- 35 **III.10.H.1.a.xx** The Permittees will ensure that the secondary containment systems for the LAW
 36 Vitrification System sub-systems listed in Permit Tables III.10.H.A and III.10.H.B, as
 37 approved/modified pursuant to Permit Condition III.10.H.5, are free of cracks or gaps
 38 to prevent any migration of dangerous and/or mixed waste or accumulated liquid out
 39 of the system to the soil, groundwater, or surface water at any time during use of the
 40 LAW Vitrification System sub-systems. Any indication that a crack or gap may exist
 41 in the containment systems will be investigated and repaired in accordance with
 42 Operating Unit Group 10, Appendix 9.18 of this Permit, as approved pursuant to
 43 Permit Condition III.10.H.5.e.v [[WAC 173-303-640](#)(4)(b)(i), [WAC 173-303-](#)
 44 [640](#)(4)(e)(i)(C), and [WAC 173-303-640](#)(6), in accordance with [WAC 173-303-680](#)(2)
 45 and (3), [WAC 173-303-806](#)(4)(i)(i)(B), and [WAC 173-303-320](#)].

- 1 **III.10.H.1.a.xxi** The Permittees must immediately, and safely, remove from service any LAW
2 Vitrification System or secondary containment system which through an integrity
3 assessment is found to be “unfit for use” as defined in [WAC 173-303-040](#), following
4 Permit Conditions III.10.H.1.a.xxiii, A through D, and F. The affected LAW
5 Vitrification System or secondary containment system must be either repaired or
6 closed in accordance with Permit Condition III.10.H.1.a.xxiii.E [[WAC 173-303-](#)
7 [640\(7\)\(e\)](#) and (f), [WAC 173-303-640\(8\)](#), in accordance with [WAC 173-303-680\(3\)](#)].
- 8 **III.10.H.1.a.xxii** An impermeable coating, as specified in Operating Unit Group 10, Appendices 9.4,
9 9.5, 9.7, 9.9, 9.11, and 9.12 of this Permit, as approved pursuant to Permit Condition
10 III.10.H.5.b.v will be maintained for all concrete containment systems and concrete
11 portions of containment systems for each LAW Vitrification System sub-systems
12 listed in Permit Tables III.10.H.A and III.10.H.B, as approved/modified pursuant to
13 Permit Condition III.10.H.5 (concrete containment systems that do not have a liner,
14 pursuant to [WAC 173-303-640\(4\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680\(2\)](#),
15 and have construction joints, will meet the requirements of [WAC 173-303-](#)
16 [640\(4\)\(e\)\(ii\)\(C\)](#), in accordance with [WAC 173-303-680\(2\)](#). The coating will prevent
17 migration of any dangerous and mixed waste into the concrete. All coatings will
18 meet the following performance standards:
- 19 A. The coating must seal the containment surface such that no cracks, seams, or
20 other avenues through which liquid could migrate are present;
 - 21 B. The coating must be of adequate thickness and strength to withstand the
22 normal operation of equipment and personnel within the given area such that
23 degradation or physical damage to the coating or lining can be identified and
24 remedied before dangerous and mixed waste could migrate from the system;
25 and
 - 26 C. The coating must be compatible with the dangerous and mixed waste,
27 treatment reagents, or other materials managed in the containment system
28 [[WAC 173-303-640\(4\)\(e\)\(ii\)\(D\)](#), in accordance with [WAC 173-303-680\(2\)](#)
29 and (3), and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)].
- 30 **III.10.H.1.a.xxiii** The Permittees will inspect all secondary containment systems for the LAW
31 Vitrification System sub-systems listed in Permit Tables III.10.H.A and III.10.H.B, as
32 approved/modified pursuant to Permit Condition III.10.H.5, in accordance with the
33 Inspection Plan specified in Operating Unit Group 10, Chapter 6A of this Permit, as
34 approved pursuant to Permit Conditions III.10.H.5.e.i and III.10.C.5.c, and take the
35 following actions if a leak or spill of dangerous and/or mixed waste is detected in
36 these containment systems [[WAC 173-303-640\(5\)\(c\)](#) and [WAC 173-303-640\(6\)](#), in
37 accordance with [WAC 173-303-680\(2\)](#) and (3), [WAC 173-303-320](#), and
38 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)]:
- 39 A. Immediately, and safely, stop the flow of dangerous and/or mixed waste into
40 the LAW Vitrification System sub-systems or secondary containment system.
 - 41 B. Determine the source of the dangerous and/or mixed waste.
 - 42 C. Remove the dangerous and/or mixed waste from the containment area in
43 accordance with [WAC 173-303-680\(2\)](#) and (3) as specified in [WAC 173-303-](#)
44 [640\(7\)\(b\)](#). The dangerous and/or mixed waste removed from containment
45 areas of the LAW Vitrification System sub-systems will be, as a minimum,
46 managed as mixed waste.

- 1 D. If the cause of the release was a spill that has not damaged the integrity of the
 2 LAW Vitrification System sub-system, the Permittees may return the LAW
 3 Vitrification System sub-system to service in accordance with
 4 [WAC 173-303-680\(2\)](#) and (3) as specified in [WAC 173-303-640\(7\)\(e\)\(ii\)](#).
 5 In such case, the Permittees will take action to insure the incident that caused
 6 the dangerous and/or mixed waste to enter the containment system will not
 7 reoccur [[WAC 173-303-320\(3\)](#)].
- 8 E. If the source of the dangerous and/or mixed waste is determined to be a leak
 9 from the primary LAW Vitrification System into the secondary containment
 10 system, or the system is unfit for use as determined through an integrity
 11 assessment or other inspection, the Permittees will comply with the
 12 requirements of [WAC 173-303-640\(7\)](#) and take the following actions:
- 13 1. Close the LAW Vitrification System sub-system following procedures in
 14 [WAC 173-303-640\(7\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680](#) and
 15 Operating Unit Group 10, Chapter 11 of this Permit, as approved
 16 pursuant to Permit Condition III.10.C.8, or
 - 17 2. Repair and re-certify (in accordance with [WAC 173-303-810\(13\)\(a\)](#), as
 18 modified pursuant to Permit Condition III.10.H.1.a.iii) the LAW
 19 Vitrification System, in accordance with Operating Unit Group 10,
 20 Appendix 9.18 of this Permit, as approved pursuant to Permit Condition
 21 III.10.H.5.e.v, before the LAW Vitrification System is placed back into
 22 service [[WAC 173-303-640\(7\)\(e\)\(iii\)](#) and [WAC 173-303-640\(7\)\(f\)](#), in
 23 accordance with [WAC 173-303-680](#)].
- 24 F. The Permittees will document in the operating record actions/procedures
 25 taken to comply with A. through E. above as specified in [WAC 173-303-](#)
 26 [640\(6\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#) and (3).
- 27 G. In accordance with [WAC 173-303-680\(2\)](#) and [WAC 173-303-680](#) (3), the
 28 Permittees will notify and report releases to the environment to Ecology as
 29 specified in [WAC 173-303-640\(7\)\(d\)](#).

30 **III.10.H.1.a.xxiv** If liquids (e.g., dangerous and/or mixed waste leaks and spills, precipitation, fire
 31 water, liquids from damaged or broken pipes) cannot be removed from the secondary
 32 containment system within twenty-four (24) hours, Ecology will be verbally notified
 33 within twenty-four (24) hours of discovery. The notification will provide the
 34 information in A, B, and C, listed below. The Permittees will provide Ecology with
 35 a written demonstration within seven (7) business days, identifying at a minimum
 36 [[WAC 173-303-640\(4\)\(c\)\(iv\)](#) and [WAC 173-303-640\(7\)\(b\)\(ii\)](#), in accordance with
 37 [WAC 173-303-680\(3\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)]:

- 38 A. Reasons for delayed removal.
- 39 B. Measures implemented to ensure continued protection of human health and
 40 the environment.
- 41 C. Current actions being taken to remove liquids from secondary containment.

42 **III.10.H.1.a.xxv** All air pollution control devices and capture systems in the LAW Vitrification System
 43 will be maintained and operated at all times in a manner so as to minimize the
 44 emissions of air contaminants and to minimize process upsets. Procedures for
 45 ensuring that the air pollution control devices and capture systems in the LAW
 46 Vitrification System are properly operated and maintained so as to minimize the
 47 emission of air contaminants and process upsets will be established.

- 1 **III.10.H.1.a.xxvi** In all future narrative permit submittals, the Permittees will include LAW
2 Vitrification sub-system names with the sub-system designation.
- 3 **III.10.H.1.a.xxvii** Modifications to approved design, plans, and specifications in Operating Unit
4 Group 10 of this Permit for the LAW Vitrification System will be allowed only in
5 accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g, III.10.C.9.d,
6 III.10.C.9.e, and III.10.C.9.h.
- 7 **III.10.H.1.a.xxviii** For any portion of the LAW Vitrification System which has the potential for
8 formation and accumulation of hydrogen gases, the Permittees will operate the
9 portion to maintain hydrogen levels below the lower explosive limit [[WAC 173-303-
10 815\(2\)\(b\)\(ii\)](#)].
- 11 **III.10.H.1.a.xxix** For each LAW Vitrification System sub-system holding dangerous waste which are
12 acutely or chronically toxic by inhalation, the Permittees will operate the system to
13 prevent escape of vapors, fumes or other emissions into the air [[WAC 173-303-
14 806\(4\)\(i\)\(i\)\(B\)](#) and [WAC 173-303-640\(5\)\(e\)](#)], in accordance with [WAC 173-303-680](#)].
- 15 **III.10.H.1.b** Performance Standards
- 16 **III.10.H.1.b.i** The LAW Vitrification System must achieve a one-time demonstration for DRE of
17 99.99% for the PODCs listed below, further details are provided in III.10.H.2.b.iii.
- 18 PODC: Naphthalene and Chlorobenzene
19 DRE in this permit condition will be calculated in accordance with the formula
20 given below:
21 $DRE = [1 - (W_{out}/W_{in})] \times 100\%$
22 Where:
23 W_{in} = mass feed-rate of one PODC in a waste feed stream; and
24 W_{out} = mass emission rate of the same PODC present in exhaust emissions prior to
25 release to the atmosphere.
- 26 **III.10.H.1.b.ii** Particulate matter emissions from the LAW Vitrification System will not exceed 34
27 mg/dscm (0.015 grains/dscf) [[40 CFR §63.1203\(b\)\(7\)](#)], in accordance with
28 [WAC 173-303-680\(2\)](#)].
- 29 **III.10.H.1.b.iii** Hydrochloric acid and chlorine gas emissions from the LAW Vitrification System
30 will not exceed 21 ppmv, combined [[40 CFR §63.1203\(b\)\(6\)](#)], in accordance with
31 [WAC 173-303-680\(2\)](#)].
- 32 **III.10.H.1.b.iv** Dioxin and Furan TEQ emissions from the LAW Vitrification System will not exceed
33 0.2 nanograms (ng)/dscm [[40 CFR §63.1203\(b\)\(1\)](#)], in accordance with
34 [WAC 173-303-680\(2\)](#)].
- 35 **III.10.H.1.b.v** Mercury emissions from the LAW Vitrification System will not exceed 45 µg/dscm
36 [[40 CFR §63.1203\(b\)\(2\)](#)], in accordance with [WAC 173-303-680\(2\)](#)].
- 37 **III.10.H.1.b.vi** Lead and cadmium emissions from the LAW Vitrification System will not exceed
38 120 µg/dscm, combined [[40 CFR §63.1203\(b\)\(3\)](#)], in accordance with [WAC 173-303-
39 680\(2\)](#)].
- 40 **III.10.H.1.b.vii** Arsenic, beryllium, and chromium emissions from the LAW Vitrification System will
41 not exceed 97 µg/dscm, combined [[40 CFR §63.1203\(b\)\(4\)](#)], in accordance with
42 [WAC 173-303-680\(2\)](#)].

- 1 **III.10.H.1.b.viii** Carbon monoxide (CO) emission from the LAW Vitrification System will not exceed
2 100 parts per million (ppm) by volume, over an hourly rolling average (as measured
3 and recorded by the CMS), dry basis [[40 CFR §63.1203\(b\)\(5\)\(i\)](#)], in accordance with
4 [WAC 173-303-680\(2\)](#)].
- 5 **III.10.H.1.b.ix** Hydrocarbon emission from the LAW Vitrification System will not exceed 10 parts
6 per million (ppm) by volume, over an hourly rolling average (as measured and
7 recorded by a temporary continuous emissions monitoring system during
8 demonstration testing required by this Permit), dry basis, and reported as propane
9 [[40 CFR §63.1203\(b\)\(5\)\(ii\)](#)], in accordance with [WAC 173-303-680\(2\)](#)].
- 10 **III.10.H.1.b.x** If the emissions from the LAW Vitrification System exceed the emission rates listed
11 in Permit Table III.10.H.E, as approved pursuant to Permit Condition III.10.C.11.b,
12 the Permittees will notify Ecology in accordance with Permit Condition
13 III.10.H.3.d.vii [[WAC 173-303-680\(2\)](#) and (3), and [WAC 173-303-815\(2\)\(b\)\(ii\)](#)].
14 The emission limits specified in Permit Conditions III.10.H.1.b.i through
15 III.10.H.1.b.ix above, will be met for the LAW Vitrification System by limiting
16 feed-rates as specified in Permit Tables III.10.H.D and III.10.H.F, as
17 approved/modified pursuant to Permit Condition III.10.H.5, compliance with
18 operating conditions specified in Permit Condition III.10.H.1.c (except as specified in
19 Permit Condition III.10.H.1.b.xii), and compliance with Permit Condition
20 III.10.H.1.b.xi.
- 21 **III.10.H.1.b.xi** Treatment effectiveness, feed-rates and operating rates for dangerous and mixed
22 waste management units contained in the LAW Building, but not included in Permit
23 Table III.10.H.A, as approved/modified pursuant to Permit Condition III.10.H.5, will
24 be as specified in Permit Sections III.10.D, III.10.E, III.10.F and consistent with
25 assumptions and basis which are reflected in Operating Unit Group 10, Appendix 6.3
26 of this Permit, as approved pursuant to Permit Condition III.10.C.11.b. For the
27 purposes of this permit condition, Operating Unit Group 10, Appendix 6.3 will be
28 superseded by Appendix 6.4 upon its approval pursuant to either Permit Conditions
29 III.10.C.11.c or III.10.C.11.d [[WAC 173-303-680\(2\)](#) and (3), and [WAC 173-303-
30 815\(2\)\(b\)\(ii\)](#)].
- 31 **III.10.H.1.b.xii** Except during periods of LAW Vitrification System startup and shutdown,
32 compliance with the operating conditions specified in Permit Condition
33 III.10.H.1.c, will be regarded as compliance with the required performance standards
34 identified in Permit Conditions III.10.H.1.b.i through x. However, if it is determined
35 that during the effective period of this Permit that compliance with the operating
36 conditions in Permit Condition III.10.H.1.c is not sufficient to ensure compliance
37 with the performance standards specified in Permit Conditions III.10.H.1.b.i through
38 x, the Permit may be modified, revoked, or reissued pursuant to Permit Conditions
39 III.10.C.2.e and III.10.C.2.f, or III.10.C.2.g.
- 40 **III.10.H.1.c** Operating Conditions [[WAC 173-303-670\(6\)](#)], in accordance with [WAC 173-303-680\(2\)](#)
41 and (3)].
42 The Permittees will operate the LAW Vitrification System in accordance with Operating
43 Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit Condition
44 III.10.H.5.e.vi, Operating Unit Group 10, Appendix 9.18 of this Permit, as approved
45 pursuant to Permit Condition III.10.H.5.e, and Operating Unit Group 10, Appendix 9.15
46 of this Permit, as approved pursuant to Permit Condition III.10.H.5.f, except as modified

1 pursuant to Permit Conditions III.10.H.1.b.xii, III.10.H.2, III.10.H.3, III.10.H.4, and in
2 accordance with the following:

- 3 **III.10.H.1.c.i** The Permittees will operate the LAW Vitrification System in order to maintain the
4 systems and process parameters listed in Permit Tables III.10.H.C and III.10.H.F, as
5 approved/modified pursuant to Permit Condition III.10.H.5, within the set-points
6 specified in Permit Table III.10.H.F.
- 7 **III.10.H.1.c.ii** The Permittees will operate the AWFCO systems, specified in Permit Table
8 III.10.H.F, as approved/modified pursuant to Permit Condition III.10.H.5, to
9 automatically cut-off and/or lock-out the dangerous and mixed waste feed to the
10 LAW Vitrification System when the monitored operating conditions deviate from the
11 set-points specified in Permit Table III.10.H.F.
- 12 **III.10.H.1.c.iii** The Permittees will operate the AWFCO systems, specified in Permit Table
13 III.10.H.F, as approved/modified pursuant to Permit Condition III.10.H.5, to
14 automatically cut-off and/or lock-out the dangerous and mixed waste feed to the
15 LAW Vitrification System when all instruments specified on Permit Table III.10.H.F
16 for measuring the monitored parameter fail or exceed its span value.
- 17 **III.10.H.1.c.iv** The Permittees will operate the AWFCO systems, specified in Permit Table
18 III.10.H.F, as approved/modified pursuant to Permit Condition III.10.H.5, to
19 automatically cut-off and/or lock out the dangerous and/or mixed waste feed to the
20 LAW Vitrification System when any portion of the LAW Vitrification System is
21 bypassed. The terms “bypassed” and “bypass event” as used in Permit Sections
22 III.10.H and III.10.I will mean if any portion of the LAW Vitrification System is
23 bypassed so that gases are not treated as during the Demonstration Test.
- 24 **III.10.H.1.c.v** In the event of a malfunction of the AWFCO systems listed in Permit Table
25 III.10.H.F, as approved/modified pursuant to Permit Condition III.10.H.5, the
26 Permittees will immediately, manually cut-off the dangerous and mixed waste feed to
27 the LAW Vitrification System. The Permittees will not restart the dangerous and/or
28 mixed waste feed until the problem causing the malfunction has been identified and
29 corrected.
- 30 **III.10.H.1.c.vi** The Permittees will manually cut-off the dangerous and mixed waste feed to the
31 LAW Vitrification System when the operating conditions deviate from the limits
32 specified in Permit Condition III.10.H.1.c.i, unless the deviation automatically
33 activates the waste feed cut-off sequence specified in Permit Conditions
34 III.10.H.1.c.ii, III.10.H.1.c.iii, and/or III.10.H.1.c.iv.
- 35 **III.10.H.1.c.vii** If greater than thirty (30) dangerous and mixed waste feed cut-off, combined, to the
36 LAW Vitrification System occur due to deviations from Permit Table III.10.H.F, as
37 approved/modified pursuant to Permit Condition III.10.H.5, within a sixty (60) day
38 period, the Permittees will submit a written report to Ecology within five (5) calendar
39 days of the thirty-first exceedance including the information specified below. These
40 dangerous and mixed waste feed cut-offs to the LAW Vitrification System, whether
41 automatically or manually activated, are counted if the specified set points are
42 deviated from while dangerous waste, mixed waste, and waste residues continue to
43 be processed in the LAW Vitrification System. A cascade event is counted at a
44 frequency of one (1) towards the first waste feed cut-off parameter, specified on
45 Permit Table III.10.H.F, from which the set-point is deviated:
- 46 A. The parameter(s) that deviated from the set-point(s) in Permit Table
47 III.10.H.F.

- 1 B. The magnitude, dates, and duration of the deviations.
- 2 C. Results of the investigation of the cause of the deviations.
- 3 D. Corrective measures taken to minimize future occurrences of the deviations.
- 4 **III.10.H.1.c.viii** If any portion of the LAW Vitrification System is bypassed while treating dangerous
5 and/or mixed waste it will be regarded as non-compliance with the operating
6 conditions specified in Permit Condition III.10.H.1.c and the performance standards
7 specified in Permit Condition III.10.H.1.b. After such a bypass event, the Permittees
8 will perform the following actions:
- 9 A. Investigate the cause of the bypass event.
- 10 B. Take appropriate corrective measures to minimize future bypasses.
- 11 C. Record the investigation findings and corrective measures in the operating
12 record.
- 13 D. Submit a written report to Ecology within five (5) days of the bypass event
14 documenting the result of the investigation and corrective measures.
- 15 **III.10.H.1.c.ix** The Permittees will control fugitive emissions from the LAW Vitrification System by
16 maintaining the melters under negative pressure.
- 17 **III.10.H.1.c.x** Except during periods of vitrification system startup and shutdown, compliance with
18 the operating conditions specified in Permit Condition III.10.H.1.c will be regarded
19 as compliance with the required performance standards identified in Permit
20 Condition III.10.H.1.b. However, evidence that compliance with these operating
21 conditions is insufficient to ensure compliance with the performance standards, will
22 justify modification, revocation, or re-issuance of this Permit, in accordance with
23 Permit Conditions III.10.C.2.e and III.10.C.2.f, or III.10.C.2.g.
- 24 **III.10.H.1.d** Inspection Requirements [[WAC 173-303-680\(3\)](#)]
- 25 **III.10.H.1.d.i** The Permittees will inspect the LAW Vitrification System in accordance with the
26 Inspection Plan in Operating Unit Group 10, Chapter 6A of this Permit, as modified
27 in accordance with Permit Condition III.10.C.5.c.
- 28 **III.10.H.1.d.ii** The inspection data for LAW Vitrification System will be recorded, and the records
29 will be placed in the WTP Unit operating record for the LAW Vitrification System, in
30 accordance with Permit Condition III.10.C.4.
- 31 **III.10.H.1.e** Monitoring Requirements [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#), [WAC 173-303-](#)
32 [670\(7\)](#) and [WAC 173-303-807\(2\)](#)], in accordance with [WAC 173-303-680\(3\)](#)]
- 33 **III.10.H.1.e.i** Upon receipt of a written request from Ecology, the Permittees will perform sampling
34 and analysis of the dangerous and mixed waste and exhaust emissions to verify that
35 the operating requirements established in the Permit achieve the performance
36 standards delineated in this Permit.
- 37 **III.10.H.1.e.ii** The Permittees will comply with the monitoring requirements specified in Operating
38 Unit Group 10, Appendices 9.2, 9.3, 9.7, 9.13, 9.15 and 9.18 of this Permit, as
39 approved pursuant to Permit Conditions III.10.H.5.c, III.10.H.5.d, III.10.H.5.e, and
40 III.10.H.5.f, as modified by Permit Conditions III.10.H.1.b.xii, III.10.H.2, III.10.H.3,
41 and III.10.H.4.

- 1 **III.10.H.1.e.iii** The Permittees will operate, calibrate, and maintain the carbon monoxide CEMS as
2 specified in this Permit in accordance with Performance Specifications found in
3 [40 CFR Part 60](#), Appendix B, in accordance with Appendix to Subpart EEE of
4 [40 CFR Part 63](#), and Operating Unit Group 10 Appendix 9.15 of this Permit, as
5 approved pursuant to Permit Condition III.10.H.5.f, and as modified by Permit
6 Conditions III.10.H.1.b.xii, III.10.H.2, III.10.H.3, and III.10.H.4.
- 7 **III.10.H.1.e.iv** The Permittees will operate, calibrate, and maintain the instruments specified on
8 Permit Tables III.10.H.C, and F, as approved/modified pursuant to Permit Condition
9 III.10.H.5, in accordance with Operating Unit Group 10, Appendix 9.15 of this
10 Permit, as approved pursuant to Permit Condition III.10.H.5.f, and as modified by
11 Permit Conditions III.10.H.1.b.xii, III.10.H.2, III.10.H.3, and III.10.H.4.
- 12 **III.10.H.1.f** Recordkeeping Requirements [[WAC 173-303-380](#) and [WAC 173-303-680\(3\)](#)]
- 13 **III.10.H.1.f.i** The Permittees will record and maintain in the WTP Unit operating record for the
14 LAW Vitrification System, all monitoring, calibration, maintenance, test data, and
15 inspection data compiled under the conditions of this Permit, in accordance with
16 Permit Conditions III.10.C.4 and III.10.C.5, as modified by Permit Conditions
17 III.10.H.1.b.xii, III.10.H.2, III.10.H.3, and III.10.H.4.
- 18 **III.10.H.1.f.ii** The Permittees will record in the WTP Unit operating record the date, time, and
19 duration of all automatic waste feed cutoffs and/or lockouts, including the triggering
20 parameters, reason for the deviation, and recurrence of the incident. The Permittees
21 will also record all incidents of AWFCO system function failures, including the
22 corrective measures taken to correct the condition that caused the failure. In addition,
23 if the AWFCO is engaged due to a pressure exceedance, the pressure value must be
24 recorded.
- 25 **III.10.H.1.f.iii** The Permittees will submit to Ecology a report semi-annually the first calendar year,
26 and annually thereafter each calendar year within ninety (90) days following the end
27 of the year. The report will include the following information:
- 28 A. Total dangerous and mixed waste feed processing time for the LAW
29 Vitrification System;
- 30 B. Date/Time of all LAW Vitrification System startups and shutdowns;
- 31 C. Date/Time/Duration/Cause/Corrective Action taken for all LAW Vitrification
32 System shutdowns caused by malfunction of either process or control
33 equipment; and
- 34 D. Date/Time/Duration/Cause/Corrective Action taken for all instances of
35 dangerous and/or mixed waste feed cut-off due to deviations from Permit
36 Table III.10.H.F, as approved/modified pursuant to Permit Condition
37 III.10.H.5.
- 38 **III.10.H.1.f.iv** The Permittees will submit an annual report to Ecology each calendar year within
39 ninety (90) days following the end of the year of all quarterly CEMS Calibration
40 Error and Annual CEMS Performance Specification Tests conducted in accordance
41 with Permit Condition III.10.H.1.e.iii.
- 42 **III.10.H.1.g** Closure
- 43 The Permittees will close the LAW Vitrification System in accordance with Operating
44 Unit Group 10, Chapter 11 of this Permit, as approved pursuant to Permit Condition
45 III.10.C.8.

- 1 **III.10.H.2 Shakedown Period** [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#),
2 [WAC 173-303-670\(7\)](#), and [WAC 173-303-807\(2\)](#), in accordance with
3 [WAC 173-303-680\(2\)](#) and (3)].
- 4 **III.10.H.2.a** The shakedown period for the LAW Vitrification System will be conducted in accordance
5 with Permit Condition III.10.H.1, Operating Unit Group 10, Appendix 9.15.
- 6 **III.10.H.2.b** Duration of the Shakedown Period
- 7 **III.10.H.2.b.i** The shakedown period for the LAW Vitrification System will begin with the
8 introduction of PODCs in the LAW Vitrification System and will end with the start of
9 the demonstration test, pursuant to Permit Condition III.10.C.2.1.
- 10 **III.10.H.2.b.ii** Each shakedown phase will not exceed the following limits, as defined by hours,
11 when the LAW Vitrification System is processing dangerous waste. The Permittees
12 may petition Ecology for one extension of each shakedown phase for seven hundred
13 and twenty (720) additional operating hours in accordance with Permit modification
14 procedures specified in Permit Conditions III.10.C.2.e and III.10.C.2.f.
- 15 Shakedown Phase 1: 720 hours
16 Shakedown Phase 2: 720 hours
- 17 **III.10.H.2.b.iii** Emissions testing will be performed during Shakedown Phase 1 to confirm DRE for
18 both PODCs, naphthalene and chlorobenzene. If pre-testing indicates potential
19 failure of one of the PODCs, then testing with a single PODC may be reconsidered
20 following approval from Ecology.
- 21 **III.10.H.2.b.iv** Shakedown Phase 1 will be completed when documentation has been submitted to
22 Ecology and the Permittees have received concurrence verifying that the LAW
23 Vitrification System has operated at a minimum of 75% of the feed-rate limit found
24 in Permit Table III.10.H.D for two (2) separate eight (8) consecutive hour periods
25 with no AWFCOs.
- 26 **III.10.H.2.b.v** A full scale emissions test will be performed during Shakedown Phase 2 to determine
27 system capability before starting the Demonstration Test. The Permittee will submit
28 the preliminary results of DRE and a complete emissions data-set to Ecology within
29 30 days of receiving the results.
- 30 **III.10.H.2.b.vi** Shakedown Phase 2 will be completed when documentation has been submitted to
31 Ecology and the Permittee has received concurrence verifying that the LAW
32 Vitrification System has operated at a minimum of 75% feed-rate limit found in
33 Permit Table III.10.H.D for a minimum of consecutive 8-hour periods on two (2)
34 consecutive days with no AWFCOs.
- 35 **III.10.H.2.c** Allowable Waste Feed during the Shakedown Period
- 36 **III.10.H.2.c.i** The Permittees may feed the dangerous waste specified for the LAW Vitrification
37 System on the Part A Forms (Operating Unit Group 10, Chapter 1 of this Permit),
38 except for those wastes outside the waste acceptance criteria specified in the WAP,
39 Attachment 1, Chapter 3 of this Permit, as approved pursuant to Permit Condition
40 III.10.C.3, except Permit Conditions III.10.H.2.c.ii through iv also apply.
- 41 **III.10.H.2.c.ii** The Permittees will not feed mixed waste to the LAW Vitrification System during the
42 Shakedown period.

- 1 **III.10.H.2.c.iii** The feed-rates to the LAW Vitrification System shall not exceed the limits in Permit
2 Table III.10.H.D, in accordance with the automatic waste feed cut offs specified in
3 Table III.10.H.F.
- 4 **III.10.H.2.c.iv** The Permittees will conduct sufficient analysis of the dangerous waste treated in the
5 LAW Vitrification System to verify that the waste feed is within the physical and
6 chemical composition limits specified in this Permit.
- 7 **III.10.H.3** **Demonstration Test Period** [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#),
8 [WAC 173-303-670\(7\)](#), and [WAC 173-303-807\(2\)](#), in accordance with
9 [WAC 173-303-680\(2\)](#) and (3)]
- 10 **III.10.H.3.a** Demonstration Test Period
- 11 **III.10.H.3.a.i** The Permittees will operate, monitor, and maintain the LAW Vitrification System as
12 specified in Permit Condition III.10.H.1, and Operating Unit Group 10, Appendix
13 9.15 of this Permit.
- 14 **III.10.H.3.a.ii** The Demonstration Test Plan, located in Operating Unit Group 10, Appendix 9.15 of
15 this Permit, will be resubmitted to Ecology for approval by the Permittees as a permit
16 modification pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f at least one
17 hundred and eighty (180) days prior to the start date of the demonstration test. The
18 revised Demonstration Test Plan will include applicable EPA promulgated test
19 methods and procedures in effect at the time of the re-submittal and projected
20 commencement and completion dates for the Demonstration Test.
- 21 **III.10.H.3.a.iii** The Demonstration Test period will begin once the Permittees have received
22 concurrence from Ecology that Shakedown Phase 2 has been completed.
- 23 **III.10.H.3.a.iv** Upon completion of the Demonstration Test, PODC and metals spiking shall be
24 discontinued and purged from the LAW Vitrification System.
- 25 **III.10.H.3.a.v** During the purge of the LAW Vitrification System, the feed-rates to the LAW
26 Vitrification System will not exceed the limits in Permit Table III.10.H.D in
27 accordance with the waste feed cut offs in Table III.10.H.F.
- 28 **III.10.H.3.a.vi** Once 7,200 gallons of non-dangerous feed material is processed through each melter,
29 the PODC listed codes are no longer applicable to the LAW Vitrification System or
30 waste generated thereafter.
- 31 **III.10.H.3.b** Performance Standards
- 32 The Permittees will demonstrate compliance with the performance standards specified in
33 Permit Condition III.10.H.1.b during the Demonstration Test Period.
- 34 **III.10.H.3.c** Allowable Waste Feed during the Demonstration Test Period
- 35 **III.10.H.3.c.i** The Permittees may feed the dangerous waste specified for the LAW Vitrification
36 System in Part A Forms (Operating Unit Group 10, Chapter 1 of this Permit), except
37 for those waste outside the waste acceptance criteria specified in the WAP, Operating
38 Unit Group 10, Chapter 3 of this Permit, as approved pursuant to Permit Condition
39 III.10.C.3, except Permit Conditions III.10.H.3.c.ii through iv also apply.
- 40 **III.10.H.3.c.ii** The Permittees will not feed mixed waste to the LAW Vitrification System.
- 41 **III.10.H.3.c.iii** The dangerous waste feed-rates to the LAW Vitrification System will not exceed the
42 limits in Permit Tables III.10.H.D in accordance with the waste feed cut offs in
43 Permit Table III.10.H.F.

- 1 **III.10.H.3.c.iv** The Permittees will conduct sufficient analysis of the dangerous waste treated in the
 2 LAW Vitrification System to verify that the dangerous waste is within the physical
 3 and chemical composition limits specified in this Permit.
- 4 **III.10.H.3.d** Demonstration Data Submissions and Certifications
- 5 **III.10.H.3.d.i** The Permittees will submit to Ecology a complete demonstration test report within
 6 one-hundred eighty (180) calendar days of completion of the Demonstration Test
 7 including all data collected during the Demonstration Test and updated Permit Tables
 8 III.10.I.D, III.10.I.E and III.10.I.F.
- 9 **III.10.H.3.d.ii** The Permittees must submit the following information to Ecology within sixty (60)
 10 calendar days of completion of the Demonstration Test:
- 11 A. A summary of data collected as required by the Demonstration Test Plan.
- 12 B. A certification that the Demonstration Test has been carried out in
 13 accordance with the approved Demonstration Test Plan and approved
 14 modifications within sixty (60) days of the completion of the Demonstration
 15 Test [[WAC 173-303-807\(8\)](#)].
- 16 C. Calculations and analytical data showing compliance with the performance
 17 standards specified in Permit Conditions III.10.H.1.b.i, III.10.H.1.b.iv,
 18 III.10.H.1.b.v, III.10.H.1.b.vi, and III.10.H.1.b.vii.
- 19 D. Laboratory data QA/QC summary for the information provided in
 20 III.10.H.3.d.ii.C.
- 21 **III.10.H.3.d.iii** The Permittees shall submit a permit modification request proposing the changes to
 22 the post Demonstration Test period AWFCO settings (Permit Table III.10.H.F) and
 23 waste feed rates (Permit Table III.10.H.D), within ninety (90) calendar days
 24 following completion of the Demonstration Test.
- 25 **III.10.H.3.d.iv** RESERVED
- 26 **III.10.H.3.d.v** After successful completion of the Demonstration Test, Permittees submittal of the
 27 following to Ecology and the Permittees receipt of approval of the following in
 28 writing, the Permittees will be authorized to feed mixed waste to the LAW
 29 Vitrification System pursuant to Permit Section III.10.I.
- 30 A. A complete Demonstration Test Report for the LAW Vitrification System and
 31 updated Permit Tables III.10.I.D, III.10.I.E, and III.10.I.F, as
 32 approved/modified pursuant to Permit Conditions III.10.H.5 and
 33 III.10.C.11.c or III.10.C.11.d. The test report will be certified in accordance
 34 with [WAC 173-303-807\(8\)](#) and [WAC 173-303-680\(2\)](#) and (3).
- 35 B. A Final Risk Assessment Report completed pursuant to Permit Conditions
 36 III.10.C.11.c or III.10.C.11.d.
- 37 **III.10.H.3.d.vi** If any calculations or testing results show that one or more of the performance
 38 standards listed in Permit Condition III.10.H.1.b, with the exception of Permit
 39 Condition III.10.H.1.b.x, for the LAW Vitrification System were not met during the
 40 Demonstration Test, the Permittees will perform the following actions:
- 41 A. Immediately stop dangerous and mixed waste feed to the LAW Vitrification
 42 System under the mode of operation that resulted in not meeting the
 43 performance standard(s).
- 44 B. Verbally notify Ecology within twenty-four (24) hours of discovery of not
 45 meeting the performance standard(s) as specified in Permit Condition I.E.21.

- 1 C. Investigate the cause of the failure and submit a report of the investigation
2 findings to Ecology within fifteen (15) days of discovery of not meeting the
3 performance standard(s).
- 4 D. Submit to Ecology within fifteen (15) days of discovery of not meeting the
5 performance standard(s), documentation supporting a mode of operation
6 where all performance standards listed in Permit Condition III.10.H.1.b, with
7 the exception of Permit Condition III.10.H.1.b.x, for the LAW Vitrification
8 System were met during the demonstration test, if any such mode was
9 demonstrated.
- 10 E. Based on the information provided to Ecology by the Permittees pursuant to
11 Permit Conditions III.10.H.3.d.vi.A through D above, and any additional
12 information, Ecology may provide in writing, direction to the Permittees to
13 stop dangerous and/or mixed waste feed to the LAW Vitrification System
14 and/or amend the mode of operation the Permittees are allowed to continue
15 operations prior to Ecology approval of a compliance schedule and/or revised
16 Demonstration Test Plan pursuant to Permit Conditions III.10.H.3.d.vi.F
17 and G.
- 18 F. If the performance standard listed in Permit Condition III.10.H.1.b.i was not
19 met during the Demonstration Test, the Permittees will submit within one
20 hundred and twenty (120) days of discovery of not meeting the performance
21 standard, a revised Demonstration Test Plan (if appropriate), and a
22 compliance schedule for Ecology approval to address this deficiency. If a
23 revised Demonstration Test Plan is submitted, it will be accompanied by a
24 request for approval to retest as a permit modification pursuant to Permit
25 Conditions III.10.C.2.e and III.10.C.2.f. The revised Demonstration Test
26 Plan (if submitted) must include substantive changes to prevent failure from
27 reoccurring.
- 28 G. If any of the performance standards listed in Permit Condition III.10.H.1.b,
29 with the exception of Permit Conditions III.10.H.1.b.i or III.10.H.1.b.x, were
30 not met during the Demonstration Test the Permittees will submit to Ecology
31 within one hundred twenty (120) days of discovery of not meeting the
32 performance standard(s), a revised Demonstration Test Plan requesting
33 approval to retest as a permit modification pursuant to Permit Conditions
34 III.10.C.2.e and III.10.C.2.f. The revised Demonstration Test Plan must
35 include substantive changes to prevent failure from reoccurring.

36 **III.10.H.3.d.vii** If any calculations or testing results show that any emission rate for any constituent
37 listed in Permit Table III.10.H.E, as approved pursuant to Permit Condition
38 III.10.C.11.b, is exceeded for LAW Vitrification System during the Demonstration
39 Test, the Permittees will perform the following actions:

- 40 A. Verbally notify Ecology within twenty-four (24) hours of the discovery of
41 exceeding the emission rate(s) as specified in Permit Condition I.E.21.
- 42 B. Submit to Ecology additional risk information to indicate that the increased
43 emissions impact is offset by decreased emission impact from one or more
44 constituents expected to be emitted at the same time, and/or investigate the
45 cause and impact of the exceedance of the emission rate(s) and submit a
46 report of the investigation findings to Ecology within fifteen (15) days of the
47 discovery of exceeding the emission rate(s); and

1 C. Based on the notification and any additional information, Ecology may
 2 provide, in writing, direction to the Permittees to stop dangerous and/or
 3 mixed waste feed to the LAW Vitrification System and/or to submit a revised
 4 Demonstration Test Plan as a permit modification pursuant to Permit
 5 Conditions III.10.C.2.e and III.10.C.2.f, or III.10.C.2.g. The revised
 6 Demonstration Test Plan must include substantive changes to prevent failure
 7 from reoccurring.

8 **III.10.H.4 Post Demonstration Test Period** [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#),
 9 and [WAC 173-303-807\(2\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and (3)].

10 **III.10.H.4.a** The Permittees will operate, monitor, and inspect the LAW Vitrification System as
 11 specified in Permit Condition III.10.H.1.

12 **III.10.H.4.b** After successful completion of the Demonstration Test, the Permittees will submit to
 13 Ecology a request to enter the Post Demonstration Test Period. Ecology has seven (7)
 14 calendar days from the receipt of the request to approve or deny the Permittees' request
 15 to enter the Post Demonstration Test Period. If the Permittees have not received a
 16 notification from Ecology to approve or deny the request, the Permittees may operate
 17 during the Post Demonstration Test Period at risk.

18 **III.10.H.4.c** After receipt of approval of Permit Conditions III.10.H.3.d.ii and III.10.H.3.d.iii the
 19 Permittees will be authorized to feed mixed waste feed to the LAW Vitrification System.

20 **III.10.H.4.d** Allowable Waste Feed during the Post-Demonstration Test Period

21 **III.10.H.4.d.i** The Permittees may feed the dangerous and/or mixed waste specified for the LAW
 22 Vitrification System on the Part A Forms (Operating Unit Group 10, Chapter 1 of this
 23 Permit), except for those wastes outside the waste acceptance criteria specified in the
 24 WAP, Operating Unit Group 10, Chapter 3 of this Permit, as approved pursuant to
 25 Permit Condition III.10.C.3, and except Permit Conditions III.10.H.4.d.ii and
 26 III.10.H.4.d.iv also apply.

27 **III.10.H.4.d.ii** The dangerous waste and mixed waste feed-rates to the LAW Vitrification System
 28 will not exceed the limits in Permit Table III.10.H.D.

29 **III.10.H.4.d.iii** During the Post Demonstration Test Period the Permittees may accept and treat up to
 30 3 million gallons of Hanford tank waste feed in the LAW Vitrification System.

31 **III.10.H.4.d.iv** The Permittees will conduct sufficient analysis of the dangerous waste and mixed
 32 waste treated in the LAW Vitrification System to verify that the waste feed is within
 33 the physical and chemical composition limits specified in this Permit.

34 **III.10.H.5 Compliance Schedules**

35 **III.10.H.5.a** All information identified for submittal to Ecology in III.10.H.5.a. through III.10.H.5.f of
 36 this compliance schedule must be signed and certified in accordance with requirements in
 37 [WAC 173-303-810\(12\)](#), as modified in accordance with Permit Condition III.10.H.1.a.iii
 38 [[WAC 173-303-806\(4\)](#)].

39 **III.10.H.5.b** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
 40 construction of each secondary containment and leak detection system for the LAW
 41 Vitrification System (per level) as identified in Permit Tables III.10.H.A and III.10.H.B,
 42 engineering information as specified below, for incorporation into Operating Unit Group
 43 10, Appendices 9.2 , 9.4, 9.5, 9.7, 9.8, 9.9, 9.11, and 9.12 of this Permit. At a minimum,
 44 engineering information specified below will show the following as described in
 45 [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#) (the information specified

- 1 below will include dimensioned engineering drawings and information on sumps and
2 floor drains):
- 3 **III.10.H.5.b.i** IQRPE Reports (specific to foundation, secondary containment, and leak detection
4 system) will include review of design drawings, calculations, and other information
5 on which the certification report is based and will include as applicable, but not
6 limited to, review of such information described below. Information (drawings,
7 specifications, etc.) already included in Operating Unit Group 10, Appendix 9.0 of
8 this Permit, may be included in the report by reference and should include drawing
9 and document numbers. IQRPE Reports will be consistent with the information
10 separately provided in ii through ix below [[WAC 173-303-640](#)(3)(a), in accordance
11 with [WAC 173-303-680](#) and [WAC 173-303-806](#)(4)(i)(i)];
- 12 **III.10.H.5.b.ii** Design drawings (General Arrangement Drawings, in plan) and specifications for the
13 foundation, secondary containment including liner installation details, and leak
14 detection methodology. These items should show the dimensions, volume
15 calculations, and location of the secondary containment system, and should include
16 items such as floor/pipe slopes to sumps, tanks, floor drains [[WAC 173-303-](#)
17 [640](#)(4)(b) through (f) and [WAC 173-303-640](#)(3)(a), in accordance with
18 [WAC 173-303-680](#) and [WAC 173-303-806](#)(4)(i)(i)];
- 19 **III.10.H.5.b.iii** The Permittees will provide the design criteria (references to codes and standards,
20 load definitions, and load combinations, materials of construction, and
21 analysis/design methodology) and typical design details for the support of the
22 secondary containment system. This information will demonstrate the foundation
23 will be capable of providing support to the secondary containment system, resistance
24 to pressure gradients above and below the system, and capable of preventing failure
25 due to settlement, compression, or uplift [[WAC 173-303-640](#)(4)(c)(ii), in accordance
26 with [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)(B)];
- 27 **III.10.H.5.b.iv** A description of materials and equipment used to provide corrosion protection for
28 external metal components in contact with soil, including factors affecting the
29 potential for corrosion [[WAC 173-303-640](#)(3)(a)(iii)(B), in accordance with
30 [WAC 173-303-680](#) and [WAC 173-303-806](#)(4)(i)(i)(A) through (B)];
- 31 **III.10.H.5.b.v** Secondary containment/foundation, and leak detection system, materials selection
32 documentation (including, but not limited to, concrete coatings and water stops, and
33 liner materials) as applicable [[WAC 173-303-806](#)(4)(i)(i)(A) through (B)];
- 34 **III.10.H.5.b.vi** Detailed description of how the secondary containment for the LAW Vitrification
35 System will be installed in compliance with [WAC 173-303-640](#)(3)(c), in accordance
36 with [WAC 173-303-680](#) and [WAC 173-303-806](#)(4)(i)(i)(A) through (B);
- 37 **III.10.H.5.b.vii** Submit Permit Tables III.10.H.B and III.10.I.B completed to provide for all
38 secondary containment sumps and floor drains the information as specified in each
39 column heading consistent with information to be provided in i. through vi., above;
- 40 **III.10.H.5.b.viii** Documentation that secondary containment and leak detection systems will not
41 accumulate hydrogen gas levels above the lower explosive limit for incorporation
42 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806](#)(4)(i)(i)(A),
43 and [WAC 173-303-806](#)(4)(i)(v)];
- 44 **III.10.H.5.b.ix** A detailed description of how LAW Vitrification System design provides access for
45 conducting future LAW Vitrification System integrity assessments [[WAC 173-303-](#)
46 [640](#)(3)(b) and [WAC 173-303-806](#)(4)(i)(i)(B)].

- 1 **III.10.H.5.c** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
2 installation of each sub-system as identified in Permit Table III.10.H.A, engineering
3 information as specified below, for incorporation into Operating Unit Group 10,
4 Appendices 9.1 through 9.14, and 9.17 of this Permit. At a minimum, engineering
5 information specified below will show the following, as required pursuant to
6 [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#) (the information specified
7 below will include dimensioned engineering drawings):
- 8 **III.10.H.5.c.i** IQRPE Reports (specific to sub-system) will include review of design drawings,
9 calculations, and other information on which the certification report is based and will
10 include as applicable, but not limited to, review of such information described below.
11 Information (drawings, specifications, etc.) already included in Operating Unit
12 Group 10, Appendix 9.0 of this Permit, may be included in the report by reference
13 and should include drawing and document numbers. The IQRPE Reports will be
14 consistent with the information separately provided in ii. through xii. below, and the
15 IQRPE Report specified in Permit Condition III.10.H.5.b [[WAC 173-303-640](#)(3)(a),
16 in accordance with [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)];
- 17 **III.10.H.5.c.ii** Design drawings [General Arrangement Drawings in plan and, Process Flow
18 Diagrams, Piping and Instrumentation Diagrams (including pressure control
19 systems), Mechanical Drawings, and specifications, and other information specific to
20 subsystems (to show location and physical attributes of each subsystem)]
21 [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
22 [WAC 173-303-806](#)(4)(i)(i)];
- 23 **III.10.H.5.c.iii** Sub-system design criteria (references to codes and standards, load definitions, and
24 load combinations, materials of construction, and analysis/design methodology) and
25 typical design details to support the subsystems. Structural support calculations
26 specific to off-specification, non-standard and field fabricated subsystems will be
27 submitted for incorporation into the Administrative Record. Documentation will
28 include but not limited to, supporting specifications, test data, treatment effectiveness
29 report, etc. supporting projected operational capability (e.g., WESP projected
30 removal efficiency for individual metals, halogens, particulates, etc.) and compliance
31 with performance standards specified in Permit Condition III.10.H.1.b
32 [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
33 [WAC 173-303-806](#)(4)(i)(i)(B)];
- 34 **III.10.H.5.c.iv** A description of materials and equipment used to provide corrosion protection for
35 external metal components in contact with water, including factors affecting the
36 potential for corrosion [[WAC 173-303-640](#)(3)(a)(iii)(B), in accordance with
37 [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)(A) through (B)];
- 38 **III.10.H.5.c.v** Sub-system materials selection documentation (e.g., physical and chemical
39 tolerances) [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
40 [WAC 173-303-806](#)(4)(i)(i)(A)];
- 41 **III.10.H.5.c.vi** Sub-system vendor information (including, but not limited to, required performance
42 warranties, as available), consistent with information submitted under ii. above, will
43 be submitted for incorporation into the Administrative Record [[WAC 173-303-](#)
44 [640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2), [WAC 173-303-806](#)(4)(i)(i)(A)
45 through (B), and [WAC 173-303-806](#)(4)(i)(v)];

- 1 **III.10.H.5.c.vii** System descriptions related to sub-system units will be submitted for incorporation
 2 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)
 3 through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 4 **III.10.H.5.c.viii** Mass and energy balance for normal projected operating conditions used in
 5 developing the Piping and Instrumentation Diagrams and Process Flow Diagrams,
 6 including assumptions and formulas used to complete the mass and energy balance,
 7 so that they can be independently verified for incorporation into the Administrative
 8 Record [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-
 9 806\(4\)\(i\)\(v\)](#)];
- 10 **III.10.H.5.c.ix** Detailed description of all potential LAW Vitrification System bypass events
 11 including:
- 12 A. A report which includes an analysis of credible potential bypass events and
 13 recommendations for prevention/minimization of the potential, impact, and
 14 frequency of the bypass event to include at a minimum:
- 15 1. Operating procedures
 16 2. Maintenance procedures
 17 3. Redundant equipment
 18 4. Redundant instrumentation
 19 5. Alternate equipment
 20 6. Alternate materials of construction
- 21 **III.10.H.5.c.x** A detailed description of how the sub-systems will be installed in compliance with
 22 [WAC 173-303-640\(3\)\(c\)](#), (d), and (e), in accordance with [WAC 173-303-680](#) and
 23 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#);
- 24 **III.10.H.5.c.xi** Sub-system design to prevent escape of vapors and emissions of acutely or
 25 chronically toxic (upon inhalation) EHW, for incorporation into the Administrative
 26 Record [[WAC 173-303-640\(5\)\(e\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and
 27 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 28 **III.10.H.5.c.xii** Documentation that sub-systems are designed to prevent the accumulation of
 29 hydrogen gases levels above the lower explosive limit for incorporation into the
 30 Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#), and
 31 [WAC 173-303-806\(4\)\(i\)\(v\)](#)].
- 32 **III.10.H.5.d** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
 33 installation of equipment for each sub-system as identified in Permit Tables III.10.H.A
 34 and III.10.H.B, not addressed in Permit Conditions III.10.H.5.b or III.10.H.5.c,
 35 engineering information as specified below, for incorporation into Operating Unit Group
 36 10, Appendices 9.1 through 9.14 of this Permit. At a minimum, engineering information
 37 specified below will show the following as required pursuant to [WAC 173-303-640](#), in
 38 accordance with [WAC 173-303-680](#) (the information specified below will include
 39 dimensioned engineering drawings):
- 40 **III.10.H.5.d.i** IQRPE Reports (specific to sub-system equipment) will include a review of design
 41 drawings, calculations, and other information as applicable on which the certification
 42 report is based. The reports will include, but not be limited to, review of such
 43 information described below. Information (drawings, specifications, etc.) already
 44 included in Operating Unit Group 10, Appendix 9.0 of this Permit, may be included
 45 in the report by reference and should include drawing and document numbers. The

- 1 IQRPE Reports will be consistent with the information provided separately in ii
2 through xiii below and the IQRPE Reports specified in Permit Conditions
3 III.10.H.5.b and III.10.H.5.c [[WAC 173-303-640\(3\)\(a\)](#), in accordance with
4 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 5 **III.10.H.5.d.ii** Design drawings [Process Flow Diagrams, Piping and Instrumentation Diagrams
6 (including pressure control systems), specifications and other information specific to
7 equipment (these drawings should include all equipment such as pipes, valves,
8 fittings, pumps, instruments, etc.)] [[WAC 173-303-640\(3\)\(a\)](#), in accordance with
9 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 10 **III.10.H.5.d.iii** Sub-system equipment design criteria (references to codes and standards, load
11 definitions, and load combinations, materials of construction, and analysis/design
12 methodology) and typical design details for the support of the sub-system equipment
13 [[WAC 173-303-640\(3\)\(a\)](#) and [WAC 173-303-640\(3\)\(f\)](#), in accordance with
14 [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 15 **III.10.H.5.d.iv** A description of materials and equipment used to provide corrosion protection for
16 external metal components in contact with soil and water, including factors affecting
17 the potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#), in accordance with
18 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 19 **III.10.H.5.d.v** Materials selection documentation for equipment for each sub-system (e.g., physical
20 and chemical tolerances) [[WAC 173-303-640\(3\)\(a\)](#), in accordance with
21 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 22 **III.10.H.5.d.vi** Vendor information (including, but not limited to, required performance warranties,
23 as available), consistent with information submitted under ii. above, for sub-system
24 equipment will be submitted for incorporation into the Administrative Record.
25 [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#), [WAC 173-303-](#)
26 [806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(iv\)](#)];
- 27 **III.10.H.5.d.vii** Sub-system, sub-system equipment, and leak detection system instrument control
28 logic narrative description (e.g., descriptions of fail-safe conditions, etc.)
29 [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-](#)
30 [806\(4\)\(i\)\(v\)](#)].
- 31 **III.10.H.5.d.viii** System description related to sub-system equipment, and system descriptions related
32 to leak detection systems, for incorporation into the Administrative Record
33 [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-](#)
34 [806\(4\)\(i\)\(v\)](#)];
- 35 **III.10.H.5.d.ix** A detailed description of how the sub-system equipment will be installed and tested
36 [[WAC 173-303-640\(3\)\(c\)](#) through (e), [WAC 173-303-640\(4\)\(b\)](#) and (c), in
37 accordance with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 38 **III.10.H.5.d.x** For process monitoring, control, and leak detection system instrumentation for the
39 LAW Vitrification System as identified in Permit Tables III.10.H.C and III.10.H. F, a
40 detailed description of how the process monitoring, control, and leak detection
41 system instrumentation, will be installed and tested [[WAC 173-303-640\(3\)\(c\)](#) through
42 (e), [WAC 173-303-640\(4\)\(b\)](#) and (c), [WAC 173-303-806\(4\)\(c\)\(vi\)](#), and
43 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];

- 1 **III.10.H.5.d.xi** Mass and energy balance for projected normal operating conditions used in
 2 developing the Piping and Instrumentation Diagrams and Process Flow Diagrams,
 3 including assumptions and formulas used to complete the mass and energy balance,
 4 so that they can be independently verified, for incorporation into the Administrative
 5 Record [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(B\)](#), and [WAC 173-303-](#)
 6 [806\(4\)\(i\)\(v\)](#)];
- 7 **III.10.H.5.d.xii** Documentation that sub-systems equipment are designed to prevent the accumulation
 8 of hydrogen gas levels above the lower explosive limit for incorporation into the
 9 Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(A\)](#), and
 10 [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 11 **III.10.H.5.d.xiii** Leak detection system documentation (e.g. vendor information, etc.) consistent with
 12 information submitted under Permit Condition III.10.H.5.c.ii and Permit Conditions
 13 III.10.H.5.d.ii, vii, viii, and x above, will be submitted for incorporation into the
 14 Administrative Record.
- 15 **III.10.H.5.e** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
 16 will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, the following as
 17 specified below for incorporation into Operating Unit Group 10, Appendix 9.18 of this
 18 Permit, except Permit Condition III.10.H.5.e.i, which will be incorporated into Operating
 19 Unit Group 10, Chapter 6 of this Permit. All information provided under this permit
 20 condition must be consistent with information provided pursuant to Permit Conditions
 21 III.10.H.5.b, c, d, e, and f, III.10.C.3.e and III.10.C.11.b, as approved by Ecology:
- 22 **III.10.H.5.e.i** Integrity assessment program and schedule for the LAW Vitrification System will
 23 address the conducting of periodic integrity assessments on the LAW Vitrification
 24 System over the life of the system, as specified in Permit Condition III.10.H.5.b.ix
 25 and [WAC 173-303-640\(3\)\(b\)](#), in accordance with [WAC 173-303-680](#), and
 26 descriptions of procedures for addressing problems detected during integrity
 27 assessments. The schedule must be based on past integrity assessments, age of the
 28 system, materials of construction, characteristics of the waste, and any other relevant
 29 factors [[WAC 173-303-640\(3\)\(b\)](#), in accordance with [WAC 173-303-680](#) and
 30 [WAC 173-303-806\(4\)\(i\)\(B\)](#)].
- 31 **III.10.H.5.e.ii** Detailed plans and descriptions, demonstrating the leak detection system is operated
 32 so that it will detect the failure of either the primary or secondary containment
 33 structure or the presence of any release of dangerous and/or mixed waste or
 34 accumulated liquid in the secondary containment system within twenty-four (24)
 35 hours [[WAC 173-303-640\(4\)\(c\)\(iii\)](#)]. Detection of a leak of at least 0.1 gallons per
 36 hour within twenty-four (24) hours is defined as being able to detect a leak within
 37 twenty-four (24) hours. Any exceptions to this criteria must be approved by Ecology
 38 in accordance with [WAC 173-303-680](#), [WAC 173-303-640\(4\)\(c\)\(iii\)](#), and
 39 [WAC 173-303-806\(4\)\(i\)\(b\)](#).
- 40 A. Dangerous waste pipe penetrations that require a penetration seal in
 41 accordance with the IBC and DOE-STD-1066, DOE Standard for Fire
 42 Protection Design Criteria, or meet ventilation sealing requirements
 43 identified in Permit Table III.10.H.G, are not required to meet the 0.1 gallons
 44 per hour within twenty-four (24) hours leak detection rate for those sections
 45 of piping that are in contact with approved silicone or equivalent low-
 46 permeability seal material.
- 47 B. Piping on either side of the penetration seal must meet the requirements of
 48 III.10.H.5.e.ii.

1
2
3
4
5
6

C. Revisions (including additions or deletions) to Permit Table III.10.H.G will be submitted to Ecology for review and approval pursuant to Conditions III.10.C.2.e and III.10.C.2.f. Addition of penetration seal locations to Permit Table III.10.H.G will be approved by Ecology prior to installation of the penetration seal.

Table III.10.H.G – LAW Plant Penetration Seal Location

Row Number	Room Number	Orientation	Discipline	Sequence Number
1.	L-0112	E	PD	02097
2.	L-0123	E	PD	01823
3.	L-0123	E	PD	01834
4.	L-0123	E	PD	01828
5.	L-0123	E	PD	01837
6.	L-0123	E	PD	01822
7.	L-0123	E	PD	01824
8.	L-0123	E	PD	01826
9.	L-0123	E	PD	01821
10.	L-0123	E	PD	01825
11.	L-0123	E	PD	01827
12.	L-0123	E	PD	01836
13.	L-0123	E	PD	01820
14.	L-0123	E	PD	01832
15.	L-0123	S	PD	01797
16.	L-0124	E	PD	01843
17.	L-0124	E	PD	01844
18.	L-0124	E	PD	01845
19.	L-0124	E	PD	01842
20.	L-0124	E	PD	01847
21.	L-0124	E	PD	01841
22.	L-0124	E	PD	01846
23.	L-0124	E	PD	01850
24.	L-0124	E	PD	01848
25.	L-0124	E	PD	01852
26.	L-0124	E	PD	01840
27.	L-0124	E	PD	01839
28.	L-0124	E	PD	01849
29.	L-0124	S	PD	01801
30.	L-0125	E	PD	01858
31.	L-0125	E	PD	01859

Table III.10.H.G – LAW Plant Penetration Seal Location

Row Number	Room Number	Orientation	Discipline	Sequence Number
32.	L-0125	E	PD	01860
33.	L-0125	E	PD	01857
34.	L-0125	E	PD	01862
35.	L-0125	E	PD	01856
36.	L-0125	E	PD	01861
37.	L-0125	E	PD	01865
38.	L-0125	E	PD	01863
39.	L-0125	E	PD	01867
40.	L-0125	E	PD	01855
41.	L-0125	E	PD	01854
42.	L-0125	E	PD	01864
43.	L-0126	S	PD	01807
44.	L-0201	F	PD	02405
45.	L-0201	S	PD	02406
46.	L-0202	F	PD	02495
47.	L-0216	W	PD	02674
48.	L-0220	E	PD	02709
49.	L-0301	F	PD	03319
50.	L-0301	S	PD	03437
51.	L-0301	S	PD	04149
52.	L-0301	S	PD	04141
53.	L-0101A	F	PD	01291
54.	L-0101A	F	PD	01292
55.	L-0101A	W	PD	01971
56.	L-0226B	F	PD	02445
57.	L-0226B	F	PD	02444
58.	L-0304F	F	PD	03278
59.	L-0304F	F	PD	03277
60.	L-B001B	E	EQ	80908
61.	L-B001B	S	PD	00196
62.	L-B001B	S	PD	00201
63.	L-C0201	F	PD	02430
64.	L-0124	W	PD	01410
65.	L-0125	W	PD	01428
66.	L-0126	W	PD	01454

- 1 **III.10.H.5.e.iii** Detailed operational plans and descriptions, demonstrating that spilled or leaked
2 waste and accumulated liquids can be removed from the secondary containment
3 system within twenty-four (24) hours [[WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)].
- 4 **III.10.H.5.e.iv** Descriptions of operational procedures demonstrating appropriate controls and
5 practices are in place to prevent spills and overflows from the LAW Vitrification
6 System or containment systems in compliance with [WAC 173-303-640\(5\)\(b\)\(i\)](#)
7 through (iii), in accordance with [WAC 173-303-680](#) and [WAC 173-303-](#)
8 [806\(4\)\(i\)\(i\)\(B\)](#);
- 9 **III.10.H.5.e.v** Description of procedures for investigation and repair of the LAW Vitrification
10 System [[WAC 173-303-640\(6\)](#) and [WAC 173-303-640\(7\)\(e\)](#) and (f), in accordance
11 with [WAC 173-303-680](#), [WAC 173-303-320](#), [WAC 173-303-806\(4\)\(a\)\(v\)](#), and
12 [WAC 173-303-806\(4\)\(a\)\(ii\)\(B\)](#)].
- 13 **III.10.H.5.e.vi** Updated Chapter 4, Narrative Description, Tables and Figures as identified in Permit
14 Tables III.10.H.A and III.10.H.B, as modified pursuant to Permit Condition
15 III.10.H.5.e.x and updated to identify routinely non-accessible LAW Vitrification
16 sub-systems.
- 17 **III.10.H.5.e.vii** Description of procedures for management of ignitable and reactive, and
18 incompatible dangerous and/or mixed waste as specified in [WAC 173-303-640\(9\)](#) and
19 (10), in accordance with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#).
- 20 **III.10.H.5.e.viii** A description of the tracking system used to track dangerous and/or mixed waste
21 generated throughout the LAW Vitrification system, pursuant to [WAC 173-303-380](#).
- 22 **III.10.H.5.e.ix** Permit Tables III.10.H.C and III.10.I.C will be completed for LAW Vitrification
23 System process and leak detection system monitors and instruments (to include, but
24 not be limited to: instruments and monitors measuring and/or controlling flow,
25 pressure, temperature, density, pH, level, humidity, and emissions) to provide the
26 information as specified in each column heading. Process and leak detection system
27 monitors and instruments for critical systems as specified in Operating Unit
28 Group 10, Appendix 2.0 and as updated pursuant to Permit Condition III.10.C.9.b,
29 and for operating parameters as required to comply with Permit Condition
30 III.10.C.3.e.iii will be addressed. Process monitors and instruments for non-waste
31 management operations (e.g., utilities, raw chemical storage, non-contact cooling
32 waters, etc.) are excluded from this permit condition [[WAC 173-303-680](#),
33 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 34 **III.10.H.5.e.x** Permit Tables III.10.H.A and III.10.I.A amended as follows [[WAC 173-303-680](#) and
35 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)]:
- 36 A. Under column 1, update and complete list of dangerous and mixed waste
37 LAW Vitrification System sub-systems, including plant items that comprise
38 each system (listed by item number).
 - 39 B. Under column 2, update and complete system designations.
 - 40 C. Under column 3, replace the 'Reserved' with Operating Unit Group 10,
41 Appendix 9.0 subsections (e.g., 9.1, 9.2, etc.) designated in Permit
42 Conditions III.10.H.5.b, c, and d specific to LAW Vitrification System
43 sub-system as listed in column 1.
 - 44 D. Under column 4, update and complete list of narrative description, tables,
45 and figures.

1 **III.10.H.5.e.xi** The permittees will incorporate operational parameters/controls required for the
 2 underground transfer line LCP-PB-03368-S32B-03 in the operating permit prior to
 3 the transfer of waste from the Effluent Management Facility evaporator system to the
 4 LAW Facility (LCP-VSL-00001/2). The operational controls will meet the
 5 mitigating requirements provided in the Design Guide Case-Specific Exception
 6 (DGCE) (number 24590-BOF-DGCE-MS-16-00022) dated 28 February 2017.

7 **III.10.H.5.f** One hundred and eighty (180) days prior to initial receipt of dangerous and/or mixed
 8 waste in the WTP Unit, the Permittees will submit for review and receive approval for
 9 incorporation into Operating Unit Group 10, Appendix 9.15 of this Permit, a
 10 Demonstration Test Plan for the LAW Vitrification System to demonstrate that the LAW
 11 Vitrification Systems meets the performance standards specified in Permit Condition
 12 III.10.H.1.b. In order to incorporate the Demonstration Test Plan for the LAW
 13 Vitrification System into Operating Unit Group 10, Appendix 9.15, Permit Condition
 14 III.10.C.2.g process will be followed. The Demonstration Test Plan will include, but not
 15 be limited to, the following information. The Demonstration Test Plan will also be
 16 consistent with the information provided pursuant to Permit Conditions III.10.H.5.b, c, d,
 17 and e, III.10.C.3.e, and III.10.C.11.b, as approved by Ecology and consistent with the
 18 schedule described in Operating Unit Group 10, Appendix 1.0 of this Permit. The
 19 documentation required pursuant to Permit Condition III.10.H.5.f.x, in addition to being
 20 incorporated into Operating Unit Group 10, Appendix 9.15, will be incorporated by
 21 reference in Operating Unit Group 10, Chapter 6 of this Permit.

22 Notes: (1) The following should be consulted to prepare this Demonstration Test Plan:
 23 “*Guidance on Setting Permit Conditions and Reporting Trial Burn Results Volume II of*
 24 *the Hazardous Waste Incineration Guidance Series,*” (EPA/625/6-89/019) and “*Risk*
 25 *Burn Guidance For Hazardous Waste Combustion Facilities,*” (EPA-R-01-001, July
 26 2001), [WAC 173-303-807\(2\)](#), [WAC 173-303-670\(5\)](#), [WAC-173-303-670\(6\)](#),
 27 [40 CFR §63.1207\(f\)\(2\)](#), [40 CFR §63.1209](#), and Appendix to [40 CFR Part 63 EEE](#).

28 (2) Cross-referencing to the information provided pursuant to permit Conditions
 29 III.H.5.b, c, d, e, and III.10.C.3.e.v, as approved by Ecology, that are redundant to
 30 elements of the Demonstration Test Plan for the LAW Vitrification System is acceptable.

31 **III.10.H.5.f.i** Analysis of each feed-stream to be fed during the demonstration test, including
 32 dangerous waste, glass formers and reductants, process streams that includes:
 33 A. Levels of ash, metals, total chlorine (organic and inorganic), other halogens
 34 and radionuclide surrogates.
 35 B. Description of the physical form of the feed-streams.
 36 C. An identification and quantification of organics that are present in the feed-
 37 stream, including constituents proposed for DRE demonstration.

38 A comparison of the proposed demonstration test feed streams to the mixed waste
 39 feed envelopes to be processed in the melters must be provided that documents that
 40 the proposed demonstration test feed streams will serve as worst case surrogates for
 41 organic destruction, formation of products of incomplete oxidation, and metals, total
 42 chlorine (organic and inorganic), other halogens, particulate formation, and
 43 radionuclides.

- 1 **III.10.H.5.f.ii** Specification of trial PODCs for which destruction and removal efficiencies are
 2 proposed to be calculated during the demonstration test and for inclusion in Permit
 3 Conditions III.10.H.1.b.i and III.10.I.1.b.i. These trial PODCs will be specified
 4 based on destructibility, concentration or mass in the waste and the dangerous waste
 5 constituents or constituents in [WAC 173-303-9905](#);
- 6 **III.10.H.5.f.iii** A description of the blending procedures, prior to introducing the feed-streams into
 7 the melter, including analysis of the materials prior to blending, and blending ratios;
- 8 **III.10.H.5.f.iv** A description of how the surrogate feeds are to be introduced for the demonstration.
 9 This description should clearly identify the differences and justify how any of
 10 differences would impact the surrogate feed introduction as representative of how
 11 mixed waste feeds will be introduced;
- 12 **III.10.H.5.f.v** A detailed engineering description of the LAW Vitrification System, including:
- 13 A. Manufacturer's name and model number for each sub-system.
 14 B. Design capacity of each sub-system including documentation (engineering
 15 calculations, manufacturer/vendor specifications, operating data, etc.)
 16 supporting projected operational efficiencies (e.g., WESP projected removal
 17 efficiency for individual metals, halogens, particulates, etc.) and compliance
 18 with performance standards specified in Permit Condition III.10.H.1.b.
 19 C. Detailed scaled engineering drawings, including Process Flow Diagrams,
 20 Piping and Instrumentation Diagrams, Vessel Drawings (plan, and elevation
 21 with cross sections) and General Arrangement Drawings.
 22 D. Process Engineering Descriptions.
 23 E. Mass and energy balance for each projected operating condition and each
 24 demonstration test condition, including assumptions and formulas used to
 25 complete the mass and energy balance, so that they can be independently
 26 verified for incorporation into the Administrative Record.
 27 F. Engineering Specifications/data sheets (materials of construction, physical
 28 and chemical tolerances of equipment, and fan curves).
 29 G. Detailed Description of Automatic Waste Feed Cutoff System addressing
 30 critical operating parameters for all performance standards specified in
 31 Permit Condition III.10.H.1.b.
 32 H. Documentation to support compliance with performance standards specified
 33 in Permit Condition III.10.H.1.b, including engineering calculations, test
 34 data, and manufacturer/vendor's warranties, etc.
 35 I. Detailed description of the design, operation, and maintenance practices for
 36 air pollution control system.
 37 J. Detailed description of the design, operation, and maintenance practices of
 38 any stack gas monitoring and pollution control monitoring system.
- 39 **III.10.H.5.f.vi** Detailed description of sampling and monitoring procedures including sampling and
 40 monitoring locations in the system, the equipment to be used, sampling and
 41 monitoring frequency, and planned analytical procedures for sample analysis
 42 including, but not limited to:
- 43 A. A short summary narrative description of each stack sample method should
 44 be included within the main body of the demonstration test plan, which
 45 references an appendix to the plan that would include for each sampling
 46 train: (1) detailed sample method procedures, (2) sampling train

- 1 configuration schematic, (3) sampling recovery flow sheet, (4) detailed
 2 analytical method procedures, and (5) sampling preparation and analysis
 3 flow sheet. The detailed procedures should clearly flag where the method
 4 has provided decision points (e.g., choices of equipment materials of
 5 construction, choices of clean-up procedures or whether additional clean-up
 6 procedures will be incorporated, whether pretest surveys or laboratory
 7 validation work will be performed, enhancements to train to accommodate
 8 high moisture content in stack gas, etc.) and what is being proposed along
 9 with the basis for the decision.
- 10 B. A short summary narrative description of the feed and residue sampling
 11 methods should be included within the main body of the demonstration test
 12 plan, which references an appendix that would include for each sample type:
 13 (1) detailed sample method procedures, (2) sampling recovery/compositing
 14 procedures, and (3) detailed analytical method procedures. The detailed
 15 procedures should clearly flag where the method has provided decision
 16 points (e.g., choices of equipment materials of construction, choices of clean-
 17 up procedures or whether additional clean-up procedures will be
 18 incorporated, whether pretest surveys or laboratory validation work will be
 19 performed, etc.) and what is being proposed along with the basis for the
 20 decision.
- 21 **III.10.H.5.f.vii** A detailed test schedule for each condition for which the demonstration test is
 22 planned, including projected date(s), duration, quantity of dangerous waste to be fed,
 23 and other relevant factors.
- 24 **III.10.H.5.f.viii** A detailed test protocol including, for each test condition, the ranges of feed-rate for
 25 each feed system, and all other relevant parameters that may affect the ability of the
 26 LAW Vitrification System to meet performance standards specified in Permit
 27 Condition III.10.H.1.b.
- 28 **III.10.H.5.f.ix** A detailed description of planned operating conditions for each demonstration test
 29 condition, including operating conditions for shakedown, demonstration test,
 30 post-demonstration test and normal operations. This information will also include
 31 submittal of Permit Tables III.10.H.D, III.10.H.F, III.10.I.D, and III.10.I.F completed
 32 with the information as specified in each column heading for each LAW Vitrification
 33 System waste feed cutoff parameter and submittal of supporting documentation for
 34 Permit Tables III.10.H.D, III.10.H.F, III.10.I.D, and III.10.I.F set-point values.
- 35 **III.10.H.5.f.x** The test conditions proposed must demonstrate meeting the performance standards
 36 specified in Permit Condition III.10.H.1.b with the simultaneous operation of both
 37 melters at capacity and input from the LAW Vitrification Vessel Ventilation System at
 38 capacity to simulate maximum loading to the LAW Vitrification System off-gas
 39 treatment system and to establish the corresponding operating parameter ranges. To
 40 the extent that operation of one (1) melter or two (2) melters cannot be sustained
 41 within the operating parameter range established at this maximum load, additional
 42 demonstration test conditions must be included in the plan and performed to establish
 43 operating parameter ranges for each proposed operating mode while demonstrating
 44 meeting the performance standards specified in Permit Condition III.10.H.1.b.
- 45 **III.10.H.5.f.xi** Detailed description of procedures for start-up and shutdown of waste feed and
 46 controlling emissions in the event of an equipment malfunction, including off-normal
 47 and emergency shutdown procedures.
- 48 **III.10.H.5.f.xii** A calculation of waste residence time.

- 1 **III.10.H.5.f.xiii** Any request to extrapolate metal feed-rate limits from Demonstration Test levels
2 must include:
- 3 A. A description of the extrapolation methodology and rationale for how the
4 approach ensures compliance with the performance standards as specified in
5 Permit Condition III.10.H.1.b.
- 6 B. Documentation of the historical range of normal metal feed-rates for each
7 feed stream.
- 8 C. Documentation that the level of spiking recommended during the
9 demonstration test will mask sampling and analysis imprecision and
10 inaccuracy to the extent that extrapolation of feed-rates and emission rates
11 from the Demonstration Test data will be as accurate and precise as if full
12 spiking were used.
- 13 **III.10.H.5.f.xiv** Documentation of the expected levels of constituents in LAW Vitrification System
14 input streams including, but not limited to, waste feed, glass former and reactants,
15 control air, process air, steam, sparge bubbler air, air in-Leakage from melter cave,
16 gases from LAW Vitrification Vessel Ventilation System, and process water.
- 17 **III.10.H.5.f.xv** Documentation justifying the duration of the conditioning required to ensure the
18 LAW Vitrification System had achieved steady-state operations under Demonstration
19 Test operating conditions.
- 20 **III.10.H.5.f.xvi** Documentation of LAW Vitrification System process and leak detection system
21 instruments and monitors as listed on Permit Tables III.10.H.C, III.10.H.F, III.10.I.C,
22 and III.10.I.F to include:
- 23 A. Procurement specifications.
- 24 B. Location used.
- 25 C. Range, precision, and accuracy.
- 26 D. Detailed descriptions of calibration/functionality test procedures (either
27 method number ASTM) or provide a copy of manufacturer's recommended
28 calibration procedures.
- 29 E. Calibration/functionality test, inspection, and routine maintenance schedules
30 and checklists, including justification for calibration, inspection and
31 maintenance frequencies, criteria for identifying instruments found to be
32 significantly out of calibration, and corrective action to be taken for
33 instruments found to be significantly out of calibration (e.g., increasing
34 frequency of calibration, instrument replacement, etc.).
- 35 F. Equipment instrument control logic narrative description (e.g., descriptions
36 of failsafe conditions, etc.) [[WAC 173-303-680\(2\)](#), [WAC 173-303-](#)
37 [806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)].
- 38 **III.10.H.5.f.xvii** Outline of demonstration test report.

Table III.10.H.A – LAW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables and Figures
<p><u>LAW Melter Process System</u> LMP-MLTR-00001 (LAW Melter 1) LMP-MLTR-00002 (LAW Melter 2)</p>	LMP	<p><u>24590-LAW</u> -CM-HC4-HXYG-00240-02-00014 -M0D-LMP-00001 -M0D-LMP-00002 -M6-LMP-00001001 -M6-LMP-00002001 -M6-LMP-00002002 -M6-LMP-00031001 -M6-LMP-00032001 -M6-LMP-00032002 -MF-LMP-00001 -MF-LMP-00002 -MF-LMP-00003 -MF-LMP-00004 -3PS-AE00-T0001 -3PN-LMP-00002 -N1D-LMP-00001 -P1-P01T-00002</p>	<p>Section 4E.2.2, Table 4E-2, and Figures 4A-1, 4A-3 and 4A-21 in Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>LAW Primary Offgas Process System</u> LOP-FCLR-00001 (Melter 1 Primary Film Cooler) LOP-FCLR-00002 (Melter 1 Standby Film Cooler No. 2) LOP-FCLR-00003 (Melter 2 Primary Film Cooler)</p>	LOP	<p><u>24590-LAW</u> -P1-P01T-00002 -M6-LOP-00004001 -M6-LOP-00004002 -M6-LOP-00005001 -M6-LOP-00005002</p>	<p>Section 4E.4.2.1, Table 4E-2, and Figures 4A-1, 4A-3 and 4A-21 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.H.A – LAW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables and Figures
LOP-FCLR-00004 (Melter 2 Standby Film Cooler)			
<p><u>LAW Primary Offgas Process System (Cont.)</u> LOP-SCB-00001 (Melter 1 Submerged Bed Scrubber) LOP-SCB-00002 (Melter 2 Submerged Bed Scrubber)</p>	LOP	<p><u>24590-LAW</u> -M5-V17T-P0007 -M5-V17T-P0008 -M6-LOP-00001001 -M6-LOP-00002001 -MK-LOP-P0001001 -MK-LOP-P0001002 -MK-LOP-P0001003 -MKD-LOP-00008 -NID-LOP-P0001 -P1-P01T-00002</p>	Section 4E.4.2.1, Table 4E-2, and Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>LAW Primary Offgas Process System (Cont.)</u> LOP-WESP-00001 (Melter 1 Wet Electrostatic Precipitator – WESP) LOP-WESP-00002 (Melter 2 Wet Electrostatic Precipitator – WESP)</p>	LOP	<p><u>24590-LAW</u> -M5-V17T-P0007 -M5-V17T-P0008 -M6-LOP-00001004 -M6-LOP-00002004 -NID-LOP-00003 -P1-P01T-00002</p> <p><u>24590-WTP</u> -3PS-MKE0-T0001</p> <p>24590-QL-POA-MKE0-00001-06-32</p>	Section 4E.4.2.1, Table 4E-2, and Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.H.A – LAW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables and Figures
<p><u>LAW Secondary Offgas/Vessel Vent Process System</u> LVP-HEPA-00001A (Melter Offgas HEPA Filter) LVP-HEPA-00001B (Melter Offgas HEPA Filter) LVP-HEPA-00002A (Melter Offgas HEPA Filter) LVP-HEPA-00002B (Melter Offgas HEPA Filter) LVP-HEPA-00003A (Melter Offgas HEPA Filter)</p>	LVP	<p><u>24590-LAW</u> -M5-V17T-00010 -M6-LVP-00001003 -P1-P01T-00005 24590-QL-POA-MKH0-00001-04-00148</p>	Section 4E.4.2.2, Table 4E-2, Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>LAW Secondary Offgas/Vessel Vent Process System (Cont.)</u> LVP-SCO-00001 (Thermal Catalytic Oxidizer – located on LVP-SKID-00002)</p>	LVP	<p><u>24590-LAW</u> -M6-LVP-00005002 24590-CD-POC-MBT0-00007-01-00353</p>	Section 4E.4.2.2, Table 4E-2, Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>LAW Secondary Offgas/Vessel Vent Process System (Cont.)</u> LVP-SCR-00001 (NOx Selective Catalytic Reduction Unit – located on LVP-SKID-00002) LVP-HX-00001 (Catalytic Oxidizer Heat Exchanger – located on LVP-SKID-00002) LVP-HTR-00002 (Catalytic Oxidizer Electric Heater – located on LVP-SKID-00002)</p>	LVP	<p><u>24590-LAW</u> -M6-LVP-00005002 24590-CD-POC-MBT0-00007-01-00353</p>	Section 4E.4.2.2, Table 4E-2, and Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.H.A – LAW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables and Figures
<p><u>LAW Secondary Offgas/Vessel Vent Process System (Cont.)</u> LVP-ADBR-00001A (Offgas Mercury Adsorber – located on LVP-SKID-00001) LVP-ADBR-00001B (Offgas Mercury Adsorber – located on LVP-SKID-00001)</p>	LVP	<p><u>24590-LAW</u> -M5-V17T-00011 -M6-LVP-00004001 -M6-LVP-00004002 -M6-LVP-00004003 -P1-P01T-00005</p> <p>24590-QL-POA-MWK0-00001-05-00198</p>	Section 4E.4.2.2, Table 4E-2, and Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>LAW Secondary Offgas/Vessel Vent Process System (Cont.)</u> LVP-SCB-00001 (Melter Offgas Caustic Scrubber)</p>	LVP	<p><u>24590-LAW</u> -P1-P01T-00005 -M6-LVP-00002001 -M6-LVP-00002002</p> <p><u>24590-QL-POA-MKAS</u> -00003-04-00050 -00003-04-00051 -00003-04-00052</p>	Section 4E.4.2.2, Table 4E-2, and Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>LAW Secondary Offgas/Vessel Vent Process System (Cont.)</u> LVP-HTR-00001A (Melter Offgas HEPA Preheater) LVP-HTR-00003A (Melter Offgas HEPA Preheater)</p>	LVP	<p><u>24590-LAW</u> -M5-V17T-00010 -M6-LVP-00001002 -P1-P01T-00005</p> <p>24590-CD-POA-MEE0-00003-03-00005</p>	Section 4E.4.2.2, Table 4E-2, and Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.H.A – LAW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables and Figures
<p><u>LAW Secondary Offgas/Vessel Vent Process System (Cont.)</u> LVP-EXHR-00001A (Melter Offgas Exhauster) LVP-EXHR-00001B (Melter Offgas Exhauster) LVP-EXHR-00001C (Melter Offgas Exhauster)</p>	<p>LVP</p>	<p><u>24590-LAW</u> -M5-V17T-00010 -M6-LVP-00001004 -M6-LVP-00001005 -M6-LVP-00001006 -M6-LVP-00002006 -P1-P01T-00005 24590-QL-POA-MACS-00007-06-00009</p>	<p>Section 4E.4.2.2, Table 4E-2, and Figures 4A-1 and 4A-3 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.H.B – LAW Vitrification Miscellaneous Unit System Secondary Containment Sumps and Floor Drains

Sump/Floor Drain I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions^a (feet) & Materials of Construction	Engineering Description (Drawing Nos., Specification Nos., etc.)
RLD-SUMP-00029 L-0123 (Process Cell, El. +3')	37	30" Dia. x 12" deep Stainless Steel (6% Mo)	<u>24590-LAW</u> -M6-RLD-00003002 -P1-P01T-00002
RLD-SUMP-00030 L-0123 (Process Cell, El. +3')	37	30" Dia. x 12" deep Stainless Steel (6% Mo)	<u>24590-LAW</u> -M6-RLD-00003002 -P1-P01T-00002
RLD-SUMP-00031 L-0124 (Process Cell Sump, El. +3')	37	30" Dia. x 12" deep Stainless Steel (6% Mo)	<u>24590-LAW</u> -M6-RLD-00003002 -P1-P01T-00002
RLD-SUMP-00032 L-0124 (Process Cell, El. +3')	37	30" Dia. x 12" deep Stainless Steel (6% Mo)	<u>24590-LAW</u> -M6-RLD-00003002 -P1-P01T-00002
LOP-FD-00001 L-0123 (LOP-BULGE-00001 Drain El. +3')	N/A	2" Dia. 6% Mo	<u>24590-LAW</u> -M6-LOP-00001003
RLD-WS-20037-S11B-01 L-0123 (Melter 1 Encasement Assembly Drain, El. +3')	N/A	1" Dia. 316L	<u>24590-LAW</u> -M6-LMP-00012001
LOP-FD-00002 L-0124 (LOP-BULGE-00002 Drain, El. +3')	N/A	2" Dia. 6% Mo	<u>24590-LAW</u> -M6-LOP-00002003

Table III.10.H.B – LAW Vitrification Miscellaneous Unit System Secondary Containment Sumps and Floor Drains

Sump/Floor Drain I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions^a (feet) & Materials of Construction	Engineering Description (Drawing Nos., Specification Nos., etc.)
RLD-WS-20033-S11B-01 L-0124 (Melter 2 Encasement Assembly Drain, El. +3')	N/A	1" Dia. 316L	<u>24590-LAW</u> -M6-LMP-00042001
RLD-FD-00025 L-0304F (Curb Floor Drain for Caustic Scrubber, El. 48')	N/A	4" Dia. 316L	<u>24590-LAW</u> -M6-RLD-00003001

^a Dimensions listed are based on permitted design. Actual dimensions may vary within acceptable design tolerances.

Table III.10.H.C – LAW Vitrification System Process and Leak Detection System Instruments and Parameters

Item No.	P&ID (24590-LAW-M6-)	Control Parameter	Measuring Instrument	Instrument Tag	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method and Range
1.	LMP-00005001	Melter 1 Plenum Temperature Average	Temperature Element	LMP-TE-1263C through LMP-TE-1280C ^a	-454 to 2,300°F	Redundant	650-2,012°F	Greater of +/- 2.2°C or +/- -0.75%	Scheduled replacement, run to failure
			Temperature Transmitter	LMP-TT-1263A (8 transmitters)					
			Temperature Indicator	LMP-TI-1263G					
2.	LMP-00035001	Melter 2 Plenum Temperature Average	Temperature Element (N type thermocouple)	LMP-TE-2263C through LMP-TE-2280C ^a	-454 to 2,300°F	Redundant	650-2,012°F	Greater of +/- 2.2°C or +/- -0.75%	Scheduled replacement, run to failure
			Temperature Transmitter	LMP-TT-2263A ^a (8 transmitters)					
			Temperature Indicator	LMP-TI2263G					
3.	LMP-00002002	Melter 1 Glass Pool Density	Density Transmitter	LMP-DT-1404	+/- 30 in. WC	Reports Signal Failure	2.4 SpG	+/- .05% span	TBD ^c
			Density Indicator	LMP-DI-1404	0-3 SpG				
4.	LMP-00032002	Melter 2 Glass Pool Density	Density Transmitter	LMP-DT-2404	+/- 30 in. WC	Reports Signal Failure	2.4 SpG	+/- .05% span	TBD ^c
			Density Indicator	LMP-DI-2404	0-3 SpG				

Table III.10.H.C – LAW Vitrification System Process and Leak Detection System Instruments and Parameters

Item No.	P&ID (24590-LAW-M6-)	Control Parameter	Measuring Instrument	Instrument Tag	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method and Range
5.	LMP-00002002	Melter 1 Glass Pool Level	Level Transmitter	LMP-LT-1403, LMP-LT-1405 ^a	+/-200 in. WC	Fails High	27.0-33.0 in.	+/- .05% span	TBD ^c
			Level Indicator	LMP-LI-1403A	0 to 100 in.				
6.	LMP-00032002	Melter 2 Glass Pool Level	Level Transmitter	LMP-LT-2403, LMP-LT-2405 ^a	+/-200 in. WC	Fails High	27.0-33.0 in.	+/- .05% span	TBD ^c
			Level Indicator	LMP-LI-2403A	0 to 100 in.				
7.	LMP-00002002	Melter 1 Plenum Pressure	Pressure Differential Transmitter	LMP-PDT-1410, LMP-PDT-1411 ^a	+/- 30 in. WC	Fails High	-5.0 in. WC	+/- .05% span	TBD ^c
			Pressure Differential Indicator	LMP-PDI-1410, LMP-PDI-1411 ^a					
8.	LMP-00032002	Melter 2 Plenum Pressure	Pressure Differential Transmitter	LMP-PDT-2410, LMP-PDT-2411 ^a	+/- 30 in. WC	Fails High	-5.0 in. WC	+/- .05% span	TBD ^c
			Pressure Differential Indicator	LMP-PDI-2410, LMP-PDI-2411 ^a					
9.	LMP-00007002	Melter 1 West Canister Level	Level Element (IR Camera)	LMP-LE-1466	0-90 in.	Reports Signal Failure	0-78 in.	TBD ^c	TBD ^c
			Level Transmitter	LMP-LT-1466					
			Level Indication	LMP-LI-1466B					

Table III.10.H.C – LAW Vitrification System Process and Leak Detection System Instruments and Parameters

Item No.	P&ID (24590-LAW-M6-)	Control Parameter	Measuring Instrument	Instrument Tag	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method and Range
10.	LMP-00007001	Melter 1 East Canister Level	Level Element (IR Camera)	LMP-LE-1511	0-90 in.	Reports Signal Failure	0-78 in.	TBD ^c	TBD ^c
			Level Transmitter	LMP-LT-1511					
			Level Indication	LMP-LI-1511B					
11.	LMP-00037002	Melter 2 West Canister Level	Level Element (IR Camera)	LMP-LE-2466	0-90 in.	Reports Signal Failure	0-78 in.	TBD ^c	TBD ^c
			Level Transmitter	LMP-LT-2466					
			Level Indication	LMP-LI-2466					
12.	LMP-00037001	Melter 2 East Canister Level	Level Element (IR Camera)	LMP-LE-2511	0-90 in.	Reports Signal Failure	0-78 in.	TBD ^c	TBD ^c
			Level Transmitter	LMP-LT-2511					
			Level Indication	LMP-LI-2511B					
13.	LMP-00010001	Melter 1 West Discharge Air Lift	On/Off Plug Valve	LMP-YV-1125	Open/Closed	Fail Closed	Open	N/A	N/A
			Valve Control	LMP-YC-1125					
14.	LMP-00008001	Melter 1 East Discharge Air Lift	On/Off Plug Valve	LMP-YV-1047	Open/Closed	Fail Closed	Open	N/A	N/A
			Valve Control	LMP-YC-1047					
15.	LMP-00040001	Melter 2 West Discharge Air Lift	On/Off Plug Valve	LMP-YV-2125	Open/Closed	Fail Closed	Open	N/A	N/A
			Valve Control	LMP-YC-2125					

Table III.10.H.C – LAW Vitrification System Process and Leak Detection System Instruments and Parameters

Item No.	P&ID (24590-LAW-M6-)	Control Parameter	Measuring Instrument	Instrument Tag	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method and Range
16.	LMP-00038001	Melter 2 East Discharge Air Lift	On/Off Plug Valve	LMP-YV-2047	Open/Closed	Fail Closed	Open	N/A	N/A
			Valve Control	LMP-YC-2047					
17.	LMP-00012001	Melter 1 Feed Encasement Assembly Leak Detection	Cable Type Conductivity Element	LMP-LE-1632	Low/High	Fail Low	Low	N/A	TBD ^c
			Level Alarm High	LMP-LAH-1632					
18.	LMP-00042001	Melter 2 Feed Encasement Assembly Leak Detection	Cable Type Conductivity Element	LMP-LE-2632	Low/High	Fail Low	Low	N/A	TBD ^c
			Level Alarm High	LMP-LAH-2632					
19.	LMP-00013002 and LMP-00005001	Melter 1 Lid Cooling	Temperature Element (RTD 100% Pt Sensor)	LMP-TE-1639, LMP-TE-1640	0-212°F	Reports Signal Failure	103 °F	$\pm(0.3+.005|t)^{\circ}\text{C}^{\text{b}}$	TBD ^c
			Temperature Transmitter	LMP-TT-1293					
			Temperature Indicator	LMP-TI-1639, LMP-TI-1640					
20.	LMP-00043002 and LMP-00035001	Melter 2 Lid Cooling	Temperature Element	LMP-TE-2639, LMP-TE-2640	0-212°F	Reports Signal Failure	103 °F	$\pm(0.3+.005|t)^{\circ}\text{C}^{\text{b}}$	TBD ^c
			Temperature Transmitter	LMP-TT-2293					

Table III.10.H.C – LAW Vitrification System Process and Leak Detection System Instruments and Parameters

Item No.	P&ID (24590-LAW-M6-)	Control Parameter	Measuring Instrument	Instrument Tag	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method and Range
			Temperature Indicator	LMP-TI-2639, LMP-TI-2640					
21.	LMP-00001001 LMP-00002001	Melter 1 Bubblers Airflow Total	Flow Element	LMP-FE-1329-1397	0-5 scfm	Fail Open	0.75 scfm	1% span >30% FS	TBD ^c
			Flow Indicator	LMP-FI-TBD	0-90 scfm	Reports Signal Failure	13.5 scfm		
22.	LMP-00031001 and LMP-00032001	Melter 2 Bubblers Airflow Total	Flow Element	LMP-FE-2329-2397	0-5 scfm	Fail Open	0.75 scfm	1% span >30% FS	TBD ^c
			Flow Indicator	LMP-FI-TBD	0-90 scfm	Reports Signal Failure	13.5 scfm		
23.	LOP-00001001	SBS Temperature Melter 1	Temperature Element (RTD 100% Pt Sensor)	LOP-TE-1038	-328-1562°F	Fail Low	122°F	$\pm(0.3+.005|t|)$ °C ^b	TBD ^c
			Temperature Transmitter	LOP-TT-1038					
			Temperature Indicator	LOP-TI-1038					
24.	LOP-00002001	SBS Temperature Melter 2	Temperature Element (RTD 100% Pt Sensor)	LOP-TE-2038	-328-1562°F	Fail Low	122°F	$\pm(0.3+.005|t|)$ °C ^b	TBD ^c
			Temperature Transmitter	LOP-TT-2038					
			Temperature Indicator	LOP-TI-2038					

Table III.10.H.C – LAW Vitrification System Process and Leak Detection System Instruments and Parameters

Item No.	P&ID (24590-LAW-M6-)	Control Parameter	Measuring Instrument	Instrument Tag	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method and Range
25.	LOP-00001004	WESP Temperature Melter 1	Temperature Element (RTD 100% Pt Sensor)	LOP-TE-1047	-328-1562°F	Fail Low	122°F	$\pm(0.3+.005|t|)$ °C ^b	TBD ^c
			Temperature Transmitter	LOP-TT-1047					
			Temperature Indicator	LOP-TI-1047					
26.	LOP-00002004	WESP Temperature Melter 2	Temperature Element (RTD 100% Pt Sensor)	LOP-TE-2047	-328-1562°F	Fail Low	125°F	$\pm(0.3+.005|t|)$ °C ^b	TBD ^c
			Temperature Transmitter	LOP-TT-2047					
			Temperature Transmitter	LOP-TI-2047					
27.	LVP-00001002	HEPA Inlet Temperature	Temperature Element (RTD 100% Pt Sensor)	LVP-TE-0104	0-900°F	Reports Signal Failure	160°F	$\pm(0.3+.005|t|)$ °C ^b	TBD ^c
			Temperature Transmitter	LVP-TT-0104					
			Temperature Transmitter	LVP-TI-0104					

Table III.10.H.C – LAW Vitrification System Process and Leak Detection System Instruments and Parameters

Item No.	P&ID (24590-LAW-M6-)	Control Parameter	Measuring Instrument	Instrument Tag	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method and Range
28.	LVP-00005002	TCO Discharge Temperature	Temperature Element (Type J Thermocouple)	LVP-TE-0511	32-900°F	Reports Signal Failure	720-750°F	$\pm(0.3+.005|t|)$ °C ^b	TBD ^c
			Temperature Transmitter	LVP-TT-0511					
			Temperature Transmitter	LVP-TI-0511					
29.	LVP-00002006	Stack Maximum CO Concentration (Hourly Rolling Average)	Analysis Element	SDJ-AE-2110, SDJ-AE-2124	Dual Range Analyzer: 0-200 ppm 0-3000 ppm	Drive Output Low, Activate Alarm	0.3-61.6 ppm	1% span	Automated Calibration with Alarms
			Analysis Transmitter	SDJ-AT-2110, SDJ-AT-2124					
			Analysis Indication	SDJ-AI-2110, SDJ-AI-2124					

Footnotes:

N/A – not applicable; TBD = to be determined

^a These instruments sets are duplicates. Only one instrument set is required to remain functioning during waste feed operations.^b Resistance temperature detector (RTD) class B.^c To be determined by Plant Engineering as each instrument calibration package is developed. All TBD items will be replaced with actual values in the required 180-day resubmittal of the EPDT Plan in accordance with III.10.H.3.a.ii.

Table III.10.H.D – Maximum Feed-Rates to LAW Vitrification System

Description of Waste	Individual Rate (lb/hr)	Total Rate (lb/hr)
PODC (as total organic carbon) ²	--	13.64
Naphthalene	11.6	--
Chlorobenzene	2.04	--
Dangerous and Mixed Waste Feed-rate	--	68.76
Total Chlorine/Chloride Feed-rate	--	40.73
Chlorine (from simulant)	TBD	--
Chlorine (from metals spiking)	TBD	--
Chlorine (from PODC spiking)	0.64	--
Total Metal Feed-rates	--	14.39
Lead (from spiking)	4.91	--
Chromium (from spiking)	9.48	--
EMF Effluent Return Metal Feed-rates ¹	TBD	TBD

Footnotes:

¹ Process samples will be taken in accordance with Section 5.1.4.2 of Appendix 9.15, Environmental Performance Demonstration Test Plan.² Feed sufficient to demonstrate 99.99% DRE plus a safety factor of 10.

1

Table III.10.H.E – LAW Vitrification System Estimated Emission Rates

Analyte	Performance Standard
2,3,7,8 -like Dioxins/furans, ng-TEQ/dscm	0.20 ng/dscm
Low-volatile Metals, total	97 µg/dscm
• Arsenic	–
• Beryllium	–
• Chromium	–
Semivolatile Metals, total	120 µg/dscm
• Lead	–

Table III.10.H.E – LAW Vitrification System Estimated Emission Rates

Analyte	Performance Standard
• Cadmium	–
Mercury	45 µg/dscm
Hydrogen chloride and chlorine gas (total chlorine)	21 ppmv
Particulate Matter	0.015 gr/dscf
Carbon Monoxide	100 ppmv
Hydrocarbon (as propane) ¹	10 ppmv

Footnotes:

¹ Hydrocarbon are only applicable during the Demonstration Test Period and is measured by a temporary continuous monitoring system.

Table III.10.H.F – LAW Vitrification System Automatic Waste Feed Cutoff Parameters During Short Term Treatment Operations

Item	Sub-system	Parameter Description	Type of Indicator	Instrument Tag Number	AWFCO Setpoint
1.	Bubblers Melter 1	Total Air Flow Maximum	Flow Indicator	LMP-FI-TBD	24.0 scfm
2.	Bubblers Melter 2	Total Air Flow Maximum	Flow Indicator	LMP-FI-TBD	24.0 scfm
3.	Plenum Melter 1	Plenum vs. Annulus Pressure Differential Maximum	Pressure Differential	LMP-PDI-1410A, LMP-PDSHH-1410A	-0.5 in. WC
4.	Plenum Melter 2	Plenum vs. Annulus Pressure Differential Maximum	Pressure Differential	LMP-PDI-2410A, LMP-PDSHH-2410A	-0.5 in. WC
5.	SBS Melter 1	Maximum Gas Temperature	Temperature Indicator	LOP-TI-1038	150°F
6.	SBS Melter 2	Maximum Gas Temperature	Temperature Indicator	LOP-TI-2038	150°F
7.	WESP Melter 1	Maximum Gas Temperature	Temperature Indicator	LOP-TI-1047	155°F
8.	WESP Melter 2	Maximum Gas Temperature	Temperature Indicator	LOP-TI-2047	155°F
9.	HEPA Inlet Temperature	Maximum Gas Temperature	Temperature Indicator	LVP-TI-0104	191°F
10.	TCO Temperature	Minimum Gas Temperature	Temperature Indicator	LVP-TI-0511	698°F
11.	LAW Stack	Maximum CO Concentration (Hourly Rolling Average)	Concentration Analyzer Indicator	SDJ-AI-2110D	100 ppm ROHA

Footnotes:

NOTE: Maintenance, at a minimum, is in accordance with equipment manufacturer’s recommendations. Dangerous and mixed waste treatment may continue during maintenance activities conducted with site-specific standard operating procedures, for a maximum of 24 hours after instrument malfunction/failure. Also, dangerous and mixed waste treatment may continue during calibrations and “blowback cycles” in accordance with manufacturer’s recommendations.

1
2
3
4
5

This page intentionally left blank.

1 **III.10.I LAW VITRIFICATION SYSTEM – LONG TERM MISCELLANEOUS THERMAL**
 2 **TREATMENT UNIT**

3 For purposes of Permit Section III.10.I, where reference is made to [WAC 173-303-640](#),
 4 the following substitutions apply: substitute the terms “LAW Vitrification System” for
 5 “tank system(s),” “sub-system(s)” for “tank(s),” “sub-system equipment” for “ancillary
 6 equipment,” and “sub-system(s) or sub-system equipment of a LAW Vitrification
 7 System” for “component(s),” in accordance with [WAC 173-303-680](#).

8 **III.10.I.1 Requirements for LAW Vitrification System Beginning Normal Operation**

9 Prior to commencing normal operations provided in Permit Section III.10.I, all
 10 requirements in Permit Section III.10.H will have been met by the Permittees and
 11 approved by Ecology, including the following: The LAW Vitrification System
 12 Demonstration Test results and the revised Final Risk Assessment provided for in Permit
 13 Condition III.10.C.11.c or III.10.C.11.d and Permit Section III.10.H, will have been
 14 evaluated and approved by Ecology, Permit Tables III.10.I.D and F, as approved/modified
 15 pursuant to Permit Condition III.10.H.5, will have been completed, submitted and
 16 approved pursuant to Permit Condition III.10.H.3.d.v and Permit Table III.10.I.E, as
 17 approved/modified pursuant to Permit Condition III.10.H.5, will have been completed,
 18 submitted and approved pursuant to Permit Condition III.10.C.11.c or d.

19 **III.10.I.1.a Construction and Maintenance** [[WAC 173-303-640](#), in accordance with [WAC 173-303-](#)
 20 [680](#)(2) and (3) and [WAC 173-303-340](#)].

21 **III.10.I.1.a.i** The Permittees will maintain the design and construction of the LAW Vitrification
 22 System as specified in Permit Condition III.10.I.1, Operating Unit Group 10,
 23 Chapter 4 of this Permit, and Operating Unit Group 10, Appendices 9.1 through 9.17
 24 of this Permit, as approved pursuant to Permit Conditions III.10.H.5.a through d and
 25 III.10.H.5.f.

26 **III.10.I.1.a.ii** The Permittees will maintain the design and construction of all containment systems
 27 for the LAW Vitrification System, as specified in Operating Unit Group 10, Chapter 4
 28 of this Permit, and Operating Unit Group 10, Appendices 9.2 and 9.4 through 9.14 of
 29 this Permit, as approved pursuant to Permit Conditions III.10.H.5.a through d.

30 **III.10.I.1.a.iii** Modifications to approved design, plans, and specifications in Operating Unit
 31 Group 10 of this Permit for the LAW Vitrification System will be allowed only in
 32 accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g, III.10.C.9.d, e,
 33 and h.

34 **III.10.I.1.a.iv** The Permittees will ensure all certifications required by specialists (e.g., independent
 35 qualified registered professional engineer; registered professional engineer;
 36 independent corrosion expert; independent qualified installation inspector;
 37 installation inspector; etc.) use the following statement or equivalent pursuant to
 38 Permit Condition III.10.C.10:

39 “I, (Insert Name) have (choose one or more of the following: overseen, supervised,
 40 reviewed, and/or certified) a portion of the design or installation of a new LAW
 41 Vitrification system or component located at (address), and owned/operated by
 42 (name(s)). My duties were: (e.g., installation inspector, testing for tightness, etc.), for
 43 the following LAW Vitrification System components (e.g., the venting piping, etc.),
 44 as required by the Dangerous Waste Regulations, namely, [WAC 173-303-640](#)(3)
 45 (applicable paragraphs [i.e., (a) through (g)], in accordance with [WAC 173-303-680](#).

- 1 “I certify under penalty of law that I have personally examined and am familiar with
 2 the information submitted in this document and all attachments and that, based on my
 3 inquiry of those individuals immediately responsible for obtaining the information, I
 4 believe that the information is true, accurate, and complete. I am aware that there are
 5 significant penalties for submitting false information, including the possibility of fine
 6 and imprisonment.”
- 7 **III.10.I.1.a.v** The Permittees will ensure periodic integrity assessments are conducted on the LAW
 8 Vitrification System listed in Permit Table III.10.I.A, as approved/modified pursuant
 9 to Permit Condition III.10.H.5, over the term of this Permit in accordance with
 10 [WAC 173-303-680](#)(2) and (3) as specified in [WAC 173-303-640](#)(3)(b), following the
 11 description of the integrity assessment program and schedule in Operating Unit
 12 Group 10, Chapter 6 of this Permit, as approved pursuant to Permit Conditions
 13 III.10.H.5.e.i and III.10.C.5.c. Results of the integrity assessments will be included
 14 in the WTP Unit operating record until ten (10) years after post closure, or corrective
 15 action is complete and certified, whichever is later.
- 16 **III.10.I.1.a.vi** The Permittees will address problems detected during the LAW Vitrification System
 17 integrity assessments specified in Permit Condition III.10.I.1.a.v following the
 18 description of the integrity assessment program in Operating Unit Group 10,
 19 Chapter 6 of this Permit, as approved pursuant to Permit Conditions III.10.H.5.e.i and
 20 III.10.C.5.c.
- 21 **III.10.I.1.a.vii** All process monitors/instruments as specified in Permit Table III.10.I.F, as
 22 approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v, will
 23 be equipped with operational alarms to warn of deviation, or imminent deviation
 24 from the limits specified in Permit Table III.10.I.F.
- 25 **III.10.I.1.a.viii** The Permittees will install and test all process and leak detection system
 26 monitors/instruments, as specified in Permit Tables III.10.I.C and III.10.I.F, as
 27 approved/modified pursuant to Permit Condition III.10.H.5 and III.10.H.3.d.v, in
 28 accordance with Operating Unit Group 10, Appendices 9.1, 9.2, and 9.14 of this
 29 Permit, as approved pursuant to Permit Conditions III.10.H.5.d.x and
 30 III.10.H.5.f..xvi.
- 31 **III.10.I.1.a.ix** No dangerous and/or mixed waste will be treated in the LAW Vitrification System
 32 unless the operating conditions, specified under Permit Condition III.10.I.1.c are
 33 complied with.
- 34 **III.10.I.1.a.x** The Permittees will not place dangerous and/or mixed waste, treatment reagents, or
 35 other materials in the LAW Vitrification System if these substances could cause the
 36 sub-system, sub-system equipment, or the containment system to rupture, leak,
 37 corrode, or otherwise fail [[WAC 173-303-640](#)(5)(a), in accordance with
 38 [WAC 173-303-680](#)(2)]. This condition is not applicable to corrosion of LAW
 39 Vitrification System sub-system or sub-system equipment that are expected to be
 40 replaced as part of normal operations (e.g., melters).
- 41 **III.10.I.1.a.xi** The Permittees will operate the LAW Vitrification System to prevent spills and
 42 overflows using description of controls and practices as required under
 43 [WAC 173-303-640](#)(5)(b), described in Permit Condition III.10.C.5 and Operating
 44 Unit Group 10, Appendix 9.18 of this Permit, as approved pursuant to Permit
 45 Condition III.1
- 46 **III.10.I.1.a.xii** 0.H.5.e [[WAC 173-303-640](#)(5)(b), in accordance with [WAC 173-303-680](#)(2) and (3),
 47 and [WAC 173-303-806](#)(4)(c)(ix)].

- 1 **III.10.I.1.a.xiii** For routinely non-accessible LAW Vitrification System sub-systems, as specified in
2 Operating Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit
3 Condition III.10.H.5.e.vi, the Permittees will mark all routinely non-accessible LAW
4 Vitrification System sub-systems access points with labels or signs to identify the
5 waste contained in each LAW Vitrification System sub-system. The label, or sign,
6 must be legible at a distance of at least fifty (50) feet and must bear a legend which
7 identifies the waste in a manner which adequately warns employees, emergency
8 response personnel, and the public of the major risk(s) associated with the waste
9 being stored or treated in the LAW Vitrification System sub-systems. For the
10 purposes of this permit condition, “routinely non-accessible” means personnel are
11 unable to enter these areas while waste is being managed in them [[WAC 173-303-
12 640\(5\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#)].
- 13 **III.10.I.1.a.xiv** For the LAW Vitrification System sub-systems not addressed in Permit Condition
14 III.10.I.1.a.xii, the Permittees will mark these LAW Vitrification System sub-systems
15 holding dangerous and/or mixed waste with labels or signs to identify the waste
16 contained in the LAW Vitrification System sub-systems. The labels, or signs, must
17 be legible at a distance of at least fifty (50) feet and must bear a legend which
18 identifies the waste in a manner which adequately warns employees, emergency
19 response personnel, and the public of the major risk(s) associated with the waste
20 being stored or treated in the LAW Vitrification System sub-systems [[WAC 173-303-
21 640\(5\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#)].
- 22 **III.10.I.1.a.xv** The Permittees will ensure that the secondary containment systems for the LAW
23 Vitrification System sub-systems listed in Permit Tables III.10.I.A and III.10.I.B, as
24 approved/modified pursuant to Permit Condition III.10.H.5, are free of cracks or gaps
25 to prevent any migration of dangerous and/or mixed waste or accumulated liquid out
26 of the system to the soil, groundwater, or surface water at any time during use of the
27 LAW Vitrification System sub-systems. Any indication that a crack or gap may exist
28 in the containment systems will be investigated and repaired in accordance with
29 Operating Unit Group 10, Appendix 9.18 of this Permit, as approved pursuant to
30 Permit Condition III.10.H.5.e.v [[WAC 173-303-640\(4\)\(b\)\(i\)](#), [WAC 173-303-
31 640\(4\)\(e\)\(i\)\(C\)](#), and [WAC 173-303-640\(6\)](#), in accordance with [WAC 173-303-680\(2\)](#)
32 and (3), [WAC 173-303-806\(4\)\(i\)\(B\)](#), and [WAC 173-303-320](#)].
- 33 **III.10.I.1.a.xvi** The Permittees must immediately, and safely, remove from service any LAW
34 Vitrification System or secondary containment system which through an integrity
35 assessment is found to be “unfit for use” as defined in [WAC 173-303-040](#), following
36 Permit Condition III.10.I.1.a.xvii A through D, and F. The affected LAW
37 Vitrification System or secondary containment system must be either repaired or
38 closed in accordance with Permit Condition III.10.I.1.a.xvii.E [[WAC 173-303-
39 640\(7\)\(e\)](#) and (f) and [WAC 173-303-640\(8\)](#), in accordance with [WAC 173-303-
40 680\(3\)](#)].
- 41 **III.10.I.1.a.xvii** An impermeable coating, as specified in Operating Unit Group 10, Appendices 9.4,
42 9.5, 9.7, 9.9, 9.11, and 9.12 of this Permit, as approved pursuant to Permit Condition
43 III.10.H.5.b.v, will be maintained for all concrete containment systems and concrete
44 portions of containment systems for the LAW Vitrification System sub-systems listed
45 in Permit Tables III.10.I.A and III.10.I.B, as approved/modified pursuant to Permit
46 Condition III.10.H.5 (concrete containment systems that do not have a liner, pursuant
47 to [WAC 173-303-640\(4\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680\(2\)](#), and have
48 construction joints, will meet the requirements of [WAC 173-303-640\(4\)\(e\)\(ii\)\(C\)](#), in
49 accordance with [WAC 173-303-680\(2\)](#). The coating will prevent migration of any

1 dangerous and/or mixed waste into the concrete. All coatings will meet the following
2 performance standards:

- 3 A. The coating must seal the containment surface such that no cracks, seams, or
4 other avenues through which liquid could migrate are present.
- 5 B. The coating must be of adequate thickness and strength to withstand the
6 normal operation of equipment and personnel within the given area such that
7 degradation or physical damage to the coating or lining can be identified and
8 remedied before dangerous and mixed waste could migrate from the system.
- 9 C. The coating must be compatible with the dangerous and/or mixed waste,
10 treatment reagents, or other materials managed in the containment system
11 [[WAC 173-303-640\(4\)\(e\)\(ii\)\(D\)](#)], in accordance with [WAC 173-303-680\(2\)](#)
12 and (3) and [WAC 173-303-806\(4\)\(i\)\(A\)](#)].

13 **III.10.I.1.a.xviii** The Permittees inspect all secondary containment systems for the LAW Vitrification
14 System sub-systems listed in Permit Tables III.10.I.A and III.10.I.B, as
15 approved/modified pursuant to Permit Condition III.10.H.5, in accordance with the
16 Inspection Plan specified in Operating Unit Group 10, Chapter 6A of this Permit, as
17 approved pursuant to Permit Conditions III.10.H.5.e.i and III.10.C.5.c, and take the
18 following actions if a leak or spill of dangerous and/or mixed waste is detected in
19 these containment systems [[WAC 173-303-640\(5\)\(c\)](#) and [WAC 173-303-640\(6\)](#)], in
20 accordance with [WAC 173-303-680\(2\)](#) and (3), [WAC 173-303-320](#), and
21 [WAC 173-303-806\(4\)\(i\)\(B\)](#)].

- 22 A. Immediately, and safely, stop the flow of dangerous and/or mixed waste into
23 the LAW Vitrification System sub-systems or secondary containment system.
- 24 B. Determine the source of the dangerous and/or mixed waste.
- 25 C. Remove the waste from the containment area in accordance with
26 [WAC 173-303-680\(2\)](#) and (3) as specified in [WAC 173-303-640\(7\)\(b\)](#). The
27 waste removed from containment areas of the LAW Vitrification System
28 sub-systems will be, as a minimum, managed as dangerous and/or mixed
29 waste.
- 30 D. If the cause of the release was a spill that has not damaged the integrity of the
31 LAW Vitrification System sub-system, the Permittees may return the LAW
32 Vitrification System sub-system to service in accordance with
33 [WAC 173-303-680\(2\)](#) and (3) as specified in [WAC 173-303-640\(7\)\(e\)\(ii\)](#). In
34 such case, the Permittees will take action to ensure the incident that caused
35 the dangerous and/or mixed waste to enter the containment system will not
36 reoccur.
- 37 E. If the source of the dangerous and/or mixed waste is determined to be a leak
38 from the primary LAW Vitrification System into the secondary containment
39 system, or the system is unfit for use as determined through an integrity
40 assessment or other inspection, the Permittees will comply with the
41 requirements of [WAC 173-303-640\(7\)](#) and take the following actions:
 - 42 1. Close the LAW Vitrification System sub-system following procedures in
43 [WAC 173-303-640\(7\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680](#) and
44 Operating Unit Group 10, Chapter 11 of this Permit, as approved
45 pursuant to Permit Condition III.10.C.8.

- 1 **III.10.I.1.b** Performance Standards
- 2 **III.10.I.1.b.i** The LAW Vitrification System must achieve a DRE of 99.99% for the PODCs listed
3 below [[40 CFR §63.1203\(c\)\(1\)](#)] and [[40CFR §63.1203\(c\)\(2\)](#)], in accordance with
4 [WAC 173-303-680\(2\)](#)];
- 5 RESERVED
- 6 DRE in this permit condition will be calculated in accordance with the formula
7 given below:
- 8 $DRE=[1-(W_{out}/W_{in})] \times 100\%$
- 9 Where:
- 10 W_{in} =mass feed rate of one PODC in a waste feed stream; and
11 W_{out} =mass emission rate of the same PODC present in exhaust emissions prior
12 to release to the atmosphere.
- 13 **III.10.I.1.b.ii** Particulate matter emissions from the LAW Vitrification System will not exceed 34
14 mg/dscm (0.015 grains/dscf) [[40 CFR §63.1203\(b\)\(7\)](#)], in accordance with
15 [WAC 173-303-680\(2\)](#)];
- 16 **III.10.I.1.b.iii** Hydrochloric acid and chlorine gas emissions from the LAW Vitrification System
17 will not exceed 21 ppmv, combined [[40 CFR §63.1203\(b\)\(6\)](#)], in accordance with
18 [WAC 173-303-680\(2\)](#)];
- 19 **III.10.I.1.b.iv** Dioxin and Furan TEQ emissions from the LAW Vitrification System will not exceed
20 0.2 nanograms (ng)/dscm, [[40 CFR §63.1203\(b\)\(1\)](#)], in accordance with
21 [WAC 173-303-680\(2\)](#)];
- 22 **III.10.I.1.b.v** Mercury emissions from the LAW Vitrification System will not exceed 45 µg/dscm
23 [[40 CFR §63.1203\(b\)\(2\)](#)], in accordance with [WAC 173-303-680\(2\)](#)];
- 24 **III.10.I.1.b.vi** Lead and cadmium emissions from the LAW Vitrification System will not exceed
25 120 µg/dscm, combined [[40 CFR §63.1203\(b\)\(3\)](#)], in accordance with [WAC 173-303-](#)
26 [680\(2\)](#)];
- 27 **III.10.I.1.b.vii** Arsenic, beryllium, and chromium emissions from the LAW Vitrification System will
28 not exceed 97 µg/dscm, combined [[40 CFR §63.1203\(b\)\(4\)](#)], in accordance with
29 [WAC 173-303-680\(2\)](#)];
- 30 **III.10.I.1.b.viii** Carbon monoxide (CO) emission from the LAW Vitrification System will not exceed
31 100 parts per million (ppm) by volume, over an hourly rolling average (as measured
32 and recorded by the CMS), dry basis [[40 CFR §63.1203\(b\)\(5\)\(i\)](#)], in accordance with
33 [WAC 173-303-680\(2\)](#) and (3)];
- 34 **III.10.I.1.b.ix** RESERVED
- 35 **III.10.I.1.b.x** If the emissions from the LAW Vitrification System exceed the emission rates listed
36 in Permit Table III.10.I.E, as approved pursuant to Permit Condition III.10.C.11.c
37 or d, the Permittees will perform the following actions [[WAC 173-303-680\(2\)](#) and
38 (3)], and [WAC 173-303-815\(2\)\(b\)\(ii\)](#)]:
- 39 A. Verbally notify Ecology within twenty-four (24) hours of the discovery of
40 exceeding the emission rate(s) as specified in Permit Condition I.E.21.
- 41 B. Submit to Ecology additional risk information to indicate that the increased
42 emissions impact is offset by decreased emission impact from one or more
43 constituents expected to be emitted at the same time, and/or investigate the
44 cause and impact of the exceedance of the emission rate(s) and submit a

1 report of the investigation findings to Ecology within fifteen (15) days of the
2 discovery of exceeding the emission rate(s).

- 3 C. Based on the notification and any additional information, Ecology may
4 provide, in writing, direction to the Permittees to stop dangerous and/or
5 mixed waste feed to the LAW Vitrification System and/or to submit a revised
6 Demonstration Test Plan as a permit modification pursuant to Permit
7 Conditions III.10.C.2.e through g. The revised Demonstration Test Plan must
8 include substantive changes to prevent failure from reoccurring.

9 The emission limits specified in Permit Conditions III.10.I.1.b.i through
10 III.10.I.1.b.ix above, will be met for the LAW Vitrification System by limiting feed
11 rates as specified in Permit Tables III.10.I.D and III.10.I.F, as approved/modified
12 pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v, compliance with
13 operating conditions specified in Permit Condition III.10.I.1.c (except as specified in
14 Permit Condition III.10.I.1.b.xii), and compliance with Permit Condition
15 III.10.I.1.b.xi;

16 **III.10.I.1.b.xi** Treatment effectiveness, feed-rates and operating rates for dangerous and/or mixed
17 waste management units contained in the LAW Building, but not included in Permit
18 Table III.10.I.A, as approved/modified pursuant to Permit Condition III.10.H.5, will
19 be as specified in Permit Sections III.10.D through F and consistent with assumptions
20 and basis which are reflected in Operating Unit Group 10, Appendix 6.3 of this
21 Permit, as approved pursuant to Permit Condition III.10.C.11.b. For the purposes of
22 this permit condition, Operating Unit Group 10, Appendix 6.3 will be superseded by
23 Appendix 6.4 upon its approval pursuant to either Permit Condition III.10.C.11.c or
24 III.10.C.11.d [[WAC 173-303-680](#)(2) and (3), and [WAC 173-303-815](#)(2)(b)(ii)];

25 **III.10.I.1.b.xii** Except during periods of LAW Vitrification System startup and shutdown,
26 compliance with the operating conditions specified in Permit Condition III.10.I.1.c,
27 will be regarded as compliance with the required performance standards identified in
28 Permit Conditions III.10.I.1.b.i through x. However, if it is determined that during
29 the effective period of this Permit that compliance with the operating conditions in
30 Permit Condition III.10.I.1.c is not sufficient to ensure compliance with the
31 performance standards specified in Permit Conditions III.10.I.1.b.i through x, the
32 Permit may be modified, revoked, or reissued pursuant to Permit Conditions
33 III.10.C.2.e and f, or III.10.C.2.g.

34 **III.10.I.1.c** Operating Conditions [[WAC 173-303-670](#)(6), in accordance with [WAC 173-303-680](#)(2)
35 and (3)]

36 The Permittees will operate the LAW Vitrification System in accordance with Operating
37 Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit Condition
38 III.10.H.5.e.vi and Operating Unit Group 10, Appendix 9.18 of this Permit, as approved
39 pursuant to Permit Condition III.10.H.5.e, and Operating Unit Group 10, Appendix 9.15
40 of this Permit, as approved pursuant to Permit Condition III.10.H.5.f, except as modified
41 pursuant to Permit Conditions III.10.H.3, III.10.I.1.b.x, III.10.I.1.b.xii, III.10.I.1.h, and in
42 accordance with and the following:

43 **III.10.I.1.c.i** The Permittees will operate the LAW Vitrification System in order to maintain the
44 systems and process parameters listed in Permit Tables III.10.I.C and III.10.I.F, as
45 approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v,
46 within the set-points specified in Permit Table III.10.I.F.

- 1 **III.10.I.1.c.ii** The Permittees will operate the AWFCO systems, specified in Permit Table III.10.I.F,
2 as approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v, to
3 automatically cut-off and/or lock-out the dangerous and/or mixed waste feed to LAW
4 Vitrification System when the monitored operating conditions deviate from the
5 set-points specified in Permit Table III.10.I.F.
- 6 **III.10.I.1.c.iii** The Permittees will operate the AWFCO systems, specified in Permit Table III.10.I.F,
7 as approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v, to
8 automatically cut-off and/or lock-out the dangerous and/or mixed waste feed to LAW
9 Vitrification System when all instruments specified in Permit Table III.10.H.F for
10 measuring the monitored parameters fails or exceeds its span value.
- 11 **III.10.I.1.c.iv** The Permittees will operate the AWFCO systems, specified in Permit Table III.10.I.F,
12 as approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v, to
13 automatically cut-off and/or lock out the dangerous waste and/or mixed waste feed to
14 the LAW Vitrification System when any portion of the LAW Vitrification System is
15 bypassed. The terms “bypassed” and “bypass event,” as used in Permit Sections
16 III.10.H and III.10.I, will mean if any portion of the LAW Vitrification System is
17 bypassed so that gases are not treated as during the Demonstration Test.
- 18 **III.10.I.1.c.v** In the event of a malfunction of the AWFCO systems listed in Permit Table III.10.I.F,
19 as approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v, the
20 Permittees will immediately, manually cut-off the dangerous and/or mixed waste feed
21 to the LAW Vitrification System. The Permittees will not restart the dangerous
22 and/or mixed waste feed until the problem causing the malfunction has been
23 identified and corrected.
- 24 **III.10.I.1.c.vi** The Permittees will manually cut-off the dangerous and/or mixed waste feed to
25 the LAW Vitrification System when the operating conditions deviate from the limits
26 specified in Permit Condition III.10.I.1.c.i, unless the deviation automatically
27 activates the waste feed cut-off sequence specified in Permit Conditions
28 III.10.I.1.c.ii, iii, and/or iv.
- 29 **III.10.I.1.c.vii** If greater than thirty (30) dangerous and/or mixed waste feed cut-off, combined, to
30 the LAW Vitrification System occur due to deviations from Permit Table III.10.I.F, as
31 approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v,
32 within a sixty (60) day period, the Permittees will submit a written report to Ecology
33 within five (5) calendar days of the thirty-first exceedance, including the information
34 specified below. These dangerous and/or mixed waste feed cut-offs to the LAW
35 Vitrification System, whether automatically or manually activated, are counted if the
36 specified set-points are deviated from while dangerous and/or mixed waste and waste
37 residues continue to be processed in the LAW Vitrification System. A cascade event
38 is counted at a frequency of one (1) towards the first waste feed cut-off parameter,
39 specified in Permit Table III.10.I.F, from which the set-point is deviated:
- 40 A. The parameter(s) that deviated from the set-point(s) in Permit Table
41 III.10.I.F.
- 42 B. The magnitude, dates, and duration of the deviations.
- 43 C. Results of the investigation of the cause of the deviations.
- 44 D. Corrective measures taken to minimize future occurrences of the deviations.

1 **III.10.I.1.c.viii** If greater than thirty (30) dangerous and/or mixed waste feed cut-off, combined, to
 2 the LAW Vitrification System occur due to deviations from Permit Table III.10.I.F, as
 3 approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v,
 4 within a thirty (30) day period, the Permittees will submit the written report required
 5 to be submitted pursuant to Permit Condition III.10.I.1.c.vii to Ecology on the first
 6 business day following the thirty-first exceedance. These dangerous and/or mixed
 7 waste feed cut-offs to the LAW Vitrification System, whether automatically or
 8 manually activated, are counted if the specified set-points are deviated from while
 9 dangerous and/or mixed waste and waste residues continue to be processed in the
 10 LAW Vitrification System. A cascade event is counted at a frequency of one (1)
 11 towards the first waste feed cut-off parameter, specified on Permit Table III.10.I.F,
 12 from which the set-point is deviated:

13 In accordance with [WAC 173-303-680](#)(2) and (3), the Permittees may not resume
 14 dangerous and/or mixed waste feed to the LAW Vitrification System until this written
 15 report has been submitted, and

- 16 A. Ecology has authorized the Permittees, in writing, to resume dangerous
 17 and/or mixed waste feed, or
- 18 B. Ecology has not, within seven (7) days, notified the Permittees in writing of
 19 the following:
 - 20 1. The Permittees written report does not document that the corrective
 21 measures taken will minimize future exceedances.
 - 22 2. The Permittees must take further corrective measures and document that
 23 these further corrective measures will minimize future exceedances.

24 **III.10.I.1.c.ix** If any portion of the LAW Vitrification System is bypassed while treating dangerous
 25 and/or mixed waste, it will be regarded as non-compliance with the operating
 26 conditions specified in Permit Condition III.10.I.1.c and the performance standards
 27 specified in Permit Condition III.10.I.1.b. After such a bypass event, the Permittees
 28 will perform the following actions:

- 29 A. Investigate the cause of the bypass event.
- 30 B. Take appropriate corrective measures to minimize future bypasses.
- 31 C. Record the investigation findings and corrective measures in the WTP Unit
 32 operating record.
- 33 D. Submit a written report to Ecology within five (5) days of the bypass event
 34 documenting the result of the investigation and corrective measures.

35 **III.10.I.1.c.x** The Permittees will control fugitive emissions from the LAW Vitrification System by
 36 maintaining the melters under negative pressure.

37 **III.10.I.1.c.xi** Except during periods of vitrification system startup and shutdown, compliance with
 38 the operating conditions specified in Permit Condition III.10.I.1.c will be regarded as
 39 compliance with the required performance standards identified in Permit Condition
 40 III.10.I.1.b. However, evidence that compliance with these operating conditions is
 41 insufficient to ensure compliance with the performance standards, will justify
 42 modification, revocation, or re-issuance of this Permit, in accordance with Permit
 43 Conditions III.10.C.2.e and f, or III.10.C.2.g.

44 **III.10.I.1.d** Inspection Requirements [[WAC 173-303-680](#)(3)]

- 1 **III.10.I.1.d.i** The Permittees will inspect the LAW Vitrification System in accordance with the
2 Inspection Plan in Operating Unit Group 10, Chapter 6A of this Permit, as modified
3 in accordance with Permit Condition III.10.C.5.c.
- 4 **III.10.I.1.d.ii** The inspection data for LAW Vitrification System will be recorded, and the records
5 will be placed in the WTP Unit operating record for LAW Vitrification System, in
6 accordance with Permit Condition III.10.C.4.
- 7 **III.10.I.1.d.iii** The Permittees will comply with the inspection requirements specified in Operating
8 Unit Group 10, Appendix 9.15 of this Permit, as approved pursuant to Permit
9 Condition III.10.H.5.f and as modified by Permit Conditions III.10.H.3, III.10.I.1.b.x,
10 III.10.I.1.b.xii, and III.10.I.1.h.
- 11 **III.10.I.1.e** Monitoring Requirements [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#), [WAC 173-303-
12 670\(7\)](#), and [WAC 173-303-807\(2\)](#), in accordance with [WAC 173-303-680\(3\)](#)]
- 13 **III.10.I.1.e.i** Upon receipt of a written request from Ecology, the Permittees will perform sampling
14 and analysis of the dangerous and/or mixed waste and exhaust emissions to verify
15 that the operating requirements established in the Permit achieve the performance
16 standards delineated in this Permit.
- 17 **III.10.I.1.e.ii** The Permittees will comply with the monitoring requirements specified in the
18 Operating Unit Group 10, Appendices 9.2, 9.3, 9.7, 9.13, 9.15 and 9.18 of this
19 Permit, as approved pursuant to Permit Condition III.10.H.5, and as modified by
20 Permit Conditions III.10.H.3, III.10.I.1.h, III.10.I.1.b.x, and III.10.I.1.b.xii.
- 21 **III.10.I.1.e.iii** The Permittees will operate, calibrate, and maintain the carbon monoxide and CEMS
22 as specified in this Permit in accordance with Performance Specifications found in
23 [40 CFR Part 60](#), Appendix B, in accordance with Appendix to Subpart EEE of
24 [40 CFR Part 63](#), and Operating Unit Group 10 Appendix 9.15 of this Permit, as
25 approved pursuant to Permit Condition III.10.H.5.f, and as modified by Permit
26 Conditions III.10.H.3, III.10.I.1.h, III.10.I.1.b.x, and III.10.I.1.b.xii.
- 27 **III.10.I.1.e.iv** The Permittees will operate, calibrate, and maintain the instruments specified in
28 Permit Tables III.10.I.C and F, as approved/modified pursuant to Permit Conditions
29 III.10.H.5 and III.10.H.3.d.v, in accordance with Operating Unit Group 10, Appendix
30 9.15 of this Permit, as approved pursuant to Permit Condition III.10.H.5.f, and as
31 modified by Permit Conditions III.10.H.3, III.10.I.1.h, III.10.I.1.b.x, and
32 III.10.I.1.b.xii.
- 33 **III.10.I.1.e.v** The Permittees shall calibrate, inspect, and maintain or replace the following
34 Melter 1 and Melter 2 cooling water flow and temperature instruments in accordance
35 with manufacturer's recommendations, or as specified in this permit, or otherwise
36 agreed to by Ecology (Melter 1: FT/TI&FI-1206, FT/TI&FI-1209, FT/TI&FI-1215,
37 FT/TI&FI-1218, FT/TI&FI-1221, FT/TI&FI-1224, FT/TI&FI-1227, FT/TI&FI-1233,
38 FT/TI&FI-1236, FT/TI&FI-1536, FT/TI&FI-1539; Melter 2: FT/TI&FI-2206,
39 FT/TI&FI-2209, FT/TI&FI-2215, FT/TI&FI-2218, FT/TI&FI-2221, FT/TI&FI-2224,
40 FT/TI&FI-2227, FT/TI&FI-2233, FT/TI&FI-2236, FT/TI&FI-2536, FT/TI&FI-
41 2539).
- 42 **III.10.I.1.f** Recordkeeping Requirements [[WAC 173-303-380](#) and [WAC 173-303-680\(3\)](#)]
- 43 **III.10.I.1.f.i** The Permittees will record and maintain in the WTP Unit operating record for the
44 LAW Vitrification System, all monitoring, calibration, maintenance, test data, and
45 inspection data compiled under the conditions of this Permit, in accordance with

- 1 Permit Conditions III.10.C.4 and 5, as modified by Permit Conditions III.10.H.3,
2 III.10.I.1.h, III.10.I.1.b.x, and III.10.I.1.b.xii.
- 3 **III.10.I.1.f.ii** The Permittees will record in the WTP Unit operating record the date, time, and
4 duration of all automatic waste feed cutoffs and/or lockouts, including the triggering
5 parameters, reason for the deviation, and recurrence of the incident. The Permittees
6 will also record all incidents of AWFCO system function failures, including the
7 corrective measures taken to correct the condition that caused the failure.
- 8 **III.10.I.1.f.iii** The Permittees will submit to Ecology an annual report each calendar year within
9 ninety (90) days following the end of the year. The report will include the following
10 information:
- 11 A. Total dangerous and/or mixed waste feed processing time for the LAW
12 Vitrification System.
- 13 B. Date/Time of all LAW Vitrification System startups and shutdowns.
- 14 C. Date/Time/Duration/Cause/Corrective Action taken for all LAW Vitrification
15 System shutdowns caused by malfunction of either process or control
16 equipment.
- 17 D. Date/Time/Duration/Cause/Corrective Action taken for all instances of
18 dangerous and/or mixed waste feed cut-off due to deviations from Permit
19 Table III.10.I.F, as approved/modified pursuant to Permit Conditions
20 III.10.H.5 and III.10.H.3.d.v.
- 21 **III.10.I.1.f.iv** The Permittees will submit an annual report to Ecology each calendar year within
22 ninety (90) days following the end of the year of all quarterly CEMS Calibration
23 Error and Annual CEMS Performance Specification Tests conducted, in accordance
24 with Permit Condition III.10.I.1.e.iii.
- 25 **III.10.I.1.f.v** The Permittees shall maintain operating and calibration/maintenance records for
26 Ecology's inspection for the following Melter 1 and Melter 2 cooling water flow and
27 temperature instruments (Melter 1: FT/TI&FI-1206, FT/TI&FI-1209, FT/TI&FI-
28 1215, FT/TI&FI-1218, FT/TI&FI-1221, FT/TI&FI-1224, FT/TI&FI-1227,
29 FT/TI&FI-1233, FT/TI&FI-1236, FT/TI&FI-1536, FT/TI&FI-1539; Melter 2:
30 FT/TI&FI-2206, FT/TI&FI-2209, FT/TI&FI-2215, FT/TI&FI-2218, FT/TI&FI-2221,
31 FT/TI&FI-2224, FT/TI&FI-2227, FT/TI&FI-2233, FT/TI&FI-2236, FT/TI&FI-2536,
32 FT/TI&FI-2539).
- 33 **III.10.I.1.f.vi** The Permittees shall maintain refractory thermocouple temperature data for Ecology
34 inspection.
- 35 **III.10.I.1.g** Closure
- 36 The Permittees will close the LAW Vitrification System in accordance with Operating
37 Unit Group 10, Chapter 11 of this Permit, as approved pursuant to Permit Condition
38 III.10.C.8.
- 39 **III.10.I.1.h** Periodic Emission Re-testing Requirements [[WAC 173-303-670\(5\)](#), [WAC 173-303-](#)
40 [670\(7\)](#), and [WAC 173-303-807\(2\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and (3)]
- 41 **III.10.I.1.h.i** The Permittees must perform re-testing in accordance with the methods and
42 frequencies described below or may submit proposed alternative test methods
43 (e.g. CEMS) for consideration. This submittal must be provided no less than
44 6 months prior to any required re-testing and must be approved by Ecology prior to
45 implementation.

III.10.I.1.h.ii

Dioxin and Furan Emission Testing

A. Within eighteen (18) months of commencing operation pursuant to Permit Section III.10.I, the Permittees will submit to Ecology for approval, a Dioxin and Furan Emission Test Plan (DFETP) for the performance of emission testing of the LAW Vitrification System gases for dioxin and furans during “Normal Operating Conditions” as a permit modification in accordance with Permit Conditions III.10.C.2.e and III.10.C.2.f. The DFETP will include all elements applicable to dioxin and furan emission testing included in the “Previously Approved Demonstration Test Plan,” applicable EPA promulgated test methods and procedures in effect at the time of the submittal, and projected commencement and completion dates for dioxin and furan emission test. “Normal Operating Conditions” will be defined for the purposes of this permit condition as follows:

1. Carbon monoxide emissions, dangerous and/or mixed waste feed-rate, and automatic waste feed cut-off parameters specified in Permit Table III.10.I.F (as approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v), that were established to maintain compliance with Permit Condition III.10.I.1.b.iv as specified in Operating Unit Group 10, Appendix 9.15 of this Permit (as approved pursuant to Permit Condition III.10.H.3.d, and in accordance with III.10.I.1.b.xii and III.10.I.1.c.xi), are held within the range of the average value over the previous twelve (12) months and the set-point value specified in Permit Table III.10.I.F. The average value is defined as the sum of the rolling average values recorded over the previous twelve (12) months divided by the number of rolling averages recorded during that time. The average value will not include calibration data, malfunction data, and data obtained when not processing dangerous and/or mixed waste.
2. Feed-rate of metals, ash, and chlorine/chloride are held within the range of the average value over the previous twelve (12) months and the set-point value specified on Permit Table III.10.I.D (as approved/modified pursuant to Permit Conditions III.10.H.5 and III.10.H.3.d.v). Feed-rate of organics as measured by TOC are held within the range of the average value over the previous twelve (12) months. The average value is defined as the sum of the rolling average values recorded over the previous twelve (12) months divided by the number of rolling averages recorded during that time. The average value will not include data obtained when not processing dangerous and/or mixed waste.

For purposes of this permit condition, the “Previously Approved Demonstration Test Plan” is defined to include the Demonstration Test Plan approved pursuant to Permit Condition III.10.H.5.f.

- B. Within sixty (60) days of Ecology’s approval of the DFETP, or within thirty-one (31) months of commencing operation pursuant to Permit Section III.10.I, whichever is later, the Permittees will implement the DFETP approved pursuant to Permit Condition III.10.I.1.h.ii.A.
- C. The Permittees will resubmit the DFETP, approved pursuant to Permit Condition III.10.I.1.h.ii.A, revised to include applicable EPA promulgated test methods and procedures in effect at the time of the submittal, and projected commencement and completion dates for dioxin and furan emission test as a permit modification in accordance with Permit Conditions

1 III.10.C.2.e and III.10.C.2.f at twenty-four (24) months from the
2 implementation date of the testing required pursuant to Permit Condition
3 III.10.I.1.h.ii.A and at reoccurring eighteen (18) month intervals from the
4 implementation date of the previously approved DFETP. The Permittees
5 will implement these newly approved revised DFETPs, every thirty-one (31)
6 months from the previous approved DFETP implementation date or within
7 sixty (60) days of the newly Ecology approved revised DFETP, whichever is
8 later, for the duration of this Permit.

9 D. The Permittees will submit a summary of operating data collected pursuant to
10 the DFETPs in accordance with Permit Conditions III.10.I.1.h.ii.A and C to
11 Ecology upon completion of the tests. The Permittees will submit to Ecology
12 the complete test report within ninety (90) calendar days of completion of the
13 testing. The test reports will be certified as specified in [WAC 173-303-](#)
14 [807](#)(8), in accordance with [WAC 173-303-680](#)(2) and (3).

15 E. If any calculations or testing results collected pursuant to the DFETPs in
16 accordance with Permit Conditions III.10.I.1.h.ii.A and C show that one or
17 more of the performance standards listed in Permit Condition III.10.I.1.b,
18 with the exception of Permit Condition III.10.I.1.b.x, for the LAW
19 Vitrification System were not met during the emission test, the Permittees
20 will perform the following actions:

- 21 1. Immediately stop dangerous and/or mixed waste feed to the LAW
22 Vitrification System under the mode of operation that resulted in not
23 meeting the performance standard(s).
- 24 2. Verbally notify Ecology within twenty-four (24) hours of discovery of
25 not meeting the performance standard(s), as specified in Permit
26 Condition I.E.21.
- 27 3. Investigate the cause of the failure and submit a report of the
28 investigation findings to Ecology within fifteen (15) days of discovery of
29 not meeting the performance standard(s).
- 30 4. Submit to Ecology within fifteen (15) days of discovery of not meeting
31 the performance standard(s) documentation supporting a mode of
32 operation where all performance standards listed in Permit Condition
33 III.I.1.b, with the exception of Permit Condition III.10.I.1.b.x, for the
34 LAW Vitrification System were met during the demonstration test, if any
35 such mode was demonstrated.
- 36 5. Based on the information provided to Ecology by the Permittees pursuant
37 to Permit Conditions III.10.I.1.h.ii.E.1 through 4 above, and any
38 additional information, Ecology may provide in writing, direction to the
39 Permittees to stop dangerous waste and mixed waste feed to the LAW
40 Vitrification System and/or amend the mode of operation the Permittees
41 are allowed to continue operations prior to Ecology approval of the
42 revised Demonstration Test Plan pursuant to Permit Condition
43 III.10.I.1.h.ii.E.6.
- 44 6. Submit to Ecology within one hundred and twenty (120) days of
45 discovery of not meeting the performance standard(s) a revised
46 Demonstration Test Plan requesting approval to retest as a permit
47 modification pursuant to Permit Conditions III.10.C.2.e and III.10.C.2.f.
48 The revised Demonstration Test Plan must include substantive changes to
49 prevent failure from reoccurring reflecting performance under operating

1 conditions representative of the extreme range of normal conditions, and
2 include revisions to Permit Tables III.10.I.D and F.

- 3 F. If any calculations or testing results collected pursuant to the DFETPs in
4 accordance with Permit Conditions III.10.I.1.h.ii.A and C show that any
5 emission rate for any constituent listed in Permit Table III.10.I.E, as
6 approved/modified pursuant to Permit Conditions III.10.C.11.c or d is
7 exceeded for LAW Vitrification System during the emission test, the
8 Permittees will perform the following actions:
- 9 1. Verbally notify Ecology within twenty-four (24) hours of the discovery
10 of exceeding the emission rate(s), as specified in Permit Condition
11 I.E.21.
 - 12 2. Submit to Ecology additional risk information to indicate that the
13 increased emissions impact is off-set by decreased emission impact from
14 one or more constituents expected to be emitted at the same time, and/or
15 investigate the cause and impact of the exceedance and submit a report of
16 the investigation findings to Ecology within fifteen (15) days of this
17 discovery of exceeding the emission rate(s).
 - 18 3. Based on the notification and any additional information, Ecology may
19 provide, in writing, direction to the Permittees to stop dangerous and/or
20 mixed waste feed to the LAW Vitrification System and/or to submit a
21 revised Demonstration Test Plan as a permit modification pursuant to
22 Permit Conditions III.10.C.2.e and f, or III.10.C.2.g. The revised
23 Demonstration Test Plan must include substantive changes to prevent
24 failure from reoccurring reflecting performance under operating
25 conditions representative of the extreme range of normal conditions, and
26 include revisions to Permit Tables III.10.I.D and III.10.I.F.

27 **III.10.I.1.h.iii**

Non-organic Emission Testing

- 28 A. Within forty-eight (48) months of commencing operation pursuant to Permit
29 Section III.10.I, the Permittees will resubmit to Ecology for approval the
30 “Previously Approved Demonstration Test Plan” revised as a permit
31 modification in accordance with Permit Conditions III.10.C.2.e and
32 III.10.C.2.f. The revised Demonstration Test Plan (RDTP) will include
33 applicable EPA promulgated test methods and procedures in effect at the time
34 of the submittal, projected commencement and completion dates for emission
35 testing to demonstrate performance standards specified in Permit Conditions
36 III.10.I.1.b.ii, iii, v, vi, and vii, and non-organic emissions as specified in
37 Permit Table III.10.I.E, as approved/modified pursuant to Permit Conditions
38 III.10.H.3.d and III.10.C.11.c or d, under “Normal Operating Conditions.”
39 “Normal Operating Conditions” will be defined for the purposes of this
40 permit condition as follows:
- 41 1. Carbon monoxide emissions, dangerous and/or mixed waste feed-rate,
42 and automatic waste feed cut-off parameters specified in Permit Table
43 III.10.I.F, as approved/modified pursuant to Permit Conditions
44 III.10.H.3.d and III.10.C.11.c or d, that were established to maintain
45 compliance with Permit Conditions III.10.I.1.b.ii, iii, v, vi, and vii, and
46 non-organic emissions, as specified in Permit Table III.10.I.E, as
47 specified in Operating Unit Group 10, Appendix 9.15 of this Permit
48 (as approved pursuant to Permit Conditions III.10.H.3.d and III.10.C.11.c
49 or d), are held within the range of the average value over the previous

1 twelve (12) months and the set-point value specified in Permit Table
2 III.10.I.F. The average value is defined as the sum of the rolling average
3 values recorded over the previous twelve (12) months divided by the
4 number of rolling averages recorded during that time. The average value
5 will not include calibration data, malfunction data, and data obtained
6 when not processing dangerous or mixed waste.

- 7 2. Feed-rate of metals, ash, and chlorine/chloride are held within the range
8 of the average value over the previous twelve (12) months and the set-
9 point value specified in Permit Table III.10.I.D, as approved/modified
10 pursuant to Permit Conditions III.10.H.3.d and III.10.C.11.c or d. The
11 average value is defined as the sum of all rolling average values recorded
12 over the previous twelve (12) months divided by the number of rolling
13 averages recorded during that time. The average value will not include
14 data obtained when not processing dangerous or mixed waste.

15 For purposes of this permit condition, the “Previously Approved
16 Demonstration Test Plan” is defined to include the Demonstration Test Plan
17 approved pursuant to Permit Condition III.10.H.5.f.

- 18 B. Within sixty (60) days of Ecology’s approval of the RDTP, or within sixty
19 (60) months of commencing operation pursuant to Permit Section III.10.I,
20 whichever is later, the Permittees will implement the RDTP approved
21 pursuant to Permit Condition III.10.I.1.h.ii.A.
- 22 C. The Permittees will resubmit the RDTP, approved pursuant to Permit
23 Condition III.10.I.1.h.ii.A, revised to include applicable EPA promulgated
24 test methods and procedures in effect at the time of the submittal, and
25 projected commencement and completion dates for emission test as a permit
26 modification in accordance with Permit Conditions III.10.C.2.e and f at
27 forty-eight (48) months from the implementation date of the testing required
28 pursuant to Permit Condition III.10.I.1.h.ii.A and at reoccurring forty-eight
29 (48) month intervals from the implementation date of the previously
30 approved RDTP. The Permittees will implement these newly approved
31 revised RDTP, every sixty (60) months from the previous approved RDTP
32 implementation date or within sixty (60) days of the newly Ecology approved
33 revised RDTP, whichever is later, for the duration of this Permit.
- 34 D. The Permittees will submit a summary of operating data collected pursuant to
35 the RDTPs in accordance with Permit Conditions III.10.I.1.h.ii.A and C to
36 Ecology upon completion of the tests. The Permittees will submit to Ecology
37 the complete test report within ninety (90) calendar days of completion of the
38 testing. The test reports will be certified pursuant to [WAC 173-303-807](#)(8),
39 in accordance with [WAC 173-303-680](#)(2) and (3).
- 40 E. If any calculations or testing results collected pursuant to the RDTPs in
41 accordance with Permit Conditions III.10.I.1.h.ii.A and C show that any
42 emission rate for any constituent listed in Permit Table III.10.I.E, as
43 approved/modified pursuant to Permit Conditions III.10.H.3.d and
44 III.10.C.11.c or d, is exceeded for LAW Vitrification System during the
45 emission test, the Permittees will perform the following actions:
- 46 1. Verbally notify Ecology within twenty-four (24) hours of the discovery
47 of exceeding the emission rate(s), as specified in Permit Condition
48 I.E.21;

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
2. Submit to Ecology additional risk information to indicate that the increased emissions impact is off-set by decreased emission impact from one or more constituents expected to be emitted at the same time, and/or investigate the cause and impact of the exceedance and submit a report of the investigation findings to Ecology within fifteen (15) days of this discovery of exceeding the emission rate(s); and
3. Based on the notification and any additional information, Ecology may provide, in writing, direction to the Permittees to stop dangerous and/or mixed waste feed to the LAW Vitrification System and/or to submit a revised Demonstration Test Plan as a permit modification pursuant to Permit Conditions III.10.C.2.e and f, or III.10.C.2.g. The revised Demonstration Test Plan must include substantive changes to prevent failure from reoccurring reflecting performance under operating conditions representative of the extreme range of normal conditions, and include revisions to Permit Tables III.10.I.D and III.10.I.F.
- F. If any calculations or testing results collected pursuant to the RDTPs in accordance with Permit Conditions III.10.I.1.h.ii.A and C show that one or more of the performance standards listed in Permit Condition III.10.I.1.b, with the exception of Permit Condition III.10.I.1.b.x, for the LAW Vitrification System were not met during the emission test, the Permittees will perform the following actions:
 1. Immediately stop dangerous and/or mixed waste feed to the LAW Vitrification System under the mode of operation that resulted in not meeting the performance standard(s);
 2. Verbally notify Ecology within twenty-four (24) hours of discovery of not meeting the performance standard(s), as specified in Permit Condition I.E.21;
 3. Investigate the cause of the failure and submit a report of the investigation findings to Ecology within fifteen (15) days of discovery of not meeting the performance standard(s);
 4. Submit to Ecology within fifteen (15) days of discovery of not meeting the performance standard(s) documentation supporting a mode of operation where all performance standards listed in Permit Condition III.I.1.b, with the exception of Permit Condition III.10.I.1.b.x, for the LAW Vitrification System were met during the demonstration test, if any such mode was demonstrated;
 5. Based on the information provided to Ecology by the Permittees pursuant to Permit Conditions III.10.I.1.h.ii.F.1 through 4 above, and any additional information, Ecology may provide in writing, direction to the Permittees to stop dangerous and/or mixed waste feed to the LAW Vitrification System and/or amend the mode of operation the Permittees are allowed to continue operations prior to Ecology approval of the revised Demonstration Test Plan pursuant to Permit Condition III.10.I.1.h.ii.F.6; and
 6. Submit to Ecology within one hundred and twenty (120) days of discovery of not meeting the performance standard(s) a revised Demonstration Test Plan requesting approval to retest as a permit modification pursuant to Permit Conditions III.10.C.2.e and f. The revised Demonstration Test Plan must include substantive changes to

1 prevent failure from reoccurring reflecting performance under operating
2 conditions representative of the extreme range of normal conditions, and
3 include revisions to Permit Tables III.10.I.D and F.

4 **III.10.I.1.h.iv** Other Emission Testing

5 A. Within seventy-eight (78) months of commencing operation pursuant to
6 Permit Section III.10.I, the Permittees will resubmit to Ecology for approval
7 the “Previously Approved Demonstration Test Plan” revised as a permit
8 modification in accordance with Permit Conditions III.10.C.2.e and f. The
9 Revised Demonstration Test Plan (RDTP) will include applicable EPA
10 promulgated test methods and procedures in effect at the time of the
11 submittal, projected commencement and completion dates for emission
12 testing to demonstrate performance standards as specified in Permit
13 Conditions III.10.I.1.b.viii and ix, and emissions as specified in Permit Table
14 III.10.I.E, as approved/modified pursuant to Permit Conditions III.10.H.3.d
15 and III.10.C.11.c or d, not addressed under Permit Conditions III.10.I.1.h.ii
16 or iii under “Normal Operating Conditions.” “Normal Operating
17 Conditions” will be defined for the purposes of this permit condition as
18 follows:

- 19 1. Carbon monoxide emissions, dangerous and/or mixed waste feed-rate,
20 and automatic waste feed cut-off parameters specified in Permit Table
21 III.10.I.F, as approved/modified pursuant to Permit Condition
22 III.10.H.3.d and III.10.C.11.c or d, that were established to maintain
23 compliance with Permit Conditions III.10.I.1.b.viii and ix, and emissions
24 as specified in Permit Table III.10.I.E, not addressed under Permit
25 Conditions III.10.I.1.h.ii or iii as specified in Operating Unit Group 10,
26 Appendix 9.15 of this Permit, as approved pursuant to Permit Condition
27 III.10.H.3.d, and in accordance with Permit Conditions III.10.I.1.b.xii
28 and III.10.I.1.c.xi are held within the range of the average value over the
29 previous twelve (12) months and the set-point value specified on Permit
30 Table III.10.I.F. The average value is defined as the sum of all rolling
31 average values recorded over the previous twelve (12) months divided by
32 the number of rolling averages recorded during that time. The average
33 value will not include calibration data, malfunction data, and data
34 obtained when not processing dangerous and/or mixed waste.
- 35 2. Feed-rate of metals, ash, and chlorine/chloride are held within the range
36 of the average value over the previous twelve (12) months and the set-
37 point value specified in Permit Table III.10.I.D, as approved/modified
38 pursuant to Permit Conditions III.10.H.3.d and III.10.C.11.c or d.
39 Feed-rate of organics as measured by TOC are held within the range of
40 the average value over the previous twelve (12) months. The average
41 value is defined as the sum of the rolling average values recorded over
42 the previous twelve (12) months divided by the number of rolling
43 averages recorded during that time. The average value will not include
44 data obtained when not processing dangerous and/or mixed waste.

45 For purposes of this permit condition, the “Previously Approved Demonstration
46 Test Plan” is defined to include the Demonstration Test Plan approved pursuant
47 to Permit Condition III.10.H.5.f.

- 1 B. Within sixty (60) days of Ecology's approval of the RDTP, or within ninety-
2 one (91) months of commencing operation pursuant to Permit Section
3 III.10.I, whichever is later, the Permittees will implement the RDTP
4 approved pursuant to Permit Condition III.10.I.1.h.iv.A.
- 5 C. The Permittees will submit a summary of operating data collected pursuant to
6 the RDTPs in accordance with Permit Condition III.10.I.1.h.iv.A to Ecology
7 upon completion of the tests. The Permittees will submit to Ecology the
8 complete test report within ninety (90) calendar days of completion of the
9 testing. The test reports will be certified as specified in [WAC 173-303-
10 807](#)(8), in accordance with Permit Condition [WAC 173-303-680](#)(2) and (3).
- 11 D. If any calculations or testing results show that one or more of the
12 performance standards listed in Permit Condition III.10.I.1.b, with the
13 exception of Permit Condition III.10.I.1.b.x, for the LAW Vitrification
14 System were not met during the emission test, the Permittees will perform
15 the following actions:
- 16 1. Immediately stop dangerous and/or mixed waste feed to the LAW
17 Vitrification System under the mode of operation that resulted in not
18 meeting the performance standard(s);
 - 19 2. Verbally notify Ecology within twenty-four (24) hours of discovery of
20 not meeting the performance standard(s), as specified in Permit
21 Condition I.E.21.
 - 22 3. Investigate the cause of the failure and submit a report of the
23 investigation findings to Ecology within fifteen (15) days of discovery of
24 not meeting the performance standard(s).
 - 25 4. Submit to Ecology within fifteen (15) days of discovery of not meeting
26 the performance standard(s) documentation supporting a mode of
27 operation where all performance standards listed in Permit Condition
28 III.I.1.b, with the exception of Permit Condition III.10.I.1.b.x, for the
29 LAW Vitrification System were met during the demonstration test, if any
30 such mode was demonstrated.
 - 31 5. Based on the information provided to Ecology by the Permittees pursuant
32 to Permit Conditions III.10.I.1.h.iv.D.1 through 4 above, and any
33 additional information, Ecology may provide in writing, direction to the
34 Permittees to stop dangerous and/or mixed waste feed to the LAW
35 Vitrification System and/or amend the mode of operation the Permittees
36 are allowed to continue operations prior to Ecology approval of the
37 revised Demonstration Test Plan, pursuant to Permit Condition
38 III.10.I.h.1.iv.D.6.
 - 39 6. Submit to Ecology within one hundred and twenty (120) days of
40 discovery of not meeting the performance standard(s) a revised
41 Demonstration Test Plan requesting approval to retest as a permit
42 modification pursuant to Permit Conditions III.10.C.2.e and f. The
43 revised Demonstration Test Plan must include substantive changes to
44 prevent failure from reoccurring reflecting performance under operating
45 conditions representative of the extreme range of normal conditions, and
46 include revisions to Permit Tables III.10.I.D and III.10.I.F.
- 47 E. If any calculations or testing results show that any emission rate for any
48 constituent listed in Permit Table III.10.I.E, as approved/modified pursuant to
49 Permit Conditions III.10.C.11.c or d, is exceeded for LAW Vitrification

1 System during the emission test, the Permittees will perform the following
2 actions:

- 3 1. Verbally notify Ecology within twenty-four (24) hours of the discovery
4 of exceeding the emission rate(s), as specified in Permit Condition
5 I.E.21.
- 6 2. Submit to Ecology additional risk information to indicate that the
7 increased emissions impact is off-set by decreased emission impact from
8 one or more constituents expected to be emitted at the same time, and/or
9 investigate the cause and impact of the exceedance of the emission
10 rate(s) and submit a report of the investigation findings to Ecology
11 within fifteen (15) days of the discovery of the exceedance of the
12 emission rate(s).
- 13 3. Based on the notification and any additional information, Ecology may
14 provide, in writing, direction to the Permittees to stop dangerous and/or
15 mixed waste feed to the LAW Vitrification System and/or to submit a
16 revised Demonstration Test Plan as a permit modification pursuant to
17 Permit Conditions III.10.C.2.e and f, or III.10.C.2.g. The revised
18 Demonstration Test Plan must include substantive changes to prevent
19 failure from reoccurring reflecting performance under operating
20 conditions representative of the extreme range of normal conditions, and
21 include revisions to Permit Tables III.10.I.D and F.

22

1
2
3
4
5

This page intentionally left blank.

Table III.10.I.A – LAW Vitrification System Description^a

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos, Specification Nos, etc.)	Narrative Description, Tables and Figures
RESERVED	RESERVED	RESERVED	RESERVED

^a Permit Table III.10.I.A will be completed in accordance with Permit Condition III.10.H.5.e.x, prior to initiating Permit Condition III.10.I.1. See Permit Table III.10.H.A for the current LAW Vitrification System Description.

1

Table III.10.I.B – LAW Vitrification System Secondary Containment Systems Including Sumps and Floor Drains

Sump/Floor Drain I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions^b (feet) & Materials of Construction	Engineering Description (Drawing Nos, Specification Nos, etc.)
RESERVED	RESERVED	RESERVED	RESERVED

^a Permit Table III.10.I.B will be completed in accordance with Permit Condition III.10.H.5.b.vii, prior to initiating Permit Condition III.10.I.1. See Permit Table III.10.H.B for the current LAW Vitrification System Secondary Containment Systems Including Sumps and Floor Drains.

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

2

Table III.10.I.C – LAW Vitrification Systems Process and Leak Detection System Instruments and Parameters

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

^a Permit Table III.10.I.C will be completed in accordance with Permit Condition III.10.H.5.e.ix, prior to initiating Permit Condition III.10.I.1. See Permit Table III.10.H.C for the current LAW Vitrification Systems Process and Leak Detection System Instruments and Parameters.

3

Table III.10.I.D – Maximum Feed-rates to LAW Vitrification System (RESERVED)

Description of Waste	Normal Operation
Dangerous and/or Mixed Waste Feed Rate	RESERVED
Ash Feed Rate	RESERVED
Total Chlorine/Chloride Feed Rate	RESERVED
Total Metal Feedrates	RESERVED

1

Table III.10.I.E – LAW Vitrification System Estimated Emission Rates (RESERVED)

Chemicals	CAS Number	Emission Rates (grams/second)
RESERVED	RESERVED	RESERVED

2

TABLE III.10.I.F – LAW Vitrification System Waste Feed Cut-off Parameters*¹ (RESERVED)

Sub-system Designation	Instrument Tag Number	Parameter Description	Set-points During Normal Operation
RESERVED	RESERVED	RESERVED	RESERVED

*A CMS will be used as defined in Permit Section III.10.C.1.

¹Maximum Feed-rate will be set based on not exceeding any of the constituent (e.g., metals, ash, and chlorine/chloride) feed limits specified on Table III.10.I.D of this Permit.

3

1 **III.10.J HLW VITRIFICATION SYSTEM – SHORT TERM MISCELLANEOUS THERMAL**
2 **TREATMENT UNIT-SHAKEDOWN, DEMONSTRATION TEST, AND POST**
3 **DEMONSTRATION TEST**

4 For purposes of Permit Section III.10.J, where reference is made to [WAC 173-303-640](#),
5 the following substitutions apply: substituting the terms “HLW Vitrification System” for
6 “tank system(s),” “sub-system(s)” for “tank(s),” “sub-system equipment” for “ancillary
7 equipment,” and “sub-system(s) or sub-system equipment of a HLW Vitrification
8 System” for “component(s),” in accordance with [WAC 173-303-680](#).

9 **III.10.J.1 General Conditions During Shakedown, Demonstration Test, and Post-**
10 **Demonstration Test for HLW Vitrification System**

11 **III.10.J.1.a** Construction and Maintenance [[WAC 173-303-640](#), in accordance with [WAC 173-303-](#)
12 [680](#)(2) and (3), and [WAC 173-303-340](#)].

13 **III.10.J.1.a.i** The Permittees will construct the HLW Vitrification System (listed in Permit Tables
14 III.10.J.A and III.10.J.B, as approved/modified pursuant to Permit Condition
15 III.10.J.5) as specified in Permit Condition III.10.J.1 and Operating Unit Group 10,
16 Chapter 4 of this Permit, and Operating Unit Group 10, Appendices 10.1 through
17 10.15 and 10.17 of this Permit, as approved pursuant to Permit Conditions III.10.J.5.a
18 through d, and III.10.J.5.f.

19 **III.10.J.1.a.ii** The Permittees will construct all containment systems for the HLW Vitrification
20 System as specified in Operating Unit Group 10, Chapter 4 of this Permit, and
21 Operating Unit Group 10, Appendices 10.2, 10.4, through 10.14 of this Permit, as
22 approved pursuant to Permit Conditions III.10.J.5.a through d.

23 **III.10.J.1.a.iii** The Permittees will ensure all certifications required by specialists (e.g., independent
24 qualified registered professional engineer, independent corrosion expert, independent
25 qualified installation inspector, etc.) use the following statement or equivalent
26 pursuant to Permit Condition III.10.C.10:

27 “I, (Insert Name) have (choose one or more of the following: overseen, supervised,
28 reviewed, and/or certified) a portion of the design or installation of a new HLW
29 Vitrification system or component located at (address), and owned/operated by
30 (name(s)). My duties were: (e.g., installation inspector, testing for tightness, etc.), for
31 the following HLW Vitrification system components (e.g., the venting piping, etc.),
32 as required by the Dangerous Waste Regulations, namely, [WAC 173-303-640](#)(3)
33 (applicable paragraphs (i.e., (a) through (g)) in accordance with [WAC 173-303-680](#)).

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

40 **III.10.J.1.a.iv** The Permittees must ensure that proper handling procedures are adhered to in order
41 to prevent damage to the HLW Vitrification System during installation. Prior to
42 covering, enclosing, or placing the new HLW Vitrification System or component in
43 use, an independent qualified installation inspector or an independent qualified
44 registered professional engineer, either of whom is trained and experienced in the
45 proper installation of similar systems or components, must inspect the system for the
46 presence of any of the following items:

- 1 A. Weld breaks
 2 B. Punctures
 3 C. Scrapes of protective coatings
 4 D. Cracks
 5 E. Corrosion
 6 F. Other structural damage or inadequate construction/installation
- 7 All discrepancies must be remedied before the HLW Vitrification system is covered,
 8 enclosed, or placed in use [[WAC 173-303-640\(3\)\(c\)](#)], in accordance with
 9 [WAC 173-303-680\(2\)](#) and (3)].
- 10 **III.10.J.1.a.v** For the HLW Vitrification System or components that are placed underground and
 11 that are back-filled, the Permittees must provide a backfill material that is a
 12 non-corrosive, porous, homogeneous substance. The backfill must be installed so
 13 that it is placed completely around the HLW Vitrification System and compacted to
 14 ensure that the HLW Vitrification System is fully and uniformly supported
 15 [\[WAC 173-303-640\(3\)\(d\)\]](#), in accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 16 **III.10.J.1.a.vi** The Permittees must test for tightness the HLW Vitrification System or components,
 17 prior to being covered, enclosed, or placed into use. If the HLW Vitrification System
 18 or components are found not to be tight, all repairs necessary to remedy the leak(s) in
 19 the system must be performed prior to the HLW Vitrification System being covered,
 20 enclosed, or placed in use [[WAC 173-303-640\(3\)\(e\)](#)], in accordance with
 21 [WAC 173-303-680\(2\)](#) and (3)].
- 22 **III.10.J.1.a.vii** The Permittees must ensure the HLW Vitrification System equipment is supported
 23 and protected against physical damage and excessive stress due to settlement,
 24 vibration, expansion, or contraction [[WAC 173-303-640\(3\)\(f\)](#)], in accordance with
 25 [WAC 173-303-680\(2\)](#) and (3)].
- 26 **III.10.J.1.a.viii** The Permittees must provide the type and degree of corrosion protection
 27 recommended by an independent corrosion expert, based on the information provided
 28 in Operating Unit Group 10, Appendices 10.9 and 10.11 of this Permit, as approved
 29 pursuant to Permit Conditions III.10.J.5.b.i, III.10.J.5.b.iv, III.10.J.5.b.v, III.10.J.5.c.i,
 30 III.10.J.5.c.iv, III.10.J.5.c.v, III.10.J.5.d.i, III.10.J.5.d.iv, and III.10.J.5.d.v, or other
 31 corrosion protection if Ecology believes other corrosion protection is necessary to
 32 ensure the integrity of the HLW Vitrification System during use of the HLW
 33 Vitrification System. The installation of a corrosion protection system that is field
 34 fabricated must be supervised by an independent corrosion expert to ensure proper
 35 installation [[WAC 173-303-640\(3\)\(g\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and
 36 (3)].
- 37 **III.10.J.1.a.ix** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the
 38 Permittees will obtain and keep on file in the WTP Unit operating record, written
 39 statements by those persons required to certify the design of the HLW Vitrification
 40 System and supervise the installation of the HLW Vitrification System, as specified in
 41 [WAC 173-303-640\(3\)\(b\)](#), (c), (d), (e), (f), and (g), in accordance with [WAC 173-303-](#)
 42 [680](#), attesting that the HLW Vitrification system and corresponding containment
 43 system listed in Permit Tables III.10.J.A and III.10.J.B, as approved/modified
 44 pursuant to Permit Condition III.10.J.5, were properly designed and installed, and
 45 that repairs, in accordance with [WAC 173-303-640\(3\)\(c\)](#) and (e), were performed
 46 [\[WAC 173-303-640\(3\)\(a\)\]](#) and [WAC 173-303-640\(3\)\(h\)](#), in accordance with
 47 [WAC 173-303-680\(3\)\]](#).

- 1 **III.10.J.1.a.x** The independent HLW Vitrification System installation inspection and subsequent
 2 written statements will be certified in accordance with [WAC 173-303-810](#)(13)(a), as
 3 modified pursuant to Permit Condition III.10.J.1.a.iii, comply with all requirements
 4 of [WAC 173-303-640](#)(3)(h) in accordance with [WAC 173-303-680](#), and will consider,
 5 but not be limited to, the following LAW Vitrification System installation
 6 documentation:
- 7 A. Field installation report with date of installation.
 - 8 B. Approved welding procedures.
 - 9 C. Welder qualification and certifications.
 - 10 D. Hydro-test reports, as applicable, in accordance with the American Society of
 11 Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII,
 12 Division 1; American Petroleum Institute (API) Standard 620, or Standard
 13 650, as applicable.
 - 14 E. Tester credentials.
 - 15 F. Field inspector credentials.
 - 16 G. Field inspector reports.
 - 17 H. Field waiver reports.
 - 18 I. Non-compliance reports and corrective action (including field waiver
 19 reports) and repair reports.
- 20 **III.10.J.1.a.xi** The Permittees will ensure periodic integrity assessments are conducted on the HLW
 21 Vitrification System, listed in Permit Table III.10.J.A, as approved/modified pursuant
 22 to Permit Condition III.10.J.5, over the term of this Permit, in accordance with
 23 [WAC 173-303-680](#)(2) and (3) as specified in [WAC 173-303-640](#)(3)(b), following the
 24 description of the integrity assessment program and schedule in Operating Unit
 25 Group 10, Addendum E of this Permit, as approved pursuant to Permit Conditions
 26 III.10.J.5.e.i and III.10.C.5.c Results of the integrity assessments will be included in
 27 the WTP Unit operating record until ten (10) years after post-closure, or corrective
 28 action is complete and certified, whichever is later.
- 29 **III.10.J.1.a.xii** The Permittees will address problems detected during the HLW Vitrification System
 30 integrity assessments specified in Permit Condition III.10.J.1.a.xi following the
 31 integrity assessment program in Operating Unit Group 10, Addendum E of this
 32 Permit, as approved pursuant to Permit Conditions III.10.J.5.e.i and III.10.C.5.c.
- 33 **III.10.J.1.a.xiii** All process monitors/instruments as specified in Permit Table III.10.J.F, as
 34 approved/modified pursuant to Permit Condition III.10.J.5, will be equipped with
 35 operational alarms to warn of deviation, or imminent deviation from the limits
 36 specified in Permit Table III.10.J.F.
- 37 **III.10.J.1.a.xiv** The Permittees will install and test all process and leak detection system
 38 monitors/instrumentation as specified in Permit Tables III.10.J.C and III.10.J.F, as
 39 approved/modified pursuant to Permit Condition III.10.J.5, in accordance with
 40 Operating Unit Group 10, Appendices 10.1, 10.2, and 10.14 of this Permit, as
 41 approved pursuant to Permit Conditions III.10.J.5.d.x and III.10.J.5.f.xvi.
- 42 **III.10.J.1.a.xv** Except during periods of HLW Vitrification System start up and shut down, no
 43 dangerous and/or mixed waste will be treated in the HLW Vitrification System unless
 44 the operating conditions specified under Permit Condition III.10.J.1.c are complied
 45 with.

- 1 **III.10.J.1.a.xvi** The Permittees will not place dangerous and/or mixed waste, treatment reagents, or
2 other materials in the HLW Vitrification System if these substances could cause the
3 subsystem, subsystem equipment, or the containment system to rupture, leak,
4 corrode, or otherwise fail [[WAC 173-303-640](#)(5)(a), in accordance with
5 [WAC 173-303-680](#)(2)]. This condition is not applicable to corrosion of HLW
6 Vitrification System sub-system and sub-system equipment that are expected to be
7 replaced as part of normal operations (e.g., melters).
- 8 **III.10.J.1.a.xvii** The Permittees will operate the HLW Vitrification System to prevent spills and
9 overflows using description of controls and practices as required under
10 [WAC 173-303-640](#)(5)(b) described in Permit Condition III.10.C.5, and Operating
11 Unit Group 10, Appendix 10.18 of this Permit, as approved pursuant to Permit
12 Condition III.10.J.5.e [[WAC 173-303-640](#)(5)(b), in accordance with [WAC 173-303-](#)
13 [680](#)(2) and (3), and [WAC 173-303-806](#)(4)(c)(ix)].
- 14 **III.10.J.1.a.xviii** For routinely non-accessible HLW Vitrification System sub-systems, as specified in
15 Operating Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit
16 Condition III.10.J.5.e.vi, the Permittees will mark all routinely non-accessible HLW
17 Vitrification System sub-systems access points with labels or signs to identify the
18 waste contained in each HLW Vitrification System sub-system. The label, or sign,
19 must be legible at a distance of at least fifty (50) feet, and must bear a legend which
20 identifies the waste in a manner which adequately warns employees, emergency
21 response personnel, and the public of the major risk(s) associated with the waste
22 being stored or treated in the HLW Vitrification System sub-systems. For the
23 purposes of this permit condition, “routinely non-accessible” means personnel are
24 unable to enter these areas while waste is being managed in them [[WAC 173-303-](#)
25 [640](#)(5)(d), in accordance with [WAC 173-303-680](#)(2)].
- 26 **III.10.J.1.a.xix** For all HLW Vitrification System sub-systems not addressed in Permit Condition
27 III.10.J.1.a.xviii, the Permittees will mark all these HLW Vitrification System
28 sub-systems holding dangerous and/or mixed waste with labels or signs to identify
29 the waste contained in the HLW Vitrification System sub-systems. The labels, or
30 signs, must be legible at a distance of at least fifty (50) feet, and must bear a legend
31 which identifies the waste in a manner which adequately warns employees,
32 emergency response personnel, and the public of the major risk(s) associated with the
33 waste being stored or treated in the HLW Vitrification System sub-systems
34 [[WAC 173-303-640](#)(5)(d), in accordance with [WAC 173-303-680](#)(2)].
- 35 **III.10.J.1.a.xx** The Permittees will ensure that the containment systems for the HLW Vitrification
36 System sub-systems listed in Permit Tables III.10.J.A and III.10.J.B, as
37 approved/modified pursuant to Permit Condition III.10.J.5, are free of cracks or gaps
38 to prevent any migration of dangerous and/or mixed waste or accumulated liquid out
39 of the system to the soil, groundwater, or surface water at any time during use of the
40 HLW Vitrification System sub-systems. Any indication that a crack or gap may exist
41 in the containment systems will be investigated and repaired in accordance with
42 Operating Unit Group 10, Appendix 10.18 of this Permit, as approved pursuant to
43 Permit Condition III.10.J.5.e.v [[WAC 173-303-640](#)(4)(b)(i), [WAC 173-303-](#)
44 [640](#)(4)(e)(i)(C), and [WAC 173-303-640](#)(6), in accordance with [WAC 173-303-680](#)(2)
45 and (3), [WAC 173-303-806](#)(4)(i)(i)(B), and [WAC 173-303-320](#)].

- 1 **III.10.J.1.a.xxii** The Permittees must immediately, and safely, remove from service any HLW
 2 Vitrification System or secondary containment system which, through an integrity
 3 assessment, is found to be “unfit for use” as defined in [WAC 173-303-040](#), following
 4 Permit Conditions III.10.J.1.a.xxiii.A through D, and F. The affected HLW
 5 Vitrification System, or secondary containment system, must be either repaired or
 6 closed in accordance with Permit Condition III.10.J.1.a.xxiii.E [[WAC 173-303-](#)
 7 [640](#)(7)(e) and (f), and [WAC 173-303-640](#)(8), in accordance with [WAC 173-303-](#)
 8 [680](#)(3)].
- 9 **III.10.J.1.a.xxiii** An impermeable coating, as specified in Operating Unit Group 10, Appendices 10.4,
 10 10.5, 10.7, 10.9, 10.11, and 10.12 of this Permit, as approved pursuant to Permit
 11 Condition III.10.J.5.b.v, will be maintained for all concrete containment systems and
 12 concrete portions of containment systems for each HLW Vitrification System
 13 sub-systems listed in Permit Tables III.10.J.A and III.10.J.B as approved/modified
 14 pursuant to Permit Condition III.10.J.5 (concrete containment systems that do not
 15 have a liner, pursuant to [WAC 173-303-640](#)(4)(e)(i), in accordance with
 16 [WAC 173-303-680](#)(2), and have construction joints, will meet the requirements of
 17 [WAC 173-303-640](#)(4)(e)(ii)(C), in accordance with [WAC 173-303-680](#)(2). The
 18 coating will prevent migration of any dangerous and mixed waste into the concrete.
 19 All coatings will meet the following performance standards:
- 20 A. The coating must seal the containment surface such that no cracks, seams, or
 21 other avenues through which liquid could migrate, are present;
 - 22 B. The coating must be of adequate thickness and strength to withstand the
 23 normal operation of equipment and personnel within the given area such that
 24 degradation or physical damage to the coating or lining can be identified and
 25 remedied before dangerous and mixed waste could migrate from the system;
 26 and
 - 27 C. The coating must be compatible with the dangerous and mixed waste,
 28 treatment reagents, or other materials managed in the containment system
 29 [[WAC 173-303-640](#)(4)(e)(ii)(D), in accordance with [WAC 173-303-680](#)(2)
 30 and (3), and [WAC 173-303-806](#)(4)(i)(i)(A)].
- 31 **III.10.J.1.a.xxiiii** The Permittees will inspect all containment systems for the HLW Vitrification
 32 System sub-systems listed in Permit Tables III.10.J.A and III.10.J.B, as
 33 approved/modified pursuant to Permit Condition III.10.J.5, in accordance with the
 34 Inspection Plan specified in Operating Unit Group 10, Chapter 6A of this Permit, as
 35 approved pursuant to Permit Conditions III.10.J.5.e.i and III.10.C.5.c, and take the
 36 following actions if a leak or spill of dangerous and/or mixed waste is detected in
 37 these containment systems [[WAC 173-303-640](#)(5)(c) and [WAC 173-303-640](#)(6), in
 38 accordance with [WAC 173-303-680](#)(2) and (3), [WAC 173-303-320](#), and
 39 [WAC 173-303-806](#)(4)(i)(i)(B)]:
- 40 A. Immediately, and safely, stop the flow of dangerous and/or mixed waste into
 41 the HLW Vitrification System sub-systems or secondary containment system.
 - 42 B. Determine the source of the dangerous and/or mixed waste.
 - 43 C. Remove the dangerous and/or mixed waste from the containment area in
 44 accordance with [WAC 173-303-680](#)(2) and (3), as specified in
 45 [WAC 173-303-640](#)(7)(b). The dangerous and/or mixed waste removed from
 46 containment areas of the HLW Vitrification System sub-systems will be, as a
 47 minimum, managed as mixed waste.

- 1 D. If the cause of the release was a spill has not damaged the integrity of the
 2 HLW Vitrification System sub-system, the Permittees may return the HLW
 3 Vitrification System sub-system to service in accordance with
 4 [WAC 173-303-680\(2\)](#) and (3), as specified in [WAC 173-303-640\(7\)\(e\)\(ii\)](#).
 5 In such case, the Permittees will take action to ensure the incident that caused
 6 the dangerous and/or mixed waste to enter the containment system will not
 7 re-occur [[WAC 173-303-320\(3\)](#)].
- 8 E. If the source of the dangerous and/or mixed waste is determined to be a leak
 9 from the primary HLW Vitrification System into the secondary containment
 10 system, or the system is unfit for use as determined through an integrity
 11 assessment or other inspection, the Permittees will comply with the
 12 requirements of [WAC 173-303-640\(7\)](#) and take the following actions:
- 13 1. Close the HLW Vitrification System Sub-system following procedures in
 14 [WAC 173-303-640\(7\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680](#) and
 15 Operating Unit Group 10, Addendum H of this Permit, as approved
 16 pursuant to Permit Condition III.10.C.8, or
 - 17 2. Repair and re-certify (in accordance with [WAC 173-303-810\(13\)\(a\)](#), as
 18 modified pursuant to Permit Condition III.10.J.1.a.iii) the HLW
 19 Vitrification System in accordance with Operating Unit Group 10,
 20 Appendix 10.18 of this Permit, as approved pursuant to Permit Condition
 21 III.10.J.5.e.v, before the HLW Vitrification System is placed back into
 22 service [[WAC 173-303-640\(7\)\(e\)\(iii\)](#) and [WAC 173-303-640\(7\)\(f\)](#), in
 23 accordance with [WAC 173-303-680](#)].
- 24 F. The Permittees will document, in the WTP Unit operating record,
 25 actions/procedures taken to comply with A. through E. above, as specified in
 26 [WAC 173-303-640\(6\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#) and (3).
- 27 G. In accordance with [WAC 173-303-680\(2\)](#) and [WAC 173-303-680\(3\)](#), the
 28 Permittees will notify and report releases to the environment to Ecology, as
 29 specified in [WAC 173-303-640\(7\)\(d\)](#).

30 **III.10.J.1.a.xxiv** If liquids (e.g., dangerous and/or mixed waste leaks and spills, precipitation, fire
 31 water, liquids from damaged or broken pipes) cannot be removed from the secondary
 32 containment system within twenty-four (24) hours, Ecology will be verbally notified
 33 within twenty-four (24) hours of discovery. The notification will provide the
 34 information in A, B, and C, listed below. The Permittees will provide Ecology with a
 35 written demonstration within seven (7) business days, identifying at a minimum
 36 [[WAC 173-303-640\(4\)\(c\)\(iv\)](#) and [WAC 173-303-640\(7\)\(b\)\(ii\)](#), in accordance with
 37 [WAC 173-303-680\(3\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)]:

- 38 A. Reasons for delayed removal;
- 39 B. Measures implemented to ensure continued protection of human health and
 40 the environment;
- 41 C. Current actions being taken to remove liquids from secondary containment.

42 **III.10.J.1.a.xxv** All air pollution control devices and capture systems in the HLW Vitrification System
 43 will be maintained and operated at all times in a manner so as to minimize the
 44 emissions of air contaminants and to minimize process upsets. Procedures for
 45 ensuring that the air pollution control devices and capture systems in the HLW
 46 Vitrification System are properly operated and maintained so as to minimize the
 47 emission of air contaminants and process upsets will be established.

- 1 **III.10.J.1.a.xxvi** In all future narrative permit submittals, the Permittees will include HLW
2 Vitrification sub-system names with the sub-system designation.
- 3 **III.10.J.1.a.xxvii** Modifications to approved design, plans, and specifications in Operating Unit
4 Group 10 of this Permit for the HLW Vitrification System will be allowed only in
5 accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g, III.10.C.9.d, e,
6 and h.
- 7 **III.10.J.1.a.xxviii** For any portion of the HLW Vitrification System that has the potential for formation
8 and accumulation of hydrogen gases, the Permittees will operate the portion to
9 maintain hydrogen levels below the lower explosive limit [[WAC 173-303-](#)
10 [815\(2\)\(b\)\(ii\)](#)].
- 11 **III.10.J.1.a.xxix** For each HLW Vitrification System sub-system holding dangerous waste which are
12 acutely or chronically toxic by inhalation, the Permittees will operate the system to
13 prevent escape of vapors, fumes or other emissions into the air [[WAC 173-303-](#)
14 [806\(4\)\(i\)\(i\)\(B\)](#) and [WAC 173-303-640\(5\)\(e\)](#) in accordance with [WAC 173-303-680](#)].
- 15 **III.10.J.1.b** Performance Standards
- 16 **III.10.J.1.b.i** The HLW Vitrification System must achieve a DRE of 99.99% for the PODCs listed
17 below [[40 CFR §63.1203\(c\)\(1\)](#) and [40-CFR 63.1203\(c\)\(2\)](#), in accordance with
18 [WAC 173-303-680\(2\)](#)].
- 19 RESERVED
- 20 DRE in this Permit condition will be calculated in accordance with the formula
21 given below:
22 $DRE = [1 - (W_{out} / W_{in})] \times 100\%$
23 Where:
24 W_{in} = mass feed rate of one PODC in a waste feed stream; and
25 W_{out} = mass emission rate of the same PODC present in exhaust emissions prior
26 to release to the atmosphere.
- 27 **III.10.J.1.b.ii** Particulate matter emissions from the HLW Vitrification System will not exceed 34
28 mg/dscm (0.015 grains/dscf) [[40 CFR §63.1203\(b\)\(7\)](#), in accordance with
29 [WAC 173-303-680\(2\)](#)]:
- 30 **III.10.J.1.b.iii** Hydrochloric acid and chlorine gas emissions from the HLW Vitrification System
31 will not exceed 21 ppmv, combined [[40 CFR §63.1203\(b\)\(6\)](#), in accordance with
32 [WAC 173-303-680\(2\)](#)]:
- 33 **III.10.J.1.b.iv** Dioxin and Furan TEQ emissions from the HLW Vitrification System will not exceed
34 0.2 nanograms (ng)/dscm [[40 CFR §63.1203\(b\)\(1\)](#), in accordance with
35 [WAC 173-303-680\(2\)](#)]:
- 36 **III.10.J.1.b.v** Mercury emissions from the HLW Vitrification System will not exceed 45 µg/dscm,
37 [[40 CFR §63.1203\(b\)\(2\)](#), in accordance with [WAC 173-303-680\(2\)](#)].
- 38 **III.10.J.1.b.vi** Lead and cadmium emissions from the HLW Vitrification System will not exceed
39 120 µg/dscm, combined [[40 CFR §63.1203\(b\)\(3\)](#), in accordance with [WAC 173-303-](#)
40 [680\(2\)](#)].
- 41 **III.10.J.1.b.vii** Arsenic, beryllium, and chromium emissions from the HLW Vitrification System will
42 not exceed 97 µg/dscm, combined [[40 CFR §63.1203\(b\)\(4\)](#), in accordance with
43 [WAC 173-303-680\(2\)](#)].

- 1 **III.10.J.1.b.viii** Carbon monoxide (CO) emission from the HLW Vitrification System will not exceed
 2 100 parts per million (ppm) by volume, over an hourly rolling average (as measured
 3 and recorded by the CMS), dry [[40 CFR §63.1203\(b\)\(5\)\(i\)](#), in accordance with
 4 [WAC 173-303-680\(2\)](#)].
- 5 **III.10.J.1.b.ix** Hydrocarbon emission from the HLW Vitrification System will not exceed 10 parts
 6 per million (ppm) by volume, over an hourly rolling average (as measured and
 7 recorded by the CMS during demonstration testing required by this Permit), dry
 8 basis, and reported as propane [[40 CFR §63.1203\(b\)\(5\)\(ii\)](#), in accordance with
 9 [WAC 173-303-680\(2\)](#)]:
- 10 **III.10.J.1.b.x** If the emissions from the HLW Vitrification System exceed the emission rates listed
 11 in Permit Table III.10.J.E, as approved pursuant to Permit Condition III.10.C.11.b,
 12 the Permittees will notify Ecology, in accordance with Permit Condition
 13 III.10.J.3.d.vii [[WAC 173-303-680\(2\)](#) and (3), and [WAC 173-303-815\(2\)\(b\)\(ii\)](#)].
 14 The emission limits specified in Permit Conditions III.10.J.1.b.i through
 15 III.10.J.1.b.ix above, will be met for the HLW Vitrification System by limiting feed
 16 rates as specified in Permit Tables III.10.J.D and III.10.J.F, as approved/modified
 17 pursuant to Permit Condition III.10.J.5, compliance with operating conditions
 18 specified in Permit Condition III.10.J.1.c (except as specified in Permit Condition
 19 III.10.J.1.b.xii), and compliance with Permit Condition III.10.J.1.b.xi.
- 20 **III.10.J.1.b.xi** Treatment effectiveness, feed-rates and operating rates for dangerous and mixed
 21 waste management units contained in the HLW Building, but not included in Permit
 22 Table III.10.J.A, as approved/modified pursuant to Permit Condition III.10.J.5, will
 23 be as specified in Permit Sections III.10.D, III.10.E, III.10.F and consistent with
 24 assumptions and basis which are reflected in Operating Unit Group 10, Appendix 6.3
 25 of this Permit, as approved pursuant to Permit Condition III.10.C.11.b. For the
 26 purposes of this permit condition, Operating Unit Group 10, Appendix 6.3 will be
 27 superseded by Appendix 6.4 upon its approval pursuant to either Permit Conditions
 28 III.10.C.11.c or III.10.C.11.d [[WAC 173-303-680\(2\)](#) and (3), and [WAC 173-303-
 29 815\(2\)\(b\)\(ii\)](#)].
- 30 **III.10.J.1.b.xii** Except during periods of HLW Vitrification System startup and shutdown,
 31 compliance with the operating conditions specified in Permit Condition III.10.J.1.c,
 32 will be regarded as compliance with the required performance standards identified in
 33 Permit Conditions III.10.J.1.b.i through x. However, if it is determined that during
 34 the effective period of this Permit that compliance with the operating conditions in
 35 Permit Condition III.10.J.1.c is not sufficient to ensure compliance with the
 36 performance standards specified in Permit Conditions III.10.J.1.b.i through x, the
 37 Permit may be modified, revoked, or reissued pursuant to Permit Conditions
 38 III.10.C.2.e and III.10.C.2.f, or III.10.C.2.g.
- 39 **III.10.J.1.c** Operating Conditions [[WAC-303-670\(6\)](#), in accordance with [WAC 173-303-680\(2\)](#)
 40 and (3)].
 41 The Permittees will operate the HLW Vitrification System in accordance with Operating
 42 Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit Condition
 43 III.10.J.5.e.vi, and Operating Unit Group 10, Appendix 10.18 of this Permit, as approved
 44 pursuant to Permit Condition III.10.J.5.e, and Operating Unit Group 10, Appendix 10.15
 45 of this Permit, as approved pursuant to Permit Condition III.10.J.5.f, except as modified
 46 pursuant to Permit Conditions III.10.J.1.b.xii, III.10.J.2, III.10.J.3, III.10.J.4, and in
 47 accordance with the following:

- 1 **III.10.J.1.c.i** The Permittees will operate the HLW Vitrification System in order to maintain the
2 systems and process parameters listed in Permit Tables III.10.J.C and III.10.J.F, as
3 approved/modified pursuant to Permit Condition III.10.J.5, within the set-points
4 specified in Permit Table III.10.J.F.
- 5 **III.10.J.1.c.ii** The Permittees will operate the AWFCO systems, specified in Permit Table III.10.J.F,
6 as approved/modified pursuant to Permit Condition III.10.J.5, to automatically cut-
7 off and/or lock-out the dangerous and mixed waste feed to the HLW Vitrification
8 System when the monitored operating conditions deviate from the set-points
9 specified in Permit Table III.10.J.F.
- 10 **III.10.J.1.c.iii** The Permittees will operate the AWFCO systems, specified in Permit Table III.10.J.F,
11 as approved/modified pursuant to Permit Condition III.10.J.5, to automatically cut-
12 off and/or lock-out the dangerous and mixed waste feed to the HLW Vitrification
13 System when all instruments specified on Permit Table III.10.H.F for measuring the
14 monitored parameters fails or exceeds its span value.
- 15 **III.10.J.1.c.iv** The Permittees will operate the AWFCO systems, specified in Permit Table III.10.J.F,
16 as approved/modified pursuant to Permit Condition III.10.J.5, to automatically cut-
17 off and/or lock out the dangerous and/or mixed waste feed to the HLW Vitrification
18 System when any portion of the HLW Vitrification System is bypassed. The terms
19 “bypassed” and “bypass event” as used in Permit Sections III.10.J and III.10.K will
20 mean if any portion of the HLW Vitrification System is bypassed so that gases are not
21 treated as during the Demonstration Test.
- 22 **III.10.J.1.c.v** In the event of a malfunction of the AWFCO systems listed in Permit Table III.10.J.F,
23 as approved/modified pursuant to Permit Condition III.10.J.5, the Permittees will
24 immediately, manually cut-off the dangerous and mixed waste feed to the HLW
25 Vitrification System. The Permittees will not restart the dangerous and/or mixed
26 waste feed until the problem causing the malfunction has been identified and
27 corrected.
- 28 **III.10.J.1.c.vi** The Permittees will manually cut-off the dangerous and mixed waste feed to the
29 HLW Vitrification System when the operating conditions deviate from the limits
30 specified in Permit Condition III.10.J.1.c.i, unless the deviation automatically
31 activates the waste feed cut-off sequence specified in Permit Conditions
32 III.10.J.1.c.ii, III.10.J.1.c.iii, and/or III.10.J.1.c.iv.
- 33 **III.10.J.1.c.vii** If greater than thirty (30) dangerous and mixed waste feed cut-offs, combined, to the
34 HLW Vitrification System occur due to deviations from Permit Table III.10.J.F, as
35 approved/modified pursuant to Permit Condition III.10.J.5, within a sixty (60) day
36 period, the Permittees will submit a written report to Ecology within five (5) calendar
37 days of the thirty-first exceedance including the information specified below. These
38 dangerous and mixed waste feed cut-offs to the HLW Vitrification System, whether
39 automatically or manually activated, are counted if the specified set-points are
40 deviated from while dangerous waste, mixed waste, and waste residues continue to
41 be processed in the HLW Vitrification System. A cascade event is counted at a
42 frequency of one (1) towards the first waste feed cut-off parameter, specified on
43 Permit Table III.10.J.F, from which the set-point is deviated:
- 44 A. The parameter(s) that deviated from the set-point(s) in Permit Table
45 III.10.J.F.
- 46 B. The magnitude, dates, and duration of the deviations.
- 47 C. Results of the investigation of the cause of the deviations.

- 1 D. Corrective measures taken to minimize future occurrences of the deviations.
- 2 **III.10.J.1.c.viii** If any portion of the HLW Vitrification System is bypassed while treating dangerous
3 and/or mixed waste, it will be regarded as non-compliance with the operating
4 conditions specified in Permit Condition III.10.J.1.c and the performance standards
5 specified in Permit Condition III.10.J.1.b. After such a bypass event, the Permittees
6 will perform the following actions:
- 7 A. Investigate the cause of the bypass event.
- 8 B. Take appropriate corrective measures to minimize future bypasses.
- 9 C. Record the investigation findings and corrective measures in the operating
10 record.
- 11 D. Submit a written report to Ecology within five (5) days of the bypass event
12 documenting the result of the investigation and corrective measures.
- 13 **III.10.J.1.c.ix** The Permittees will control fugitive emissions from the HLW Vitrification System by
14 maintaining the melter under negative pressure.
- 15 **III.10.J.1.c.x** Except during periods of HLW Vitrification System startup and shutdown,
16 compliance with the operating conditions specified in Permit Condition III.10.J.1.c
17 will be regarded as compliance with the required performance standards identified in
18 Permit Condition III.10.J.1.b. However, evidence that compliance with these
19 operating conditions is insufficient to ensure compliance with the performance
20 standards, will justify modification, revocation, or re-issuance of this Permit, in
21 accordance with Permit Conditions III.10.C.2.e and III.10.C.2.f, or III.10.C.2.g.
- 22 **III.10.J.1.d** Inspection Requirements [[WAC 173-303-680\(3\)](#)].
- 23 **III.10.J.1.d.i** The Permittees will inspect the HLW Vitrification System in accordance with the
24 Inspection Plan in Operating Unit Group 10, Chapter 6A of this Permit, as modified
25 in accordance with Permit Condition III.10.C.5.c.
- 26 **III.10.J.1.d.ii** The inspection data for HLW Vitrification System will be recorded, and the records
27 will be placed in the WTP Unit operating record for the HLW Vitrification System, in
28 accordance with Permit Condition III.10.C.4.
- 29 **III.10.J.1.d.iii** The Permittees will comply with the inspection requirements specified in Operating
30 Unit Group 10, Appendix 10.15 of this Permit, as approved pursuant to Permit
31 Condition III.10.J.5.f, and as modified by Permit Conditions III.10.J.1.b.xii,
32 III.10.J.2, III.10.J.3., and III.10.J.4.
- 33 **III.10.J.1.e** Monitoring Requirements [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#), [WAC 173-303-670\(7\)](#),
34 and [WAC 173-303-807\(2\)](#)], in accordance with [WAC 173-303-680\(3\)](#)
- 35 **III.10.J.1.e.i** Upon receipt of a written request from Ecology, the Permittees will perform sampling
36 and analysis of the dangerous and mixed waste and exhaust emissions to verify that
37 the operating requirements established in the Permit achieve the performance
38 standards delineated in this Permit.
- 39 **III.10.J.1.e.ii** The Permittees will comply with the monitoring requirements specified in Operating
40 Unit Group 10, Appendices 10.2, 10.3, 10.7, 10.13, 10.15, and 10.18 of this Permit,
41 as approved pursuant to Permit Conditions III.10.J.5.c, III.10.J.5.d, III.10.J.5.e, and
42 III.10.J.5.f, as modified by Permit Conditions III.10.J.1.b.xii, III.10.J.2, III.10.J.3,
43 and III.10.J.4.

- 1 **III.10.J.1.e.iii** The Permittees will operate, calibrate, and maintain the carbon monoxide CEMS as
2 specified in this Permit in accordance with Performance Specifications found in
3 [40 CFR Part 60](#), Appendix B, in accordance with Appendix to Subpart EEE of
4 [40 CFR Part 63](#), and Operating Unit Group 10 Appendix 10.15 of this Permit, as
5 approved pursuant to Permit Condition III.10.J.5.f, and as modified by Permit
6 Conditions III.10.J.1.b.xii, III.10.J.2, III.10.J.3, and III.10.J.4.
- 7 **III.10.J.1.e.iv** The Permittees will operate, calibrate, and maintain the instruments specified on
8 Permit Tables III.10.J.C and F, as approved/modified pursuant to Permit Condition
9 III.10.J.5, in accordance with Operating Unit Group 10, Appendix 10.15 of this
10 Permit, as approved pursuant to Permit Condition III.10.J.5.f, and as modified by
11 Permit Conditions III.10.J.1.b.xii, III.10.J.2, III.10.J.3, and III.10.J.4.
- 12 **III.10.J.1.f** Recordkeeping Requirements [[WAC 173-303-380](#) and [WAC 173-303-680\(3\)](#)]
- 13 **III.10.J.1.f.i** The Permittees will record and maintain in the WTP Unit operating record for the
14 HLW Vitrification System, all monitoring, calibration, maintenance, test data, and
15 inspection data compiled under the conditions of this Permit, in accordance with
16 Permit Conditions III.10.C.4 and III.10.C.5, as modified by Permit Conditions
17 III.10.J.1.b.xii, III.10.J.2, III.10.J.3, and III.10.J.4.
- 18 **III.10.J.1.f.ii** The Permittees will record in the WTP Unit operating record the date, time, and
19 duration of all automatic waste feed cut-offs and/or lockouts, including the triggering
20 parameters, reason for the deviation, and recurrence of the incident. The Permittees
21 will also record all incidents of AWFCO system function failures, including the
22 corrective measures taken to correct the condition that caused the failure.
- 23 **III.10.J.1.f.iii** The Permittees will submit to Ecology a report semi-annually the first calendar year,
24 and annually thereafter each calendar year within ninety (90) days following the end
25 of the year. The report will include the following information:
- 26 A. Total dangerous and mixed waste feed processing time for the HLW
27 Vitrification System.
 - 28 B. Date/Time of all HLW Vitrification System startups and shutdown.
 - 29 C. Date/Time/Duration/Cause/Corrective Action taken for all HLW Vitrification
30 System shutdowns caused by malfunction of either process or control
31 equipment.
 - 32 D. Date/Time/Duration/Cause/Corrective Action taken for all instances of
33 dangerous and/or mixed waste feed cut-off due to deviations from Permit
34 Table III.10.J.F, as approved/modified pursuant to Permit Condition
35 III.10.J.5.
- 36 **III.10.J.1.f.iv** The Permittees will submit an annual report to Ecology each calendar year within
37 ninety (90) days following the end of the year of all quarterly CEMS Calibration
38 Error and Annual CEMS Performance Specification Tests conducted in accordance
39 with Permit Condition III.10.J.1.e.iii.
- 40 **III.10.J.1.g** Closure
- 41 The Permittees will close the HLW Vitrification System in accordance with Operating
42 Unit Group 10, Addendum H of this Permit, as approved pursuant to Permit Condition
43 III.10.C.8.

- 1 **III.10.J.2** **Shakedown Period** [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#),
2 [WAC 173-303-670\(7\)](#), and [WAC 173-303-807\(2\)](#), in accordance with
3 [WAC 173-303-680\(2\)](#) and (3)].
- 4 **III.10.J.2.a** The shakedown period for the HLW Vitrification System will be conducted in accordance
5 with Permit Condition III.10.J.1, Operating Unit Group 10, Appendix 10.15 of this
6 Permit, as approved pursuant to Permit Condition III.10.J.5.f, and as modified in
7 accordance with Permit Conditions III.10.J.1.b.xii, III.10.J.2, and III.10.J.3.
- 8 **III.10.J.2.b** Duration of the Shakedown Period
- 9 **III.10.J.2.b.i** The shakedown period for the HLW Vitrification System will begin with the initial
10 introduction of dangerous waste in the HLW Vitrification System following
11 construction and will end with the start of the demonstration test.
- 12 **III.10.J.2.b.ii** The shakedown period will not exceed the following limits, as defined by hours of
13 operation, when the HLW Vitrification System is processing dangerous waste. The
14 Permittees may petition Ecology for one (1) extension of each shakedown phase for
15 seven hundred and twenty (720) additional operating hours in accordance with permit
16 modification procedures specified in Permit Conditions III.10.C.2.e and III.10.C.2.f.
- 17 Shakedown Phase 1: 720 hours
18 Shakedown Phase 2: 720 hours
- 19 **III.10.J.2.b.iii** Shakedown Phase 2 will not be commenced until documentation has been submitted
20 to Ecology verifying that the HLW Vitrification System has operated at a minimum
21 of 75% of the shakedown Phase 1 feed-rate limit for two (2) separate eight (8)
22 consecutive hour periods with no AWFCOs.
- 23 **III.10.J.2.c** Allowable Waste Feed during the Shakedown Period
- 24 **III.10.J.2.c.i** The Permittees may feed the dangerous waste specified for the HLW Vitrification
25 System on the Part A Forms (Operating Unit Group 10, Chapter 1 of this Permit),
26 except for those waste outside the waste acceptance criteria specified in the WAP,
27 Operating Unit Group 10, Chapter 3 of this Permit, as approved pursuant to Permit
28 Condition III.10.C.3, except Permit Conditions III.10.J.2.c.ii through v also apply.
- 29 **III.10.J.2.c.ii** The Permittees will not feed the following waste to the HLW Vitrification System
30 during Shakedown Phase 1:
- 31 A. Acutely toxic dangerous waste listed in [WAC 173-303-081\(a\)\(2\)\(a\)\(i\)](#).
32 B. Mixed waste.
- 33 **III.10.J.2.c.iii** The Permittees will not feed the following waste to the HLW Vitrification System
34 during Shakedown Phase 2:
- 35 A. Mixed waste.
- 36 **III.10.J.2.c.iv** The feed-rates to the HLW Vitrification System will not exceed the limits in Permit
37 Tables III.10.J.D and III.10.J.F, as approved/modified pursuant to Permit Condition
38 III.10.J.5.
- 39 **III.10.J.2.c.v** The Permittees will conduct sufficient analysis of the dangerous waste treated in the
40 HLW Vitrification System to verify that the waste feed is within the physical and
41 chemical composition limits specified in this Permit.

- 1 **III.10.J.3** **Demonstration Test Period** [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#),
2 [WAC 173-303-670\(7\)](#), and [WAC 173-303-807\(2\)](#), in accordance with
3 [WAC 173-303-680\(2\)](#) and (3)]
- 4 **III.10.J.3.a** Demonstration Test Period
- 5 **III.10.J.3.a.i** The Permittees will operate, monitor, and maintain the HLW Vitrification System as
6 specified in Permit Condition III.10.J.1, and Operating Unit Group 10,
7 Appendix 10.15 of this Permit, as approved pursuant to Permit Condition III.10.J.5.f,
8 except as modified in accordance with Permit Conditions III.10.J.1.b.xii and
9 III.10.J.3.
- 10 **III.10.J.3.a.ii** Operating Unit Group 10, Appendix 10.15 of this Permit, as approved pursuant to
11 Permit Condition III.10.J.5.f, will be re-submitted to Ecology for approval by the
12 Permittees as a permit modification pursuant to Permit Conditions III.10.C.2.e and
13 III.10.C.2.f at least one hundred and eighty (180) days prior to the start date of the
14 demonstration test. The revised Demonstration Test Plan will include applicable EPA
15 promulgated test methods and procedures in effect at the time of the re-submittal and
16 projected commencement and completion dates for the Demonstration Test.
- 17 **III.10.J.3.a.iii** The Permittees will not commence the demonstration test period until documentation
18 has been submitted to Ecology verifying that the HLW Vitrification System has
19 operated at a minimum of 75% of the demonstration test period feed-rate limit for a
20 minimum of an eight (8) consecutive hours period on two (2) consecutive days.
- 21 **III.10.J.3.b** Performance Standards
- 22 The Permittees will demonstrate compliance with the performance standards specified in
23 Permit Condition III.10.J.1.b during the Demonstration Test Period.
- 24 **III.10.J.3.c** Allowable Waste Feed during the Demonstration Test Period
- 25 **III.10.J.3.c.i** The Permittees may feed the dangerous waste specified for the HLW Vitrification
26 System in Part A Forms (Operating Unit Group 10, Chapter 1 of this Permit), except
27 for those waste outside the waste acceptance criteria specified in the WAP, Operating
28 Unit Group 10, Chapter 3 of this Permit, as approved pursuant to Permit Condition
29 III.10.C.3, except Permit Conditions III.10.J.3.c.ii through iv also apply.
- 30 **III.10.J.3.c.ii** The Permittees will not feed mixed waste to the HLW Vitrification System.
- 31 **III.10.J.3.c.iv.** The dangerous waste feed-rates to the HLW Vitrification System will not exceed the
32 limits in Permit Tables III.10.J.D and F, as approved/modified pursuant to Permit
33 Condition III.10.J.5.
- 34 **III.10.J.3.c.v.** The Permittees will conduct sufficient analysis of the dangerous waste treated in the
35 HLW Vitrification System to verify that the dangerous waste is within the physical and
36 chemical composition limits specified in this Permit.
- 37 **III.10.J.3.d** Demonstration Data Submissions and Certifications
- 38 **III.10.J.3.d.i** The Permittees will submit to Ecology a complete demonstration test report within
39 one hundred and eighty (180) calendar days of completion of the Demonstration Test
40 including all data collected during the Demonstration Test and updated Permit Tables
41 III.10.K.D, III.10.K.E, and III.10.K.F.
- 42 **III.10.J.3.d.ii** The Permittees must submit the following information to Ecology prior to receiving
43 Ecology's approval to commence feed of dangerous waste and mixed waste to the
44 HLW Vitrification System:

- 1 A. The Permittees will submit a summary of data collected as required during
 2 the Demonstration Test to Ecology upon completion of the Demonstration
 3 Test.
 4 B. A certification that the Demonstration Test has been carried out in
 5 accordance with the approved Demonstration Test Plan and approved
 6 modifications within thirty (30) days of the completion of the Demonstration
 7 Test [[WAC 173-303-807\(8\)](#)].
 8 C. Calculations and analytical data showing compliance with the performance
 9 standards specified in Permit Conditions III.10.J.1.b.i, III.10.J.1.b.iv,
 10 III.10.J.1.b.v, III.10.J.1.b.vi, and III.10.J.1.b.vii.
 11 D. Laboratory data QA/QC summary for the information provided in
 12 III.10.J.3.d.ii.C.

13 **III.10.J.3.d.iii** After successful completion of the Demonstration Test and receipt of Ecology's
 14 approval, the Permittees will be authorized to commence feed of dangerous waste
 15 and mixed waste to the HLW Vitrification System for the post-demonstration test
 16 period indicated in Permit Tables III.10.J.D and F, as approved/modified pursuant to
 17 Permit Condition III.10.J.5, in compliance with the operating requirements specified
 18 in Permit Condition III.10.J.1.c and within the limitations specified in Permit
 19 Condition III.10.C.14.

20 **III.10.J.3.d.iv** RESERVED

21 **III.10.J.3.d.v** After successful completion of the Demonstration Test, Permittees submittal of the
 22 following to Ecology, and Permittees receipt of Ecology approval of the following in
 23 writing, the Permittees will be authorized to feed dangerous waste and mixed waste
 24 to the HLW Vitrification System pursuant to Permit Section III.10.K.

- 25 A. A complete Demonstration Test Report for the HLW Vitrification System and
 26 updated Permit Tables III.10.K.D, III.10.K.E, and III.10.K.F, as
 27 approved/modified pursuant to Permit Conditions III.10.J.5 and III.10.C.11.c
 28 or III.10.C.11.d, the test report will be certified in accordance with
 29 [WAC 173-303-807\(8\)](#), in accordance with [WAC 173-303-680\(2\)](#) and (3).
 30 B. A Final Risk Assessment Report completed pursuant to Permit Conditions
 31 III.10.C.11.c or III.10.C.11.d.

32 **III.10.J.3.d.vi** If any calculations or testing results show that one or more of the performance
 33 standards listed in Permit Condition III.10.J.1.b, with the exception of Permit
 34 Condition III.10.J.1.b.x, for the HLW Vitrification System were not met during the
 35 Demonstration Test, the Permittees will perform the following actions:

- 36 A. Immediately stop dangerous and mixed waste feed to the HLW Vitrification
 37 System under the mode of operation that resulted in not meeting the
 38 performance standard(s).
 39 B. Verbally notify Ecology within twenty-four (24) hours of discovery of not
 40 meeting the performance standard(s) as specified in Permit Condition I.E.21.
 41 C. Investigate the cause of the failure and submit a report of the investigation
 42 findings to Ecology within fifteen (15) days of discovery of not meeting the
 43 performance standard(s).
 44 D. Submit to Ecology within fifteen (15) days of discovery of not meeting the
 45 performance standard(s), documentation supporting a mode of operation
 46 where all performance standards listed in Permit Condition III.10.J.1.b, with

1 the exception of Permit Condition III.10.J.1.b.x, for the HLW Vitrification
 2 System were met during the demonstration test, if any such mode was
 3 demonstrated.

- 4 E. Based on the information provided to Ecology by the Permittees, pursuant to
 5 Permit Conditions III.10.J.3.d.vi.A through D above, and any additional
 6 information, Ecology may provide, in writing, direction to the Permittees to
 7 stop dangerous and/or mixed waste feed to the LAW Vitrification System
 8 and/or amend the mode of operation the Permittees are allowed to continue
 9 operations prior to Ecology approval of a compliance schedule and/or revised
 10 Demonstration Test Plan, pursuant to Permit Conditions III.10.J.3.d.vi.F
 11 and G.
- 12 F. If the performance standard listed in Permit Condition III.10.J.1.b.i was not
 13 met during the Demonstration Test, the Permittees will submit within one
 14 hundred and twenty (120) days of discovery of not meeting the performance
 15 standard, a revised Demonstration Test Plan (if appropriate) and a
 16 compliance schedule for Ecology approval to address this deficiency. If a
 17 revised Demonstration Test Plan is submitted, it will be accompanied by a
 18 request for approval to retest as a permit modification pursuant to Permit
 19 Conditions III.10.C.2.e and III.10.C.2.f. The revised Demonstration Test
 20 Plan (if submitted) must include substantive changes to prevent failure from
 21 reoccurring.
- 22 G. If any of the performance standards listed in Permit Condition III.10.J.1.b,
 23 with the exception of Permit Conditions III.10.J.1.b.i or III.10.J.1.b.x, were
 24 not met during the Demonstration Test, the Permittees will submit to Ecology
 25 within one hundred and twenty (120) days of discovery of not meeting the
 26 performance standard(s), a revised Demonstration Test Plan requesting
 27 approval to retest as a permit modification pursuant to Permit Conditions
 28 III.10.C.2.e and III.10.C.2.f. The revised Demonstration Test Plan must
 29 include substantive changes to prevent failure from reoccurring.

30 **III.10.J.3.d.vii** If any calculations or testing results show that any emission rate for any constituent
 31 listed in Permit Table III.10.J.E, as approved pursuant to Permit Condition
 32 III.10.C.11.b, is exceeded for HLW Vitrification System during the Demonstration
 33 Test, the Permittees will perform the following actions:

- 34 A. Verbally notify Ecology within twenty-four (24) hours of the discovery of
 35 exceeding the emission rate(s) as specified in Permit Condition I.E.21.
- 36 B. Submit to Ecology additional risk information to indicate that the increased
 37 emissions impact is offset by decreased emission impact from one or more
 38 constituents expected to be emitted at the same time, and/or investigate the
 39 cause and impact of the exceedance of the emission rate(s) and submit a
 40 report of the investigation findings to Ecology within fifteen (15) days of the
 41 discovery of exceeding the emission rate(s).
- 42 C. Based on the notification and any additional information, Ecology may
 43 provide, in writing, direction to the Permittees to stop dangerous and/or
 44 mixed waste feed to the HLW Vitrification System and/or to submit a revised
 45 Demonstration Test Plan as a permit modification pursuant to Permit
 46 Conditions III.10.C.2.e and III.10.C.2.f, or III.10.C.2.g. The revised
 47 Demonstration Test Plan must include substantive changes to prevent failure
 48 from reoccurring.

- 1 **III.10.J.4 Post-Demonstration Test Period [WAC 173-303-670(5), WAC 173-303-670(6),**
2 **and WAC 173-303-807(2), in accordance with WAC 173-303-680(2) and (3)].**
- 3 **III.10.J.4.a** The Permittees will operate, monitor, and maintain the HLW Vitrification System as
4 specified in Permit Condition III.10.J.1 and Operating Unit Group 10, Appendix 10.15 of
5 this Permit, as approved pursuant to Permit Condition III.10.J.5, except as modified in
6 accordance with Permit Conditions III.10.J.1.b.xii, III.10.J.3, and III.10.J.4.
- 7 **III.10.J.4.b** Allowable Waste Feed during the Post-Demonstration Test Period
- 8 **III.10.J.4.b.i** The Permittees may feed the dangerous and/or mixed waste specified for the HLW
9 Vitrification System on the Part A Forms (Operating Unit Group 10, Chapter 1 of this
10 Permit), except for those waste outside the waste acceptance criteria specified in the
11 WAP, Operating Unit Group 10, Chapter 3 of this Permit, as approved pursuant to
12 Permit Condition III.10.C.3, and except Permit Conditions III.10.J.4.b.ii and
13 III.10.J.4.b.iii also apply.
- 14 **III.10.J.4.b.ii** The dangerous waste and mixed waste feed rates to the HLW Vitrification System
15 will not exceed the limits in Permit Tables III.10.J.D and F, as approved/modified
16 pursuant to Permit Condition III.10.J.5, or in Permit Condition III.10.J.3.
- 17 **III.10.J.4.b.iii** The Permittees will conduct sufficient analysis of the dangerous waste and mixed
18 waste treated in HLW Vitrification System to verify that the waste feed is within the
19 physical and chemical composition limits specified in this Permit.
- 20 **III.10.J.5 Compliance Schedules**
- 21 **III.10.J.5.a** All information identified for submittal to Ecology in a. through f. of this compliance
22 schedule must be signed and certified in accordance with requirements in [WAC 173-303-](#)
23 [810\(12\)](#), as modified in accordance with Permit Condition III.10.J.1.a.iii [[WAC 173-303-](#)
24 [806\(4\)](#)].
- 25 **III.10.J.5.b** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
26 construction of each secondary containment and leak detection system for the HLW
27 Vitrification System (per level) as identified in Permit Tables III.10.J.A and III.10.J.B,
28 engineering information as specified below, for incorporation into Operating Unit
29 Group 10, Appendices 10.2, 10.4, 10.5, 10.7, 10.8, 10.9, 10.11, and 10.12 of this Permit.
30 At a minimum, engineering information specified below will show the following as
31 described in [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#) (the information
32 specified below will include dimensioned engineering drawings and information on
33 sumps and floor drains):
- 34 **III.10.J.5.b.i** IQRPE Reports (specific to foundation, secondary containment, and leak detection
35 system) will include review of design drawings, calculations, and other information
36 on which the certification report is based and will include, but not limited to, review
37 of such information described below. Information (drawings, specifications, etc.)
38 already included in Operating Unit Group 10, Appendix 10.0 of this Permit, may be
39 included in the report by reference and should include drawing and document
40 numbers. IQRPE Reports will be consistent with the information separately provided
41 in ii through ix below [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-](#)
42 [680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 43 **III.10.J.5.b.ii** Design drawings (General Arrangement Drawings, plan) and specifications for the
44 foundation, secondary containment including liner installation details, and leak
45 detection methodology. These items should show the dimensions, volume
46 calculations, and location of the secondary containment system, and should include

- 1 items such as floor/pipe slopes to sumps, tanks, floor drains [[WAC 173-303-](#)
2 [640\(4\)\(b\)](#) through (f) and [WAC 173-303-640\(3\)\(a\)](#), in accordance with
3 [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 4 **III.10.J.5.b.iii** The Permittees will provide the design criteria (references to codes and standards,
5 load definitions, and load combinations, materials of construction, and
6 analysis/design methodology) and typical design details for the support of the
7 secondary containment system. This information will demonstrate the foundation
8 will be capable of providing support to the secondary containment system, resistance
9 to pressure gradients above and below the system, and capable of preventing failure
10 due to settlement, compression, or uplift [[WAC 173-303-640\(4\)\(c\)\(ii\)](#), in accordance
11 with [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 12 **III.10.J.5.b.iv** A description of materials and equipment used to provide corrosion protection for
13 external metal components in contact with soil, including factors affecting the
14 potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#), in accordance with
15 [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 16 **III.10.J.5.b.v** Secondary containment/foundation, and leak detection system, materials selection
17 documentation (including, but not limited to, concrete coatings and water stops, and
18 liner materials), as applicable [[WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 19 **III.10.J.5.b.vi** Detailed description of how the secondary containment for the HLW Vitrification
20 System will be installed in compliance with [WAC 173-303-640\(3\)\(c\)](#), in accordance
21 with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B);
- 22 **III.10.J.5.b.vii** Submit Permit Tables III.10.J.B and III.10.K.B completed to provide for all
23 secondary containment sumps and floor drains the information, as specified in each
24 column heading consistent with information to be provided in i through vi, above;
- 25 **III.10.J.5.b.viii** Documentation that secondary containment and leak detection systems will not
26 accumulate hydrogen gas levels above the lower explosive limit for incorporation
27 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#),
28 and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 29 **III.10.J.5.b.ix** A detailed description of how HLW Vitrification System design provides access for
30 conducting future HLW Vitrification System integrity assessments [[WAC 173-303-](#)
31 [640\(3\)\(b\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)].
- 32 **III.10.J.5.c** The Permittees will submit to Ecology pursuant to Permit Condition III.10.C.9.f, prior to
33 installation of each sub-system as identified in Permit Table III.10.J.A, engineering
34 information as specified below, for incorporation into Operating Unit Group 10,
35 Appendices 10.1 through 10.14 and 10.17 of this Permit. At a minimum, engineering
36 information specified below will show the following, as required pursuant to
37 [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#) (the information specified
38 below will include dimensioned engineering drawings):
- 39 **III.10.J.5.c.i** IQRPE Reports (specific to sub-system) will include review of design drawings,
40 calculations, and other information on which the certification report is based and will
41 include as applicable, but not limited to, review of such information described below.
42 Information (drawings, specifications, etc.) already included in Operating Unit
43 Group 10, Appendix 10.0 of this Permit, may be included in the report by reference
44 and should include drawing and document numbers. The IQRPE Reports will be
45 consistent with the information separately provided in ii. through xii. below and the

- 1 IQRPE Report specified in Permit Condition III.10.J.5.b [[WAC 173-303-640](#)(3)(a), in
2 accordance with [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)];
- 3 **III.10.J.5.c.ii** Design drawings [General Arrangement Drawings in plan, Process Flow Diagrams,
4 Piping and Instrumentation Diagrams, (including pressure control systems),
5 Mechanical Drawings, and specifications, and other information specific to
6 subsystems (to show location and physical attributes of each subsystem specific to
7 miscellaneous units)] [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-
8 680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)];
- 9 **III.10.J.5.c.iii** Sub-system design criteria (references to codes and, standards, load definitions, and
10 load combinations, materials of construction, and analysis/design methodology) and
11 typical design details to support the sub-systems. Structural support calculations
12 specific to off-specification, non-standard, and field-fabricated subsystems will be
13 submitted for incorporation into the Administrative Record. Documentation will
14 include, but not be limited to, supporting specifications (test data, treatment
15 effectiveness report, etc.), supporting projected operational capability (e.g., WESP
16 projected removal efficiency for individual metals, halogens, particulates, etc.), and
17 compliance with performance standards specified in Permit Condition III.10.J.1.b
18 [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
19 [WAC 173-303-806](#)(4)(i)(i)(B)];
- 20 **III.10.J.5.c.iv** A description of materials and equipment used to provide corrosion protection for
21 external metal components in contact with water, including factors affecting the
22 potential for corrosion [[WAC 173-303-640](#)(3)(a)(iii)(B), in accordance with
23 [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)(A) through (B)];
- 24 **III.10.J.5.c.v** Sub-system materials selection documentation (e.g., physical and chemical
25 tolerances) [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
26 [WAC 173-303-806](#)(4)(i)(i)(A)];
- 27 **III.10.J.5.c.vi** Sub-system vendor information (including, but not limited to, required performance
28 warranties, as available), consistent with information submitted under ii. above, will
29 be submitted for incorporation into the Administrative Record [WAC 173-303-
30 640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2), [WAC 173-303-806](#)(4)(i)(i)(A)
31 through (B), and [WAC 173-303-806](#)(4)(i)(v)];
- 32 **III.10.J.5.c.vii** System descriptions related to sub-system units will be submitted for incorporation
33 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806](#)(4)(i)(i)(A)
34 through (B), and [WAC 173-303-806](#)(4)(i)(v)];
- 35 **III.10.J.5.c.viii** Mass and energy balance for normal projected operating conditions used in
36 developing the Piping and Instrumentation Diagrams and Process Flow Diagrams,
37 including assumptions and formulas used to complete the mass and energy balance,
38 so that they can be independently verified for incorporation into the Administrative
39 Record [[WAC 173-303-680](#)(2), [WAC 173-303-806](#)(4)(i)(i)(B), and [WAC 173-303-
40 806](#)(4)(i)(v)];
- 41 **III.10.J.5.c.ix** Detailed description of all potential HLW Vitrification System bypass events
42 including:
- 43 A. A report which includes an analysis of credible potential bypass events and
44 recommendations for prevention/minimization of the potential, impact, and
45 frequency of the bypass event to include at a minimum:
- 46 1. Operating procedures

- 1 2. Maintenance procedures
 - 2 3. Redundant equipment
 - 3 4. Redundant instrumentation
 - 4 5. Alternate equipment
 - 5 6. Alternate materials of construction
- 6 **III.10.J.5.c.x** A detailed description of how the sub-systems will be installed in compliance with
7 [WAC 173-303-640](#)(3)(b), (c), (d), and (e), in accordance with [WAC 173-303-680](#) and
8 [WAC 173-303-806](#)(4)(i)(i)(B);
- 9 **III.10.J.5.c.xi** Sub-system design to prevent escape of vapors and emissions of acutely or
10 chronically toxic (upon inhalation) EHW, for incorporation into the Administrative
11 Record [[WAC 173-303-640](#)(5)(e), in accordance with [WAC 173-303-680](#)(2), and
12 [WAC 173-303-806](#)(4)(i)(i)(B)];
- 13 **III.10.J.5.c.xii** Documentation that sub-systems are designed to prevent the accumulation of
14 hydrogen gases levels above the lower explosive limit for incorporation into the
15 Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806](#)(4)(i)(i)(A), and
16 [WAC 173-303-806](#)(4)(i)(v)];
- 17 **III.10.J.5.d** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
18 installation of equipment for each sub-system as identified in Permit Tables III.10.J.A and
19 III.10.J.B, not addressed in Permit Conditions III.10.J.5.b or III.10.J.5.c, engineering
20 information as specified below, for incorporation into Operating Unit Group 10,
21 Appendices 10.1 through 10.14 of this Permit. At a minimum, engineering information
22 specified below will show the following as required pursuant to in [WAC 173-303-640](#), in
23 accordance with [WAC 173-303-680](#) (the information specified below will include
24 dimensioned engineering drawings):
- 25 **III.10.J.5.d.i** IQRPE Reports (specific to sub-system equipment) will include a review of design
26 drawings, calculations, and other information as applicable on which the certification
27 report is based. The reports will include, but not be limited to, review of such
28 information described below. Information (drawings, specifications, etc.) already
29 included in Operating Unit Group 10, Appendix 10.0 of this Permit, may be included
30 in the report by reference and should include drawing and document numbers. The
31 IQRPE Reports will be consistent with the information provided separately in ii.
32 through xiii. below and the IQRPE Reports specified in Permit Conditions
33 III.10.J.5.b and III.10.J.5.c [[WAC 173-303-640](#)(3)(a), in accordance with
34 [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(I)(I)(A) through (B)];
- 35 **III.10.J.5.d.ii** Design drawings [Process Flow Diagrams, Piping and Instrumentation Diagrams
36 (including pressure control systems), and specifications, and other information
37 specific to equipment (these drawings should include all equipment such as pipes,
38 valves, fittings, pumps, instruments, etc.)] [[WAC 173-303-640](#)(3)(a), in accordance
39 with [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)(A) through (B)];
- 40 **III.10.J.5.d.iii** Sub-system equipment design criteria (references to codes and standards, load
41 definitions and load combinations, materials of construction, and analysis/design
42 methodology) and typical design details for the support of the sub-system equipment.
43 [[WAC 173-303-640](#)(3)(a) and [WAC 173-303-640](#)(3)(f), in accordance with
44 [WAC 173-303-680](#) and [WAC 173-303-806](#)(4)(i)(i)(B)];

- 1 **III.10.J.5.d.iv** A description of materials and equipment used to provide corrosion protection for
2 external metal components in contact with soil and water, including factors affecting
3 the potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#)], in accordance with
4 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 5 **III.10.J.5.d.v** Materials selection documentation for equipment for each sub-system (e.g., physical
6 and chemical tolerances) [[WAC 173-303-640\(3\)\(a\)](#)], in accordance with
7 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 8 **III.10.J.5.d.vi** Vendor information (including, but not limited to, required performance warranties,
9 as available), consistent with information submitted under ii. above, for sub-system
10 equipment will be submitted for incorporation into the Administrative Record
11 [[WAC 173-303-640\(3\)\(a\)](#)], in accordance with [WAC 173-303-680\(2\)](#), [WAC 173-303-](#)
12 [806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(iv\)](#)];
- 13 **III.10.J.5.d.vii** Sub-system, sub-system equipment, and leak detection system instrument control
14 logic narrative description (e.g., descriptions of fail-safe conditions, etc.)
15 [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-](#)
16 [806\(4\)\(i\)\(v\)](#)];
- 17 **III.10.J.5.d.viii** System description related to sub-system equipment, and system descriptions related
18 to leak detection systems, for incorporation into the Administrative Record
19 [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-](#)
20 [806\(4\)\(i\)\(v\)](#)];
- 21 **III.10.J.5.d.ix** A detailed description of how the sub-system equipment will be installed and tested
22 [[WAC 173-303-640\(3\)\(c\)](#) through (e) and [WAC 173-303-640\(4\)\(b\)](#) and (c), in
23 accordance with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 24 **III.10.J.5.d.x** For process monitoring, control, and leak detection system instrumentation for the
25 HLW Vitrification System as identified in Permit Tables III.10.J.C and III.10.J.F, a
26 detailed description of how the process monitoring, control, and leak detection
27 system instrumentation will be installed and tested [[WAC 173-303-640\(3\)\(c\)](#) through
28 (e), [WAC 173-303-640\(4\)\(b\)](#) and (c), [WAC 173-303-806\(4\)\(c\)\(vi\)](#), and
29 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 30 **III.10.J.5.d.xi** Mass and energy balance for projected normal operating conditions used in
31 developing the Piping and Instrumentation Diagrams and Process Flow Diagrams,
32 including assumptions and formulas used to complete the mass and energy balance,
33 so that they can be independently verified, for incorporation into the Administrative
34 Record [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-](#)
35 [806\(4\)\(i\)\(v\)](#)];
- 36 **III.10.J.5.d.xii** Documentation that sub-systems equipment are designed to prevent the accumulation
37 of hydrogen gas levels above the lower explosive limit into the Administrative
38 Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#), and [WAC 173-303-](#)
39 [806\(4\)\(i\)\(v\)](#)] [[WAC 173-303-815\(2\)\(b\)\(ii\)](#)];
- 40 **III.10.J.5.d.xiii** Leak Detection system documentation (e.g. vendor information etc.) consistent with
41 information submitted under Permit Condition III.10.J.5.c.ii and Permit Conditions
42 III.10.J.5.d.ii, vii, viii, and x above, will be submitted for incorporation into the
43 Administrative Record.
- 44 **III.10.J.5.e** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
45 will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, the following as
46 specified below for incorporation into Operating Unit Group 10, Appendix 10.18 of this

1 Permit, except Permit Condition III.10.J.5.e.i, which will be incorporated into Operating
2 Unit Group 10, Addendum E of this Permit. All information provided under this permit
3 condition must be consistent with information provided pursuant to Permit Conditions
4 III.10.J.5.b, c, d, e, and f, III.10.C.3.e.v, and III.10.C.11.b, as approved by Ecology:

- 5 **III.10.J.5.e.i** Integrity assessment program and schedule for the HLW Vitrification System will
6 address the conducting of periodic integrity assessments on the HLW Vitrification
7 System over the life of the system, as specified in Permit Condition III.10.J.5.b.ix and
8 as specified in [WAC 173-303-640\(3\)\(b\)](#), in accordance with [WAC 173-303-680](#), and
9 descriptions of procedures for addressing problems detected during integrity
10 assessments. The schedule must be based on past integrity assessments, age of the
11 system, materials of construction, characteristics of the waste, and any other relevant
12 factors [[WAC 173-303-640\(3\)\(b\)](#), in accordance with [WAC 173-303-680](#) and
13 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 14 **III.10.J.5.e.ii** Detailed plans and descriptions, demonstrating the leak detection system is operated
15 so that it will detect the failure of either the primary or secondary containment
16 structure or the presence of any release of dangerous and/or mixed waste or
17 accumulated liquid in the secondary containment system within twenty-four (24)
18 hours [[WAC 173-303-640\(4\)\(c\)\(iii\)](#)]. Detection of a leak of at least 0.1 gallons per
19 hour within twenty-four (24) hours is defined as being able to detect a leak within
20 twenty-four (24) hours. Any exceptions to this criteria must be approved by Ecology
21 in accordance with [WAC 173-303-680](#), [WAC 173-303-640\(4\)\(c\)\(iii\)](#), and
22 [WAC 173-303-806\(4\)\(i\)\(i\)\(b\)](#);
- 23 **III.10.J.5.e.iii** Detailed operational plans and descriptions, demonstrating that spilled or leaked
24 waste and accumulated precipitation liquids can be removed from the secondary
25 containment system within twenty-four (24) hours [[WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 26 **III.10.J.5.e.iv** Descriptions of operational procedures demonstrating appropriate controls and
27 practices are in place to prevent spills and overflows from the HLW Vitrification
28 System or containment systems in compliance with [WAC 173-303-640\(5\)\(b\)\(i\)](#)
29 through (iii), in accordance with [WAC 173-303-680](#) and [WAC 173-303-](#)
30 [806\(4\)\(i\)\(i\)\(B\)](#);
- 31 **III.10.J.5.e.v** Description of procedures for investigation and repair of the HLW Vitrification
32 System [[WAC 173-303-640\(6\)](#) and [WAC 173-303-640\(7\)\(e\)](#) and (f), in accordance
33 with [WAC 173-303-680](#), [WAC 173-303-320](#), [WAC 173-303-806\(4\)\(ia\)\(iv\)](#), and
34 [WAC 173-303-806\(4\)\(a\)\(ii\)\(B\)](#)];
- 35 **III.10.J.5.e.vi** Updated Chapter 4, Narrative Description, Tables and Figures as identified in Permit
36 Tables III.10.J.A and III.10.J.B, as modified pursuant to Permit Condition
37 III.10.H.5.e.x and updated to identify routinely non-accessible LAW Vitrification
38 sub-systems.
- 39 **III.10.J.5.e.vii** Description of procedures for management of ignitable and reactive, and
40 incompatible dangerous and/or mixed waste as specified in accordance with
41 [WAC 173-303-640\(9\)](#) and (10), in accordance with [WAC 173-303-680](#) and
42 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#).
- 43 **III.10.J.5.e.viii** A description of the tracking system used to track dangerous and/or mixed waste
44 generated throughout the HLW Vitrification System, pursuant to [WAC 173-303-380](#).

- 1 **III.10.J.5.e.ix** Permit Table III.10.J.C and III.10.K.C will be revised and/or completed for HLW
 2 Vitrification System process and leak detection system monitors and instruments
 3 (to include, but not be limited to: instruments and monitors measuring and/or
 4 controlling flow, pressure, temperature, density, pH, level, humidity, and emissions)
 5 to provide the information as specified in each column heading. Process and leak
 6 detection system monitors and instruments for critical systems, as specified in
 7 Operating Unit Group 10, Appendix 2.0 and as updated pursuant to Permit Condition
 8 III.10.C.9.b and for operating parameters as required to comply with Permit
 9 Condition III.10.C.3.e.iii, will be addressed. Process monitors and instruments for
 10 non-waste management operations (e.g., utilities, raw chemical storage, non-contact
 11 cooling waters, etc.) are excluded from this permit condition [[WAC 173-303-680](#),
 12 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 13 **III.10.J.5.e.x** Permit Tables III.10.J.A and III.10.K.A amended as follows [[WAC 173-303-680](#) and
 14 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)]:
- 15 A. Under column 1, update and complete list of dangerous and mixed waste
 16 HLW Vitrification System sub-systems, including plant items that comprise
 17 each system (listed by item number).
 - 18 B. Under column 2, update and complete system designations.
 - 19 C. Under column 3, replace the ‘Reserved’ with Operating Unit Group 10,
 20 Appendix 10.0 sub-sections (e.g., 10.1, 10.2, etc.) designated in Permit
 21 Conditions III.10.J.5.b, c, and d specific to HLW Vitrification System
 22 sub-system, as listed in column 1.
 - 23 D. Under column 4, update and complete list of narrative description, tables,
 24 and figures.
- 25 **III.10.J.5.f** One hundred and eighty (180) days prior to initial receipt of dangerous and/or mixed
 26 waste in the WTP Unit, the Permittees will submit for review and receive approval for
 27 incorporation into Operating Unit Group 10, Appendix 10.15 of this Permit, a
 28 Demonstration Test Plan for the HLW Vitrification System to demonstrate that the HLW
 29 Vitrification Systems meets the performance standards specified in Permit Condition
 30 III.10.J.1.b. In order to incorporate the Demonstration Test Plan for the HLW
 31 Vitrification System into Operating Unit Group 10, Appendix 10.15, Permit Condition
 32 III.10.C.2.g process will be followed. The Demonstration Test Plan will include, but not
 33 be limited to, the following information. The Demonstration Test Plan will also be
 34 consistent with the information provided pursuant to Permit Conditions III.10.J.5.b, c, d
 35 and e, III.10.C.3.e.v and III.10.C.11.b, as approved by Ecology and consistent with the
 36 schedule described in Operating Unit Group 10, Appendix 1.0 of this Permit. The
 37 documentation required pursuant to Permit Condition III.10.J.5.f.xvi, in addition to being
 38 incorporated into Operating Unit Group 10, Appendix 10.15, will be incorporated by
 39 reference in Operating Unit Group 10, Addendum E of this Permit.
- 40 Notes: (1) The following should be consulted to prepare this Demonstration Test Plan:
 41 “*Guidance on Setting Permit Conditions and Reporting Trial Burn Results Volume II of*
 42 *the Hazardous Waste Incineration Guidance Series,*” and EPA/625/6-89/019 and “*Risk*
 43 *Burn Guidance For Hazardous Waste Combustion Facilities,*” EPA-R-01-001, July 2001,
 44 [WAC 173-303-807\(2\)](#), [WAC 173-303-670\(5\)](#), [WAC-173-303-670\(6\)](#),
 45 [40 CFR §63.1207\(f\)\(2\)](#), [40 CFR §63.1209](#) and Appendix to [40 CFR Part 63 EEE](#).
- 46 (2) Cross-referencing to the information provided pursuant to permit Conditions
 47 III.H.5.b, c, d, e and III.10.C.3.e.v, as approved by Ecology, that are redundant to
 48 elements of the Demonstration Test Plan for the HLW Vitrification System is acceptable.

- 1 **III.10.J.5.f.i** Analysis of each feed-stream to be fed during the demonstration test, including
 2 dangerous waste, glass formers and reductants, process streams (e.g., control air,
 3 process air, steam, sparge bubbler air, air in-leakage from melter cave, and gases from
 4 HLW Vitrification Vessel Ventilation System, process water, etc.) that includes:
- 5 A. Levels of ash, levels of metals, total chlorine (organic and inorganic), other
 6 halogens and radionuclide surrogates.
 - 7 B. Description of the physical form of the feed-streams;
 - 8 C. An identification and quantification of organics that are present in the feed-
 9 stream, including constituents proposed for DRE demonstration;
- 10 A comparison of the proposed demonstration test feed streams to the mixed waste
 11 feed envelopes to be processed in the melter must be provided that documents that
 12 the proposed demonstration test feed streams will serve as worst case surrogates for
 13 organic destruction, formation of products of incomplete oxidation, and metals, total
 14 chlorine (organic and inorganic), other halogens, particulate formation, and
 15 radionuclides;
- 16 **III.10.J.5.f.ii** Specification of trial PODCs for which destruction and removal efficiencies are
 17 proposed to be calculated during the demonstration test and for inclusion in Permit
 18 Conditions III.10.J.1.b.i and III.10.K.1.b.i. These trial PODCs will be specified
 19 based on destructibility, concentration or mass in the waste and the dangerous waste
 20 constituents or constituents in [WAC 173-303-9905](#);
- 21 **III.10.J.5.f.iii** A description of the blending procedures, prior to introducing the feed-streams into
 22 the melter, including analysis of the materials prior to blending, and blending ratios;
- 23 **III.10.J.5.f.iv** A description of how the surrogate feeds are to be introduced for the demonstration.
 24 This description should clearly identify the differences and justify how any of
 25 differences would impact the surrogate feed introduction as representative of how
 26 mixed waste feeds will be introduced;
- 27 **III.10.J.5.f.v** A detailed engineering description of the HLW Vitrification System, including:
- 28 A. Manufacturer's name and model number for each sub-system.
 - 29 B. Design capacity of each sub-system including documentation (engineering
 30 calculations, manufacturer/vendor specifications, operating data, etc.)
 31 supporting projected operational efficiencies (e.g., WESP projected removal
 32 efficiency for individual metals, halogens, particulates, etc.) and compliance
 33 with performance standards specified in Permit Condition III.10.J.1.b.
 - 34 C. Detailed scaled engineering drawings, including Process Flow Diagrams,
 35 Piping and Instrumentation Diagrams, Vessel Drawings (plan, and elevation
 36 with cross sections) and General Arrangement Drawings.
 - 37 D. Process Engineering Descriptions.
 - 38 E. Mass and energy balances for each projected operating condition and each
 39 demonstration test condition, including assumptions and formulas used to
 40 complete mass and energy balances so that they can be independently
 41 verified for incorporation into the Administrative Record.
 - 42 F. Engineering Specifications/data sheets (materials of construction, physical
 43 and chemical tolerances of equipment, equipment performance warranties,
 44 and fan curves).

- 1 G. Detailed Description of Automatic Waste Feed Cut-off System addressing
- 2 critical operating parameters for all performance standards specified in
- 3 Permit Condition III.10.J.1.b.
- 4 H. Documentation to support compliance with performance standards specified
- 5 in Permit Condition III.10.J.1.b, including engineering calculations, test data,
- 6 and manufacturer/vendor’s warranties, etc.
- 7 I. Detailed description of the design, operation and maintenance practices for
- 8 air pollution control system.
- 9 J. Detailed description of the design, operation, and maintenance practices of
- 10 any stack gas monitoring and pollution control monitoring system.

11 **III.10.J.5.f.vi** Detailed description of sampling and monitoring procedures including sampling and
 12 monitoring locations in the system, the equipment to be used, sampling and
 13 monitoring frequency, and planned analytical procedures for sample analysis
 14 including, but not limited to:

- 15 A. A short summary narrative description of each stack sample method should
- 16 be included within the main body of the demonstration test plan, which
- 17 references an appendix to the plan that would include for each sampling
- 18 train: (1) detailed sample method procedures, (2) sampling train
- 19 configuration schematic, (3) sampling recovery flow sheet, (4) detailed
- 20 analytical method procedures, and (5) sampling preparation and analysis
- 21 flow sheet. The detailed procedures should clearly flag where the method
- 22 has provided decision points (e.g., choices of equipment materials of
- 23 construction, choices of clean-up procedures or whether additional clean-up
- 24 procedures will be incorporated, whether pretest surveys or laboratory
- 25 validation work will be performed, enhancements to train to accommodate
- 26 high moisture content in stack gas, etc.) and what is being proposed along
- 27 with the basis for the decision.
- 28 B. A short summary narrative description of the feed and residue sampling
- 29 methods should be included within the main body of the demonstration test
- 30 plan, which references an appendix that would include for each sample type:
- 31 (1) detailed sample method procedures, (2) sampling recovery/compositing
- 32 procedures, and (3) detailed analytical method procedures. The detailed
- 33 procedures should clearly flag where the method has provided decision
- 34 points (e.g., choices of equipment materials of construction, choices of clean-
- 35 up procedures or whether additional clean-up procedures will be
- 36 incorporated, whether pretest surveys or laboratory validation work will be
- 37 performed, etc.) and what is being proposed along with the basis for the
- 38 decision.

39 **III.10.J.5.f.vii** A detailed test schedule for each condition for which the demonstration test is
 40 planned, including projected date(s), duration, quantity of dangerous waste to be fed,
 41 and other relevant factors;

42 **III.10.J.5.f.viii** A detailed test protocol including, for each test condition, the ranges of feed-rate for
 43 each feed system, and all other relevant parameters that may affect the ability of the
 44 HLW Vitrification System to meet performance standards specified in Permit
 45 Condition III.10.J.1.b;

- 1 **III.10.J.5.f.ix** A detailed description of planned operating conditions for each demonstration test
 2 condition, including operating conditions for shakedown, demonstration test, post-
 3 demonstration test and normal operations. This information will also include
 4 submittal of Permit Tables III.10.J.D, III.10.J.F, III.10.K.D, and III.10.K.F completed
 5 with the information as specified in each column heading for each HLW Vitrification
 6 System waste feed cut-off parameter and submittal of supporting documentation for
 7 Permit Tables III.10.J.D, III.10.J.F, III.10.K.D, and III.10.K.F set-point values.
- 8 **III.10.J.5.f.x** The test conditions proposed must demonstrate meeting the performance standards
 9 specified in Permit Condition III.10.J.1.b with the simultaneous operation of the
 10 melter at capacity and input from the HLW Vitrification Vessel Ventilation System at
 11 capacity to simulate maximum loading to the HLW Vitrification System off-gas
 12 treatment system and to establish the corresponding operating parameter ranges.
- 13 **III.10.J.5.f.xi** A detailed description of procedures for start-up and shutdown of waste feed and
 14 controlling emissions in the event of an equipment malfunction, including off-normal
 15 and emergency shutdown procedures;
- 16 **III.10.J.5.f.xii** A calculation of waste residence time;
- 17 **III.10.J.5.f.xiii** Any request to extrapolate metal feed-rate limits from Demonstration Test levels
 18 must include:
- 19 A. A description of the extrapolation methodology and rationale for how the
 20 approach ensures compliance with the performance standards, as specified in
 21 Permit Condition III.10.J.1.b.
- 22 B. Documentation of the historical range of normal metal feed-rates for each
 23 feed stream.
- 24 C. Documentation that the level of spiking recommended during the
 25 demonstration test will mask sampling and analysis imprecision and
 26 inaccuracy to the extent that extrapolation of feed-rates and emission rates
 27 from the Demonstration Test data will be as accurate and precise as if full
 28 spiking were used.
- 29 **III.10.J.5.f.xiv** Documentation of the expected levels of constituents in HLW Vitrification System
 30 input streams, including, but not limited to, waste feed, glass former and reactants,
 31 control air, process air, steam, sparge bubbler air, air in-leakage from melter cave,
 32 gases from HLW Vitrification Vessel Ventilation System, and process water.
- 33 **III.10.J.5.f.xv** Documentation justifying the duration of the conditioning required to ensure the
 34 HLW Vitrification System had achieved steady-state operations under Demonstration
 35 Test operating conditions.
- 36 **III.10.J.5.f.xvi** Documentation of HLW Vitrification System process and leak detection system
 37 instruments and monitors as listed on Permit Tables III.10.J.C, III.10.J.F, III.10.K.C,
 38 and III.10.K.F to include:
- 39 A. Procurement specifications.
- 40 B. Location used.
- 41 C. Range, precision, and accuracy.
- 42 D. Calibration/functionality test procedures (either method number ASTM) or
 43 provide a copy of manufacturer's recommended calibration procedures.

- 1 E. Calibration/functionality test, inspection, and routine maintenance schedules
2 and checklists, including justification for calibration, inspection and
3 maintenance frequencies, criteria for identifying instruments found to be
4 significantly out of calibration, and corrective action to be taken for
5 instruments found to be significantly out of calibration (e.g., increasing
6 frequency of calibration, instrument replacement, etc.).
- 7 F. Equipment instrument control logic narrative description (e.g., descriptions
8 of failsafe conditions, etc.) [[WAC 173-303-680](#)(2), [WAC 173-303-](#)
9 [806](#)(4)(i)(i)(B), and [WAC 173-303-806](#)(4)(i)(v)]
- 10 **III.10.J.5.f.xvii** Outline of demonstration test report.

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p><u>HLW Melter Process System</u></p> <p>HMP-MLTR-00001 (HLW Melter 1)</p> <p>HMP-MLTR-00002 (HLW Melter 2)</p>	<p>HMP</p>	<p>-M6-HMP-00001001</p> <p>-M6-HMP-00001002</p> <p>-M6-HMP-00003001</p> <p>-M6-HMP-00004001</p> <p>-M6-HMP-00006001</p> <p>-M6-HMP-00006002</p> <p>-M6-HMP-00007001</p> <p>-M6-HMP-00008001</p> <p>-M6-HMP-00013002</p> <p>-M6-HMP-00013003</p> <p>-M6-HMP-20001001</p> <p>-M6-HMP-20001002</p> <p>-M6-HMP-20003001</p> <p>-M6-HMP-20004001</p> <p>-M6-HMP-20006001</p> <p>-M6-HMP-20008001</p> <p>-M6-HMP-20013002</p> <p>-M6-HMP-20013003</p> <p>-M5-V17T-P0002</p> <p>-M5-V17T-P20002</p> <p>-M0D-HMP-00001</p> <p>-M0D-HMP-00002</p> <p>-MF-HMP-00001</p> <p>-MF-HMP-00002</p> <p>-MF-HMP-00003</p>	<p>Section 4F.2.2; Table 4F-2; and Figures 4A-1, 4A-4 and 4A-27 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
		-N1D-HMP-P0001 -P1-P01T-00002 -3PS-AE00-T0001	
<p><u>Melter Offgas Treatment Process System</u></p> <p>HOP-FCLR-00001 (Melter 1 Offgas Film Cooler)</p> <p>HOP-FCLR-00002 (Melter 2 Offgas Film Cooler)</p> <p>HOP-FCLR-00003 (Melter 1 Standby Offgas Insert)</p> <p>HOP-FCLR-00004 (Melter 2 Standby Offgas Insert)</p>	HOP	<p><u>24590-HLW</u></p> <p>-M5-V17T-P0002</p> <p>-M5-V17T-P20002</p> <p>-M6-HMP-00002001</p> <p>-M6-HMP-00002002</p> <p>-M6-HMP-20002001</p> <p>-3YD-HOP-00001^a</p>	Section 4F.4.2; Table 4F-2; and Figures 4A-1, 4A-4 and 4A-27 in Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-SCB-00001 (Melter 1 Submerged Bed Scrubber, SBS)</p> <p>HOP-SCB-00002 (Melter 2 Submerged Bed Scrubber, SBS)</p>	HOP	<p><u>24590-HLW</u></p> <p>-M5-V17T-P0003</p> <p>-M5-V17T-P20003</p> <p>-M6-HOP-00001001</p> <p>-M6-HOP-00001002</p> <p>-M6-HOP-00001003</p> <p>-M6-HOP-20001001</p> <p>-M6-HOP-20001002</p> <p>-M6-HOP-20001003</p>	Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
		-MKD-HOP-00016 -MK-HOP-P0001001 -MK-HOP-P0001002 -MK-HOP-P0001003 -MK-HOP-P0001004 -N1D-HOP-P0010 -P1-P01T-00002 -3YD-HOP-00001 ^a <u>24590-WTP</u> -3PS-MV00-T0001 -3PS-MV00-T0002 -3PS-MV00-T0003	
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-WESP-00001 (Melter 1 Wet Electrostatic Precipitator, WESP)</p> <p>HOP-WESP-00002 (Melter 2 Wet Electrostatic Precipitator, WESP)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-P0003 -M5-V17T-P20003 -M6-HOP-00002 -M6-HOP-20002 -N1D-HOP-P0002 -P1-P01T-00004 -P1-P01T-00005 -3YD-HOP-00001^a</p> <p><u>24590-WTP</u></p> <p>-3PS-MKE0-T0001</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-HEPA-00001A (Melter 1 Primary Offgas HEPA Filter)</p> <p>HOP-HEPA-00001B (Melter 1 Primary Offgas HEPA Filter)</p> <p>HOP-HEPA-00002A (Melter 1 Secondary Offgas HEPA Filter)</p> <p>HOP-HEPA-00002B (Melter 1 Secondary Offgas HEPA Filter)</p> <p>HOP-HEPA-00007A (Melter 2 Primary Offgas HEPA Filter)</p> <p>HOP-HEPA-00007B (Melter 2 Primary Offgas HEPA Filter)</p> <p>HOP-HEPA-00008A (Melter 2 Secondary Offgas HEPA Filter)</p> <p>HOP-HEPA-00008B (Melter 2 Secondary Offgas HEPA Filter)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-P0003</p> <p>-M5-V17T-P20003</p> <p>-M6-HOP-00010</p> <p>-M6-HOP-20010</p> <p>-MAD-HOP-00010</p> <p>-MAD-HOP-00011</p> <p>-MAD-HOP-00012</p> <p>-MAD-HOP-00013</p> <p>-MAD-HOP-00014</p> <p>-MAD-HOP-00015</p> <p>-MAD-HOP-00016</p> <p>-MAD-HOP-00017</p> <p>-P1-P01T-00002</p> <p>-3YD-HOP-00001^a</p> <p><u>24590-WTP</u></p> <p>-3PS-MKH0-T0002</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-ADBR-00001A (Melter 1 Activated Carbon Adsorber – located on Activated Carbon Adsorber Skid HOP-ADBR-00001)</p> <p>HOP-ADBR-00001B (Melter 1 Activated Carbon Adsorber – located on Activated Carbon Adsorber Skid HOP-ADBR-00001)</p> <p>HOP-ADBR-00002A (Melter 2 Activated Carbon Adsorber – located on Activated Carbon Adsorber Skid HOP-ADBR-00002)</p> <p>HOP-ADBR-00002B (Melter 2 Activated Carbon Adsorber – located on Activated Carbon Adsorber Skid HOP-ADBR-00002)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00003001</p> <p>-M6-HOP-00003002</p> <p>-M6-HOP-20003001</p> <p>-M6-HOP-20003002</p> <p>-MVD-HOP-00015</p> <p>-MVD-HOP-00016</p> <p>-N1D-HOP-00003</p> <p>-P1-P01T-00002</p> <p><u>24590-WTP</u></p> <p>-3PS-MWK0-T0001</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-HEME-00001A (Melter 1 High Efficiency Mist Eliminator, HEME)</p> <p>HOP-HEME-00001B (Melter 1 High Efficiency Mist Eliminator, HEME)</p> <p>HOP-HEME-00002A (Melter 2 High Efficiency Mist Eliminator, HEME)</p> <p>HOP-HEME-00002B (Melter 2 High Efficiency Mist Eliminator, HEME)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-P0003</p> <p>-M5-V17T-P20003</p> <p>-M6-HOP-00009001</p> <p>-M6-HOP-00009002</p> <p>-M6-HOP-20009001</p> <p>-M6-HOP-20009002</p> <p>-MVD-HOP-00007</p> <p>-MV-HOP-P0002001</p> <p>-MV-HOP-P0002002</p> <p>-MV-HOP-P0002003</p> <p>-N1D-HOP-P0001</p> <p>-P1-P01T-00002</p> <p>-3YD-HOP-00001^a</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-SCO-00001 (Thermal Catalytic Oxidizer – located on Catalyst Skid HOP-SKID-00005)</p> <p>HOP-SCO-00004 (Thermal Catalytic Oxidizer – located on Catalyst Skid HOP-SKID-00007)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00008001</p> <p>-M6-HOP-00008002</p> <p>-M6-HOP-00008003</p> <p>-M6-HOP-20008001</p> <p>-M6-HOP-20008002</p> <p>-M6-HOP-20008003</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
		-MKD-HOP-00019 -N1D-HOP-00004 -N1D-HOP-00005 -P1-P01T-00002 -3PS-MBTV-T0002 <u>24590-LAW</u> -3PS-MBTV-T0001	
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-SCR-00001 (NOx Selective Catalytic Reducer – located on Catalyst Skid HOP-SKID-00005)</p> <p>HOP-SCR-00002 (NOx Selective Catalytic Reducer – located on Catalyst Skid HOP-SKID-00007)</p>	HOP	<p><u>24590-HLW</u></p> -M5-V17T-00004 -M5-V17T-20004 -M6-HOP-00008001 -M6-HOP-00008002 -M6-HOP-00008003 -M6-HOP-20008001 -M6-HOP-20008002 -M6-HOP-20008003 -MKD-HOP-00019 -N1D-HOP-00004 -N1D-HOP-00005 -P1-P01T-00002 -3PS-MBTV-T0002 <u>24590-LAW</u> -3PS-MBTV-T0001	Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-HX-00001 (Catalyst Skid Preheater – located on Catalyst Skid HOP-SKID-00005)</p> <p>HOP-HX-00003 (Catalyst Skid Preheater – located on Catalyst Skid HOP-SKID-00007)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00008001</p> <p>-M6-HOP-00008002</p> <p>-M6-HOP-00008003</p> <p>-M6-HOP-20008001</p> <p>-M6-HOP-20008002</p> <p>-M6-HOP-20008003</p> <p>-MKD-HOP-00019</p> <p>-N1D-HOP-00008</p> <p>-P1-P01T-P0002</p> <p>-3PS-MBTV-T0002</p> <p><u>24590-LAW</u></p> <p>-3PS-MBTV-T0001</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-HTR-00001 (Catalyst Skid Electric Heater – located on Catalyst Skid HOP-SKID-00005)</p> <p>HOP-HTR-00007 (Catalyst Skid Electric Heaters – located on Catalyst Skid HOP-SKID-00007)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00008001</p> <p>-M6-HOP-00008002</p> <p>-M6-HOP-00008003</p> <p>-M6-HOP-20008001</p> <p>-M6-HOP-20008002</p> <p>-M6-HOP-20008003</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
		-MKD-HOP-00019 -P1-P01T-00002 -3PS-MBTV-T0002 -N1D-HOP-00011 <u>24590-LAW</u> -3PS-MBTV-T0001	
<u>Melter Offgas Treatment Process System (Cont.)</u> HOP-ABS-00002 (Silver Mordenite Column) HOP-ABS-00003 (Silver Mordenite Column)	HOP	<u>24590-HLW</u> -M5-V17T-00004 -M5-V17T-20004 -M6-HOP-00008001 -M6-HOP-00008002 -M6-HOP-00008003 -M6-HOP-20008001 -M6-HOP-20008002 -M6-HOP-20008003 -MKD-HOP-00014 -MKD-HOP-00017 -NID-HOP-P0006 -P1-P01T-00001 -3PS-MBT0-TP001	Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-HTR-00001B (HEPA Preheater)</p> <p>HOP-HTR-00002A (HEPA Preheater)</p> <p>HOP-HTR-00005A (HEPA Preheater)</p> <p>HOP-HTR-00005B (HEPA Preheater)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-P0003</p> <p>-M5-V17T-P20003</p> <p>-M6-HOP-00010</p> <p>-M6-HOP-20010</p> <p>-MED-HOP-00013</p> <p>-3PS-MEE0-T0001</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-HX-00002 (Silver Mordenite Preheater)</p> <p>HOP-HX-00004 (Silver Mordenite Preheater)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00003001</p> <p>-M6-HOP-00003002</p> <p>-M6-HOP-20003001</p> <p>-M6-HOP-20003002</p> <p>-N1D-HOP-00007</p> <p>-P1-P01T-00002</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-FAN-00001A (Booster Extraction Fan)</p> <p>HOP-FAN-00001B (Booster Extraction Fan)</p> <p>HOP-FAN-00001C (Booster Extraction Fan)</p> <p>HOP-FAN-00009A (Booster Extraction Fan)</p> <p>HOP-FAN-00009B (Booster Extraction Fan)</p> <p>HOP-FAN-00009C (Booster Extraction Fan)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00003001</p> <p>-M6-HOP-00003002</p> <p>-M6-HOP-20003001</p> <p>-M6-HOP-20003002</p> <p>-MAD-HOP-00018</p> <p>-P1-P01T-00001</p> <p><u>24590-WTP</u></p> <p>-3PS-MACS-T0004</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HOP-FAN-00008A (Stack Extraction Fan)</p> <p>HOP-FAN-00008B (Stack Extraction Fan)</p>	<p>HOP</p>	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00008001</p> <p>-M6-HOP-00008002</p> <p>-M6-HOP-00008003</p> <p>-M6-HOP-20008001</p> <p>-M6-HOP-20008002</p>	<p>Section 4F.4.2; Table 4F-2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.</p>

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
<p>HOP-FAN-00008C (Stack Extraction Fan)</p> <p>HOP-FAN-000010A (Stack Extraction Fan)</p> <p>HOP-FAN-000010B (Stack Extraction Fan)</p> <p>HOP-FAN-000010C (Stack Extraction Fan)</p>		<p>-M6-HOP-20008003</p> <p>-MAD-HOP-00038</p> <p>-P1-P01T-00005</p> <p><u>24590-WTP</u></p> <p>-3PS-MACS-T0004</p>	
<p><u>Melter Offgas Treatment Process System (Cont.)</u></p> <p>HLW Stack</p>	HOP	<p><u>24590-HLW</u></p> <p>-M5-V17T-00004</p> <p>-M5-V17T-20004</p> <p>-M6-HOP-00008001</p> <p>-M6-HOP-00008002</p> <p>-M6-HOP-00008003</p> <p>-M6-HOP-20008001</p> <p>-M6-HOP-20008002</p> <p>-M6-HOP-20008003</p>	Section 4F.4.2; and Figures 4A-1 and 4A-4 in Operating Unit Group 10, Chapter 4 of this Permit.
<p><u>Pulse Jet Ventilation System</u></p> <p>PJV-HTR-00002 (Pulse Jet Ventilation HEPA Electric Preheater)</p>	PJV	<p><u>24590-HLW</u></p> <p>-M6-PJV-00001001</p> <p>-M6-PJV-00002001</p>	

Table III.10.J.A – HLW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables, and Figures
PJV-HEPA-00004B (PJV System HEPA Filter (Standby Primary)) PJV-HEPA-00005B (PJV System HEPA Filter (Standby Secondary)) PJV-HEPA-00004A (PJV System HEPA Filter (Primary)) PJV-HEPA-00005A (PJV System HEPA Filter (Secondary)) PJV-FAN-00002A (Pulse Jet Vent Extraction Fan) PJV-FAN-00002B (Pulse Jet Vent Extraction Fan)			
<p><u>Process Vessel Vent Extraction System</u></p> <p>PVV system contains ancillary equipment only.</p>	PVV	<p><u>24590-HLW</u> -M6-PVV-00001 -M6-PVV-20001</p>	

^a System Descriptions are maintained in the Administrative Record, and are listed here for information only.

Table III.10.J.B – HLW Vitrification Systems Secondary Containment Systems Including Sumps and Floor Drains

Sump/Floor Drain I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions ^a (feet) & Materials of Construction	Maximum Allowable Liquid Height (inches)	Secondary Containment Volume (gallons)	Engineering Description (Drawing Nos., Specification Nos., etc.)
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

^aDimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

1

Table III.10.J.C – HLW Vitrification System Process and Leak Detection System Instruments and Parameters

P&ID	Monitoring or Control Parameter	Type of Instrument or Control Device	Instrument or Control Device Tag No.	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Instrument Calibration Method No. and Range
24590-HLW-M6-HMP-00004001	Melter 1 plenum temperature, 62”	TBD	(TE-0920A + TT-0920A + TI-0920A)* Or (TE-0920C + TT-0921A + TI-0921F)*	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-00004001	Melter 1 plenum temperature, 59”	TBD	(TE-0920B + TT-920A + TI-0920B)* Or (TE-920D + TT-0921A+ TI-0921E)*	TBD	TBD	TBD	TBD	TBD

Table III.10.J.C – HLW Vitrification System Process and Leak Detection System Instruments and Parameters

P&ID	Monitoring or Control Parameter	Type of Instrument or Control Device	Instrument or Control Device Tag No.	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Instrument Calibration Method No. and Range
24590-HLW-M6-HMP-20004001	Melter 2 plenum temperature, 62”	TBD	(TE-2920A + TT-2920A + TI-2920A)* Or (TE-2920C + TT-2921A + TI-2920C)*	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-20004001	Melter 2 plenum temperature, 59”	TBD	(TE-2920B + TT-2920A + TI-2920B)* Or (TE-2920D + TT-2921A + TI-2920D)*	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-0001300224590-HLW-M6-HMP-00013003	Melter 1 glass pool density	TBD	DT-0132 DI-0132	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-0001300224590-HLW-M6-HMP-00013003	Melter 1 glass pool level	TBD	LT-0131 LI-0131	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-2001300224590-HLW-M6-HMP-20013003	Melter 2 glass pool density	TBD	DT-2132 DI-2132	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-2001300224590-HLW-M6-HMP-20013003	Melter 2 glass pool level	TBD	LT-2131 LI-2131	TBD	TBD	TBD	TBD	TBD

Table III.10.J.C – HLW Vitrification System Process and Leak Detection System Instruments and Parameters

P&ID	Monitoring or Control Parameter	Type of Instrument or Control Device	Instrument or Control Device Tag No.	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Instrument Calibration Method No. and Range
24590-HLW-M6-HMP-0001300224590-HLW-M6-HMP-00013003	Melter 1 plenum pressure	TBD	(PDT-0139A + PDI-0139A)* Or (PDT-0139B + PDI-0139B)*	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-2001300224590-HLW-M6-HMP-20013003	Melter 2 plenum pressure	TBD	(PDT-2139A + PDI-2139A)* Or (PDT-2139B + PDI-2139B)*	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-0000800124590-HLW-M6-HMP-00008002	Melter 1 West canister level	TBD	LT-0816 (LI-0816A Or LI-0816B)**	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-00007001	Melter 1 West Discharge Air Lift	TBD	YC-0761 YV-0761	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-0000800124590-HLW-M6-HMP-00008002	Melter 1 East canister level	TBD	LT-0820 (LI-0820A Or LI-0820B)**	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-0000600124590-HLW-M6-HMP-00006002	Melter 1 East Discharge Air Lift	TBD	YC-0664 YV-0664	TBD	TBD	TBD	TBD	TBD

Table III.10.J.C – HLW Vitrification System Process and Leak Detection System Instruments and Parameters

P&ID	Monitoring or Control Parameter	Type of Instrument or Control Device	Instrument or Control Device Tag No.	Instrument Range	Expected Range	Fail States	Instrument Accuracy	Instrument Calibration Method No. and Range
24590-HLW-M6-HMP-2000800124590-HLW-M6-HMP-20008002	Melter 2 West canister level	TBD	LT-2816 (LI-2816A Or LI-2816B)**	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-20007001	Melter 2 West Discharge Air Lift	TBD	YC-2761 YV-2761	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-2000800124590-HLW-M6-HMP-20008002	Melter 2 East canister level	TBD	LT-2820 (LI-2820A Or LI-2820B)**	TBD	TBD	TBD	TBD	TBD
24590-HLW-M6-HMP-20006001	Melter 2 East Discharge Air Lift	TBD	YC-2664 YV-2664	TBD	TBD	TBD	TBD	TBD
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

*These instrument sets are duplicates. Only one instrument set is required to remain functioning during waste feed operations.

**These instruments are duplicates. Only one instrument is required to remain functioning during waste feed operations.

1
2
3
4
5

This page intentionally left blank.

Table III.10.J.D – Maximum Feed-Rates to HLW Vitrification System (RESERVED)

Description of Waste	Shakedown 1	Shakedown 2, Demonstration Test and Post Demonstration Test
Dangerous and Mixed Waste Feed Rate	RESERVED	RESERVED
Ash Feed Rate	RESERVED	RESERVED
Total Chlorine/Chloride Feed Rate	RESERVED	RESERVED
Total Metal Feedrates	RESERVED	RESERVED

1

Table III.10.J.E – HLW Vitrification System Estimated Emission Rates (RESERVED)

Chemicals	CAS Number	Emission Rates (grams/second)
RESERVED	RESERVED	RESERVED

2

Table III.10.J.F – HLW Vitrification System Waste Feed Cut-off Parameters* (RESERVED)

Subsystem Designation	Instrument Tag Number	Parameter Description	Setpoints During Shakedown 1 and Post Demonstration Test	Setpoints During Shakedown 2 and Demonstration Test
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

*A CMS will be used as defined in Permit Section III.10.C.1.

¹Maximum Feed-rate will be set based on not exceeding any of the constituent (e.g., metals, ash, and chlorine/chloride) feed limits specified on Permit Table III.10.J.D of this Permit

3

III.10.K HLW VITRIFICATION SYSTEM – LONG TERM MISCELLANEOUS THERMAL TREATMENT UNIT

5

For purposes of Permit Section III.10.K, where reference is made to [WAC 173-303-640](#), the following substitutions apply: substitute the terms “HLW Vitrification System” for “tank system(s),” “sub-system(s)” for “tank(s),” “sub-system equipment” for “ancillary equipment,” and “sub-system(s) or sub-system equipment of a HLW Vitrification System” for “component(s),” in accordance with [WAC 173-303-680](#).

6

7

8

9

10

III.10.K.1 Requirements For HLW Vitrification System Beginning Normal Operation

11

Prior to commencing normal operations provided in Permit Section III.10.K, all requirements in Permit Section III.10.J will have been met by the Permittees and approved by Ecology, including the following: The HLW Vitrification System Demonstration Test results and the revised Final Risk Assessment provided for in Permit Conditions III.10.C.11.c or d and Permit Section III.10.J, will have been evaluated and

12

13

14

15

16

1 approved by Ecology, Permit Tables III.10.K.D and F, as approved/modified pursuant to
2 Permit Condition III.10.J.5, will have been completed, submitted and approved pursuant
3 to Permit Condition III.10.J.3.d.v and Permit Table III.10.K.E, as approved/modified
4 pursuant to Permit Condition III.10.J.5, will have been completed, submitted and
5 approved pursuant to Permit Conditions III.10.C.11.c or d.

6 **III.10.K.1.a** Construction and Maintenance [[WAC 173-303-640](#), in accordance with [WAC 173-303-680](#)(2) and (3), and [WAC 173-303-340](#)]

8 **III.10.K.1.a.i** The Permittees will maintain the design and construction of the HLW Vitrification
9 System as specified in Permit Condition III.10.K.1, Operating Unit Group 10,
10 Chapter 4 of this Permit, and Operating Unit Group 10, Appendices 10.1 through
11 10.17 of this Permit, as approved pursuant to Permit Conditions III.10.J.5.a through d
12 and III.10.J.5.f.

13 **III.10.K.1.a.ii** The Permittees will maintain the design and construction of all containment systems
14 for the HLW Vitrification System as specified in Operating Unit Group 10, Chapter 4
15 of this Permit, and Operating Unit Group 10, Appendices 10.2 and 10.4 through
16 10.14 of this Permit, as approved pursuant to Permit Conditions III.10.J.5.a
17 through d.

18 **III.10.K.1.a.iii** Modifications to approved design, plans, and specifications in Operating Unit
19 Group 10, of this Permit, for the HLW Vitrification System will be allowed only in
20 accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g, III.10.C.9.d, e,
21 and h.

22 **III.10.K.1.a.iv** The Permittees will ensure all certifications required by specialists (e.g., independent
23 qualified registered professional engineer; registered, professional engineer;
24 independent corrosion expert; independent qualified installation inspector;
25 installation inspector; etc.) use the following statement or equivalent pursuant to
26 Permit Condition III.10.C.10:

27 “I, (Insert Name) have (choose one or more of the following: overseen, supervised,
28 reviewed, and/or certified) a portion of the design or installation of a new HLW
29 Vitrification system or component located at (address), and owned/operated by
30 (name(s)). My duties were: (e.g., installation inspector, testing for tightness, etc.), for
31 the following HLW Vitrification system components (e.g., the venting piping, etc.),
32 as required by the Dangerous Waste Regulations, namely, [WAC 173-303-640](#)(3)
33 (applicable paragraphs [i.e., (a) through (g)]), in accordance with [WAC 173-303-680](#).

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

40 **III.10.K.1.a.v** The Permittees will ensure periodic integrity assessments are conducted on the HLW
41 Vitrification System listed in Permit Table III.10.I.A, as approved/modified pursuant
42 to Permit Condition III.10.J.5, over the term of this Permit, in accordance with
43 [WAC 173-303-680](#)(2) and (3), as specified in [WAC 173-303-640](#)(3)(b) following the
44 description of the integrity assessment program and schedule in Operating Unit
45 Group 10, Addendum E of this Permit, as approved pursuant to Permit Conditions
46 III.10.J.5.e.i and III.10.C.5.c. Results of the integrity assessments will be included in

- 1 the WTP Unit operating record until ten (10) years after post-closure, or corrective
2 action is complete and certified, whichever is later.
- 3 **III.10.K.1.a.vi** The Permittees will address problems detected during the HLW Vitrification System
4 integrity assessments specified in Permit Condition III.10.K.1.a.v following the
5 description of the integrity assessment program in Operating Unit Group 10,
6 Addendum E of this Permit, as approved pursuant to Permit Conditions III.10.J.5.e.i
7 and III.10.C.5.c.
- 8 **III.10.K.1.a.vii** All process monitors/instruments as specified in Permit Table III.10.K.F, as
9 approved/modified pursuant to Permit Condition III.10.J.5 and III.10.J.3.d.v, will be
10 equipped with operational alarms to warn of deviation, or imminent deviation from
11 the limits specified in Permit Table III.10.K.F.
- 12 **III.10.K.1.a.viii** The Permittees will install and test all process and leak detection system
13 monitors/instruments, as specified in Permit Tables III.10.K.C and III.10.K.F, as
14 approved/modified pursuant to Permit Conditions III.10.J.5 and III.10.J.3.d.v, in
15 accordance with Operating Unit Group 10, Appendices 10.1, 10.2, and 10.14 of this
16 Permit, as approved pursuant to Permit Conditions III.10.J.5.d.x and III.10.J.5.f.xvi.
- 17 **III.10.K.1.a.ix** No dangerous and/or mixed waste will be treated in the HLW Vitrification System
18 unless the operating conditions, specified under Permit Condition III.10.K.1.c are
19 complied with.
- 20 **III.10.K.1.a.x** The Permittees will not place dangerous and/or mixed waste, treatment reagents, or
21 other materials in the HLW Vitrification System if these substances could cause the
22 sub-system, sub-system equipment, or the containment system to rupture, leak,
23 corrode, or otherwise fail [[WAC 173-303-640\(5\)\(a\)](#), in accordance with
24 [WAC 173-303-680\(2\)](#)]. This condition is not applicable to corrosion of HLW
25 Vitrification System sub-system or sub-system equipment that are expected to be
26 replaced as part of normal operations (e.g., melter).
- 27 **III.10.K.1.a.xi** The Permittees will operate the HLW Vitrification System to prevent spills and
28 overflows using the description of controls and practices as required under
29 [WAC 173-303-640\(5\)\(b\)](#), described in Permit Condition III.10.C.5, and Operating
30 Unit Group 10, Appendix 10.18 of this Permit, as approved pursuant to Permit
31 Condition III.10.J.5.e [[WAC 173-303-640\(5\)\(b\)](#), in accordance with [WAC 173-303-](#)
32 [680\(2\)](#) and (3), [WAC-173-303-806\(4\)\(c\)\(ix\)](#)].
- 33 **III.10.K.1.a.xii** For routinely non-accessible HLW Vitrification System sub-systems, as specified in
34 Operating Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit
35 Condition III.10.J.5.e.vi, the Permittees will mark all routinely non-accessible HLW
36 Vitrification System sub-systems access points with labels or signs to identify the
37 waste contained in each HLW Vitrification System sub-system. The label, or sign,
38 must be legible at a distance of at least fifty (50) feet, and must bear a legend which
39 identifies the waste in a manner which adequately warns employees, emergency
40 response personnel, and the public of the major risk(s) associated with the waste
41 being stored or treated in the HLW Vitrification System sub-systems. For the
42 purposes of this permit condition, “routinely non-accessible” means personnel are
43 unable to enter these areas while waste is being managed in them [[WAC 173-303-](#)
44 [640\(5\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#)].

- 1 **III.10.K.1.a.xiii** For all the HLW Vitrification System sub-systems not addressed in Permit Condition
2 III.10.K.1.a.xii, the Permittees will mark all these HLW Vitrification System
3 sub-systems holding dangerous and/or mixed waste with labels or signs to identify
4 the waste contained in the HLW Vitrification System sub-systems. The labels, or
5 signs, must be legible at a distance of at least fifty (50) feet, and must bear a legend
6 which identifies the waste in a manner which adequately warns employees,
7 emergency response personnel, and the public of the major risk(s) associated with the
8 waste being stored or treated in the HLW Vitrification System sub-systems
9 [[WAC 173-303-640](#)(5)(d), in accordance with [WAC 173-303-680](#)(2)].
- 10 **III.10.K.1.a.xiv** The Permittees will ensure that the secondary containment systems for the HLW
11 Vitrification System sub-systems listed in Permit Tables III.10.K.A and III.10.K.B, as
12 approved/modified pursuant to Permit Condition III.10.J.5, are free of cracks or gaps
13 to prevent any migration of dangerous and/or mixed waste or accumulated liquid out
14 of the system to the soil, groundwater, or surface water at any time during the use of
15 the HLW Vitrification System sub-systems. Any indication that a crack or gap may
16 exist in the containment systems will be investigated and repaired in accordance with
17 Operating Unit Group 10, Appendix 10.18 of this Permit, as approved pursuant to
18 Permit Condition III.10.J.5.e.v [[WAC 173-303-640](#)(4)(b)(i), [WAC 173-303-](#)
19 [640](#)(4)(e)(i)(C), and [WAC 173-303-640](#)(6), in accordance with [WAC 173-303-680](#)(2)
20 and (3), [WAC 173-303-806](#)(4)(i)(B), and [WAC 173-303-320](#)].
- 21 **III.10.K.1.a.xv** The Permittees must immediately and safely remove from service any HLW
22 Vitrification System or secondary containment system which through an integrity
23 assessment is found to be “unfit for use” as defined in [WAC 173-303-040](#), following
24 Permit Condition III.10.K.1.a.xvii.A through D, and F. The affected HLW
25 Vitrification System or secondary containment system must be either repaired or
26 closed in accordance with Permit Condition III.10.K.1.a.xvii.E [[WAC 173-303-](#)
27 [640](#)(7)(e) and (f) and [WAC 173-303-640](#)(8), in accordance with [WAC 173-303-](#)
28 [680](#)(3)].
- 29 **III.10.K.1.a.xvi** An impermeable coating, as specified in Operating Unit Group 10, Appendices 10.4,
30 10.5, 10.7, 10.9, 10.11, and 10.12 of this Permit, as approved pursuant to Permit
31 Condition III.10.J.5.b.v, will be maintained for all concrete containment systems and
32 concrete portions of containment systems for the HLW Vitrification System
33 sub-systems listed in Permit Tables III.10.K.A and III.10.K.B, as approved/modified
34 pursuant to Permit Condition III.10.J.5 (concrete containment systems that do not
35 have a liner, pursuant to [WAC 173-303-640](#)(4)(e)(i), in accordance with
36 [WAC 173-303-680](#)(2), and have construction joints, will meet the requirements of
37 [WAC 173-303-640](#)(4)(e)(ii)(C), in accordance with [WAC 173-303-680](#)(2). The
38 coating will prevent migration of any dangerous and/or mixed waste into the
39 concrete. All coatings will meet the following performance standards:
- 40 A. The coating must seal the containment surface such that no cracks, seams, or
41 other avenues through which liquid could migrate are present;
- 42 B. The coating must be of adequate thickness and strength to withstand the
43 normal operation of equipment and personnel within the given area such that
44 degradation or physical damage to the coating or lining can be identified and
45 remedied before dangerous and/or mixed waste could migrate from the
46 system; and
- 47 C. The coating must be compatible with the dangerous and/or mixed waste,
48 treatment reagents, or other materials managed in the containment system

1 [\[WAC 173-303-640\(4\)\(e\)\(ii\)\(D\)](#), in accordance with [WAC 173-303-680\(2\)](#)
2 and (3), and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)].

3 **III.10.K.1.a.xvii**

4 The Permittees will inspect all secondary containment systems for the HLW
5 Vitrification System sub-systems listed in Permit Tables III.10.K.A and III.10.K.B, as
6 approved/modified pursuant to Permit Condition III.10.J.5, in accordance with the
7 Inspection Plan specified in Operating Unit Group 10, Chapter 6A of this Permit, as
8 approved pursuant to Permit Conditions III.10.J.5.e.i and III.10.C.5.c, and take the
9 following actions if a leak or spill of dangerous and/or mixed waste is detected in
10 these containment systems [[WAC 173-303-640\(5\)\(c\)](#), [WAC 173-303-640\(6\)](#) in
11 accordance with [WAC 173-303-680\(2\)](#) and (3), [WAC 173-303-320](#), and
[WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)]:

- 12 A. Immediately, and safely, stop the flow of dangerous and/or mixed waste into
13 the HLW Vitrification System sub-systems or secondary containment system.
- 14 B. Determine the source of the dangerous and/or mixed waste.
- 15 C. Remove the dangerous and/or mixed waste from the containment area in
16 accordance with [WAC 173-303-680\(2\)](#) and (3), as specified in
17 [WAC 173-303-640\(7\)\(b\)](#). The dangerous and/or mixed waste removed from
18 containment areas of the HLW Vitrification System will be, at a minimum,
19 managed as mixed waste.
- 20 D. If the cause of the release was a spill that has not damaged the integrity of the
21 HLW Vitrification System sub-system, the Permittees may return the HLW
22 Vitrification System sub-system to service in accordance with
23 [WAC 173-303-680\(2\)](#) and (3), as specified in [WAC 173-303-640\(7\)\(e\)\(ii\)](#). In
24 such case, the Permittees will take action to ensure the incident that caused
25 the dangerous and/or mixed waste to enter the containment system will not
26 reoccur.
- 27 E. If the source of the dangerous and/or mixed waste is determined to be a leak
28 in from the primary HLW Vitrification System into the secondary
29 containment system, or the system is unfit for use as determined through an
30 integrity assessment or other inspection, the Permittees will comply with the
31 requirements of [WAC 173-303-640\(7\)](#) and take the following actions:
- 32 1. Close the HLW Vitrification System sub-system following procedures in
33 [WAC 173-303-640\(7\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680](#), and
34 Operating Unit Group 10, Addendum H of this Permit, as approved
35 pursuant to Permit Condition III.10.C.8.
- 36 2. Repair and re-certify (in accordance with [WAC 173-303-810\(13\)\(a\)](#), as
37 modified pursuant to Permit Condition III.10.K.1.a.iii) the HLW
38 Vitrification System, in accordance with Operating Unit Group 10,
39 Appendix 10.18 of this Permit, as approved pursuant to Permit Condition
40 III.10.J.5.e.v, before the HLW Vitrification System is placed back into
41 service [[WAC 173-303-640\(7\)\(e\)\(iii\)](#) and [WAC 173-303-640\(7\)\(f\)](#), in
42 accordance with [WAC 173-303-680](#)].
- 43 F. The Permittees will document in the operating record actions/procedures
44 taken to comply with A through E above, as specified in [WAC 173-303-](#)
45 [640\(6\)\(d\)](#), in accordance with [WAC 173-303-680\(2\)](#) and (3).
- 46 G. In accordance with [WAC 173-303-680\(2\)](#) and (3), the Permittees will notify
47 and report releases to the environment to Ecology as specified in
48 [WAC 173-303-640\(7\)\(d\)](#).

- 1 **III.10.K.1.a.xviii** If liquids (e.g., dangerous and/or mixed waste, leaks and spills, precipitation, fire
2 water, liquids from damaged or broken pipes) cannot be removed from the secondary
3 containment system within twenty-four (24) hours; Ecology will be verbally notified
4 within twenty-four (24) hours of discovery. The notification will provide the
5 information in A, B, and C, listed below. The Permittees will provide Ecology with a
6 written demonstration within seven (7) business days, identifying at a minimum
7 [[WAC 173-303-640](#)(4)(c)(iv) and [WAC 173-303-640](#)(7)(b)(ii), in accordance with
8 [WAC 173-303-680](#)(3) and [WAC 173-303-806](#)(4)(i)(i)(B)]:
- 9 A. Reasons for delayed removal.
10 B. Measures implemented to ensure continued protection of human health and
11 the environment.
12 C. Current actions being taken to remove liquids from secondary containment.
- 13 **III.10.K.1.a.xix** All air pollution control devices and capture systems in the HLW Vitrification System
14 will be maintained and operated at all times in a manner so as to minimize the
15 emissions of air contaminants and to minimize process upsets. Procedures for
16 ensuring that the air pollution control devices and capture systems in the HLW
17 Vitrification System are properly operated and maintained so as to minimize the
18 emission of air contaminants and process upsets will be established.
- 19 **III.10.K.1.a.xx** In all future narrative permit submittals, the Permittees will include HLW
20 Vitrification sub-system names with the sub-system designation.
- 21 **III.10.K.1.a.xxi** For any portion of the HLW Vitrification System which has the potential for
22 formation and accumulation of hydrogen gases, the Permittees will operate the
23 portion to maintain hydrogen levels below the lower explosive limit [[WAC 173-303-](#)
24 [815](#)(2)(b)(ii)].
- 25 **III.10.K.1.a.xxii** For each HLW Vitrification System sub-system holding dangerous waste which are
26 acutely or chronically toxic by inhalation, the Permittees will operate the system to
27 prevent escape of vapors, fumes, or other emissions into the air [[WAC 173-303-](#)
28 [806](#)(4)(i)(i)(B) and [WAC 173-303-640](#)(5)(e), in accordance with [WAC 173-303-680](#)].
- 29 **III.10.K.1.b** Performance Standards
- 30 **III.10.K.1.b.i** The HLW Vitrification System must achieve a DRE of 99.99% for the PODCs listed
31 below [[40 CFR §63.1203](#)(c)(1) and [40CFR §63.1203](#)(c)(2), in accordance with
32 [WAC 173-303-680](#)(2)]:
- 33 RESERVED
- 34 DRE in this Permit Condition will be calculated in accordance with the formula
35 given below:
36 $DRE = [1 - (W_{out}/W_{in})] \times 100\%$
37 Where:
38 W_{in} = mass feed-rate of one PODC in a waste feed stream; and
39 W_{out} = mass emission rate of the same PODC present in exhaust emissions prior to
40 release to the atmosphere.
- 41 **III.10.K.1.b.ii** Particulate matter emissions from the HLW Vitrification System will not exceed 34
42 mg/dscm (0.015 grains/dscf) [[40 CFR §63.1203](#)(b)(7), in accordance with
43 [WAC 173-303-680](#)(2)];

- 1 **III.10.K.1.b.iii** Hydrochloric acid and chlorine gas emissions from the HLW Vitrification System
2 will not exceed 21 ppmv, combined [[40 CFR §63.1203\(b\)\(6\)](#), in accordance with
3 [WAC 173-303-680\(2\)](#)];
- 4 **III.10.K.1.b.iv** Dioxin and Furan TEQ emissions from the HLW Vitrification System will not exceed
5 0.2 nanograms (ng)/dscm [[40 CFR §63.1203\(b\)\(1\)](#), in accordance with
6 [WAC 173-303-680\(2\)](#)];
- 7 **III.10.K.1.b.v** Mercury emissions from the HLW Vitrification System will not exceed 45 µg/dscm
8 [[40 CFR §63.1203\(b\)\(2\)](#), in accordance with [WAC 173-303-680\(2\)](#)];
- 9 **III.10.K.1.b.vi** Lead and cadmium emissions from the HLW Vitrification System will not exceed
10 120 µg/dscm, combined [[40 CFR §63.1203\(b\)\(3\)](#), in accordance with [WAC 173-303-](#)
11 [680\(2\)](#)];
- 12 **III.10.K.1.b.vii** Arsenic, beryllium, and chromium emissions from the HLW Vitrification System will
13 not exceed 97 µg/dscm, combined [[40 CFR §63.1203\(b\)\(4\)](#), in accordance with
14 [WAC 173-303-680\(2\)](#)];
- 15 **III.10.K.1.b.viii** Carbon monoxide (CO) emission from the HLW Vitrification System will not exceed
16 100 parts per million (ppm) by volume, over an hourly rolling average (as measured
17 and recorded by the CMS), dry basis [[40 CFR §63.1203\(b\)\(5\)\(i\)](#), in accordance with
18 [WAC 173-303-680\(2\)](#) and (3)];
- 19 **III.10.K.1.b.ix** RESERVED
- 20 **III.10.K.1.b.x** If the emissions from the HLW Vitrification System exceed the emission rates listed
21 in Permit Table III.10.K.E, as approved pursuant to Permit Condition III.10.C.11.c or
22 d, the Permittees will perform the following actions [[WAC 173-303-680\(2\)](#) and (3),
23 and [WAC 173-303-815\(2\)\(b\)\(ii\)](#)):
- 24 A. Verbally notify Ecology within twenty-four (24) hours of the discovery of
25 exceeding the emission rate(s) as specified in Permit Condition I.E.21.
- 26 B. Submit to Ecology additional risk information to indicate that the increased
27 emissions impact is off-set by decreased emission impact from one or more
28 constituents expected to be emitted at the same time, and/or investigate the
29 cause and impact of the exceedance of the emission rate(s) and submit a
30 report of the investigation findings to Ecology within fifteen (15) days of the
31 discovery of exceeding the emission rate(s).
- 32 C. Based on the notification and any additional information, Ecology may
33 provide, in writing, direction to the Permittees to stop dangerous and/or
34 mixed waste feed to the HLW Vitrification System and/or to submit a revised
35 Demonstration Test Plan as a permit modification pursuant to Permit
36 Conditions III.10.C.2.e and f, or III.10.C.2.g. The revised Demonstration
37 Test Plan must include substantive changes to prevent failure from
38 reoccurring.
- 39 The emission limits specified in Permit Conditions III.10.K.1.b.i through
40 III.10.K.1.b.ix above, will be met for the HLW Vitrification System by limiting feed
41 rates as specified in Permit Tables III.10.K.D and III.10.K.F, as approved/modified
42 pursuant to Permit Condition III.10.J.5 and III.10.J.3.d.v, compliance with operating
43 conditions specified in Permit Condition III.10.K.1.c (except as specified in Permit
44 Condition III.10.K.1.b.xii), and compliance with Permit Condition III.10.K.1.b.xi.

- 1 **III.10.K.1.b.xi** Treatment effectiveness, feed-rates, and operating rates for dangerous and/or mixed
2 waste management units contained in the HLW Building, but not included in Permit
3 Table III.10.K.A, as approved/modified pursuant to Permit Condition III.10.J.5, will
4 be as specified in Permit Sections III.10.D, III.10.E, III.10.F and consistent with the
5 assumptions and basis which are reflected in Operating Unit Group 10, Appendix 6.3
6 of this Permit, as approved pursuant to Permit Condition III.10.C.11.b. For the
7 purposes of this permit condition, Operating Unit Group 10, Appendix 6.3 will be
8 superseded by Appendix 6.4 upon its approval pursuant to either Permit Conditions
9 III.10.C.11.c or d [[WAC 173-303-680](#)(2) and (3), and [WAC 173-303-815](#)(2)(b)(ii)].
- 10 **III.10.K.1.b.xii** Compliance with the operating conditions specified in Permit Condition III.10.K.1.c,
11 will be regarded as compliance with the required performance standards identified in
12 Permit Conditions III.10.K.1.b.i through x. However, if it is determined that during
13 the effective period of this Permit that compliance with the operating conditions in
14 Permit Condition III.10.K.1.c is not sufficient to ensure compliance with the
15 performance standards specified in Permit Conditions III.10.K.1.b.i through x, the
16 Permit may be modified, revoked, or reissued pursuant to Permit Conditions
17 III.10.C.2.e and f, or III.10.C.2.g.
- 18 **III.10.K.1.c** Operating Conditions [[WAC 173-303-670](#)(6), in accordance with [WAC 173-303-680](#)(2)
19 and (3)]
- 20 The Permittees will operate the HLW Vitrification System in accordance with Operating
21 Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit Condition
22 III.10.J.5.e.vi, Operating Unit Group 10, Appendix 10.18 of this Permit, as approved
23 pursuant to Permit Conditions III.10.J.5.e and f, and Operating Unit Group 10,
24 Appendix 10.15 of this Permit, as approved pursuant to Permit Condition III.10.J.5.f,
25 except as modified pursuant to Permit Conditions III.10.J.3, III.10.K.1.b.x,
26 III.10.K.1.b.xii, III.10.K.1.h, and in accordance with and the following:
- 27 **III.10.K.1.c.i** The Permittees will operate the HLW Vitrification System in order to maintain the
28 systems and process parameters listed in Permit Tables III.10.K.C and III.10.K.F, as
29 approved/modified pursuant to Permit Conditions III.10.J.5 and III.J.3.d.v, within the
30 set-points specified in Permit Table III.10.K.F.
- 31 **III.10.K.1.c.ii** The Permittees will operate the AWFCO systems, specified in Permit Table
32 III.10.K.F, as approved/modified pursuant to Permit Conditions III.10.J.5 and
33 III.J.3.d.v, to automatically cut-off and/or lock-out the dangerous and/or mixed waste
34 feed to HLW Vitrification System when the monitored operating conditions deviate
35 from the set-points specified in Permit Table III.10.K.F.
- 36 **III.10.K.1.c.iii** The Permittees will operate the AWFCO systems, specified in Permit Table
37 III.10.K.F, as approved/modified pursuant to Permit Conditions III.10.J.5 and
38 III.J.3.d.v, to automatically cut-off and/or lock-out the dangerous and/or mixed waste
39 feed to HLW Vitrification System when all instruments specified on Permit Table
40 III.10.I.F for measuring the monitored parameters fails or exceeds its span value.
- 41 **III.10.K.1.c.iv** The Permittees will operate the AWFCO systems, specified in Permit Table
42 III.10.K.F, as approved/modified pursuant to Permit Conditions III.10.J.5 and
43 III.J.3.d.v, to automatically cut-off and/or lock out the dangerous and/or mixed waste
44 feed to the HLW Vitrification System when any portion of the HLW Vitrification
45 System is bypassed. The terms “bypassed” and “bypass event” as used in Permit
46 Sections III.10.J and K will mean if any portion of the HLW Vitrification System is
47 bypassed so that gases are not treated as during the Demonstration Test.

1 **III.10.K.1.c.v** In the event of a malfunction of the AWFCO systems listed in Permit Table
 2 III.10.K.F, as approved/modified pursuant to Permit Conditions III.10.J.5 and
 3 III.J.3.d.v, the Permittees will immediately, manually, cut-off the dangerous and/or
 4 mixed waste feed to the HLW Vitrification System. The Permittees will not restart
 5 the dangerous and/or mixed waste feed until the problem causing the malfunction has
 6 been identified and corrected.

7 **III.10.K.1.c.vi** The Permittees will manually cut-off the dangerous and/or mixed waste feed to the
 8 HLW Vitrification System when the operating conditions deviate from the limits
 9 specified in Permit Condition III.10.K.1.c.i, unless the deviation automatically
 10 activates the waste feed cut-off sequence specified in Permit Conditions
 11 III.10.K.1.c.ii, iii, and/or iv.

12 **III.10.K.1.c.vii** If greater than thirty (30) dangerous and/or mixed waste feed cut-off, combined, to
 13 the HLW Vitrification System occur due to deviations from Permit Table III.10.K.F,
 14 as approved/modified pursuant to Permit Conditions III.10.J.5 and III.J.3.d.v, within
 15 a sixty (60) day period, the Permittees will submit a written report to Ecology within
 16 five (5) calendar days of the thirty-first (31) exceedance including the information
 17 specified below. These dangerous and/or mixed waste feed cut-offs to the HLW
 18 Vitrification System, whether automatically or manually activated, are counted if the
 19 specified set-points are deviated from while dangerous and/or mixed waste and waste
 20 residues continue to be processed in the HLW Vitrification System. A cascade event
 21 is counted at a frequency of one (1) towards the first waste feed cut-off parameter,
 22 specified on Permit Table III.10.K.F, from which the set-point is deviated:

- 23 A. The parameter(s) that deviated from the set-point(s) in Permit Table
- 24 III.10.K.F;
- 25 B. The magnitude, dates, and duration of the deviations;
- 26 C. Results of the investigation of the cause of the deviations; and
- 27 D. Corrective measures taken to minimize future occurrences of the deviations.

28 **III.10.K.1.c.viii** If greater than thirty (30) dangerous and/or mixed waste feed cut-offs, combined, to
 29 the HLW Vitrification System occur due to deviations from Permit Table III.10.K.F,
 30 as approved/modified pursuant to Permit Conditions III.10.J.5 and III.J.3.d.v, within
 31 a thirty (30) day period, the Permittees will submit the written report required to be
 32 submitted pursuant to Permit Condition III.10.K.1.c.vii to Ecology, on the first
 33 business day following the thirty-first exceedance. These dangerous and/or mixed
 34 waste feed cut-offs to the HLW Vitrification System, whether automatically or
 35 manually activated, are counted if the specified set-points are deviated from while
 36 dangerous and/or mixed waste and waste residues continue to be processed in the
 37 HLW Vitrification System. A cascade event is counted at a frequency of one (1)
 38 towards the first waste feed cut-off parameter, specified on Permit Table III.10.K.F,
 39 from which the set-point is deviated:

40 In accordance with [WAC 173-303-680](#)(2) and (3), the Permittees may not resume
 41 dangerous and/or mixed waste feed to the HLW Vitrification System until this written
 42 report has been submitted; and

- 43 A. Ecology has authorized the Permittees, in writing, to resume dangerous
- 44 and/or mixed waste feed, or
- 45 B. Ecology has not, within seven (7) days, notified the Permittees in writing of
- 46 the following:

- 1 1. The Permittees written report does not document that the corrective
2 measures taken will minimize future exceedances.
 - 3 2. The Permittees must take further corrective measures and document that
4 these further corrective measures will minimize future exceedances.
- 5 **III.10.K.1.c.ix** If any portion of the HLW Vitrification System is bypassed while treating dangerous
6 and/or mixed waste, it will be regarded as non-compliance with the operating
7 conditions specified in Permit Condition III.10.K.1.c and the performance standards
8 specified in Permit Condition III.10.K.1.b. After such a bypass event, the Permittees
9 will perform the following actions:
- 10 A. Investigate the cause of the bypass event.
 - 11 B. Take appropriate corrective measures to minimize future bypasses.
 - 12 C. Record the investigation findings and corrective measures in the operating
13 record.
 - 14 D. Submit a written report to Ecology within five (5) days of the bypass event
15 documenting the result of the investigation and corrective measures.
- 16 **III.10.K.1.c.x** The Permittees will control fugitive emissions from the HLW Vitrification System by
17 maintaining the melter under negative pressure.
- 18 **III.10.K.1.c.xi** Compliance with the operating conditions specified in Permit Condition III.10.K.1.c.
19 will be regarded as compliance with the required performance standards identified in
20 Permit Condition III.10.K.1.b. However, evidence that compliance with these
21 operating conditions is insufficient to ensure compliance with the performance
22 standards, will justify modification, revocation, or re-issuance of this Permit, in
23 accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g.
- 24 **III.10.K.1.d** Inspection Requirements [[WAC 173-303-680\(3\)](#)]
- 25 **III.10.K.1.d.i** The Permittees will inspect the HLW Vitrification System in accordance with the
26 Inspection Plan in Operating Unit Group 10, Chapter 6A of this Permit, as modified
27 in accordance with Permit Condition III.10.C.5.c.
- 28 **III.10.K.1.d.ii** The inspection data for HLW Vitrification System will be recorded, and the records
29 will be placed in the WTP Unit operating record for HLW Vitrification System, in
30 accordance with Permit Condition III.10.C.4.
- 31 **III.10.K.1.d.iii** The Permittees will comply with the inspection requirements specified in Operating
32 Unit Group 10, Appendix 10.15 of this Permit, as approved pursuant to Permit
33 Condition III.10.J.5.f, and as modified by Permit Conditions III.10.J.3, III.10.K.1.b.x,
34 III.10.K.1.b.xii, and III.10.K.1.h.
- 35 **III.10.K.1.e** Monitoring Requirements [[WAC 173-303-670\(5\)](#), [WAC 173-303-670\(6\)](#), [WAC 173-303-670\(7\)](#),
36 and [WAC 173-303-807\(2\)](#)], in accordance with [WAC 173-303-680\(3\)](#)]
- 37 **III.10.K.1.e.i** Upon receipt of a written request from Ecology, the Permittees will perform sampling
38 and analysis of the dangerous and/or mixed waste and exhaust emissions to verify
39 that the operating requirements established in the permit achieve the performance
40 standards delineated in this Permit.
- 41 **III.10.K.1.e.ii** The Permittees will comply with the monitoring requirements specified in the
42 Operating Unit Group 10, Appendices 10.2, 10.3, 10.7, 10.13, 10.15, and 10.18 of
43 this Permit, as approved pursuant to Permit Condition III.10.J.5, and as modified by
44 Permit Conditions III.10.J.3, III.10.K.1.h, and III.10.K.1.b.x and xii.

- 1 **III.10.K.1.e.iii** The Permittees will operate, calibrate, and maintain the carbon monoxide CEMS as
 2 specified in this Permit in accordance with Performance Specifications found in
 3 [40 CFR Part 60](#), Appendix B, in accordance with Appendix to Subpart EEE of
 4 [40 CFR Part 63](#), and Operating Unit Group 10 Appendix 10.15 of this Permit, as
 5 approved pursuant to Permit Condition III.10.J.5.f, and as modified by Permit
 6 Conditions III.10.J.3, III.10.K.1.h, and III.10.K.1.b.x and xii.
- 7 **III.10.K.1.e.iv** The Permittees will operate, calibrate, and maintain the instruments specified on
 8 Permit Tables III.10.K.C and F, as approved/modified pursuant to Permit Conditions
 9 III.10.J.5 and III.10.J.3.d.v, in accordance with Operating Unit Group 10, Appendix
 10 10.15 of this Permit, as approved pursuant to Permit Condition III.10.J.5.f, and as
 11 modified by Permit Conditions III.10.J.3, III.10.K.1.h, and III.10.K.1.b.x and xii.
- 12 **III.10.K.1.e.v** The Permittees shall calibrate, inspect, and maintain or replace the following cooling
 13 water flow and temperature instruments: (Melter 1: FT/FI-0306, FT/FI-0316, FT/FI-
 14 0321, FT/FI-0326, FT/FI-0336, TE/TT/TI-0352; Melter 2: FT/FI-2306, FT/FI-2316,
 15 FT/FI-2321, FT/FI-2326, FT/FI-2336, TE/TT/TI-2352) in accordance with
 16 manufacturer's recommendations.
- 17 **III.10.K.1.f** Recordkeeping Requirements [[WAC 173-303-380](#) and [WAC 173-303-680\(3\)](#)]
- 18 **III.10.K.1.f.i** The Permittees will record and maintain in the WTP Unit operating record for the
 19 HLW Vitrification System, all monitoring, calibration, maintenance, test data, and
 20 inspection data compiled under the conditions of this Permit, in accordance with
 21 Permit Conditions III.10.C.4 and 5 as modified by Permit Conditions III.10.J.3,
 22 III.10.K.1.h, and III.10.K.1.b.x and xii.
- 23 **III.10.K.1.f.ii** The Permittees will record in the WTP Unit operating record the date, time, and
 24 duration of all automatic waste feed cut-offs and/or lockouts, including the triggering
 25 parameters, reason for the deviation, and recurrence of the incident. The Permittees
 26 will also record all incidents of AWFCO system function failures, including the
 27 corrective measures taken to correct the condition that caused the failure.
- 28 **III.10.K.1.f.iii** The Permittees will submit to Ecology an annual report each calendar year within
 29 ninety (90) days following the end of the year. The report will include the following
 30 information:
- 31 A. Total dangerous and/or mixed waste feed processing time for the HLW
 32 Vitrification System.
- 33 B. Date/Time of all HLW Vitrification System startups and shutdowns.
- 34 C. Date/Time/Duration/Cause/Corrective Action taken for all HLW Vitrification
 35 System shutdowns caused by malfunction of either process or control
 36 equipment.
- 37 D. Date/Time/Duration/Cause/Corrective Action taken for all instances of
 38 dangerous and/or mixed waste feed cut-off due to deviations from Permit
 39 Table III.10.K.F, as approved/modified pursuant to Permit Conditions
 40 III.10.J.5 and III.10.J.3.d.v.
- 41 **III.10.K.1.f.iv** The Permittees will submit an annual report to Ecology each calendar year within
 42 ninety (90) days following the end of the year of all quarterly CEMS Calibration
 43 Error and Annual CEMS Performance Specification Tests conducted in accordance
 44 with Permit Condition III.10.K.1.e.iii.

- 1 **III.10.K.1.f.v** The Permittees shall maintain operating and calibration/maintenance records for
 2 Ecology’s inspection for the following cooling water flow and temperature
 3 instruments (Melter 1: FT/FI-0306, FT/FI-0316, FT/FI-0321, FT/FI-0326,
 4 FT/FI-0336, TE/TT/TI-0352; Melter 2: FT/FI-2306, FT/FI-2316, FT/FI-2321,
 5 FT/FI-2326, FT/FI-2336, TE/TT/TI-2352).
- 6 **III.10.K.1.f.vi** The Permittees shall maintain refractory thermocouple temperature data for Ecology
 7 inspection.
- 8 **III.10.K.1.g** Closure
 9 The Permittees will close the HLW Vitrification System in accordance with Operating
 10 Unit Group 10, Addendum H of this Permit, as approved pursuant to Permit Condition
 11 III.10.C.8.
- 12 **III.10.K.1.h** Periodic Emission Re-testing Requirements [[WAC 173-303-670\(5\)](#), [WAC 173-303-](#)
 13 [670\(7\)](#), and [WAC 173-303-807\(2\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 14 **III.10.K.1.h.i** Dioxin and Furan Emission Testing
- 15 A. Within eighteen (18) months of commencing operation pursuant to Permit
 16 Section III.10.K, the Permittees will submit to Ecology for approval, a
 17 Dioxin and Furan Emission Test Plan (DFETP) for the performance of
 18 emission testing of the HLW Vitrification System gases for dioxin and furans
 19 during “Normal Operating Conditions” as a permit modification in
 20 accordance with Permit Conditions III.10.C.2.e and f. The DFETP will
 21 include all elements applicable to dioxin and furan emission testing included
 22 in the “Previously Approved Demonstration Test Plan,” applicable EPA
 23 promulgated test methods and procedures in effect at the time of the
 24 submittal, and projected commencement and completion dates for dioxin and
 25 furan emission test. “Normal Operating Conditions” will be defined for the
 26 purposes of this permit condition as follows:
- 27 1. Carbon monoxide emissions, dangerous and/or mixed waste feed-rate,
 28 and automatic waste feed cut-off parameters specified on Permit Table
 29 III.10.K.F (as approved/modified pursuant to Permit Conditions
 30 III.10.J.5 and III.10.J.3.d.v), that were established to maintain
 31 compliance with Permit Condition III.10.K.1.b.iv, as specified in
 32 Operating Unit Group 10, Appendix 10.15 of this Permit (as approved
 33 pursuant to Permit Condition III.10.J.3.d and in accordance with
 34 III.10.K.1.b.xii and III.10.K.1.c.xi), are held within the range of the
 35 average value over the previous twelve (12) months and the set-point
 36 value specified on Permit Table III.10.K.F. The average value is defined
 37 as the sum of the rolling average values recorded over the previous
 38 twelve (12) months divided by the number of rolling averages recorded
 39 during that time. The average value will not include calibration data,
 40 malfunction data, and data obtained when not processing dangerous
 41 and/or mixed waste.
- 42 2. Feed-rate of metals, ash, and chlorine/chloride are held within the range
 43 of the average value over the previous twelve (12) months and the set-
 44 point value specified on Permit Table III.10.K.D (as approved/modified
 45 pursuant to Permit Conditions III.10.J.5 and III.10.J.3.d.v). Feed-rate of
 46 organics as measured by TOC are held within the range of the average
 47 value over the previous twelve (12) months. The average value is

1 defined as the sum of the rolling average values recorded over the
2 previous twelve (12) months divided by the number of rolling averages
3 recorded during that time. The average value will not include data
4 obtained when not processing dangerous and/or mixed waste.

5 For purposes of this permit Condition, the “Previously Approved
6 Demonstration Test Plan” is defined to include the Demonstration Test Plan
7 approved pursuant to Permit Condition III.10.J.5.f.

- 8 B. Within sixty (60) days of Ecology’s approval of the DFETP, or within thirty-
9 one (31) months of commencing operation pursuant to Permit Section
10 III.10.K, whichever is later, the Permittees will implement the DFETP
11 approved, pursuant to Permit Condition III.10.K.1.h.i.A.
- 12 C. The Permittees will resubmit the DFETP, approved pursuant to Permit
13 Condition III.10.K.1.h.i.A, revised to include applicable EPA promulgated
14 test methods and procedures in effect at the time of the submittal, and
15 projected commencement and completion dates for dioxin and furan
16 emission test as a permit modification in accordance with Permit Conditions
17 III.10.C.2.e and f at twenty-four (24) months from the implementation date
18 of the testing required pursuant to Permit Condition III.10.K.1.h.i.A and at
19 reoccurring eighteen (18) month intervals from the implementation date of
20 the previously approved DFETP. The Permittees will implement these
21 newly approved revised DFETPs every thirty-one (31) months from the
22 previous approved DFETP implementation date or within sixty (60) days of
23 the newly Ecology approved revised DFETP, whichever is later, for the
24 duration of this Permit.
- 25 D. The Permittees will submit a summary of operating data collected pursuant to
26 the DFETPs in accordance with Permit Conditions III.10.K.1.h.i.A and C to
27 Ecology upon completion of the tests. The Permittees will submit to Ecology
28 the complete test report within ninety (90) calendar days of completion of the
29 testing. The test reports will be certified as specified in [WAC 173-303-
30 807](#)(8), in accordance with [WAC 173-303-680](#)(2) and (3).
- 31 E. If any calculations or testing results collected pursuant to the DFETPs in
32 accordance with Permit Conditions III.10.K.1.h.i.A and C show that one or
33 more of the performance standards listed in Permit Condition III.10.K.1.b,
34 with the exception of Permit Condition III.10.K.1.b.x, for the HLW
35 Vitrification System were not met during the emission test, the Permittees
36 will perform the following actions:
- 37 1. Immediately stop dangerous and/or mixed waste feed to the HLW
38 Vitrification System under the mode of operation that resulted in not
39 meeting the performance standard(s).
 - 40 2. Verbally notify Ecology within twenty-four (24) hours of discovery of
41 not meeting the performance standard(s) as specified in Permit Condition
42 I.E.21.
 - 43 3. Investigate the cause of the failure and submit a report of the
44 investigation findings to Ecology within fifteen (15) days of discovery of
45 not meeting the performance standard(s).
 - 46 4. Submit to Ecology within fifteen (15) days of discovery of not meeting
47 the performance standard(s) documentation supporting a mode of
48 operation where all performance standards listed in Permit Condition
49 III.K.1.b, with the exception of Permit Condition III.10.K.1.b.x, for the

- 1 HLW Vitrification System were met during the demonstration test, if any
 2 such mode was demonstrated.
- 3 5. Based on the information provided to Ecology by the Permittees,
 4 pursuant to Permit Conditions III.10.K.1.h.i.E.1 through 4 above, and
 5 any additional information, Ecology may provide, in writing, direction to
 6 the Permittees to stop dangerous and/or mixed waste feed to the HLW
 7 Vitrification System and/or amend the mode of operation the Permittees
 8 are allowed to continue operations prior to Ecology approval of the
 9 revised Demonstration Test Plan pursuant to Permit Condition
 10 III.10.K.1.h.i.E.6.
- 11 6. Submit to Ecology within one hundred and twenty (120) days of
 12 discovery of not meeting the performance standard(s) a revised
 13 Demonstration Test Plan requesting approval to retest as a permit
 14 modification pursuant to Permit Conditions III.10.C.2.e and f. The
 15 revised Demonstration Test Plan must include substantive changes to
 16 prevent failure from reoccurring reflecting performance under operating
 17 conditions representative of the extreme range of normal conditions, and
 18 include revisions to Permit Tables III.10.K.D and F.
- 19 F. If any calculations or testing results collected pursuant to the DFETPs in
 20 accordance with Permit Conditions III.10.K.1.h.i.A and C show that any
 21 emission rate for any constituent listed in Permit Table III.10.K.E, as
 22 approved/modified pursuant to Permit Conditions III.10.C.11.c or d, is
 23 exceeded for HLW Vitrification System during the emission test, the
 24 Permittees will perform the following actions:
- 25 1. Verbally notify Ecology within twenty-four (24) hours of the discovery
 26 of exceeding the emission rate(s) as specified in Permit Condition I.E.21;
 27
- 28 2. Submit to Ecology additional risk information to indicate that the
 29 increased emissions impact is off-set by decreased emission impact from
 30 one or more constituents expected to be emitted at the same time, and/or
 31 investigate the cause and impact of the exceedance and submit a report of
 32 the investigation findings to Ecology within fifteen (15) days of this
 33 discovery of exceeding the emission rate(s); and
- 34 3. Based on the notification and any additional information, Ecology may
 35 provide, in writing, direction to the Permittees to stop dangerous and/or
 36 mixed waste feed to the HLW Vitrification System and/or to submit a
 37 revised Demonstration Test Plan as a permit modification pursuant to
 38 Permit Conditions III.10.C.2.e and f, or III.10.C.2.g. The revised
 39 Demonstration Test Plan must include substantive changes to prevent
 40 failure from reoccurring reflecting performance under operating
 41 conditions representative of the extreme range of normal conditions, and
 42 include revisions to Permit Tables III.10.K.D and F.

42 **III.10.K.1.h.ii** Non-organic Emission Testing

- 43 A. Within forty-eight (48) months of commencing operation pursuant to Permit
 44 Section III.10.K, the Permittees will resubmit to Ecology for approval the
 45 “Previously Approved Demonstration Test Plan” revised as a permit
 46 modification in accordance with Permit Conditions III.10.C.2.e and f. The
 47 revised Demonstration Test Plan (RDTP) will include applicable EPA
 48 promulgated test methods and procedures in effect at the time of the

1 submittal, projected commencement and completion dates for emission
2 testing to demonstrate performance standards specified in Permit Conditions
3 III.10.K.1.b.ii, iii, v, vi, and vii, and non-organic emissions as specified in
4 Permit Table III.10.K.E, as approved/modified pursuant to Permit Conditions
5 III.10.J.3.d and III.10.C.11.c or d, under “Normal Operating Conditions.”
6 “Normal Operating Conditions” will be defined for the purposes of this
7 permit condition as follows:

- 8 1. Carbon monoxide emissions, dangerous and/or mixed waste feed-rate,
9 and automatic waste feed cut-off parameters specified in Permit Table
10 III.10.K.F, as approved/modified pursuant to Permit Conditions
11 III.10.J.3.d and III.10.C.11.c or d, that were established to maintain
12 compliance with Permit Conditions III.10.K.1.b.ii, iii, v, vi, and vii, and
13 non-organic emissions, as specified in Permit Table III.10.K.E, as
14 specified in Operating Unit Group 10, Appendix 10.15 of this Permit
15 (as approved pursuant to Permit Conditions III.10.J.3.d and III.10.C.11.c
16 or d), are held within the range of the average value over the previous
17 twelve (12) months and the set-point value specified on Permit Table
18 III.10.K.F. The average value is defined as the sum of the rolling
19 average values recorded over the previous twelve (12) months divided by
20 the number of rolling averages recorded during that time. The average
21 value will not include calibration data, malfunction data, and data
22 obtained when not processing dangerous and/or mixed waste; and
- 23 2. Feed-rate of metals, ash, and chlorine/chloride are held within the range
24 of the average value over the previous twelve (12) months and the set-
25 point value specified on Permit Table III.10.K.D, as approved/modified
26 pursuant to Permit Conditions III.10.J.3.d and III.10.C.11.c or d. The
27 average value is defined as the sum of all rolling average values recorded
28 over the previous twelve (12) months divided by the number of rolling
29 averages recorded during that time. The average value will not include
30 data obtained when not processing dangerous and/or mixed waste.

31 For purposes of this permit Condition, the “Previously Approved
32 Demonstration Test Plan” is defined to include the Demonstration Test Plan
33 approved pursuant to Permit Condition III.10.J.5.f.

- 34 B. Within sixty (60) days of Ecology’s approval of the RDTP, or within sixty
35 (60) months of commencing operation pursuant to Permit Section III.10.K,
36 whichever is later, the Permittees will implement the RDTP approved
37 pursuant to Permit Condition III.10.K.1.h.ii.A.
- 38 C. The Permittees will resubmit the RDTP, approved pursuant to Permit
39 Condition III.10.K.1.h.ii.A, revised to include applicable EPA promulgated
40 test methods and procedures in effect at the time of the submittal, and
41 projected commencement and completion dates for emission test as a permit
42 modification in accordance with Permit Conditions III.10.C.2.e and f at
43 forty-eight (48) months from the implementation date of the testing required
44 pursuant to Permit Condition III.10.K.1.h.ii.A and at reoccurring forty-eight
45 (48) month intervals from the implementation date of the previously
46 approved RDTP. The Permittees will implement these newly approved
47 revised RDTP, every sixty (60) months from the previous approved RDTP
48 implementation date or within sixty (60) days of the newly Ecology approved
49 revised RDTP, whichever is later, for the duration of this Permit.

- 1 D. The Permittees will submit a summary of operating data collected pursuant to
2 the RDTPs in accordance with Permit Conditions III.10.K.1.h.ii.A and C to
3 Ecology upon completion of the tests. The Permittees will submit to Ecology
4 the complete test report within ninety (90) calendar days of completion of the
5 testing. The test reports will be certified pursuant to [WAC 173-303-807](#)(8),
6 in accordance with [WAC 173-303-680](#)(2) and (3).
- 7 E. If any calculations or testing results collected pursuant to the DFETPs in
8 accordance with Permit Conditions III.10.K.1.h.ii.A and C show that any
9 emission rate for any constituent listed in Permit Table III.10.K.E, as
10 approved/modified pursuant to Permit Conditions III.10.J.3.d and
11 III.10.C.11.c or d, is exceeded for HLW Vitrification System during the
12 emission test, the Permittees will perform the following actions:
- 13 1. Verbally notify Ecology within twenty-four (24) hours of the discovery
14 of exceeding the emission rate(s) as specified in Permit Condition I.E.21.
 - 15 2. Submit to Ecology additional risk information to indicate that the
16 increased emissions impact is off-set by decreased emission impact from
17 one or more constituents expected to be emitted at the same time, and/or
18 investigate the cause and impact of the exceedance and submit a report of
19 the investigation findings to Ecology within fifteen (15) days of this
20 discovery of exceeding the emission rate(s).
 - 21 3. Based on the notification and any additional information, Ecology may
22 provide, in writing, direction to the Permittees to stop dangerous and/or
23 mixed waste feed to the HLW Vitrification System and/or to submit a
24 revised Demonstration Test Plan as a permit modification pursuant to
25 Permit Conditions III.10.C.2.e and f, or III.10.C.2.g. The revised
26 Demonstration Test Plan must include substantive changes to prevent
27 failure from reoccurring reflecting performance under operating
28 conditions representative of the extreme range of normal conditions, and
29 include revisions to Permit Tables III.10.K.D and III.10.K.F.
- 30 F. If any calculations or testing results collected pursuant to the DFETPs in
31 accordance with Permit Conditions III.10.K.1.h.ii.A and C show that one or
32 more of the performance standards listed in Permit Condition III.10.K.1.b,
33 with the exception of Permit Condition III.10.K.1.b.x, for the HLW
34 Vitrification System were not met during the emission test, the Permittees
35 will perform the following actions:
- 36 1. Immediately stop dangerous and/or mixed waste feed to the HLW
37 Vitrification System under the mode of operation that resulted in not
38 meeting the performance standard(s).
 - 39 2. Verbally notify Ecology within twenty-four (24) hours of discovery of
40 not meeting the performance standard(s), as specified in Permit
41 Condition I.E.21.
 - 42 3. Investigate the cause of the failure and submit a report of the
43 investigation findings to Ecology within fifteen (15) days of discovery of
44 not meeting the performance standard(s).
 - 45 4. Submit to Ecology within fifteen (15) days of discovery of not meeting
46 the performance standard(s) documentation supporting a mode of
47 operation where all performance standards listed in Permit Condition
48 III.K.1.b, with the exception of Permit Condition III.10.K.1.b.x, for the

1 HLW Vitrification System were met during the demonstration test, if any
2 such mode was demonstrated.

- 3 5. Based on the information provided to Ecology by the Permittees pursuant
4 to Permit Conditions III.10.K.1.h.ii.F.1 through 4 above, and any
5 additional information, Ecology may provide, in writing, direction to the
6 Permittees to stop dangerous and/or mixed waste feed to the HLW
7 Vitrification System and/or amend the mode of operation the Permittees
8 are allowed to continue operations prior to Ecology approval of the
9 revised Demonstration Test Plan pursuant to Permit Condition
10 III.10.K.1.h.ii.F.6.
- 11 6. Submit to Ecology within one hundred and twenty (120) days of
12 discovery of not meeting the performance standard(s) a revised
13 Demonstration Test Plan requesting approval to retest as a permit
14 modification pursuant to Permit Conditions III.10.C.2.e and f. The
15 revised Demonstration Test Plan must include substantive changes to
16 prevent failure from reoccurring reflecting performance under operating
17 conditions representative of the extreme range of normal conditions, and
18 include revisions to Permit Tables III.10.K.D and F.

19 **III.10.K.1.h.iii** Other Emission Testing

- 20 A. Within seventy-eight (78) months of commencing operation pursuant to
21 Permit Section III.10.K, the Permittees will resubmit to Ecology for approval
22 the "Previously Approved Demonstration Test Plan" revised as a permit
23 modification in accordance with Permit Conditions III.10.C.2.e and f. The
24 revised Demonstration Test Plan (RDTP) will include applicable EPA
25 promulgated test methods and procedures in effect at the time of the
26 submittal, projected commencement and completion dates for emission
27 testing to demonstrate performance standards as specified in Permit
28 Conditions III.10.K.1.b.viii and ix, and emissions as specified on Permit
29 Table III.10.K.E, as approved/modified pursuant to Permit Conditions
30 III.10.J.3.d and III.10.C.11.c or d, not addressed under Permit Conditions
31 III.10.K.1.h.i or ii under "Normal Operating Conditions." "Normal
32 Operating Conditions" will be defined for the purposes of this permit
33 Condition as follows:

- 34 1. Carbon monoxide emissions, dangerous and/or mixed waste feed-rate,
35 and automatic waste feed cut-off parameters specified on Permit Table
36 III.10.K.F, as approved/modified pursuant to Permit Condition
37 III.10.J.3.d and III.10.C.11.c or d, that were established to maintain
38 compliance with Permit Conditions III.10.K.1.b.viii and ix, and
39 emissions as specified on Permit Table III.10.K.E, not addressed under
40 Permit Conditions III.10.K.1.h.i or ii as specified in Operating Unit
41 Group 10, Appendix 10.15 of this Permit, as approved pursuant to Permit
42 Condition III.10.J.3.d, and in accordance with Permit Conditions
43 III.10.K.1.b.xii and III.10.K.1.c.xi are held within the range of the
44 average value over the previous twelve (12) months and the set-point
45 value specified on Permit Table III.10.K.F. The average value is defined
46 as the sum of all rolling average values recorded over the previous
47 twelve (12) months divided by the number of rolling averages recorded
48 during that time. The average value will not include calibration data,

malfunction data, and data obtained when not processing dangerous and/or mixed waste; and

2. Feed-rate of metals, ash, and chlorine/chloride are held within the range of the average value over the previous twelve (12) months and the set-point value specified on Permit Table III.10.K.D, as approved/modified pursuant to Permit Conditions III.10.J.3.d and III.10.C.11.c or d. Feed-rate of organics as measured by TOC are held within the range of the average value over the previous twelve (12) months. The average value is defined as the sum of the rolling average values recorded over the previous twelve (12) months divided by the number of rolling averages recorded during that time. The average value will not include data obtained when not processing dangerous and/or mixed waste.

For purposes of this permit Condition, the “Previously Approved Demonstration Test Plan” is defined to include the Demonstration Test Plan approved pursuant to Permit Condition III.10.J.5.f.

- B. Within sixty (60) days of Ecology’s approval of the RDTP, or within ninety-one (91) months of commencing operation pursuant to Permit Section III.10.K, whichever is later, the Permittees will implement the RDTP approved pursuant to Permit Condition III.10.K.1.h.iii.A.
- C. The Permittees will submit a summary of operating data collected pursuant to the RDTPs in accordance with Permit Condition III.10.K.1.h.iii.A to Ecology upon completion of the tests. The Permittees will submit to Ecology the complete test report within ninety (90) calendar days of completion of the testing. The test reports will be certified as specified in [WAC 173-303-807](#)(8), in accordance with Permit Condition [WAC 173-303-680](#)(2) and (3).
- D. If any calculations or testing results show that one or more of the performance standards listed in Permit Condition III.10.K.1.b, with the exception of Permit Condition III.10.K.1.b.x, for the HLW Vitrification System were not met during the emission test, the Permittees will perform the following actions:
 1. Immediately stop dangerous and/or mixed waste feed to the HLW Vitrification System under the mode of operation that resulted in not meeting the performance standard(s).
 2. Verbally notify Ecology within twenty-four (24) hours of discovery of not meeting the performance standard(s), as specified Permit Condition I.E.21.
 3. Investigate the cause of the failure and submit a report of the investigation findings to Ecology within fifteen (15) days of discovery of not meeting the performance standard(s).
 4. Submit to Ecology within fifteen (15) days of discovery of not meeting the performance standard(s) documentation supporting a mode of operation where all performance standards listed in Permit Condition III.10.K.1.b, with the exception of Permit Condition III.10.K.1.b.x, for the HLW Vitrification System were met during the demonstration test, if any such mode was demonstrated.
 5. Based on the information provided to Ecology by the Permittees pursuant to Permit Conditions III.10.K.1.h.iii.D.1 through 4 above, and any additional information, Ecology may provide, in writing, direction to the

- 1 Permitees to stop dangerous and/or mixed waste feed to the HLW
2 Vitrification System and/or amend the mode of operation the Permitees
3 are allowed to continue operations prior to Ecology approval of the
4 revised Demonstration Test Plan, pursuant to Permit Condition
5 III.10.K.1.h.iii.D.6.
- 6 6. Submit to Ecology within one hundred and twenty (120) days of
7 discovery of not meeting the performance standard(s) a revised
8 Demonstration Test Plan requesting approval to retest as a permit
9 modification pursuant to Permit Conditions II.10.C.2.e and f. The
10 revised Demonstration Test Plan must include substantive changes to
11 prevent failure from reoccurring reflecting performance under operating
12 conditions representative of the extreme range of normal conditions, and
13 include revisions to Permit Tables III.10.K.D and F.
- 14 E. If any calculations or testing results show that any emission rate for any
15 constituent listed in Permit Table III.10.K.E, as approved/modified pursuant
16 to Permit Condition III.10.C.11.c or d, is exceeded for HLW Vitrification
17 System during the emission test, the Permitees will perform the following
18 actions:
- 19 1. Verbally notify Ecology within twenty-four (24) hours of the discovery
20 of exceeding the emission rate(s) as specified in Permit Condition I.E.21;
- 21 2. Submit to Ecology additional risk information to indicate that the
22 increased emissions impact is off-set by decreased emission impact from
23 one or more constituents expected to be emitted at the same time, and/or
24 investigate the cause and impact of the exceedance of the emission
25 rate(s) and submit a report of the investigation findings to Ecology
26 within fifteen (15) days of the discovery of the exceedance of the
27 emission rate(s); and
- 28 3. Based on the notification and any additional information, Ecology may
29 provide, in writing, direction to the Permitees to stop dangerous and/or
30 mixed waste feed to the HLW Vitrification System and/or to submit a
31 revised Demonstration Test Plan as a permit modification pursuant to
32 Permit Conditions III.10.C.2.e and f, or III.10.C.2.g. The revised
33 Demonstration Test Plan must include substantive changes to prevent
34 failure from reoccurring reflecting performance under operating
35 conditions representative of the extreme range of normal conditions, and
36 include revisions to Permit Tables III.10.K.D and F.

1
2
3
4
5

This page intentionally left blank.

Table III.10.K.A – HLW Vitrification System Description

Sub-system Description	Sub-System Designation	Engineering Description (Drawing Nos., etc.)	Narrative Description, Tables, and Figures
RESERVED	RESERVED	RESERVED	RESERVED

^a Permit Table III.10.K.A will be completed in accordance with Permit Condition III.10.J.5.e.x, prior to initiating Permit Condition III.10.K.1. See Permit Table III.10.J.A for the current HLW Vitrification System Description.

1

Table III.10.K.B – HLW Vitrification System Secondary Containment Systems Including Sumps and Floor Drains

Sump/Floor Drain I.D. # & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions^b (feet) & Materials of Construction	Engineering Description (Drawing Nos., Specification Nos., etc.)
RESERVED	RESERVED	RESERVED	RESERVED

^a Permit Table III.10.K.B will be completed in accordance with Permit Condition III.10.J.5.b.vii, prior to initiating Permit Condition III.10.K.1. See Permit Table III.10.J.B for the current HLW Vitrification System Secondary Containment Systems Including Sumps and Floor Drains.

^b Dimensions listed are based on permitted design. Actual dimensions may vary within plus or minus (TBD).

2

Table III.10.K.C – HLW Vitrification System Process and Leak Detection System Instruments and Parameters

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

^a Permit Table III.10.K.C will be completed in accordance with Permit Condition III.10.J.5.e.ix, prior to initiating Permit Condition III.10.K.1. See Permit Table III.10.J.C for the current HLW Vitrification System Process and Leak Detection System Instruments and Parameters.

3

1
2
3
4
5

This page intentionally left blank.

1

Table III.10.K.D – Maximum Feed-rates to HLW Vitrification System (RESERVED)

Description of Waste	Normal Operation
Dangerous and/or mixed waste Feed Rate	RESERVED
Ash Feed Rate	RESERVED
Total Chlorine/Chloride Feed Rate	RESERVED
Total Metal Feed Rates	RESERVED

2

Table III.10.K.E – HLW Vitrification System Estimated Emission Rates (RESERVED)

Chemicals	CAS Number	Emission Rates (grams/second)
RESERVED	RESERVED	RESERVED

3

TABLE III.10.K.F – HLW Vitrification System Waste Feed Cut-off Parameters* 1 (RESERVED)

Sub-system Designation	Instrument Tag Number	Parameter Description	Set-points During Normal Operation
RESERVED	RESERVED	RESERVED	RESERVED

*A CMS will be used as defined in Permit Section III.10.C.1.

¹Maximum Feed-rate will be set based on not exceeding any of the constituent (e.g., metals, ash, and chlorine/chloride) feed limits specified on Table III.10.K.D of this Permit

4

III.10.L ANALYTICAL LABORATORY SPECIFIC OPERATING CONDITIONS

Unit Description

The Analytical Laboratory is one of the six major facilities within the WTP Operating Unit Group. The LAB will operate to ensure efficient WTP operations by performing analysis of samples to meet permitting, process control, authorization basis, and waste form qualification requirements.

The LAB consists of analytical laboratory rooms, hotcells, and a waste management area for storage of secondary waste generated for analytical activities. The LAB also contains a Radioactive Liquid Waste Disposal (RLD) Tank System (tanks and ancillary equipment) which will be used to store and manage liquid waste generated in the LAB. Under the DFLAW configuration, the contents of the laboratory area sink drain collection vessel are transferred to the EMF Direct Feed Effluent Transfer (DEP) System for evaporation and treatment prior to being returned to the LAW vitrification process, or sent to be treated at the Liquid Effluent Retention Facility/Effluent Treatment Facility (LERF/ETF). Construction of the LAB was completed in 2014 and operations are expected to begin 2023.

This Chapter provides unit-specific Permit conditions applicable to the dangerous waste management units for the WTP LAB.

21
22

- 1 **III.10.L.1 Compliance With Unit-Specific Permit Conditions**
- 2 **III.10.L.1.a** The Permittees will comply with all permit conditions and corresponding Chapters for the
3 WTP Operating Unit Group with respect to dangerous waste management and dangerous
4 waste management units in Operating Unit Group 10, in addition to applicable
5 requirements in Part I and II.
- 6 **III.10.L.2 General Waste Management**
- 7 **III.10.L.2.a** The Permittees are authorized to accept, according to the requirements of Permit
8 Condition III.10.C.2 and Chapter 3, Waste Analysis Plan, dangerous/mixed waste for
9 management in Operating Unit Group 10 dangerous waste management units.
- 10 **III.10.L.2.b** The Permittees will manage wastes at the facility in accordance with the requirements of
11 this Permit, including the performance standard requirements in [WAC 173-303-283](#),
12 incorporated by reference.
- 13 **III.10.L.2.c** The Permittees will maintain the physical structure of the Analytical Laboratory as
14 documented in the applicable sections of Permit Chapter 4H, Analytical Laboratory.
15 [[WAC 173-303-640](#)(2), [WAC 173-303-640](#)(3), [WAC 173-303-640](#)(4)]
- 16 **III.10.L.3 Waste Analysis**
- 17 **III.10.L.3.a** The Permittees will comply with requirements in Permit Condition III.10.C.3 and
18 Chapter 3/3A, Waste Analysis Plan, for all dangerous and/or mixed waste managed at the
19 WTP Operating Unit Group. [[WAC 173-303-300](#)(5)]
- 20 **III.10.L.3.b** The Permittees will comply with the requirements of [WAC 173-303-395](#)(1), (2), and (6).
- 21 **III.10.L.3.c** The Permittees will have an accurate and complete waste profile as described in
22 Chapter 3/3A, Waste Analysis Plan, Section 3A.3.1.1, for every waste stream accepted by
23 the Analytical Laboratory. [[WAC 173-303-380](#)(1)(a)(b)]
- 24 **III.10.L.3.d** Inaccurate or incomplete waste analysis information is not a defense for noncompliance
25 by the Permittees with the waste management requirements and conditions in this Permit,
26 or the LDR specified in the requirements of [WAC 173-303-140](#), incorporated by
27 reference.
- 28 **III.10.L.4 Recordkeeping and Reporting**
- 29 **III.10.L.4.a** The Permittees will keep and maintain records in the Hanford Facility Operating Record,
30 Analytical Laboratory, as required by [WAC 173-303-380](#), as specified in the
31 corresponding chapters and Permit Condition II.I.
- 32 **III.10.L.4.b** The Permittees will place a copy of each waste profile required by Permit Condition
33 III.10.C.3.d, in the Hanford Facility Operating Record, Analytical Laboratory file
34 required by Permit Condition II.I. [[WAC 173-303-380](#)(1)(a)]
- 35 **III.10.L.4.c** Records and results of waste analysis required by Permit Condition III.10.C.4 and
36 Chapter 3, Waste Analysis Plan, will be maintained in the Hanford Facility Operating
37 Record, WTP analytical laboratory as required by Permit Condition II.I. [[WAC 173-303-](#)
38 [380](#)(1)(a)]
- 39 **III.10.L.4.d** The Permittees will place updates to engineering drawings listed in Appendix 11 into the
40 Hanford Facility Operating Record for the Analytical Laboratory.

- 1 **III.10.L.4.e** The Permittees will keep summary reports and details of all incidents that require
2 implementation of the Contingency Plan in the Hanford Facility Operating Record,
3 Analytical Laboratory, according to the requirements of Permit Condition II.A.1.
4 [[WAC 173-303-380](#)(1)(d)]
- 5 **III.10.L.5 Security**
- 6 **III.10.L.5.a** The Permittees will maintain in accordance with Permit Condition III.10.C.13 that onsite,
7 unrestricted, twenty-four (24) hour access to key WTP Unit operating data and emissions
8 monitoring data will be provided to Ecology. This onsite, unrestricted access will include
9 providing and maintaining for Ecology only use a computer terminal and printer with
10 access to key WTP Unit operating data bases and emissions monitoring data bases. This
11 terminal will be equipped with all necessary software and hardware to monitor, retrieve,
12 and trend this data. Additional remote access will be provided on Ecology request if
13 security concerns can be addressed.
- 14 **III.10.L.5.b** The Permittees will implement and maintain the practices described in Chapter 6,
15 Procedures to Prevent Hazards, as required by Permit Condition II.M at the WTP
16 Operating Unit Group. [[WAC 173-303-310](#)]
- 17 **III.10.L.6 Preparedness and Prevention**
- 18 **III.10.L.6.a** The Permittees will comply with the Preparedness and Prevention requirements,
19 procedures and practices described in Chapter 6, Procedures to Prevent Hazards, in
20 addition to [WAC 173-303-340](#).
- 21 **III.10.L.6.b** The Permittees will operate and maintain the runoff controls, interlock systems and other
22 systems described in Chapter 6, Procedures to Prevent Hazards, in accordance with the
23 requirements of [WAC 173-303-640](#)(5), incorporated by reference.
- 24 **III.10.L.7 Contingency Plan**
- 25 **III.10.L.7.a** The Permittees will comply with Chapter 7, Contingency Plan in addition to the
26 requirements of Permit Condition II.A when applicable. [[WAC 173-303-350](#)]
- 27 **III.10.L.7.b** The Permittees will implement the emergency procedures specified in Chapter 7,
28 Contingency Plan in the event of a fire, explosion, or release that could threaten human
29 health or the environment, in accordance with the requirements of [WAC 173-303-340](#) and
30 [WAC-173-303-360](#), incorporated by reference.
- 31 **III.10.L.8 Inspections**
- 32 **III.10.L.8.a** The Permittees will implement the practices specific to the WTP Operating Unit Group as
33 described in Chapter 6A, Inspection Plan, and include the inspection requirements of
34 Chapter 6A in the inspection schedule required by Permit Condition II.O.
35 [[WAC 173-303-320](#)]
- 36 **III.10.L.8.b** The Permittees will keep a copy of the elements of the inspection log or summary
37 required by [WAC 173-303-380](#)(1)(e); -380(3) and -320.
- 38 **III.10.L.8.c** The Permittees will remedy any problem revealed by inspections on a schedule which
39 prevents hazards to the public health and environment per the requirements of
40 [WAC 173-303-320](#)(3), incorporated by reference.
- 41 **III.10.L.8.d** Where an inspection reveals a problem that creates a hazard that is imminent or has
42 already occurred, the Permittees will take remedial action immediately per the
43 requirements of [WAC 173-303-320](#)(3), incorporated by reference.

- 1 **III.10.L.9 Training**
- 2 **III.10.L.9.a** The Permittees will include the training requirements described in Chapter 8, Personnel
3 Training, in the training program required by Permit Condition II.C. [[WAC 173-303-](#)
4 [330](#)]
- 5 **III.10.L.10 Other General Requirements – Reserved**
- 6 **III.10.L.11 Closure**
- 7 **III.10.L.11.a** The Permittees will close the WTP Analytical Laboratory Dangerous Waste Management
8 Unit in Operating Unit Group 10 in accordance with Chapter 11, Closure Plan.
9 [[WAC 173-303-610](#)]
- 10 **III.10.L.11.b** The Permittees will provide prior written notice to Ecology of the date they expect to
11 begin closure of any dangerous waste management unit subject to the requirements of
12 this Permit in accordance with Permit Condition II.J.3. The notice of closure may apply
13 to closure of any dangerous waste management units in the WTP Operating Unit Group,
14 or final closure of the remaining Operating Unit Group 10. [[WAC 173-303-610\(3\)\(c\)](#)]
- 15 **III.10.L.12 Post-Closure – Reserved**
- 16 **III.10.L.13 Critical Systems**
- 17 **III.10.L.13.a** The RLD is a critical system within the LAB. The RLD in the LAB will comply with
18 III.10.C.9, Critical Systems.
- 19 **III.10.L.14 Reserved**
- 20 **III.10.L.15 Containers**
- 21 **III.10.L.15.a Container Storage and Treatment Unit Standards**
- 22 **III.10.L.15.b** The Permittees will ensure that all containers remain in good condition. If a container
23 holding mixed and dangerous waste is not in good condition (e.g., severe rusting or
24 corrosion, or apparent structural defects), or if it begins to leak, the Permittees must
25 transfer the waste from the container to a container that is in good condition or place the
26 leaking container in an appropriate over-pack container. [[WAC 173-303-630\(2\)](#)]
- 27 **III.10.L.15.c Container Management Standards**
- 28 **III.10.L.15.d** The Permittees will maintain and manage wastes in accordance with the requirements,
29 procedures, and practices described in Chapter 4H, Analytical Laboratory in addition to
30 [WAC 173-303-630](#).
- 31 **III.10.L.15.e** The contents of any leaking container will be transferred as soon as possible considering
32 safety of the work force to a compatible container which is in good condition or to an
33 over pack container. Any waste residue remaining in the damaged container will be
34 managed as a dangerous waste unless the container is empty pursuant to [WAC 173-303-](#)
35 [160\(2\)](#).
- 36 **III.10.L.15.f** The Permittees will label containers in accordance with the requirements of Chapter 4H,
37 Analytical Laboratory [[WAC 173-303-630\(3\)](#)]
- 38 **III.10.L.15.g** The Permittees will ensure wastes will not be ignitable, reactive or incompatible with
39 containers and with other wastes stored or treated in containers within the Container
40 Storage Area for the Analytical Laboratory, and if such wastes are managed in any
41 container storage area, the containers of incompatible waste or chemicals will not be
42 stored in close proximity to each other; according to the requirements of Chapter 4H,
43 Analytical Laboratory [[WAC 173-303-630\(4\)](#), [WAC 173-303-630\(9\)](#)]

- 1 **III.10.L.15.i** The Permittees will remove any accumulated liquids from container storage areas in
 2 according with the requirements of Chapter 4H, Analytical Laboratory to ensure
 3 containers are not in contact with free liquids and to prevent overflow of the container
 4 storage area secondary containment.
- 5 **III.10.L.15.j** The Permittees will comply with the requirements for air emissions from containers in
 6 Chapter 4H, Analytical Laboratory [[WAC 173-303-692](#)].
- 7 **III.10.L.16 Tank Systems**
- 8 **III.10.L.16.a Tank System Management Requirements**
- 9 **III.10.L.16.a.i** The Permittees will comply with the schedule for conducting integrity assessments
 10 for the WTP analytical laboratory tank systems as described in Chapter 4H,
 11 Analytical Laboratory and the requirements in [WAC 173-303-640](#)(3)(b).
- 12 **III.10.L.16.a.ii** If the findings of an integrity assessment indicate that a WTP analytical laboratory
 13 tank has structural deficiencies or lacks integrity such that it may collapse, rupture, or
 14 fail, the Permittees will at a minimum do the following:
- 15 **III.10.L.16.a.ii.A** Evaluate and review the waste acceptance criteria in Chapter 3, Waste Analysis
 16 Plan;
- 17 **III.10.L.16.a.ii.B** Evaluate and review the applicable tank design and/or operating requirements in
 18 Chapter 4H, Analytical Laboratory;
- 19 **III.10.L.16.a.ii.C** Evaluate and review any other permit requirements, which may reasonably
 20 influence the integrity of the tank in question;
- 21 **III.10.L.16.a.ii.D** Based on this evaluation and review, the Permittees will request the required
 22 permit modifications in accordance with [WAC 173-303-830](#). [[WAC 173-303-](#)
 23 [640](#)(3)(b), [WAC 173-303-815](#)(2)(b)]
- 24 **III.10.L.16.a.iii** The Permittees will submit a permit change notification to the Part A (Chapter 1) for
 25 the Analytical Laboratory in accordance with Permit Condition I.C if the capacity
 26 decreases or increases for the Analytical Laboratory tank systems.
- 27 **III.10.L.16.b Tank System Operating Requirements**
- 28 **III.10.L.16.b.i** The Permittees will not place dangerous wastes or treatment reagents in the tank
 29 system if they could cause the tank, ancillary equipment, or the containment system
 30 to rupture, leak, corrode or fail. [[WAC 173-303-640](#)(5)(a)]
- 31 **III.10.L.16.b.ii** The Permittees will operate the Analytical Laboratory Tank System to prevent spills
 32 and overflows using the controls and practices as required under [WAC 173-303-](#)
 33 [640](#)(5)(b) described in Permit Condition III.10.C.5, and Operating Unit Group 10,
 34 Appendix 13.18 of this Permit. [[WAC 173-303-640](#)(5)(b), [WAC 173-303-](#)
 35 [806](#)(4)(c)(ix)]
- 36 **III.10.L.16.b.iii** The Permittees will comply with the requirements of [WAC 173-303-640](#)(7), in
 37 response to spills or leaks from the Tank System. [[WAC 173-303-640](#)(5)(c)]
- 38 **III.10.L.16.b.iv** For all Analytical Laboratory Unit Systems the Permittees will mark all the unit
 39 systems holding dangerous and/or mixed waste with labels or signs to identify the
 40 waste contained in the unit. The labels or sign must be legible at a distance of at least
 41 fifty (50) feet, and must bear a legend which identifies the waste in a manner which
 42 adequately warns employees, emergency response personnel, and the public of the
 43 major risk(s) associated with the waste being stored or treated in the unit system(s).
 44 [[WAC 173-303-640](#)(5)(d), in accordance with [WAC 173-303-680](#)(2)].

- 1 **III.10.L.16.b.v** For each Analytical Laboratory Unit System holding dangerous waste which are
 2 acutely or chronically toxic by inhalation, the Permittees will operate the system to
 3 prevent escape of vapors, fumes, or other emissions into the air. [[WAC 173-303-](#)
 4 [806\(4\)\(i\)\(i\)\(B\)](#) and [WAC 173-303-640\(5\)\(e\)](#), in accordance with [WAC 173-303-680](#)]
- 5 **III.10.L.16.b.vi** The Permittees will ensure that incompatible wastes/material are not placed in the
 6 same tank system, unless [WAC 173-303-395\(1\)\(b\)](#) is complied with. [[WAC 173-](#)
 7 [303-640\(10\)\(a\)](#)]
- 8 **III.10.L.16.b.vii** The Permittees will not place dangerous waste in a tank system that has not been
 9 previously decontaminated and that previously held an incompatible waste/material,
 10 unless [WAC 173-303-395\(1\)\(b\)](#) is complied with. [[WAC 173-303-640\(10\)\(b\)](#)]
- 11 **III.10.L.16.b.viii** If there is indication that a tank system is leaking or unfit for use, the Permittees will
 12 comply with [WAC 173-303-640\(7\)](#).
- 13 **III.10.L.16.b.ix** The Permittees will not transfer waste into the analytical laboratory tank systems in
 14 excess of the maximum capacity of the tanks as listed in Table III.10.E.D.
- 15 **III.10.L.16.b.x** The Permittees will comply with the requirements of Chapter 4H, Analytical
 16 Laboratory, in response to spills or leaks from tank systems at the Analytical
 17 Laboratory [[WAC 173-303-640\(5\)\(c\)](#), [WAC 173-303-640\(7\)](#)].
- 18 **III.10.L.16.b.xi** The Permittees will comply with the requirements of [WAC 173-303-640\(9\)](#)
 19 incorporated by reference. [[WAC 173-303-640\(9\)](#)]
- 20 **III.10.L.16.b.xii** The Permittees will comply with the requirements of [WAC 173-303-640\(10\)](#),
 21 incorporated by reference.

22 **III.10.M EMF MISCELLANEOUS UNIT SYSTEMS**

23 Unless otherwise noted in Permit Table III.10.M.A, for purposes of Permit Section
 24 III.10.M., where reference is made to [WAC 173-303-640](#), the following substitutions
 25 apply: substitute the terms “EMF Miscellaneous Unit System(s)” for “tank system(s),”
 26 “miscellaneous unit(s)” for “tank(s),” “equipment” for “ancillary equipment,” and
 27 “miscellaneous unit(s) or equipment of a EMF Miscellaneous Unit System” for
 28 “component(s)” in accordance with [WAC 173-303-680](#). Miscellaneous unit systems,
 29 exempt from the [WAC-173-303-640](#) requirements in Permit Section III.10.M are noted as
 30 exempt in Table III.10.M.A.

31 **III.10.M.1 Waste and Storage Limits**

32 **III.10.M.1.a** The Permittees may process, in the EMF Miscellaneous Unit Systems listed in Permit
 33 Table III.10.M.A, as approved/modified pursuant to Permit Condition III.10.M.9, all
 34 dangerous and mixed waste listed in the Part A Forms, Operating Unit Group 10,
 35 Chapter 1 of this Permit, and in accordance with in the WAP, Operating Unit Group 10,
 36 Chapter 3/Chapter 3A of this Permit, as approved pursuant to Permit Condition
 37 III.10.C.3. Total EMF Miscellaneous Unit dangerous and mixed waste storage at the
 38 Facility will not exceed the limits specified in Permit Table III.10.M.A.

39 **III.10.M.1.b** The Permittees may process dangerous and mixed waste only in approved EMF
 40 Miscellaneous Unit Systems listed in Permit Table III.10.M.A in accordance with Permit
 41 Section III.10.M and in accordance with Operating Unit Group 10, Chapters 1.0 and 4.0
 42 of this Permit, and Operating Unit Group 10, Appendices 13.1 through 13.14 of this
 43 Permit, as approved pursuant to Permit Conditions III.10.M.9.b through e. The
 44 Permittees will limit the total volume of wastes to quantities specified for the individual
 45 miscellaneous units listed in Permit Table III.10.M.A.

- 1 **III.10.M.1.c** RESERVED
- 2 **III.10.M.1.d** The Permittees will ensure all certifications required by specialists (e.g., independent
3 qualified registered professional engineer; independent corrosion expert; independent
4 qualified installation inspector; etc.) use the following statement or equivalent pursuant to
5 Permit Condition III.10.C.10:
- 6 “I, (Insert Name) have (choose one or more of the following: overseen, supervised,
7 reviewed, and/or certified) a portion of the design or installation of a new miscellaneous
8 unit system or component located at (address), and owned/operated by (name(s)). My
9 duties were: (e.g., installation inspector, testing for tightness, etc.), for the following
10 miscellaneous unit system components (e.g., the venting piping, etc.), as required by the
11 Dangerous Waste Regulations, namely, [WAC 173-303-640\(3\)](#) (applicable paragraphs
12 (i.e., (a) through (g)) in accordance with [WAC 173-303-680](#)).
- 13 “I certify under penalty of law that I have personally examined and am familiar with the
14 information submitted in this document and all attachments and that, based on my inquiry
15 of those individuals immediately responsible for obtaining the information, I believe that
16 the information is true, accurate, and complete. I am aware that there are significant
17 penalties for submitting false information, including the possibility of fine and
18 imprisonment.”
- 19 **III.10.M.1.e** In all future narrative permit submittals, the Permittees will include Miscellaneous Unit
20 System names with the unit designation (e.g., Evaporator Separator Vessel; DEP-EVAP-
21 00001).
- 22 **III.10.M.2** **Miscellaneous Unit Systems Design and Construction** [[WAC 173-303-640](#), in
23 accordance with [WAC 173-303-680\(2\)](#) and [WAC 173-303-340](#)].
- 24 **III.10.M.2.a** The Permittees will construct the EMF Miscellaneous Unit Systems identified in Permit
25 Table III.10.M.A, as specified in Operating Unit Group 10, Appendices 13.1 through
26 13.14 of this Permit, as approved pursuant to Permit Conditions III.10.M.9.b,
27 III.10.M.9.c, and III.10.M.9.d.
- 28 **III.10.M.2.b** The Permittees will construct secondary containment systems for the EMF Miscellaneous
29 Unit Systems identified in Permit Tables III.10.M.A, as specified in Operating Unit
30 Group 10, Appendices 13.2, 13.4 through 13.14 of this Permit, as approved pursuant to
31 Permit Conditions III.10.M.9.b, III.10.M.9.c, and III.10.M.9.d.
- 32 **III.10.M.2.c** Modifications to approved design, plans, and specifications in Operating Unit Group 10
33 of this Permit for the EMF Miscellaneous Unit Systems will be allowed only in
34 accordance with Permit Conditions III.10.C.2.e and f, or III.10.C.2.g, III.10.C.9.d, e,
35 and h.
- 36 **III.10.M.3** **Miscellaneous Unit System Installation and Certification** [[WAC 173-303-640](#),
37 in accordance with [WAC 173-303-680\(2\)](#) and (3), and [WAC 173-303-340](#)].
- 38 **III.10.M.3.a** The Permittees must ensure that proper handling procedures are adhered to in order to
39 prevent damage to EMF Miscellaneous Unit Systems during installation. Prior to
40 covering, enclosing, or placing a new EMF Miscellaneous Unit System(s) or
41 component(s) in use, an independent qualified installation inspector or an independent
42 qualified registered professional engineer, either of whom is trained and experienced in
43 the proper installation of similar systems or components, must inspect the system for the
44 presence of any of the following items:
- 45 **III.10.M.3.a.i** Weld breaks;

- 1 **III.10.M.3.a.ii** Punctures;
- 2 **III.10.M.3.a.iii** Scrapes of protective coatings;
- 3 **III.10.M.3.a.iv** Cracks;
- 4 **III.10.M.3.a.v** Corrosion;
- 5 **III.10.M.3.a.vi** Other structural damage or inadequate construction/installation;
- 6 **III.10.M.3.a.vii** All discrepancies must be remedied before the EMF Miscellaneous Unit Systems are
7 covered, enclosed, or placed in use [[WAC 173-303-640\(3\)\(c\)](#)] in accordance with
8 [WAC 173-303-680\(2\)](#) and (3)].
- 9 **III.10.M.3.b** For EMF Miscellaneous Unit Systems or components that are placed underground and
10 that are back-filled, the Permittees must provide a backfill material that is a non-corrosive
11 porous, homogeneous substance. The backfill must be installed so that it is placed
12 completely around the miscellaneous unit and compacted to ensure that the miscellaneous
13 unit and piping are fully and uniformly supported [[WAC 173-303 640\(3\)\(d\)](#)], in
14 accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 15 **III.10.M.3.c** The Permittees must test for tightness all new EMF miscellaneous units and equipment,
16 prior to being covered, enclosed, or placed into use. If the EMF Miscellaneous Unit
17 Systems are found not to be tight, all repairs necessary to remedy the leak(s) in the
18 system must be performed prior to the EMF Miscellaneous Units Systems being covered,
19 enclosed, or placed in use [[WAC 173-303-640\(3\)\(e\)](#)], in accordance with [WAC 173-303-](#)
20 [680\(2\)](#) and (3)].
- 21 **III.10.M.3.d** The Permittees must ensure EMF Miscellaneous Unit Systems equipment is supported
22 and protected against physical damage and excessive stress due to settlement, vibration,
23 expansion, or contraction [[WAC 173-303-640\(3\)\(f\)](#)], in accordance with [WAC 173-303-](#)
24 [680\(2\)](#) and (3)].
- 25 **III.10.M.3.e** The Permittees must provide the type and degree of corrosion protection recommended
26 by an independent corrosion expert, based on the information provided in Operating Unit
27 Group 10, Appendices 13.9 and 13.11 as approved pursuant to Permit Conditions
28 III.10.M.9.b.i., III.10.M.9.b.iv, III.10.M.9.b.v, III.10.M.9.c.i, III.10.M.9.c.iv,
29 III.10.M.9.c.v, and III.10.M.9.d.i, III.10.M.9.d.iv, III.10.M.9.d.v, or other corrosion
30 protection if Ecology believes other corrosion protection is necessary to ensure the
31 integrity of the EMF Miscellaneous Unit Systems during use of the EMF Miscellaneous
32 Unit Systems. The installation of a corrosion protection system that is field fabricated
33 must be supervised by an independent corrosion expert to ensure proper installation
34 [[WAC 173-303-640\(3\)\(g\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and (3)].
- 35 **III.10.M.3.f** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
36 will obtain, and keep on file in the WTP Unit operating record, written statements by
37 those persons required to certify the design of the EMF Miscellaneous Unit Systems and
38 supervise the installation of the EMF Miscellaneous Unit Systems, as specified in
39 [WAC 173-303-640\(3\)\(b\)](#), (c), (d), (e), (f), and (g), in accordance with [WAC 173-303-680](#),
40 attesting that each EMF Miscellaneous Unit System and corresponding containment
41 system listed in Permit Table III.10.M.A, as approved/modified pursuant to Permit
42 Condition III.10.M.9, were properly designed and installed, and that repairs, in
43 accordance with [WAC 173-303-640\(3\)\(c\)](#) and (e), were performed [[WAC 173-303-](#)
44 [640\(3\)\(a\)](#), [WAC 173-303-640\(3\)\(h\)](#)], in accordance with [WAC 173-303-680\(3\)](#)].

- 1 **III.10.M.3.g** The independent EMF Miscellaneous Unit System installation inspection and subsequent
 2 written statements will be certified in accordance with [WAC 173-303-810](#)(13)(a) as
 3 modified pursuant to Permit Condition III.10.M.1.d, comply with all requirements of
 4 [WAC 173-303-640](#)(3)(h), in accordance with [WAC 173-303-680](#), and will consider, but
 5 not be limited to, the following miscellaneous unit system installation documentation:
- 6 **III.10.M.3.g.i** Field installation report with date of installation;
- 7 **III.10.M.3.g.ii** Approved welding procedures;
- 8 **III.10.M.3.g.iii** Welder qualifications and certification;
- 9 **III.10.M.3.g.iv** Hydro-test reports, as applicable, in accordance with the American Society of
 10 Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Division 1,
 11 American Petroleum Institute (API) Standard 620, or Standard 650 as applicable;
- 12 **III.10.M.3.g.v** Tester credentials;
- 13 **III.10.M.3.g.vi** Field inspector credentials;
- 14 **III.10.M.3.g.vii** Field inspector reports;
- 15 **III.10.M.3.g.viii** Field waiver reports; and
- 16 **III.10.M.3.g.ix** Non-compliance reports and corrective action (including field waiver reports) and
 17 repair reports.
- 18 **III.10.M.4 Integrity Assessments** [[WAC 173-303-340](#) and [WAC 173-303-640](#), in
 19 accordance with [WAC 173-303-680](#)(2) and (3)].
- 20 **III.10.M.4.a** The Permittees will ensure periodic integrity assessments are conducted on the EMF
 21 Miscellaneous Unit Systems listed in Permit Table III.10.M.A, as approved/modified
 22 pursuant to Permit Condition III.10.M.9, over the term of this Permit in accordance with
 23 [WAC 173-303-680](#)(2) and (3) as specified in [WAC 173-303-640](#)(3)(b), following the
 24 description of the integrity assessment program and schedule in Operating Unit
 25 Group 10, Chapter 6 of this Permit, as approved pursuant to Permit Conditions
 26 III.10.M.9.e.i and III.10.M.4.c. Results of the integrity assessments will be included in
 27 the WTP Unit operating record until ten (10) years after post-closure, or corrective action
 28 is complete and certified, whichever is later.
- 29 **III.10.M.4.b** The Permittees will address problems detected during EMF Miscellaneous Unit Systems
 30 integrity assessments specified in Permit Condition III.10.M.4.a following the integrity
 31 assessment program in Operating Unit Group 10, Chapter 6 of this Permit, as approved
 32 pursuant to Permit Conditions III.10.M.9.e.i and III.10.M.4.c.
- 33 **III.10.M.4.c** The Permittees must immediately and safely remove from service any EMF
 34 Miscellaneous Unit System or secondary containment system which through an integrity
 35 assessment is found to be “unfit for use” as defined in [WAC 173-303-040](#), following
 36 Permit Condition III.10.M.5.i.i through iv, and vi. The affected EMF Miscellaneous Unit
 37 or secondary containment system must be either repaired or closed in accordance with
 38 Permit Condition III.10.M.5.i.v [[WAC 173-303-640](#)(7)(e) and (f) and [WAC 173-303-](#)
 39 [640](#)(8), in accordance with [WAC 173-303-680](#)(3)].
- 40 **III.10.M.5 Miscellaneous Unit Management Practices**
- 41 **III.10.M.5.a** No dangerous and/or mixed waste will be managed in the EMF Miscellaneous Unit
 42 Systems unless the operating conditions, specified under Permit Condition III.10.M.5, are
 43 complied with.

- 1 **III.10.M.5.b** The Permittees will install and test all process and leak detection system
2 monitoring/instrumentation, as specified in Permit Table III.10.M.A, as
3 approved/modified pursuant to Permit Condition III.10.M.9, in accordance with
4 Operating Unit Group 10, Appendices 13.1, 13.2, and 13.14 of this Permit, as approved
5 pursuant to Permit Condition III.10.M.9.d.x.
- 6 **III.10.M.5.c** The Permittees will not place dangerous and/or mixed waste, treatment reagents, or other
7 materials in the EMF Miscellaneous Unit Systems if these substances could cause the
8 systems to rupture, leak, corrode, or otherwise fail [[WAC 173-303-640\(5\)\(a\)](#)], in
9 accordance with [WAC 173-303-680\(2\)](#)].
- 10 **III.10.M.5.d** The Permittees will operate the EMF Miscellaneous Unit Systems to prevent spills and
11 overflows using the description of controls and practices, as required under
12 [WAC 173-303-640\(5\)\(b\)](#), described in Permit Condition III.10.M.5, and Operating Unit
13 Group 10, Appendix 13.13 of this Permit, as approved pursuant to Permit Condition
14 III.10.M.9.e.iv [[WAC 173-303-640\(5\)\(b\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and
15 (3) and [WAC 173-303-806\(4\)\(c\)\(ix\)](#)].
- 16 **III.10.M.5.e** For routinely non-accessible EMF Miscellaneous Unit Systems, as specified in Operating
17 Unit Group 10, Chapter 4 of this Permit, as updated pursuant to Permit Condition
18 III.10.M.9.e.vi, the Permittees will mark all routinely non-accessible EMF Miscellaneous
19 Unit System access points with labels or signs to identify the waste contained in the units.
20 The label, or sign, must be legible at a distance of at least fifty (50) feet and must bear a
21 legend which identifies the waste in a manner which adequately warns employees,
22 emergency response personnel, and the public of the major risk(s) associated with the
23 waste being stored or treated in the miscellaneous unit system(s). For the purposes of this
24 Permit condition, “routinely non-accessible” means personnel are unable to enter these
25 areas while waste is being managed in them [[WAC 173-303-640\(5\)\(d\)](#)], in accordance
26 with [WAC 173-303-680\(2\)](#)].
- 27 **III.10.M.5.f** For all EMF Miscellaneous Unit Systems not addressed in Permit Condition III.10.M.5.e,
28 the Permittees will mark all these miscellaneous unit systems holding dangerous and/or
29 mixed waste with labels or signs to identify the waste contained in the unit. The labels,
30 or sign, must be legible at a distance of at least fifty (50) feet, and must bear a legend
31 which identifies the waste in a manner which adequately warns employees, emergency
32 response personnel, and the public of the major risk(s) associated with the waste being
33 stored or treated in the miscellaneous unit system(s) [[WAC 173-303-640\(5\)\(d\)](#)], in
34 accordance with [WAC 173-303-680\(2\)](#)].
- 35 **III.10.M.5.g** The Permittees will ensure that the secondary containment systems for EMF
36 Miscellaneous Unit Systems listed in Permit Table III.10.M.A, as approved/modified
37 pursuant to Permit Condition III.10.M.9, are free of cracks or gaps to prevent any
38 migration of dangerous and/or mixed waste or accumulated liquid out of the system to the
39 soil, ground water, or surface water at any time waste is in the EMF Miscellaneous Units
40 System. Any indication that a crack or gap may exist in the containment systems will be
41 investigated and repaired in accordance with Operating Unit Group 10, Appendix 13.18
42 of this Permit, as approved pursuant to Permit Condition III.10.M.9.e.v. [[WAC 173-303-640\(4\)\(b\)\(i\)](#),
43 [WAC 173-303-640\(4\)\(e\)\(i\)\(C\)](#)], and [WAC 173-303-640\(6\)](#) in accordance
44 with [WAC 173-303-680\(2\)](#) and (3), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-320](#)].
45

- 1 **III.10.M.5.h** An impermeable coating, as specified in Operating Unit Group 10, Appendices 13.4,
 2 13.5, 13.7, 13.9, 13.11, and 13.12 of this Permit, as approved pursuant to Permit
 3 Condition III.10.M.9.b.v of this Permit, will be maintained for all concrete containment
 4 systems and concrete portions of containment systems for each EMF Miscellaneous Unit
 5 System listed in Permit Table III.10.M.A, as approved/modified pursuant to Permit
 6 Condition III.10.M.9 [concrete containment systems that do not have a liner pursuant to
 7 [WAC-173-303-640\(4\)\(e\)\(i\)](#), in accordance with [WAC 173-303-680\(2\)](#), and have
 8 construction joints, will meet the requirements of [WAC 173-303-640\(4\)\(e\)\(ii\)\(C\)](#), in
 9 accordance with [WAC 173-303-680\(2\)](#)]. The coating will prevent migration of any
 10 dangerous and mixed waste into the concrete. All coatings will meet the following
 11 performance standards:
- 12 **III.10.M.5.h.i** The coating must seal the containment surface such that no cracks, seams, or other
 13 avenues through which liquid could migrate are present;
- 14 **III.10.M.5.h.ii** The coating must be of adequate thickness and strength to withstand the normal
 15 operation of equipment and personnel within the given area such that degradation or
 16 physical damage to the coating or lining can be identified and remedied before
 17 dangerous and mixed waste could migrate from the system; and
- 18 **III.10.M.5.h.iii** The coating must be compatible with the dangerous and mixed waste, treatment
 19 reagents, or other materials managed in the containment system [[WAC 173-303-](#)
 20 [640\(4\)\(e\)\(ii\)\(D\)](#), in accordance with [WAC 173-303-680\(2\)](#) and (3) and
 21 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)].
- 22 **III.10.M.5.i** The Permittees will inspect all secondary containment systems for the EMF
 23 Miscellaneous Unit Systems listed in Permit Table III.10.M.A, as approved/modified
 24 pursuant to Permit Condition III.10.M.9, in accordance with the Inspection Plan specified
 25 in Operating Unit Group 10, Chapter 6/Chapter 6A of this Permit, as approved pursuant
 26 to Permit Conditions III.10.M.9.e.ii, and take the following actions if a leak or spill of
 27 dangerous and/or mixed waste is detected in these containment systems [[WAC 173-303-](#)
 28 [640\(5\)\(c\)](#) and [WAC 173-303-640\(6\)](#), in accordance with [WAC 173-303-680\(2\)](#) and (3),
 29 [WAC 173-303-320](#), and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)]:
- 30 **III.10.M.5.i.i** Immediately and safely stop the flow of dangerous and/or mixed waste into the
 31 miscellaneous unit system or secondary containment system;
- 32 **III.10.M.5.i.ii** Determine the source of the dangerous and/or mixed waste;
- 33 **III.10.M.5.i.iii** Remove the waste from the containment area in accordance with [WAC 173-303-](#)
 34 [680\(2\)](#) and (3), as specified in [WAC 173-303-640\(7\)\(b\)](#). The dangerous and/or
 35 mixed waste removed from containment areas of miscellaneous unit systems will be,
 36 as a minimum, managed as dangerous and/or mixed waste;
- 37 **III.10.M.5.i.iv** If the cause of the release was a spill that has not damaged the integrity of the
 38 miscellaneous unit system, the Permittees may return the miscellaneous unit system
 39 to service in accordance with [WAC 173-303-680\(2\)](#) and (3), as specified in
 40 [WAC 173-303-640\(7\)\(e\)\(ii\)](#). In such a case, the Permittees will take action to ensure
 41 the incident that caused liquid to enter the containment system will not reoccur
 42 [[WAC 173-303-320\(3\)](#)];

- 1 **III.10.M.5.i.v** If the source of the dangerous and/or mixed waste is determined to be a leak from the
 2 primary EMF Miscellaneous Unit System into the secondary containment system, or
 3 the system is unfit for use as determined through an integrity assessment or other
 4 inspection, the Permittees must comply with the requirements of [WAC 173-303-
 5 640\(7\)](#), and take the following actions:
- 6 A. Close the EMF Miscellaneous Unit System following procedures in
 7 [WAC 173-303-640\(7\)\(e\)\(i\)](#) and in accordance with [WAC 173-303-680](#), and
 8 Operating Unit Group 10, Chapter 11 of this Permit, as approved pursuant to
 9 Permit Condition III.10.C.8; or
- 10 B. Repair and re-certify (in accordance with [WAC 173-303-810\(13\)\(a\)](#), as
 11 modified pursuant to Permit Condition III.10.M.1.d) the EMF Miscellaneous
 12 Unit System in accordance with Operating Unit Group 10, Appendix 13.11 of
 13 this Permit, as approved pursuant to Permit Condition III.10.M.9.e.v before
 14 the EMF Miscellaneous Unit System is placed back into service
 15 [[WAC 173-303-640\(7\)\(e\)\(iii\)](#) and [WAC 173-303-640\(7\)\(f\)](#), in accordance
 16 with [WAC 173-303-680](#)].
- 17 **III.10.M.5.i.vi** The Permittees will document, in the operating record, actions/procedures taken to
 18 comply with III.10.M.5.i through v above, as specified in [WAC 173-303-640\(6\)\(d\)](#)
 19 and in accordance with [WAC 173-303-680\(2\)](#) and (3).
- 20 **III.10.M.5.i.vii** In accordance with [WAC 173-303-680\(2\)](#) and (3), the Permittees will notify and
 21 report releases to the environment to Ecology as specified in [WAC 173-303-
 22 640\(7\)\(d\)](#).
- 23 **III.10.M.5.j** If liquids (e.g., Dangerous and/or mixed waste leaks and spills, precipitation, fire water,
 24 liquids from damaged or broken pipes) cannot be removed from the secondary
 25 containment system within twenty-four (24) hours, Ecology will be verbally notified
 26 within twenty-four (24) hours of discovery. The notification will provide the information
 27 in A., B., and C. listed below. The Permittees will provide Ecology with a written
 28 demonstration, within seven (7) business days, identifying at a minimum [[WAC 173-303-
 29 640\(4\)\(c\)\(iv\)](#) and [WAC 173-303-640\(7\)\(b\)\(ii\)](#)], in accordance with [WAC 173-303-680\(3\)](#)
 30 and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)]:
- 31 A. Reasons for delayed removal.
- 32 B. Measures implemented to ensure continued protection of human health and the
 33 environment.
- 34 C. Current actions being taken to remove liquids from secondary containment.
- 35 **III.10.M.5.k** The Permittees will operate the EMF Miscellaneous Unit Systems in accordance with
 36 Operating Unit Group 10, Chapter 4 as updated pursuant to Permit Condition
 37 III.10.M.9.e.vi and Appendix 13.18 of this Permit, as approved pursuant to Permit
 38 Condition III.10.M.9.e, and the following:
- 39 **III.10.M.5.k.i** The Permittees will operate the EMF Miscellaneous Unit Systems in order to
 40 maintain the systems and process parameters listed in Permit Table III.10.M.A as
 41 approved/modified pursuant to Permit Condition III.10.M.9, within the operating
 42 trips and operating ranges specified in Permit Table III.10.M.A, and consistent with
 43 assumptions and basis which are reflected in Operating Unit Group 10, Appendix 6.3,
 44 as approved pursuant to Permit Condition III.10.M.9.b. [[WAC 173-303-815\(2\)\(b\)\(ii\)](#)
 45 and [WAC 173-303-680\(2\)](#) and (3)]. For the purposes of this Permit Condition,
 46 Operating Unit Group 10, Appendix 6.3. will be superseded by Appendix 6.4. upon
 47 its approval pursuant to either Permit Conditions III.10.M.9.c or III.10.M.9.d.

- 1 **III.10.M.5.k.ii** The Permittees will calibrate/function test the instruments listed in Permit Table
2 III.10.M.A, in accordance with Operating Unit Group 10, Appendix 13.18, as
3 approved pursuant to Permit Condition III.10.M.9.e.xii.
- 4 **III.10.M.5.l** For any portion of the EMF Miscellaneous Unit Systems which have the potential for
5 formation and accumulation of hydrogen gases, the Permittees will operate the portion to
6 maintain hydrogen levels below the lower explosive limit [[WAC 173-303-815\(2\)\(b\)\(ii\)](#)].
- 7 **III.10.M.5.m** For each miscellaneous unit holding dangerous waste which are acutely or chronically
8 toxic by inhalation, the Permittees will operate the system to prevent escape of vapors,
9 fumes, or other emissions into the air [[WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#) and [WAC 173-303-](#)
10 [640\(5\)\(e\)](#)], in accordance with [WAC 173-303-680](#)].
- 11 **III.10.M.6 Inspections** [[WAC 173-303-680\(3\)](#)]
- 12 **III.10.M.6.a** The Permittees will inspect the EMF Miscellaneous Unit Systems in accordance with the
13 Inspection Plan in Operating Unit Group 10, Chapter 6/Chapter 6A of this Permit, as
14 modified in accordance with Permit Condition III.10.C.5.c.
- 15 **III.10.M.6.b** The inspection data for EMF Miscellaneous Unit Systems will be recorded, and the
16 records will be placed in the WTP Unit operating record for the EMF Miscellaneous Unit
17 Systems, in accordance with Permit Condition III.10.C.4.
- 18 **III.10.M.7 Recordkeeping**
- 19 The Permittees will record and maintain in the WTP Unit operating record for the EMF
20 Miscellaneous Unit Systems, all monitoring, calibration, maintenance, test data, and
21 inspection data compiled under the conditions of this Permit, in accordance with Permit
22 Conditions III.10.C.4 and III.10.C.5.
- 23 **III.10.M.8 Closure**
- 24 The Permittees will close the EMF Miscellaneous Unit Systems in accordance with
25 Operating Unit Group 10, Chapter 11, as approved pursuant to Permit Condition
26 III.10.C.8.
- 27 **III.10.M.9 Compliance Schedule**
- 28 **III.10.M.9.a** All information identified for submittal to Ecology in a. through e. of this compliance
29 schedule must be signed and certified in accordance with requirements in [WAC 173-303-](#)
30 [810\(12\)](#), as modified in accordance with Permit Condition III.10.M.1.d. [[WAC 173-303-](#)
31 [806\(4\)](#)].
- 32 **III.10.M.9.b** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
33 construction of each secondary containment and leak detection system for the EMF
34 Miscellaneous Unit Systems (per level) as identified in Permit Tables III.10.M.A,
35 engineering information as specified below, for incorporation into Operating Unit
36 Group 10, Appendices 13.2, 13.4, 13.5, 13.7, 13.8, 13.9, 13.11, and 13.12 of this Permit.
37 At a minimum, engineering information specified below will show the following as
38 described in [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#) (the information
39 specified below will include dimensioned engineering drawings and information on
40 sumps and floor drains):
- 41 **III.10.M.9.b.i** IQRPE Reports (specific to foundation, secondary containment, and leak detection
42 system) will include review of design drawings, calculations, and other information
43 on which the certification report is based and will include as applicable, but not
44 limited to, review of such information described below. Information (drawings,
45 specifications, etc.) already included in Operating Unit Group 10, Appendix 13.0 of

- 1 this Permit may be included in the report by reference and should include drawing
2 and document numbers. IQRPE Reports will be consistent with the information
3 separately provided in III.10.M.9.b ii through ix below [[WAC 173-303-640\(3\)\(a\)](#)], in
4 accordance with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 5 **III.10.M.9.b.ii** Design drawings (General Arrangement Drawings, in plan) and specifications for the
6 foundation, secondary containment, including, liner installation details, and leak
7 detection methodology [Note: leak detection systems for areas where daily, direct, or
8 remote visual inspection is not feasible, will be continuous in accordance with
9 [WAC 173-303-640\(4\)\(e\)\(iii\)\(C\)](#)]. These items should show the dimensions, volume
10 calculations, and location of the secondary containment system, and should include
11 items such as floor/pipe slopes to sumps, tanks, floor drains [[WAC 173-303-](#)
12 [640\(4\)\(b\)](#) through (f) and [WAC 173-303-640\(3\)\(a\)](#)], in accordance with
13 [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)](#)];
- 14 **III.10.M.9.b.iii** The Permittees will provide the design criteria (references to codes and standards,
15 load definitions, and load combinations, materials of construction, and
16 analysis/design methodology) and typical design details for the support of the
17 secondary containment system. This information will demonstrate the foundation
18 will be capable of providing support to the secondary containment system, resistance
19 to pressure gradients above and below the system, and capable of preventing failure
20 due to settlement, compression, or uplift [[WAC 173-303-640\(4\)\(c\)\(ii\)](#)], in accordance
21 with [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 22 **III.10.M.9.b.iv** A description of materials and equipment used to provide corrosion protection for
23 external metal components in contact with soil, including factors affecting the
24 potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#)], in accordance with
25 [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 26 **III.10.M.9.b.v** Secondary containment/foundation and leak detection systems materials selection
27 documentation (including, but not limited to, concrete coatings and water stops, and
28 liner materials), as applicable [[WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B)];
- 29 **III.10.M.9.b.vi** Detailed description of how the secondary containment for each miscellaneous unit
30 system will be installed in compliance with [WAC 173-303-640\(3\)\(c\)](#), in accordance
31 with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B);
- 32 **III.10.M.9.b.vii** Submit Permit Table III.10.E.S completed to provide for all secondary containment
33 sumps and floor drains, the information as specified in each column heading,
34 consistent with information to be provided in III.10.M.9.b i through vi above;
- 35 **III.10.M.9.b.viii** Documentation that secondary containment and leak detection systems will not
36 accumulate hydrogen gas levels above the lower explosive limit for incorporation
37 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#),
38 and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 39 **III.10.M.9.b.ix** A detailed description of how miscellaneous unit design provides access for
40 conducting future miscellaneous unit integrity assessments [[WAC 173-303-640\(3\)\(b\)](#)
41 and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)].

- 1 **III.10.M.9.c** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.M.9, prior to
2 installation of each EMF Miscellaneous Unit System as identified in Permit Table
3 III.10.M.A, engineering information as specified below, for incorporation into Operating
4 Unit Group 10, Appendix 13.1 through 13.18 of this Permit. At a minimum, engineering
5 information specified below will show the following as required pursuant to
6 [WAC 173-303-640](#) and in accordance with [WAC 173-303-680](#) (the information specified
7 below will include dimensioned engineering drawings):
- 8 **III.10.M.9.c.i** IQRPE Reports (specific to miscellaneous unit) will include review of design
9 drawings, calculations, and other information on which the certification report is
10 based and will include as applicable, but not limited to, review of such information
11 described below. Information (drawings, specifications, etc.) already included in
12 Operating Unit Group 10, Appendix 8.0 of this Permit may be included in the report
13 by reference and should include drawing and document numbers. The IQRPE
14 Reports will be consistent with the information separately provided in III.10.M.9.c.ii
15 through xi below and the IQRPE Report specified in Permit Condition III.10.M.9.b.i
16 [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
17 [WAC 173-303-806](#)(4)(i)(i)];
- 18 **III.10.M.9.c.ii** Design drawings (General Arrangement Drawings in plan, Process Flow Diagrams,
19 Piping and Instrumentation Diagrams [including pressure control systems], and
20 Mechanical Drawings) and specifications, and other information specific to
21 miscellaneous units (to show location and physical attributes of each miscellaneous
22 unit), [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
23 [WAC 173-303-806](#)(4)(i)(i)];
- 24 **III.10.M.9.c.iii** Miscellaneous unit design criteria (references to codes and standards, load
25 definitions, and load combinations, materials of construction, and analysis/design
26 methodology) and typical design details for the support of the miscellaneous unit(s).
27 Structural support calculations specific to off-specification, non-standard, and field
28 fabricated miscellaneous units will be submitted for incorporation into the
29 Administrative Record [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-](#)
30 [680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)(B)];
- 31 **III.10.M.9.c.iv** A description of materials and equipment used to provide corrosion protection for
32 external metal components in contact with water, including factors affecting the
33 potential for corrosion [[WAC 173-303-640](#)(3)(a)(iii)(B), in accordance with
34 [WAC 173-303-680](#)(2) and [WAC 173-303-806](#)(4)(i)(i)(A) through (B)];
- 35 **III.10.M.9.c.v** Miscellaneous unit materials selection documentation (e.g., physical and chemical
36 tolerances) [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2) and
37 [WAC 173-303-806](#)(4)(i)(i)(A)];
- 38 **III.10.M.9.c.vi** Miscellaneous unit vendor information (including, but not limited to, required
39 performance warranties, as available), consistent with information submitted under ii
40 above, will be submitted for incorporation into the Administrative Record
41 [[WAC 173-303-640](#)(3)(a), in accordance with [WAC 173-303-680](#)(2), [WAC 173-303-](#)
42 [806](#)(4)(i)(i)(A) through (B), and [WAC 173-303-806](#)(4)(i)(v)];
- 43 **III.10.M.9.c.vii** System Description related to miscellaneous units will be submitted for incorporation
44 into the Administrative Record [[WAC 173-303-680](#), [WAC 173-303 806](#)(4)(i)(i)(A)
45 through (B), and [WAC 173-303-806](#)(4)(i)(v)].

- 1 **III.10.M.9.c.viii** Mass and energy balance for normal projected operating conditions used in
 2 developing the Piping and Instrumentation Diagrams and the Process Flow Diagrams,
 3 including assumptions and formulas used to complete the mass and energy balance,
 4 so that they can be independently verified for incorporation into the Administrative
 5 Record [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(B\)](#), and [WAC 173-303-](#)
 6 [806\(4\)\(i\)\(v\)](#)];
- 7 **III.10.M.9.c.ix** A detailed description of how the miscellaneous unit will be installed in compliance
 8 with [WAC 173-303-640\(3\)\(c\)](#), (d), and (e), in accordance with [WAC 173-303-680](#)
 9 and [WAC 173-303-806\(4\)\(i\)\(B\)](#);
- 10 **III.10.M.9.c.x** Documentation that miscellaneous units are designed to prevent the accumulation of
 11 hydrogen gas levels above the lower explosive limit for incorporation into the
 12 Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(A\)](#), and
 13 [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 14 **III.10.M.9.c.xi** Documentation that miscellaneous units are designed to prevent escape of vapors and
 15 emissions of acutely or chronically toxic (upon inhalation) EHW, for incorporation
 16 into the Administrative Record [[WAC 173-303-640\(5\)\(e\)](#), in accordance with
 17 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 18 **III.10.M.9.d** The Permittees will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, prior to
 19 installation of equipment as identified in Permit Table III.10.M.A, not addressed in
 20 Permit Condition III.10.M.9.c, engineering information as specified below for
 21 incorporation into Operating Unit Group 10, Appendices 13.1 through 13.14 of this
 22 Permit. At a minimum, engineering information specified below will show the following
 23 as required pursuant to [WAC 173-303-640](#), in accordance with [WAC 173-303-680](#)
 24 (the information specified below will include dimensioned engineering drawings):
- 25 **III.10.M.9.d.i** IQRPE Reports (specific to equipment) will include a review of design drawings,
 26 calculations, and other information as applicable, on which the certification report is
 27 based. The reports will include, but not be limited to, review of such information
 28 described below. Information (drawings, specifications, etc.) already included in
 29 Operating Unit Group 10, Appendix 13.0 of this Permit may be included in the report
 30 by reference and should include drawing and document numbers. The IQRPE
 31 Reports will be consistent with the information provided separately in ii. through xiii.
 32 below and the IQRPE Reports specified in Permit Conditions III.10.M.9.b and
 33 III.10.M.9.c [[WAC 173-303-640\(3\)\(a\)](#), in accordance with [WAC 173-303-680\(2\)](#) and
 34 [WAC 173-303-806\(4\)\(i\)\(A\)](#) through (B)];
- 35 **III.10.M.9.d.ii** Design drawings (Process Flow Diagrams, Piping and Instrumentation Diagrams
 36 [including pressure control systems]) specifications and other information specific to
 37 equipment (these drawings should include all equipment such as pipe, valves,
 38 fittings, pumps, instruments, etc.) [[WAC 173-303-640\(3\)\(a\)](#), in accordance with
 39 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(A\)](#) through (B)];
- 40 **III.10.M.9.d.iii** The Permittees will provide the design criteria (references to codes and standards,
 41 load definitions, and load combinations, materials of construction, and
 42 analysis/design methodology) and typical design details for the support of the
 43 equipment [[WAC 173-303-640\(3\)\(a\)](#) and [WAC 173-303-640\(3\)\(f\)](#), in accordance
 44 with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(B\)](#)];

- 1 **III.10.M.9.d.iv** A description of materials and equipment used to provide corrosion protection for
2 external metal components in contact with soil and water, including factors affecting
3 the potential for corrosion [[WAC 173-303-640\(3\)\(a\)\(iii\)\(B\)](#)], in accordance with
4 [WAC 173-303-680\(2\)](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 5 **III.10.M.9.d.v** Materials selection documentation for equipment (e.g., physical and chemical
6 tolerances) [[WAC 173-303-640\(3\)\(a\)](#)], in accordance with [WAC 173-303-680\(2\)](#) and
7 [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)];
- 8 **III.10.M.9.d.vi** Vendor information (including, but not limited to, required performance warranties,
9 as available), consistent with information submitted under ii above, for equipment
10 will be submitted for incorporation into the Administrative Record [[WAC 173-303-](#)
11 [640\(3\)\(a\)](#)], in accordance with [WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#)
12 through (B), and [WAC 173-303-806\(4\)\(i\)\(iv\)](#)];
- 13 **III.10.M.9.d.vii** Miscellaneous unit, equipment, and leak detection system instrument control logic
14 narrative description (e.g., descriptions of fail-safe conditions, etc.) [[WAC 173-303-](#)
15 [680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)].
- 16 **III.10.M.9.d.viii** System Descriptions related to equipment and system descriptions related to leak
17 detection systems, for incorporation into the Administrative Record [[WAC 173-303-](#)
18 [680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#) through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 19 **III.10.M.9.d.ix** A detailed description of how the equipment will be installed and tested
20 [[WAC 173-303-640\(3\)\(c\)](#) through (e) and [WAC 173-303-640\(4\)\(b\)](#) and (c), in
21 accordance with [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 22 **III.10.M.9.d.x** For process monitoring, control, and leak detection system instrumentation for the
23 WTP Unit Miscellaneous Unit Systems as identified in Permit Table III.10.M.A, a
24 detailed description of how the process monitoring, control, and leak detection
25 system instrumentation will be installed and tested [[WAC 173-303-640\(3\)\(c\)](#) through
26 (e), [WAC 173-303-640\(4\)\(b\)](#) and (c), [WAC 173-303-806\(4\)\(c\)\(vi\)](#), and
27 [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#)];
- 28 **III.10.M.9.d.xi** Mass and energy balance for projected normal operating conditions, used in
29 developing the Piping and Instrumentation Diagrams and Process Flow Diagrams,
30 including assumptions and formulas used to complete the mass and energy balance,
31 so that they can be independently verified, for incorporation into the Administrative
32 Record [[WAC 173-303-680\(2\)](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-](#)
33 [806\(4\)\(i\)\(v\)](#)];
- 34 **III.10.M.9.d.xii** Documentation that miscellaneous units are designed to prevent the accumulation of
35 hydrogen gas levels above the lower explosive limit for incorporation into the
36 Administrative Record [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(i\)\(A\)](#), and
37 [WAC 173-303-806\(4\)\(i\)\(v\)](#)].
- 38 **III.10.M.9.d.xiii** Leak detection system documentation (e.g. vendor information, etc.) consistent with
39 information submitted under Permit Condition III.10.M.9.c.ii and Permit Conditions
40 III.10.M.9.d.ii, vii, viii, and x above, will be submitted for incorporation into the
41 Administrative Record.

- 1 **III.10.M.9.e** Prior to initial receipt of dangerous and/or mixed waste in the WTP Unit, the Permittees
2 will submit to Ecology, pursuant to Permit Condition III.10.C.9.f, the following as
3 specified below for incorporation into Operating Unit Group 10, Appendix 13.18, except
4 Permit Condition III.10.M.9.e.i, which will be incorporated into Operating Unit
5 Group 10, Chapter 6, of this Permit. All information provided under this permit
6 condition must be consistent with information provided pursuant to Permit Conditions
7 III.10.M.9.b, c, d, and e, III.10.M.3.e, and III.10.C.11.b, as approved by Ecology.
- 8 **III.10.M.9.e.i** Integrity assessment program and schedule for the EMF Miscellaneous Unit Systems
9 will address the conducting of periodic integrity assessments on the EMF
10 Miscellaneous Unit Systems over the life of the systems, as specified in Permit
11 Condition III.10.M.9.b.ix and [WAC 173-303-640\(3\)\(b\)](#), in accordance with
12 [WAC 173-303-680](#), and descriptions of procedures for addressing problems detected
13 during integrity assessments. The schedule must be based on past integrity
14 assessments, age of the system, materials of construction, characteristics of the waste,
15 and any other relevant factors [[WAC 173-303-640\(3\)\(b\)](#), in accordance with
16 [WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 17 **III.10.M.9.e.ii** Detailed plans and descriptions, demonstrating the leak detection system is operated
18 so that it will detect the failure of either the primary or secondary containment
19 structure or the presence of any release of dangerous and/or mixed waste or
20 accumulated liquid in the secondary containment system within twenty-four (24)
21 hours [WAC 173-303-640\(4\)\(c\)\(iii\)](#). Detection of a leak of at least 0.1 gallons per
22 hour within twenty-four (24) hours is defined as being able to detect a leak within
23 twenty-four (24) hours. Any exceptions to this criteria must be approved by Ecology
24 in accordance with [WAC 173-303-680](#), [WAC 173-303-640\(4\)\(c\)\(iii\)](#), and
25 [WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 26 **III.10.M.9.e.iii** Detailed operational plans and descriptions, demonstrating that spilled or leaked
27 waste and accumulated liquids can be removed from the secondary containment
28 system within twenty-four (24) hours [[WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 29 **III.10.M.9.e.iv** Descriptions of operational procedures demonstrating appropriate controls and
30 practices are in place to prevent spills and overflows from the EMF Miscellaneous
31 Unit Systems, or containment systems, in compliance with [WAC 173-303-](#)
32 [640\(5\)\(b\)\(i\)](#) through in accordance with [WAC 173-303-680](#) [[WAC 173-303-](#)
33 [806\(4\)\(i\)\(B\)](#)];
- 34 **III.10.M.9.e.v** Description of procedures for investigation and repair of the EMF Miscellaneous
35 Unit Systems [[WAC 173-303-640\(6\)](#) and [WAC 173-303-640\(7\)\(e\)](#) and (f), in
36 accordance with [WAC 173-303-680](#), [WAC 173-303-320](#), [WAC 173-303-806\(4\)\(a\)\(v\)](#),
37 and [WAC 173-303-806\(4\)\(i\)\(B\)](#)];
- 38 **III.10.M.9.e.vi** Updated Chapter 4, Narrative Descriptions, Tables and Figures as identified in Permit
39 Table III.10.M.A, as modified pursuant to Permit Condition III.10.M.9.e.ix, and
40 updated to identify routinely non-accessible EMF Miscellaneous Unit Systems
41 [[WAC 173-303-680](#) and [WAC 173-303-806\(4\)\(i\)\(A\)](#) through (B)];
- 42 **III.10.M.9.e.vii** Descriptions of procedures for management of ignitable and reactive, and
43 incompatible dangerous and/or mixed waste, in accordance with [WAC 173-303-](#)
44 [640\(9\)](#) and (10), in accordance with [WAC 173-303-680](#) and [WAC 173-303-](#)
45 [806\(4\)\(i\)\(B\)](#).

- 1 **III.10.M.9.e.viii** A description of the tracking system used to track dangerous and/or mixed waste
 2 generated throughout the EMF Miscellaneous Unit Systems, pursuant to
 3 [WAC 173-303-380](#).
- 4 **III.10.M.9.e.ix** Permit Table III.10.M.A, amended as follows [[WAC 173-303-680](#) and
 5 [WAC 173-303-806\(4\)\(i\)\(A\)](#) through (B)]:
- 6 A. Under column 1, update and complete list of dangerous and mixed waste
 7 EMF Miscellaneous Unit Systems, including plant items which comprise
 8 each system (listed by item number).
 - 9 B. Under column 2, update and complete system designations.
 - 10 C. Under column 3, replace the ‘Reserved’ with the Operating Unit Group 10,
 11 Appendix 13.0 subsections specific to miscellaneous unit systems as listed in
 12 column 1.
 - 13 D. Under column 4, update and complete list of narrative description tables and
 14 figures.
 - 15 E. Under column 5, update and complete maximum operating volume for each
 16 miscellaneous unit, as applicable.
 - 17 F. Permit Table III.10.M.A, amended as follows:
 - 18 1. Under column 1, update and complete list of plant items that comprise
 19 the EMF Vessel Vent System (listed by item number).
 - 20 2. Under column 2, update and complete designations.
 - 21 3. Under column 3, replace the ‘Reserved’ with the Operating Unit Group
 22 10, Appendix 13.0, subsections (e.g., 13.1, 13.2, etc.) specific to systems
 23 as listed in column 1.
 - 24 4. Under column 4, update and complete list of narrative description tables
 25 and figures.
- 26 **III.10.M.9.e.x** Permit Table III.10.M.A will be completed for EMF Miscellaneous Unit System
 27 process and leak detection system monitors and instruments (to include, but not be
 28 limited to: instruments and monitors measuring and/or controlling flow, pressure,
 29 temperature, density, pH, level, humidity, and emissions) to provide the information
 30 as specified in each column heading. Process and leak detection system monitors and
 31 instruments for critical systems as specified in Operating Unit Group 10, Appendix
 32 2.0 and as updated pursuant to Permit Condition III.10.C.9.b and for operating
 33 parameters as required to comply with Permit Condition III.10.C.3.e.iii will be
 34 addressed. Process monitors and instruments for non-waste management operations
 35 (e.g., utilities, raw chemical storage, non-contact cooling waters, etc.) are excluded
 36 from this permit condition [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(A\)](#)
 37 through (B), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 38 **III.10.M.9.e.xi** Supporting documentation for operating trips and expected operating range as
 39 specified in Permit Table III.10.M.A, as approved pursuant to Permit Condition
 40 III.10.M.9.e.x [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(B\)](#), [WAC 173-303-
 41 806\(4\)\(i\)\(iv\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];
- 42 **III.10.M.9.e.xii** Documentation of process and leak detection instruments and monitors (as listed in
 43 Permit Table III.10.M.A) for the EMF Miscellaneous Unit Systems to include, but
 44 not be limited to, the following [[WAC 173-303-680](#), [WAC 173-303-806\(4\)\(i\)\(B\)](#),
 45 and [WAC 173-303-806\(4\)\(i\)\(v\)](#)];

- 1 A. Procurement Specifications.
- 2 B. Location used.
- 3 C. Range, precision, and accuracy.
- 4 D. Detailed descriptions of calibration/functionality test procedures
- 5 (e.g., method number [ASTM]) or provide a copy of manufacturer's
- 6 recommended calibration procedures.
- 7 E. Calibration/functionality test, inspection, and routine maintenance schedules
- 8 and checklists, including justification for calibration, inspection and
- 9 maintenance frequencies, criteria for identifying instruments found to be
- 10 significantly out of calibration, and corrective action to be taken for
- 11 instruments found to be significantly out of calibration (e.g., increasing
- 12 frequency of calibration, instrument replacement, etc.).
- 13 F. Equipment instrument control logic narrative description (e.g., descriptions
- 14 of fail-safe conditions, etc.) [[WAC 173-303-680\(2\)](#), [WAC 173-303-](#)
- 15 [806\(4\)\(i\)\(i\)\(B\)](#), and [WAC 173-303-806\(4\)\(i\)\(v\)](#)].

Table III.10.M.A – EMF Plant Miscellaneous Unit System Description

Miscellaneous Unit System Description/Location	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DEP-COND-00001 (Evaporator Primary Condenser) E-0102	DEP	24590-BOF -M5-V17T-00012 -M6-DEP-00003004 -MED-DEP-00004 -N1D-DEP-00007 -P1-25-00001 -3PS-MEVV-T0001 24590-CM-POA-MEVV-00003-05-00001 (Sheet 2 of 3, Sheet 3 of 3)	4G.3.2; Table 4G-2	NA
DEP-COND-00002 (Evaporator Inter-Condenser) E-0102	DEP	24590-BOF -M5-V17T-00012 -M6-DEP-00003004 -MED-DEP-00005 -N1D-DEP-00007 -P1-25-00001 24590-CM-POA-ME00-00003-04-00004 (Sheet 2 of 3, Sheet 3 of 3)	4G.3.3; Table 4G-2	NA

Table III.10.M.A – EMF Plant Miscellaneous Unit System Description

Miscellaneous Unit System Description/Location	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DEP-COND-00003 (Evaporator After-Condenser) E-0102	DEP	24590-BOF -M5-V17T-00012 -M6-DEP-00003004 -MED-DEP-00006 -N1D-DEP-00007 -P1-25-00001 24590-CM-POA-ME00-00003-04-00001 (Sheet 2 of 3, Sheet 3 of 3)	4G.3.4; Table 4G-2	NA
DEP-EVAP-00001 (Evaporator Separator Vessel) E-0103	DEP	24590-BOF -M5-V17T-00012 -M6-DEP-00003001 -MVD-DEP-00009 -N1D-DEP-00010 -P1-25-00001 -3PS-MEVV-T0001 24590-CM-POA-MEVV-00003-05-00002 (Sheet 2 of 6, Sheet 5 of 6)	4G.3.4; Table 4G-2	3,544
DVP-HTR-00001A (Process Ventilation Preheater) E-0102	DEP	Reserved	4G; Table 4G-2	NA
DVP-HTR-00001B (Process Ventilation Preheater) E-0102	DEP	Reserved	4G; Table 4G-2	NA

Table III.10.M.A – EMF Plant Miscellaneous Unit System Description

Miscellaneous Unit System Description/Location	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DVP-HEPA-00003A (Process Ventilation Primary HEPA Filter) E-0102A	DEP	Reserved	4G; Table 4G-2	NA
DVP-HEPA-00003B (Process Ventilation Primary HEPA Filter) E-0102A	DEP	Reserved	4G; Table 4G-2	NA
DVP-HEPA-00004A (Process Ventilation Secondary HEPA Filters) E-0102A	DEP	Reserved	4G; Table 4G-2	NA
DVP-HEPA-00004B (Process Ventilation Secondary HEPA Filters) E-0102A	DEP	Reserved	4G; Table 4G-2	NA
DEP-HX-00001 (Evaporator Concentrate/Feed Vessels LAW Effluent Cooler) E-0103	DEP	24590-BOF -M5-V17T-00013 -M6-DEP-00002006 -MED-DEP-00001 -N1D-DEP-00008 -P1-25-00001 -3PS-MEP0-T0001 24590-CM-POA-MEP0-00006-04-00004 (Sheet D3334)	4G.3.8; Table 4G-2	NA

Table III.10.M.A – EMF Plant Miscellaneous Unit System Description

Miscellaneous Unit System Description/Location	Miscellaneous Unit System Designation	Description Drawings	Narrative Description, Tables & Figures	Maximum Capacity (gallons)
DEP-RBLR-00001 (Evaporator Reboiler) E-0103	DEP	24590-BOF -M5-V17T-00012 -M6-DEP-00003002 -MBD-DEP-00001 -N1D-DEP-00009 -P1-25-00001 -3PS-MEVV-T0001 24590-CM-POA-MEVV-00003-05-00003 (Sheet 2 of 4, Sheet 3 of 4)	4G.3.9; Table 4G-2	NA
DVP-EXHR-00001A (Process Ventilation Exhausters) E-0102	DEP	Reserved	4G; Table 4G-2	NA
DVP-EXHR-00001B (Process Ventilation Exhausters) E-0102	DEP	Reserved	4G; Table 4G-2	NA

**WASTE TREATMENT AND IMMOBILIZATION PLANT
CHAPTER 7.0
CONTINGENCY PLAN
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
04/30/2019	24590-WTP-PCN-ENV-19-001 (8C.2019.Q2)
11/01/2017	8C.2017.Q3
09/05/2017	8C.2017.6F
08/2011	

This page intentionally left blank.

1
2
3
4
5
6

CHAPTER 7.0
CONTINGENCY PLAN

1
2
3
4
5
6

This page intentionally left blank.

**CHAPTER 7.0
CONTINGENCY PLAN**

1
2
3
4
5
6 **TABLE OF CONTENTS**

7	7.0 Contingency Plan	5
8	7.1 General Facility Information	5
9	7.1.1 Facility Name.....	5
10	7.1.2 Facility Location.....	5
11	7.1.3 Owner	6
12	7.2 Emergency Response Organization.....	6
13	7.2.1 Building Emergency Director/Emergency Coordinator	6
14	7.3 Circumstances Prompting Implementation	6
15	7.3.1 Facility Hazards	7
16	7.3.2 Response to Facility Operations Emergencies.....	10
17	7.3.3 Natural Phenomena.....	13
18	7.4 Emergency Response Procedures.....	14
19	7.4.1 Incident Response, Hazard Assessment, and Identification	14
20	7.4.2 Notification	14
21	7.4.3 Containment and Control of Emergencies.....	14
22	7.4.4 Protective Actions.....	14
23	7.4.5 Identification of Dangerous Materials	15
24	7.4.6 Prevention of Recurrence or Spread of Fires, Explosions, or Releases	17
25	7.4.7 Post-Emergency Actions.....	17
26	7.5 Emergency Equipment	18
27	7.5.1 Communications Equipment/Warning Systems	18
28	7.5.2 Portable Emergency Equipment	19
29	7.5.3 Communications Equipment.....	20
30	7.5.4 Personal Protective Equipment.....	20
31	7.5.5 Spill Control and Containment Supplies.....	21
32	7.5.6 Incident Command Post.....	21
33	7.6 Coordination Agreements.....	22
34	7.7 Evacuation Plan.....	22
35	7.8 Required Reports, Recordkeeping, and Certifications	22
36	7.8.1 General Requirements.....	22

1 7.8.2 Requirements for Tank Systems 22

2 7.9 Plan Locations and Amendment to Contingency Plan 22

3 7.10 References..... 22

4 Appendix 7-1 Hanford Site Evacuation Routes 25

5 Appendix 7-2 WTP Site Evacuation Routes 27

6

7 **TABLES**

8 Table 7.5-1 Fixed Emergency Equipment 19

9 Table 7.5-2 Portable Emergency Equipment 19

10 Table 7.5-3 Communications Equipment 20

11 Table 7.5-4 Personal Protective Equipment..... 20

12 Table 7.5-5 Spill Kits and Spill Control Equipment..... 21

13 Table 7-1 Hanford Facility Documents Containing Contingency Plan Requirements of

14 WAC 173-303-350(3) 31

15 **Figures**

16

17 Figure App-7-1 Hanford Site Evacuation Routes 26

18 Figure App-7-2 WTP Site Evacuation Routes 29

19

1 **7.0 CONTINGENCY PLAN**

2 The Contingency Plan requirements provided in Washington Administrative Code [\(WAC\) 173-303-350](#),
3 Contingency Plan and Emergency Procedures, are satisfied in portions of this Contingency Plan and the
4 following document:

- 5 • *Hanford Emergency Management Plan* (DOE/RL-94-02 2014) (Attachment 4 of the *Dangerous*
6 *Waste Portion of the Resource Conservation and Recovery Act (RCRA) Permit for the Treatment,*
7 *Storage, and Disposal of Dangerous Waste*)

8 The Contingency Plan also serves to satisfy a broad range of other requirements (e.g., Occupational
9 Safety and Health Administration Standards [[29 CFR 1910](#)], Toxic Substance Control Act of 1976
10 [[40 CFR 761](#)], and United States Department of Energy Orders). Therefore, revisions made to portions of
11 this Contingency Plan document that are not governed by the requirements of [WAC 173-303](#) will not be
12 considered as a modification subject to [WAC 173-303-830](#) or Hanford Facility Dangerous Waste Permit,
13 Condition I.C.3.

14 [Table 7-1](#) identifies which portions of the Contingency Plan are written to meet [WAC 173-303](#)
15 contingency plan requirements. In addition to the Contingency Plan portions identified in [Table 7-1](#),
16 [Section 7.9](#) of the Contingency Plan is written to meet [WAC 173-303](#) requirements identifying where
17 copies of the *Hanford Emergency Management Plan* and the Contingency Plan are maintained on the
18 Hanford Facility. Therefore, revisions to [Section 7.9](#) and the portions identified in [Table 7-1](#) are
19 considered a modification subject to [WAC 173-303-830](#) or Hanford Facility Dangerous Waste Permit,
20 Condition I.C.3.

21 **7.1 General Facility Information**

22 The Hanford Tank Waste Treatment and Immobilization Plant (WTP) will be a dedicated treatment plant
23 that will treat mixed waste transferred from the U.S. Department of Energy (DOE), Office of River
24 Protection (ORP) Double-Shell Tank System Unit at the Hanford Site. The WTP is located on the
25 Hanford Site, a 560-square-mile (1,450-square kilometer) DOE site in southeastern Washington State.
26 The WTP is located in the east portion of the 200 Area near the center of the Hanford Site.

27 The Hanford Site Emergency Preparedness Program is based on the incident command system (ICS) that
28 allows a graded approach for response to emergency events. This plan contains a description of WTP
29 facility specific emergency planning and response and is used in conjunction with the *Hanford Emergency*
30 *Management Plan* (DOE/RL-94-02). Response to events is performed using WTP and Hanford Site level
31 emergency procedures. A revised and updated contingency plan will be submitted at least 18 months
32 before the start of cold commissioning, when all information necessary for emergency planning is
33 available. The plan will be updated to incorporate additional WTP facilities as they are completed and
34 become operational.

35 **7.1.1 Facility Name**

36 US Department of Energy Hanford Site
37 Waste Treatment Plant

38 **7.1.2 Facility Location**

39 Benton County, Washington, within the 200 East Area.

40 Buildings and facilities covered by this plan are as follows:

- 41 • Pretreatment Facility (PTF)
- 42 • Low-Activity Waste (LAW) Facility
- 43 • High-Level Waste Facility (HLW)
- 44 • Balance of Facilities (e.g., support buildings)

- 1 • Analytical Laboratory (Lab)
- 2 • Effluent Management Facility

3 **7.1.3 Owner**

4 United States Department of Energy
5 Office of River Protection
6 P.O. Box 450
7 Richland, Washington 99352

8 **Facility Manager:**

9 Bechtel National, Inc.
10 2435 Stevens Center Pl.
11 Richland, Washington 99354

12 **7.2 Emergency Response Organization**

13 The Emergency Response Organization (ERO), as described in this section and in Section 2.2 of
14 DOE/RL-94-02, is available 24 hours each day to respond to events at the plant. The Building
15 Emergency Director (BED) is prepared to carry out his or her duties immediately and whenever an
16 imminent or actual emergency exists, as required by [WAC 173-303-360](#)(2)(a), (b), and (c).
17 DOE/RL-94-02, Section 2.2.1, details the responsibilities of the BED. An on-duty BED will be the
18 designated primary BED. A designated alternate BED will also be available on each shift. Other ERO
19 personnel will be on duty with either primary or alternate responsibilities. A BED, Incident Command
20 Post (ICP) Hazards Communicator, ICP Communicator, and a Hazards Assessor (chemical or
21 radiological, or both, depending on the event) will staff the ERO along with various BED support
22 personnel. In addition, the BED will designate a plant operations specialist to support the Hanford Fire
23 Department (HFD) personnel.

24 **7.2.1 Building Emergency Director/Emergency Coordinator**

25 Emergency response will be directed by the BED, as the Emergency Coordinator, until the Incident
26 Commander (IC) arrives. The Incident Command System (ICS) staff with supporting on call personnel
27 then fulfill the responsibilities of the Emergency Coordinator as discussed in [WAC 173-303-360](#). During
28 events, facility personnel perform response duties under the direction of the BED. The Incident
29 Command Post (ICP) is managed by either the senior Hanford Fire Department member present on the
30 scene or senior Hanford Patrol member present on the scene (security events only). These individuals are
31 designated as the IC and as such, have the authority to request and obtain any resources necessary for
32 protecting people and the environment. The BED becomes a member of the ICP and functions under the
33 direction of the IC. In this role, the BED continues to manage and direct facility operations.

34 A listing of BEDs by title, work location, and work telephone numbers will be inserted in the Building
35 Emergency Plan (BEP) when issued prior to operations. The BED is located at the WTP (current
36 locations are not determined at this time) or available through an “on-call” list 24 hours a day.

37 Names and home telephone numbers of the BEDs will be available from the Patrol Operations
38 Center (POC) prior to operations, in accordance with Permit Condition II.A.4.

39 **7.3 Circumstances Prompting Implementation**

40 This plan will be implemented when the BED has determined that a release, fire, or explosion has
41 occurred at the facility or in adjacent site facilities. Actions determined in DOE/RL-94-02 and the
42 requirements of [WAC 173-303](#) will be implemented.

1 The BED ensures that trained personnel identify the character, source, amount, and aerial extent of the
2 release, fire, or explosion to the extent possible. Waste identification is made by activities that can
3 include, but are not limited to the following:

- 4 • Visual inspection of involved containers
- 5 • Sampling activities in the field
- 6 • Reference to inventory records
- 7 • Consulting with facility personnel

8 Samples of materials involved in an emergency will be taken by qualified personnel and analyzed as
9 appropriate. The BED will use the following guidelines to determine if an event has met the requirements
10 of [WAC 173-303-360\(2\)\(d\)](#):

- 11 1. The event involved an unplanned spill, release, fire, or explosion,

12 AND

- 13 2.a. The unplanned spill or release involved a dangerous waste, or the material involved became a
14 dangerous waste as a result of the event (e.g., product that is not recoverable), or

- 15 2.b. The unplanned fire or explosion occurred at the WTP or transportation activity subject to the
16 *Resource Conservation and Recovery Act of 1976 (RCRA)* contingency planning requirements,

17 AND

- 18 3. Time-urgent response from an emergency services organization was required to mitigate the
19 event, or a threat to human health or the environment exists.

20 As soon as possible, after stabilizing event conditions, the BED will determine in consultation with the
21 Environmental Organization if notification to the Washington State Department of Ecology (Ecology) is
22 needed to meet [WAC 173-303-360\(2\)\(d\)](#) reporting requirements. Additional information is found in
23 Permit Attachment 4 and DOE/RL-94-02, Section 4.2.

24 If review of all available information does not yield a definitive assessment of the danger posed by the
25 incident, a worst-case condition will be presumed and appropriate protective actions and notifications will
26 be initiated. The BED will be responsible for initiating any protective actions based on their best
27 judgment of the incident.

28 The BED will assess each incident to determine the response necessary to protect personnel, facility, and
29 the environment. If assistance from Hanford Patrol, HFD, or ambulance units is required, the Hanford
30 Emergency Response Number (911 from site office phones or 373-0911 from cellular phones) will be
31 used to contact the Patrol Operations Center and request the desired assistance.

32 **7.3.1 Facility Hazards**

33 Chemical and radiological hazards will be present in the WTP operating facilities. In addition, while
34 construction is ongoing, dangerous wastes will be generated that are typical of construction, consisting
35 mostly of ignitable materials (e.g., spent solvents, waste fuels), corrosives (acids and bases), and toxic
36 materials, which are packaged in various-sized US Department of Transportation containers for shipment
37 to permitted, offsite treatment and disposal facilities. The WTP project has established accumulation
38 areas for these construction-type wastes. Prior to facilities becoming operational, this plan will be
39 updated to reflect additional hazards information.

40 Hazardous waste is managed in temporary satellite accumulation areas (SAA) or central accumulation
41 areas (CAA) within the WTP site boundary. Field Environmental Compliance staff oversee hazardous
42 waste management areas, as well as an inventory of the waste in each of the areas. The list of the SAA
43 and CAA will be maintained within the WTP unit-specific operating record.

1 **7.3.1.1 Hazardous Materials**

2 The WTP maintains and manages a chemical database on a real time basis and can be queried to provide
3 a list of all chemicals on site meeting the criteria for further evaluation. Chemicals used at the WTP
4 Construction Site are evaluated in accordance with procedures that will be developed prior to the receipt
5 of waste. During the chemical evaluation, if the product has a 3 or 4 on a the health hazard rating
6 (National Fire Protection Agency [NFPA] or Hazardous Materials Identification System [HMIS]) or
7 contains a chemical that is listed on the Superfund Amendments and Reauthorization Act (SARA)
8 Extremely Hazardous Substance (EHS) list 302, it is sent to the Emergency Management Administrator
9 for evaluation.

10 A list of chemicals meeting the listed criteria above can be generated using the WTP safety data sheets
11 (SDS) database at any time to provide the most up to date list. In addition, 24590-WTP-RPT-CON-03-
12 001, Rev 6, *Emergency Planning Hazards Survey* provides a brief summary of chemicals that will be
13 evaluated for future WTP Operations.

14 Chemicals that meet the following criteria are excluded from further consideration if they meet one or
15 more of the criteria:

16 Public Use - Commonly available to and used by the general public (if the formulation and is the same
17 as for products that are distributed without significant restrictions to the public.)

18 Dispersible - Materials that do not present an airborne exposure hazard due to its physical form or other
19 factors. Materials may be eliminated if they meet one of the following tests:

- 20 • The substance is a solid at normal temperatures and does not contain or include a significant
21 fraction of small particles readily dispersible (less than 10 microns in diameter).
- 22 • No plausible release mechanism/process by which a large fraction of a solid material can be
23 reduced to small particles for dispersion and inhalation (less than 10 microns in diameter).
- 24 • The substance is a liquid and exhibits a vapor pressure (or partial pressure of a hazardous material
25 in solution) of less than 11 mmHg at about 25 degrees Celsius.

26 Human Health Hazard - Materials that have been assigned a NFPA health hazard category rating (or a
27 health hazard rating assigned locally using the criteria published in NFPA 704) of 0, 1, or 2.

28 Quantity - Individual container quantities smaller than those "easily and safely manipulated by one
29 person (i.e., "laboratory scale" quantities). As used here, containers with capacities of no more than 5
30 gallons (19 L) for liquids, 40 pounds (18 kg) for solids or 10 pounds (4.5 kg) for compressed gases meet
31 such a definition. Note that this threshold is used as a final screening criterion for material that could
32 not be screened out using any of the other criteria above.

33 Currently the WTP chemical screening process identified no hazardous chemicals having an NFPA or
34 HMIS hazard rating of 3 or 4 that require an Emergency Planning Hazard Assessment (EPHA) to be
35 completed. Future chemical use for operational activities and processes will be evaluated when
36 established.

37 **7.3.1.2 Industrial Hazards**

38 Industrial hazards associated with the WTP Site include electrical equipment, pressurized equipment and
39 systems, high temperature equipment, rotating equipment, confined spaces, forklifts, cranes, lifting
40 operations, and compressed gas cylinders.

41 Safe design of the plant, job safety analysis, job control system work packages, and SDS provide the basis
42 for the safe use of this equipment in the workplace. Personnel will be trained in the safe use and handling
43 of compressed gas cylinders, cranes, forklifts etc., as applicable.

1 **7.3.1.3 Radioactive, Dangerous, and Mixed Waste**

2 Safe design of the plant, job safety analysis, job control system work packages, and SDS provide the basis
3 for safe handling of radioactive, dangerous, and mixed waste.

4 Dangerous waste categories managed at the WTP will be identical to the double-shell tank farms when
5 tank waste treatment commences. Categories include characteristic, listed, and state-only wastes, two of
6 which are designated as extremely hazardous waste (WT01 and WP01). The following summarizes the
7 dangerous waste numbers:
8

Characteristic Waste Numbers			
D001	D002	D003	D004
D005	D006	D007	D008
D009	D010	D011	D018
D019	D022	D028	D029
D030	D033	D034	D035
D036	D038	D039	D040
D041	D043		
Listed Waste Numbers			
F001	F002	F003	F004
F005	F039 ^a		
State-only Wastes ^b			
WT01	WT02	WP01	WP02

^a Multi-source leachate (F039) is included as a waste derived from non-specific wastes F001 through F005.

^b Washington State criteria

9

10 The WTP will use the following types of permitted dangerous waste management units:

- 11 • Storage in containers
- 12 • Treatment and storage in tanks
- 13 • Treatment in miscellaneous units (e.g., the melters)
- 14 • Containment buildings
- 15 • Miscellaneous units

16 **Solid Form**

17 Radioactive, dangerous, and mixed wastes may be generated at the WTP during process and maintenance
18 activities. Any waste generated will be properly managed in a designated accumulation area(s) and
19 transported to a permitted storage area. Temporary SAA and/or 90-day pads may also be used during an
20 event if necessary and will be regulated in accordance with [WAC 173-303-200\(2\)](#).

21 **Liquid Form**

22 Highly radioactive mixed waste solutions may be present at the WTP operating facilities. Although these
23 solutions and slurries contain chemicals that are hazardous, the bounding consequence for spills or
24 releases of this waste is usually based on the radiological components of the waste.

1 Gaseous Form

2 The WTP airborne effluent streams are produced through the following:

- 3 • Radiological control area heating ventilation air conditioning (HVAC) system – exhaust from
- 4 radiological controlled areas.
- 5 • Vessel off-gas systems – vapors and gases from these systems.

6 The off-gas systems remove particulate, condensate NO_x, and organic vapors from the air stream before
7 discharging them to the radiological controlled area HVAC system. The combined air stream passes
8 through high efficiency particulate air filtration and is monitored for radioactivity and chemicals.

9 **7.3.2 Response to Facility Operations Emergencies**

10 Depending on the severity of the event, the BED reviews the site-wide procedures and the WTP
11 emergency response procedure(s) and, as required, categorizes and/or classifies the event. If necessary,
12 the BED initiates area protective actions and Hanford Site ERO activation. The steps identified in the
13 following description of actions do not have to be performed in sequence because of the unanticipated
14 sequence of incident events.

15 **7.3.2.1 Facility Operations Emergencies**

16 **7.3.2.1.1 Loss of Utilities**

17 A case-by-case evaluation is required for each event to determine loss of utility impacts. When a BED
18 determines a loss of utility impact, actions are taken to ensure dangerous and/or mixed waste is being
19 properly managed to the extent possible given event circumstances. As necessary, the BED will stop
20 operations and take appropriate actions until the utility is restored.

21 **7.3.2.1.1.1 Loss of Electrical Power**

22 Should there be a partial or total loss of electrical power to the WTP; automatic measures ensure the plant
23 is in a safe operational configuration. (Safe operational configuration is defined as a shutdown to
24 minimal operations that will prevent releases and prevent unnecessary damage to the equipment.)

25 The emergency power system will consist of two diesel turbine- automatically controlled emergency
26 diesel generators and one diesel engine standby generator. The automatic and standby generators are
27 connected to three separate 4.16kV emergency switchgears. Upon loss of power the emergency diesel
28 turbine generators will automatically start. The emergency diesel turbine generators are capable of
29 starting, accelerating, and being loaded with the design load in a specified time limit. The standby diesel
30 generator is started manually or automatically in the event of a prolonged loss of offsite power. The
31 emergency power system will be connected to essential loads in order to ensure only a short-term power
32 interruption for those loads designated as essential. Critical indications and controls are backed up by
33 uninterruptible power supplies and batteries. The plant will remain in a safe condition during loss of
34 electrical power.

35 Egress lighting will consist of self-contained fixtures with battery packs and charging systems. These
36 lighting systems will be located in stairways, exit routes, and fire alarm stations and will come on
37 automatically upon loss of normal power to the fixture. A selected part of the normal lighting will operate
38 as essential lighting, and will provide a minimum level of illumination throughout the plant to aid in
39 restoring the plant to normal operation. Essential lighting will be powered by the emergency power
40 system and will be available after an offsite power loss, following a delay required to start the emergency
41 power supply diesel generators and for the generators to pick up the essential loads.

1 Selected instrumentation and controls will also be powered by an un-interruptible power supply (UPS)
2 system and therefore will be unaffected by a loss of offsite power. UPS systems will be battery backed,
3 and the battery chargers will be connected to the emergency power system. Radiation monitors, such as
4 Continuous Air Monitors (CAMs) and area 1 radiation monitors, are also powered by the UPS systems
5 and continue operating during power failure.

6 **7.3.2.1.1.2 Loss of Water**

7 Upon loss of the raw water system, operations will be restricted. Upon loss of potable water chemical
8 operations will be terminated until safety showers and eyewash stations are available. Upon loss of the
9 fire suppression system, the plant will be placed in a safe configuration, and corrective actions will be
10 implemented.

11 **7.3.2.1.1.3 Loss of Ventilation**

12 A cascade ventilation system is used at the WTP in conjunction with physical building containment
13 features to confine transferable radioactive contamination in the event of an accidental release, spill, or
14 system failure. The ventilation system is designed to maintain building differential pressures so air will
15 flow from areas of lesser contamination potential to areas of greater contamination potential through
16 containment boundary penetrations such as engineered air gaps and air in-bleed ductwork.

17 The WTP is divided into numbered zones with the higher number indicating the greater hazard potential
18 and therefore the greater degree of control/restriction required. Radiation (R1 to R5) and contamination
19 (C1 to C5) zones are classified independently in order to differentiate between the need for shielding or
20 confinement.

21 Supply air in C2 areas flows via C3 to the C5 areas, where it will be discharged by the C5 exhaust fans.
22 In some instances, the airflow will flow from the C2 areas to the C3 areas, where it will be discharged by
23 the C3 exhaust fans. Some C2 air flow will be directly exhausted. Upon loss of the ventilation system,
24 restoration of the C3 and C5 exhaust fans will be immediately attempted. If the C3 and C5 exhaust fans
25 cannot be restored immediately, the C2 supply fans are automatically stopped, and personnel may be
26 notified to evacuate C3 areas, as a precautionary measure.

27 The BED and either the ERO or the IC will take the following actions:

- 28 • Locate the source of the problem, and take steps necessary to control the event
- 29 • Ensure appropriate areas have been evacuated
- 30 • Monitor contamination levels in the plant
- 31 • Restore ventilation system

32 **7.3.2.1.1.4 Loss of Process or Instrument Air**

33 The process air system will use redundant air compressors. One will be in operation and the other(s) will
34 be in autostart mode. If the standby compressor fails to start on loss of the operating compressor, a
35 backup compressor will be started locally.

36 **7.3.2.1.2 Major Process Disruption/Loss of Plant Control**

37 A major process disruption or loss of plant control could be caused by a failure of the process control
38 system. A system condition that causes loss of the process control system could cause plant abnormalities
39 that would lead to increased radiological challenges to WTP protection systems.

40 Non-essential personnel will exit the area of WTP where the system condition has occurred. The system
41 condition will be assessed, and corrective actions will be implemented. Operations will be placed on
42 recirculation by securing the waste feed to the plant. Facility shutdown will be accomplished by
43 performing manual, localized actions such as system isolation, equipment shutdown, etc.

1 **7.3.2.1.3 Pressure Release**

2 The WTP has high-pressure steam and low-pressure compressed air and steam systems. Loss of the
3 compressed air or steam system or systems could result in loss of plant control or a process disruption.
4 Process disruption or loss of plant control could interrupt operations. However, it is not likely that this
5 event would be classified as an emergency.

6 Pressurized gases are used throughout the WTP. In addition, compressed gas cylinders will be stored in
7 the compressed gas storage area. The inventory of gases includes flammable and nonflammable gases.
8 These gases pose a hazard in the immediate storage area, or in the immediate area of the location being
9 used. Failure of compressed gas bottles could cause flying debris hazards.

10 A process system pressure release is categorized as a condensate spray release.

11 **7.3.2.1.4 Fire and (or) Explosion**

12 In the event of a fire, the discoverer activates a fire alarm; calls 911 from site office phones/373-0911
13 from cellular phones or verifies that 911 has been called. Automatic initiation of a fire alarm (by the
14 smoke detectors, sprinkler systems, or pull boxes) is also possible.

- 15 • Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit
16 and proceed to the designated staging area for accountability.
- 17 • On actuation of the fire alarm, ONLY if time permits, personnel should shut down equipment,
18 secure waste, and lock up classified materials (or hand carry them out). The alarm automatically
19 signals the Hanford Fire Department.
- 20 • The BED proceeds directly to the ICP, obtains all necessary information pertaining to the
21 incident, and sends a representative to meet Hanford Fire Department.
- 22 • The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- 23 • The BED informs the Hanford Site ERO as to the extent of the emergency (including estimates of
24 dangerous waste, mixed waste, or radioactive material quantities released to the environment).
- 25 • If operations are stopped in response to the fire, the BED ensures that systems are monitored for
26 leaks, pressure buildup, gas generation, and ruptures.
- 27 • Hanford Fire Department firefighters extinguish the fire as necessary.

28 The following is representative of the type of information that the BED may be called upon to provide to
29 the incident command structure or other response agencies:

- 30 • Location and health of personnel, including missing personnel and possible locations for fire
31 fighters to search for them
- 32 • Location and severity of fire, including character, exact source, and the amount, area, and extent
33 of any released materials
- 34 • Known hazardous conditions (such as, radiological, non-radiological, electrical, thermal,
35 flammable materials, pressurized cylinders, toxic gas, pressure systems, batteries, radiation areas)
- 36 • Plant operating status
- 37 • Utility systems status
- 38 • Support for WTP radiological control personnel (that is, monitoring, surveys, sampling,
39 decontamination)

- 1 • WTP layout
- 2 • Support for firefighter activities as required
- 3 • Notifications as required in accordance with plant procedures and Hanford Emergency
- 4 • Management Plan (DOE/RL-94-02),

5 NOTE: Following a fire and/or explosion, [WAC 173-303-640\(7\)](#) will be addressed for the WTP regarding
6 fitness for use.

7 **7.3.2.1.5 Hazardous Material, Dangerous and/or Mixed Waste Spill**

8 Dangerous waste or mixed waste could spill due to equipment failure or operator error. The severity of
9 the event would depend on the nature and quantity of the spill. In addition, the presence of process
10 chemicals could result in a spill of hazardous materials, due to equipment failure or operator error. See
11 [Section 7.4](#) of this document for details on responding to incidents.

12 **7.3.2.1.6 Transportation and (or) Packaging Incidents**

13 A transportation or packaging event involving hazardous chemicals or radioactive material could result in
14 personnel exposure to hazardous materials. Potential environmental damage could occur due to the
15 release of hazardous or radioactive materials.

16 **7.3.3 Natural Phenomena**

17 The WTP operating facilities are being designed such that it will not fail under a design basis event.
18 Therefore, natural phenomena events are not expected to cause structural damage to these facilities, which
19 would constitute an emergency, or cause a release to the environment. However, the following natural
20 phenomena that have the potential to cause conditions that are beyond the facility design basis are
21 discussed: a beyond design basis seismic event, high winds, volcanic eruption and ash fall, a flood, a
22 range fire, and an aircraft crash.

23 **7.3.3.1 Seismic Event**

24 Depending on the magnitude of the beyond design basis event, severe structural damage can occur,
25 resulting in serious injuries or fatalities and the release of hazardous materials to the environment.
26 Damaged electrical circuits and wiring could result in the initiation of fires.

27 **7.3.3.2 Volcanic Eruption or Ash Fall**

28 Though not expected to cause structural damage, the ash resulting from a volcanic eruption could cause
29 shorts in electrical equipment and plug ventilation system filters.

30 **7.3.3.3 High Winds or Tornadoes**

31 High winds defined as sustained winds above a threshold that would potentially or actually cause
32 significant structural damage to the facility are not expected to occur. (Significant structural damage is
33 interpreted to mean a breach of facility containment and confinement systems sufficient to cause an actual
34 or potential release of hazardous material to the environment). However, dirt and dust from windstorms
35 could cause shorts in electrical equipment, or could plug ventilation system filters. Disruption of normal
36 operations is possible.

37 **7.3.3.4 Flood**

38 The 200 Area is well above projected flood elevations for the Columbia and Yakima Rivers; therefore, a
39 flood is not considered a credible natural event for the WTP. The grading and drainage features that are
40 provided ensures that precipitation, even from a downpour, would infiltrate the ground or drain off toward
41 the Columbia River without significant flooding. The WTP is not sited in a wetlands or coastal
42 high-hazard area.

1 **7.3.3.5 Range Fire**

2 The hazards associated with a range fire are similar to those associated with a building fire plus potential
3 site access restrictions and travel hazards such as poor visibility. Smoke and ash from a range fire can
4 also cause shorts in electrical equipment, or plug ventilation system filters. Disruption of normal
5 operations is possible.

6 **7.4 Emergency Response Procedures**

7 **7.4.1 Incident Response, Hazard Assessment, and Identification**

8 The initial response to any emergency is to immediately protect the health and safety of people in the
9 affected area. Identification of released material is essential to determine appropriate protective actions.
10 Containment, treatment, and disposal assessment are secondary responses.

11 The following sections describe the process for implementing basic protective actions as well as
12 descriptions of response actions for the events listed in [Section 7.3](#) of this plan. DOE/RL-94-02,
13 Section 1.3, provides concept of operations for emergency response on the Hanford Site. Site-specific
14 procedures are detailed in Department of Energy, Richland Operations Office (RL) *Emergency Plan*
15 *Implementing Procedures* (DOE-0223) and DOE/RL-94-02, Section 1.3.3.2 will be used as necessary for
16 hazard assessment and identification of hazards. Facility specific actions will be denoted in WTP BEP.

17 **7.4.2 Notification**

18 As soon as possible after stabilizing event conditions, the BED will determine in consultation with the
19 Environmental Organization if notification to Ecology is needed to meet [WAC 173-303-360\(2\)\(d\)](#)
20 reporting requirements. Additional information regarding requirements for appropriate notifications is
21 found in Permit Attachment 4, DOE/RL-94-02, Section 4.2.

22 **7.4.3 Containment and Control of Emergencies**

23 Site-specific procedures are detailed in RL *Emergency Plan Implementing Procedures* (DOE-0223) and
24 will be used as necessary for the containment and control of emergencies. Facility specific actions will be
25 denoted in WTP BEP.

26 **7.4.4 Protective Actions**

27 Depending on the severity of the event, the BED reviews the site-wide and WTP emergency response
28 procedure(s) and, as required, categorizes and (or) classifies the event. If necessary, the BED initiates
29 area protective actions and Hanford Site ERO activation. The steps identified in the following description
30 of actions do not have to be performed in sequence because of the unanticipated sequence of incident
31 events.

32 The following emergency signals will be used to initiate emergency response:

- 33
- 34 • Evacuation - steady siren
 - 35 • Take cover - wavering siren
 - 36 • Fire - gong/bell

37 Protective action responses are discussed in the following sections. The steps identified in the description
38 of actions do not have to be performed in sequence because of the unanticipated sequence of incident
events.

1 **7.4.4.1 Evacuation**

2 The objective of a facility evacuation order is to limit personnel exposure to hazardous materials or
3 dangerous/mixed waste by increasing the distance between personnel and the hazard. The scope of the
4 evacuation includes evacuation of the facility due to an event at the facility as well as evacuation of the
5 facility in response to a site evacuation order. Evacuation is directed by the BED when conditions
6 warrant and applies to all personnel not actively involved in the event response or in emergency plan
7 related activities.

8 The BED initiates the evacuation by directing an announcement be made to evacuate along with the
9 evacuation location over the public address system and facility radios. Personnel proceed to a
10 predetermined staging area (see [Figure App-7-2](#) WTP Site Evacuation Routes), or other safe upwind
11 location, as determined by the BED. The BED determines the operating configuration of the facility and
12 identifies any additional protective actions to limit personnel exposure to the hazard.

13 Emergency organization personnel or assigned operations personnel conduct a sweep of occupied
14 buildings to ensure that all personnel and visitors have evacuated. For an immediate evacuation,
15 accountability is performed at the staging area. The BED assigns Personnel Accountability Aides (PAAs)
16 and Staging Area Managers (SAMs) with the responsibility to ensure that evacuation actions are taken at
17 WTP. When evacuation actions are complete, the aides/managers provide a status report to the BED. The
18 BED provides status to the IC.

19 **7.4.4.2 Take Cover**

20 The objective of the take cover order is to limit personnel exposure to hazardous or dangerous/mixed
21 waste when evacuation is inappropriate or not practical. Evacuation might not be practical or appropriate
22 because of extreme weather conditions or the material release might limit the ability to evacuate
23 personnel safely.

24 The BED initiates the take cover by directing an announcement be made over the public address system
25 and facility radios, and, as conditions warrant, by activating the 200 Area take cover alarms by calling the
26 POC using 373-3800. Protective actions associated with operations include configuring, or shutting
27 down, the ventilation systems. Determination of additional take cover actions is based on operating
28 configuration, weather conditions, amount and duration of release, and other conditions, as applicable to
29 the event and associated hazard. As a minimum, personnel exposure to the hazard is minimized. The
30 BED assigns personnel as accountability aides with responsibility to ensure that take cover actions are
31 taken at all occupied buildings (take cover locations at WTP). When take cover actions are complete, the
32 PAAs provide the BED with a status report.

33 **7.4.5 Identification of Dangerous Materials**

34 The WTP has engineering controls to contain and/or minimize spills. These controls include containment
35 berms, dedicated spill control sumps, remote leak detection systems, remote gauges, and level indicators.
36 The WTP operating procedures will provide alarm response and maintenance actions for leak detection
37 equipment, surveillance of possible leak locations, and response actions for detected spills.

38 Spills can result from many sources including process leaks, container spills or leaks, damaged packages
39 or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra
40 hazards posed by the presence of radioactive materials.

1 The following actions will be taken in response to a spill or release of hazardous material, dangerous and
2 (or) mixed waste:

3 The person discovering a spill will immediately:

4 Stops work

5 Warns others in the vicinity

6 Isolates the area, so others do not wander into the hazard

7 Minimizes exposure by moving upwind (if outside) or to another area (if indoors)

- 8 • The discoverer notifies the BED and provides details, including size of spill, location, quality, and
9 item spilled.
- 10 • The BED determines if emergency conditions exist requiring response from the HFD based on
11 classification of the spill, injured personnel, and evaluates need to perform additional protective
12 actions.
- 13 • If HFD resources are not needed, the spill is mitigated with resources identified and proper
14 notifications are made.
- 15 • If the HFD resources are needed, the BED calls 373-0911 and requests emergency services.
- 16 • The BED sends a representative to meet the HFD.
- 17 • The BED provides a formal turnover to the IC when the IC arrives.
- 18 • The BED informs the Hanford Site ERO as to the extent of the emergency (including estimates of
19 dangerous waste, mixed waste, or radioactive material quantities released to the environment).
- 20 • If operations are stopped in response to the spill, the BED ensures that systems are monitored for
21 leaks, pressure buildup, gas generation, and ruptures.
- 22 • The HFD stabilizes the spill.

23 As necessary, the BED will also initiate or arrange for the following and ensure all personnel involved
24 follow the guidance from *Hanford Emergency Management Plan* (DOE/RL-94-02 1999):

- 25 • Notify plant personnel of the spill or release by making an announcement over the public address
26 system and facility radios.
- 27 • Establish a control point at a safe location, and coordinate further spill mitigation activities.
- 28 • Notify the contractor Environmental Point of Contact for support.
- 29 • Obtain all available information pertaining to the event, evaluate the need for event categorization
30 or classification, and begin ERO activation as necessary.
- 31 • Initiate use of plant and emergency response procedures.
- 32 • Arrange for care of any injured persons.
- 33 • Maintain access control at the event site by keeping unauthorized personnel and vehicles away
34 from the area. Security personnel can be used to assist in site control. In determining which
35 areas are to be controlled, the BED will consider environmental factors such as wind velocity and
36 direction.
- 37 • Arrange for proper remediation of the event after evaluation, and if required, incident
38 investigation processes have been initiated.
- 39 • Remain available for fire, patrol, and other authorities on the scene, and provide all required
40 information.
- 41 • Enlist the assistance of alternate BED(s) or ERO personnel, if response activities are projected to
42 be long term.

- 1 • Ensure the use of proper protective equipment, remedial techniques, transfer procedures, and
- 2 decontamination procedures by all involved personnel, if remediation is performed by plant
- 3 personnel.
- 4 • Remain at the scene to oversee activities and provide information, if remediation is performed by
- 5 the HFD Hazardous Materials (HAZMAT) Team or other response teams.
- 6 • Ensure proper containerization, packaging, and labeling of recovered spill materials.
- 7 • Ensure decontamination (or restocking) and restoration of emergency equipment used in the spill
- 8 remediation before resuming operations.
- 9 • Provide required reports after the event in accordance with WTP procedures

10 Additional actions to be taken in response to a leaking tank include the following:

- 11 • Removal of the leaking tank from service.
- 12 • Conduct an investigation to determine the cause of the event.
- 13 • Perform repairs or replacements before the tank is returned to service—with, as required—final
- 14 approval from an independent certified professional engineer.
- 15 • Following an emergency event involving a tank system, address all requirements of
- 16 [WAC 173-303-640\(7\)](#) regarding fitness for use.

17 If a catastrophic dumping of mixed waste occurs, affected plants or processes will be immediately shut
 18 down. The actions described in [Section 7.3](#) will be performed. If a catastrophic dumping causes a high
 19 radiation alarm on the C5 or C3 ventilation systems, the standby systems will be started, and actions
 20 described in [Section 7.3.2.1.1.3](#) will be performed.

21 **7.4.5.1 Damaged or Unacceptable Shipments**

22 No waste will be received at the WTP from outside of the Hanford Site. Therefore, this section of the
 23 plan is not applicable.

24 **7.4.6 Prevention of Recurrence or Spread of Fires, Explosions, or Releases**

25 The BED, as part of the Incident Command System, takes the steps necessary to ensure that a secondary
 26 release, fire, or explosion does not occur. The BED will take measures, where applicable, to stop
 27 processes and operations, collect and contain released wastes and remove or isolate containers. The BED
 28 ensures monitoring for leaks, pressure buildups, gas generation, or ruptures in valves, pipes or other
 29 equipment, whenever this is appropriate.

30 Following a fire and (or) explosion, [WAC 173-303-640\(7\)](#) will be addressed for any tank systems that
 31 may have been affected regarding fitness for use.

32 **7.4.7 Post-Emergency Actions**

33 DOE/RL-94-02, Section 9, describes actions for event termination, incident recovery, and restart of
 34 operations. The extent by which these actions are employed is based on the incident classification of each
 35 event. In addition, DOE/RL-94-02 also contains actions for management of incompatible wastes that
 36 might apply.

37 Equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris.
 38 Decontaminated equipment is checked for proper operation before storage for subsequent use.
 39 Consumable and disposed materials are restocked. Fire extinguishers are replaced.

40 The BED ensures that equipment used during the incident is cleaned and fit for its intended use before
 41 operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished.

1 **7.4.7.1 Termination of Event**

2 *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.0, describes actions for event
3 termination, incident recovery, and restart of operations. The extent by which these actions are employed
4 is based on the incident classification of each event. In addition, *Hanford Emergency Management Plan*
5 (DOE/RL-94-02) also contains actions for the management of incompatible wastes that might apply.

6 For events where the RL-Emergency Operations Center (EOC) is activated, the RL and DOE-ORP
7 Emergency Manager has the authority to declare event termination. This decision is based on input from
8 the BED, IC, and other emergency response organization members. For events where the RL-EOC is not
9 activated, the ICS and staff will declare event termination.

10 **7.4.7.2 Incident Recovery and Restart of Operations**

11 A recovery plan is developed when necessary in accordance with DOE/RL-94-02, Section 9.2.

12 A recovery plan is needed following an event where further risk could be introduced to personnel, the
13 facility, or the environment through recovery action and (or) to maximize the preservation of evidence.

14 If the emergency response is implemented in accordance with Section 4 of this plan, Ecology will be
15 notified before operations can resume. This notification is in addition to the required reports discussed in
16 Section 5.1 of DOE/RL-94-02 and will include the following statements:

- 17 • There are no incompatibility issues with the waste and released materials from the incident.
- 18 • All the equipment has been cleaned, fit for its intended use, and placed back into service.

19 The notification required by [WAC 173-303-360\(2\)\(j\)](#) may be made via telephone conference and
20 documentation of the notification will be included in the WTP operating record. Additional information
21 that Ecology requests regarding these restart conditions will be included in the required 15-day report
22 identified in [Section 7.8](#) of this plan and required by [WAC 173-303-360\(2\)\(k\)](#).

23 For emergencies not involving activation of the RL-EOC, the BED ensures that conditions are restored to
24 normal before operations are resumed. If the Hanford Site ERO was activated and the emergency phase
25 is complete, a special recovery organization could be appointed at the discretion of RL to restore
26 conditions to normal. This process is detailed in RL and contractor emergency procedures. The makeup
27 of this organization depends on the extent of the damage and the effects. The onsite recovery
28 organization will be appointed by the appropriate contractor's management.

29 After an event, the BED or the onsite recovery organization ensures that no waste that might be
30 incompatible with the released material is treated, stored, and (or) disposed of until cleanup is completed
31 pursuant to [WAC 173-303-360\(2\)\(j\)](#). Cleanup actions are taken by WTP personnel or other assigned
32 personnel. DOE/RL-94-02, Section 9.2.3, describes actions to be taken.

33 Waste from cleanup activities is designated and managed as newly generated waste. A field check for
34 compatibility is performed before storage, as necessary. Incompatible wastes are not placed in the same
35 container. Waste containers are placed in approved storage areas appropriate for their compatibility class.

36 If incompatibility of waste was a factor in the incident, the BED or the onsite recovery organization
37 ensures that the cause is corrected.

38 **7.5 Emergency Equipment**

39 Hanford Site emergency resources and equipment are described and listed in DOE/RL-94-02,
40 Section 11.2. Emergency resources and equipment for the entire WTP are presented in this section.

41 **7.5.1 Communications Equipment/Warning Systems**

42 [Table 7.5-1](#) lists the fixed emergency equipment available at the WTP.

43

Table 7.5-1 Fixed Emergency Equipment

Type	Location	Capability
Safety shower/eye wash station	Throughout the WTP in locations designated by facility procedures.	Assist in flushing chemicals and materials from body or eyes and face.
Automatic sprinkler system	Throughout the WTP.	Assist in the control of fire.
Fire alarm pull boxes	Throughout the WTP.	Activate the building fire alarm and notify fire department, as developed by Coordination Agreements.
Emergency diesel generators	East of the LAW Facility.	Provide emergency power.
Fire hose connections	Throughout the WTP in locations designated by facility procedures.	Allow for connection of fire hoses to site water system for manual fire suppression.

1

2 **7.5.2 Portable Emergency Equipment**

3 [Table 7.5-2](#) lists the portable emergency equipment available at the WTP.

4

Table 7.5-2 Portable Emergency Equipment

Type	Location	Capability
General purpose fire extinguishers	Throughout the WTP.	Fire suppression for class A, B, and C fires.
CO ₂ or clean-agent fire extinguishers	Throughout the WTP.	Suppress electrical fires.
Miscellaneous emergency equipment	Throughout the facility located in emergency equipment cabinets as designated by facility procedures.	Safety harnesses, blankets, first aid kits, stretchers, emergency lights, and emergency tools.

5

1 **7.5.3 Communications Equipment**

2 [Table 7.5-3](#) lists communications and warning systems at the WTP.

3

Table 7.5-3 Communications Equipment

Type	Location	Capability
<u>Siren System</u> Evacuation STEADY SIREN Take Cover WAVERING SIREN Fire GONG/BELL	Throughout the WTP.	Alert facility personnel of emergency conditions.
Public address system	Throughout the WTP.	Provides for information dissemination to facility personnel.
Telephone system	WTP Central Control Room, office areas, and other plant locations.	Internal and external communications.
Portable two-way radios	Throughout the WTP.	Communications to the CCR.

4

5 **7.5.4 Personal Protective Equipment**

6 [Table 7.5-4](#) lists types of protective equipment available at the WTP.

7

Table 7.5-4 Personal Protective Equipment

Type	Location	Capability
<ul style="list-style-type: none"> • Waterproof coveralls • Leather protective wear • Respirators • Filtered masks • Oxygen supplies • Escape packs • SCBAs 	Throughout the facility in or near emergency equipment cabinets as designated by facility procedure.	Protection from various hazards (e.g., smoke, fumes, oxygen deficient atmosphere, chemicals, high airborne radioactivity concentrations, and radiological contamination)

SCBA = self-contained breathing apparatus.

8

1 **7.5.5 Spill Control and Containment Supplies**

2 [Table 7.5-5](#) lists the locations of spill kits and includes a basic listing of contents.

3

Table 7.5-5 Spill Kits and Spill Control Equipment

Type	Location	Capability
Absorbents and spill response materials 55-gal drums Overpack drums Bags Step-off pads Protective clothing Chemical resistant coveralls Surgical and chemical gloves Acid Goggles/Face shields Sodium-bicarbonate Barrier Tape Rags Scissors Flashlight Batteries pH paper Mop handles Mop heads Mop bucket with wringer Hazardous material labels Non-sparking shovel Hazardous absorbent booms Ear plugs Portable barriers	Throughout the facility in or near spill kit cabinets as designated by facility procedures.	Control and mitigation of radioactive and chemical spills.

4

5 **7.5.6 Incident Command Post**

6 If the ICP is activated, the BED will notify appropriate personnel of its location by either the public
7 address system, radios, or telephones. Emergency resource materials are stored at each location. The IC
8 could activate the Hanford Fire Department Mobile Command Unit if necessary.

9 The ICP will contain the following:

- 10 • Telephone communications, (including speakerphones and headsets) including the Hanford
- 11 Site Emergency Alerting System (HSEAS)
- 12 • Radio communications

- 1 • Access to the public address system
- 2 • Access to plant operations data
- 3 • Access to plant systems information
- 4 • Access to accountability and building access control information

5 **7.6 Coordination Agreements**

6 RL has established a number of coordination agreements, or memoranda of understanding with various
7 agencies to ensure proper response resource availability for incidents involving the Hanford Site.
8 A description of the agreements is contained in DOE/RL-94-02, Section 3, Table 3-1.

9 **7.7 Evacuation Plan**

10 [Figure App-7-1](#) and [Figure App-7-2](#) shows the evacuation routes for the Hanford Site and WTP Facility.
11 Evacuation routing maps for the WTP will be maintained in the facility operating record and provide
12 identification of the primary staging area and a general layout of the facility. Alternate evacuation routes
13 and staging areas will be determined and used on a case-by-case basis, and based on meteorological
14 conditions at the time of an event.

15 **7.8 Required Reports, Recordkeeping, and Certifications**

16 Post incident written reports are required for certain incidents on the Hanford Site. The reports are
17 described in DOE/RL-94-02, Section 5.1.

18 **7.8.1 General Requirements**

19 Facility management will note in the WTP operating record, the time, date, and details of any incident that
20 requires implementation of the contingency plan (refer to [Section 7.3](#) of this plan). Within fifteen (15)
21 days after the incident, a written report on the incident will be submitted to Ecology. The report will
22 include all items specified in [WAC 173-303-360\(2\)\(k\)](#).

23 **7.8.2 Requirements for Tank Systems**

24 If a release from a tank system occurs that requires notification according to [WAC 173-303-640\(7\)](#),
25 notification as described in WTP procedures will be followed.

26 **7.9 Plan Locations and Amendment to Contingency Plan**

27 Copies of this Contingency plan are maintained at the following locations:

- 28 • WTP ICP
- 29 • WTP Control Room

30 Portions of the plan will be reviewed and immediately amended if necessary when conditions described in
31 DOE/RL-94-02, Section 14.3.1.1, occur. In addition, the plan will be revised prior to operation of
32 additional WTP facilities. This will include information that is not currently available. Subsequently, the
33 plan will be reviewed annually and updated as needed.

34 **7.10 References**

35 DOE/RL-94-02, *Hanford Emergency Management Plan*, as amended

36 [WAC 173-303](#), Washington State Dangerous Waste Regulations, Washington Administrative Code,
37 Washington State Department of Ecology, Olympia, Washington, as amended

38 Ecology, 2011, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery*
39 *Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Permit Number*
40 *WA7890008967*, Washington State Department of Ecology, Olympia, Washington, as amended

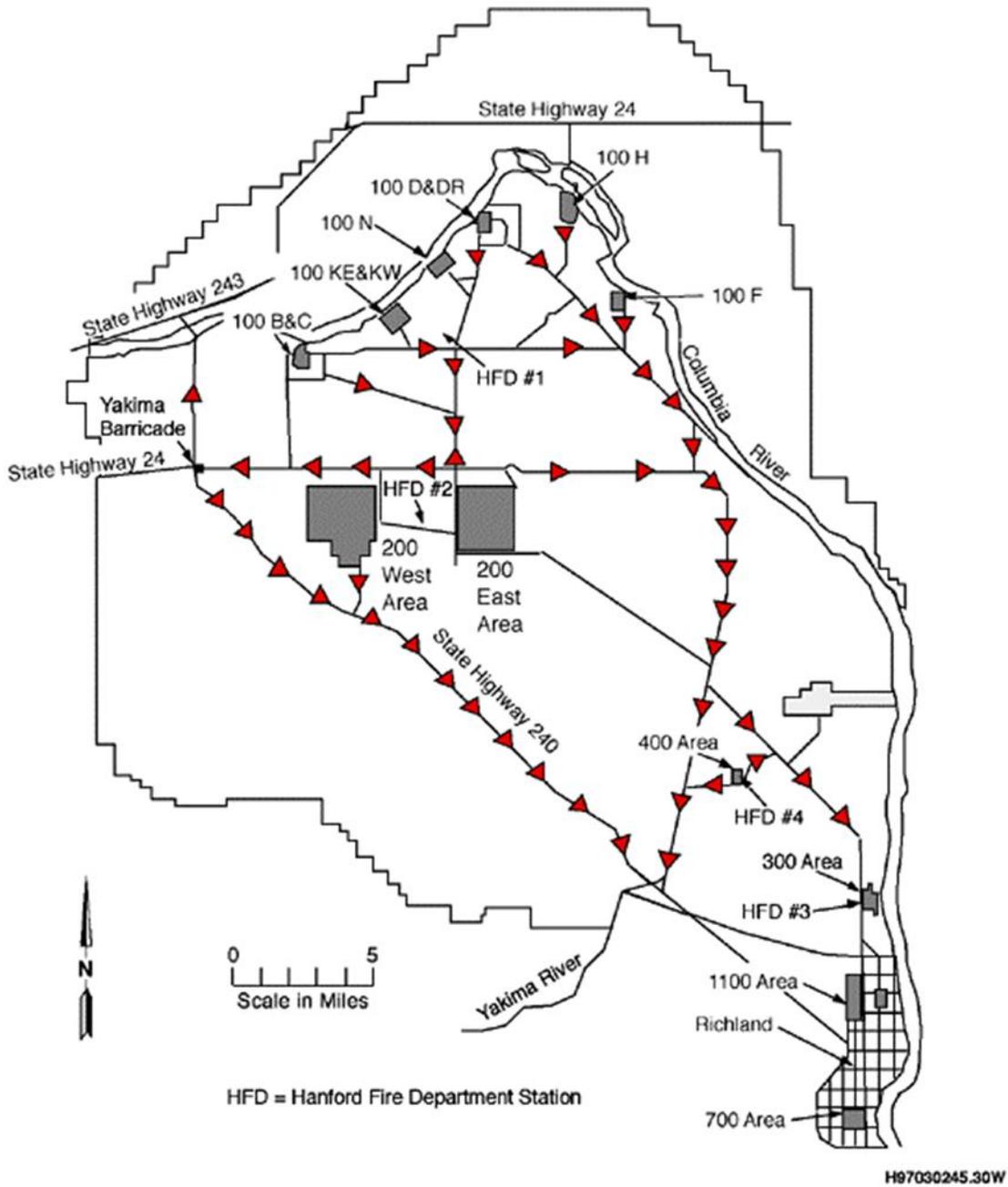
- 1 DOE-0223, *Emergency Plan Implementing Procedures*
- 2 24590-WTP-RPT-CON-03-001, Rev 6, *Emergency Planning Hazards Survey*

1
2
3
4
5
6

This page intentionally left blank.

1
2
3
4
5
6

Appendix 7-1
Hanford Site Evacuation Routes



1
2
3

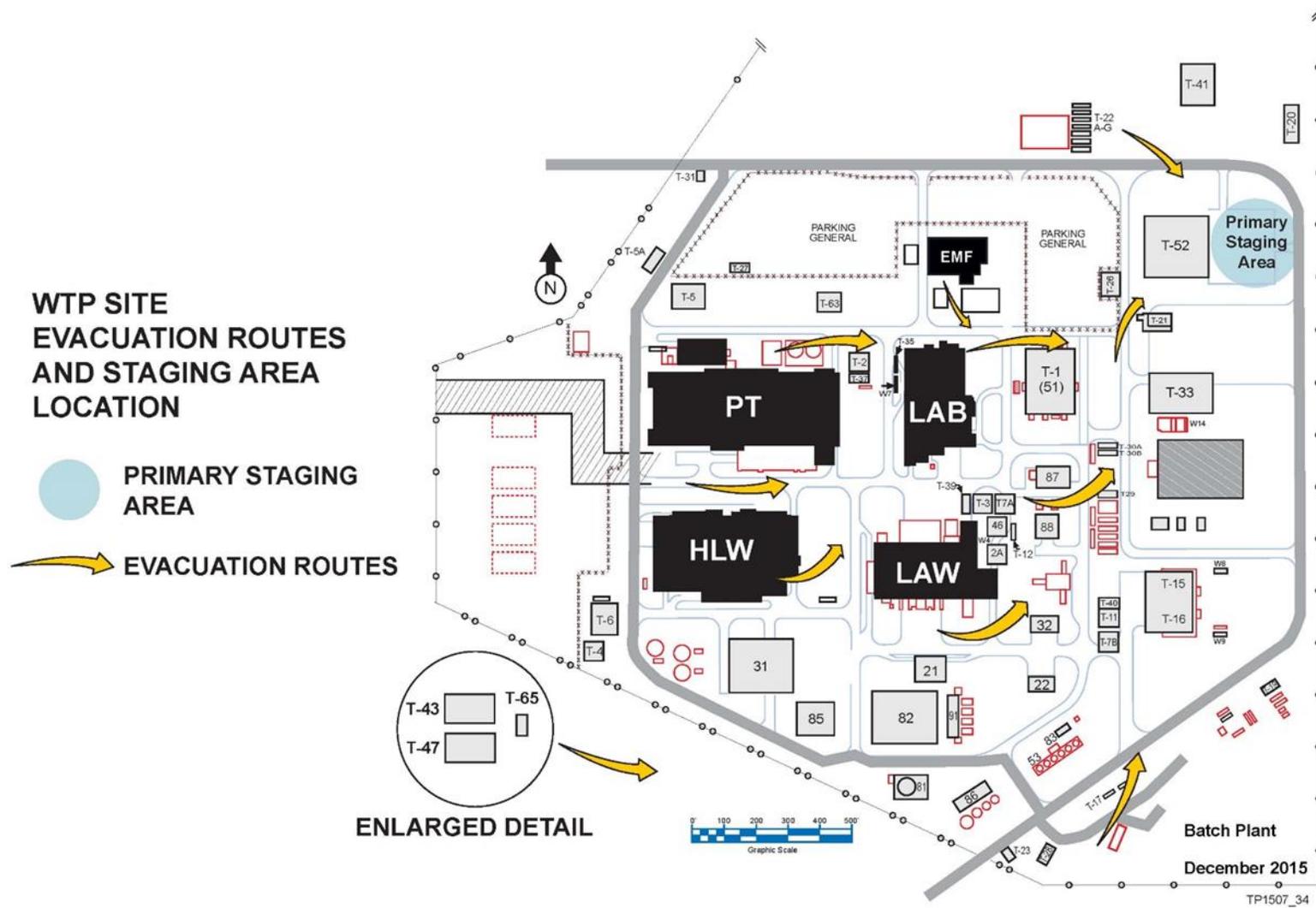
Figure App-7-1 Hanford Site Evacuation Routes

1
2
3
4
5

Appendix 7-2
WTP Site Evacuation Routes

1
2
3
4
5

This page intentionally left blank.



1
2
3

Figure App-7-2 WTP Site Evacuation Routes

1
2
3
4
5

This page intentionally left blank.

Table 7-1 Hanford Facility Documents Containing Contingency Plan Requirements of [WAC 173-303-350\(3\)](#)

Requirement	<i>Hanford Emergency Management Plan (DOE/RL-94-02): Attachment 4 of the Hanford Facility Dangerous Waste Permit</i>	Chapter 7.0 Contingency Plan¹
-350(3)(a) – A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360 .	X ² Section 1.3.4	X ² Sections 7.3 through 7.3.2 and 7.4.4 and 7.4.6 ³ Sections 7.3.2.1.6
-350(3)(b) – A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370(5) , Manifest system, reasons for not accepting dangerous waste shipments.	X ² Section 1.3.4	X ^{2,4} Section 7.4.5.1
-350(3)(c) – A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4) .	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1	
-350(3)(d) – A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1) . Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810 (14)(a)(i)), rather than as part of the permit application.		X ⁵ Section 7.2.1

Table 7-1 Hanford Facility Documents Containing Contingency Plan Requirements of [WAC 173-303-350\(3\)](#)

Requirement	<i>Hanford Emergency Management Plan (DOE/RL-94-02): Attachment 4 of the Hanford Facility Dangerous Waste Permit</i>	Chapter 7.0 Contingency Plan¹
-350(3)(e) – A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.	X Hanford Fire Department: Section 11.2	X Section 7.5
-350(3)(f) – An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	X ⁶ Figure 7-3 and Table 5-1	X ⁷ Section 7.4.4 through 7.4.4.2 Section 7.7

An “X” indicates requirement applies.

¹Portions of the *Hanford Emergency Management Plan* not enforceable through Appendix A of that document are not made enforceable by reference in Chapter 7.0 Contingency Plan.

²The *Hanford Emergency Management Plan* contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions are required at the Hanford Site level. If other credible scenarios exist or if emergency procedures at the WTP are different, the description of actions contained in the Chapter 7.0 Contingency Plan will be used during an event by a building emergency director.

³[Sections 7.3.2, 7.4.4, and 7.4.6](#) of Chapter 7.0 Contingency Plan are those sections subject to the Class 2 “Changes in emergency procedures (i.e., spill or release response procedures)” described in [WAC 173-303-830](#), Appendix I, Section B.6.a.

⁴This requirement only applies to Treatment, Storage, or Disposal units that receive shipment of dangerous or mixed waste defined as offsite shipments in accordance with [WAC 173-303](#).

⁵Emergency Coordinator names and home telephone numbers are maintained separately from the contingency plan document, on file in accordance with Hanford Facility Dangerous Waste Permit General Condition II.A.3, and is updated, at a minimum, monthly.

⁶The Hanford Facility (site-wide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

⁷An evacuation route for the WTP is provided. Evacuation routes for occupied buildings surrounding the WTP are provided through information boards posted within buildings.

WASTE TREATMENT AND IMMOBILIZATION PLANT
APPENDIX 1.0
WTP INTERIM COMPLIANCE SCHEDULE
CHANGE CONTROL LOG

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Appendices	Modification Date	Modification Number
Appendix 1.0	06/12/2019	24590-WTP-PCN-ENV-19-002 (8C.2019.Q2)
Appendix 1.1	11/28/2017	8C.2017.8F
Appendix 1.2	05/11/2018	24590-WTP-PCN-ENV-18-005
Appendix 1.3	08/30/2018	8C.2018.3F
Appendix 1.4	06/12/2019	24590-WTP-PCN-ENV-19-002 (8C.2019.Q2)
Appendix 1.5	10/02/2018	24590-WTP-PCN-ENV-18-008 (8C.2018.Q4)

This page intentionally left blank.

1
2
3
4
5
6

OPERATING UNIT GROUP 10
APPENDIX 1.0
WTP INTERIM COMPLIANCE SCHEDULE

1
2
3
4
5

This page intentionally left blank.

1
2
3 **OPERATING UNIT GROUP 10**
4 **APPENDIX 1.0**
5 **WTP INTERIM COMPLIANCE SCHEDULE**

6
7 Where information regarding treatment, management, and disposal of the radioactive source, byproduct
8 material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of
9 1954, as amended) has been incorporated into this permit, it is not incorporated for the purpose of
10 regulating the radiation hazards of such components under the authority of this permit and [chapter 70.105](#)
11 [Revised Code of Washington](#). In the event of any conflict between Permit Condition III.10.A and any
12 statement relating to the regulation of source, special nuclear, and byproduct material contained in
13 portions of permit application that are incorporated into this permit, Permit Condition III.10.A will
14 prevail.

1
2
3
4
5

This page intentionally left blank.

**WASTE TREATMENT AND IMMOBILIZATION PLANT
APPENDIX 1.4
INTERIM COMPLIANCE SCHEDULE –
WTP EFFLUENT MANAGEMENT FACILITY (EMF)
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
06/12/2019	24590-WTP-PCN-ENV-19-002 (8C.2019.Q2)
08/23/2018	8C.2018.4F
09/05/2017	8C.2017.6F

This page intentionally left blank.

1
2

Appendix 1.4
Interim Compliance Schedule – WTP Effluent Management Facility (EMF)

	EMF Compliance Schedule Submittal	Interim Compliance Date
	III.10.C.2	
EMF-1	Submit documentation stating the EMF has been constructed in compliance with the Permit.	12/31/2020
	III.10.C.3	
EMF-3	Update and submit for approval Waste Analysis Plan and associated Quality Assurance Project Plan (Chapter 3A and 3B) to Ecology for review and approval.	6/30/2020
	III.10.C.5	
EMF-4	Update and submit for approval Procedures to Prevent Hazards and Inspection Schedule (Chapter 6 and Appendix 6A) to Ecology for review and approval.	6/30/2020
	III.10.C.6	
EMF-5	Update and submit the Contingency Plan (Chapter 7) to Ecology for review and approval.	6/30/2020
	III.10.C.7	
EMF-6	Update and submit Training Program (Chapter 8) to Ecology for review and approval.	6/30/2020
EMF-7	Submit under separate cover the actual WTP Dangerous Waste Training Plan for incorporation into Administrative Record.	6/30/2020
	III.10.C.8	
EMF-8	Update and submit the Closure Plan (Chapter 11) to Ecology for review and approval.	6/30/2020
	III.10.C.11	
EMF-9	Update and submit Risk Assessment Work Plan, revised in consultation with Ecology to address the DFLAW configuration.	08/30/2019
	Containers III.10.D.10	
EMF-11	Update and submit descriptions of container management practices (Appendix 4G) to Ecology for review and approval.	6/30/2020
	Prior to Installation III.10.E.9	
EMF-13	Update and submit engineering information for each dangerous waste tank (Appendix 4G) to Ecology for review and approval.	Complete
EMF-14	Update and submit engineering information for each tank system ancillary equipment (Appendix 4G) to Ecology for review and approval.	Complete
	Report of Progress	
EMF-45	Update and submit descriptions of tank management practices (Appendix 4G) to Ecology for review and approval.	6/30/2020

	EMF Compliance Schedule Submittal	Interim Compliance Date
	EMF Misc. Units Systems III.10.M.A	
EMF-16	Submit engineering information for EMF Miscellaneous Treatment Unit Systems.	Complete
	Final Compliance Date	
EMF-32	Final Compliance Date (Hot Commissioning Complete)	12/31/2023

1

**WASTE TREATMENT AND IMMOBILIZATION PLANT
APPENDIX 9.0
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Appendices	Modification Date	Modification Number
Appendix 9.0	05/21/2019	24590-LAW-PCN-ENV-19-004 (8C.2019.Q2)
Appendix 9.1	07/06/2017	8C.2017.2F
Appendix 9.2	07/30/2018	24590-LAW-PCN-ENV-18-001 (8C.2018.Q3)
Appendix 9.4	11/01/2017	8C.2017.Q3
Appendix 9.5	12/7/2018	24590-WTP-PCN-ENV-18-001 (8C.2018.Q4)
Appendix 9.6	05/20/2019	24590-LAW-PCN-ENV-16-004 (8C.2019.Q2)
Appendix 9.7	03/06/2018	24590-LAW-PCN-ENV-17-005 (8C.2018.Q1)
Appendix 9.8		
Appendix 9.9	05/20/2019	24590-LAW-PCN-ENV-16-004 (8C.2018.Q2)
Appendix 9.10		
Appendix 9.11	03/06/2019	24590-LAW-PCN-ENV-18-008 (8C.2019.Q1)
Appendix 9.13	11/01/2017	8C.2017.Q3
Appendix 9.15	08/30/2018	8C.2018.3F
Appendix 9.18	05/21/2019	24590-LAW-PCN-ENV-19-004 (8C.2019.Q2)

This page intentionally left blank.

1
2
3
4
5

OPERATING UNIT GROUP 10
APPENDIX 9.0

1
2
3
4
5

This page intentionally left blank.

1
2
3
4
5
6
7
8
9
10
11
12
13

OPERATING UNIT GROUP 10
APPENDIX 9.0

Where information regarding treatment, management, and disposal of the radioactive source, byproduct material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954, as amended) has been incorporated into this permit, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit and [chapter 70.105 Revised Code of Washington](#) (RCW). In the event of any conflict between Permit Condition III.10.A and any statement relating to the regulation of source, special nuclear, and byproduct material contained in portions of the permit application that are incorporated into this permit, Permit Condition III.10.A will prevail.

1
2
3
4
5

This page intentionally left blank.

1
2
3
4
5
6
7
8
9
10
11
12

**DRAWINGS AND DOCUMENTS
OPERATING UNIT GROUP 10 – APPENDIX 9.2
LOW ACTIVITY WASTE BUILDING
PIPING AND INSTRUMENTATION DIAGRAMS**

The documents listed in the following table are incorporated by reference into this permit and are subject to the requirements set forth in Part I Standard Conditions, Part II General Facility Conditions, and Part III Operating Unit Group 10 Conditions. Upon request, copies of the documents can be viewed at the Nuclear Waste Program Resource Center located at 3100 Port of Benton Blvd., Richland, WA. Appointments for viewing can be scheduled by calling (509) 372-7950.

Drawing/Document Number	Description
24590-LAW-M6-LCP-00001001, Rev 0	P&ID – LAW Concentrate Receipt Process System LCP-BULGE-00001
24590-LAW-M6N-LCP-00045	Drawing Change Notice – Add DFLAW Utility Isolations to LAW LCP System and Transfer Line
24590-LAW-M6-LCP-00001002, Rev 0	P&ID – LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00001
24590-LAW-M6-LCP-00001003, Rev 0	P&ID – LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00001
24590-LAW-M6-LCP-00001004, Rev 0	P&ID – LAW Concentrate Receipt Process System LCP-BULGE-00002 (Sheet 1 of 2)
24590-LAW-M6-LCP-00001005, Rev 1	P&ID – LAW Concentrate Receipt Process System LCP-BULGE-00002
24590-LAW-M6-LCP-00001006, Rev 0	P&ID – LAW Concentrate Receipt Process System Expansion Vessel LCP-VSL-00005
24590-LAW-M6-LCP-00002001, Rev 0	P&ID – LAW Concentrate Receipt Process System LCP-BULGE-00003 (Sheet 1 of 2)
24590-LAW-M6-LCP-00002002, Rev 1	P&ID – LAW Concentrate Receipt Process System LCP-BULGE-00003
24590-LAW-M6-LCP-00002003, Rev 0	P&ID – LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00002
24590-LAW-M6-LCP-00002004, Rev 0	P&ID – LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00002
24590-LAW-M6-LFP-00001001, Rev 0	P&ID – LAW Melter Feed Process System Melter 1 Feed Preparation LFP-VSL-00001
24590-LAW-M6-LFP-00001002, Rev 0	P&ID – LAW Melter Feed Process System Melter 1 Feed Preparation LFP-VSL-00001
24590-LAW-M6-LFP-00001003, Rev 0	P&ID – LAW Melter Feed Process System Melter 1 Feed Vessel LFP-VSL-00002
24590-LAW-M6-LFP-00001004, Rev 1	P&ID – LAW Melter Feed Process System Melter 1 Feed Vessel LFP-VSL-00002

Drawing/Document Number	Description
24590-LAW-M6-LFP-00001005, Rev 0	P&ID – LAW Melter Feed Process System Melter 1 Feed Preparation and Feed LFP-BULGE-00001
24590-LAW-M6-LFP-00001006, Rev 1	P&ID – LAW Melter Feed Process System Melter 1 Feed Preparation and Feed LFP-BULGE-00001
24590-LAW-M6-LFP-00003001, Rev 0	P&ID – LAW Melter Feed Process System Melter 2 Feed Preparation LFP-VSL-00003
24590-LAW-M6-LFP-00003002, Rev 0	P&ID – LAW Melter Feed Process System Melter 2 Feed Preparation LFP-VSL-00003
24590-LAW-M6-LFP-00003003, Rev 0	P&ID – LAW Melter Feed Process System Melter 2 Feed Vessel LFP-VSL-00004
24590-LAW-M6-LFP-00003004, Rev 1	P&ID – LAW Melter Feed Process System Melter 2 Feed Vessel LFP-VSL-00004
24590-LAW-M6-LFP-00003005, Rev 0	P&ID – LAW Melter Feed Process System Melter 2 Feed Preparation and Feed LFP-BULGE-00002
24590-LAW-M6-LFP-00003006, Rev 1	P&ID – LAW Melter Feed Process System Melter 2 Feed Preparation and Feed LFP-BULGE-00002
24590-LAW-M6-LMP-00001001, Rev 0	P&ID – LAW Melter Process System Melter 1 Agitation Zone 1 & Zone 2 and LMP-RK-00040A/B Confidential Business Information
24590-LAW-M6-LMP-00002001, Rev 1	P&ID – LAW Melter Process System Melter 1 Agitation Zone 3 & Level Detection LMP-RK-00040B and PPJ-RK-00001 Confidential Business Information
24590-LAW-M6-LMP-00002002, Rev 0	P&ID – LAW Melter Process System Melter 1 Agitation Zone 3 & Level Detection and LMP-RK-00040C Confidential Business Information
24590-LAW-M6-LMP-00003001, Rev 0	P&ID – LAW Melter Process System Melter 1 Walls and Floor Panels Cooling System
24590-LAW-M6-LMP-00005001, Rev 0	P&ID – LAW Melter Process System Melter 1 Electrode Extension Cooling & Glass/Plenum Temperatures Confidential Business Information
24590-LAW-M6-LMP-00007001, Rev 0	P&ID – LAW Melter Process System Melter 1 Glass Pouring and Monitoring Instrumentation
24590-LAW-M6-LMP-00007002, Rev 0	P&ID – LAW Melter Process System Melter 1 Glass Pouring and Monitoring Instrumentation
24590-LAW-M6-LMP-00008001, Rev 0	P&ID – LAW Melter Process System Melter 1 Discharge Heaters, Power Controls (1-4) & Air Lift – Eastside
24590-LAW-M6-LMP-00010001, Rev 0	P&ID – LAW Melter Process System Melter 1 Discharge Heaters, Power Controls (1-4) & Air Lift – Westside
24590-LAW-M6-LMP-00012001, Rev 0	P&ID – LAW Melter Process System Melter 1 Feed Nozzles Cooling System and Feed Nozzles

Drawing/Document Number	Description
24590-LAW-M6-LMP-00013001, Rev 0	P&ID – LAW Melter Process System Melter 1 Lid, Plenum and Offgas Ports Cooling System
24590-LAW-M6-LMP-00013002, Rev 0	P&ID – LAW Melter Process System Melter 1 Melter Lid Cooling Loop
24590-LAW-M6-LMP-00031001, Rev 0	P&ID – LAW Melter Process System Melter 2 Agitation Zone 1 & Zone 2 Confidential Business Information
24590-LAW-M6-LMP-00032001, Rev 1	P&ID – LAW Melter Process System Melter 2 Agitation Zone 3 & Level Detection LMP-RK-000041B and PPJ-RK-00002 Confidential Business Information
24590-LAW-M6-LMP-00032002, Rev 0	P&ID – LAW Melter Process System Melter 2 Agitation Zone 3 & Level Detection LMP-RK-00041C Confidential Business Information
24590-LAW-M6-LMP-00033001, Rev 0	P&ID – LAW Melter Process System Melter 2 Walls and Floor Panels Cooling System
24590-LAW-M6-LMP-00035001, Rev 0	P&ID – LAW Melter Process System Melter 2 Electrode Extension Cooling & Glass/Plenum Temperatures Confidential Business Information
24590-LAW-M6-LMP-00037001, Rev 0	P&ID – LAW Melter Process System Melter 2 Glass Pouring and Monitoring Instrumentation
24590-LAW-M6-LMP-00037002, Rev 0	P&ID – LAW Melter Process System Melter 2 Glass Pouring and Monitoring Instrumentation
24590-LAW-M6-LMP-00038001, Rev 0	P&ID – LAW Melter Process System Melter 2 Discharge Heaters, Power Controls (1-4) & Air Lift – Eastside
24590-LAW-M6-LMP-00040001, Rev 0	P&ID – LAW Melter Process System Melter 2 Discharge Heaters, Power Controls (1-4) & Air Lift – Westside
24590-LAW-M6-LMP-00042001, Rev 0	P&ID – LAW Melter Process System Melter 2 Feed Nozzles Cooling System and Feed Nozzles
24590-LAW-M6-LMP-00043001, Rev 0	P&ID – LAW Melter Process System Melter 2 Lid, Plenum and Offgas Ports Cooling System
24590-LAW-M6-LMP-00043002, Rev 0	P&ID – LAW Melter Process System Melter 2 Melter Lid Cooling Loop
24590-LAW-M6-LOP-00001001, Rev 1	P&ID – LAW Primary Offgas Process System Melter 1 LOP-SCB-00001
24590-LAW-M6-LOP-00001002, Rev 1	P&ID – LAW Primary Offgas Process System Melter 1 LOP-VSL-00001
24590-LAW-M6-LOP-00001003, Rev 0	P&ID – LAW Primary Offgas Process System Melter 1 LOP-BULGE-00001
24590-LAW-M6-LOP-00001004, Rev 2	P&ID – LAW Primary Offgas Process System Melter 1 LOP-WESP-00001

Drawing/Document Number	Description
24590-LAW-M6-LOP-00001005, Rev 1	P&ID – LAW Primary Offgas Process System Melter 1 Film Cooler Offgas
24590-LAW-M6-LOP-00001006, Rev 0	P&ID – LAW Primary Offgas Process System Melter 1 LOP-PMP-00003A/B
24590-LAW-M6-LOP-00002001, Rev 1	P&ID – LAW Primary Offgas Process System Melter 2 LOP-SCB-00002
24590-LAW-M6-LOP-00002002, Rev 1	P&ID – LAW Primary Offgas Process System Melter 2 LOP-VSL-00002
24590-LAW-M6-LOP-00002003, Rev 0	P&ID – LAW Primary Offgas Process System Melter 1 LOP-BULGE-00001
24590-LAW-M6-LOP-00002004, Rev 2	P&ID – LAW Primary Offgas Process System Melter 2 LOP-WESP-00002
24590-LAW-M6-LOP-00002005, Rev 1	P&ID – LAW Primary Offgas Process System Melter 2 Film Cooler Offgas
24590-LAW-M6-LOP-00002006, Rev 0	P&ID – LAW Primary Offgas Process System Melter 2 LOP-PMP-00006A/B
24590-LAW-M6-LOP-00004001, Rev 1	P&ID – LAW Primary Offgas Process System Melter 1 LOP-FCLR-00002
24590-LAW-M6-LOP-00004002, Rev 1	P&ID – LAW Primary Offgas Process System Melter 1 LOP-FCLR-00001
24590-LAW-M6-LOP-00005001, Rev 1	P&ID – LAW Primary Offgas Process System Melter 2 LOP-FCLR-00004
24590-LAW-M6-LOP-00005002, Rev 1	P&ID – LAW Primary Offgas Process System Melter 2 LOP-FCLR-00003
24590-LAW-M6-LVP-00001001, Rev 0	P&ID – LAW Secondary Offgas/Vessel Vent Process System Combined Header
24590-LAW-M6-LVP-00001002, Rev 2	P&ID – LAW Secondary Offgas/Vessel Vent Process System HEPA Preheaters
24590-LAW-M6-LVP-00001003, Rev 1	P&ID – LAW Secondary Offgas/Vessel Vent Process System HEPA Filters
24590-LAW-M6-LVP-00001004, Rev 2	P&ID – LAW Secondary Offgas/Vessel Vent Process System Offgas Exhausters LVP-EXHR-00001A
24590-LAW-M6-LVP-00001005, Rev 2	P&ID – LAW Secondary Offgas/Vessel Vent Process System Offgas Exhausters LVP-EXHR-00001B
24590-LAW-M6-LVP-00001006, Rev 2	P&ID – LAW Secondary Offgas/Vessel Vent Process System Offgas Exhausters LVP-EXHR-00001C
24590-LAW-M6-LVP-00002001, Rev 1	P&ID – LAW Secondary Offgas/Vessel Vent Process System Caustic Scrubber Bypass
24590-LAW-M6-LVP-00002002, Rev 1	P&ID – LAW Secondary Offgas/Vessel Vent Process System Caustic Scrubber LVP-SCB-00001
24590-LAW-M6-LVP-00002003, Rev 0	P&ID – LAW Secondary Offgas/Vessel Vent Process System Caustic Collection Tank LVP-TK-00001

Drawing/Document Number	Description
24590-LAW-M6-LVP-00002004, Rev 0	P&ID – LAW Secondary Offgas/Vessel Vent Process System Scrubber Recirculation Loop LVP-PMP-00003A/3B
24590-LAW-M6-LVP-00002005, Rev 0	P&ID – LAW Secondary Offgas/Vessel Vent Process System Transfer Pumps LVP-PMP-00002A/B
24590-LAW-M6N-LVP-00138	Drawing Change Notice – Add Isolations and New Transfer Line to the LAW LVP System for DFLAW Operations
24590-LAW-M6-LVP-00002006, Rev 2	P&ID – LAW Secondary Offgas/Vessel Vent Process System Stack Discharge Monitoring System
24590-LAW-M6-LVP-00002007, Rev 0	P&ID – LAW Secondary Offgas/Vessel Vent Process System Stack Discharge Monitoring System
24590-LAW-M6-LVP-00003001, Rev 0	P&ID – LAW Secondary Offgas/Vessel Vent Process System Equipment Vents
24590-LAW-M6-LVP-00004001, Rev 2	P&ID – LAW Secondary Offgas/Vessel Vent Process System Mercury Mitigation Equipment Bypass
24590-LAW-M6-LVP-00004002, Rev 3	P&ID – LAW Secondary Offgas/Vessel Vent Process System Mercury Mitigation Equipment LVP-SKID-00001
24590-LAW-M6-LVP-00004003, Rev 2	P&ID – LAW Secondary Offgas/Vessel Vent Process System Mercury Mitigation Equipment LVP-ADBR-00001A/B
24590-LAW-M6-LVP-00005002, Rev 4	P&ID – LAW Secondary Offgas/Vessel Vent Process System SCO/SCR Skid
24590-LAW-M6-RLD-00001001, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System Plant Wash Vessel RLD-VSL-00003
24590-LAW-M6-RLD-00001002, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System Plant Wash Vessel RLD-VSL-00003
24590-LAW-M6-RLD-00001003, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System SBS Condensate Collection RLD-VSL-00005
24590-LAW-M6-RLD-00001004, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System SBS Condensate Collection RLD-VSL-00005
24590-LAW-M6-RLD-00001005, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System Plant Wash & SBS Condensate Collection RLD-BULGE-00004
24590-LAW-M6-RLD-00001006, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System Plant Wash & SBS Condensate Collection RLD-BULGE-00004
24590-LAW-M6N-RLD-00086	Drawing Change Notice – Add Isolations to the LAW RLD System for DFLAW Operations
24590-LAW-M6-RLD-00002001, Rev 1	P&ID – LAW Radioactive Liquid Waste Disposal System C3/C5 Drains/Sump Collection RLD-VSL-00004

Drawing/Document Number	Description
24590-LAW-M6-RLD-00002002, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System C3/C5 Drains/Sump Collection RLD-VSL-00004
24590-LAW-M6-RLD-00002003, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System C3/C5 Drains/Sump Collection RLD-BULGE-00001
24590-LAW-M6-RLD-00002004, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System C3/C5 Drains/Sump Collection RLD-BULGE-00001
24590-LAW-M6-RLD-00002005, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System C3/C5 Sumps RLD-SUMP-00010/11/28
24590-LAW-M6-RLD-00003001, Rev 0	P&ID – LAW Radioactive Liquid Waste Disposal System C3/C5 Floor Drains Collection
24590-LAW-M6-RLD-00003002, Rev 2	P&ID – LAW Radioactive Liquid Waste Disposal System Process Cell Sumps at EL 2 FT
24590-LAW-M6-RLD-00003003, Rev 2	P&ID – LAW Radioactive Liquid Waste Disposal System Process and Effluent Cell Sumps at EL 2 FT
RESERVED	RESERVED

- 1
- 2 Source documents (which do not include a "P" in the last set of numbers, e.g. "-P0001," or "-TP001")
- 3 should be used in conjunction with any document change notices issued against them.
- 4 We are currently transitioning from permit documents (which include a "P" in the last set of numbers) to
- 5 source documents. At the end of the transition period, permit submittals will contain source documents
- 6 and will be incorporated into the permit as described in Ecology Publication #07-05-006.

This information has been identified as **CONFIDENTIAL BUSINESS INFORMATION**

Per the Department of Ecology's letter dated June 20, 2018, "Re: Request to the Department of Ecology to Grant Confidentiality" under the criteria of the [Revised Code of Washington 43.21A.160](#) and [Washington Administrative Code 173-303-810](#)(15), the following document and associate changes are granted confidentiality and are exempt from public review:

Document Number: 24590-LAW-M6-LMP-00002001, Rev 1

Title: LAW Melter Process System Melter 1 Agitation Zone 3 and Level Detection LMP-RK-00040B
and PPJ-RK-00001

This information has been identified as **CONFIDENTIAL BUSINESS INFORMATION**

Per the Department of Ecology's letter dated June 20, 2018, "Re: Request to the Department of Ecology to Grant Confidentiality" under the criteria of the [Revised Code of Washington 43.21A.160](#) and [Washington Administrative Code 173-303-810\(15\)](#), the following document and associate changes are granted confidentiality and are exempt from public review:

Document Number: 24590-LAW-M6-LMP-00032001, Rev 1

Title: LAW Melter Process System Melter 2 Agitation Zone 3 and Level Detection LMP-RK-000041B
& PPJ-RK-00002

**DRAWINGS AND DOCUMENTS
OPERATING UNIT GROUP 10 – APPENDIX 9.6
LOW ACTIVITY WASTE BUILDING
MECHANICAL DRAWINGS**

The documents listed in the following table are incorporated by reference into this permit and are subject to the requirements set forth in Part I Standard Conditions, Part II General Facility Conditions, and Part III Operating Unit Group 10 Conditions. Upon request, copies of the documents can be viewed at the Nuclear Waste Program Resource Center located at 3100 Port of Benton Blvd., Richland, WA. Appointments for viewing can be scheduled by calling (509) 372-7950.

Drawing/Document Number	Description
24590-LAW-M0D-LEH-00014, Rev. 7	Mechanical Handling Data Sheet for LEH-CRN-00003
24590-LAW-M0D-LMP-00001, Rev. 3	Mechanical Handling Data Sheet for Melter 1
24590-LAW-M0D-LMP-00002, Rev. 3	Mechanical Handling Data Sheet for Melter 2
24590-LAW-M0D-LPH-00003, Rev. 5	Mechanical Handling Data Sheet for LPH-CRN-00002
24590-LAW-M7-LEH-00002002, Rev. 1	LAW Vitrification System LEH Mechanical Handling Diagram Container Export Handling System
24590-LAW-M7-LPH-00001004, Rev. 2	LAW Vitrification System LPH Mechanical Handling Diagram Container Pour Handling System
24590-LAW-MAD-LVP-00006, Rev. 10	Mechanical Data Sheet for LAW Offgas Exhauster LVP-EXHR-00001A/B/C
24590-LAW-MED-LVP-00006, Rev. 2	Mechanical Systems Data Sheet for LVP HEPA Off-gas Pre-Heaters
24590-CD-POA-MEE0-00003-03-00004, Rev. 00I	Vendor Mechanical Drawing for the LAW HEPA Filter Preheater
24590-CD-POA-MEE0-00003-03-00005, Rev. B00	Vendor Mechanical Drawing for the LAW HEPA Filter Preheaters LVP-HTR-00001A/3A (Sheets 1, 2, and 3 of 3)
24590-LAW-MF-LMP-00001, Rev. 0	Mechanical Drawing for the LAW Melter Assembly – Isometric View Confidential Business Information
24590-LAW-MF-LMP-00002, Rev. 0	Mechanical Drawing for the LAW Melter Assembly – Plan View Confidential Business Information
24590-LAW-MF-LMP-00003, Rev. 0	Mechanical Drawing for the LAW Melter Assembly – East, West, and North Elevation Confidential Business Information
24590-LAW-MF-LMP-00004, Rev. 0	Mechanical Drawing for the LAW Melter Assembly – Section A-A Confidential Business Information

24590-LAW-MKD-LOP-00008, Rev. 2	Mechanical Data Sheet for LOP-SCB-00001/2
24590-LAW-MKD-LVP-00011, Rev. 6	Mechanical Data Sheet for the LAW Melter Offgas Caustic Scrubber
24590-QL-POA-MACS-00007-06-00009, Rev. 00A	Vendor Mechanical Drawing for LVP Exhausters LVP-EXHR-00001A/B/C
24590-QL-POA-MKAS-00003-04-00050, Rev. B01	Vendor Mechanical Drawing for the LAW Melter Offgas Caustic Scrubber LVP-SCB-00001
24590-QL-POA-MKAS-00003-04-00051, Rev. 00E	Vendor Mechanical Drawing for the LAW Melter Offgas Caustic Scrubber
24590-QL-POA-MKAS-00003-04-00052, Rev. 00H	Vendor Mechanical Drawing for the LAW Melter Offgas Caustic Scrubber LVP-SCB-00001
24590-QL-POA-MKE0-00001-06-32, Rev. B01	General Arrangement LAW WESP LOP-WESP-0001/0002
24590-QL-POA-MKH0-00001-04-00148, Rev. 00D	Vendor Mechanical Drawing for LVP HEPA Filter Housings LVP-HEPA-00001A/B, -00002A/B, -00003A
24590-QL-POA-MWKO-00001-05-00198, Rev. B03	Vendor Mechanical Drawing LAW Carbon Bed LVP-ADBR-00001A/B LAW Carbon Bed Final Assembly (Sheets 1, 2, 3, and 4 of 5)
24590-LAW-MKD-LVP-00012, Rev. 15	Mechanical Data Sheet for the LAW Catalytic Oxidizer/Reducer
24590-CD-POC-MBT0-00007-01-00353, Rev. B02	LAW Thermal Catalytic Oxidizer TCO General Arrangement LVP-SKID-00002 (Sheets 1 and 2 of 5)
24590-LAW-MKD-LVP-00013, Rev. 2	Mechanical Data Sheet for the Safe Change HEPA Filter Housing
24590-QL-MRA-MKH0-00001-T0003	Technical Change Notice for LVP Filter Housing Design and Operating Pressure Change
24590-WTP-SDDR-HV-10-00001	Supplier Deviation Disposition Request for LVP Filter Housing Data Sheet
24590-LAW-MK-LOP-P0001001, Rev. 0	Equipment Assembly LAW Submerged Bed Scrubber LOP-SCB-00001/2, Sheet 1 of 3
24590-LAW-MK-LOP-P0001002, Rev. 0	Equipment Assembly LAW Submerged Bed Scrubber LOP-SCB-00001/2, Sheet 2 of 3
24590-LAW-MK-LOP-P0001003, Rev. 0	Equipment Assembly LAW Submerged Bed Scrubber LOP-SCB-00001/2, Sheet 3 of 3
24590-LAW-MTD-LVP-00001, Rev. 1	Mechanical Data Sheet for LVP-TK-00001
24590-LAW-MT-LVP-00005001, Rev. 0	LAW Caustic Collection Tank LVP-TK-00001 General Arrangement
24590-LAW-MVD-LCP-00004, Rev. 3	Mechanical Data Sheet for LCP-VSL-00001
24590-LAW-MVD-LCP-00005, Rev. 3	Mechanical Data Sheet for LCP-VSL-00002
24590-LAW-MVD-LFP-00007, Rev. 4	Mechanical Data Sheet for LFP-VSL-00002
24590-LAW-MVD-LFP-00008, Rev. 4	Mechanical Data Sheet for LFP-VSL-00004
24590-LAW-MVD-LFP-P0010, Rev. 1	Mechanical Data Sheet for LFP-VSL-00001
24590-LAW-MVD-LFP-P0011, Rev. 1	Mechanical Data Sheet for LFP-VSL-00003

24590-LAW-MVD-LOP-00004, Rev. 6	Mechanical Data Sheet for LOP-VSL-00001
24590-LAW-MVD-LOP-00005, Rev. 6	Mechanical Data Sheet for LOP-VSL-00002
24590-LAW-MVD-LVP-00003, Rev. 6	Mechanical Data Sheet for Activated Carbon Adsorber, LVP-ADBR-00001A/B
24590-LAW-MVD-RLD-00001, Rev. 4	Mechanical Data Sheet for RLD-VSL-00004
24590-LAW-MVD-RLD-00006, Rev. 4	Mechanical Data Sheet for RLD-VSL-00005
24590-LAW-MVD-RLD-00007, Rev. 2	Mechanical Data Sheet for RLD-VSL-00003
24590-LAW-MV-LCP-P0001, Rev. 0	Equipment Assembly Concentrate Receipt Vessel LCP-VSL-00001
24590-LAW-MV-LCP-P0002, Rev. 0	Equipment Assembly Concentrate Receipt Vessel LCP-VSL-00002
24590-LAW-MV-LFP-P0001, Rev. 0	Equipment Assembly Melter 1 Feed Vessel LFP-VSL-00002
24590-LAW-MV-LFP-P0002, Rev. 0	Equipment Assembly Melter 2 Feed Vessel LFP-VSL-00004
24590-LAW-MV-LFP-P0004, Rev. 0	Equipment Assembly Melter 1 Feed Preparation Vessel LFP-VSL-00001
24590-LAW-MV-LFP-P0005, Rev. 0	Equipment Assembly Melter 2 Feed Preparation Vessel LFP-VSL-00003
24590-LAW-MV-LOP-P0001, Rev. 0	Equipment Assembly LAW Melter 1 SBS Condensate Vessel LOP-VSL-00001
24590-LAW-MV-LOP-P0002, Rev. 0	Equipment Assembly LAW Melter 2 SBS Condensate Vessel LOP-VSL-00002
24590-LAW-MV-RLD-P0001, Rev. 2	Equipment Assembly C3/C5 Drains/Sump Collection Vessel RLD-VSL-00004
24590-LAW-MV-RLD-P0002, Rev. 1	Equipment Assembly Plant Wash Vessel RLD-VSL-00003
24590-LAW-MV-RLD-P0003, Rev. 1	Equipment Assembly SBS Condensate Collection Vessel RLD-VSL-00005
RESERVED	RESERVED

- 1
- 2 Source documents (which do not include a "P" in the last set of numbers, e.g. "-P0001," or "-TP001")
- 3 should be used in conjunction with any document change notices issued against them.
- 4 We are currently transitioning from permit documents (which include a "P" in the last set of numbers) to
- 5 source documents. At the end of the transition period, permit submittals will contain source documents
- 6 and will be incorporated into the permit as described in Ecology Publication #07-05-006
- 7 (<http://www.ecy.wa.gov/biblio/0705006.html>).
- 8

1
2
3
4
5

This page intentionally left blank.

Exhauster Data Sheet: 24590-LAW-MAD-LVP-00006				MR No. 24590-QL-MRA-MACS-00007	
				Plant Item No. 24590-LAW-MA-LVP-EXHR-00001A/B/C	Rev. No. 10
1	Project	RPP-WTP	Bldg./Room #	LAW/ L-0304 C, D, E	
2	Project #	24590	Supporting Calculations	24590-LAW-M4C-LOP-00001	
3				24590-LAW-M6C-LVP-00004	
4	Site	DOE Hanford		24590-LAW-MEC-LVP-00003	
5	Safety Class	SS	Supporting Drawings	24590-LAW-M6-LVP-00001004 24590-LAW-M6-LVP-00001005 24590-LAW-M6-LVP-00001006	Quantity Required
6	Seismic Category	SC-III			3
7	System No.	LVP	System Description	24590-LAW-3YD-LOP-00001	Quality Level
8					
9	Description: LAW Offgas Exhauster				
10	EXHAUSTER LOCATION DESIGN CONDITIONS				
11	Indoor Design Temperature	Minimum	50 °F	Maximum	113 °F
12	Contamination Classification Area	C2		Relative Humidity	10% (min)
13	Environmental Qualification	(See Attachment 2)		Elevation	661 ft above MSL
14			Hanford Standard Atmospheric Pressure	399	inches WC
15	EXHAUSTER DESIGN / MAXIMUM OPERATING CONDITIONS (FLOW CONDITIONS, EACH EXHAUSTER)				
16	Design / Maximum Exhauster Inlet Flow (Note 19)	4,449/4,075	ACFM	Exhauster Design Temp	315 °F
17	Design / Maximum Pressure Relative to Atm (Inlet)	-166/-160	inches WC	Inlet Gas Temperature at Maximum Flow (Note 12)	122 °F
18	Design / Maximum Pressure Relative to Atm (Outlet)	+14/+14	inches WC	Design / Maximum Inlet Gas Density (Note 15)	0.037/ 0.037 lbs/ft ³
19	Exhauster Efficiency at Design Conditions	*58	%	Power at Design Conditions	*186 BHP
20	Exhauster Speed at Design Conditions	*3425	RPM	Exhauster Motor Operating Weight	*2253 pounds
21	Maximum Discharge Temperature	Note 9	*315 °F	Assembly Weight (Motor + Exhauster + Base)	Note 17
22	Discharge Temperature at Design Conditions	Note 9	*290 °F	Natural Frequencies (Note 8)	*Note 8A RPM
23				Deleted	*Deleted °F
24	EXHAUSTER NORMAL & MINIMUM OPERATING CONDITIONS (FLOW CONDITIONS, EACH EXHAUSTER)				
25	Normal Exhauster Flow	3447	ACFM	Inlet Gas Temperature at Normal Flow (Note 12)	122 °F
26	Pressure Relative to Atm at Normal flow (Inlet)	-127	inches WC	Inlet Gas Density at Normal Conditions (Note 15)	0.042 lbs/ft ³
27	Discharge Temperature at Normal Conditions	Note 14	243 °F		
28	Minimum Exhauster Flow	1,516	ACFM	Inlet Gas Temperature at Minimum flow	107 °F
29	Pressure Relative to Atm at Minimum flow (Inlet)	-90	inches WC	Inlet Gas Density at Minimum Conditions (Note 15)	0.049 lbs/ft ³
30	Discharge Temperature at Minimum Conditions	185	°F		
31					
32	EXHAUSTER CONSTRUCTION				
33	Exhauster Manufacturer	*Spencer Turbine		Exhauster Model Number	*GS 42307
34	Drive Arrangement	*Coupled		Inlet Orientation	*Vertical up #5
35	Motor Position	Direct drive		Discharge Orientation	*Vertical up #1
36	Motor Rotation (Note 6)	*CW		Exhauster Type	*Multi-Stage Centrifugal Blower
37	Dimensions (Note 11)	*168.25 x 69.42 x 77			
38	Exhauster RPM (Design)	*3550		Exhauster Shaft Diameter	*5 inch under fans
39	Brake Horsepower (Design)	*200		Actual Brake Horsepower	*186
40	Exhauster Bearing Type	*Deep Groove Ball		Exhauster Bearing Designator	*313 Tandem inlet end / 313 KS outlet end
41					
42	EXHAUSTER MATERIALS				
43	Housing (Note 7)	316 L stainless steel (Note 18)		Impellor/ lobes / screw	316 L stainless steel (Note 18)
44	Deleted			Mounting frame	*Structural Steel A36
45	Shaft	410 stainless steel		Inlet check valve	None
46	Deleted			Discharge check valve	By Buyer
47	Inlet Screen	None		Bearing Special Feature (Note 4)	L10 service rating 100khr
48	Shaft Coupling	*Carbon Steel with SS Disc Packs		Safety Guards	OSHA Compatible
49					
50	EXHAUSTER ACCESSORIES				
51	Flanged Inlet	Yes		Flanged Inlet Dimensions	12 inch ANSI B16.5 RF 150#
52	Flanged Discharge	Yes		Flanged Discharge Dimensions	12 inch ANSI B16.5 RF 150#
53	Drain Connection	Yes		Drain Connection Size (Note 5)	*(8) 1 inch drains
54	Shaft Seals	Yes		Seal Type	Double Mechanical w/ purge and control panel



Exhauster Data Sheet:

24590-LAW-MAD-LVP-00006

MR No. 24590-QL-MRA-MACS-00007	Rev. No. 10
Plant Item No. 24590-LAW-MA-LVP-EXHR-00001A/B/C	

1	Project	RPP-WTP	Bldg./Room #	LAW/ L-0304 C, D, E		
2	Project #	24590	Supporting Calculations	24590-LAW-M4C-LOP-00001		
3				24590-LAW-M6C-LVP-00004		
4	Site	DOE Hanford		24590-LAW-MEC-LVP-00003		
5	Safety Class	SS	Supporting Drawings	24590-LAW-M6-LVP-00001004	Quantity Required	3
6	Seismic Category	SC-III		24590-LAW-M6-LVP-00001005		
7	System No.	LVP	System Description	24590-LAW-3YD-LOP-00001	Quality Level	Q

8

9 Description: **LAW Offgas Exhauster**

55

56 **EXHAUSTER ACCESSORIES (continued)**

57	Isolation base	No	Isolation Pad Mfg and Model No	*N/A
58	Vibration Isolation	* N/A		
59	Flexible Inlet Connection	Yes	Removable insulation (Note 13)	Yes
60	Flexible Inlet Connection Type	Flexible Metal Hose	Metal Bellows	
61	Flexible Inlet Connection Material	*316L SS	316L flex hose, 12", ANSI 16.5 RF 150# 316 L flgs	
62	Flexible Connection Manufacturer	*DME, INC		
63	Flexible Outlet Connection	Yes	Removable insulation (Note 13)	Yes
64	Flexible Outlet Connection Type	Flexible Metal Hose	Metal Bellows	
65	Flexible Outlet Connection Material	*316L SS	316L flex hose, 12", ANSI 16.5 RF 150# 316 L flanges	
66	Flexible Connection Manufacturer	*DME, INC		
67	Insulation (Note 13)	*Fiberglass Tape 1/8 inch	Thick Double wrapped with 50% overlap	
68	Silencer	No		
69	Seal purge hose	Flexible Metal Hose	316L flex hose, 1/2", ANSI 16.5 RF 150# 316 L flanges, 304 hose braid	

70 **EXHAUSTER MOTOR AND DRIVE REQUIREMENTS**

71 Driven Equipment / Motor / ASD relationship is as follows::

72	<u>Exhauster Tag Number</u>	<u>Motor Tag Number</u>	<u>ASD Tag Number</u>
73	LVP-EXHR-00001A	LVP-MTR-00001A	LVP-ASD-00001A
74	LVP-EXHR-00001B	LVP-MTR-00001B	LVP-ASD-00001B
75	LVP-EXHR-00001C	LVP-MTR-00001C	LVP-ASD-00001C

76 Variable Speed Drive **Yes** **Provided by others**

77 Special Drive Features **1. ASD to operate motor from 30% to 100% of required RPM within a 30 second time frame (max). (Note 8)**

78

79 **PROCESS OFFGAS STREAM COMPOSITION (TOTAL - 2 FANS IN OPERATION)**

80		NOMINAL	MAXIMUM	
81	N ₂	5.32E+03	5.40E+03	kg/hour
82	O ₂	1.60E+03	1.61E+03	kg/hour
83	H ₂ O	8.93E+02	1.04E+03	kg/hour
84	CO ₂	1.01E+02	1.14E+02	kg/hour
85	Ar	9.01E+01	9.11E+01	kg/hour
86	NH ₃	5.65E-01	9.36E-01	kg/hour
87	NO	2.99E-01	4.25E-01	kg/hour
88	N ₂ O	3.97E+00	6.38E+00	kg/hour
89	NO ₂	3.74E-01	7.76E-01	kg/hour
90	CO	1.59E-01	5.46E-01	kg/hour
91	H ₂	3.83E-02	5.01E-02	kg/hour
92	HCl	4.60E-05	1.23E-04	kg/hour
93	HF	2.49E-06	3.66E-06	kg/hour
94	I ₂	5.56E-05	5.56E-05	kg/hour
95	SO ₂	9.49E-04	1.84E-03	kg/hour
96	VOC	2.82E-02	5.85E-02	kg/hour
97	Particulate	1.24E-05	3.65E-05	kg/hour
98	Hg	1.97E-04	2.01E-04	kg/hour
99	Total	8.01E+03	8.27E+03	kg/hour
100	Gas Density	0.0424	0.0371	lbs/cubic foot



Exhauster Data Sheet:

24590-LAW-MAD-LVP-00006

MR No.
24590-QL-MRA-MACS-00007
 Plant Item No.
24590-LAW-MA-LVP-EXHR-00001A/B/C Rev. No.
10

1	Project	RPP-WTP	Bldg./Room #	LAW/ L-0304 C, D, E		
2	Project #	24590	Supporting Calculations	24590-LAW-M4C-LVP-00001		
3				24590-LAW-M6C-LVP-00004		
4	Site	DOE Hanford		24590-LAW-MEC-LVP-00003		
5	Safety Class	SS	Supporting Drawings	24590-LAW-M6-LVP-00001004	Quantity Required	3
6	Seismic Category	SC-III		24590-LAW-M6-LVP-00001005		
7	System No.	LVP	System Description	24590-LAW-3YD-LVP-00001	Quality Level	Q

9	Description: LAW Offgas Exhauster					
102	Notes					
103	1)	* Denotes data to be provided / verified by SELLER.				
104	2)	N/A denotes "Not Applicable".				
105	3)	TBD denotes "To Be Determined" at a later date.				
106	4)	Provide each bearing pillow blocks with RTDs for remote indication				
107	5)	See Specification 24590-LAW-3PS-MACS-T0001				
108	6)	Rotation is listed as viewed from drive side.				
109	7)	Gaskets must withstand chemical constituents listed above.				
110	8)	Natural frequencies within operating ranges to be blocked in ASD programming (A) Calculated Natural Frequencies: 1,348 RPM and 1,377 RPM Natural frequencies to be verified during factory testing.				
111	9)	Maximum Discharge Temperature is the maximum sustainable discharge temperature which is above the discharge temperature at design flow conditions.				
112	10)	Contents of this document are dangerous waste permit (DWP) affecting.				
113	11)	Bounding exhauster unit dimensions: 175 inches long X 70 inches wide X 84 inches high				
114	12)	Normal and maximum temperatures are for material selection and corrosion analysis. Changes to these values are not required to be transmitted to the vendor.				
115	13)	Removable insulation to be provided by SELLER				
116	14)	Normal discharge temperature up to 282°F				
117	15)	Normal, minimum, maximum and design gas densities are based on the density for air (Reference 24590-LAW-M6C-LVP-00004).				
118	16)	Discharge pressure assumed to be 0.0 inches W.C. and minimum operating conditions				
119	17)	Assembly WGT (motor + exhauster + base) is an estimate				
120	18)	Maximum 0.030% C; dual certified.				
121	19)	Required design inlet flow of 4,449 ACFM is bounded by supplied design inlet flow of 4760 ACFM as shown on vendor supplied performance curves and on referenced P&IDs.reflected				

SAFETY SCREENING

10	Revised to update references and updated EOD form	M. O'Neill	P. Nielsen	N/A	S. Austen	P. Snider	P. Omel	12/9/15
9	Revised to update Supporting Drawings Field and to add Note 19	M. O'Neill	D. J. Rickettson	D. Krahn	S. Austen	P. Snider	P. Omel	5/29/2013
8	Revised to align normal and maximum data with referenced calculation and corrosion analysis. Design impacts negligible. Transmittal to vendor not required.	M. O'Neill	D. J. Rickettson	D. Krahn	M. Sanvictores	P. Snider	D. Mildon	
7	Incorporated 24590-QL-MRA-MACS-00007-T0002, 24590-WTP-SDDR-MS-11-00072, 24590-QL-POA-MACS-00007-04-00001, 24590-QL-POA-MACS-00007-04-00002. Incorporated by reference: 24590-WTP-SDDR-MS-11-00047	M. O'Neill	D. J. Rickettson	B. Niemi	M. O'Neill	P. Snider	D. Mildon	12/13/2011
6	Incorp supplier exceptions	M. O'Neill	D. J. Rickettson	D. Krahn	N. Whitcomb	G. Goolsby	J. Roth	8/25/2010
5	DCN 24590-WTP-M6N-M80T-00005 incorporated. Reissue for purchase	M. O'Neill	D. J. Rickettson	D. Krahn	T. Valenti	G. Goolsby	J. Roth	2/12/2010
4	Reissued for purchase. Incorp of Vendor exceptions.	M. O'Neill	S. E. Anderson	D. Krahn	C. Knauss	S. Kretzschmar	R. Stevens	9/8/2008
3	Re-issued with updated design conditions, reformatted mechanical datasheet for clarity, attached motor and EQ datasheets. This document supersedes 24590-LAW-MAD-LVP-00009	M. O'Neill	S. E. Anderson	D. Krahn	C. Knauss	S. Kretzschmar	R. Stevens	3/26/2008
2	Re-issued for purchase	SS	N/A	N/A	RLH	N/A	SS	2/1/2005
1	Issued for purchase	SS	N/A	N/A	RLH	N/A	ED	12/14/2004
0	Issued for bids	SS	N/A	N/A	RLH	N/A	ED	8/18/2004
Rev	Reason for Revision	System Engineer	Responsible Engineer	E&NS	Checker	Reviewer	Approver	Date



ATTACHEMENT 1
24590-LAW-MAD-LVP-00006
ELECTRICAL DATA SHEET
LOW VOLTAGE INDUCTION MOTOR

MR No.
24590-QL-MRA-MACS-00007

Plant Item No.
24590-LAW-EM-LVP-MTR-00001A/B/C

Rev. No.
10

Motor Tag No.: 24590-LAW-EM-LVP-MTR-00001A/B/C
 Driven Equipment No.: 24590-LAW-LVP-EXHR-00001A/B/C
 Service: LAW Offgas Exhauster
 Refer to "Primary Specification": 24590-LAW-3PS-MACS-T0001

LINE NO.	DESCRIPTION	USER SPECIFIED	SUPPLIER FURNISHED	UNITS
27	MANUFACTURER	-	*Reliance	-
28	NEMA FRAME	-	*447TS	-
29	MODEL NUMBER	-	*N/A	-
30	SERIAL NUMBER / MANUFACTURER DATE	-	*B658247-010T1	-
31	FULL LOAD CURRENT	-	*215	A
32	FULL LOAD TORQUE	-	*294	ft-lb
33	POWER FACTOR : - @ 50 % LOAD	-	*87.7	%
34	- @ 75 % LOAD	-	*90.9	%
	- @ 100 % LOAD	-	*91.7	%
	EFFICIENCY : - @ 50% LOAD	-	*94.4	%
35	- @ 75% LOAD	-	*95.1	%
	- @ 100% LOAD	-	*95.1	%
	LOCKED ROTOR CURRENT @ 100 % of RATED VOLTAGE	-	*1423	A
36	LOCKED ROTOR CURRENT @ 80% of RATED VOLTAGE	-	*1140	A
37	ALLOWABLE STALL TIME @ FULL VOLTAGE	-	*27	SEC
38	ALLOWABLE STALL TIME @ 80% of VOLTAGE	-	*41	SEC
39	LOSSES @ FULL LOAD	-	*7642	W
40	ROTOR WK2 @ MOTOR SHAFT SPEED (For > 250 hp only)	-	*N/A	lb-ft ²
41	STARTING POWER FACTOR (For > 75 hp only)	-	*30.9	-
42	SUB TRANSIENT REACTANCE AND X/R (For > 250 hp only)	-	*N/A	-
43	WEIGHT	-	*2253	lbs
44	ROTATION (CW, CCW, BI-DIR.) FACING DRIVEN EQUIPMENT	-	*BI-DIR	-
45	MEAN TIME BETWEEN FAILURE (MOTOR 100 HP AND ABOVE)	-	*N/A	-
46	STARTING METHOD (FULL/REDUCED VOLTAGE, ASD APPLICATION)	ASD	*ASD	-
47				
48	RECOMMENDED BEARING LUBRICANT	-	*Exxon Polyrex EM	
49				

NOTES:
 (1) DELETED
 (2) Motor should be applied within its rating based on service factor of 1.0.
 (3) Data Sheet Line no. from 34 to 46 are applicable for motor 100 HP and above.
 (4) The exhauster and motor are subjected to the same environmental conditions.
 (5) Equipped with 245w, 129v space heater. Not required for indoor applications.



ATTACHMENT 2

EQUIPMENT QUALIFICATION DATASHEET (EQD)

24590-LAW-MAD-LVP-00006

Rev.: 10

Page 6 of 10

PART A - For Supplier/Subcontractor Information

Section 1 - Completed by Design Engineering

1.1 Equipment Description:

Secondary Offgas Exhausters

1.2 Requisition Number: 24590-QL-MRA-MACS-00007

For Supplier/ Subcontractor Use

WTP Internal Use Only

1.3 Component Tag Number	Stock Code	Bounding Operating Conditions Reference	Equipment Mounting Elevation	Location (i.e., room number)	Location (thru wall)
24590-LAW-MA-LVP-EXHR-00001A/B/C	N/A		48'	L-0304C/D/E	N/A
24590-LAW-EM-LVP-MTR-00001A/B/C	N/A		48'	L-0304C/D/E	N/A

1.4 Safety Function:

Provide negative pressure on the LAW melters, primary and secondary offgas systems. Provides both confinement as well as motive force for offgas flow through all the offgas equipment up to and including discharge at stack. Exhausters shall remain functional (i.e., able to support their required safety function) following an SC-III event. Ref 24590-WTP-PSAR-ESH-01-002-03, rev 5i, Sect 4.4.3 & 5.6.3.

1.5 Safety Classification	<input type="checkbox"/> SC	<input checked="" type="checkbox"/> SS	<input type="checkbox"/> Non-Safety
1.6 Post Accident Monitoring (PAM)	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	
1.7 Seismic Category	<input type="checkbox"/> SC-I	<input type="checkbox"/> SC-II	<input checked="" type="checkbox"/> SC-III <input type="checkbox"/> SC-IIIIE <input type="checkbox"/> SC-IV
1.8 Seismic Safety Function	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	
1.9 Seismic Operability Requirements	<input checked="" type="checkbox"/> During Seismic Event	<input checked="" type="checkbox"/> After Seismic Event	<input type="checkbox"/> None
1.10 Qualified Life Note i	<input checked="" type="checkbox"/> 40 years	<input type="checkbox"/> Other:	<input type="checkbox"/> To be determined by Qualifier
1.11 Normal Plant/Process Induced Vibration Note q	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	
1.12 Design Basis Event (DBE) Submergence Note p	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	

Electrical Interfaces Supporting the Safety Function

1.13 Power Supply Voltage (VAC, VDC): 460
1.14 Power Supply Frequency (Hz): 60HZ to ASD. ASD to motor frequency is variable
1.15 Power Connection Method: Cable lugs, Flexible conduit/cable entry
1.16 I/O Signals to/from Equipment: To: None to exhausters. From: Inboard and outboard bearing temperatures
1.17 I/O Connection Method: PCJ



ATTACHMENT 2 EQUIPMENT QUALIFICATION DATASHEET (EQD)

24590-LAW-MAD-LVP-00006

Rev.: 10

Mechanical Interfaces Supporting the Safety Function	
1.18 Mounting Configuration (orientation):	Horizontal mounted
1.19 Mounting Method (bolts, welds, etc.):	Base to be welded to existing embeds or anchored into the concrete depending on the Seller's anchorage configuration. Reference drawings 24590-BOF-DD-S13T-00001, 24590-LAW-DB-S13T-00135 & 00136.
1.20 Auxiliary Devices:	Inlet and outlet hoses, LVP-HOSE-00003 to 00008

Section 2 - Initial Input by EEQ

2.1 Equipment Safety Function Type Note m	<input checked="" type="checkbox"/> Electrical	<input checked="" type="checkbox"/> Active Mechanical	<input checked="" type="checkbox"/> Passive Mechanical
2.2 Classification of Environment	<input type="checkbox"/> Harsh	<input checked="" type="checkbox"/> Mild	<input type="checkbox"/> To be determined by Vendor
2.3 Abnormal Wet Sprinkler Note g	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	Duration: 2 hr
2.4 Design Basis Event (DBE) Steam Break	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	Duration: N/A Temp: N/A
2.5 Design Basis Event (DBE) Flooding	Duration: 12.5 hr Flood height: 0.92 ft		

2.6 Indoor Environmental Ambients							
		Normal		Abnormal		Design Basis Event (DBE)	
		High	Low	High	Low	High	Low
Temperature		95 °F	50 °F	113 °F	50 °F	113 °F	50 °F
	<i>Note</i>		<i>Note b</i>		<i>Note b</i>		<i>Note b</i>
	Duration	40 yr	N/A	8 hr/yr	N/A	2 hr	N/A
	<i>Note</i>	<i>Note a</i>	<i>Note b</i>	<i>Note a</i>	<i>Note b</i>	<i>Note b</i>	<i>Note b</i>
Relative Humidity		90 %	10 %	95 %	10 %	95 %	10 %
	<i>Note</i>	<i>Note c</i>	<i>Note c</i>	Note c	Note c	Note c	Note c
	Duration	N/A	N/A	N/A	N/A	2 hr	2 hr
	<i>Note</i>	<i>Note c</i>	<i>Note c</i>	Note c	Note c	Note c	Note c
Pressure		0 in-w.g.	-0.4 in-w.g.	4 in-w.g.	-2.4 in-w.g.	4 in-w.g.	-2.4 in-w.g.
	<i>Note</i>	<i>Note d</i>	<i>Note d</i>	Note d	Note d	Note d	Note d
	Duration	N/A	N/A	N/A	N/A	2 hr	2 hr
	<i>Note</i>	Note d	Note d	Note d	Note d	<i>Note d</i>	<i>Note d</i>
Radiation Dose Rate		0.5 mRad/hr		0.5 mRad/hr		0.5 mRad/hr	
	<i>Note</i>						
	Duration	40 yrs		0 hr		0 hr	
	<i>Note</i>	<i>Note e</i>		<i>Note e</i>		<i>Note e</i>	
Additional Information		Note h, i		Note h		Note f, h	

2.7 Outdoor Environmental Ambients - N/A

2.8 Normal Spray Exposure			
Chemical/Fluid	Concentration (M)	Duration (yr)	Note
None		40	
2.9 Design Basis Event (DBE) Spray Exposure & Flood Composition			
Chemical/Fluid	Concentration (M)	Duration (hr)	Note
None		12.5	



ATTACHMENT 2 EQUIPMENT QUALIFICATION DATASHEET (EQD)

24590-LAW-MAD-LVP-00006
Rev.: 10

Chemical/Fluid	Flowstream	pH	Temp (° F)	Duration (hr)	Note
None				12.5	

2.10 General EQD Notes (check all that apply):

- a) For thermal aging, the high normal temperature shall be assumed to subsist for 40 years less the duration of the high abnormal temperature. For any lesser qualified life, the normal and abnormal condition durations shall be assigned proportionally. The abnormal temperature is stated to subsist for a certain number of hours per year. It shall be taken to subsist for this number of hours for each year of the qualified life.
- b) The ability to provide the safety function at the low normal temperature, the low abnormal temperature or the low DBE/DBA temperature (whichever be the lowest) shall be established by test, analysis, or operating experience. The thermal aging at these respective low temperatures will be conservatively covered by the thermal aging per item a) above. Therefore, no duration is assigned for the low temperatures.
- c) The ability to provide the safety function at the extremes of the normal and abnormal humidity conditions, taking into consideration the high and the low normal and high and low abnormal, shall be established by test, analysis, or operating experience. No duration is assigned for the normal and abnormal humidity conditions.
- d) If the performance of the safety function of the equipment is affected by ambient pressure, the ability to provide the safety function at the extremes of the normal and abnormal pressure conditions, taking into consideration the high and the low normal and the high and low abnormal pressures, shall be established by test, analysis, or operating experience. No duration is assigned to the normal and abnormal pressure conditions.
- e) (1) If the abnormal radiation dose rate is the same as the normal radiation dose rate, the normal radiation dose rate shall be assumed to subsist for 40 years, or any lesser qualified life, and the duration of the abnormal radiation dose rate is "0."
- (2) If the abnormal radiation dose rate is higher than the normal radiation dose rate, the abnormal radiation dose rate shall be assumed to subsist for 40 years, or any lesser qualified life, and the duration of the normal radiation dose rate is "0."
- f) The DBE/DBA conditions shall be taken to subsist for the stated number of hours following the qualified life of the equipment.
- g) Spray due to fire sprinkler actuation shall be taken to occur once over the entire qualified life duration for a period of 2 hours, even if the qualified life is a period less than 40 years. If spray qualification is provided for DBE conditions (whether for water or chemical spray), then separate qualification for the fire sprinkler spray need not be provided.
- h) The values stated in this EQD are the ambients and do not include the thermodynamic and radiation conditions imposed by the process fluids. The data pertaining to process fluid and service induced parameters are to be taken into account where significant, such as in thermal aging analyses. This data can be obtained from the equipment data sheets or the Equipment Specification.
- i) Equipment that is to be installed in inaccessible locations must be qualified to a 40-year life without the need for maintenance or replacement.
- j) For suspended ash, 24590-WTP-U0D-W16T-00001, Rev 0, states:

Suspended Ash Concentrations (mg/m ³):	174 (ave), 220 (max.)
Ash fall Rate (in/hr):	0.35 (ave), 0.44 (max)
Grain Size (µm):	75
Max. Ash fall (in)	7.4 (uncompacted), 3.0 (compacted)
Compacted Density:	96 lb/ft ³
- k) The equipment qualifier shall perform qualification to the most conservative capability of the equipment. The qualification shall not be less conservative than the bounding environmental conditions detailed in this document.
- m) For environmental qualification purposes, an active mechanical safety function bounds passive mechanical, and an electrical safety function bounds both, with respect to the environmental qualification requirements.



ATTACHMENT 2 EQUIPMENT QUALIFICATION DATASHEET (EQD)

24590-LAW-MAD-LVP-00006
Rev.: 10

2.11 Specific Notes:

- n) The normal, abnormal, and DBE low temperature is listed as 59°F in 24590-LAW-U0D-W16T-00001, Rev 2. 50°F is used in this datasheet per Basis of Design (BOD) Table 12-1 (Plant Rooms), 24590-WTP-DB-ENG-01-001, Rev 2.
- o) The abnormal and DBE high temperatures are listed as 59°F in 24590-LAW-U0D-W16T-00001, Rev 2. 50°F is used in this datasheet per Basis of Design (BOD) Table 12-1 (Plant Rooms), 24590-WTP-DB-ENG-01-001, Rev 2.
- p) Seller shall be responsible to locate any sensitive part of the exhauster, junction box or control panel above the flood height of 0.92 ft.
- q) LVP Exhausters are exempt from IEEE-323 requirements per CCN 216355.

Section 3 - Completed by ESQ

3.1 WTP Seismic Design Specification and/or Criteria:

Document No.	Remarks / Notes
24590-WTP-3PS-FB01-T0001	

3.2 Specified Seismic Load Parameters:

Document No.	Remarks / Notes
24590-WTP-3PS-FB01-T0001	

3.3 Specific Notes:

- r) N/A
- s)

PART B - Internal WTP Use Only

Section 4 - Completed by EEQ, ESQ, and Design Engineering as necessary

4.1 Reference List

(Source and developmental documents. See Material Requisition for documents transmitted to the vendor.)

No.	Document No.	Rev	Title
1.	See list of Reference in Attachment 3		
2.			
3.			

4.2 Specific Notes:

- t) N/A
- u)

ATTACHMENT 3

REFERENCES for Data Sheet: 24590-LAW-MAD-LVP-00006

(For WTP Internal Use only)

Data Sheet	Document #	Rev	Document Title
Mechanical Datasheet	24590-LAW-M6-LVP-00001004	1	<i>P&ID-LAW - LAW Secondary Offgas/Vessel Vent Process System Offgas Exhausters LVP-EXHR-00001A</i>
	24590-LAW-N1D-LVP-00003	3	<i>LVP-EXHR-00001A/B/C (LAW) Melter Offgas Exhauster</i>
	24590-LAW-M6-LVP-00001005	1	<i>P&ID-LAW - LAW Secondary Offgas/Vessel Vent Process System Offgas Exhausters LVP-EXHR-00001B</i>
	24590-LAW-M6-LVP-00001006	1	<i>P&ID-LAW - LAW Secondary Offgas/Vessel Vent Process System Offgas Exhausters LVP-EXHR-00001C</i>
	24590-LAW-M6C-LVP-00004	1	<i>Offgas Pipe and Exhauster Sizing for LOP and LVP Systems</i>
	24590-LAW-MEC-LVP-00003	1	<i>Design Pressure and Design Temperature Calculation for LVP System</i>
	24590-WTP-DB-ENG-01-001	2	<i>Basis of Design</i>
	24590-LAW-M4C-LOP-00001	3	<i>LAW Melter Offgas System Design Basis Flowsheets</i>
	24590-QL-POA-MACS-00007-04-00002	0D	<i>Data Sheet - Exhauster Data Sheet 24590-LAW-MA-LVP-EXHR-00001A/B/C</i>
Equipment Qualification Datasheet	24590-LAW-P1N-P01T-00050	N/A	<i>Radiation/ Contamination Classification Changes</i>
	24590-QL-POA-MACS-00007-06-00015	00H	<i>Drawing - Project 645 - LAW Exhausters Embed Plate Layout/Welding</i>
	24590-LAW-EVD-LVP-20005	5	<i>24590-LAW-EV-LVP-ASD-00001-A/B/C - Electrical Data Sheet Adjustable Speed Drive</i>
	24590-WTP-3PS-SS90-T0002	0	<i>Engineering Specification for WTP Project Tailoring of ANSI/AISC N690 & IEEE 323, 344 & 382</i>
	24590-WTP-3PS-FB01-T0001	6	<i>Engineering Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks</i>
	24590-WTP-DB-ENG-01-001	2	<i>Basis of Design</i>
	24590-LAW-U0D-W16T-00001	2	<i>LAW Room Environment Data Sheet</i>
	24590-LAW-M0C-20-00007	B	<i>LAW Facility Flooding Evaluation</i>
	24590-WTP-3PS-JQ06-T0005	3	<i>Engineering Specification for Environmental Qualification of Control and Electrical Systems and Components</i>
	24590-WTP-U0D-W16T-00001	0	<i>WTP Outdoor Environment Data Sheet</i>
24590-WTP-PSAR-ESH-01-002-03	5k	<i>Preliminary Documented Safety Analysis To Support Construction Authorization; LAW Facility Specific Information</i>	
Electrical Datasheet	24590-WTP-3PS-MUMI-T0002	3	<i>Engineering Specification for Low Voltage Induction Motors</i>
	24590-QL-POA-MACS-00007-04-00001	0C	<i>Data Sheet - Electrical Data Sheet Low Voltage Induction Motor</i>



R11785882

	Mechanical Systems Data Sheet		Component No. 24590-LAW-ME-LVP-HTR-00001A 24590-LAW-ME-LVP-HTR-00001B 24590-LAW-ME-LVP-HTR-00003A 24590-LAW-ME-LVP-HTR-00003B 24590-LAW-JC-LVP-PNL-00014 24590-LAW-JC-LVP-PNL-00015	
	LVP OFF-GAS HEPA PRE-HEATERS		Data Sheet No. 24590-LAW-MED-LVP-00006	Rev. 2

Project:	RPP-WTP	P&ID's:	24590-LAW-M6-LVP-00001002		
Project No:	24590	EQ Datasheet	24590-LAW-MOQ-LVP-00002		
Environmental Qualification	YES (By BUYER) 24590-LAW-U0D-W16T-00001		Calculation No. 24590-LAW-M4C-LOP-00001 24590-LAW-MEC-LVP-00003 24590-LAW-MEC-LVP-00005 24590-LAW-M6C-20-00006		
Project Site:	Hanford		QUALITY LEVEL Q	SAFETY CLASS SS	
BLDG	20, LAW	SYSTEM	LVP	SEISMIC CATEGORY SC-III	
Description:	LVP HEPA Off-gas Pre-Heaters				

PROCESS DESIGN					
Process Input	Unit	One Melter (Minimum)	Two Melter (Normal)	Two Melter (Maximum)	Two Melter (Bounding)
Dry Air	SCFM	1024	2553	2607	3178
Steam	SCFM	65	321	343	785
Others	SCFM	2.1	15.4	26	45
Design Pressure (Note 1)	PSIG	15/FV	15/FV	15/FV	15/FV
Design Temperature	°F	250	250	250	250
Temperature In	°F	104	124	126	146
Temperature Out	°F	140	160	162	182
ΔT	°F	36	36	36	36
COMPONENT DESIGN					
Input	Unit	One Melter (Minimum)	Two Melter (Normal)	Two Melter (Maximum)	Two Melter (Bounding)
Maximum Operating Pressure	psig	15	15	15	15
Maximum Operating Temperature	°F	182	182	182	182
Maximum Temperature Differential	°F	36	36	36	36



Mechanical Systems Data Sheet

**LVP OFF-GAS
HEPA PRE-HEATERS**

Component No.
 24590-LAW-ME-LVP-HTR-00001A
 24590-LAW-ME-LVP-HTR-00001B
 24590-LAW-ME-LVP-HTR-00003A
 24590-LAW-ME-LVP-HTR-00003B
 24590-LAW-JC-LVP-PNL-00014
 24590-LAW-JC-LVP-PNL-00015

Data Sheet No.	Rev.
24590-LAW-MED-LVP-00006	2

Design Notes

1. LVP HEPA Pre-Heaters have a design pressure value of FV and 15 psig to correspond with the pipe design temperature of 250°F. Hydrostatic test pressure shall be 1.5 times 15 psig.
2. *: SELLER to confirm/complete values.
3. Heating elements to be sized to keep relative humidity of process stream below 70% (below dew point) and raise offgas temperature by 20°C (36°F) from inlet to outlet.
4. Contents of this document are Dangerous Waste Permit affecting.
5. Equipment cyclic data listed below. Fatigue Assessment to be done in accordance with para. AD-160 of ASME Section VIII Division 2, Rules for Construction of Pressure Vessels - Alternative Rules, (2004 edition, w/ 2005-2006 Addenda).
6. 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 radio nuclides is provided for process description only.
7. Contents of this document are Air Permit affecting.

EQUIPMENT CYCLIC DATA

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	FV	15	480	
Operating Pressure	psig	-3	-2	480	
Operating Temperature	°F	59	235	480	24590-LAW-M4C-LOP-00001 states a max temperature of 182°F. For conservatism 235°F is chosen to evaluate fatigue, per ASME Section VIII, Division 1, AD-160, reflecting short term deviations from the maximum conditions.
Contents Specific Gravity		-	-	480	AIR @ 68.0% Relative Humidity Inlet
Contents Level	inch	N/A	N/A		
Localized Features					
Nozzles		N/A			
Supports		N/A			



Mechanical Systems Data Sheet

**LVP OFF-GAS
HEPA PRE-HEATERS**

Component No.
 24590-LAW-ME-LVP-HTR-00001A
 24590-LAW-ME-LVP-HTR-00001B
 24590-LAW-ME-LVP-HTR-00003A
 24590-LAW-ME-LVP-HTR-00003B
 24590-LAW-JC-LVP-PNL-00014
 24590-LAW-JC-LVP-PNL-00015

Data Sheet No.	Rev.
24590-LAW-MED-LVP-00006	2

Heater Specification

<u>Input</u>	<u>Unit</u>	<u>Description</u>
Type/Brand	-	Chromalox Flanged Immersion Heater
Model Number	-	TMIS-72-039P-E2XX TMIS-72-075P-E2XX
Weight	Lbs.	1118
Active Safety Heater Power	kW	39=(13 x 3)
Maximum Power @ Design Temperature	kW	39
Minimum Power @ Minimum Temperature	kW	13
Heating Element Material	-	Incoloy 800
Internal Structural Components Spacer Rods, Grills	-	SA-479/(316/316L)
Heating Element Density	W/in²	5
Passive Mechanical Boundary Safety Heater Power	kW	75
Maximum Power @ Design Temperature	kW	75
Minimum Power @ Minimum Temperature	kW	0
Design Specification & Qualification	-	ASME Section VIII, Division 1



Mechanical Systems Data Sheet

**LVP OFF-GAS
HEPA PRE-HEATERS**

Component No.
 24590-LAW-ME-LVP-HTR-00001A
 24590-LAW-ME-LVP-HTR-00001B
 24590-LAW-ME-LVP-HTR-00003A
 24590-LAW-ME-LVP-HTR-00003B
 24590-LAW-JC-LVP-PNL-00014
 24590-LAW-JC-LVP-PNL-00015

Data Sheet No.	Rev.
24590-LAW-MED-LVP-00006	2

Mechanical Connection		
<u>Input</u>	<u>Unit</u>	<u>Description</u>
Lifting Lugs	-	Supplied on flange
Flange Size, Type/Rating	in	24, ASME B16.5 RF CL 150
Flange Material	-	Allvac AL6XN(B462/UNS N08367)
Pressure Boundary Enclosure Materials (Heating Element Tubes)		Incoloy 800
Body Flange Gasket	-	Spiral Wound (HAST C-FG, 1/8" SS, CL 150, B16.20, B16.5)
Mounting	-	Vertical (Flanged to plant piping)
Electrical (Note 2)		
<u>Input</u>	<u>Unit</u>	<u>Description</u>
UL Listing	-	Required NRTL certification
Number of Circuits (Active Safety Heater)(Note 3)	-	3
Number of Circuits (Passive Mechanical Boundary Heater)	-	1
Terminal Seals	-	Hermetic Seals (1000°F)
Terminal Enclosure	-	NEMA 2, Explosion Resistant
Terminal Enclosure Standoff	in	6
Controls & Instrumentation		
Control Panels (Remote)	-	NEMA 4, UL Listed



Mechanical Systems Data Sheet

**LVP OFF-GAS
HEPA PRE-HEATERS**

Component No.
 24590-LAW-ME-LVP-HTR-00001A
 24590-LAW-ME-LVP-HTR-00001B
 24590-LAW-ME-LVP-HTR-00003A
 24590-LAW-ME-LVP-HTR-00003B
 24590-LAW-JC-LVP-PNL-00014
 24590-LAW-JC-LVP-PNL-00015

Data Sheet No.	Rev.
24590-LAW-MED-LVP-00006	2

Buyer's Connection	-	Profibus Control Signal (Note 4)
Over-temperature Protection Thermocouple	-	Yes, Type K, (Heater mounted) 1 per circuit (Note 5)

Heater Specification Notes

1. *: SELLER to confirm/complete values.
2. BUYER supplies 480 Volts, 3 phase, alternating current to heaters. For passive mechanical boundary heater, manufacturer's standard offering of electrical connection shall be provided.
3. Active electrical safety heaters shall have three independently wired 13 kW elements.
4. Applies to Passive Mechanical Boundary Heaters (LVP-HTR-00001A/-00003A)
5. LVP-HTR-00001A/-00003A have one over temperature thermocouple working with heater panels (LVP-PNL-00014/-00015). LVP-HTR-00001B/-00003B have three over temperature thermocouples, one for each heater. The B train heater thermocouples are not in use for over temperature protection and are used for indication only by the ICN.

Reference List:

24590-CD-POA-MEE0-00003-03-00004	REV. 00I	△ 2
24590-CD-POA-MEE0-00003-03-00005	REV. 00J	
24590-CD-POA-MEE0-00003-15-00007	REV. 00C	
24590-LAW-M4C-LOP-00001	REV. 3	
24590-LAW-MEC-LVP-00003	REV. 1	
24590-LAW-MEC-LVP-00005	REV. 0	
24590-LAW-M6C-20-00006	REV. 0	△ 2
24590-LAW-U0D-W16T-00001	REV. 3	
24590-LAW-M6-LVP-00001002	REV. 0	
24590-LAW-M0Q-LVP-00002	REV. 1	△ 2



Mechanical Systems Data Sheet

LVP OFF-GAS HEPA PRE-HEATERS

Component No.

- 24590-LAW-ME-LVP-HTR-00001A
- 24590-LAW-ME-LVP-HTR-00001B
- 24590-LAW-ME-LVP-HTR-00003A
- 24590-LAW-ME-LVP-HTR-00003B
- 24590-LAW-JC-LVP-PNL-00014
- 24590-LAW-JC-LVP-PNL-00015

Data Sheet No.

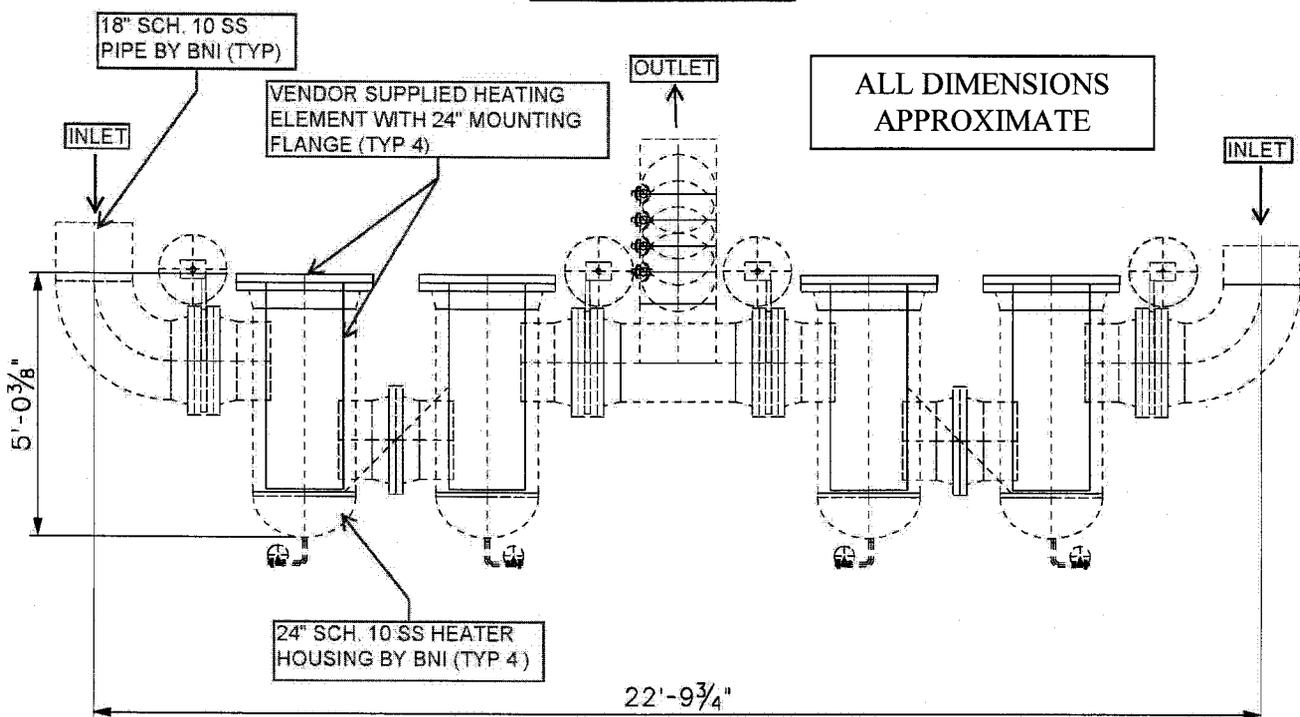
24590-LAW-MED-LVP-00006

Rev.

2

Figure 1:

(Conceptual Design)



LVP HEPA PRE-HEATER Piping Arrangement to be provided by BUYER. Piping configuration conceptual design (above) provided for clarity. SELLER scope is heating units and standard offering remote mounted control panels only.

Units consist of one 75 kW unit and one 39 kW unit (3, 13kW elements). Piping, Orientation, and installation by BUYER.

Ref. 24590-CD-POA-MEE0-00003-03-00004, 24590-CD-POA-MEE0-00003-03-00005 for detail design of preheater units, including assembly dimensions and domed lids outside flanged connections.





Mechanical Systems Data Sheet

LVP OFF-GAS HEPA PRE-HEATERS

Component No.

24590-LAW-ME-LVP-HTR-00001A
24590-LAW-ME-LVP-HTR-00001B
24590-LAW-ME-LVP-HTR-00003A
24590-LAW-ME-LVP-HTR-00003B
24590-LAW-JC-LVP-PNL-00014
24590-LAW-JC-LVP-PNL-00015

Data Sheet No.

24590-LAW-MED-LVP-00006

Rev.

2

(BNI Internal Notes):

Design Codes for LVP HEPA Preheaters

- Preheater element assemblies ASME Section VIII Division 1 (SELLER)
 - Preheater element assemblies NDE will be by (SELLER)
 - Visual Examination (VT)
 - Dye Penetrant Examination (PT)
 - Hydrostatic Examination in accordance with ASME Section VIII Division 1

Quality Notes

(Note: SELLER's Quality Assurance plan shall be commercially acceptable and able to fulfill the technical requirements of this material requisition upon successful audit/survey by BNI to the requirements of CM Datasheet of Quality Assurance Program.

BUYER shall have right of access to SELLER's facilities (technical, commercial, and quality personnel) /subcontractors(technical, commercial, and quality personnel) to conduct audits, surveys, and surveillances during the course of this procurement to make sure that all quality and technical requirements are being met. It is not the intent of the BUYER to evaluate the SELLER's compliance to ASME NQA-1 (2000) requirements. The BUYER will satisfy all ASME NQA-1 (2000), Commercial Grade Dedication, Equipment Environmental, and Seismic Qualification requirements of this procurement.

Equipment Qualification

The equipment environmental and seismic qualification will be performed by the BUYER. SELLER equipment designs shall not be considered complete until determined sufficient by BUYER's equipment qualification. Fabrication of SELLER designs or shipment of standard off-the shelf items shall not commence before completion of equipment qualification, except to provide identical test unit(s) if test is required. (Note: 24590-QL-MRA-J000-00001: Equipment Qualification Services)

Commercial Grade Dedication

(Note, BNI Internal Reference: BUYER to dedicate LVP HEPA Pre-Heaters to Quality Level Q, Seismic Category III through special tests and inspections under BUYER's Commercial Grade Dedication program which will verify the nuclear safety functions of the LVP HEPA Pre-Heaters. SELLER does not have any Commercial Grade Dedication or ASME NQA-1 (2000) scope for this material requisition.) [Internal Note: BNI to CGD under 24590-WTP-3PS-G000-T0019: Engineering Specification for Acquisition of Commercial Items and Services for Use in Safety Applications at WTP]



Mechanical Systems Data Sheet

**LVP OFF-GAS
HEPA PRE-HEATERS**

Component No.

24590-LAW-ME-LVP-HTR-00001A
24590-LAW-ME-LVP-HTR-00001B
24590-LAW-ME-LVP-HTR-00003A
24590-LAW-ME-LVP-HTR-00003B
24590-LAW-JC-LVP-PNL-00014
24590-LAW-JC-LVP-PNL-00015

Data Sheet No.

24590-LAW-MED-LVP-00006

Rev.

2

General Notes



1. Revision 1 of the datasheet, reduces the NEMA rating of the terminal enclosure from NEMA 7 to NEMA 2 with the incorporation of 24590-WTP-SDDR-MS-13-00035. The SDDR provides justification for the reduction in conservatism. Revision 2 of the datasheet, reduces process design flow rates on Sheet 1. The flow rate reduction increases conservatism during Minimum and Maximum conditions, while it does not impact the bounding condition of the heaters. No other changes between Revisions 0, 1, and 2 impact margin or conservatism.



Mechanical Systems Data Sheet

**LVP OFF-GAS
HEPA PRE-HEATERS**

Component No.
 24590-LAW-ME-LVP-HTR-00001A
 24590-LAW-ME-LVP-HTR-00001B
 24590-LAW-ME-LVP-HTR-00003A
 24590-LAW-ME-LVP-HTR-00003B
 24590-LAW-JC-LVP-PNL-00014
 24590-LAW-JC-LVP-PNL-00015

Data Sheet No.	Rev.
24590-LAW-MED-LVP-00006	2

APPROVALS

<p>2 7/20/16</p>	<p>Resolves CR 15-00938 by including a margin statement as Note 1 under General Notes. Corrects process design air flow values on Sheet 1. Updates the Reference List on Sheet 5 and adds a new reference. Removes heater overall assembly dimension statement.</p>	<p>Checked <small>By: Josh Wood - jawood Org Name: LBL Placed: Jul 18, 2016</small></p> <p>Originator <small>By: Sarkis Aktavoukian - saaktavo Org Name: LAW Mechanical Systems Placed: Jul 14, 2016</small></p>	<p>J. Wood</p>	<p>N/A</p>	<p>N/A</p>	<p><i>[Signature]</i> P. Rajagopalan</p>
<p>1 (03/16/15)</p>	<p>Issued for Purchase (rework) Ref. NCR-14-0180 Added spacer bar material specification Incorporates Vendor Data 24590-CD-POA-MEE0-00003-15-00007, REV. 00C Incorporates 24590-QL-MRA-MEE0-00003-T0001, 24590-WTP-SDDR-MS-12-00035, 24590-WTP-SDDR-MS-13-00035</p>	<p>J. Wood</p>	<p>P. Meeuwsen</p>	<p>C. Caimi</p>	<p>N. Kippes</p>	<p>P. Rajagopalan</p>
<p>0 (11/17/11)</p>	<p>PURCHASE, Supersedes 24590-LAW-MED-LVP-00005, REV 5</p>	<p>J. Wood</p>	<p>G. Goolsby</p>	<p>D. Krahn</p>	<p>M. R. O'Neill</p>	<p>D. Wilsey</p>
<p>Revision</p>	<p>Issued for</p>	<p>Originator</p>	<p>Checker</p>	<p>NSE (formerly E&NS)</p>	<p>Reviewer</p>	<p>Approver</p>

**DRAWINGS AND DOCUMENTS
OPERATING UNIT GROUP 10 – APPENDIX 9.9
LOW ACTIVITY WASTE BUILDING
MATERIAL SELECTION DOCUMENTATION**

The documents listed in the following table are incorporated by reference into this permit and are subject to the requirements set forth in Part I Standard Conditions, Part II General Facility Conditions, and Part III Operating Unit Group 10 Conditions. Upon request, copies of the documents can be viewed at the Nuclear Waste Program Resource Center located at 3100 Port of Benton Blvd., Richland, WA. Appointments for viewing can be scheduled by calling (509) 372-7950.

See Appendix 7.9 for material selection documentation common to the Pretreatment, LAW, HLW, and Laboratory buildings.

Drawing/Document Number	Description
24590-LAW-N1D-LCP-P0001, Rev. 1	Material Selection Data Sheet for LCP-VSL-00001/2
24590-LAW-N1D-LFP-00002, Rev. 0	Corrosion Evaluation for LFP-PMP-00001A/B & 3A/B, Melter 1 & 2 Feed Preparation Vessel Pumps Official Use Only
24590-LAW-N1D-LFP-00003, Rev. 0	Corrosion Evaluation for LFP-PMP-00002 & LFP-PMP-00004, Melter 1 & 2 Feed Vessel Pumps Official Use Only
24590-LAW-N1D-LFP-00004, Rev. 2	Corrosion Evaluation for LFP-VSL-00001/3
24590-LAW-N1D-LFP-00006, Rev. 0	Corrosion Evaluation for LFP-VSL-00002/4
24590-LAW-N1D-LMP-00001, Rev. 2	Corrosion Evaluation: LAW Melter 1 and Melter 2 Gas Barrier and Cooling Panels Inside of Gas Barrier Official Use Only
24590-LAW-N1D-LOP-P0001, Rev. 1	Material Selection Data Sheet for LOP-SCB-00001/2
24590-LAW-N1D-LOP-P0002, Rev. 1	Material Selection Data Sheet for LOP-VSL-00001/2
24590-LAW-N1D-LOP-00003, Rev. 4	Corrosion Evaluation for LOP-WESP-00001 & LOP-WESP-00002, LAW- Melter 1 and Melter Wet Electrostatic Precipitator (WESP) Official Use Only
24590-LAW-N1D-LOP-P0004, Rev. 0	Material Selection Data Sheet: LOP Offgas Piping (downstream of film cooler to SBS entry)
24590-LAW-N1D-LVP-00001, Rev. 7	Corrosion Evaluation for LVP-SCB-00001
24590-LAW-N1D-LVP-00002, Rev. 4	Corrosion Evaluation for LVP-TK-00001

Drawing/Document Number	Description
24590-LAW-N1D-LVP-00003, Rev. 5	Corrosion Evaluation for LVP-EXHR-00001A/B/C
24590-LAW-N1D-LVP-00004, Rev. 4	Corrosion Evaluation for LVP-ADBR-00001A/B
24590-LAW-N1D-LVP-00005, Rev. 3	Corrosion Evaluation for LVP-HX-00001
24590-LAW-N1D-LVP-00006, Rev. 3	Corrosion Evaluation for LVP-HTR-00002
24590-LAW-N1D-LVP-00007, Rev. 4	Corrosion Evaluation for LVP-SCO-00001
24590-LAW-N1D-LVP-00008, Rev. 3	Corrosion Evaluation for LVP-SCR-00001
24590-LAW-N1D-LVP-00009, Rev. 3	Corrosion Evaluation for LVP-HTR-00001A/B & LVP-HTR-00003A/B
24590-LAW-N1D-RLD-00001, Rev. 6	Corrosion Evaluation for RLD-VSL-00004, C3/C5 Drains/Sump Collection Vessel Official Use Only
24590-LAW-N1D-RLD-00002, Rev. 4	Corrosion Evaluation for RLD-VSL-00005
24590-LAW-N1D-RLD-00005, Rev. 5	Corrosion Evaluation for RLD-VSL-00003
RESERVED	RESERVED

- 1
- 2 Source documents (which do not include a "P" in the last set of numbers, e.g. "-P0001," or "-TP001")
- 3 should be used in conjunction with any document change notices issued against them.
- 4 We are currently transitioning from permit documents (which include a "P" in the last set of numbers) to
- 5 source documents. At the end of the transition period, permit submittals will contain source documents
- 6 and will be incorporated into the permit as described in Ecology Publication #07-05-006.

CORROSION EVALUATION

**LVP-TK-00001
Caustic Collection Tank**

Contents of this document are Dangerous Waste Permit affecting

Results

Materials Considered:

Material (UNS No.)	Acceptable Material
Type 304L (S30403)	
Type 316L (S31603)	X
AL-6XN® 6% Mo (N08367)	X
Hastelloy® C-22® (N06022)	X

Recommended Material Types: Tank - Type 316 (max 0.030% C; dual certified)

Minimum Corrosion Allowance: 0.04 inch (includes 0.024 inch corrosion allowance and 0.004 inch erosion allowance)

Inputs and References:

- Operating Temperature (°F) (norm/max): 118/123 (24590-LAW-MEC-LVP-00003)
- Uniform corrosion allowance: 0.024 inch (24590-WTP-M0C-50-00004)
- Uniform erosion allowance: 0.004 inch (24590-WTP-M0C-50-00004)
- Location: Room L-0218; outcell (24590-LAW-P1-P01T-00004)
- Corrosion evaluation based on operating conditions as stated in the applicable section of the *WTP Process Corrosion Data – Volume-4* (24590-WTP-RPT-PR-04-0001-04)

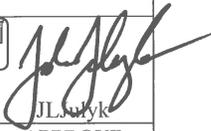
Assumptions and Supporting Justifications (see Section 19, References)

- Operating conditions presented on the Process Corrosion Datasheet (PCDS) are conservative with respect to corrosion.⁵
- Process service water at ambient temperature is introduced into LVP-TK-0001 for dilution of the scrubber solution.⁵
- 5 molar NaOH at ambient temperature is provided for pH control and to neutralize acid gases condensed from the scrubber.⁵
- Where the text of the Process Corrosion Data report attached describes the transfer of liquid effluents to RLD-VSL-00017A/B for the baseline configuration, it should also include the transfer of liquid effluents to DEP-VSL-00004A/B under the DFLAW configuration.⁶

Operating Restrictions

- Develop procedure to bring the tank contents within the limits defined for Type 316L in 24590-WTP-DB-ENG-01-001, *Basis of Design*, Table 18-1, in the event that sampling indicates that temperature, pH, or chloride concentration exceeds those limits.
- Develop a procedure to control, at a minimum, cleaning, rinsing, and flushing of tank and internals, as applicable.
- Develop procedure to control lay-up and storage; includes both before operation and during idle periods after plant start-up.
- Procedures are to be reviewed and accepted by MET prior to use.

Concurrence MT
Operations

4	11/20/18	Corrected revision numbers Incorporate revised PCDS Update references Minor editorial changes	 DAdler	 MFang	 RBDavis	 JLJolyk
REV	DATE	REASON FOR REVISION	ORIGINATE	CHECK	REVIEW	APPROVE

CORROSION EVALUATION

REVISION HISTORY

3	12/23/15	Complete re-write; no rev bars shown New format Incorporate revised PCDS Update references	DLAdler	APRangus	RBDavis	TErwin
2	5/25/05	Update wear allowance based on 24590-WTP-RPT-M-04-0008	DLAdler	JRDivine	NA	APRangus
1	7/8/04	Change item number from VSL to TK Correct description Update design temp/pressure Incorporate new PCDS Information regarding inadvertent nitric acid addition Re-format references Add DWP note	DLAdler	JRDivine	APR	APRangus
0	3/6/02	Initial Issue	JRDivine	DLAdler	NA	SKirk
REV	DATE	REASON FOR REVISION	ORIGINATE	CHECK	REVIEW	APPROVE

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.

This bound document contains a total of 14 sheets.

CORROSION EVALUATION

Corrosion/Erosion Detailed Discussion

The caustic collection tank is designed to hold caustic scrub solution, control pH by addition of 5 molar NaOH, and control precipitation by addition of process service water (PSW).

Where the text of the Process Corrosion Data report attached describes the transfer of liquid effluents to RLD-VSL-00017A/B for the baseline configuration, it should also include the transfer of liquid effluents to DEP-VSL-00004A/B under the DFLAW configuration.

1 General/Uniform Corrosion Analysis

a Background

General corrosion or uniform corrosion is corrosion that is distributed more-or-less uniformly over the surface of a material without appreciable localization. This leads to relatively uniform thinning on sheet and plate materials and general thinning on one side or the other (or both) for pipe and tubing. It is recognized by a roughening of the surface and by the presence of corrosion products. The mechanism of the attack is an electrochemical process that takes place at the surface of the material. Differences in composition or orientation between small areas on the metal surface create anodes and cathodes that facilitate the corrosion process.

b Component-Specific Discussion

Based on the applicable PCDS, the tank contains alkaline scrub solution at operating temperature of 122 °F. Due to normal design evolution, the source calculation referenced by the PCDS has been revised lowering the normal temperature of the tank contents to 118 °F and showing the maximum operating temperature to be 123 °F. The difference in operating temperatures between the two documents has been considered and found insignificant. This evaluation will continue based on the temperature shown in the PCDS, 122 °F. Either type 304L or type 316L is expected to be sufficiently resistant to water. The uniform corrosion rate is low under these conditions. A 0.04 inch total corrosion allowance is recommended; 0.024 inch allowance for uniform corrosion (24590-WTP-MOC-50-00004, *Wear Allowance for WTP Waste Slurry Systems*).

2 Pitting Corrosion Analysis

Pitting is localized corrosion of a metal surface that is confined to a point or small area and takes the form of cavities. Chloride is known to cause pitting in acid and neutral solutions. Normally the tank is to operate at 122 °F at a pH of 9.5. The tank is operated such that conditions do not promote localized corrosion. The tank contents are not stagnant.

The expected chemistry and temperature in this tank fall within the limits for localized corrosion established for 300 series stainless steel in Table 18-1 of 24590-WTP-DB-ENG-01-001.

3 Crevice Corrosion Analysis

Crevice corrosion is a form of localized corrosion of a metal or alloy surface at, or immediately adjacent to, an area that is shielded from full exposure to the environment because of close proximity of the metal or alloy to the surface of another material or an adjacent surface of the same metal or alloy. Crevice corrosion is similar to pitting in mechanism. It can, however, be initiated at lower temperatures than is pitting.

Crevices in this tank are limited by the design and fabrication practice. The expected chemistry and temperature in this tank fall within the limits established for Type 316L in Table 18-1 of 24590-WTP-DB-ENG-01-001.

4 Stress Corrosion Cracking Analysis

Stress corrosion cracking (SCC) is the cracking of a material produced by the combined action of corrosion and sustained tensile stress (residual or applied).

The exact amount of chloride required to cause stress corrosion cracking is unknown. In part this is because the amount varies with temperature, metal sensitization, and the environment. But it is also unknown because chloride tends to concentrate under heat transfer conditions, by evaporation, and electrochemically during a corrosion process. Hence, even as little as 10 ppm can lead to cracking under some conditions. Generally, as seen in Sedriks (1996) and Davis (1987), stress corrosion cracking does not usually occur below about 140°F for sensitized alloys.

The expected chemistry and temperature in this tank fall within the limits established for Type 316L in Table 18-1 of 24590-WTP-DB-ENG-01-001.

5 End Grain Corrosion Analysis

End grain corrosion is preferential aqueous corrosion that occurs along the worked direction of wrought stainless steels exposed to highly oxidizing acid conditions. End grain corrosion typically is not a major concern, it propagates along the rolling direction of the plate, not through the cross-sectional thickness. In addition, end grain corrosion is exclusive to metallic product forms with exposed end grains from shearing or mechanical cutting. Such conditions are not present in this system.

CORROSION EVALUATION

6 Weld Corrosion Analysis

The welds used in the fabrication will follow the WTP specifications and standards for quality workmanship. The materials selected for this fabrication are compatible with the weld filler metals and ASME/AWS practice. Using the welding practices specified for the project there should not be gross micro-segregation, precipitation of secondary phases, formation of unmixed zones, or volatilization of the alloying elements that could lead to localized corrosion of the weld. Assuming that correct weld procedures are followed, no preferential corrosion of weld beads or heat-affected zones occurs in nitric acid or alkaline-based stream.

7 Microbiologically Influenced Corrosion Analysis

Microbiologically influenced corrosion (MIC) refers to corrosion affected by the presence or activity, or both, of microorganisms. The proposed operating conditions are suitable for microbial growth. However, treated process water is used and water quality is controlled to prevent MIC.

8 Fatigue/Corrosion Fatigue Analysis

Corrosion-fatigue is the result of the combined action of cyclic stresses and a corrosive environment. The fatigue process is thought to cause rupture of the protective passive film, upon which stainless steel can actively corrode in the localized area of the film rupture. The corrosive environment may also act to reduce the stress necessary for film rupture. The result is that a metal exposed to a corrosive environment and cyclic mechanical load may initiate cracking at conditions at stress levels less than the endurance limit for the material. The conclusion that corrosion fatigue will not be a problem is based on the low mechanical and thermal cycling.

9 Vapor Phase Corrosion Analysis

Conditions in the vapor phase and at the vapor/liquid interface can be significantly different than those present in the liquid phase. The vapor space corrosion rates are less than the immersed surfaces and the transport away from the surface will be less because of the no-flow conditions. As compared to the corrosion in the immersion section, the corrosion rates in the vapor space are much lower. Vapor phase corrosion is not a concern.

10 Erosion Analysis

Erosion is the progressive loss of material from a solid surface resulting from mechanical interaction between that surface and a fluid, a multi-component fluid, or solid particles carried with the fluid. Velocities within the tank are expected to be below 12 ft/s and solids content negligible. Erosion allowance of 0.004 inch for components with low solids content (< 2 wt%) at low velocities is based on 24590-WTP-M0C-50-00004.

11 Galling of Moving Surfaces Analysis

Where two metals are moving in contact with each other without lubrication, there is a risk of damage to their surfaces. No moving unlubricated surfaces are present within the tank; therefore, galling is not a concern.

12 Fretting/Wear Analysis

Fretting corrosion refers to corrosion damage caused by a slight oscillatory slip between two surfaces. Similar to galling but at a much smaller movement, the corrosion products and metal debris break off and act as an abrasive between the surfaces, producing a classic three-body wear problem. This damage is induced under load and repeated relative surface motion. Conditions which lead to fretting are not present in the tank; therefore, fretting is not a concern.

13 Galvanic Corrosion Analysis

Galvanic corrosion is an electrochemical process in which one metal corrodes preferentially to another when both metals are in electrical contact, in the presence of an electrolyte. Dissimilar metals and alloys have different electrode potentials, and when two are in contact in an electrolyte, one metal acts as anode and the other as cathode. The electropotential difference between the dissimilar metals is the driving force for an accelerated attack. A potential difference far greater than 200 mv is needed for a driving force sufficient to initiate galvanic corrosion. The potential difference for any combination of the materials typically used on the Project is not sufficient for galvanic currents to overcome the passive protective film. For such alloys, there is negligible potential difference so galvanic corrosion is not a concern.

14 Cavitation Analysis

Cavitation is the formation and rapid collapse of cavities or bubbles of vapor or gas within a liquid resulting from mechanical or hydrodynamic forces. Cavitation is typically associated with pumps and orifice plates, not tanks. Therefore, damage from cavitation is not expected in these components.

WTP design limits conditions which lead to cavitation; therefore, cavitation is not a concern.

CORROSION EVALUATION

15 Creep Analysis

Creep is time-dependent strain occurring under stress and is described as plastic flow, yielding at stresses less than the yield strength. Creep is only experienced in plants operating at high temperatures. Temperatures much greater than one half the absolute melting temperature of the alloy are necessary for thermally activated creep to become a concern. The tank operating and design temperatures are too low to lead to creep; therefore, creep is not a concern.

16 Inadvertent Nitric Acid Addition

At this time, the design does not provide for the regular use of nitric acid reagent in this system. Addition of nitric acid into the system would require operator intervention to complete the routing. Nitric acid is a known inhibitor solution for austenitic stainless steels, duplex CD4MCu, and high nickel alloys. The presence of nitric acid is not a concern for the stainless steel and nickel alloys; especially at the operating temperatures listed.

17 Conclusion and Justification

The conclusion of this evaluation is that LVP-TK-00001 can be fabricated from a 300 series stainless steel and is capable of providing 40 years of service. Based on the expected operating conditions, a 300 series stainless steel is expected to be satisfactorily resistant to uniform and localized corrosion. The probable uniform corrosion over 40 years is 0.024 inch. The probable uniform erosion over 40 years is 0.004 inch. A total general corrosion and erosion allowance of 0.04 inch is recommended such that there is margin provided (0.012 in).

The localized corrosion margin is based on comparison of the expected process conditions against the limits for Type 316L documented in Table 18-1 of 24590-WTP-DB-ENG-01-001. The tank contents are within the applicable limits. Velocities within the tank are expected to be below 12 ft/s and solids content negligible. Such conditions do not suggest that localized erosion will occur; no localized erosion allowance is necessary for the tank.

18 Margin

The system is designed with a uniform corrosion allowance of 0.04 inch based on the range of inputs, system knowledge, handbooks, literature, and engineering judgment/experience. The service conditions used for materials selection has been described and result in a total predicted uniform loss of 0.024 inches. The expected uniform erosion over 40 years is less than 0.004 inch. The conditions result in a corrosion allowance of 0.040 inches, which exceeds the minimum required corrosion allowance specified in the input calculations (0.028 inches). The uniform corrosion design margin for the operating conditions is sufficient to expect a 40-year operating life and is justified in the calculation 24590-WTP-M0C-50-00004, *Wear Allowance for WTP Waste Slurry Systems*.

The erosion allowance of 0.004 inch is based on 24590-WTP-M0C-50-00004. The recommended uniform erosion allowance provides sufficient protection for erosion of the vessel walls. The margin in the erosive wear allowance is contained in the referenced calculation.

The maximum operating parameters for this tank are bounded by the materials localized corrosion design limits documented in the WTP Materials Localized Corrosion Design Limits in Table 18-1 of the Basis of Design. The difference between the design limits and the operating maximums is the localized corrosion design margin and, based on the operating conditions, is sufficient to expect a 40 year operating life. The Caustic Collection Tank, LVP-TK-00001, is protected from localized corrosion (pitting, crevice, and stress corrosion) by operating within the acceptable range of the design limits. Operational and process restriction will be used to ensure the limits are maintained.

MATERIALS LOCALIZED CORROSION DESIGN LIMITS – Type 316L

	<u>Temperature</u> (°F)	<u>pH</u>		<u>Chloride (ppm)</u>	
DESIGN LIMIT	150 max	5 to 10		300 max	
Caustic Scrub Solution to LVP-SCB-00001 (LVP17)	122	9.5		51	
<u>Inlet Vessels to LVP-TK-00001</u>					
	<u>Temperature</u> (°F)	<u>pH</u>	<u>Chloride</u> (molar)	<u>Hydroxide</u> (molar)	<u>Cl/OH</u> (molar)
DESIGN LIMIT	150 max	≥ 10			≤ 2
5M NaOH for pH control (LVP19)	77	14.7	0.0	4.7	0
PSW water addition (LVP20)	Process service water is a utility and is not addressed in the PCDS				

Inlet vessels to LVP-TK-00001 based on 24590-WTP-RPT-PR-04-0001-04, Section 6.6, and Figure 10.

References sources for this table:

- Design limits – 24590-WTP-DB-ENG-01-001, *Basis of Design, Table 18-1*
- 5M NaOH (LVP19) -- 24590-WTP-RPT-PR-04-0001-04, *WTP Process Corrosion Data - Vol 4, Figure C-39*

CORROSION EVALUATION

19 References:

1. 24590-LAW-MEC-LVP-00003, *Design Pressure and Design Temperature Calculation for LVP System*.
2. 24590-LAW-P1-P01T-00004, *LAW Vitrification Building General Arrangement Plan at El. 28'-0"*.
3. 24590-WTP-M0C-50-00004, *Wear Allowance for WTP Waste Slurry Systems*.
4. Deleted
5. 24590-WTP-RPT-PR-04-0001-04, *WTP Process Corrosion Data - Volume 4*.
6. 24590-LAW-M5-V17T-00011, *Process Flow Diagram LAW Vit Secondary Offgas Treatment (System LVP)*.
7. 24590-WTP-DB-ENG-01-001, *Basis of Design*.
8. Davis, JR (Ed), 1987, *Corrosion, Vol 13*, In "Metals Handbook", ASM International, Metals Park, OH 44073.
9. Sedriks, AJ, 1996, *Corrosion of Stainless Steels*, John Wiley & Sons, Inc., New York, NY 10158.

Additional Reading

- 24590-LAW-M6-LVP-00002003, *P&ID-LAW - LAW Secondary Offgas/Vessel Vent Process System Caustic Collection Tank LVP-TK-00001*.
- 24590-LAW-MTD-LVP-00001, *Mechanical Datasheet for 24590-LAW-MT-LVP-TK-00001 - LAW Caustic Collection Tank*.
- 24590-WTP-RPT-M-04-0008, *Evaluation of Stainless Steel and Nickel Alloy Wear Rates In WTP Waste Streams At Low Velocities*.
- Agarwal, DC, *Nickel and Nickel Alloys*, In: Revie, WW, 2000. *Uhlig's Corrosion Handbook*, 2nd Edition, Wiley-Interscience, New York, NY 10158.
- Berhardsson, S, R Mellstrom, and J Oredsson, 1981, *Properties of Two Highly corrosion Resistant Duplex Stainless Steels*, Paper 124, presented at Corrosion 81, NACE International, Houston, TX 77218.
- Blackburn, LD to PG Johnson, Internal Memo, Westinghouse Hanford Co, *Evaluation of 240-AR Chloride Limit*, August 15, 1991.
- Davis, JR (Ed), 1994, *Stainless Steels*, In ASM Metals Handbook, ASM International, Metals Park, OH 44073.
- Hamner, NE, 1981, *Corrosion Data Survey*, Metals Section, 5th Ed, NACE International, Houston, TX 77218.
- Phull, BS, WL Mathay, RW Ross, 2000, *Corrosion Resistance of duplex and 4-6% Mo-Containing Stainless Steels in FGD Scrubber Absorber Slurry Environments*, Corrosion 2000, Paper 00578, NACE International, Houston, TX 77218.
- Uhlig, HH, 1948, *Corrosion Handbook*, John Wiley & Sons, New York, NY 10158.
- Van Delinder, LS (Ed), 1984, *Corrosion Basics*, NACE International, Houston, TX 77084.

CORROSION EVALUATION

PROCESS CORROSION DATA SHEET (extract)

Component(s) (Name/ID #) CAUSTIC COLLECTION TANK (LVP-TK-00001)Facility LAWIn Black Cell? NO

		Stream ID LVP17
Chemicals	Unit	AQUEOUS
Cations (ppm)		
Al ⁺³ (Aluminum)	ppm	0
Fe ⁺³ (Iron)	ppm	0
Hg ⁺² (Mercury)	ppm	0
Pb ⁺² (Lead)	ppm	0
Anions (ppm)		
Cl ⁻ (Chloride)	ppm	51
CO ₃ ⁻² (Carbonate)	ppm	5518
F ⁻ (Fluoride)	ppm	15
NO ₂ ⁻ (Nitrite)	ppm	0
NO ₃ ⁻ (Nitrate)	ppm	1
PO ₄ ⁻³ (Phosphate)	ppm	0
SO ₄ ⁻² (Sulfate)	ppm	31
OH(aq) ⁻	ppm	76
OH(s) ⁻	ppm	0
pH		9.50
Suspended Solids	wt%	0
Temperature	°F	122
Liquid Density	lb/ft3	68.6

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev 1
WTP Process Corrosion Data - Volume 4

Figure C- 39 LVP-TK-00001 Aqueous PCDS

Properties	Stream ID			
	LVP17	LVP19	LVP20	LVP17b
Suspended Solids [wt %]	0	0	0	0
Total Salts [wt %]	0.63	18.01	0	0.62
Sodium Molarity [M]	0.11	5.01	0	0.11
Relative Humidity [%]	n/a	n/a	n/a	n/a
pH	9.50	14.70	7.00	11.43
Anti-Foam Agent [ppm]	0	0	0	0
TOC [kg/h]	4.87E-02	0	0	4.87E-02
Pressure [bar]	0.90	0.99	0.99	0.90
Temperature [C]	50.00	25.00	25.00	50.00
Temperature [F]	122.00	77.00	77.00	122.00
Water Flow Rate [kg/hr]	44,947.78	22.57	1,359.20	46,331.72
Total Aqueous Flow Rate [kg/hr]	45232.54	27.53	1359.20	46619.27
Total Flow Rate [kg/hr]	4.52E+04	2.75E+01	1.36E+03	4.66E+04
UserNote	VIT LIQUID Caustic Scrubber Scrubbing Solution Recirc.	VIT LIQUID 5M NaOH Addition to Scrubber Solution	VIT LIQUID Process Water Addition to Scrubber Solution	VIT LIQUID LAW Liquid to LS_SPLIT



AQUEOUS				
Cations (ppm)				
Ag+	0	0	0	0
Al+3	0	0	0	0
Am+3	0	0	0	0
As+5	0	0	0	0
B+3	0	0	0	0
Ba+2	0	0	0	0
Be+2	0	0	0	0
Bi+3	0	0	0	0
Ca+2	0	0	0	0
Cd+2	0	0	0	0
Ce+4	0	0	0	0
Co+2	0	0	0	0
Cr+3	0	0	0	0
Cr+6	0	0	0	0
Cs+	0	0	0	0
Cu+2	0	0	0	0
Eu+3	0	0	0	0
Fe+2	0	0	0	0
Fe+3	0	0	0	0
H+	4	0	0	0
Hg+2	0	0	0	0
K+	0	0	0	0
La+3	0	0	0	0
Li+	0	0	0	0
Mg+2	0	0	0	0
Mn+4	0	0	0	0
Mo+6	0	0	0	0
Na+	3994	103469	0	3976
Nd+3	0	0	0	0
Ni+2	0	0	0	0
Pb+2	0	0	0	0
Pd+2	0	0	0	0
Pr+4	0	0	0	0
Pu+4	0	0	0	0
Ra+2	0	0	0	0
Rb+	0	0	0	0
Rh+3	0	0	0	0
Ru+4	0	0	0	0
Sb+3	0	0	0	0
Se+4	0	0	0	0
Si+4	0	0	0	0
Sr+2	0	0	0	0
Ta+5	0	0	0	0
Tc+4	0	0	0	0
Te+4	0	0	0	0
Th+4	0	0	0	0
Ti+4	0	0	0	0
Ti+5	0	0	0	0
U+4	0	0	0	0
V+3	0	0	0	0
W+6	0	0	0	0
Y+3	0	0	0	0
Zn+2	0	0	0	0
Zr+4	0	0	0	0
Anions (ppm)				
B(OH)4-	0	0	0	0
C2O4-2	0	0	0	0
Cl-	51	29	0	49
CN-	0	0	0	0
CO3-2	5518	198	0	5352
F-	15	0	0	15
H2PO4-	0	0	0	0
H2SiO4-2	0	0	0	0
H3SiO4-	0	0	0	0
HCO3-	0	0	0	0
HPO4-2	0	0	0	0
HSO3-	0	0	0	0
HSO4-	0	0	0	0
I-	0	0	0	0
IO3-	0	0	0	0
NH4+	236	0	0	229
NO2-	0	0	0	0
NO3-	1	0	0	1
O-2	0	0	0	0
O2-2	0	0	0	0
OH(aq)-	76	76410	0	75
OH(s)-	0	0	0	0
PO4-3	0	0	0	0
SO3-2	101	0	0	98
SO4-2	31	24	0	30
Organics (ppm)				
AFA_DCMPC	0	0	0	0
AFA_NVOC	0	0	0	0
NVOC	0	0	0	0
Sucrose	0	0	0	0
SVOC	0	0	0	0
VOC	1	0	0	1

GENERAL NOTE FOR USE OF PCDS:

- The information provided by the PCDS report is intended solely for use in support of the vessel material selection process and Corrosion Evaluations. The inputs, assumptions, and computational/engineering models used in generating the results presented herein are specific to this effort. Use of the information presented herein for any other purpose will require separate consideration and analysis to support justification of its use for the desired, alternative purpose.
- The process descriptions in this report cover routine process operations and non-routine (infrequent) process operations, when such exist, that could impact corrosion or erosion of process equipment.
- The data in the non-shaded columns of the PCDSs has NOT been adjusted to comply with the highest expected, vessel-specific operational conditions.
- The process descriptions provided in this report are for general information and reflective of the corrosion engineer's analysis for transparency, the information is current only at the time this document is issued. These process descriptions should not be referenced for design.

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev 1
WTP Process Corrosion Data - Volume 4

6.6.1 Description of Vessel/Equipment

The LAW Secondary Offgas/Vessel Vent Process (LVP) System is designed to treat the offgas from the LAW Primary Offgas Process (LOP) System and the LAW Facility vessel vents. The purpose of the LVP System is to remove almost all remaining particulates, miscellaneous acid gases, nitrogen oxides, VOCs, and mercury from the LAW Facility offgas that have not been removed by the LOP system.

Figure 10 is a sketch of the input and output arrangement of streams for all equipment within the LVP System. Streams that are not primary routes (infrequent transfers) are represented with dashed lines.

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev 1
 WTP Process Corrosion Data - Volume 4

Figure 10a LVP System Sketch

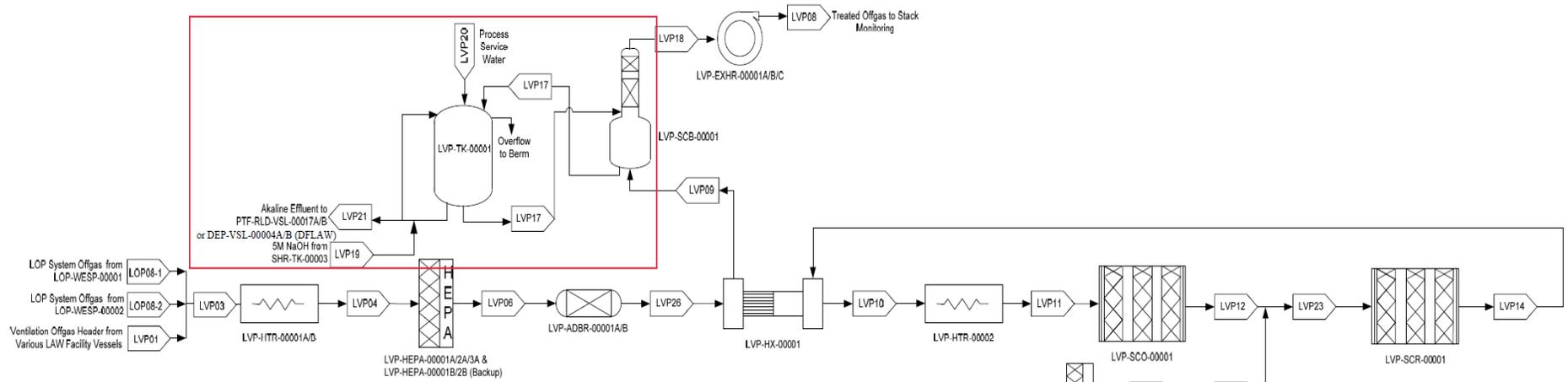
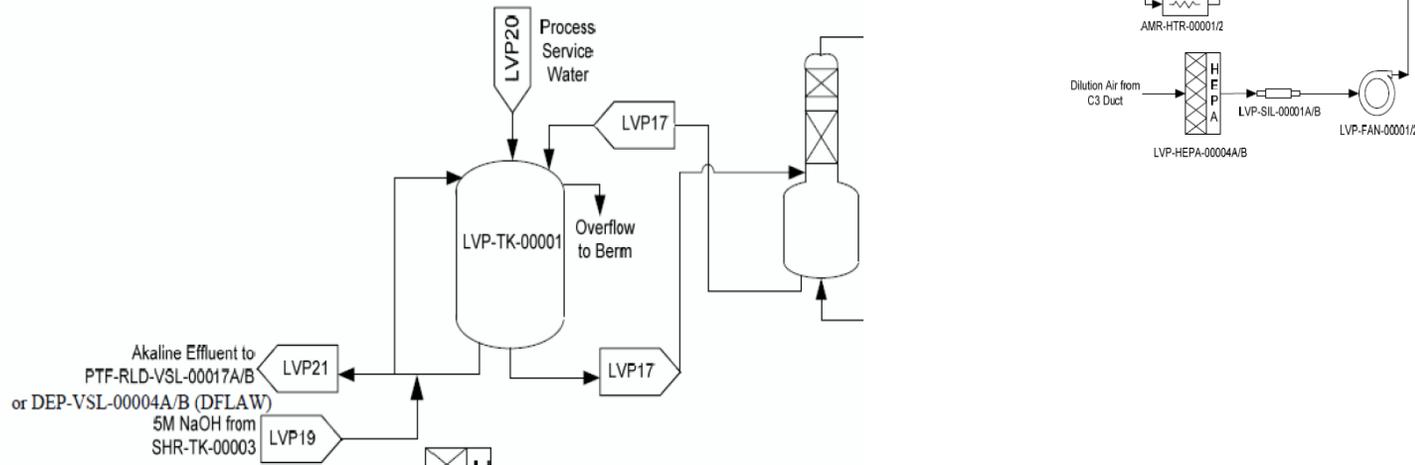


Figure 10b LVP System Sketch (applicable portion shown)



CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev 1

WTP Process Corrosion Data - Volume 4

6.6.2 System Functions

The process functions of this system are as follows:

- Receive LAW Offgas from LOP System and LAW Facility Vessel Ventilation Streams
- Receive Reagents Streams Such as Ammonia or Dilution Air to Ensure Offgas Component Destruction
- Treat Offgas to Ensure Requirements are Met Before Emitting to Atmosphere
- Transfer Offgas to Stack
- Transfer Liquid Effluents to RLD-VSL-00017A/B

6.6.3.1 Receipt Streams

The LVP system primarily receives LAW offgas from the LOP system and LAW Facility vessel ventilation streams. Other LVP system equipment receives various streams to help process the offgas. The receipt streams for each piece of equipment are listed as follows, by vessel, in order of process flow:

The following equipment are not part of the primary offgas flow stream processing equipment, but are ancillary equipment provided to help the primary offgas processing equipment achieve their goal.

LVP-TK-00001

- LVP20 - PSW water addition for precipitation control
- LVP19 - 5M NaOH for pH control

6.6.3.1.16 LVP20 - PSW water addition for precipitation control

Process service water is a utility and will not be addressed in this report. See Section 2.3.3 for further details.

As discussed in 6.6.3.1.14, PSW is introduced to LVP-TK-0001 for dilution. PSW is also sprayed into the scrubber bottom plenum region through nozzles N07 A through D to quench the incoming offgas stream introduced via nozzle N01 on the scrubber (24590-LAW-MKD-LVP- 00011, Rev. 3, Ref. 7.1.5(10), pages 5, 6 & 8; 24590-LAW-MTC-LVP-00002, Rev. 1, Ref. 7.1.4(31), Section 6.1.1). The total PSW spray flow rate is 6gpm (1.5gpm per nozzle; 4 spray nozzles).

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev 1
WTP Process Corrosion Data - Volume 4

6.6.3.1.17 LVP19 - 5M NaOH for pH control

5 M NaOH is used for pH control and to neutralize acid gases condensed from the scrubber.

Molarity

The normal sodium molarity for stream LVP19 is 5 molar.

Temperature

The temperature will normally be 76°F to 77°F (24590-WTP-DB-PET-09-001, Table B-22, Ref. 7.1.1(3)). The temperature in internal unoccupied C3 areas (24590-WTP-DB-ENG-01-001, Table 12-1, page 12-19, Ref. 7.1.1(2)), where LAW-SHR-TK-00003 is located, ranges from 59°F to 95°F. Therefore the maximum will be 95°F.

Solids Concentration

The contents of stream LVP19 will be fresh 5 molar sodium hydroxide reagent. Due to the process used to manufacture this sodium hydroxide however, trace quantities of impurities will be present in the solution. The following table provides the impurities of membrane grade, 50 wt% sodium hydroxide available from the Dow Chemical Company. This sodium hydroxide is representative of commercially available sodium hydroxide and will be used for estimating concentrations of impurities. The WTP selection of sodium hydroxide reagent is not expected to be lower in quality.

Note: Since 5 molar sodium hydroxide is made by diluting 19 molar sodium hydroxide with demineralized water, the concentration of each impurity is lower in the 5 molar sodium hydroxide compared to the 19 molar sodium hydroxide. *The following table lists only the impurity concentrations of 19 molar sodium hydroxide:*

Impurity	Limit (for 19 molar sodium hydroxide)
Sodium Carbonate	0.10 wt%
Sodium Chloride	100 ppm
Sodium Sulfate	100 ppm
Sodium Chlorate	65 ppm
Iron	5 ppm

Liquid Density

5 molar sodium hydroxide is 16.83 wt% sodium hydroxide. 17 wt% sodium hydroxide has a specific gravity of 1.1902 which corresponds to a liquid density of 74.27 lb/ft³ (OxyChem Caustic Soda Handbook, Ref. 7.2(7)).

Liquid pH

The pH of 5 molar sodium hydroxide is by definition 14.7 (24590-BOF-M4C-50-00001, Ref. 7.1.4(1)).

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev 1
WTP Process Corrosion Data - Volume 4

6.6.3.2 Outlet Streams

The outlet streams for each piece of equipment are listed as follows, by vessel, in order of process flow:

The following equipment are not part of the primary offgas flow stream processing equipment, but are ancillary equipment to help the primary offgas processing equipment achieve their goal.

LVP-TK-00001

- LVP17 - Caustic Scrub Solution to LVP-SCB-00001
- LVP21 - Chemical Waste to RLD-VSL-00017A/B
- Overflow to Berm (off-normal)

6.6.3.1.14 LVP17 - Caustic Scrub Solution from LVP-TK-00001 to LVP-SCB-00001

Stream LVP17 is the caustic scrubber solution recirculating from LVP-TK-00001 to LVP-SCB-00001.

Molarity

The normal sodium molarity range of the caustic scrubber solution from LVP-TK-00001 is 1.78-1.89 molar Na (24590-WTP-M4C-V11T-00024, Ref. 7.1.4(32)). Note that 5M NaOH is added to the scrubbing solution to neutralize the acid gases collected in the caustic collection tank LVP-TK-00001 and maintain the pH value of the scrubbing solution. The resulting sodium molarity for this stream will be provided in the corrosion data sheet.

Temperature

The minimum temperature of the caustic scrubber solution from LVP-TK-00001 is 59°F based on the minimum temperature of the C3 area (24590-WTP-DB-ENG-01-001, Ref. 7.1.1(2), Table 12-1). The normal and maximum temperature of the caustic scrubber solution from LVP-TK-00001 is 122°F based on the scrubber solution temperature in equilibrium with the scrubber exit offgas temperature (24590-LAW-MEC-LVP-00003, Ref. 7.1.4(16), Section 6.14).

Solids Concentration

The solids concentration for the caustic scrubber solution from LVP-TK-00001 is negligible (24590-WTP-DB-PET-09-001, Ref. 7.1.1(3), Appendix B, Table B-23).

Liquid Density

Process service water is added to the caustic scrubber solution to maintain the scrubber solution below 10wt% dissolved solids (24590-LAW-MEC-LVP-00003, Ref. 7.1.4(16), Section 2.4). The maximum density of the caustic scrubber solution is 68.6 lb/ft³ (24590-LAW-MEC-LVP-00003, Ref. 7.1.4(16), Section 2.30)

Liquid pH

The pH of the scrubber solution is continuously monitored and normally maintained in the range of 9.0 to 9.5 (24590-LAW-MVC-LVP-00001, Ref. 7.1.4(21), Section 3). The scrubber solution pH can be raised if necessary for corrosion control (bottom shell/head are Alloy C-276, 24590-LAW-MKD-LVP-00011, Ref. 7.1.5(4), pg.1, 3, Note 12).

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev 1
WTP Process Corrosion Data - Volume 4

6.6.3.2.1 LVP21 - Chemical Waste to RLD-VSL-00017A/B from LVP-TK-00001

Stream LVP21 is the alkaline effluent from the LAW caustic collection tank LVP-TK-00001, which collects the caustic scrub solution from LVP-SCB-00001. LVP-TK-00001 has a 1 to 2 day hold-up capacity of the accumulated caustic scrub solution, which is periodically discharged to RLD-VSL-000017A/B in the PT Facility. After the transfer, the line is flushed with PSW. This stream will have the same properties as stream LVP17 given in Section 6.6.3.1.14. Under normal operating conditions, the flow in this stream will equate approximately to the 6gpm quench flow introduced via nozzles N07A through D on the scrubber (discussed Section 6.6.3.1.16), less evaporative losses to the scrubber overheads.

6.6.3.2.3 Overflow to Berm from LVP-TK-00001 (off-normal)

Overflow to Berm from LVP-TK-00001 has the same properties as LVP21 but is considered an off-normal event. Therefore, this transfer will not be discussed further in this document.

6.6.4 Process Modes

6.6.4.1 Normal Operations

Based on the assessment of streams frequently transferred in and out of the LVP System equipment, the following normal processing modes are considered:

The following equipment are not part of the primary offgas flow stream processing equipment, but are ancillary equipment to help the primary offgas processing equipment achieve their goal.

LVP-TK-00001

- Scrub Solution from LVP-SCB-00001
- LVP20 - PSW water addition for precipitation control
- LVP19 - 5M NaOH for pH control
- LVP17 - Caustic Scrub Solution from LVP-TK-00001 via LVP-HX-00001
- LVP21 - Chemical Waste to RLD-VSL-00017A/B

6.6.5 Summary of Processing Conditions for LVP System

6.6.5.1 Normal Operations

The following table summarizes the normal processing modes for LVP System equipment.

Stream Number	Weight % UDS		Na Molarity		Temperature (°F)	
	normal	upper	normal	upper	normal	upper
<u>LVP-TK-00001</u>						
Scrub Solution from LVP-SCB-00001 (in)	0	trace	1.79-1.89	Note 1	122	122
LVP20 (in)	N/A - PSW is a utility and not addressed in this report					
LVP19 (in)	0	0	5	5	76-77	95
LVP17 (out)	0	trace	1.79-1.89	Note 1	122	122
LVP21 (out)	0	trace	1.79-1.89	Note 1	122	122

CORROSION EVALUATION

**LVP-EXHR-00001A/B/C
Melter Offgas Exhauster**

Contents of this document are Dangerous Waste Permit affecting

Results

Materials Considered:

Material (UNS No.)	Acceptable Material
Type 304L (S30403)	
Type 316L (S31603)	X (housing/impeller)
Al-6XN® 6% Mo (N08367)	X (housing/impeller)
Hastelloy® C-22® (N06022)	X (housing/impeller)
Type 410	X (shaft only)

Recommended Material Types: **Housing – Type 316 (max 0.030% C; dual certified)**
 Shaft – Type 410
 Impeller – Type 316 (max 0.030% C; dual certified)

Minimum Corrosion Allowance: **0.010 inch (surfaces in contact with offgas)**

Inputs and References

- Discharge temperature (°F) (nom/max): 241/289 (24590-LAW-M4C-LOP-00001)
- Corrosion allowance (in contact with offgas, excluding heat transfer surfaces): 0.010 inch (24590-WTP-GPG-M-047)
- Location: Rooms L-0304C/D/E; (24590-LAW-P1-P01T-00005)
- Corrosion evaluation is based on operating conditions as stated in the applicable section of *WTP Process Corrosion Data Report – Volume 4* (24590-WTP-RPT-PR-04-0001-04)

Assumptions and Justification (refer to Section 19—References)

- Operating conditions presented on the Process Corrosion Datasheet (PCDS) are conservative with respect to corrosion.⁷
- Three multi-stage centrifugal blowers are located downstream of the caustic scrubber. The purpose of the exhausters is to provide the motive force to draw the melter offgas and vessel ventilation streams, under vacuum, through the abatement processes of the offgas system and to expel the treated offgas through the stack. The three exhausters are arranged in parallel. Two exhausters will normally be running at a time with the third exhauster in standby. If one exhauster should fail, the standby exhauster is automatically started.¹
- Measures should be taken to prevent the potential formation of condensation in any offline exhauster and the resulting corrosion.¹
- Where the text of the attached Process Corrosion Data report describes the transfer of liquid effluents to RLD-VSL-00017A/B (baseline configuration), it should also include the transfer of liquid effluents to DEP-VSL-00004A/B under the DFLAW configuration.⁹

Operating Restrictions

- Develop a procedure to control, at a minimum, cleaning, rinsing, and flushing of component and internals, as applicable.
- Develop procedure to control lay-up and storage; including both before plant is operational and during inactive periods after plant start-up.
- Procedures are to be reviewed and accepted by MET prior to use.

Concurrence MT
Operations

5	11/14/18	Incorporate revised PCDS Minor editorial changes Update references	Originator By: Debbie Adler - dadler Org Name: MET Prepared: Sep 27, 2018 DLAdler	Checked By: mfang Org Name: Prepared: Sep 27, 2018 Mfang	Reviewed No Comments By: RB Davis Org Name: Bechtel Prepared: Sep 27, 2018 RBDavis	JLJulyk
REV	DATE	REASON FOR REVISION	ORIGINATE	CHECK	REVIEW	APPROVE

CORROSION EVALUATION

REVISION HISTORY

4	12/23/15	Complete re-write; no rev bars shown New format Incorporate revised PCDS Update references Add AEA notice	DLAdler	APRangus	RBDavis	TERwin
3	5/21/13	Expand discussion throughout Correct sect i typo Correct typo in references Additional reference	DLAdler	JRDivine	NA	SWVail
2	11/15/12	Update design pressure Sect d—Remove mercury reference	DLAdler	RBDavis	NA	DJWilsey
1	7/18/12	Update wear allowance based on 24590-WTP-RPT-M-04-0008 Update design and operating temps Additional operating modes Add DWPA note Expand section d to discuss mercury and liquid metal embrittlement Incorporate revised PCDS Minor non-technical edits	DLAdler	RBDavis	NA	SWVail
0	8/11/04	Initial Issue	DLAdler	JRDivine	APR	APRangus
REV	DATE	REASON FOR REVISION	ORIGINATE	CHECK	REVIEW	APPROVE

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.

This bound document contains a total of 14 sheets.

CORROSION EVALUATION

Corrosion/Erosion Detailed Discussion

The offgas exhauster is an assembled component consisting of a structure, housing, impeller, shaft, bearings, seals, and cooling system. Corrosion, wear, and fatigue affect each part. Materials selection for these assembled components is based on the function, service environment, and material properties. Often a trade-off is required for availability and life attributes. Exhauster inlet, outlet, housing, and impeller are exposed to potentially aggressive halogen-containing gases, variable humidity, and decontamination agents at low pressure. No condensation is expected.

The recommended material for the shaft is Type 410, a hardenable stainless steel commonly used for valve stems, motor shafts and mounting lugs and brackets. Type 410 combines the superior wear resistance of the chromium-carbon steels and excellent corrosion resistance of chromium stainless steel. Type 410 provides good corrosion resistance to mild atmospheres. It resists corrosion in many light industrial and domestic environments as well as potable and mine waters. Type 410 stainless steel exhibits good corrosion resistance to atmospheric corrosion, potable water, and to a lesser degree to corrosive chemical environments because of the ability to form a tightly adherent passive oxide film which protects their surfaces from further attack.

Please note that where the text of the attached Process Corrosion Data report describes the transfer of liquid effluents to RLD-VSL-00017A/B (baseline configuration), it should also include the transfer of liquid effluents to DEP-VSL-00004A/B under the DFLAW configuration.

1 General/Uniform Corrosion Analysis

a Background

General corrosion or uniform corrosion is corrosion that is distributed more-or-less uniformly over the surface of a material without appreciable localization. This leads to relatively uniform thinning on sheet and plate materials and general thinning on one side or the other (or both) for pipe and tubing. It is recognized by a roughening of the surface and by the presence of corrosion products. The mechanism of the attack typically is an electrochemical process that takes place at the surface of the material. Differences in composition or orientation between small areas on the metal surface create anodes and cathodes that facilitate the corrosion process.

b Component-Specific Discussion

Standard exhauster/blowers can be fabricated with a manufactured (cut and welded) housing or cast housing. The materials as allowed by design code can be either carbon steel or stainless steel; although corrosion and erosion resistant alloys are required unless there is sufficient bulk to the carbon steel material to ensure integrity while corroding at a high rate. The required corrosion allowance should be adjusted depending on the material selected; carbon steel or corrosion resistant steel.

Carbon steel or low alloy steel does not have sufficient corrosion resistance in this environment. The shaft is recommended to be fabricated from a corrosion resistant material such as a martensitic or precipitation-hardened stainless steel. Depending on how the attachments are made, the inlet and outlet material should match either the piping or the housing where the weld is made. Copper and aluminum alloys should be avoided for any part of this fabrication because of the corrosion caused by the decontamination acids and nitrogen compounds in the gas. If the housing is manufactured, the alloys need to be wrought carbon or stainless steel. Based on the PCDS, the exhauster operating temperature is 282 °F. During the normal course of design evolution, the process calculation upon which the PCDS temperature is based has been revised. The maximum discharge temperature (stream LVP08) is shown in the revised calculation as 289 °F. The difference in operating temperatures between the two documents has been considered and found insignificant. This evaluation will continue based on the temperature shown in the PCDS, 282 °F. The reported operating conditions suggest that Type 316L is acceptable for the housing.

2 Pitting Corrosion Analysis

Pitting is localized corrosion of a metal surface that is confined to a point or small area and takes the form of cavities. Pitting corrosion will only be a concern if moisture is present during normal operation. Shut-down and heat-up thermal transients will likely condense vapors on the cold surfaces. Measures should be taken to prevent the potential formation of condensation in the exhauster while offline (24590-LAW-3ZD-LOP-00001, *LAW Primary Offgas Process (LOP) and LAW Secondary Offgas/Vessel Vent Process (LVP) System Design Description*). Locations at crevices, at dead-legs, at low points, and under deposits will host conditions that support corrosion. The constituents in the offgas vapor phase can be aggressive in oxidizing environments, when mixed with aqueous condensate, towards carbon steel and Type 304L stainless steel. Therefore, a material with a higher pitting corrosion resistance than Type 304L is necessary. Type 316L stainless steel, or better, is recommended for this application.

At the stated operating conditions, localized corrosion is not a major concern; corrosion will not proceed without sufficient electrolyte present. Type 316L is recommended.

3 Crevice Corrosion Analysis

Crevice corrosion is a form of localized corrosion of a metal or alloy surface at, or immediately adjacent to, an area that is shielded from full exposure to the environment because of close proximity of the metal or alloy to the surface of another material or an adjacent surface of the same metal or alloy. Crevice corrosion is similar to pitting in mechanism. Crevice corrosion will only be a concern if sufficient moisture is present. The offgas humidity is controlled so condensation is controlled.

At the stated operating conditions, localized corrosion is not a major concern. Type 316L is recommended. Justification for this position begins with the understanding that this is an air handling unit operating at elevated temperatures, above the dew point. Corrosion will not take place or initiate when insufficient electrolyte is present.

CORROSION EVALUATION

4 Stress Corrosion Cracking Analysis

Stress corrosion cracking (SCC) is the cracking of a material produced by the combined action of corrosion and sustained tensile stress (residual or applied). In addition, sensitization of the grain boundaries is prevented with the materials recommended. The “L” grade (low carbon) stainless steel specified tends to negate sensitization from becoming a corrosion issue. It is assumed that condensation in the unit will be prevented; therefore, the exhauster will not undergo stress corrosion cracking because insufficient moisture will be present.

The temperature of the gas during operation, 282 °F, will be greater than the dew point. Corrosion will not take place or initiate when insufficient electrolyte is present.

5 End Grain Corrosion Analysis

End grain corrosion is preferential aqueous corrosion that occurs along the worked direction of wrought stainless steels exposed to highly oxidizing acid conditions. End grain corrosion typically is not a major concern; it propagates along the rolling direction of the plate, not necessarily through the cross sectional thickness. In addition, end grain corrosion is exclusive to metallic product forms with exposed end grains from shearing or mechanical cutting. Such conditions are not present in this component.

End grain corrosion is not expected to occur in the exhausters because the temperature of the gas will be greater than the dew point of the gas therefore corrosion will not occur in the absence of sufficient electrolyte.

6 Weld Corrosion Analysis

The welds used in the fabrication will follow the WTP specifications and standards for quality workmanship. The materials selected for this fabrication are compatible with the weld filler metals and ASME/AWS practice. Using the welding practices specified for the project there should not be gross micro-segregation, precipitation of secondary phases, formation of unmixed zones, or volatilization of the alloying elements that could lead to localized corrosion of the weld.

Corrosion at welds is not expected to occur in the exhausters because, at 282 °F, the temperature of the gas will be greater than the dew point of the gas; therefore corrosion will not occur in the absence of sufficient electrolyte.

7 Microbiologically Influenced Corrosion Analysis

Microbiologically influenced corrosion (MIC) refers to corrosion affected by the presence or activity, or both, of microorganisms. In this system, the stated operating conditions are not suitable for microbial growth. The exhausters will operate at elevated temperatures and the presence of condensation is unlikely.

8 Fatigue/Corrosion Fatigue Analysis

Corrosion-fatigue is the result of the combined action of high cyclic stresses and a corrosive environment. Rotating equipment is designed for normal operating loads as well as a limited number of stops and starts. For rotating equipment operated with high cyclic stresses (on/off loads) or random equipment loads due to imbalance, the fatigue process is thought to cause localized rupture of the protective passive film, upon which stainless steel can experience anodic dissolution until re-passivation. Multiple initiation sites are common when corrosion is involved, and the cracking that follows tends to be transgranular and branched. Distortions due to local yielding may increase vibrational loads to shorten the component life. The corrosive environment may reduce the stress necessary for film rupture, however the alkaline nature of the vapor promotes passivation.

The exhausters are not cyclically operated; offgas flow is constant and operation steady. Thermal cycles are low associated and are with the start-up and shut down of the exhauster (24590-WTP-MVC-50-00009, *LAW, BOF, and Lab Vessel Cyclic Datasheet Inputs*). Corrosion fatigue will not be a problem due to the low mechanical and thermal cycling, as well as the lack of sufficient electrolyte for corrosion.

9 Vapor Phase Corrosion Analysis

Vapor phase corrosion considers the gas and vapor constituents that form acidic condensate and the alloy corrosion resistance. The aggressive constituents are HCl, HF, and HNO₃; however these are present in low concentrations in the gas. The upstream equipment removes acid gas-forming constituents; therefore, vapor phase corrosion is negligible. The formation of acidic condensate requires moisture condensing on the surface and mixing with the adsorbed surface constituents to produce an aggressive environment. Condensation on the surface is not likely during normal operation.

Vapor phase corrosion will not occur in the exhauster because the maximum operation conditions for this component preclude the presence of sufficient moisture and concentrations of acid gas forming components.

10 Erosion Analysis

Erosion is the progressive loss of material from a surface resulting from mechanical interaction between a particle and that surface. Solid particle erosion can occur in air, steam, and water fluid systems. When the fluid propels the solid particles at a sufficient velocity and the particle mass is sufficient, the surface can be damaged by the combined effect of millions of individual erosion “scars”. The conditions expected for this component are not severe. Prior to reaching the exhausters, the offgas passes through a high efficiency particulate filter (HEPA) so should be free of particulates, and the flow through the exhauster is relatively low (24590-LAW-M6C-LVP-00004, *Offgas Pipe and Exhauster Sizing for LOP And LVP Systems*). The impingement erosion is not likely when there are very low particulates and moisture in the gas stream.

CORROSION EVALUATION

The recommended general erosion wear allowance provides sufficient protection for erosion of the component walls.

11 Galling of Moving Surfaces Analysis

Galling is a form of wear caused by a combination of friction and adhesion between moving surfaces. Under high compressive forces and movement, the friction temperatures cold-weld the two surfaces together at the surface asperities. As the adhesively bonded surface moves some of the bonded material breaks away. Microscopic examination of the galled surface shows some material stuck or even friction welded to the adjacent surface, while the softer of the two surfaces appears gouged with balled-up or torn lumps of material stuck to its surface.

The corrosion evaluation is specific to the process fluid and the inside components of the exhauster. Although the rotating shaft will have a bearing set, the set should be on the outside of the seals. Inside the exhauster, the metallic surfaces will not contact and therefore galling is not possible.

Conditions which lead to galling are not present in this component; therefore, galling is not a concern.

12 Fretting/Wear Analysis

Fretting corrosion refers to corrosion damage caused by a slight oscillatory slip between two surfaces. Similar to galling but a much smaller movement, the corrosion products and metal debris break off and act as an abrasive between the surfaces, classic 3-body wear problem. This damage is induced under load and repeated relative surface motion, as induced for example by vibration. Pits or grooves and oxide debris characterize this damage, typically found in machinery, bolted assemblies and ball or roller bearings. Contact surfaces exposed to vibration during transportation are exposed to the risk of fretting corrosion.

The corrosion evaluation is specific to the process fluid and the inside components of the exhauster. Although the rotating shaft will have a bearing set, the set should be on the outside of the seals. Inside the exhauster, the metallic surfaces will not contact and therefore fretting wear is not possible.

Conditions which lead to fretting are not present in this component; therefore, fretting is not a concern.

13 Galvanic Corrosion

Galvanic corrosion is an electrochemical process in which one metal corrodes preferentially to another when both metals are in electrical contact, in the presence of an electrolyte. Dissimilar metals and alloys have different electrode potentials, and when two are in contact in an electrolyte, one metal acts as anode and the other as cathode. The electropotential difference between the dissimilar metals is the driving force for an accelerated attack. A potential difference of more than 200 mv is needed for sufficient driving force. Galvanic compatibility is one of the attributes used to select the WTP alloys. Austenitic stainless steels in contact with other austenitic stainless steels do not have sufficient electropotential difference to significantly influence the metal loss.

No sufficiently dissimilar metals are present. The gas is dry and contains insufficient moisture to act as an electrolyte. Galvanic corrosion is not expected to be a corrosion issue under these conditions.

14 Cavitation

Cavitation corrosion is defined as another synergistic process, the combined influence of mechanical disruption of the metal surface and the corrosion of the active metal. Cavitation occurs when the local fluid pressure drops below the vapor pressure of the fluid resulting in a liquid vapor interface or bubbles to form. Their collapse on the metal surface has sufficient energy to rupture the oxide film and depending on alloy, may be capable of removing metal. The fluid chemistry and alloy define corrosion characteristics of the oxide film; where localization of the cavitation produces a condition where the bubble collapse rate is greater than the ability to passivate, the normally passive alloy can experience accelerated loss. This is most likely to occur in pumps, valves (flow control), orifices, ejectors/eductors, and nozzles. Cavitation is not expected in an offgas system.

15 Creep

Creep is defined as a time-dependent deformation at elevated temperature and constant stress, creep is a thermally activated process. The temperature at which creep begins depends on the alloy composition. Creep failures and stress rupture failures follow the same mechanism and are influenced by similar variables like temperature. Stress rupture is defined as bi-axial creep restricted to pipe like geometries. Creep is found in components subjected to heat for long periods, and the creep rate generally increases as the temperature nears the melting point. At 282 °F, the maximum operating temperature for the exhausters is far too low to experience creep; therefore, creep is not a concern.

16 Inadvertent Addition of Nitric Acid

Inadvertent introduction of nitric acid into the offgas system is not a plausible scenario. Nitric acid and decontamination agents may be used over short durations. Procedures will be used to control exposures and corrosion loss.

CORROSION EVALUATION

17 Conclusion & Justification

The conclusion of this evaluation is that LVP-EXHR-00001A/C can be fabricated from Type 316 stainless steel and that Type 316 stainless steel is capable of service for the design life. Type 410 stainless steel is used for the shaft for its superior wear resistance and good corrosion resistance. Providing the reported dry-air conditions are maintained, Type 316 stainless steel is expected to be resistant to uniform and localized corrosion. The probable uniform corrosion is negligible; a minimum allowance of 0.010 inch for surfaces in contact with the offgas is recommended for conservatism. Conditions in the heater do not promote erosion so no erosion allowance is necessary.

18 Margin

Per 24590-WTP-GPG-M-047, *Preparation of Corrosion Evaluations*, "When corrosion effects are known to be negligible or entirely absent, no corrosion allowance need be specified." In the reported dry-air conditions, there is insufficient electrolyte to drive corrosion. The system is designed with a uniform corrosion allowance of 0.010 inch based on the range of inputs, system knowledge, and engineering judgment/experience. The service conditions used for materials selection have been described above and result in negligible uniform loss. The specified minimum corrosion allowance exceeds the minimum required corrosion allowance which provides margin. The uniform corrosion design margin for the operating conditions is sufficient to expect a 40 year operating life.

Localized erosion of this component is not expected. Prior to reaching the exhausters, the offgas passes through a high efficiency particulate filter (HEPA) and, therefore, should be free of particulates. The solids content and gas velocity are sufficiently low that localized erosion is not a concern. Since localized erosion effects are not present, additional localized erosion protection is not required.

This component contains insufficient fluids or electrolyte to promote localized corrosion. As shown in the PCDS summary table (below), the unit operates at temperatures above the dew point and at low humidity (~ 23% at the outlet). While not quantifiable, the largest contributor to the total localized corrosion design margin is the absence of sufficient moisture to form a corrosive electrolyte. During inactive periods of plant operations and prior to initial plant startup, layup and storage procedures will monitor and control condensation.

CORROSION EVALUATION

19 References

1. 24590-LAW-3ZD-LOP-00001, *System Description for The LAW Primary Offgas (LOP) And Secondary Offgas/Vessel Vent (LVP) Systems.*
2. 24590-LAW-M6C-LVP-00004, *Offgas Pipe and Exhauster Sizing for LOP And LVP Systems.*
3. 24590-LAW-M4C-LOP-00001, *LAW Melter Offgas System Design Basis Flowsheets.*
4. 24590-LAW-P1-P01T-00005, *LAW Vitrification Building General Arrangement Plan at El. 48 Feet - 0 Inches.*
5. Deleted
6. 24590-WTP-MVC-50-00009, *LAW, BOF, and Lab Vessel Cyclic Datasheet Inputs.*
7. 24590-WTP-RPT-PR-04-0001-04, *WTP Process Corrosion Data-Volume 4.*
8. 24590-WTP-GPG-M-047, *Preparation of Corrosion Evaluations.*
9. 24590-LAW-M5-V17T-00011, *Process Flow Diagram LAW Vit Secondary Offgas Treatment (System LVP).*

Additional Reading

- 24590-LAW-MAD-LVP-00006, *Mechanical Data Sheet, 24590-LAW-MA-LVP-EXHR-00001A/B/C - Law Offgas Exhauster Blower*
- 24590-WTP-M0C-50-00004, *Wear Allowance for WTP Waste Slurry Systems*
- 24590-WTP-RPT-M-04-0008, *Evaluation Of Stainless Steel And Nickel Alloy Wear Rates In WTP Waste Streams At Low Velocities.*
- Berhardsson, S, R Mellstrom, and J Oredsson, 1981, *Properties of Two Highly Corrosion Resistant Duplex Stainless Steels*, Paper 124, presented at Corrosion 81, NACE International, Houston, TX 77218
- Davis, JR (Ed), 1987, *Corrosion, Vol 13*, In "Metals Handbook", ASM International, Metals Park, OH 44073
- Davis, JR (Ed), 1994, *Stainless Steels*, In ASM Metals Handbook, ASM International, Metals Park, OH 44073
- Hamner, NE, 1981, *Corrosion Data Survey*, Metals Section, 5th Ed, NACE International, Houston, TX 77218
- Jones, RH (Ed.), 1992, *Stress-Corrosion Cracking*, ASM International, Metals Park, OH 44073
- Koch, GH, 1995, *Localized Corrosion in Halides Other Than Chlorides*, MTI Pub No. 41, Materials Technology Institute of the Chemical Process Industries, Inc, St Louis, MO 63141
- Phull, BS, WL Mathay, & RW Ross, 2000, *Corrosion Resistance of Duplex and 4-6% Mo-Containing Stainless Steels in FGD Scrubber Absorber Slurry Environments*, Presented at Corrosion 2000, Orlando, FL, March 26-31, 2000, NACE International, Houston TX 77218.
- Sedriks, AJ, 1996, *Corrosion of Stainless Steels*, John Wiley & Sons, Inc., New York, NY 10158
- Uhlig, HH, 1948, *Corrosion Handbook*, John Wiley & Sons, New York, NY 10158
- Van Delinder, LS (Ed), 1984, *Corrosion Basics*, NACE International, Houston, TX 77084
- Wilding, MW and BE Paige, 1976, *Survey on Corrosion of Metals and Alloys in Solutions Containing Nitric Acid*, ICP-1107, Idaho National Engineering Laboratory, Idaho Falls, ID

CORROSION EVALUATION

PROCESS CORROSION DATA SHEET (extract)

Component(s) (Name/ID #) MELTER OFFGAS EXHAUSTER (LVP-EXHR-00001A/B/C)

Facility LAW

In Black Cell? NO

		Stream ID LVP08
Chemicals	Unit	GASEOUS
HCl	ppmV	0
HF	ppmV	0
NH3	ppmV	126
NO	ppmV	26
NO2	ppmV	0
SO2	ppmV	0
RH	%	23.47
Suspended Solids	wt%	NA
Temperature	°F	282

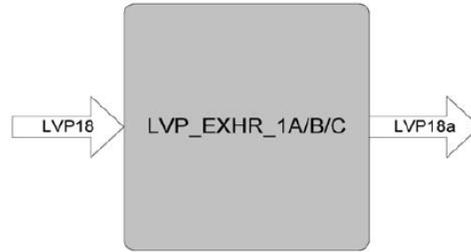
CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 0A
WTP Process Corrosion Data-Volume 4

Figure C- 42 LVP-EXHR-00001A/B/C Gaseous PCDS

Vessel : LVP_EXHR_1A/B/C

Properties	Stream ID	
	LVP18	LVP18a
Suspended Solids [wt %]	n/a	n/a
Total Salts [wt %]	n/a	n/a
Sodium Molarity [M]	n/a	n/a
Relative Humidity [%]	100.00	23.47
pH	n/a	n/a
Anti-Foam Agent [ppm]	0	0
TOC [kg/h]	2.40E-11	1.59E-03
Pressure [bar]	0.87	1.32
Temperature [C]	50.00	138.89
Temperature [F]	122.00	282.00
Water Flow Rate [kg/hr]	539.18	539.18
Total Aqueous Flow Rate [kg/hr]	539.18	539.18
Total Flow Rate [kg/hr]	6.42E+03	6.42E+03
UserNote	VIT VAPOR Caustic Scrubber Offgas Discharge	VIT VAPOR FROM LVP_EXHR_00001ABC TO OUTLET



GASEOUS		
(ppmV or mg/m ³)		
Ar	6199	6258
CH3I	0	0
Cl2	0	0
CO	8	13
CO2	9761	16243
F2	0	0
H2	0	0
HCl	0	0
HCN	0	0
HF	0	0
I2	0	0
N2	526157	529798
NaCl(s)	0	0
NaCN(s)	0	0
NaF(s)	0	0
NaI(s)	0	0
NH3	122	126
NO	25	26
NO2	0	0
O2	141350	141639
P2O5(s)	0	0
PO2	0	0
SO2	0	0
SO3(s)	0	0

Note: Concentrations for constituents representing particulates (as denoted by suffix "(s)" in their name) are reported in units of mg/m³; all others are reported in units of ppmV

GENERAL NOTE FOR USE OF PCDS:

- The information provided by the PCDS report is intended solely for use in support of the vessel material selection process and Corrosion Evaluations. The inputs, assumptions, and computational/engineering models used in generating the results presented herein are specific to this effort. Use of the information presented herein for any other purpose will require separate consideration and analysis to support justification of its use for the desired, alternative purpose.
- The process descriptions in this report cover routine process operations and non-routine (infrequent) process operations, when such exist, that could impact corrosion or erosion of process equipment.
- The data in the non-shaded columns of the PCDSs has NOT been adjusted to comply with the highest expected, vessel-specific operational conditions.
- The process descriptions provided in this report are for general information and reflective of the corrosion engineer's analysis for transparency, the information is current only at the time this document is issued. These process descriptions should not be referenced for design.

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 0A
WTP Process Corrosion Data-Volume 4

6.6.1 Description of Vessel/Equipment

The LAW Secondary Offgas/Vessel Vent Process (LVP) System is designed to treat the offgas from the LAW Primary Offgas Process (LOP) System and the LAW Facility vessel vents. The purpose of the LVP System is to remove almost all remaining particulates, miscellaneous acid gases, nitrogen oxides, VOCs, and mercury from the LAW Facility offgas that have not been removed by the LOP system.

Figure 10 is a sketch of the input and output arrangement of streams for all equipment within the LVP System. Streams that are not primary routes (infrequent transfers) are represented with dashed lines.

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1
WTP Process Corrosion Data-Volume 4

Figure 10a LVP System Sketch

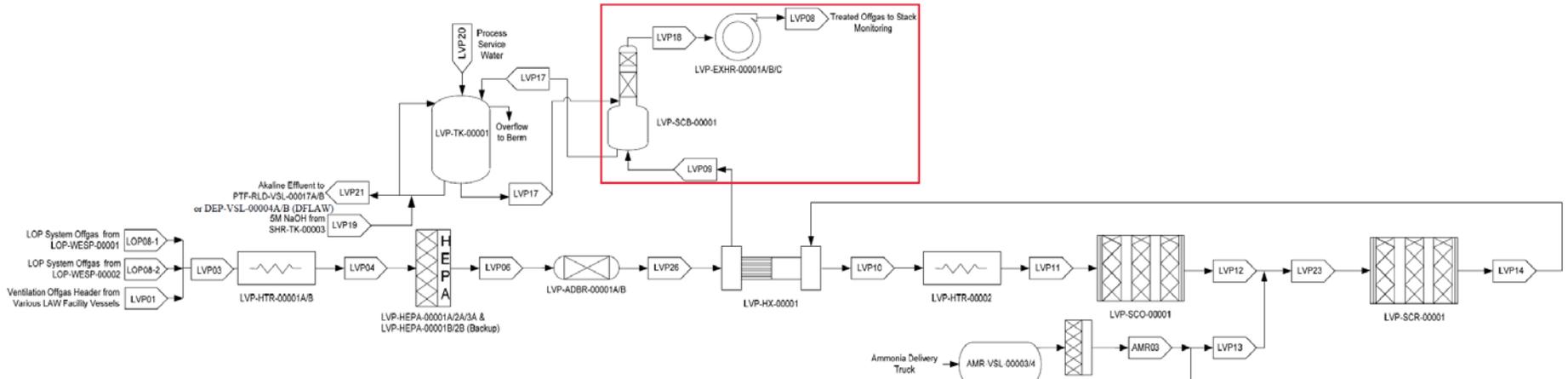
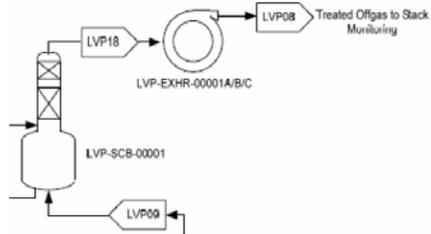


Figure 10b LVP System Sketch (pertinent portion of system shown)



CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1
WTP Process Corrosion Data-Volume 4

6.6.2 System Functions

The process functions of this system are as follows:

- Receive LAW Offgas from LOP System and LAW Facility Vessel Ventilation Streams
- Receive Reagents Streams Such as Ammonia or Dilution Air to Ensure Offgas Component Destruction
- Treat Offgas to Ensure Requirements are Met Before Emitting to Atmosphere
- Transfer Offgas to Stack
- Transfer Liquid Effluents to RLD-VSL-00017A/B

These vessels perform additional system functions beyond the process functions, but these are outside the scope of this document. The non-process functions are not discussed any further in this document. However, they are listed below for completeness:

- Confine Hazardous Materials
- Flush System Components
- Report System Data

6.6.3 Description of Process Functions

All process streams have been taken from Process Flow Diagrams 24590-LAW-M5-V17T-00010 and 24590-LAW-M5-V17T-00011 and associated drawing change notices (DCNs) 24590-LAW-M5N-V17T-00012/15/17/29 and 24590-LAW-M5N-V17T-00012/19/23/29, respectively. The P&IDs have also been looked at to obtain the most accurate flow diagram. These are as follows; 24590-LAW-M6-LVP-00001001 / 1002 / 1003 / 1004 / 1005 / 1006 / 2001 / 2002 / 2003 / 2004 / 2005 / 2006 / 3001 / 4001 / 4002 / 4003 / 5001 / 5002 and 24590-BOF-M6-AMR-00002001 / 2002 / 3001 / 3002 / 5001. See Section 7.1.3 for corresponding references in this section. A description of the process function of each piece of equipment is listed as follows:

<u>Equipment</u>	<u>Process Function</u>
LVP-EXHR-00001A/B/C	The centrifugal blowers provide motive force for the offgas to be processed through equipment. They also maintain the offgas at a negative pressure so any contamination will leak inwards towards the melter vs. out to the atmosphere.

6.6.3.1 Receipt Streams

The LVP system primarily receives LAW offgas from the LOP system and LAW Facility vessel ventilation streams. Other LVP system equipment receives various streams to help process the offgas. The receipt streams for each piece of equipment are listed as follows, by vessel, in order of process flow:

LVP-EXHR-00001A/B/C

- LVP18 - Offgas from LVP-SCB-00001

6.6.3.1.15 LVP18 - Offgas from LVP-SCB-00001

This stream is the offgas from the scrubber that is sent to the exhausters and subsequently to the stack.

Molarity

N/A

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1
WTP Process Corrosion Data-Volume 4

Temperature

The normal and maximum temperature of stream LVP18 will be 122°F (24590-LAW-M4E-LOP-00009, Ref. 7.1.4(13)).

Solids Concentration

The solids concentration will normally be near zero or trace solids because water is added to LVP-TK-00001 for precipitation control.

Vapor Density

The vapor density will normally be 4.84E-2 lb/ft³ to 3.71E-2 lb/ft³ (24590-LAW-M4C-LOP-00001, pg. 37, Cell AI48; pg. 41, Cell AI48, Ref. 7.1.4(12)).

Liquid pH

N/A

6.6.3.2 Outlet Streams

The outlet streams for each piece of equipment are listed as follows, by vessel, in order of process flow:

LVP-EXHR-00001A/B/C

- LVP08 - Exhauster discharge to stack

6.6.3.2.2 LVP08 - Exhauster discharge to Stack

This stream is the offgas from the exhausters subsequently sent to the stack.

Molarity

N/A

Temperature

The temperature will normally be 243°F (24590-LAW-M4E-LOP-00009, pg. 11, Cell Q51, Ref. 7.1.4(13)). The maximum temperature is 282°F (24590-LAW-M4E-LOP-00009, pg. 15, Cell Q51, Ref. 7.1.4(13)).

Solids Concentration

The solids concentration will normally be near zero or trace solids.

Vapor Density

The vapor density will normally be 5.11E-2 lb/ft³ to 4.77E-2 lb/ft³ (24590-LAW-M4E-LOP-00009, pg. 11, Cell AI51; pg. 15, Cell AI51, Ref. 7.1.4(13)).

Liquid pH

N/A

6.6.4 Process Modes

6.6.4.1 Normal Operations

Based on the assessment of streams frequently transferred in and out of the LVP System equipment, the following normal processing modes are considered:

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1
WTP Process Corrosion Data-Volume 4

LVP-EXHR-00001A/B/C

- LVP18 - Offgas from LVP-SCB-00001 to LVP-EXHR-00001A/B/C
- LVP08 - Exhauster discharge to stack

6.6.4.2 Infrequent Operations

None identified.

6.6.5 Summary of Processing Conditions for LVP System

6.6.5.1 Normal Operations

The following table summarizes the normal processing modes for LVP System equipment.

Stream Number	Weight % UDS		Na Molarity		Temperature (°F)	
	normal	upper	normal	upper	normal	upper
<u>LVP-EXHR-00001A/B/C</u>						
LVP18 (in)	0	trace	n/a	n/a	122	122
LVP08 (out)	0	trace	n/a	n/a	243	282

CORROSION EVALUATION

**LVP-ADBR-00001A/B
Activated Carbon Bed Adsorber**

Contents of this document are Dangerous Waste Permit affecting

Results

Materials Considered

Materials Considered (UNS No.)	Acceptable Materials
Carbon Steel	X (not in contact with offgas)
Type 304L (S30403)	
Type 316L (S31603)	X
Al-6XN® 6% Mo (N08367/N08926)	
Hastelloy® C-22® (N06022)	

Recommended Material Types:

Offgas components – Type 316L stainless steel (max 0.030% C; dual certified)

Components not in direct contact with offgas stream –

Carbon steel, coated for corrosion protection (e.g., housing support frame, pipe supports, maintenance platform)

Minimum Corrosion Allowance: 0.010 inch (0.00 inch for carbon steel)

Inputs and References

- Design Temperature (°F): 300 (24590-LAW-MKC-LVP-00005)
- Operating temperature (°F) (nom/max): 160/171 (24590-LAW-M4C-LOP-00001)
- Corrosion allowance: 0.010 inch (for conservatism)
- Location: Room L-304F; outcell (24590-LAW-P1-P01T-00005)
- Corrosion evaluation based on operating conditions as stated in applicable section of the Process Corrosion Data report (24590-WTP-RPT-PR-04-0001-04)

Assumptions and Supporting Justifications (see References, Section 19)

- Operating conditions presented on the PCDS are conservative with respect to corrosion.⁴
- During normal operating conditions, offgas is received from the LVP HEPA filters at 160 °F (171 °F max) and transferred to LVP-HX-00001 at 169 °F (207 °F max).¹
- Where the text of the attached Process Corrosion Data report describes the transfer of liquid effluents to RLD-VSL-00017A/B (baseline configuration), it should also include the transfer of liquid effluents to DEP-VSL-00004A/B under the DFLAW configuration.⁷
- A non-safety, manually-activated water deluge system is provided for both adsorbers with a high-high level trip to prevent overflowing with water on system activation. Manual water drain valves are provided for use in restoring the carbon beds to service.

Operating Restrictions

- Develop a work process for decontamination as necessary.
- Develop work process to control lay-up and storage; including plant startup and periods while the component is not in use once plant is operational.
- Procedures and work processes are to be reviewed and accepted by MET prior to use.

Concurrence **KG**
Operations

4	11/14/18	Incorporate revised PCDS Minor editorial changes Update references	Originator By: Debbie Adler - dadler Org Name: MET Placed: Sep 27, 2018 DLAdler	Checked By: -mfang Org Name: Placed: Sep 27, 2018 MFang	Reviewed No Comments By: Dr. Robert Davis - rdavis Org Name: Bechtel Placed: Sep 27, 2018 RBDavis	 JLJulyk
REV	DATE	REASON FOR REVISION	ORIGINATE	CHECK	REVIEW	APPROVE

CORROSION EVALUATION

REVISION HISTORY

3	4/28/15	Complete re-write; no rev bars shown New format Incorporate revised PCDS Update references Add AEA notice	DLAdler	TRangus	RBDavis	TErwin
2	12/21/11	Update design pressure Incorporate revised PCDS Addition text in section b	DLAdler	RBDavis	NA	SWVail
1	4/1/11	LVP-ADBR-00002A/B eliminated Update component description Update design conditions Incorporation of revised PCDS Expand section d to discuss mercury and liquid metal embrittlement Minor non-technical edits	DLAdler	RBDavis	NA	SWVail
0	8/24/04	Initial Issue	DLAdler	JRDivine	APR	APRangus
REV	DATE	REASON FOR REVISION	ORIGINATE	CHECK	REVIEW	APPROVE

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.

This bound document contains a total of 13 sheets.

CORROSION EVALUATION

Corrosion/Erosion Detailed Discussion

Treated activated carbon and other media are used to remove mercury and acid gases in order to protect the downstream equipment. The offgas flows to two mercury adsorbers, which are normally operated in series as part of a mercury mitigation equipment skid.

Please note that where the text of the attached Process Corrosion Data report describes the transfer of liquid effluents to RLD-VSL-00017A/B (baseline configuration), it should also include the transfer of liquid effluents to DEP-VSL-00004A/B under the DFLAW configuration.

1 General/Uniform Corrosion Analysis

a Background

General corrosion, or uniform corrosion, is corrosion that is distributed more-or-less uniformly over the surface of a material without appreciable localization. This leads to relatively uniform thinning on sheet and plate materials and general thinning on one side or the other (or both) for pipe and tubing. It is recognized by a roughening of the surface and usually by the presence of corrosion products. The mechanism of the attack typically is an electrochemical process that takes place at the surface of the material. Differences in composition or orientation between small areas on the metal surface create anodes and cathodes that facilitate the corrosion process.

b Component-Specific Discussion

Based on the applicable PCDS, the adsorbers have an operating temperature of 162 °F. Due to normal design evolution, the source calculation referenced by the PCDS has been revised lowering the normal temperature of stream to 160 °F and showing the maximum discharge temperature to be 171 °F. The difference in operating temperatures between the two documents has been considered and found to have no significant impact on this evaluation. This evaluation will continue based on the temperature shown in the PCDS, 162 °F. The anticipated dry-air conditions are not conducive to general corrosion and general corrosion is not expected. Unless there is sustained 65% relative humidity, corrosion cannot be sustained. A corrosion allowance of 0.010 inch is added to the wall thickness for a conservative design. Carbon steel is appropriate for items not in contact with the offgas stream.

The reported operating conditions suggest that either Type 304L or Type 316L is acceptable. However, to be consistent with the secondary offgas system, Type 304L will not be used. Structure components not in contact with the offgas stream can be coated carbon steel.

2 Pitting Corrosion Analysis

Pitting is localized corrosion of a metal surface that is confined to a point or small area and takes the form of cavities. Pitting corrosion will only be a concern if moisture is present during normal operation. While the equipment is to operate dry and be laid-up dry, postulated short-term shut-down and heat-up thermal transients, during which temperatures may drop as far as to ambient, could condense vapors on the cold surfaces. Condensation does not occur above the boiling point and is expected to be minimal and of short duration (< 24 hours) and will have minor effect on Type 316L. The constituents in the offgas vapor phase can be aggressive in oxidizing environments, when mixed with aqueous condensate, and might lead to minor pit initiation in carbon steel and Type 304L stainless steel. Therefore, a material with a higher pitting corrosion resistance than Type 304L is recommended. Type 316L stainless steel, or better, is recommended for this application.

At the stated operating conditions, localized corrosion is not a major concern; corrosion will not proceed without sufficient electrolyte present. Type 316L is recommended.

3 Crevice Corrosion Analysis

Crevice corrosion is a form of localized corrosion of a metal or alloy surface at, or immediately adjacent to, an area that is shielded from full exposure to the environment because of close proximity of the metal or alloy to the surface of another material or an adjacent surface of the same metal or alloy. Crevice corrosion is similar to pitting in mechanism. Crevice corrosion will only be a concern if sufficient moisture is present. Little or no condensation is expected in the unit when operating in the specified temperature range.

At the stated operating conditions, localized corrosion is not a major concern; corrosion will not proceed without sufficient electrolyte present. Type 316L is recommended.

4 Stress Corrosion Cracking Analysis

Stress corrosion cracking (SCC) is the cracking of a material produced by the combined action of corrosion and sustained tensile stress (residual or applied). The "L" grade (low carbon) stainless steel specified tends to negate sensitization from becoming a corrosion issue.

This system will be exposed to mercury vapor and, probably, liquid mercury at temperatures below 200 °F. According to Pawel (1999), mercury does not wet Type 316L below 437 °F; without being wetted by mercury, Type 316L will not crack. At expected operating temperatures between 160 °F and 189 °F, SCC will only be a concern in the presence of sufficient moisture. Little or no condensation is expected in the unit when operating in the specified temperature range. Corrosion will not take place or initiate when insufficient electrolyte is present. Type 316L is recommended.

CORROSION EVALUATION

5 End Grain Corrosion Analysis

End grain corrosion is preferential aqueous corrosion that occurs along the worked direction of wrought stainless steels exposed to highly oxidizing acid conditions. End grain corrosion typically is not a major concern, it propagates along the rolling direction of the plate, not necessarily through the cross sectional thickness. In addition, end grain corrosion is exclusive to metallic product forms with exposed end grains from shearing or mechanical cutting. Nitric acid is an oxidizing acid that could cause end grain attack. However, the exposure period is low. Conditions which lead to end grain corrosion are not present in this component; therefore, end grain corrosion is not a concern.

6 Weld Corrosion Analysis

The welds used in the fabrication will follow the WTP specifications and standards for quality workmanship. The materials selected for this fabrication are compatible with the weld filler metals and ASME/AWS practice. Using the welding practices specified for the project, there should not be gross micro-segregation, precipitation of secondary phases, formation of unmixed zones, or volatilization of the alloying elements that could lead to localized corrosion of the weld. Based on the operating temperature and insufficient electrolyte, corrosion at welds is not expected to be a concern.

7 Microbiologically Influenced Corrosion Analysis

Microbiologically influenced corrosion (MIC) refers to corrosion affected by the presence or activity, or both, of microorganisms. Typically, with the exception of cooling water systems and stagnant water, MIC is not observed in operating systems.

The adsorber will operate at elevated temperatures and the offgas is dry. In this system, the stated operating conditions are not suitable for microbial growth.

8 Fatigue/Corrosion Fatigue Analysis

Corrosion-fatigue is the result of the combined action of cyclic stresses and a corrosive environment. The fatigue process is thought to cause rupture of the protective passive film, upon which stainless steel can actively corrode in the localized area of the film rupture. The corrosive environment may also act to reduce the stress necessary for film rupture. The result is that a metal exposed to a corrosive environment and cyclic mechanical load may initiate cracking at conditions at stress levels less than the endurance limit for the material.

The adsorber is not cyclically operated; offgas flow is constant, steady, and dry. Thermal cycles and therefore thermal stress is also low and associated with the start-up and shut down of the offgas system. Based on the low mechanical and thermal cycling, as well as the lack of sufficient electrolyte, corrosion fatigue will not be a problem.

9 Vapor Phase Corrosion Analysis

Vapor phase corrosion considers the gas and vapor constituents that form acid condensate. Acid gases are generated from the melter feed decomposing into CO_2 , NO_x , SO_x , NH_3 , etc. When water is present, corresponding acids, such as HCl , HF , HNO_3 , can form. Normally water is not present; therefore, significant condensation on the surface is not expected during normal operation.

Vapor phase corrosion will not occur in the adsorber because the operating conditions for this component preclude the presence of sufficient moisture and concentrations of acid gas-forming components.

10 Erosion Analysis

Erosion is the progressive loss of material from a surface resulting from mechanical interaction between a particle and that surface. Solid particle erosion can occur in air, steam, and water fluid systems. When the fluid propels the solid particles at a sufficient velocity and the particle mass is sufficient, the surface can be damaged by the combined effect of millions of individual erosion "scars". In this component, the solids content and gas velocity are sufficiently low that erosion is not a concern.

11 Galling of Moving Surfaces Analysis

Galling is a form of wear caused by a combination of friction and adhesion between moving surfaces. Under high compressive forces and movement, the friction temperatures cold-weld the two surfaces together at the surface asperities. As the adhesively bonded surface moves some of the bonded material breaks away. Microscopic examination of the galled surface shows some material stuck or even friction welded to the adjacent surface, while the softer of the two surfaces appears gouged with balled-up or torn lumps of material stuck to its surface.

Galling is commonly found in metal surfaces that are in sliding contact with each other. It is especially common where there is inadequate lubrication between the surfaces. The adsorber does not have any moving surfaces, so galling is not a concern.

CORROSION EVALUATION

12 Fretting/Wear Analysis

Fretting corrosion refers to corrosion damage caused by a slight oscillatory slip between two surfaces. Similar to galling but at a much smaller movement, the corrosion products and metal debris break off and act as an abrasive between the surfaces, producing a classic three-body wear problem. This damage is induced under load and repeated relative surface motion, as induced for example by vibration. Pits or grooves and oxide debris characterize this damage. Contact surfaces exposed to vibration during transportation are also exposed to the risk of fretting corrosion.

The adsorber does not have moving parts and design precludes fretting corrosion problem. Fretting corrosion is not expected in this component.

13 Galvanic Corrosion Analysis

Galvanic corrosion is an electrochemical process in which one metal corrodes preferentially to another when both metals are in electrical contact, in the presence of an electrolyte. Dissimilar metals and alloys have different electrode potentials, and when two are in contact in an electrolyte, one metal acts as anode and the other as cathode. The electropotential difference between the dissimilar metals is the driving force for an accelerated attack. A potential difference of more than 200 mV is needed for a sufficient driving force to make a difference. Galvanic compatibility is one of the attributes used to select the WTP alloys. Austenitic stainless steels in contact with other austenitic stainless steels do not have sufficient electropotential difference to significantly influence the metal loss. The adsorber materials are all austenitic stainless steel. In addition, the gas contains insufficient moisture to act as an electrolyte. Further, there is insufficient potential between the stainless steel materials of the adsorber and the carbon steel used in the structure for galvanic corrosion to be concern under the external environment conditions. Therefore, galvanic corrosion is not expected to be an issue under these conditions.

14 Cavitation Analysis

Cavitation corrosion is defined as another synergistic process, the combined influence of mechanical disruption of the metal surface and the corrosion of the active metal. Cavitation occurs when the local fluid pressure drops below the vapor pressure of the fluid resulting in a liquid vapor interface or bubbles to form. Their collapse on the metal surface has sufficient energy to rupture the oxide film and depending on alloy, may be capable of removing metal. The fluid chemistry and alloy define corrosion characteristics of the oxide film; however, localization of the cavitation produces a condition where the bubble collapse rate is greater than the ability to passivate, the normally passive alloy can experience accelerated loss. Cavitation is not expected in an offgas system

15 Creep Analysis

Creep is defined as a time-dependent deformation at elevated temperature and constant stress; creep is a thermally activated process. Creep is found in components subjected to heat for long periods and the creep rate generally increases as the temperature nears the melting point. The temperature at which creep begins depends on the alloy composition. Conditions which lead to creep are not present in this component; therefore, creep is not a concern.

16 Inadvertent Addition of Nitric Acid

Addition of nitric acid to the offgas lines is not a plausible scenario.

17 Conclusion & Justification

Type 316L will be sufficiently resistant to general corrosion. At the stated operating conditions, uniform and localized corrosion are not a concern, providing the reported dry-air conditions are maintained. Conditions which lead to end grain corrosion, weld corrosion, MIC, creep, and inadvertent nitric acid addition are not present in this system. Conditions which lead to fatigue or corrosion fatigue, vapor phase corrosion, galling, fretting, galvanic corrosion, and cavitation are not present in this component due to design. The recommended corrosion allowance provides sufficient protection for erosion of the vessel wall.

18 Margin

Margin between design operating conditions and corrosion-caused failure is sufficient. The largest contributor to the total margin is the absence of the sufficient moisture needed to form a corrosive electrolyte. If there is no electrolyte, there can be no corrosion.

Per 24590-WTP-GPG-M-047, *Preparation of Corrosion Evaluations*, "When corrosion effects are known to be negligible or entirely absent, no corrosion allowance need be specified.." However, for conservatism and integration with other system components a 0.010 inch corrosion allowance is recommended for the housing.

CORROSION EVALUATION

19 References

1. 24590-LAW-M4C-LOP-00001, *LAW Melter Offgas System Design Basis Flowsheets*.
2. 24590-LAW-MKC-LVP-00005, *LAW Activated Carbon Bed Operating Conditions and Process Design Requirements*.
3. 24590-LAW-P1-P01T-00005, *LAW Vitrification Building General Arrangement Plan at El. 48 Feet - 0 Inches*.
4. 24590-WTP-RPT-PR-04-0001-04, *WTP Process Corrosion Data-Volume 4*
5. Deleted
6. 24590-WTP-GPG-M-047, *Preparation of Corrosion Evaluations*.
7. 24590-LAW-M5-V17T-00011, *Process Flow Diagram LAW Vit Secondary Offgas Treatment (System LVP)*.
8. Pawel, SJ, JR DiStefano, and ET Manneschildt, 1999, *Corrosion of Type 316L Stainless Steel in a Mercury Thermal Convection Loop*, ORNL/TM-13754.

Additional Reading

- 24590-LAW-M6-LVP-00004003, *P&ID - LAW - LAW Secondary Offgas/Vessel Vent Process System Mercury Mitigation Equipment LVP-ADBR-00001A/B*.
- 24590-LAW-MVD-LVP-00003, *24590-LAW-MV-LVP-ADBR-00001A, 24590-LAW-MV-LVP-ADBR-00001B - Activated Carbon Adsorber for Mercury Abatement (LVP-SKID-00001)*.
- 24590-QL-POA-MWK0-00001-09-00023, *Data Sheet - Mechanical Data Sheet: Activated Carbon Adsorber, LAW*
- CCN 130178, Wilding, MW and BE Paige, 1976, *Survey on Corrosion of Metals and Alloys in Solutions Containing Nitric Acid*, ICP-1107, Idaho National Engineering Laboratory, Idaho Falls, ID
- Berhardsson, S, R Mellstrom, and J Oredsson, 1981, *Properties of Two Highly Corrosion Resistant Duplex Stainless Steels*, Paper 124, presented at Corrosion 81, NACE International, Houston, TX 77218
- Davis, JR (Ed), 1994, *Stainless Steels*, In ASM Metals Handbook, ASM International, Metals Park, OH 44073
- Jones, RH (Ed.), 1992, *Stress-Corrosion Cracking*, ASM International, Metals Park, OH 44073
- Koch, GH, 1995, *Localized Corrosion in Halides Other Than Chlorides*, MTI Pub No. 41, Materials Technology Institute of the Chemical Process Industries, Inc, St Louis, MO 63141
- Uhlig, HH, 1948, *Corrosion Handbook*, John Wiley & Sons, New York, NY 10158
- Van Delinder, LS (Ed), 1984, *Corrosion Basics*, NACE International, Houston, TX 77084

CORROSION EVALUATION

PROCESS CORROSION DATA SHEET (extract)

Component(s) (Name/ID #) ACTIVATED CARBON BED ADSORBER (LVP-ADBR-00001A/B)

Facility LAW

In Black Cell? NO

		Stream ID LVP06
Chemicals	Unit	GASEOUS
HCl	ppmV	291
HF	ppmV	162
NH3	ppmV	22
NO	ppmV	2110
NO2	ppmV	10
SO2	ppmV	10
RH	%	13.93
Suspended Solids	wt%	0
Temperature	°F	162

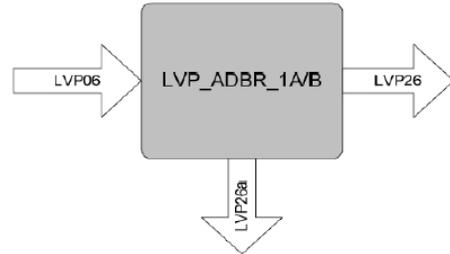
CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 0A
WTP Process Corrosion Data-Volume 4

Figure C- 22 LVP-ADBR-00001A/B Gaseous PCDS

Vessel : LVP_ADBR_1A/B

Properties	Stream ID		
	LVP06	LVP26a	LVP26
Suspended Solids [wt %]	0	0	0
Total Salts [wt %]	0.00	0.05	0.00
Sodium Molarity [M]	n/a	n/a	n/a
Relative Humidity [%]	13.93	50.00	13.02
pH	n/a	n/a	n/a
Anti-Foam Agent [ppm]	0	0	0
TOC [kg/hr]	2.70E-03	0	2.70E-03
Pressure [bar]	0.95	1.00	0.92
Temperature [C]	72.22	25.00	87.22
Temperature [F]	162.00	77.00	189.00
Water Flow Rate [kg/hr]	303.79	0.00	303.79
Total Aqueous Flow Rate [kg/hr]	303.80	0.00	303.79
Total Flow Rate [kg/hr]	5.20E+03	2.47E+00	5.19E+03



UserNote VIT VAPOR Exhauster Fan Offgas Discharge VIT ACCUMULATION LAW Solids Accumulator from LVP-ADBR-00001 to Outlet Stream VIT VAPOR Activated Carbon Adsorber Discharge

GASEOUS [ppmV or mg/m ³]			
Ar	8200	0	8189
CH3I	0	0	0
Cl2	0	0	0
CO	431	0	257
CO2	26052	0	15680
F2	0	0	0
H2	0	0	0
HCl	291	520274	9
HCN	0	0	0
HF	162	290243	5
I2	0	0	0
N2	699638	0	694400
NaCl(s)	0	0	0
NaCN(s)	0	0	0
NaF(s)	0	0	0
NaI(s)	0	0	0
NH3	22	0	21
NO	2110	0	2041
NO2	10	0	9
O2	188773	0	187781
P2O5(s)	0	0	0
PO2	0	0	0
SO2	10	0	0
SO3(s)	0	0	0

Note: Concentrations for constituents representing particulates (as denoted by suffix "(s)" in their name) are reported in units of mg/m³; all others are reported in units of ppmV

GENERAL NOTE FOR USE OF PCDS:

- The information provided by the PCDS report is intended solely for use in support of the vessel material selection process and Corrosion Evaluations. The inputs, assumptions, and computational/engineering models used in generating the results presented herein are specific to this effort. Use of the information presented herein for any other purpose will require separate consideration and analysis to support justification of its use for the desired, alternative purpose.
- The process descriptions in this report cover routine process operations and non-routine (infrequent) process operations, when such exist, that could impact corrosion or erosion of process equipment.
- The data in the non-shaded columns of the PCDSs has NOT been adjusted to comply with the highest expected, vessel-specific operational conditions.
- The process descriptions provided in this report are for general information and reflective of the corrosion engineer's analysis for transparency, the information is current only at the time this document is issued. These process descriptions should not be referenced for design.

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 0A
WTP Process Corrosion Data-Volume 4

6.6.1 Description of Vessel/Equipment

The LAW Secondary Offgas/Vessel Vent Process (LVP) System is designed to treat the offgas from the LAW Primary Offgas Process (LOP) System and the LAW Facility vessel vents. The purpose of the LVP System is to remove almost all remaining particulates, miscellaneous acid gases, nitrogen oxides, VOCs, and mercury from the LAW Facility offgas that have not been removed by the LOP system.

Figure 10 is a sketch of the input and output arrangement of streams for all equipment within the LVP System. Streams that are not primary routes (infrequent transfers) are represented with dashed lines.

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1 WTP Process Corrosion Data-Volume 4

Figure 10a LVP System Sketch

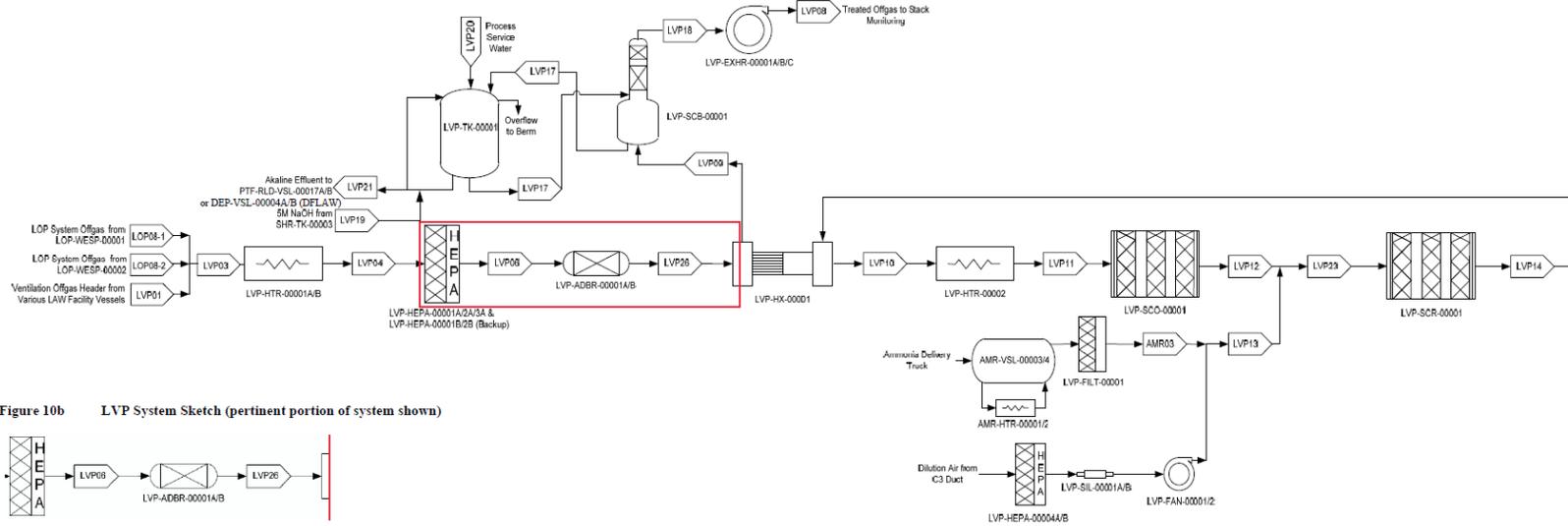
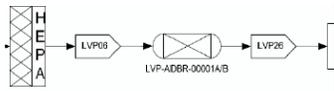


Figure 10b LVP System Sketch (pertinent portion of system shown)



CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1
WTP Process Corrosion Data-Volume 4

6.6.2 System Functions

The process functions of this system are as follows:

- Receive LAW Offgas from LOP System and LAW Facility Vessel Ventilation Streams
- Receive Reagents Streams Such as Ammonia or Dilution Air to Ensure Offgas Component Destruction
- Treat Offgas to Ensure Requirements are Met Before Emitting to Atmosphere
- Transfer Offgas to Stack
- Transfer Liquid Effluents to RLD-VSL-00017A/B

These vessels perform additional system functions beyond the process functions, but these are outside the scope of this document. The non-process functions are not discussed any further in this document. However, they are listed below for completeness:

- Confine Hazardous Materials
- Flush System Components
- Report System Data

6.6.3 Description of Process Functions

All process streams have been taken from Process Flow Diagrams 24590-LAW-M5-V17T-00010 and 24590-LAW-M5-V17T-00011 and associated drawing change notices (DCNs) 24590-LAW-M5N-V17T-00012/15/17/29 and 24590-LAW-M5N-V17T-00012/19/23/29, respectively. The P&IDs have also been looked at to obtain the most accurate flow diagram. These are as follows; 24590-LAW-M6-LVP-00001001 / 1002 / 1003 / 1004 / 1005 / 1006 / 2001 / 2002 / 2003 / 2004 / 2005 / 2006 / 3001 / 4001 / 4002 / 4003 / 5001 / 5002 and 24590-BOF-M6-AMR-00002001 / 2002 / 3001 / 3002 / 5001. See Section 7.1.3 for corresponding references in this section. A description of the process function of each piece of equipment is listed as follows:

Equipment	Process Function
LVP-ADBR-00001A/B	The absorber bed uses activated carbon to remove mercury and acid gases. This protects downstream equipment, LVP-SCO-00001 and LVP-SCR-00001.

6.6.3.1 Receipt Streams

The LVP system primarily receives LAW offgas from the LOP system and LAW Facility vessel ventilation streams. Other LVP system equipment receives various streams to help process the offgas. The receipt streams for each piece of equipment are listed as follows, by vessel, in order of process flow:

LVP-ADBR-00001A/B

- LVP06 - Offgas from LVP-HEPA-00001A/2A/3A (LVP-HEPA-00001B/2B as backup)

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1
WTP Process Corrosion Data-Volume 4

6.6.3.1.3 LVP06 - Offgas from LVP-HEPA-00001A/2A/3A (LVP-HEPA-00001B/2B as backup)

Stream LVP06 is the offgas from the HEPA filters that enters the adsorber beds.

Molarity

N/A

Temperature

The temperature of stream LVP06 will normally be 160°F (24590-LAW-M4C-LOP-00001, pg. 37, Cell Q30, Ref. 7.1.4(12)). The maximum temperature is 162°F (24590-LAW-M4C-LOP-00001, pg. 41, Cell Q30, Ref. 7.1.4(12)).

Solids Concentration

The solids concentration for stream LVP06 will normally be near zero or trace solids.

Vapor Density

The vapor density of stream LVP06 will normally be 4.88E-2 lb/ft³ to 4.79E-2 lb/ft³ (24590-LAW-M4C-LOP-00001, pg. 37, Cell AI30; pg. 41, Cell AI30, Ref. 7.1.4(12)).

Liquid pH

N/A

6.6.3.2 Outlet Streams

The outlet streams for each piece of equipment are listed as follows, by vessel, in order of process flow:

LVP-ADBR-00001A/B

- LVP26 - Offgas from LVP-ADBR-00001A/B

6.6.3.1.4 LVP26 - Offgas from LVP-ADBR-00001A/B

Stream LVP26 is the offgas from the adsorbers that enters the heat exchanger.

Molarity

N/A

Temperature

The temperature of stream LVP26 will normally be 169°F (24590-LAW-M4C-LOP-00001, pg. 37, Cell Q33, Ref. 7.1.4(12)). The maximum temperature is 189°F (24590-LAW-M4C-LOP-00001, pg. 41, Cell Q33, Ref. 7.1.4(12)).

Solids Concentration

The solids concentration for stream LVP26 will normally be near zero or trace solids.

Vapor Density

The vapor density of stream LVP26 will normally be 4.47E-2 lb/ft³ to 4.02E-2 lb/ft³ (24590-LAW-M4C-LOP-00001, pg. 37, Cell AI33; pg. 41, Cell AI33, Ref. 7.1.4(12)).

Liquid pH

N/A

CORROSION EVALUATION

24590-WTP-RPT-PR-04-0001-04, Rev. 1
WTP Process Corrosion Data-Volume 4

6.6.4 Process Modes

6.6.4.1 Normal Operations

Based on the assessment of streams frequently transferred in and out of the LVP System equipment, the following normal processing modes are considered:

LVP-ADBR-00001A/B

- LVP06 - Offgas from LVP-HEPA-00001A/2A/3A (LVP-HEPA-00001B/2B as backup)
- LVP26 - Offgas from LVP-ADBR-00001A/B

6.6.4.2 Infrequent Operations

None identified.

6.6.5 Summary of Processing Conditions for LVP System

6.6.5.1 Normal Operations

The following table summarizes the normal processing modes for LVP System equipment.

Stream Number	Weight % UDS		Na Molarity		Temperature (°F)	
	normal	upper	normal	upper	normal	upper
<u>LVP-ADBR-00001A/B</u>						
LVP06 (in)	0	trace	n/a	n/a	160	162
LVP26 (out)	0	trace	n/a	n/a	169	189

OFFICIAL USE ONLY

This information has been identified as **Official Use Only**.

Official Use Only (OUO) information is certain unclassified information that may be exempt from public release under the Freedom of Information Act (FOIA) and has the potential to damage governmental, commercial, or private interests if disseminated to persons who do not need to know the information to perform their jobs or other DOE-authorized activities.

Per the U.S. Department of Energy's Official Use Only Policy and DOE Order 471.3, Administrative Change 1, "Identifying and Protecting Official Use Only Information" and DOE M 471.3.1 Administrative Change 1, "Manual for Identifying and Protecting Official Use Only Information," the following document and associated changes is granted confidentiality and is exempt from public review:

Title: 24590-LAW-N1D-LFP-00002_NA - Corrosion Evaluation for LFP-PMP-00001A/B & 3A/B, Melter 1 & 2 Feed Preparation Vessel Pumps
--

OFFICIAL USE ONLY

This information is exempt from public inspection and copying.

OFFICIAL USE ONLY

This information has been identified as **Official Use Only**.

Official Use Only (OUO) information is certain unclassified information that may be exempt from public release under the Freedom of Information Act (FOIA) and has the potential to damage governmental, commercial, or private interests if disseminated to persons who do not need to know the information to perform their jobs or other DOE-authorized activities.

Per the U.S. Department of Energy's Official Use Only Policy and DOE Order 471.3, Administrative Change 1, "Identifying and Protecting Official Use Only Information" and DOE M 471.3.1 Administrative Change 1, "Manual for Identifying and Protecting Official Use Only Information," the following document and associated changes is granted confidentiality and is exempt from public review:

Title: 24590-LAW-N1D-LFP-00003_NA - Corrosion Evaluation for LFP-PMP-00002 & LFP-PMP-00004, Melter 1 & 2 Feed Vessel Pumps
--

OFFICIAL USE ONLY

This information is exempt from public inspection and copying.

OFFICIAL USE ONLY

This information has been identified as **Official Use Only**.

Official Use Only (OUO) information is certain unclassified information that may be exempt from public release under the Freedom of Information Act (FOIA) and has the potential to damage governmental, commercial, or private interests if disseminated to persons who do not need to know the information to perform their jobs or other DOE-authorized activities.

Per the U.S. Department of Energy's Official Use Only Policy and DOE Order 471.3, Administrative Change 1, "Identifying and Protecting Official Use Only Information" and DOE M 471.3.1 Administrative Change 1, "Manual for Identifying and Protecting Official Use Only Information," the following document and associated changes is granted confidentiality and is exempt from public review:

Title: 24590-LAW-N1D-LMP-00001_002 - Corrosion Evaluation -LAW Melter 1 and Melter 2 Gas Barrier and Cooling Panels Inside of Gas Barrier

OFFICIAL USE ONLY

This information is exempt from public inspection and copying.

OFFICIAL USE ONLY

This information has been identified as **Official Use Only**.

Official Use Only (OUO) information is certain unclassified information that may be exempt from public release under the Freedom of Information Act (FOIA) and has the potential to damage governmental, commercial, or private interests if disseminated to persons who do not need to know the information to perform their jobs or other DOE-authorized activities.

Per the U.S. Department of Energy's Official Use Only Policy and DOE Order 471.3, Administrative Change 1, "Identifying and Protecting Official Use Only Information" and DOE M 471.3.1 Administrative Change 1, "Manual for Identifying and Protecting Official Use Only Information," the following document and associated changes is granted confidentiality and is exempt from public review:

Title: 24590-LAW-N1D-LOP-00003_004 - Corrosion Evaluation - LOP-WESP-00001 & LOP-WESP-00002, LAW- Melter 1 and Melter Wet Electrostatic Precipitator (WESP)

OFFICIAL USE ONLY

This information is exempt from public inspection and copying.

OFFICIAL USE ONLY

This information has been identified as **Official Use Only**.

Official Use Only (OUO) information is certain unclassified information that may be exempt from public release under the Freedom of Information Act (FOIA) and has the potential to damage governmental, commercial, or private interests if disseminated to persons who do not need to know the information to perform their jobs or other DOE-authorized activities.

Per the U.S. Department of Energy's Official Use Only Policy and DOE Order 471.3, Administrative Change 1, "Identifying and Protecting Official Use Only Information" and DOE M 471.3.1 Administrative Change 1, "Manual for Identifying and Protecting Official Use Only Information," the following document and associated changes is granted confidentiality and is exempt from public review:

Title: 24590-LAW-N1D-RLD-00001_006 - Corrosion Evaluation - RLD-VSL-00004, C3/C5 Drains/Sump Collection Vessel

OFFICIAL USE ONLY

This information is exempt from public inspection and copying.

1
2
3 **DRAWINGS AND DOCUMENTS**
4 **OPERATING UNIT GROUP 10 – APPENDIX 9.18**
5 **LOW ACTIVITY WASTE BUILDING**
6 **OPERATING DOCUMENTS**

7 The documents listed in the following table are incorporated by reference into this permit and are subject
8 to the requirements set forth in Part I Standard Conditions, Part II General Facility Conditions, and Part
9 III Operating Unit Group 10 Conditions. Upon request, copies of the documents can be viewed at the
10 Nuclear Waste Program Resource Center located at 3100 Port of Benton Blvd., Richland, WA.
11 Appointments for viewing can be scheduled by calling (509) 372-7950.

Drawing/Document Number	Description
24590-LAW-PER-PR-03-001, Rev. 2	LAW Vitrification Offgas System Bypass Analysis
24590-LAW-PER-M-05-001, Rev. 0	Waste Removal Capability for the LAW Vitrification Facility
24590-LAW-PER-M-05-002, Rev. 3	Leak Detection Capability in the LAW Facility
RESERVED	RESERVED

12 Source documents (which do not include a "P" in the last set of numbers, e.g. "-P0001," or "-TP001")
13 should be used in conjunction with any document change notices issued against it.

14 We are currently transitioning from permit documents (which include a "P" in the last set of numbers) to
15 source documents. At the end of the transition period, permit submittals will contain source documents
16 and will be incorporated into the permit as described in Ecology Publication #07-05-006.
17

1
2
3
4
5

This page intentionally left blank.



Leak Detection Capability in the LAW Facility

Document title:

Document number: 24590-LAW-PER-M-05-002, Rev 3

Contract number: DE-AC27-01RV14136

Department: Process and Mechanical Systems

Author(s): Aaron Wand *Aaron Wand*

Checked by: Brad Stiver *Brad Stiver*

Issue status: Issued for Permitting Use

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

Approved by: ~~Jeanette Shoemaker~~ *Carrie Roberts*
CER 3/14/2018

Approver's position: Mechanical Engineering Group Supervisor

Approver's signature: *Carrie Roberts* *Signature* 3/14/2018 *Date*

This bound document contains a total of 23 sheets

River Protection Project
Waste Treatment Plant
2435 Stevens Center Place
Richland, WA 99354
United States of America
Tel: 509 371 2000

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.

History Sheet

Rev	Reason for revision	Revised by
0	Issued for Permitting Use	R. Hanson
1	Modified sump depth from 15 inches to 12 inches.	R. Hanson
2	Changed diameter description from 24 inches to 30 inches in section 7.2.1.1	R. Hanson
3	Major revision of methodology, results, and summary based on revised calculation to resolve PIER-MGT-11-0105-C Action 08. Revision marks are not included.	A. Wand

CER
1/22/2019

Contents

Notice.....	ii
History Sheet	iii
Acronyms	v
1 Summary	1
2 Objective.....	1
3 Description	2
4 Inputs/Assumptions	2
5 Analysis.....	7
6 Detectable Leak Rates	8
6.1 Leakage Through Pipes	8
6.2 Leakage Along Floor-Rivulet Flow.....	11
6.3 Results	14
7 References	15

Acronyms

AEA	Atomic Energy Act of 1954
ASX	Autosampling System
BNI	Bechtel National, Incorporated
CCN	Correspondence Control Number
CGS	centimeter gram second units of measurement
DOE	US Department of Energy
DWP	Dangerous Waste Permit
GPH	Gallons per hour
LAW	Low Activity Waste
RLD	Radioactive Liquid Waste Disposal System
STD	Standard
WAC	Washington Administrative Code
WTP	River Protection Project-Waste Treatment Plant

1 Summary

The Low Activity Waste (LAW) Vitrification facility secondary containment must satisfy the leak detection criteria of the Washington Administrative Code (WAC) 173-303-640(4), Reference 7.5, and the Waste Treatment Plant Dangerous Waste Permit (DWP) number 7890008967, Condition No: III.10.E.9.e.ii and III.10.H.5.e.ii for tank and miscellaneous treatment system secondary containment areas, Reference 7.6. This report documents the minimum leak rates that can be detected within 24 hours in the regulated secondary containment sumps.

The LAW facility contains seven DWP regulated Radioactive Liquid Waste Disposal System (RLD) sumps within the process/effluent cells. Leaks of vessels or piping within the cells will flow along the floor or in containment piping, and are collected in a sump equipped with full time level detection instrumentation. All sumps are the dry type, that is, the sumps are dry unless there is a leak that reaches the sump. All sumps are of the same size except for sump RLD-SUMP-00028 located in the minus 21-foot elevation C3/C5 cell. All sumps are provided with radar type leak detection.

Since the DWP has established a minimum leak rate of 0.1 gallons per hour (gph), this report documents the time to detect the minimum leak of 0.1 gph in the sumps based on the time to fill the sump plus the time for the 0.1 gph leak to flow to the sump. The time to fill the sump is calculated in Reference 7.2 and reproduced in this document by first determining the minimum detectable volume in each sump and then the time required to reach this detectable volume at a leak rate of 0.1 gph. If the "time to detect" is less than 24 hours for a flow rate of 0.1 gph for all sumps, the permit condition is met.

Note that there are several minor differences between the calculation in Reference 7.2 and this document. These differences include a simplified iterative process by use of Equation 6-6 and an increase of 0.2 feet in the maximum leak route in Table 4-3. The use of Equation 6-6 produces a slightly higher leak velocity of ~0.003 ft/sec. This velocity is in agreement with the leak detection flow rate of 0.1 gal/hr and the calculated cross-sectional area of a partially full circular pipe (Equation 6-4). The leak detection time through the evaluated piping is reduced by six minutes in Table 6-3 due to the increase in velocity. The overall conclusion is unchanged and the leak rate of 0.1 gph is shown to be detectable in less than 24 hours.

This permit report documents that the time to fill the sump to the detectable level is the critical factor for establishing a leak rate versus the time for the leak (rivulet) to cross the floor or for the leak to wet and travel through the pipe. This approach has been previously presented to the Department of Ecology.

2 Objective

The objective of this report is to document the capability to detect a 0.1 gph leak of dangerous waste within 24 hours in the LAW facility secondary containment area sumps. The leakages include:

- Leaks from vessels, equipment and/or piping containing DWP regulated waste that flows by gravity directly to sumps containing leak detection instrumentation
- Leaks that flow by gravity to floor drains that are routed to another cell containing a sump with leak detection instrumentation. This includes process bulges in LAW.

3 Description

The LAW facility regulated sumps must satisfy the leak detection criteria of the WAC and DWP conditions for secondary containment systems. The regulatory requirements for leak detection are contained in WAC-173-303-640 (4), Tank Systems, Section 4, Containment and Detection of Releases and are restated as follows:

- (b) Secondary Containment systems must be:
 - (ii) Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.
- (c) To meet the requirements of (b) of this subsection, secondary containment systems must be at a minimum:
 - (iii) Provided with a leak detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous waste or accumulated liquid in the secondary containment system within twenty-four hours, or at the earliest practicable time if the owner or operator can demonstrate to the department that the existing detection technologies or site conditions will not allow detection of a release within twenty-four hours.

In addition, the Waste Treatment Plant Dangerous Waste Permit (Reference. 7.6), Conditions: III.10.E.9.e.ii and III.10.H.5.e.ii require submittal of:

Detailed plans and descriptions, demonstrating the leak detection system is operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous and/or mixed waste, or accumulated liquid in the secondary containment system within twenty-four (24) hours [WAC 173-303-640(4)(c)(iii)]. Detection of a leak of at least 0.1 gallons per hour within twenty-four (24) hours is defined as being able to detect a leak within twenty-four (24) hours. Any exceptions to this criterion must be approved by Ecology [WAC 173-303-680, WAC 173-303-640(4)(c)(iii), and WAC 173-303-806(4)(i)(i)(b)].

4 Inputs/Assumptions

- 4.1 The RLD sump locations in the cells and the maximum total floor distances are summarized in Table 4-1. The distances are measured conservatively from the General Arrangement drawings (References 7.7 through 7.10) and have been rounded up. The maximum leak travel distance is conservatively computed by summing the distance along the walls (E-W and N-S) from the furthest point of the sump. Based on the estimate of travel distances for leaks in each cell, the longest leak flow distance on the floors to any sump is 87 feet. See Table 4-1, for sumps RLD-SUMP-00028 through -00032, -00035, and -00036. The sumps also have gravity drain piping from other floor drains or bulges that terminate in the sumps. The LAW samplers ASX-SMPLR-00012/00013 weir containments are included in Table 4-1. Table 4-3 summarizes the longest horizontal pipe run to the sump.

Table 4-1: RLD Sump Locations and Max Floor Distances

Room Number	Sump Name	RLD-SUMP-000xx	Sump Loc. in Cell	Elev.	N-S Dist.	E-W Dist.	Ref.	Max Total Distance, ft
L-B001B	C3/C5 Drain Collection Cell Sump	28	NE corner	-21'	16'-7"	23'-4"	7.3.8, 7.7, 7.11	40
L-0123	Process Cell 1 West Sump	29	W wall	+3'	38'-4"	48'-4"	7.3.9, 7.8, 7.11	87
L-0123	Process Cell 1 East Sump	30	E wall	+3'	38'-4"	48'-4"	7.3.9, 7.8, 7.11	87
L-0124	Process Cell 2 West Sump	31	W wall	+3'	38'-4"	48'-4"	7.3.9, 7.8, 7.11	87
L-0124	Process Cell 2 East Sump	32	E wall	+3'	38'-4"	48'-4"	7.3.9, 7.8, 7.11	87
L-0126	Effluent Cell West Sump	35	W wall	+3'	38'-4"	31'-4"	7.3.10, 7.8, 7.11	70
L-0126	Effluent Cell East Sump	36	E wall	+3'	38'-4"	31'-4"	7.3.10, 7.8, 7.11	70
L-0301	ASX-SMPLR-00012 Weir	NA	NA	+48'	~42"	~68"	7.10, 7.23, 7.24	<10
L-0301	ASX-SMPLR-00013 Weir	NA	NA	+48'	~42"	~68"	7.10, 7.25, 7.26	<10

4.2 The RLD sump dimensions are as follows.

4.2.1 The six process and effluent sumps (RLD-SUMP-00029/30/31/32/35/36) are 30 inches outside diameter x 12 inches deep (Reference 7.1, Table 1 and Reference 7.11). The sump is fabricated from 30-inch diameter by 3/8" thick pipe (I.D. = 29.25 in). The bottom consists of a flat plate.

4.2.2 The C3/C5 Drain Collection Cell sump (RLD-SUMP-00028) is 24 inches outside diameter and 30 inches in depth (Reference 7.1, Table 1 and Reference 7.11). The sump is fabricated from 24-inch diameter by 3/8" thick pipe (I.D. = 23.25 in). The bottom consists of a flat plate.

4.3 The secondary containment floors with stainless steel liners are sloped at a minimum grade of 1:100 to direct potential leakage in these areas to the respective sumps (Reference 7.7, 7.8, & 7.27).

4.4 Potential leak routes for DWP regulated equipment are summarized in Table 4-2.

Table 4-2: Potential Leak Routes for DWP Regulated Equipment

From¹ (Room)	To	Pipeline No.	References
RLD-BULGE-00001 (L-B001A)	RLD-SUMP-00028	RLD-ZF-00102-S11B-02	7.3.8, 7.3.6, 7.7
RLD-BULGE-00004 (L-0202)	RLD-SUMP-00036	RLD-ZF-33830-N11F-02	7.3.10, 7.3.3, 7.8, 7.9
LOP-BULGE-00002 (L-0202)	RLD-SUMP-00031	LOP-ZR-01503-N11F-02	7.3.9, 7.3.22, 7.8, 7.9
LOP-BULGE-00001 (L-0202)	RLD-SUMP-00029	LOP-ZR-01505-N11F-02	7.3.9, 7.3.20, 7.8, 7.9
LFP-BULGE-00002 (L-0202)	RLD-SUMP-00032	LFP-PB-00027-S12A-02	7.3.9, 7.3.18, 7.8, 7.9
LFP-BULGE-00001 (L-0202)	RLD-SUMP-00030	LFP-PB-01388-S12A-02	7.3.9, 7.3.16, 7.8, 7.9
LCP-BULGE-00003 (L-0202)	RLD-SUMP-00031	LCP-PB-00051-S12A-02	7.3.9, 7.3.14, 7.8, 7.9
LCP-BULGE-00002 (L-0202)	RLD-SUMP-00029	LCP-PB-01305-S12A-02	7.3.9, 7.3.12, 7.8, 7.9
LCP-BULGE-00001 (L-0202)	RLD-SUMP-00029	LCP-PB-01306-S12A-02	7.3.9, 7.3.11, 7.8, 7.9
LOP-ZS-01598-W11A-03 (LOP-WESP-00001) (L-0123)	RLD-SUMP-00028	RLD-ZS-06562-S11B-01 LOP-ZS-01598-W11A-03	7.3.21, 7.3.8, 7.3.5, 7.7, 7.8
LOP-ZS-01548-W11A-03 (LOP-WESP-00002) (L-0124)	RLD-SUMP-00028	RLD-ZS-03346-S11B-01 LOP-ZS-01548-W11A-03	7.3.23, 7.3.8, 7.3.5, 7.7, 7.8
ASX-SMPLR-00013 (L-0301)	RLD-SUMP-00028	RLD-ZS-03358-S11B-01 RLD-ZS-03359-W11A-04	7.3.8, 7.3.5, 7.3.24, 7.7, 7.10
ASX-SMPLR-00013 / RLD-BULGE-00001 (L-0301)	RLD-SUMP-00028	RLD-ZS-06558-S11B-01 RLD-ZS-06557-W11A-04	7.3.8, 7.3.7, 7.7, 7.10
ASX-SMPLR-00013 (L-0301)	LFP-BULGE- 00001	LFP-PB-03198-S32B-04	7.3.24, 7.3.17, 7.9, 7.10
LFP-BULGE-00001 (L-0202)	ASX-SMPLR- 00013	LFP-PB-03196-S32B-04	7.3.24, 7.3.17, 7.9, 7.10
ASX-SMPLR-00013 (L-0301)	LCP-BULGE- 00002	LCP-PB-00023-S32B-04	7.3.24, 7.3.13, 7.9, 7.10
LCP-BULGE-00002 (L-0202)	ASX-SMPLR- 00013	LCP-PB-01326-S32B-04	7.3.24, 7.3.13, 7.9, 7.10

¹ The samplers themselves are not DWP regulated, but the lower containment areas and the connecting pipelines directing drainage to the sumps are.

24590-LAW-PER-M-05-002, Rev. 3
Leak Detection Capability in the Low Activity Waste Facility

From¹ (Room)	To	Pipeline No.	References
ASX-SMPLR-00012 (L-0301)	RLD-BULGE-00004	RLD-ZF-01294-S32B-04	7.3.26, 7.3.3, 7.9, 7.10
RLD-BULGE-00004 (L-0202)	ASX-SMPLR-00012	RLD-ZF-03392-S32B-04	7.3.26, 7.3.3, 7.9, 7.10
ASX-SMPLR-00012 (L-0301)	RLD-BULGE-00004	RLD-ZS-03368-S32B-04	7.3.26, 7.3.4, 7.9, 7.10
RLD-BULGE-00004 (L-0202)	ASX-SMPLR-00012	RLD-ZS-06570-S32B-04	7.3.26, 7.3.4, 7.9, 7.10
ASX-SMPLR-00012 (L-0301)	LFP-BULGE-00002	LFP-PB-03203-S32B-04	7.3.25, 7.3.19, 7.9, 7.10
LFP-BULGE-00002 (L-0202)	ASX-SMPLR-00012	LFP-PB-03201-S32B-04	7.3.25, 7.3.19, 7.9, 7.10
ASX-SMPLR-00012 (L-0301)	LCP-BULGE-00003	LCP-PB-01366-S32B-04	7.3.25, 7.3.15, 7.9, 7.10
LCP-BULGE-00003 (L-0202)	ASX-SMPLR-00012	LCP-PB-01349-S32B-04	7.3.25, 7.3.15, 7.9, 7.10
RLD-ZF-03453-W11A-02 (RLD-VSL-00003) (L-0126)	RLD-SUMP-00028	RLD-ZF-03443-S11B-01 RLD-ZF-03453-W11A-02	7.3.8, 7.3.1, 7.7, 7.8
RLD-ZF-03454-W11A-02 (RLD-VSL-00005) (L-0126)	RLD-SUMP-00028	RLD-ZF-03444-S11B-01 RLD-ZF-03454-W11A-02	7.3.8, 7.3.2, 7.7, 7.8
LMP-LDB-00001 (Melter 1) (L-0112)	RLD-SUMP-00030	RLD-WS-20037-S11B-01 LMP-WS-20093-S11B-01	7.3.9, 7.3.27, 7.8
LMP-LDB-00002 (Melter 2) (L-0112)	RLD-SUMP-00032	RLD-WS-20033-S11B-01 LMP-WS-20094-S11B-01	7.3.9, 7.3.28, 7.8

4.5 The maximum pipeline length (from ASX-SMPLR-00012 (N10) to RLD-BULGE-00004 (N20/N16) to RLD-SUMP-00036) is determined from the isometric drawings identified in References 7.4.1 through 7.4.5 and tabulated below.

Table 4-3: Maximum Leak Route

Isometric Drawing	Length, ft	Description
24590-LAW-P3-RLD-ZS03368001	35.7	Connection to ASX-SMPLR-00012 (N10)
24590-LAW-P3-RLD-ZS03368002	72.9	
24590-LAW-P3-RLD-ZS03368003	85.8	
24590-LAW-P3-RLD-ZS03368004	16.2	Connection to RLD-BULGE-00004 (N20 & N16)
24590-LAW-P3-RLD-ZF33830001	25.0	Open to RLD-SUMP-00036
Total	235.6	

- 4.6 The analyzed pipelines (i.e. pipelines noted in Input 4.5) are N11F and S32B pipe class (Reference 7.14 and 7.15). Per Reference 7.14, piping class N11F is AL-6XN, schedule 40S for 1/2" to 2" nominal diameter pipeline. Piping class S32B (encasement) is 316L stainless steel, schedule 40S (STD) for 1" to 8" nominal diameter pipeline (gravity drain).

Table 4-4: Pipe Dimensions

Pipeline	Pipe Class Ref.	Dimensions (Ref. 7.16, p. B-16 & B-17)	
		Nom Pipe Size (inch) Sch 40S	I.D. (inch)
RLD-ZF-33830-N11F-02	7.14	2	2.067
RLD-ZS-03368-S32B-04 (encasement / jacket)	7.15	4	4.026

- 4.7 The isometric piping noted in Input 4.5 contains a minimum slope that ranges from 1:30 (2/5 inch per foot) (Reference 7.4.3 & 7.4.4) to 1:50 (6/25 inch per foot) (Reference 7.4.1).
- 4.8 Waste is assumed to be like that of water at 100°F with the physical properties (Reference 7.12, p. 30.37) as shown in Table 4-5 below:

Table 4-5: Physical Properties of Water

Constant	English Units	CGS Units
ρ , density	61.99 lbm/ft ³	0.993 gm/cm ³
μ , dynamic viscosity	1.648 lbm/ft hr	0.00681 gm/cm sec
γ , surface tension	0.0048 lbf/ft	69.96 dyne/cm or 69.96 gm/sec ²

- 4.9 The minimum detectable level within the LAW Secondary Containment System is assumed to be 0.5" above the bottom of each sump based on preliminary vendor information provided by C&I and a project specification for level measurement (Reference 7.20, Section 3.2.1).
- 4.10 The following items (a through g) were derived from agreements between BNI, DOE, and Department of Ecology (Reference 7.21):
- a. The liquid leaking is water at a temperature of 100°F.
 - b. The leak is at a constant rate over the 24-hour period.
 - c. The leak is assumed to occur at the farthest point from the sump.
 - d. No evaporation will occur.
 - e. The liquid does not foam in the sumps.
 - f. Hold-up of piping is considered and is defined as wetting of the surface.
 - g. Level detection instruments will be properly installed and calibrated upon installation. Periodic, normal maintenance and calibration will be performed on level instruments during operation of the facility and the instruments will be maintained in an operable condition.
- 4.11 The wetting factor from experimental data was found to be 0.32 fl. oz/ft (Reference 7.13) for a NPS 6 pipe. The wetting factor will be conservatively increased by 50% to 0.48 fl. oz./ft to provide additional margin to the calculated holdup time.
- 4.12 The rivulet flow in this report is based on the simplified model for a wide flat rivulet. Figure 5 of Reference 7.17 shows dashed lines that are asymptotic solutions for wide-flat rivulets at high Ω

values and for narrow rivulets at low Ω values. For a contact angle of 5° , figure 5 shows that the wide flat rivulet model, represented by equations 26 and 27 of Reference 7.17, is applicable when Ω is larger than 0.001 and P is larger than 5. This assumption is verified by the evaluation of Ω and P using data from this report.

- 4.13 Reference 7.17, Table 2 shows for a rivulet flow rate of 6.2 ml/min (~0.1 gph), the corresponding contact angle, θ , is experimentally measured as 9 to 12 degrees. A conservative rivulet contact angle of 6 degrees is assumed for this report. The smaller contact angle results in a longer time to sump for a given flow path length from the following logic: a smaller contact angle yields a larger rivulet width, which yields a larger rivulet cross sectional area, which leads to a lower velocity (since the flow rate is fixed). This assumption is conservative.
- 4.14 The floor is uniformly sloped and the flow path is in straight lines (no meandering flow).
- 4.15 The average velocity equation assigned to the leakage being conveyed within the sloped pipe is developed from boundary layer theory for flow down an incline plane. This velocity equation is assumed to apply to the leakage flows in the pipe since this average velocity will be applied throughout the entire length of the pipe even when the pipe contains vertical drops (where velocity would increase, thereby reducing the travel time to detection device).
- 4.16 The rivulet flow path for each cell is conservatively considered to be along the straight walls rather than diagonally across the cell: North-South + East-West distances. This is a conservative assumption.
- 4.17 There are no obstructions in the flow path. Leaks from any equipment or piping fall directly to the floor at the point of leakage and do not travel along pipes or other equipment and the rivulet does not split into multiple streams as it travels across the floor. While actual leaks may not conform to this scenario, it is beyond the objective of this report to assess every possible leak scenario. The intent is to provide a calculated leak detection volume that is not overly complex but still maintains sufficient accuracy to demonstrate leak detection capability within a reasonable level of uncertainty.
- 4.18 The level instrument response time (i.e., the time between the fluid reaching a specified level set point and the instrument responding to the process condition) is considered negligible with regards to the leak detection time requirement. The level instrumentation is anticipated to have response times on the order of seconds and therefore, the response time is insignificant based on the 24-hour detection limit.
- 4.19 All sumps within the LAW Facility are conservatively assumed to be dry. This maximizes the time required to fill the sumps to a detectable level.

5 Analysis

To establish if the LAW cell sumps can detect a permit condition leakage rate of 0.1 gph within a 24-hour time, a total time is determined. This includes the time for a leak to travel to a sump (t_1) including travel within pipes and/or across the cell floor; the time to fill the sump to a detectable level (t_2); and the time it takes to wet the surface of a pipe or 'holdup' (t_3).

Leakage flowing inside pipes uses the boundary layer theory while leakage flowing on the floor is modeled as a rivulet of uniform width. The time taken by the liquid to reach the sump and time required for minimum liquid accumulation in the sump (before it can be detected) are determined in Section 6.

6 Detectable Leak Rates

6.1 Leakage Through Pipes

The elapsed time to detect a leak that is flowing through a pipe is composed of three independent time components:

t_1 = Elapsed time for the leak to travel through the pipes to the sump

t_2 = Time to fill the sump to a level that can be detected by the associated leak detection instrumentation

t_3 = Liquid holdup time or elapsed time for leak to wet the interior surface

Therefore, the total time for leakage detection through pipes is $t_{total} = t_1 + t_2 + t_3$. If the total time is less than 24 hours for a flowrate (Q) of 0.1 gph for all leak detection equipment, the permit condition is met.

6.1.1 Holdup Time within Pipe, t_3

The elapsed time for the leak to wet the flow path (flow channel) from the most-remote location to its corresponding leak detection feature (i.e., a sump) is estimated based on an experimentally determined value of wetting holdup (Reference 7.13) and results in the following equation for determining the time to account for the holdup of water flowing through a pipe:

Equation 6-1: Holdup Time (t_3):

$$t_3 = \frac{c L}{Q}$$

c = wetting factor, gal/ft or fluid ounces/ft (abbreviated as: fl. oz/ft)
 with use of conversion factor: 128 fl. oz/gal

L = travel distance, ft

Q = leakage volumetric flow rate, gal/hr

Based on input 4.5, the longest run of pipe originates at ASX-SMPLR-00012, flows to RLD-BULGE-00004 and then to RLD-SUMP-00036 and is 235.6 feet. The entire length of the pipe route is considered when calculating leak travel time per assumption 4.15, however, for liquid holdup, the pipe vertical drop will be subtracted out since liquid holdup should be minimal in the vertical sections. The vertical pipe sections are approximately 44' (Reference 7.4.1 thru 7.4.5), therefore the length of piping that is considered for liquid holdup (L) is then: 235.6 ft - 44 ft ~ 191 ft.

With the wetting factor (c) set 0.48 fl. oz/ft per assumption 4.11 and the flow rate (Q) set to 0.1 gph, the maximum holdup time from Equation 6-1 becomes:

$$t_3 = \left(\frac{0.48 \text{ fl. oz.}}{\text{ft}} \right) \left(\frac{\text{gal}}{128 \text{ fl. oz.}} \right) \left(\frac{191 \text{ ft}}{1} \right) \left(\frac{\text{hr}}{0.1 \text{ gal}} \right) = 7.16 \text{ hr}$$

6.1.2 Leak Travel Time to Sump via Pipe, t_l

The time delay for the leak to reach the detection equipment is calculated using equations derived from boundary layer theory for uniform flow down an inclined plane (assumption 4.15). The average velocity distribution from boundary layer theory from Reference 7.18, p. 317, Equation 9.4b is:

Equation 6-2: Average Leak Velocity (v):

$$v = \frac{g S_p d_p^2}{3 n}$$

- g = gravitation acceleration, 32.17 ft/s²
- S_p = Slope of the pipe, dimensionless
- d_p = flow depth, ft
- n = kinematic viscosity, ft²/s

Equation 6-3: General Equation for Volumetric Flow Rate (Q):

$$Q = Av$$

A = cross-sectional flow area, ft²

The wetted cross-sectional area for gravity flow in a circular pipe is found from (Reference 7.19, p. 5)

Equation 6-4: Wetted Cross-Section (A):

$$A = \frac{(\theta_{fs} - \sin \theta_{fs}) D_p^2}{8}$$

- D_p = pipe diameter, ft
- θ_{fs} = free surface angle (see Figure 6-1), radians

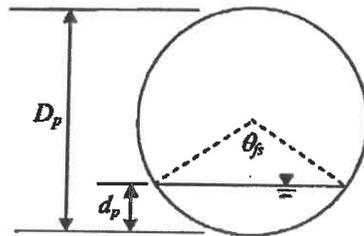


Figure 6-1: Partially Full Pipe Sketch

The depth of flow can be found by the following equation (Reference 7.22, Attachment A).

Equation 6-5: Depth of Partially Full Pipe (d_p):

$$d_p = D_p \sin^2 \left(\frac{\theta_{fs}}{4} \right)$$

Substituting Equation 6-3 through Equation 6-5 into Equation 6-2:

Equation 6-6: Volumetric Flow Rate in Partially Full Pipe (Q_p):

$$Q_p = \frac{g S_p D_p^4 (\theta - \sin \theta) \left(\sin \frac{\theta}{4} \right)^4}{24n}$$

Equation 6-6 is solved by iterating the free surface angle (θ) until the volumetric flow rate (Q_p) equals the permit condition leakage rate (Q) of 0.1 gph. The constants in Table 6-1 are also substituted into Equation 6-6.

Table 6-1: Time for Leak to Travel through the Pipes to the Sump Calculation Constants

Constant	Value	Note
$D_p =$	4.026 inch (0.3355 ft)	Input 4.6 for encasement pipe
$Q =$	0.1 gph = 3.714 E-6 ft ³ /s	Leak flow rate
$g =$	32.17 ft/s ²	Acceleration due to gravity
$S_p =$	1/50 = 0.02	Assumption 4.7, slope of pipe
$\mu =$	1.648 lbm/ft.hr	Table 4-5
$\rho =$	61.99 lbm/ft ³	Table 4-5

Since kinematic viscosity (n) is equal to dynamic viscosity (μ) / density (ρ), kinematic viscosity is calculated as:

$$n = (1.648 \text{ lbm/ft.hr}) / (61.99 \text{ lbm/ft}^3) \times (1 \text{ hr} / 3600 \text{ sec}) = 7.38\text{E-}6 \text{ ft}^2/\text{sec}$$

The free surface angle (θ) is found to be 0.277 radians, or 15.86 degrees, by iterating Equation 6-6. Once the angle is determined, Equation 6-5 can be solved for the depth of the partially full pipe resulting in a value of 1.60e-3 feet. Substituting the depth into Equation 6-2 result in a velocity of 0.0747 ft/sec.

The travel delay for the leakage to reach the sump is calculated by dividing the length of pipe by the velocity. The results are converted to units of hours. Equation 6-7 applies to rivulet flow as well.

Equation 6-7: Time to Travel to Sump (t_1):

$$t_1 = L / v \times (\text{hr} / 3600 \text{ sec})$$

Substituting the values in Equation 6-7:

$$t_1 = (235.6 \text{ ft} / 0.0747 \text{ ft/s}) \times (\text{hr} / 3600\text{s}) = 0.88 \text{ hr}$$

6.1.3 Time to Obtain a Detectable Sump Volume, t_2

Based on inspection of Input 4.2, the largest sump contains a 30" diameter (3/8" thick) pipe. The sump detectable volume is determined from the equation for the volume of a cylinder.

Equation 6-8: Volume to Detection (\forall):

$$\forall = \frac{\pi}{4} D_s^2 \times h \times \frac{\text{gal}}{231 \text{ in}^3}$$

$$D_s = 29.25 \text{ inch (Input 4.2.1) = sump diameter}$$

$$h = 0.5 \text{ inch (assumption 4.9) = detectable liquid height}$$

The sump detectable volume determined from Equation 6-8:

$$\forall = \pi/4 \times (29.25 \text{ inch})^2 \times 0.5 \text{ in} \times (\text{gal}/231 \text{ in}^3) = 1.45 \text{ gal}$$

The time to fill the leak detection equipment, t_2 , is calculated from the following equation:

Equation 6-9: Time to Fil Sump to Detectable Level (t_2):

$$t_2 = \forall / Q$$

Substituting the volume and permit condition leakage flow rate (Q) of 0.1 gph into Equation 6-9:

$$t_2 = (1.45 \text{ gal}) \times (\text{hr} / 0.1 \text{ gal}) = 14.5 \text{ hr}$$

6.1.4 Total Detection Time, t_{total}

The total detection time is the sum of the previously determined pipe wetting, transport, and sump filling delays, which can be expressed in equation form as:

$$t_{total} = t_1 + t_2 + t_3 = 0.88 \text{ hr} + 14.5 \text{ hr} + 7.16 \text{ hr} \cong 22.5 \text{ hr}$$

The resultant total detection time value of 22.5 hours is less than 24 hours for a minimum leak rate of 0.1 gph, thus satisfying the permit requirement for leakage detection.

6.2 Leakage Along Floor-Rivulet Flow

The time to detect a leak traveling across a floor liner is composed of two time components: t_1 and t_2 . The first component, t_1 , is the time for the leak to reach the leak detection equipment (Equation 6-7). The second component, t_2 , is the time to fill the leak detection equipment based on the minimum leak rate.

For each leak detection equipment, t_2 is calculated by dividing the minimum detectable volume by the volumetric flow rate of the leak. The t_1 component is calculated using the methodology from Reference 7.17 (rivulet flow). The elapsed time to detect a leak (t_{total}) is the sum of these two time components: $t_{total} = t_1 + t_2$. If the total time is less than 24 hours for a flow rate of 0.1 gph for all leak detection equipment, the permit condition is met.

Calculation of t_1 for each leak detection equipment is not necessary; using the longest path length bounds the "time to detection." As indicated in Assumption 4.1, the rivulet leak travel distance is calculated by summing the distance along the walls: adding the north-south (N-S) wall distance to the east-west (E-W) wall distance.

6.2.1 Leakage Travel Time to Room Sumps, t_1

There is no need to calculate the flow rate of the leak across the floor since the permit has established a minimum leak rate of 0.1 gph. The approach illustrated here has been presented to and concurred by the Department of Ecology.

The "time to detection" is determined using the average leak velocity at the minimum leak rate of 0.1 gph. The methodology shown in Reference 7.17 for rivulet flow forms the basis for the rivulet leak velocity calculation. The method requires the calculation of the angle of inclination for the rivulet, the capillary constant, and the rivulet cross sectional area. In order to be consistent with the units in Reference 7.17, most units within this section are presented in grams (gm) and centimeters (cm).

The angle of inclination (α) which is the slope of the floor with respect to a vertical plane, as shown in Figure 6-2, is determined using trigonometry in Equation 6-10. The slope of the floor with respect to the horizontal plane is S_o .

Equation 6-10: Inclination Angle for Rivulet Flow (α):

$$\alpha = \tan^{-1} \left(\frac{1}{S_o} \right)$$

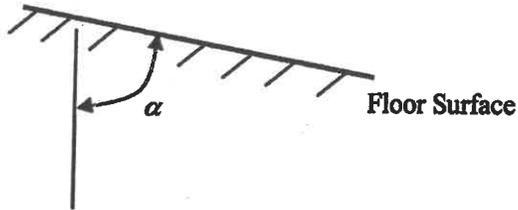


Figure 6-2: inclination Angle for Rivulet Flow

From Assumption 4.3, $S_o = 1/100 = 0.01$. Substituting the values in Equation 6-10:

$$\alpha = \tan^{-1}(1/0.01) = 89.427^\circ$$

The capillary constant (a), the basis for the dimensionless width, is defined below (Reference 7.17, p. 973, equation following equation 9):

Equation 6-11: Capillary Constant (a):

$$a = \sqrt{\frac{\gamma}{\rho g \sin \alpha}}$$

- a = capillary constant, cm
- γ = liquid surface tension, dyne/cm (= gm/sec²)
- ρ = liquid density, gm/cm³
- g = gravitational acceleration = 980.7 cm/sec²

The liquid properties are based on water at 100 °F (Assumption 4.8) and are listed in Table 4-5. Substituting these values into Equation 6-11:

$$a = \sqrt{\frac{69.96 \text{ gm/sec}^2}{0.993 \frac{\text{gm}}{\text{cm}^3} \times 980.7 \frac{\text{cm}}{\text{sec}^2} \times \sin(89.427^\circ)}} = 0.268 \text{ cm}$$

For the wide flat rivulet, its depth is determined based on (Reference 7.17, 2nd equation following equation 25) where theta (θ) is the contact angle in degrees:

Equation 6-12: Dimensionless Depth of Wide Flat Rivulet (Y_o):

$$Y_o = 2 \sin\left(\frac{\theta}{2}\right)$$

The dimensionless depth, Y_o , is also defined in Reference 7.17, following equation 17 (2nd line following equation 17), as the ratio of the dimensional rivulet depth (η_o) and the capillary constant (a).

Equation 6-13: Dimensionless Depth of Wide Flat Rivulet (Y_o):

$$Y_o = \eta_o/a$$

Substituting Equation 6-12 into Equation 6-13 and solving for the dimensional rivulet depth (η_o) yields:

Equation 6-14: Dimensional Rivulet Depth (η_o):

$$\eta_o = 2a \sin(\theta/2)$$

From Assumption 4.13, the contact angle (θ) is 6 degrees. Substituting this in Equation 6-14 results in:

$$\eta_0 = 2 \times 0.268 \text{ cm} \times \sin(6^\circ/2) = 0.02805 \text{ cm}$$

The rivulet width, l , is determined from Reference 7.17, Equation 27:

Equation 6-15: Rivulet Width (l):

$$\frac{\mu Q \tan \alpha}{l \gamma} \sqrt{\frac{\rho g \sin \alpha}{\gamma}} = \frac{8}{3} \sin^3(\theta/2), \text{ Solving for } l: l = \frac{3 \mu Q \tan \alpha}{8 \gamma \sin^3(\theta/2)} \sqrt{\frac{\rho g \sin \alpha}{\gamma}}$$

The width of the rivulet can now be calculated using Equation 6-15 and the values in Table 6-2.

Table 6-2: Constants for Rivulet Width Equation 6-15

$\alpha =$	89.427°
$\gamma =$	69.96 gm/sec ² (Assumption 4.8)
$\mu =$	0.00681 gm/cm-sec (Assumption 4.8)
$\rho =$	0.993 gm/cm ³ (Assumption 4.8)
$g =$	980.7 cm/sec ²
$\theta =$	6° (Assumption 4.13)
$Q =$	0.1 gph = 0.1052 cm ³ /sec

$$l = \frac{3 \left(0.00681 \frac{\text{gm}}{\text{cm sec}} \right) \left(0.1052 \frac{\text{cm}^3}{\text{sec}} \right) \tan(89.427^\circ)}{8(69.96 \text{ gm/sec}^2) \sin^3(6^\circ/2)} \sqrt{\frac{\left(0.993 \frac{\text{gm}}{\text{cm}^3} \right) \left(980.7 \frac{\text{cm}}{\text{sec}^2} \right) \sin(89.427^\circ)}{69.96 \text{ gm/sec}^2}}$$

$$l = 9.99 \text{ cm}$$

The rivulet cross-sectional area is determined using the approximation that the wide flat rivulet has a rectangular cross-section (rectangular cross-section for the wide flat rivulet is noted in Reference 7.17, p. 975), thus the area is defined as:

Equation 6-16: Rivulet Cross-Sectional Area (A):

$$A = l \eta_0$$

Substituting values in Equation 6-16 we have:

$$A = 9.99 \text{ cm} \times 0.02805 \text{ cm} = 0.2802 \text{ cm}^2$$

With the volumetric flow rate known (Q), the rivulet velocity (v) can be calculated from Equation 6-3.

$$v = Q/A = (0.1052 \text{ cm}^3/\text{s}) / (0.2802 \text{ cm}^2) = 0.3754 \text{ cm/sec}$$

The method used in this calculation is from Reference 7.17 and is based on a dimensionless flow rate (Ω) and dimensionless stream width (P) along with other parameters. The following equations for the dimensionless parameters, P and Ω , are from Reference 7.17, p. 974, equation following equation 17 and the 3rd equation following equation 17, respectively.

Equation 6-17: Dimensionless Rivulet Width (P):

$$P = l/a$$

Equation 6-18: Dimensionless Rivulet Flow Rate (Ω):

$$\Omega = \frac{\mu \rho g Q}{\gamma^2} \tan \alpha \sin \alpha$$

The dimensionless rivulet width (P) using Equation 6-17 is:

$$P = 9.99 \text{ cm} / 0.268 \text{ cm} = 37.3$$

The dimensionless flow rate (Ω) is calculated using Equation 6-18 and constants from Table 6-2:

$$\Omega = \frac{\left(0.00681 \frac{\text{gm}}{\text{cm sec}}\right) \left(0.993 \frac{\text{gm}}{\text{cm}^3}\right) \left(980.7 \frac{\text{cm}}{\text{sec}^2}\right) \left(0.1052 \frac{\text{cm}^3}{\text{sec}}\right)}{\left(69.96 \text{ gm/sec}^2\right)^2} \tan(89.472^\circ) \sin(89.472^\circ)$$

$$\Omega = 0.014$$

From Reference 7.17 (p. 977, Figure 5), the point at the coordinates of $\Omega = 0.014$ and $P = 37.3$ falls right on the asymptotic solutions for a wide rivulet close to $\theta = 5$ degrees. This confirms the assumption for a wide rivulet flow (Assumption 4.12).

The time to flow to sump, t_1 , is calculated for the sump with the longest rivulet travel distance. The longest distance (from Input 4.1) 87 feet. Equation 6-7 is used to calculate the time to flow to sump, t_1 :

$$t_1 = L/v = \frac{87 \text{ ft}}{0.3754 \text{ cm/sec}} \times \frac{30.48 \text{ cm}}{\text{ft}} \times \frac{\text{hr}}{3600 \text{ sec}} = 1.96 \text{ hr}$$

6.2.2 Time to Obtain a Detectable Sump Volume, t_2

The time to obtain a detectable vessel sump volume is calculated in Section 6.1.3 and is:

$$t_2 = 14.5 \text{ hr}$$

6.2.3 Total Detection Time, t_{total}

The total detection time is the sum of t_1 (Section 6.2.1) and t_2 (Section 6.2.2):

$$t_{total} = t_1 + t_2 = 1.96 \text{ hr} + 14.5 \text{ hr} \cong 16.5 \text{ hr}$$

6.3 Results

The results of this analysis are compiled in Table 6-3. This table summarizes the leaks into two rows, leakage through pipes and across floors. This analysis demonstrates that the LAW sumps can detect a permit condition leakage rate of 0.1 gal/hr within a 24-hour period, thus the permit condition for LAW is satisfied.

Table 6-3 LAW Facility, Time to Leak Detection Capability

Description of Leak	Time to Sump t_1 (hr)	Time to Fill t_2 (hr)	Time to Wet t_3 (hr)	Time to Detect t_{total} (hr)
Leakage through Pipe	0.88	14.5	7.16	22.5
Leakage across Floor	1.96	14.5	n/a	16.5

7 References

- 7.1 24590-LAW-PER-M-02-001, Rev. 5, LAW Facility Sump Data, July 19, 2007
- 7.2 24590-LAW-M6C-RLD-00013, Rev. 1, Leak detection Capability in the LAW Facility-System RLD
- 7.3 **P&IDs**
 - 7.3.1 24590-LAW-M6-RLD-00001001, Rev. 0, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM PLANT WASH VESSEL RLD-VSL-00003
 - 7.3.2 24590-LAW-M6-RLD-00001003, Rev. 0, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM SBS CONDENSATE COLLECTION RLD-VSL-00005
 - 7.3.3 24590-LAW-M6-RLD-00001005, Rev. 0, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM PLANT WASH & SBS CONDENSATE COLLECTION RLD-BULGE-00004
 - 7.3.4 24590-LAW-M6-RLD-00001006, Rev. 0, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM PLANT WASH & SBS CONDENSATE COLLECTION RLD-BULGE-00004
 - 7.3.5 24590-LAW-M6-RLD-00002001, Rev. 1, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3/C5 DRAINS/SUMP COLLECTION RLD-VSL-00004
 - 7.3.6 24590-LAW-M6-RLD-00002003, Rev. 0, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3/C5 DRAINS/SUMP COLLECTION RLD-BULGE-00001
 - 7.3.7 24590-LAW-M6-RLD-00002004, Rev. 0, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3/C5 DRAINS/SUMP COLLECTION RLD-BULGE-00001
 - 7.3.8 24590-LAW-M6-RLD-00002005, Rev. 1, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3/C5 SUMPS RLD-SUMP-00010/11/28
 - 7.3.9 24590-LAW-M6-RLD-00003002, Rev. 2, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM PROCESS CELL SUMPS AT EL 2 FT
 - 7.3.10 24590-LAW-M6-RLD-00003003, Rev. 2, P&ID - LAW RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM PROCESS AND EFFLUENT CELL SUMPS AT EL 2 FT
 - 7.3.11 24590-LAW-M6-LCP-00001001, Rev. 0, P&ID - LAW CONCENTRATE RECEIPT PROCESS SYSTEM LCP-BULGE-00001
 - 7.3.12 24590-LAW-M6-LCP-00001004, Rev. 0, P&ID - LAW CONCENTRATE RECEIPT PROCESS SYSTEM LCP-BULGE-00002 (SHEET 1 OF 2)
 - 7.3.13 24590-LAW-M6-LCP-00001005, Rev. 1, P&ID - LAW CONCENTRATE RECEIPT PROCESS SYSTEM LCP-BULGE-00002 (SHEET 2 OF 2)
 - 7.3.14 24590-LAW-M6-LCP-00002001, Rev. 0, P&ID - LAW CONCENTRATE RECEIPT PROCESS SYSTEM LCP-BULGE-00003 (SHEET 1 OF 2)

- 7.3.15** 24590-LAW-M6-LCP-00002002, Rev. 1, P&ID - LAW CONCENTRATE RECEIPT PROCESS SYSTEM LCP-BULGE-00003 (SHEET 2 OF 2)
- 7.3.16** 24590-LAW-M6-LFP-00001005, Rev. 0, P&ID - LAW MELTER FEED PROCESS SYSTEM MELTER 1 FEED PREPARATION AND FEED LFP-BULGE-00001
- 7.3.17** 24590-LAW-M6-LFP-00001006, Rev. 1, P&ID - LAW - LAW MELTER FEED PROCESS SYSTEM MELTER 1 FEED PREPARATION AND FEED LFP-BULGE-00001
- 7.3.18** 24590-LAW-M6-LFP-00003005, Rev. 0, P&ID - LAW MELTER FEED PROCESS SYSTEM MELTER 2 FEED PREPARATION AND FEED LFP-BULGE-00002
- 7.3.19** 24590-LAW-M6-LFP-00003006, Rev. 1, P&ID - LAW - LAW MELTER FEED PROCESS SYSTEM MELTER 2 FEED PREPARATION AND FEED LFP-BULGE-00002
- 7.3.20** 24590-LAW-M6-LOP-00001003, Rev. 0, P&ID - LAW PRIMARY OFFGAS PROCESS SYSTEM MELTER 1 LOP-BULGE-00001
- 7.3.21** 24590-LAW-M6-LOP-00001004, Rev. 2, P&ID - LAW PRIMARY OFFGAS PROCESS SYSTEM MELTER 1 LOP-WESP-00001
- 7.3.22** 24590-LAW-M6-LOP-00002003, Rev. 0, P&ID - LAW PRIMARY OFFGAS PROCESS SYSTEM MELTER 1 LOP-BULGE-00002
- 7.3.23** 24590-LAW-M6-LOP-00002004, Rev. 2, P&ID - LAW PRIMARY OFFGAS PROCESS SYSTEM MELTER 2 LOP-WESP-00002
- 7.3.24** 24590-LAW-M6-ASX-00007001, Rev. 1, P&ID - LAW AUTOSAMPLING SYSTEM ISOLOK DETAILS ASX-SMPLR-0013
- 7.3.25** 24590-LAW-M6-ASX-00009001, Rev. 1, P&ID - LAW AUTOSAMPLING SYSTEM ISOLOK ASX-SMPLR-00012
- 7.3.26** 24590-LAW-M6-ASX-00009002, Rev. 0, P&ID - LAW AUTOSAMPLING SYSTEM ISOLOK ASX-SMPLR-00012
- 7.3.27** 24590-LAW-M6-LMP-00012001, Rev. 0, P&ID - LAW MELTER PROCESS SYSTEM MELTER 1 FEED NOZZLES COOLING SYSTEM AND FEED NOZZLES
- 7.3.28** 24590-LAW-M6-LMP-00042001, Rev. 0, P&ID - LAW MELTER PROCESS SYSTEM MELTER 2 FEED NOZZLES COOLING SYSTEM AND FEED NOZZLES

- 7.4 **Piping Isometrics**
 - 7.4.1 24590-LAW-P3-RLD-ZS03368001, Rev. 1, RLD-ZS-03368-S32B-2-LAW VITRIFICATION BUILDING ISOMETRIC
 - 7.4.2 24590-LAW-P3-RLD-ZS03368002, Rev. 1, RLD-ZS-03368-S32B-2-LAW VITRIFICATION BUILDING ISOMETRIC
 - 7.4.3 24590-LAW-P3-RLD-ZS03368003, Rev. 1, RLD-ZS-03368-S32B-2-LAW VITRIFICATION BUILDING ISOMETRIC
 - 7.4.4 24590-LAW-P3-RLD-ZS03368004, Rev. 1, RLD-ZS-03368-S32B-2-LAW VITRIFICATION BUILDING ISOMETRIC
 - 7.4.5 24590-LAW-P3-RLD-ZF33830001, Rev. 0, RLD-ZF-33830-NIIF-2-LAW VITRIFICATION BUILDING ISOMETRIC
- 7.5 WAC 173-303-640. Tank Systems, Section 4, Containment and Detection of Releases in Dangerous Waste Regulations, Washington State Administrative Code.
- 7.6 WA 7890008967. Dangerous Waste Permit (DWP). Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste at the Hanford Waste Treatment and Immobilization Plant, Rev. 8C.
- 7.7 24590-LAW-P1-P01T-00001, Rev. 4, LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. (-)21'-0"
- 7.8 24590-LAW-P1-P01T-00002, Rev. 7, LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 3 FEET - 0 INCHES
- 7.9 24590-LAW-P1-P01T-00004, Rev. 6, LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 28 FEET - 0 INCHES
- 7.10 24590-LAW-P1-P01T-00005, Rev. 6, LAW VITRIFICATION BUILDING GENERAL ARRANGEMENT PLAN AT EL. 48 FEET - 0 INCHES
- 7.11 24590-LAW-DD-S13T-00014, Rev. 7, LAW Vittrification Building Main Building 24" and 30" Dia. Sump Detail
- 7.12 2009 ASHRAE Handbook Fundamentals
- 7.13 CCN 093156 E-mail Message from Danielle Mathews to Roosevelt Molina, dated August 20,2004, Subject: Flour Daniel Northwest Calculation No. W314-P-039, Encasement Leak Detection, October 19, 1998

- 7.14 24590-WTP-3PB-P000-TN11F, Rev. 18, PIPING MATERIAL CLASSIFICATION PIPE CLASS N11F
- 7.15 24590-WTP-3PB-P000-TS32B, Rev. 25, PIPING MATERIAL CLASSIFICATION PIPE CLASS S32B
- 7.16 "Flow of Fluids through Valves, Fittings, and Pipe", Technical Paper No. 410, Crane Co., 1988
- 7.17 Towell, G. D, and Rothfeld, L. B. 1996, Hydrodynamics of Rivulet Flow, AIChE, Journal, Vol. 12, No. 5, p. 972-980
- 7.18 Roberson, John A. and Clayton T. Crow, Engineering Fluid Mechanics 2nd Edition, Houghton Mifflin Co., Boston, MA, 1980
- 7.19 24590-WTP-GPG-M-033, Rev. 4, Fire Water Floor Drain System
- 7.20 24590-WTP-3PS-JL10-T0002, Rev. 0, Engineering Specification for Radar Level Measurement
- 7.21 CCN 097799, Leak Detection Capability Scoping Statement Revision 6, 08/19/2004
- 7.22 24590-WTP-M6C-M11T-00004, Rev. 1, Supporting Calculation for Fire Water Floor Drain System Design Guide
- 7.23 24590-QL-HC4-HAHH-00001-06-00959, Rev. C, DRAWING - AUTOSAMPLING SYSTEM ASX-SMPLR-00012 GLOVEBOX SUBASSEMBLY SHEET 1 OF 3
- 7.24 24590-QL-HC4-HAHH-00001-06-00960, Rev. C, DRAWING - AUTOSAMPLING SYSTEM ASX-SMPLR-00012 GLOVEBOX SUBASSEMBLY SHEET 2
- 7.25 24590-QL-HC4-HAHH-00001-06-00962, Rev. C, DRAWING - AUTOSAMPLING SYSTEM ASX-SMPLR-00013 GLOVEBOX SUBASSEMBLY SHEET 1 OF 3
- 7.26 24590-QL-HC4-HAHH-00001-06-00963, Rev. C, DRAWING - AUTOSAMPLING SYSTEM ASX-SMPLR-00013 GLOVEBOX SUBASSEMBLY SHEET 2
- 7.27 24590-LAW-DD-S13T-00001, Rev. 6, LAW Vitrification Building Main Building Liner Plate Grillage Details

**WASTE TREATMENT AND IMMOBILIZATION PLANT
APPENDIX 11.0
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Appendices	Modification Date	Modification Number
Appendix 11.0	06/13/2019	24590-LAB-PCN-ENV-19-001 (8C.2019.Q2)
Appendix 11.1	07/06/2017	8C.2017.2F
Appendix 11.2	05/10/2018	24590-LAB-PCN-ENV-17-002
Appendix 11.4	06/13/2019	24590-LAB-PCN-ENV-19-001 (8C.2019.Q2)
Appendix 11.5	12/7/2018	24590-WTP-PCN-ENV-18-001 (8C.2018.Q4)
Appendix 11.6	09/13/2018	24590-LAW-PCN-ENV-17-013 (8C.2018.Q3)
Appendix 11.8		
Appendix 11.9	03/14/2019	24590-LAB-PCN-ENV-18-001 (8C.2019.Q1)
Appendix 11.10		
Appendix 11.11	05/15/2018	24590-LAB-PCN-ENV-14-001
Appendix 11.13		
Appendix 11.18	04/15/2019	24590-LAB-PCN-ENV-19-002 8C.2019.Q2

This page intentionally left blank.

1
2
3
4
5

OPERATING UNIT GROUP 10
APPENDIX 11.0

1
2
3
4
5

This page intentionally left blank.

OPERATING UNIT GROUP 10
APPENDIX 11.0

1
2
3
4
5
6
7
8
9
10
11
12
13

Where information regarding treatment, management, and disposal of the radioactive source, byproduct material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954, as amended) has been incorporated into this permit, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit and [chapter 70.105 of the Revised Code of Washington](#) (RCW). In the event of any conflict between Permit Condition III.10.A and any statement relating to the regulation of source, special nuclear, and byproduct material contained in portions of the permit application that are incorporated into this permit, Permit Condition III.10.A will prevail.

1
2
3
4
5

This page intentionally left blank.

1
2
3 **DRAWINGS AND DOCUMENTS**
4 **OPERATING UNIT GROUP 10 – APPENDIX 11.4**
5 **LABORATORY BUILDING**
6 **GENERAL ARRANGEMENT DRAWINGS**
7

8 The documents listed in the following table are incorporated by reference into this permit and are subject
9 to the requirements set forth in Part I Standard Conditions, Part II General Facility Conditions, and
10 Part III Operating Unit Group 10 Conditions. Upon request, copies of the documents can be viewed at the
11 Nuclear Waste Program Resource Center located at 3100 Port of Benton Blvd., Richland, WA.
12 Appointments for viewing can be scheduled by calling (509) 372-7950.
13

Drawing/Document	Description
24590-LAB-P1-60-00007, Rev. 3	Analytical Laboratory General Arrangement Plan at El. -19'-2" Sections E-E, F-F, G-G
24590-LAB-P1-60-00008, Rev. 4	Analytical Laboratory General Arrangement Plan at El. 0'-0"
RESERVED	RESERVED

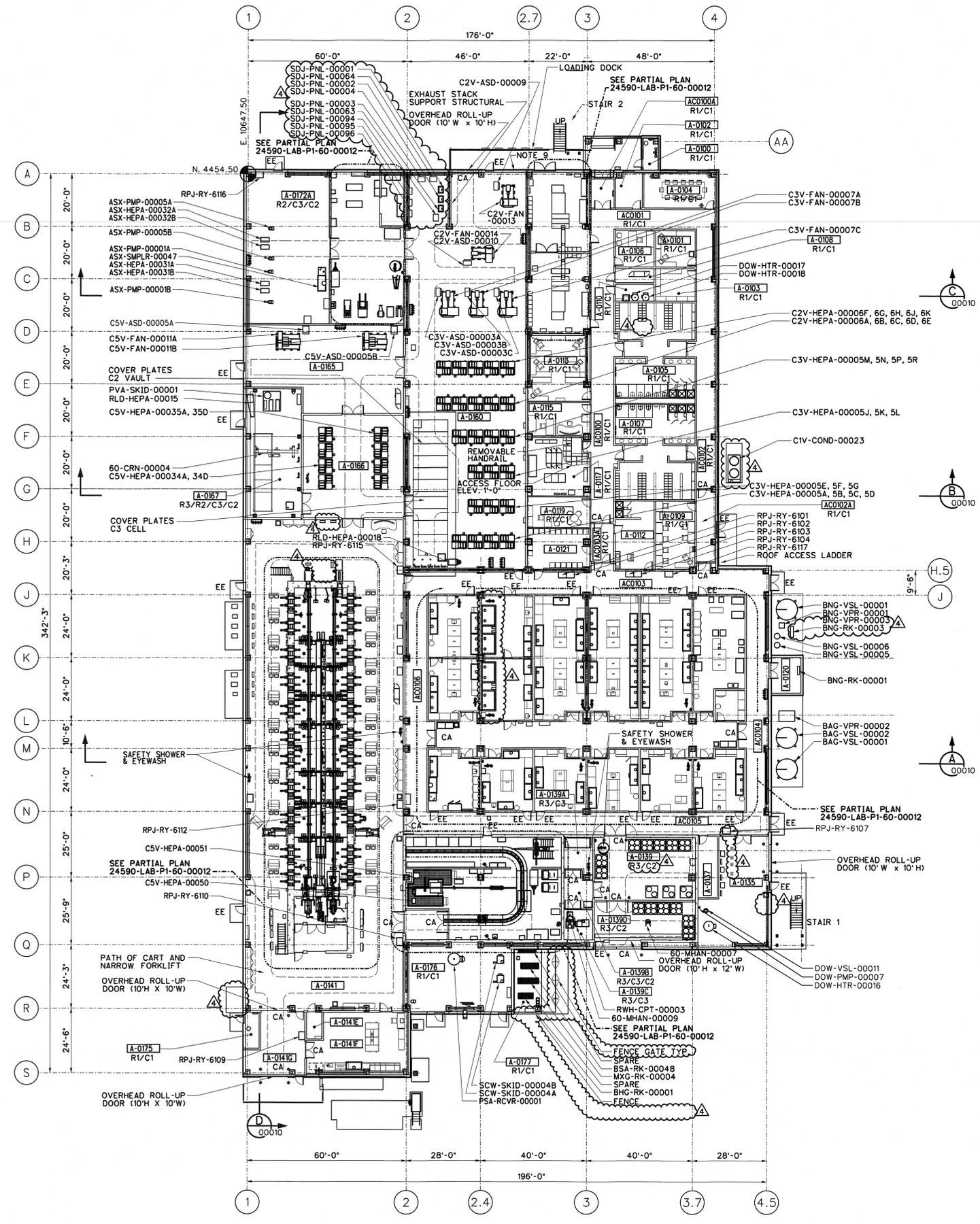
14
15 Source documents (which do not include a "P" in the last set of numbers, e.g. "-P0001," or "-TP001")
16 should be used in conjunction with any document change notices issued against them.

17 We are currently transitioning from permit documents (which include a "P" in the last set of numbers) to
18 source documents. At the end of the transition period, permit submittals will contain source documents
19 and will be incorporated into the permit as described in Ecology Publication #07-05-006.
20

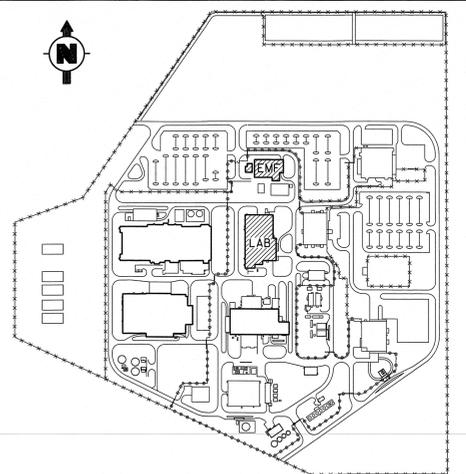
1
2
3
4
5

This page intentionally left blank.

H
G
F
E
D
C
B
A



PLAN AT EL 0'-0"



KEY PLAN

- NOTES:**
- REFER TO DRAWING 24590-LAB-P1-60-00010 SECTION 'A' FOR CONVERSIONS FROM LAB FACILITY ELEVATIONS TO SITE ELEVATIONS. (LAB FACILITY ELEVATION 0'-0" - SITE ELEVATION 677'-0" MSL).
 - FOR SITE REFERENCE SEE PLOT PLAN DRAWING 24590-BOF-P1-50-00001.
 - FOR LEGEND SEE DRAWING 24590-LAB-P1-60-00007.
 - CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
 - ALL OPERATING AREAS ARE DESIGNATED R2/C2 UNLESS NOTED OTHERWISE.
 - FOR ROOM NUMBERS AND DESCRIPTION, SEE DRAWINGS 24590-LAB-A5-A19T-05200001, 24590-LAB-A5-A19T-05200002.
 - DELETED
 - RADIATION LEVEL FOR ROOM A-0167 IS R2 BUT AREA OVER THE C5 CELL PUMP PITS, PIPING & VALVE PIT COVER IS R3.
 - SEE NOTE 9 ON REV 2 OF THIS DRAWING FOR REV 2 HISTORY.
 - SEE NOTE 10 ON REV 2 OF THIS DRAWING FOR REV 2 HISTORY. SEE NOTE 10 ON REV 3 OF THIS DRAWING FOR REV 3 HISTORY.
 - ROOMS A-0141C (MSM MAINTENANCE SHOP) AND A-0141D (SPARE MSM ROOM) ARE TO BE OPERATED AND MAINTAINED AT AN R2/C3 LEVEL DURING NORMAL PLANT OPERATIONS. LOCAL CONTAMINATION LEVELS MAY INCREASE DURING MSM MAINTENANCE LOCAL DECONTAMINATION AND SURVEY OPERATIONS WILL ENSURE AREA IS RETURNED TO R2 LEVELS AT COMPLETION OF MAINTENANCE ACTIVITIES.
 - ONLY MAJOR EQUIPMENT ITEMS ARE IDENTIFIED. REFER TO 24590-LAB-P1-P23T-00101 THRU 24590-LAB-P1-P23T-00108 FOR ALL EQUIPMENT IDENTIFICATIONS.
 - ROOMS ARE OFFICIALLY IDENTIFIED BY ROOM NUMBERS ONLY. ROOM NUMBERS ARE ESTABLISHED AND CONTROLLED ON GENERAL ARRANGEMENT DRAWINGS. ONLY ROOM NUMBERS ARE NEEDED TO IDENTIFY ROOMS ON ENGINEERING DISCIPLINE DOCUMENTS. WHILE ROOM NUMBERS ARE CONTROLLED, THE MOST COMMON NAME OF ROOMS ASSOCIATED WITH EACH ROOM NUMBER IS SHOWN FOR REFERENCE ONLY ON ARCHITECTURAL FLOOR PLANS.
 - ROOM TAGS: A-0172, A-0172B & AC107 AND A-0141B REMOVED FROM THIS DRAWING.
 - INCORPORATED:
 - 24590-LAB-DBN-S13T-00025 - ADDED A SLAB NEAR R/1 FOR HEAT TRACING.
 - 24590-LAB-PN-60-00026 - ROOM A-0139 CLASSIFICATION CHANGED FROM R3/C3 TO R3/C2.
 - 24590-LAB-PN-60-00030 - PCM RPJ-RY-6107 MOVED FROM ROOM A-0135 TO AC105 TO MATCH C&I.
 - 24590-LAB-PN-60-00032 - ADDED BNG-RK-00003, AND BNG-VPR-00003 TO MEET AS BUILT LAYOUT.
 - 24590-WTP-FC-14-0250 - OUTSIDE SLAB AREA A-0177 AND FENCE UPDATED TO GIVE SPACE FOR GAS BOTTLE RACKS.
 - 24590-WTP-FC-C-15-0024 - BOLLARD MOVED TO MEET NEC SPACE REQUIREMENTS FOR ELECTRICAL EQUIPMENT.
 - 24590-WTP-FC-C-18-0141 - REMOVED 12 LOCKERS TO ALLOW ACCESS TO CIV-HTR-0001B TO MAINTAIN EQUIPMENT.
 - 24590-WTP-FC-E-12-0562 - MOVED LIH-PNL-00021, LIH-PNL-00022, EMJ-JB-00174, AND EMJ-JB-00297 TO ALLOW BETTER ACCESS TO LIH-GB-00001.
 - 24590-WTP-FC-E-14-0271 - WITH MODIFICATIONS, SGJ PANELS UPDATED AND TAGS RETAINED TO MEET AIR PERMIT REQUIREMENTS PER WTP ENVIRONMENTAL PROTECTION GROUPS EDR REQUEST.
 - 24590-WTP-FC-M-17-0079 - UPDATED EXTERIOR CONDENSOR CIV-COND-00023 AND ASSOCIATED SLAB SIZE INCREASED TO ALLOW SPACE FOR CONTROL PANEL ACCESS.
 - 24590-LAB-EIE-CSA-14-0006 - EXTERIOR SLAB ADDED FOR HEAT TRACE EQUIPMENT NEAR COLUMN R/1.
 - UPDATED BACKGROUND FOR NEW LAYOUT OF ARL FUME HOODS, COLUMNS J-L/2.5. DELETED NOTE 7. IT HAS NO PURPOSE ON CURRENT DRAWING, UPDATED NOTE 10 TO LEAD BACK TO PREVIOUS REVISIONS FOR HISTORY.

REFERENCE DRAWINGS	
DWG NO	TITLE
24590-BOF-P1-50-00001	RPP - WTP PLOT PLAN
24590-LAB-P1-60-00007	ANALYTICAL LABORATORY GENERAL ARRANGEMENT PLAN AT EL. (-)19'-2" SECTIONS E-E, F-F, G-G
24590-LAB-P1-60-00009	ANALYTICAL LABORATORY GENERAL ARRANGEMENT PLAN AT EL. 17'-0"
24590-LAB-P1-60-00010	ANALYTICAL LABORATORY GENERAL ARRANGEMENT SECTIONS A-A, B-B, C-C & D-D
24590-LAB-P1-60-00011	ANALYTICAL LABORATORY GENERAL ARRANGEMENT PLAN AT ROOF
24590-LAB-P1-60-00012	ANALYTICAL LABORATORY GENERAL ARRANGEMENT PARTIAL PLANS AT EL. 0'-0"
24590-LAB-A5-A19T-05200001	ANALYTICAL LABORATORY ARCHITECTURAL ROOM FINISH SCHEDULE
24590-LAB-A5-A19T-05200002	ANALYTICAL LABORATORY ARCHITECTURAL ROOM FINISH SCHEDULE

NO	REVISION	DATE	BY	CHKD	DATE
4	REVISE DRAWING - SEE NOTE 15	10/20/10	RJM	WJM	10/20/10
3	REVISE DRAWING - SEE NOTE 10	4/25/12	RJM	CWS	JL
2	REVISE DRAWING - SEE NOTES 9 & 10	1/5/05	RWM	KAC	PR
0	ISSUE FOR DESIGN	10-28-03	KAC	RLH	WTM

REVISION HISTORY	
ISSUED BY	PROJECT No. 24590
ISSUE STAMP	SITE HANFORD
ORIGINATOR	AREA 200E
CHECKER	BUILDING No. 200A
APPROVER	DATE
REVIEWER	DATE

ANALYTICAL LABORATORY GENERAL ARRANGEMENT PLAN AT EL 0'-0"

CONTRACT No. DE-AC27-01RV14136

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

ISSUED BY	PROJECT No.	24590
ISSUE STAMP	SITE	HANFORD
ORIGINATOR	AREA	200E
CHECKER	BUILDING No.	200A
APPROVER	DATE	
REVIEWER	DATE	

1
2
3 **DRAWINGS AND DOCUMENTS**
4 **OPERATING UNIT GROUP 10 – APPENDIX 11.18**
5 **LABORATORY BUILDING**
6 **OPERATING DOCUMENTS**
7

8 The documents listed in the following table are incorporated by reference into this permit and are subject
9 to the requirements set forth in Part I Standard Conditions, Part II General Facility Conditions, and
10 Part III Operating Unit Group 10 Conditions. Upon request, copies of the documents can be viewed at the
11 Nuclear Waste Program Resource Center located at 3100 Port of Benton Blvd., Richland, WA.
12 Appointments for viewing can be scheduled by calling (509) 372-7950.
13

Drawing/Document Number	Description
24590-LAB-PER-M-04-0001, Rev. 3	Leak Detection Capability in the LAB Facility
24590-LAB-PER-M-04-0002, Rev. 0	LAB Waste Removal Capability for the Effluent Vessels Cells
RESERVED	RESERVED

14
15 Source documents (which do not include a "P" in the last set of numbers, e.g. "-P0001," or "-TP001")
16 should be used in conjunction with any document change notices issued against them.

17 We are currently transitioning from permit documents (which include a "P" in the last set of numbers) to
18 source documents. At the end of the transition period, permit submittals will contain source documents
19 and will be incorporated into the permit as described in Ecology Publication #07-05-006.
20

1
2
3
4
5

This page intentionally left blank.



ISSUED BY
RPP-WTP PDC

R11918978

Leak Detection Capability in the LAB Facility

Document title:

Document number: 24590-LAB-PER-M-04-0001, Rev 3

Contract number: DE-AC27-01RV14136

Department: Process and Mechanical Systems

Author(s): Annalene Decker

Originator
By: Annalene Decker - ADECKER
Org Name: Mechanical Systems
Placed: Sep 25, 2018

Checked by: Pietro Martinelli

Checked
By: Pietro Martinelli - pmartine
Org Name: MS Resident Engineering
Placed: Sep 25, 2018

Issue status: Issued for Permitting Use

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

Approved by: Alfredo Ceja

Approver's position: Mechanical Engineering Group Supervisor

Approver's signature: Alfredo Ceja 10-4-18

NSE Review: The LAB Leak Detection Capability report does not represent a design change and does not impact the PDSA or safety design bases. No Comment. No SE required. N/A-10 Item! DRB

J. C. Bechtel 9/26/2018

This bound document contains a total of 33 sheets

River Protection Project
Waste Treatment Plant
2435 Stevens Center Place
Richland, WA 99354
United States of America
Tel: 509 371 2000

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.

History Sheet

Rev	Reason for revision	Revised by
0	Issued for Permitting Use	P. Martinelli
1	Update to reflect confirmed calculation 24590-LAB-M6C-RLD-00027, Rev 0.	P.E. Stanley
2	Minor revision of methodology, results, and summary based on revised report to resolve PIER-MGT-11-0105-C Action 09. Revision marks are not included.	J. Holway
3	Minor revision to address comments from Ecology. See revision lines in right margin.	A. Decker

Contents

1	Summary	1
2	Objective.....	1
3	Description	1
4	Inputs/Assumptions	2
5	Analysis.....	7
6	Detectable Leak Rates	7
7	Results and Conclusions.....	21
8	References	22
	Attachment A Pipe Cap Dimensions	27

Acronyms

AEA	Atomic Energy Act of 1954
BNI	Bechtel National, Incorporated
CCN	Correspondence Control Number
CGS	centimeter gram second units of measurement
DOE	US Department of Energy
DWP	Dangerous Waste Permit
LAW	Low Activity Waste
RLD	Radioactive Liquid Waste Disposal System
STD	Standard
WAC	Washington Administrative Code
WTP	River Protection Project-Waste Treatment Plant

1 Summary

The Analytical Laboratory (LAB) facility secondary containment must satisfy the leak detection criteria of the Washington Administrative Code (WAC) 173-303-640(4), Reference 8.4, and the Waste Treatment Plant Dangerous Waste Permit (DWP) number 7890008967, Condition No: III.10.E.9.e.ii and III.10.H.5.e.ii for tank and miscellaneous treatment system secondary containment areas, Reference 8.2. This report evaluates the minimum leak rates that can be detected within 24 hours in the regulated secondary containment sumps.

The LAB facility contains six DWP regulated sumps and eight leak detection boxes (LDBs). Leaks of vessels or piping within the cells will flow along the floor (or in containment piping), and are collected in a sump or LDB and are detected with level instrumentation. This report evaluates the time to detect a leak of 0.1 gallons per hour (gph) and determines if the time is within the DWP permit requirement of 24 hours for potential leaks that are collected. Regulated double-wall piping is sloped as provided on the associated P&ID to direct a leak towards the LDBs.

Since the DWP has established a minimum leak rate of 0.1 gph, this report determines the time to detect the minimum leak of 0.1 gph in the sumps based on the time to fill the sump plus the time for the 0.1 gph leak to flow to the sump. The time to fill the sump is calculated by first determining the minimum detectable volume in each sump and then the time required to reach this detectable column at a leak rate of 0.1 gph. If the "time to detect" is less than 24 hours for a flow rate of 0.1 gph for all sumps, the permit condition is met.

This Permit Document will document that the time to fill the sump to the detectable level is the critical factor for establishing a leak detection rate vs. the time for the leak (rivulet) to cross the floor or for the leak to wet and travel through the pipe. This approach has been previously presented to the Department of Ecology.

2 Objective

The objective of this report is to document the capability to detect a 0.1 gph leak of dangerous waste within 24 hours in the LAB facility secondary containment area sumps. The leakages include:

- Leaks from vessels, equipment and/or piping containing DWP regulated waste that flows by gravity directly to sumps containing leak detection instrumentation
- Leaks that flow by gravity to drains that are routed to another cell containing a sump with leak detection instrumentation.

3 Description

The LAB facility regulated sumps must satisfy the leak detection criteria of the WAC and DWP conditions for secondary containment systems. The regulatory requirements for leak detection are contained in WAC-173-303-640 (4), Tank Systems, Section 4, Containment and Detection of Releases and are restated as follows:

- (b) Secondary Containment systems must be:
 - (ii) Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

(c) To meet the requirements of (b) of this subsection, secondary containment systems must be at a minimum:

(iii) Provided with a leak detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous waste or accumulated liquid in the secondary containment system within twenty-four hours, or at the earliest practicable time if the owner or operator can demonstrate to the department that the existing detection technologies or site conditions will not allow detection of a release within twenty-four hours.

In addition, the Waste Treatment Plant Dangerous Waste Permit (Reference. 8.2), Conditions: III.10.E.9.e.ii and III.10.H.5.e.i require submittal of:

Detailed plans and descriptions, demonstrating the leak detection system is operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous and/or mixed waste, or accumulated liquid in the secondary containment system within twenty-four (24) hours. Detection of a leak of at least 0.1 gallons per hour within twenty-four (24) hours is defined as being able to detect a leak within twenty-four (24) hours. Any exceptions to this criterion must be approved by Ecology [WAC 173-303-640(4)(c)(iii), WAC 173-303-806(4)(c)(vii)].

There are two dangerous waste vessels in the Analytical Laboratory (LAB). The first vessel is RLD-VSL-00164 (Ref. 8.19.5), laboratory area sink drain collection vessel, and will hereafter be referred to as the C3 vessel; this vessel is associated with RLD-SUMP-00041. The second vessel is RLD-VSL-00165 (Ref. 8.19.1), hotcell drain collection vessel and will hereafter be referred to as the C5 vessel; this vessel is associated with RLD-SUMP-00042. The sumps associated with these vessels will be included in this report along with the pit pump sumps.

4 Inputs/Assumptions

4.1 The vessel cell dimensions are summarized as follows

- C3 Effluent Vessel Cell (Rm No. A-B003), 13'-0" (East-West) x 27'-3" (North-South) (Ref. 8.24.3, Grid H5 & E6)
- C5 Effluent Vessel Cell (Rm No. A-B004), 21'-0" (East-West) x 29'-0" (North-South) (Ref. 8.24.1, Grid D7 & B8)

4.2 The pit dimensions are summarized as follows:

- C3 Pump Pit (Rm No. A-B002), 13'-0" (East-West) x 14'-5 1/2" (North-South) (Ref. 8.24.3, Grid H7 & E8)
- C5 Pump Pit (South, Rm No. A-B007), 6'-9" (East-West) x 6'-5" (North-South) (Ref. 8.24.1, Grid H7 & E8)
- C5 Piping Pit (Rm No. A-B006), 6'-9" (East-West) x 14'-0" (North-South) (Ref. 8.24.1, Grid H7 & F8)
- C5 Pump Pit (North, Rm No. A-B005), 6'-9" (East-West) x 6'-5" (North-South) (Ref. 8.24.1, Grid H7 & G8).

4.3 There are five leak detection boxes in C3 (Ref. 8.19.10) and three in C5 (Ref. 8.19.11) that are DWP regulated with the following details: NPS 8, horizontal, Schedule 40 pipe, with an NPS 8

cap welded on either end. A detectable leakage volume is built up in an 11 inch segment of pipe, plus the cap, by a 2-inch high weir located in the middle of the device (Ref. 8.14 & 8.23).

- 4.4 The stainless steel liners in the vessel cells and in the pump pits are sloped at a minimum grade of 1 :100 (1 %) to direct potential leakage towards the sump (note 14 of Ref. 8.24.1 & 8.24.3).
- 4.5 The length of the longest runs of regulated, double-wall pipe is defined by the isometric drawings identified in Ref. 8.20.1 through 8.20.14 and Ref. 8.20.15 through 8.20.19 as tabulated in Table 4.1 & Table 4.2, respectively.

Table 4.1 Longest Double Containment Pipe from ARL-HOOD-00055 to LDB-00005

Isometric Drawing	Length, ft	Comments
24590-LAB-P3-RLD-WU02269051	6.87	Length to the most remote cleanout
24590-LAB-P3-RLD-WU02269052	11.15	
24590-LAB-P3-RLD-WU02269053	9.54	
24590-LAB-P3-RLD-WU02198051	6.92	
24590-LAB-P3-RLD-WU02198052	6.50	
24590-LAB-P3-RLD-WU02198053	33.00	
24590-LAB-P3-RLD-WU02198054	12.50	
24590-LAB-P3-RLD-WU02198055	18.05	
24590-LAB-P3-RLD-WU02227051	20.40	
24590-LAB-P3-RLD-WU02227052	24.25	
24590-LAB-P3-RLD-WU02227053	34.46	
24590-LAB-P3-RLD-WU02227054	10.05	
24590-LAB-P3-RLD-WU02227055	8.39	
24590-LAB-P3-RLD-WU02249001	15.33	Connection to RLD-LDB-00005
Total	217.41	

Table 4.2 Longest Drain Collection Header from C3 Maintenance Shop to LDB-00007

Isometric Drawing	Length, ft	Comments
24590-LAB-P3-RLD-WU02289051	20.83	C3 Maintenance Sink
24590-LAB-P3-RLD-WU0230052	38.39	
24590-LAB-P3-RLD-WU0230053	63.13	
24590-LAB-P3-RLD-WU0230054	67.35	
24590-LAB-P3-RLD-WU02250001	13.07	Connection to RLD-LDB-00007
Total	202.77	

- 4.6 There is one sump in each DWP vessel cell. RLD-SUMP-00041 is located in Room A-B003 (the RLD-VSL00164 vessel cell) and RLD-SUMP-00042 is located Room A-B004 (the RLD-VSL-00165 vessel cell) (Ref. 8.19.1, 8.19.5). These sumps are 30-inch nominal diameter and approximately 13-inch deep. Both sumps are made from a section of nominal pipe size (NPS 30) standard-wall pipe (or an equivalent rolled plate) and a 30-inch diameter, standard wall, pipe cap (or equivalent ellipsoidal-head section) (Ref. 8.24.1, 8.24.3, & 8.17). Details on the vessel cell sumps are provided in Table 4.3.

Table 4.3 Vessel Cell Sump Details

Sump	Location	Dimensions	Reference
RLD-SUMP-00041	A-B003 (C3 Vessel Cell)	13'-0" x 27'-3" (354.25 ft ²)	8.19.1, 8.19.5

Sump	Location	Dimensions	Reference
RLD-SUMP-00042	A-B004 (C5 Vessel Cell)	21'-0" x 29'-0" (609 ft ²)	8.19.1, 8.19.5

4.7 There is one sump in each pump pit and all are DWP regulated (Ref. 8.19.2, 8.19.3, 8.19.4, 8.19.6). The sumps are formed by a rectangular depression in the liner around the drain for the pit. A removal weir around the drain hole allows formation of a detectable volume before excess leakage is directed back to its associated vessel. Details on the pit pump sumps are provided in Table 2.4.

Table 4.4 Pit Pump Sump Details

Sump	Location	Dimensions	Reference
RLD-SUMP-00043A	A-B007 (C5 Pump Pit)	1'-6" x 3'-0" (4.5 ft ² area)	8.24.2, 8.15, 8.24.5, 8.24.6
RLD-SUMP-00043B	A-B005 (C5 Pump Pit)	1'-6" x 3'-0" (4.5 ft ² area)	8.24.2, 8.15, 8.24.5, 8.24.6
RLD-SUMP-00044	A-B006 (C5 Piping Pit)	2'-0" x 2'-6" (5 ft ² area)	8.24.2, 8.15, 8.24.5, 8.24.6
RLD-SUMP-00045	A-B002 (C3 Pump Pit)	2'-0" x 2'-6" (5 ft ² area)	8.24.3, 8.15, 8.24.7, 8.24.8

4.8 The pipelines of concern within this calculation are W11B, S32B, and S11E pipe class (Ref. 8.21.1, 8.22.2, and 8.22.3), which contain the following details:

- Piping class S11E is 316L stainless steel, schedule 40S (STD) for 1/2" to 4" and 10S (STD) for 6" to 14" nominal diameter pipelines (Ref. 8.22.3).
- Piping class S32B (Double Containment) is a) for encasement/jacket: A106 carbon steel, schedule 40S (STD) for 3" to 10" nominal diameter pipelines and b) for carrier pipe: 316L SS, schedule 40S for 1" to 8" nominal diameter pipelines (Ref. 8.22.2) gravity drain lines for 1" to 2" diameter pipelines).
- Piping class WIIB (Double Containment) is a) for encasement/jacket: A106 Gr B, schedule 40S (STD) for 4" to 6" nominal diameter pipelines and b) for carrier pipe: UNS N06022 Hastelloy C-22, schedule 40S for 1.5" to 4" nominal diameter pipelines (Ref. 8.21.1).

The S11E pipe code is only discussed because these lines travel from the annulus of the W11B and S32B coaxial containment pipes to the leak detection boxes. All S11E single walled piping is located within the vessel cell or pump and piping pit secondary containment areas. Dimensions for nominal diameter pipes are illustrated in Table 2.5.

Table 4.5 Pipeline Diameter Details

Pipeline	Pipe Class Ref.	Carrier Pipe (Ref. 8.18, pg. B-16 & B-17)		Encasement Pipe (Ref. 8.18, p.B-17)		
		Nom. Pipe Size (inch) Sch. 40S or Std.	I.D. (inch)	Nom. Pipe Size (inch) Sch. 40S or Std.	I.D. (inch)	Cross-Sec Area (ft ²)
RLD-WU-02269-WIIB-02	8.21.1	2	2.067	4	4.026	0.0884
RLD-WU-02198-WIIB-03 RLD-WU-02227-WIIB-03	8.21.1	3	3.068	6	6.065	0.2006
RLD-WU-22010-WIIB-04 RLD-ZN-00001-WIIB-04	8.21.1	4	4.026	6	6.065	0.2006
RLD-WU-02302-S32B-01/2	8.21.2	1-1/2	1.610	4	4.026	0.0884
RLD-WU-02301-S32B-02	8.21.2	2	2.067	4	4.026	0.0884
RLD-WU-02224-S32B-03	8.21.2	3	3.068	6	6.065	0.2006

Pipeline	Pipe Class Ref.	Carrier Pipe (Ref. 8.18, pg. B-16 & B-17)		Encasement Pipe (Ref. 8.18, p.B-17)		
		Nom. Pipe Size (inch) Sch. 40S or Std.	I.D. (inch)	Nom. Pipe Size (inch) Sch. 40S or Std.	I.D. (inch)	Cross-Sec Area (ft ²)
RLD-ZN-03433-S32B-03	8.21.2	3	3.068	6	6.065	0.2006
	8.21.2	3	3.068	8	7.981	0.3474
RLD-WU-02300-S32B-08	8.21.2	8	7.981	10	10.02	0.5475
RLD-WU-02249-S11E-01 RLD-WU-02239-S11E-01 RLD-WU-22013-S11E-01 RLD-WU-02250-S11E-01 RLD-WU-02310-S11E-01 RLD-ZN-03401-S11E-01 RLD-ZN-03435-S11E-01 RLD-ZN-03402-S11E-01	8.21.3	1	1.049	n/a	n/a	n/a

- 4.9** The double-wall (co-axial) piping has a minimum slope of 1:192 (1/16 inch per foot) (Ref. 8.19.1 note 9, 8.19.4 note 18, 8.19.5 note 10, 8.19.6 note 10, 8.19.7 note 11, 8.19.8 note 12, 8.19.9 note 11, 8.19.10 note 8, 8.19.10 note 8, 8.19.12 note 7).
- 4.10** The vessel cell and pit sumps have radar-type level detection instrumentation (Ref. 8.19.7, 8.19.2, 8.19.3, 8.19.4, 8.19.5, 8.19.6) with an accuracy of ± 0.5 inch (Ref. 8.12, Section 3.2.1). The leak detection boxes contain thermal dispersion type level detection instrumentation (Ref. 8.22).
- 4.11** The water properties at 100°F (Ref. 8.13, p. 30.37) are as follows:

Table 4.6

Constant	English Units	CGS Units
<i>p</i> , density	61.99 lbm/ft ³	0.993 g/cm ³
<i>u</i> , dynamic viscosity	1.648 lbm/ft·hr	0.00681 g/cm·sec
<i>y</i> , surface tension	0.0048 lbf/ft	69.96 dyn/cm or 69.96 g/sec ²

- 4.12** The following items (a through g) were derived from agreements between BNI, DOE, and Department of Ecology (Ref. 8.28):
- a. The liquid leaking is water at a temperature of 100°F.
 - b. The leak is at a constant rate over the 24-hour period.
 - c. The leak is assumed to occur at the furthest point from the leak detection device.
 - d. No evaporation will occur.
 - e. The liquid does not foam in the sumps.
 - f. Hold-up of piping is considered and is defined as wetting of the surface.
 - g. Level detection instruments will be properly installed and calibrated upon installation. Periodic, normal maintenance and calibration will be performed on level instruments during operation of the facility and the instruments will be maintained in an operable condition.
- 4.13** The average velocity equation assigned to the leakage being conveyed within the sloped pipe is developed from boundary layer theory for flow down an inclined plane. This velocity equation is assumed to apply to the leakage flows in the annular-region of the double-wall pipe since this average velocity will be applied throughout the entire length of the pipe even when the pipe

contains vertical drops (where the velocity would increase, thereby reducing the travel time to detection device).

- 4.14 The wetting factor from experimental data was found to be 0.32 fl oz/ft (Reference 8.16) for a NPS 6 pipe. The wetting factor will be conservatively increased by 100% to 0.64 fl oz/ft to provide additional margin to the calculated holdup time.
- 4.15 The rivulet flow in this report is based on the simplified model for a wide flat rivulet. Figure 5 of Reference 8.10 shows dashed lines that are asymptotic solutions for wide-flat rivulets at high Ω values and for narrow rivulets at low Ω values. For a contact angle of 5° , figure 5 shows that the wide flat rivulet model, represented by equations 26 and 27 of Reference 8.10, is applicable when Ω is larger than 0.001 and P is larger than 5. This assumption is verified by the evaluation of Ω and P using data from this report.
- 4.16 Reference 8.10, Table 2 shows for a rivulet flow rate of 6.2 mL/min (~0.1 gph), the corresponding contact angle, θ , is experimentally measured as 9 to 12 degrees. A conservative rivulet contact angle of 6 degrees is assumed for this report. The smaller contact angle results in a longer time to sump for a given flow path length from the following logic: a smaller contact angle yields a larger rivulet width, which yields a larger rivulet cross sectional area, which leads to a lower velocity (since the flow rate is fixed). This assumption is conservative.
- 4.17 The rivulet flow path for each cell is conservatively considered to be along the straight walls rather than diagonally across the cell: North-South + East-West distances. The floor is uniformly sloped and the flow path is in straight lines (no meandering flow).
- 4.18 There are no obstructions in the flow path. Leaks from any equipment or piping fall directly to the floor at the point of leakage and do not travel along pipes or other equipment and the rivulet does not split into multiple streams as it travels across the floor. While actual leaks may not conform to this scenario, it is beyond the objective of this report to assess every possible leak scenario. The intent is to provide a calculated leak detection volume that is not overly complex but still maintains sufficient accuracy to demonstrate leak detection capability within a reasonable level of uncertainty.
- 4.19 The level instrument response time (i.e., the time between the fluid reaching a specified level set point and the instrument responding to the process condition) is considered negligible with regards to the leak detection time requirement. The level instrumentation is anticipated to have response times on the order of seconds and therefore, the response time is insignificant based on the 24-hour detection limit.
- 4.20 For the sumps with circular/elliptical bases, it will be conservatively assumed that radar guide tube is offset from the center of the sump by 8 inches; therefore, the fluid level as measured from the center of the sump must rise slightly higher in the sump to be within the radar's 0.5" detection specification (Input 4.10). In addition, a 10% contingency will be added to the fluid level that is based on the radar's offset and its accuracy. These dimensions provide a bounding value and simplify the calculation; the physical layout and added margin make this assumption conservative
- 4.21 The LDBs have "thermal dispersion" level detection instrumentation that will be assumed to contain an accuracy of ± 0.5 inch in the reservoir (e.g. Ref. 8.11). This assumption is supported by the "Issued for Quote" datasheets (Ref. 8.22). The assumed performance characteristics reflect the capabilities of commercially-available thermal dispersion level switches: Instruments with

accuracies of ± 0.1 inch are available and a more common accuracy of ± 0.25 inch is half of that required (Ref. 8.11), therefore this assumption is considered conservative.

- 4.22 Based on a review of the 3-D Model and Ref. 8.15, the two longest runs of pipe are anticipated to be either the C5 collection header from the C3 Maintenance Shop -Maintenance Decon Booth (60-MHAN-00003) or a C3 collection header from a lab sink or fume hood in the southeast corner of the Rad Lab Area. Both are estimated to be below 220 ft (Table 4.1 and Table 4.2); a length of 250 ft will be used to account for uncertainty in alternative pipe routes.
- 4.23 The curved head portion of the pipe cap (Input 4.6) that is used for the cell sumps (RLD-SUMP-00041/42) can be approximated by a 2:1 semi-ellipsoidal head. See Attachment A-1, note (b) for confirmation that pipe heads are ellipsoidal per ASME B16.9.
- 4.24 The removal weirs in the pit sumps contain a 4.25 inch diameter weir strainer and a 6 inch diameter by 1.25 inch height seal cover plate as provided on vendor drawing (Ref. 8.26, weir plate detail). The displaced volume the weir plates introduce in the sumps will be ignored; this is conservative since a larger fill volume will be required, increasing the time to fill.

5 Analysis

To establish if the LAB cell sumps/LDBs can detect a permit condition leakage rate of 0.1 gph within a 24-hour time, a total time is determined. This includes the time for a leak to travel to a sump (t_1) including travel within pipes and/or across the cell floor; the time to fill the sump to a detectable level (t_2); and the time it takes to wet the surface of a pipe or 'holdup' (t_3).

Leakage flowing inside pipes uses the boundary layer theory while leakage flowing on the floor is modeled as a rivulet of uniform width. The time taken by the liquid to reach the sump and time required for minimum liquid accumulation in the sump (before it can be detected) are determined in Section 6. The leak detection boxes will collect leakage through pipes only; floor leakage is taken care of by sumps.

The sumps associated with the C3 and C5 vessels will be included in this report along with the pit pump sumps.

The postulated piping leak is a leak into the annular space of in-slab coaxial piping. Piping leaks inside of a secondary containment area such as vessel cell or piping or pump pit are addressed by the postulated leak to a liner floor (rivulet flow method).

6 Detectable Leak Rates

6.1 Leakage Through Pipes-Leak Detection Boxes

The elapsed time to detect a leak that is flowing through a pipe is composed of three independent time components: (i) a liquid holdup time or elapsed time for leak to wet the interior surface, t_3 , (ii) elapsed time for the leak to travel through the pipes to the sump, t_1 , and (iii) the time to fill the sump to a level that can be detected by the associated leak detection instrumentation, t_2 . Therefore, the total time for leakage detection through pipes is $t_{total} = t_1 + t_2 + t_3$. If the total time is less than 24 hours for a flowrate of 0.1 gph for all leak detection equipment, the permit condition is met.

6.1.1 Holdup Time within Coaxial Pipe, t_3

The elapsed time for the leak to wet the flow path (flow channel) from the most-remote location to its corresponding leak detection feature (e.g., a cell sump) is estimated based on an experimentally determined value of wetting holdup (Ref. 8.16) and the following equation:

$$t_3 = \frac{cL}{Q} \quad (\text{Equation 6.1})$$

Where:

t_3 = holdup time, hr

c = wetting factor, gal/ft or fluid ounces/ft (abbreviated as: fl oz/ft) with use of conversion factor:
128 fl oz/gal

L = travel distance, ft

Q = leakage volumetric flow rate, gal/hr

The maximum distance from any postulated leak to its respective LDB is obtained from Assumption 4.22. The line length from the pipe cleanout upstream of the furthest drain to the LDB is used; this length conservatively includes any straight-vertical drops (Assumption 4.13).

The wetting factor is equal 0.32 fl oz/ft for 6-inch pipes, however, a factor of 0.64 fl oz/ft is used (Assumption 4.14) for conservatism. Hence, the time required to wet the flow channel is:

$$L = 250 \text{ ft} \quad (\text{Assumption 4.22})$$

$$Q = 0.1 \text{ gph} \quad (\text{DWP requirement})$$

$$t_3 = \left(\frac{0.64 \text{ fl. oz.}}{\text{ft}} \right) \left(\frac{\text{gal}}{128 \text{ fl. oz.}} \right) \left(\frac{250 \text{ ft}}{1} \right) \left(\frac{\text{hr}}{0.1 \text{ gal}} \right) = 12.5 \text{ hr}$$

6.1.2 Leak Travel Time to Sump via Pipe, t_1

The time delay for the leak to reach or activate the detection equipment is calculated using equations derived from boundary layer theory for uniform flow down an inclined plane (Assumption 4.13). The average velocity distribution from boundary layer theory (Reference 8.5, p. 249 thru 251, Equation 9.4b) is:

$$v = \frac{g S_p d_p^2}{3 n} \quad (\text{Equation 6.2})$$

where:

v = average leak velocity, ft/s

g = gravitation constant, 32.17 ft/s²

S_p = Slope of the pipe, dimensionless

d_p = flow depth, ft

n = kinematic viscosity, ft²/s

The general equation for volumetric flow rate is given by:

$$Q = Av \quad (\text{Equation 6.3})$$

where:

Q = volumetric flow rate, ft³/s
 A = cross-sectional flow area, ft²

Therefore, combining Equation 6.2 and Equation 6.3, the flow depth, d_p , can be found by solving the following relationship:

$$d_p = \sqrt{\frac{3 n Q}{g S_p A}} \quad (\text{Equation 6.4})$$

The geometry based cross-sectional area for gravity flow in a circular pipe is found from (Reference 8.6, p. 5)

$$A = \frac{(\theta_{fs} - \sin \theta_{fs}) D_p^2}{8} \quad (\text{Equation 6.5})$$

where:

D_p = pipe diameter, ft

θ_{fs} = free surface angle (see Figure 1), radians

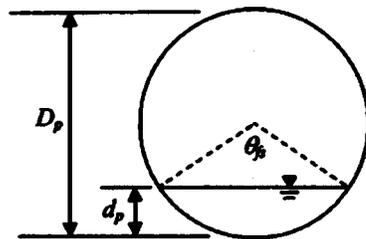


Figure 1. Partially Full Pipe Sketch

The depth of flow can be found by the following equation (Attachment A of Reference 8.7)

$$d_p = D_p \sin^2\left(\frac{\theta_{fs}}{4}\right) \quad (\text{Equation 6.6})$$

There are four unknowns (θ_{fs} , A , v , and d_p) to the set of four equations represented by Equation 6.3 through Equation 6.6. Though it is difficult to split theta in these equations in order to use a solve-and-substitute method, iterations are used instead.

The time delay for the leak to reach the detection box is simply

The time required for the leakage flow to travel from its point of origin to the sump is calculated from the Equations 6.3 through 6.6. The following constants are used:

$D_p = 10.02$ inch (0.835 ft) (D_p ranges from 4.026 inch (0.3355 ft) to 10.02 inch (0.835 ft). The larger, 0.835 ft, diameter is used since it yields a lower velocity (determined by performing calculation).

$Q = 0.1$ gph = 3.714 E-6 ft³/s

g = gravitation constant = 32.17 ft/s²

S_p = Slope of the pipe = 1/192 = 0.0052 (Input 4.9)

μ = dynamic viscosity = 1.648 lbm/ft·hr (Input 4.11)

ρ = 61.99 lbm/ft³ (Input 4.11)

Since kinematic viscosity (ν) is equal to dynamic viscosity (μ) / density (ρ), kinematic viscosity found to be:

$$\nu = (1.648 \text{ lbm/ft}\cdot\text{hr}) / (61.99 \text{ lbm/ft}^3) * (1 \text{ hr} / 3600 \text{ sec}) = 7.39\text{E-}6 \text{ ft}^2/\text{sec}$$

A Mathcad equation solve block is used to determine the unknowns, the results are:

$$\begin{aligned} d_p &= 2.07 \times 10^{-3} \text{ ft} \\ A &= 1.147 \times 10^{-4} \text{ ft}^2 \\ \theta_{fs} &= 0.199 \text{ radians or } 11.4 \text{ deg} \\ \nu &= 0.024 \text{ ft/sec} \end{aligned}$$

The travel delay for the leakage to reach the sump is:

$$t_l = L / \nu * (\text{hr} / 3600 \text{ sec}) \quad (\text{Equation 6.7})$$

Where:

t_l = time to reach detection device, hr
 ν = average velocity of leak, ft/sec
 L = travel distance, ft

Equation 6.7 applies to rivulet flow as well.

Substituting the values in Equation 6.7 yields:

$$t_l = L / \nu * (\text{hr} / 3600 \text{ sec}) = (250 \text{ ft} / 0.024 \text{ ft/sec}) (\text{hr} / 3600 \text{ sec}) = 2.89 \text{ hr}$$

6.1.3 Time to Minimum LDB Detectable Level, t_2

The amount of leakage required to obtain a detectable volume in a LDB, cell sump, or pit sump is determined using the physical dimensions and other characteristics of the LDBs or sumps.

Each of the eight LAB LDBs consists of a horizontal NPS 8 Schedule 40 pipe with a NPS 8 cap on either end (Input 4.3). A detectable leakage volume is created by a 2-inch weir located in the middle of the LDB; the detectable leakage volume is the partial volume sum of the 11-inch horizontal pipe section (created by the weir), the straight portion of the cap, and the curved portion of the cap.

The partial volume of the horizontal pipe can be determined by the following equations (Appendix E of Reference 8.8.)

$$\Phi = \arccos\left(\frac{R-h}{R}\right) \quad (\text{Equation 6.8})$$

Where:

Φ = the angle (in radians) formed by the edge of the fluid free surface and the vertical plane at the cylinder centerline

$R = (1/2) d_o$ = inside pipe radius, ft

h = detectable liquid height, ft

Substituting the values into Equation 6.8,

$$R = (1/2) * (7.981 \text{ inch}) * (\text{ft}/12 \text{ inch}) = 0.3325 \text{ ft}$$

$$h = 0.5 \text{ in} * (\text{ft}/12 \text{ inch}) = 0.0417 \text{ ft} \quad (\text{Assumption 4.21})$$

$$d_o = (7.981 \text{ inch}) * (\text{ft}/12 \text{ inch}) = 0.6651 \text{ ft} \quad (8'' \text{ Sch. 40 pipe, Reference 4.8, p. B-17})$$

$$\Phi = \arccos\left(\frac{0.3325 - 0.0417}{0.3325}\right) = 0.506 \text{ rad or } 29 \text{ deg}$$

The partial pipe volume equation is used with the fluid free surface angle.

$$\nabla_p = R^2 l \left[\left(\frac{\pi \Phi^\circ}{180} \right) - \sin \Phi \cos \Phi \right] \quad (\text{Equation 6.9})$$

Where:

- ∇_p = partial volume of the pipe, ft³
- $R = (1/2) d_o$ = inside pipe radius, ft
- l = cylindrical length of the detectable volume, ft
- Φ° = the free surface angle, deg

Substituting the values into Equation 6.9,

$$l = 11 \text{ inch (see Input 4.3)} + 2 \text{ inch of horizontal-section cap}^{(1)} = 13 \text{ inch (1.0833 ft)}$$

$$\Phi^\circ = \text{free surface angle} = 29 \text{ deg}$$

$$\nabla_p = 0.3325^2 \cdot 1.0833 \left[\left(\frac{\pi \cdot 29}{180} \right) - \sin(29) \cos(29) \right]$$

$$= 0.0098 \text{ ft}^3 \text{ (or } 0.0098 \text{ ft}^3 \cdot 7.48 \text{ gal/ft}^3 \cong 0.073 \text{ gal)}$$

The partial volume of the horizontal cap can be determined by the following equation (Appendix D of Ref. 8.8.)

$$\nabla_h = \frac{\pi h^2 (1.5 d_o - h)}{12} \quad (\text{Equation 6.10})$$

Where:

- $h = 0.5 \text{ inch (0.0417 ft)}$ (Assumption 4.21)
- $R = 0.3325 \text{ ft}$

Substituting the values into Equation 6.10,

$$\nabla_h = \frac{\pi (0.0417 \text{ ft})^2 [1.5 \cdot 0.6651 \text{ ft} - 0.0417 \text{ ft}]}{12} = 4.352 \times 10^{-4} \text{ ft}^3 (3.26 \times 10^{-3} \text{ gal})$$

The total volume required to produce a minimum detectable level is thus

$$\nabla_{total} = \nabla_p + \nabla_h = 0.073 \text{ gal} + 3.26 \times 10^{-3} \text{ gal} \cong 0.076 \text{ gal}$$

The time required to obtain a detectible volume in a LDB is given by:

$$t_2 = \nabla / Q \quad (\text{Equation 6.11})$$

$$t_2 = (0.076 \text{ gal}) \cdot (\text{hr} / 0.1 \text{ gal}) = 0.76 \text{ hr}$$

6.1.4 Total LDB Detection Time, t_{total}

The total detection time is the sum of the previously enumerated pipe wetting, transport, and LDB filling delays, in equation form:

$$t_{total} = t_1 + t_2 + t_3$$

$$t_{total} = 2.89 \text{ hr} + 0.76 \text{ hr} + 12.5 \text{ hr} \cong 16.2 \text{ hr}$$

The resultant value is less than 24 hours for a minimum leak rate of 0.1 gph, thus satisfying the permit requirement for leakage detection for LDBs.

6.2 Vessel Cell Sumps

The succeeding analysis determines the time to detect a leakage in the C3 and C5 vessel cells (RLD-SUMP-00041 and RLD-SUMP-00042).

The time to detect a leak traveling across a cell or pit floor liner is composed of two time components: t_1 and t_2 . The first time component, t_1 , is the time for the leak to reach the leak detection device (Equation 6.7). The second time component, t_2 , is the time to fill the leak detection device to a level that can be detected by the associated leak detection device based on the minimum leak rate.

For each leak detection device, " t_2 " is calculated by dividing the minimum detectable volume by the volumetric flow rate of the leak. The time component " t_1 " is calculated using the methodology from Reference 8.10 (rivulet flow). The elapsed time to detect a leak, t_{total} , is the sum of these two time components: $t_{total} = t_1 + t_2$. If the total time is less than 24 hours for a flow rate of 0.1 gph for all leak detection devices, the permit condition is met.

Calculation of " t_1 " for each leak detection device within a set (e.g. " t_1 " for each pit sump) is not necessary; using the longest path length bounds the "time to detection." As indicated in Assumption 4.17, the rivulet leak travel distance is computed by summing the distance along the walls: adding the north-south wall distance to the east-west wall distance.

6.2.1 Leakage Travel Time to Cell Sump, t_1

The time required for the leakage flow to travel from its point of origin to the cell sump under rivulet flow conditions is calculated. Note: most of the units within this section are in grams, centimeters in order to stay consistent with Reference 8.10. The methodology in this section is as follows.

The "time to detection" is determined using the average leak velocity at the minimum leak rate of 0.1 gph. The methodology shown in Reference 8.10 for rivulet flow forms the basis for the rivulet leak velocity calculation. The method requires the calculation of the angle of inclination for the rivulet, the capillary constant, and the rivulet cross sectional area. To be consistent with the units in Ref. 8.10, most units within this section are presented in grams (g) and centimeters (cm).

The angle of inclination, α , which is the slope of the floor with respect to a vertical plane, as shown in Figure 2, is determined using trigonometry as shown with the following equation

$$\alpha = 90^\circ - \tan^{-1}(S_o) \quad (\text{Equation 6.12})$$

Where:

α = angle of inclination, degrees
 S_o = slope of floor, ft/ft = 0.01 (1%) (Input 4.4)

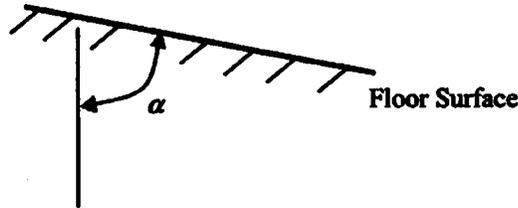


Figure 2. Inclination Angle for Rivulet Flow

From Input 4.4, $S_o = 1/100 = 0.01$. Substituting the values in the above Equation 6.12, we have:

$$\alpha = 90^\circ - \tan^{-1}(0.01) = 90^\circ - 0.5729^\circ = 89.427^\circ$$

Calculate the capillary constant, a

The capillary constant, the basis for the dimensionless width, is defined below (Reference 8.10, p. 973, equation following equation 9):

$$a = \sqrt{\frac{\gamma}{\rho g \sin \alpha}} \quad \text{(Equation 6.13)}$$

where:

- a = capillary constant, cm
- γ = liquid surface tension, dyne/cm (= g/sec^2)
- ρ = liquid density, g/cm^3
- g = gravitational acceleration = 980.7 cm/sec^2

The liquid properties are based on water at 100 °F (Input 4.11) are as follows:

- $\gamma = 69.96 \text{ g/sec}^2$
- $\rho = 0.993 \text{ g/cm}^3$
- $\alpha = 89.427^\circ$

Substituting these in Equation 6.13 above, we have:

$$a = \sqrt{\frac{69.96 \text{ g/sec}^2}{0.993 \text{ g/cm}^3 \times 980.7 \text{ cm/s}^2 \times \sin(89.427^\circ)}}$$

$$a = 0.268 \text{ cm}$$

Calculate the rivulet depth

For the wide flat rivulet, its depth is determined based on (Reference 8.10, 2nd equation following equation 25):

$$Y_o = 2 \sin\left(\frac{\theta}{2}\right) \quad \text{(Equation 6.14)}$$

where:

Y_o = dimensionless depth and is defined in Reference 8.10, definitions following equation 17 (2nd line following equation 17), as:

$$Y_0 = \eta_0 / a$$

where:

η_0 = rivulet depth, cm

θ = contact angle, degrees

Solving for η_0 yields:

$$\eta_0 = 2a \sin(\theta/2) \quad (\text{Equation 6.15})$$

From Assumption 4.16 we have $\theta = 6^\circ$. Substituting this in Equation 6.15 results in:

$$\eta_0 = 2 \times 0.268 \text{ cm} \times \sin(6^\circ/2)$$

$$\eta_0 = 0.02805 \text{ cm}$$

Calculate the width of the rivulet

The rivulet width, l , is determined from Reference 8.10, Equation 27:

$$\frac{\mu Q \tan \alpha}{l \gamma} \sqrt{\frac{\rho g \sin \alpha}{\gamma}} = \frac{8}{3} \sin^3(\theta/2)$$

Rearranging the above equation to solve for l :

$$l = \frac{3 \mu Q \tan \alpha}{8 \gamma \sin^3(\theta/2)} \sqrt{\frac{\rho g \sin \alpha}{\gamma}} \quad (\text{Equation 6.16})$$

where:

l = rivulet width, cm

μ = dynamic liquid viscosity, g/cm.sec

Q = volume flow, cm³/sec

Substituting the values below into Equation 6.16 gives;

$$\alpha = 89.427^\circ$$

$$\gamma = 69.96 \text{ g/sec}^2 \quad (\text{Input 4.11})$$

$$\mu = 0.00681 \text{ g/cm.sec} \quad (\text{Input 4.11})$$

$$\rho = 0.993 \text{ g/cm}^3 \quad (\text{Input 4.11})$$

$$g = 980.7 \text{ cm/sec}^2$$

$$\theta = 6 \text{ degrees} \quad (\text{Assumption 4.16})$$

$$Q = 0.1 \text{ gph} = 0.1052 \text{ cm}^3 / \text{sec}$$

$$l = \frac{3 \cdot (0.00681 \text{ g/cmsec}) \cdot (0.1052 \text{ cm}^3 / \text{sec}) \cdot \tan(89.427 \text{ deg})}{8 \cdot (69.96 \text{ g/sec}^2) \cdot (\sin^3(6 \text{ deg}/2))} \sqrt{\frac{(0.993 \text{ g/cm}^3) \cdot (980.7 \text{ cm/sec}^2) \cdot \sin(89.427 \text{ deg})}{(69.96 \text{ g/sec}^2)}}$$

$$l = 9.99 \text{ cm}$$

The rivulet cross-sectional area is determined using the approximation that the wide flat rivulet is rectangular (rectangular cross section for the wide flat rivulet is noted in Ref. 8.10, p. 975), thus the area is defined as:

$$A = l \cdot \eta_0 \quad (\text{Equation 6.17})$$

Where:

A = rivulet area, cm^2

Substituting the values for l and η_0 :

$$A = 9.99 \text{ cm} \cdot 0.02805 \text{ cm}$$

$$A = 0.2802 \text{ cm}^2$$

With the volumetric flow rate known, the rivulet velocity, v , can be calculated from rearranging Equation 6.3:

$$v = Q / A \quad (\text{Equation 6.18})$$

Where:

$$Q = 0.1 \text{ gph} = 0.1052 \text{ cm}^3 / \text{sec}$$

$$v = \frac{0.1052 \text{ cm}^3 / \text{sec}}{0.2802 \text{ cm}^2}$$

$$v = 0.3754 \text{ cm/sec}$$

Calculate Dimensionless Flow and Rivulet Width

The method used in this calculation is from Reference 8.10 and is based on a dimensionless flow rate, Ω , and dimensionless stream width, P , along with other parameters. The following equations for the dimensionless parameters, P and Ω , are used to calculate these values (from Reference 8.10, p. 974, equation following equation 17 and the 3rd equation following equation 17, respectively).

$$P = l / a \quad (\text{Equation 6.19, Reference 8.10, equation 17})$$

where:

P = dimensionless width

l = rivulet width, cm

a = capillary constant, cm

The dimensionless rivulet width (P) is calculated using Equation 6.19 as follows:

$$P = 9.99 \text{ cm} / 0.268 \text{ cm} = 37.3$$

The Equation for Ω is defined in Reference 8.10 as:

$$\Omega = \frac{\mu \rho g Q}{\gamma^2} \cdot \tan \alpha \cdot \sin \alpha \quad (\text{Equation 6.20, Reference 8.10, equation 17})$$

where:

Ω = dimensionless flow rate

Q = volumetric flow rate, cm^3/sec

γ = liquid surface tension, dyne/cm ($= \text{g/sec}^2$)

ρ = liquid density, g/cm^3

g = gravitational acceleration = 980.7 cm/sec^2

α = angle of inclination (slope), degrees

The dimensionless flow rate (Ω) is calculated using Equation 6.18 and the values below:

$$\alpha = 89.427^\circ$$

$$\begin{aligned}\gamma &= 69.96 \text{ g/sec}^2 && \text{(Assumption 4.4)} \\ \mu &= 0.00681 \text{ g/cm.sec} && \text{(Assumption 4.4)} \\ \rho &= 0.993 \text{ g/cm}^3 && \text{(Assumption 4.4)} \\ g &= 980.7 \text{ cm/sec}^2 \\ Q &= 0.1 \text{ gph} = 0.1052 \text{ cm}^3/\text{sec}\end{aligned}$$

$$\Omega = \frac{0.00681 \text{ g/cm.sec} \times 0.993 \text{ g/cm}^3 \times 980.7 \text{ cm/sec}^2 \times 0.1052 \text{ cm}^3/\text{sec}}{69.96^2 \text{ g/sec}^2} \cdot \tan(89.427^\circ) \cdot \sin(89.427^\circ)$$

$$\Omega = 0.014$$

From Reference 8.10 (p. 977, Figure 5), the point at the coordinates of $\Omega = 0.014$ and $P = 37.3$ falls right on the asymptotic solutions for a wide rivulet close to $\theta = 5$ degrees. This confirms the assumption for a wide rivulet flow (Assumption 4.15).

Time to Flow to Sump

The time to sump is calculated for the sump with the longest rivulet travel distance. The distances from Input 4.1 are:

C3 cell (Rm A-B003): 13 ft + 27.25 ft = 40.25 ft

C5 cell (Rm A-B004): 21 ft + 29 ft = 50 ft

For the longest rivulet travel distance (the C5 cell), the time to flow to sump is determined from

$$t_1 = L / v / 3600 \text{ sec/ hr} \quad \text{(Equation 6.7)}$$

Where:

L = path length, = 50 ft (1,524 cm)

v = 0.3754 cm/sec (previously calculated)

$$t_1 = \frac{1,524 \text{ cm}}{0.3754 \text{ cm/s}} \cdot \frac{\text{hr}}{3600 \text{ s}}$$

$$t_1 = 1.13 \text{ hrs}$$

6.2.2 Time to Obtain a Detectable Sump Volume, t_2

The time to fill the detection device, t_2 , is calculated from the following equation

$$t_2 = \nabla / Q \quad \text{(Equation 6.11)}$$

Where:

t_2 = time to fill the, hr

∇ = volume to detection, gallons

Q = leak rate, 0.1 gph

The volumes of the different detecting devices are determined using the methodology shown below.

6.2.2.1 Detectable Volume of Round Sumps

A sketch is shown in Figure 1 to graphically depict the referenced dimensions for the round sumps with a 2:1 semi-ellipsoidal bottom head.

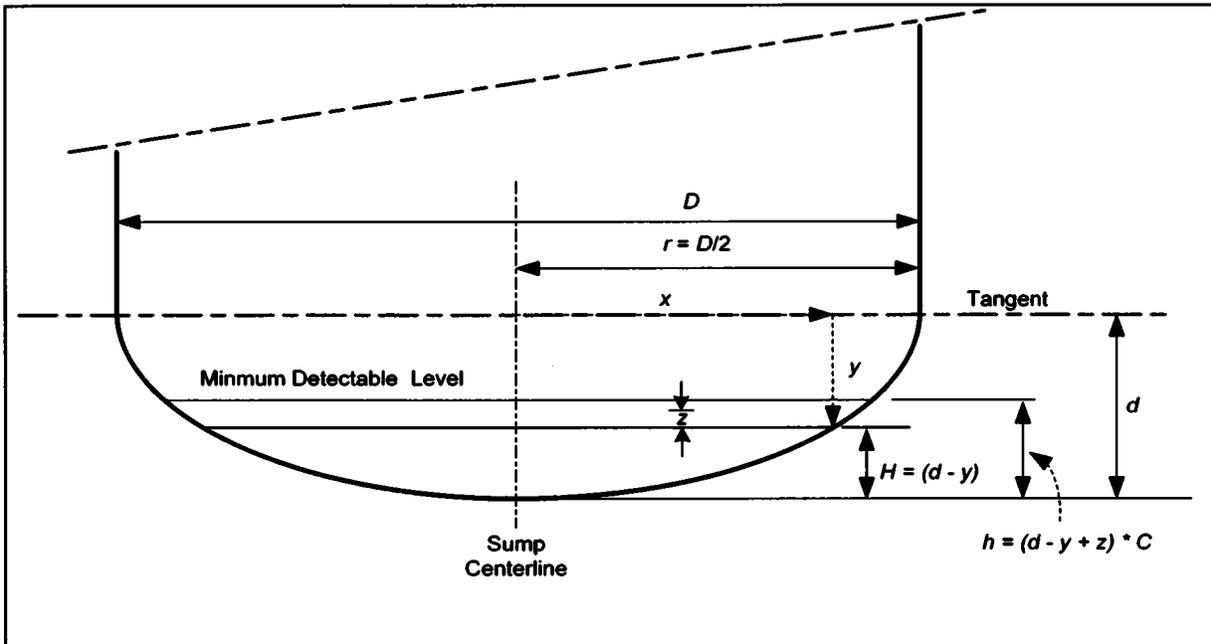


Figure 1. Sketch of 2:1 Semi-Ellipsoidal Head

The overall height of the semi-ellipsoidal head, d , is defined by (Ref. 8.25, p.5, equation 6-1):

$$d = 0.25 * D \quad (\text{Equation 6.21})$$

Where:

d = height of semi-ellipsoidal head (tangent to bottom of head), in
 D = inside diameter of semi-ellipsoidal head, in

The level indication for detecting a leak in the sump is assumed to have installation requirements noted in Assumption 4.20. Off-center level indication means that the liquid level needs to rise up the curvature of the sump (2:1 semi ellipsoidal head, Assumption 4.23) for detection. The height requirement for this installation is determined by calculating:

- the height of the ellipsoidal head at an off-center point, and
- adding the minimum accuracy of the instrument.

The height of the ellipsoidal head at an off-center point, y , is calculated using the following equation from Appendix B of Reference 8.25.

$$y = \frac{1}{2} \sqrt{r^2 - x^2} \quad (\text{Equation 6.22})$$

Where:

y = vertical distance from top (tangent) of semi-ellipsoidal head to off-center point, inch
 r = inside radius of ellipsoidal head, inch
 x = horizontal distance from center of semi-ellipsoidal head to off-center point, inch

The height requirement for minimum accuracy of the instrument, h , is then calculated from the following equation

$$h = (d - y + z) * C \quad (\text{Equation 6.23})$$

Where:

h = minimum height of liquid for leak detection in semi-ellipsoidal head, inch

d = height of semi-ellipsoidal head, inch

y = vertical distance from top of semi-ellipsoidal head to off-center point, inch

z = instrument accuracy, inch

C = margin, %

The minimum detectable volume in the sump is determined from the formula (Ref. 8.25, Equation 6-3, p.5) that relates depth in the ellipsoidal head to volume

$$\nabla = \pi D h^2 \left[1 - \frac{4h}{3D} \right] \quad (\text{Equation 6.24})$$

Where:

∇ = volume based on the liquid level h , cubic inches

h = minimum height of liquid for leak detection in sump, in

D = sump inside diameter, in

∇ in cubic inches is then converted to gallons with a conversion factor.

6.2.2.2 Detectable Volume of Leak Detection Boxes

The amount of leakage required to obtain a detectible volume in a LDB, cell sump, or pit sump is determined using the physical dimensions and other characteristics of the LDBs or sumps.

Each of the eight LAB LDBs consists of a horizontal NPS 8 Schedule 40 pipe with a NPS 8 cap on either end (Input 4.3). A detectable leakage volume is created by a 2-inch weir located in the middle of the LDB; the detectable leakage volume is the partial volume sum of the 11-inch horizontal pipe section (created by the weir), the straight portion of the cap, and the curved portion of the cap.

The partial volume of the horizontal pipe can be determined by the following equations (Appendix E of Ref. 8.8)

$$\Phi = \arccos\left(\frac{R-h}{R}\right) \quad (\text{Equation 6.25})$$

Where:

Φ = the angle (in radians) formed by the edge of the fluid free surface and the vertical plane at the cylinder centerline

$R = (1/2) d_o$ = inside pipe radius, ft

h = detectable liquid height, ft

Thermal dispersion instrumentation exists for all leak detection boxes (Input 4.10), therefore the detectable liquid height is set equal to the thermal dispersion accuracy.

$$\nabla_p = R^2 l \left[\left(\frac{\pi \Phi^3}{180} \right) - \sin \Phi \cos \Phi \right] \quad (\text{Equation 6.26})$$

Where:

∇_p = partial volume of the pipe, ft³

$R = (1/2) d_o$ = inside pipe radius, ft

l = cylindrical length of the detectable volume, ft

Φ° = the free surface angle, deg

The partial volume of the horizontal cap can be determined by the following equation (Appendix D of Ref. 8.8)

$$\nabla_h = \frac{\pi h^2(1.5d_o - h)}{12} \quad (\text{Equation 6.27})$$

The total volume is then just the sum of the individual volumes: $\nabla = \nabla_p + \nabla_h$

6.2.2.3 Detectable Volume of Pump Pit Sumps

The pump pit sumps are rectangular in nature (Input 4.6) and the detectable volume is calculated with

$$\nabla = L \times W \times h \quad (\text{Equation 6.28})$$

Where:

L = length of the trough, in

W = width of the trough, in

h = detectable liquid height, in

∇ is in cubic inches, it is then converted to gallons with a conversion factor.

Radar detection exists for the rectangular pit sumps (Input 4.10), therefore the detectable liquid height is set to equal the radar accuracy.

6.2.3 Time to Obtain a Detectable Vessel Cell Sump Volume, t_2

The curved head portion of the pipe cap that is used for the cell sump is approximated by a 2:1 semi-ellipsoidal head (Assumption 4.23). These round sumps contain the same dimensions; cap is NPS 30 (Input 4.6). The overall height of the 2:1 semi-ellipsoidal head, d , is defined as follows:

$$d = 0.25 * D \quad (\text{Equation 6.21})$$

$$D = 29.25 \text{ inch} \quad (\text{Reference 8.18, p. B-19 \& Input 4.6})$$

$$d = 0.25 * 29.25 \text{ inch}$$

$$d = 7.3 \text{ inch}$$

The height from the top (tangent) of the semi-ellipsoidal head to a point 8" off-center is determined by

$$y = \frac{1}{2} \sqrt{r^2 - x^2} \quad (\text{Equation 6.22})$$

Where:

$$r = D/2 = 14.6 \text{ inch}$$

$$x = 8 \text{ inch} \quad (\text{Assumption 4.20})$$

$$y = \frac{1}{2} \sqrt{14.6^2 - 8^2}$$

$$y = 6.1 \text{ inch}$$

The height requirement for minimum accuracy of the instrument, h , is then calculated from the following equation:

$$h = (d - y + z) * C \quad (\text{Equation 6.23})$$

Where:

$$d = 7.3 \text{ inch}$$

$$y = 6.1 \text{ inch}$$

$$z = 0.5 \text{ inch}$$

$$C = 1.10$$

$$h = (7.3 \text{ inch} - 6.1 \text{ inch} + 0.5 \text{ inch}) * 1.1$$

$$h = 1.87 \text{ inch}$$

(Input 4.10)

(Assumption 4.20)

The minimum detectable volume in the sump is then calculated by

$$V = \pi D h^2 \left[1 - \frac{4h}{3D} \right] \quad (\text{Equation 6.24})$$

Where:

$$D = 29.25 \text{ inch}$$

$$h = 1.87 \text{ inch}$$

$$V = \pi (29.25 \text{ in}) (1.87 \text{ in})^2 \left[1 - \frac{4(1.87 \text{ in})}{3(29.25 \text{ in})} \right]$$

$$V = 294 \text{ in}^3 = 1.27 \text{ gal}$$

The time for sump collection, t_2 , is calculated from

$$t_2 = V / Q \quad (\text{Equation 6.11})$$

$$t_2 = 1.27 \text{ gallons} / 0.1 \text{ gph} = 12.7 \text{ hrs}$$

6.2.4 Total Detection Time, t_{total}

The total detection time is the sum of the previously enumerated transport time and cell sump filling time:

$$t_{total} = t_1 + t_2$$

$$t_{total} = 1.13 \text{ hr} + 12.7 \text{ hr} \cong 13.8 \text{ hr}$$

6.3 Pit and Piping Sumps

The succeeding analysis determines the time to detect a leak in the C3/C5 Pump Pits and C5 Piping Pit.

6.3.1 Leakage Travel Time to Pit Sump, t_1

The time required for the leakage flow to travel from its point of origin to its respective pit sump is calculated by using the velocity for the rivulet determined in Section 6.2.1. The velocity can be used because the geometry (e.g. angle of inclination) and fluid properties are considered to be the same, thus the rivulet velocity will be the same.

The rivulet travel distances are determined from Input 4.2 and summarized below:

$$\text{C3 Pump Pit (Rm No. A-B002): } 13 \text{ ft} + 14.46 \text{ ft} = 27.46 \text{ ft}$$

$$\text{C5 Pump Pit (south, Rm No. A-B007): } 6.75 \text{ ft} + 6.42 \text{ ft} = 13.17 \text{ ft}$$

$$\text{C5 Piping Pit (Rm No. A-B006): } 6.75 \text{ ft} + 14 \text{ ft} = 20.75 \text{ ft}$$

$$\text{C5 Pump Pit (north, Rm No. A-B005): } 6.75 \text{ ft} + 6.42 \text{ ft} = 13.17 \text{ ft}$$

The longest path is 27.46 ft and this will be used in the calculation. The estimated time for the rivulet to travel is determined with

$$t_1 = L / v / 3600 \text{ sec} / \text{hr} \quad (\text{Equation 6.7})$$

Where:

$$L = 27.46 \text{ ft (837 cm)}$$

$$v = 0.3754 \text{ cm/sec} \quad (\text{Section 6.2.1})$$

$$t_1 = \frac{837 \text{ cm}}{0.3754 \text{ cm / sec}} \cdot \frac{\text{hr}}{3600 \text{ sec}}$$

$$t_1 = 0.62 \text{ hr}$$

6.3.2 Time to Obtain a Detectable Pit Sump Volume, t_2

Based on inspection of Input 4.7, the two largest pit sumps are in the C3 Pump Pit or the C5 Piping Pit. These sumps are identical in size. The detectable volume in the sump is determined from

$$V = L \times W \times h \quad (\text{Equation 6.28})$$

Where:

$$h = 0.5 \text{ inch} \quad (\text{Input 4.10})$$

$$L = 2 \text{ ft} \quad (\text{Table 4.4})$$

$$W = 2.5 \text{ ft} \quad (\text{Table 4.4})$$

$$V = 2.0 \text{ ft} \times 2.5 \text{ ft} \times 0.5 \text{ in} \times (144 \text{ in}^2/\text{ft}^2) \times (\text{gal}/231 \text{ in}^3) \cong 1.6 \text{ gal}$$

The time to detect this volume is

$$t_2 = V / Q \quad (\text{Equation 6.11})$$

$$t_2 = (1.6 \text{ gal}) * (\text{hr} / 0.1 \text{ gal}) = 16.0 \text{ hr}$$

6.3.3 Total Pit Sump Detection Time, t_{total}

The total detection time is the sum of the previously enumerated transport and pit sump filling delays:

$$t_{total} = t_1 + t_2$$

$$t_{total} = 0.62 \text{ hr} + 16.0 \text{ hr} \cong 16.6 \text{ hr}$$

The resultant value is less than 24 hr, therefore the permit condition is satisfied for the pit sumps.

7 Results and Conclusions

The results of this analysis are compiled in Table 7.1. This table is a comprehensive list of all leak detection devices considered in this analysis and demonstrates that the LAB LDBs, cell sumps, and pit sumps are capable of detecting a permit condition leakage rate of 0.1 gal/hr within a 24-hour period, thus the permit condition for LAB is satisfied.

Table 7.1 Analytical Laboratory Facility, Time to Leak Detection Capability

Description of Leak Detection Area	Sump or LDB	Time to Fill t_2 (hr) (Sect. 6.1.3, 6.2.2, 6.3.2)	Time to Sump t_1 (hr) (Sect. 6.1.2, 6.2.1, 6.3.1)	Time to Wet t_3 (hr) (Sect. 6.1.1)	Time to Detect t_{total} (hr)
C3 Rad Lab Sink Collection Header	RLD-LDB-00005	0.76	2.89	12.5	16.2
C5 Hotcell Collection Header to RLD-VSL-00165	RLD-LDB-00002	0.76	2.89	12.5	16.2
C3 Transfer Line to C5 RLD-VSL-00165	RLD-LDB-00004	0.76	2.89	12.5	16.2
C3 PVA Drain Header	RLD-LDB-00006	0.76	2.89	12.5	16.2
C3 Sample Receiving/ Shipping Drain Header	RLD-LDB-00008	0.76	2.89	12.5	16.2
C5 Glove Box Header	RLD-LDB-00009	0.76	2.89	12.5	16.2
C3 Spare Collection Header (RLD-WU-02301-S32B-02)	RLD-LDB-00011	0.76	2.89	12.5	16.2
C3 Maintenance Drain Header	RLD-LDB-00007	0.76	2.89	12.5	16.2
C5 Vessel Cell, A-B004	RLD-SUMP-00042	12.7	1.13	n/a	13.8
C3 Vessel Cell, A-B003	RLD-SUMP-00041	12.7	1.13	n/a	13.8
C3 Pump Pit, A-B003	RLD-SUMP-00045	16.0	0.62	n/a	16.6
C5 Pump Pit, A-B007	RLD-SUMP-00043A	16.0	0.62	n/a	16.6
C5 Pump Pit, A-B005	RLD-SUMP-00043B	16.0	0.62	n/a	16.6
C5 Piping Pit, A-B006	RLD-SUMP-00044	16.0	0.62	n/a	16.6

8 References

- 8.1 24590-WTP-DB-ENG-01-001, Rev. 7, Basis of Design
- 8.2 WA 7890008967. Dangerous Waste Permit (DWP). Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste at the Hanford Waste Treatment and Immobilization Plant.
- 8.3 24590-LAB-PER-M-02-002, Rev. 2, "Sump Data for LAB Facility," 8/20/2004
- 8.4 WAC 173-303-640. Tank Systems, Section 4, Containment and Detection of Releases in Dangerous Waste Regulations, Washington State Administrative Code.
- 8.5 Roberson, John A. and Clayton T. Crow, Engineering Fluid Mechanics, Houghton Mifflin Co., Boston, MA, 1975
- 8.6 24590-WTP-GPG-M-033, Rev. 4, Fire Water Floor Drain System
- 8.7 24590-WTP-M6C-M11T-00004, Rev. 1, Supporting Calculation for Fire Water Floor Drain System Design Guide
- 8.8 Moss, D., Pressure Vessel Design Manual, Gulf Publishing Co., Houston, TX (1987).

- 8.9** R.G. Hudson, The Engineers' Manual, John Wiley & Sons, 2nd Edition
- 8.10** Towell, G.D. and Rothfeld, L.B. 1966. *Hydrodynamics of Rivulet Flow*, *AIChE Journal*, Vol. 12, No. 5, p 972-980
- 8.11** Product Brochure for FCI level switch: <http://www.fluidcomponents.com/products/level-switches/flt93-series-level-switches/flt93f-level-switch>
- 8.12** 24590-WTP-3PS-JL10-T0002, Rev. 0, Engineering Specification for Radar Level Measurement
- 8.13** 2009 ASHRAE Handbook – Fundamentals
- 8.14** 24590-LAB-MX-RLD-00001, Rev. 1, Equipment Assembly - LAB Radioactive Liquid Waste Disposal System Secondary Containment Leak Detection Box
- 8.15** 24590-LAB-P1-60-00007, Rev. 3, Analytical Laboratory General Arrangement Plan at EL (-)19'-2", Section E-E, F-F & G-G
- 8.16** CCN 093156, E-Mail Message from Danielle Mathews to Roosevelt Molina, dated August 20, 2004, Subject: Fluor Daniel Northwest Calculation No. W314-P-039, Encasement Leak Detection, October 19, 1998
- 8.17** 24590-QL-BPO-DD00-00001-45-00033, Rev. B, DRAWING - ANALYTICAL LABORATORY C5 CELL SUMPS
- 8.18** "Flow of Fluids through Valves, Fittings, and Pipe", Technical Paper No. 410, Crane Co., 19

- 8.19 P&IDs**
 - 8.19.1** 24590-LAB-M6-RLD-00001001, Rev. 1, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C5 COLLECTION AND TRANSFER RLD-VSL-00165
 - 8.19.2** 24590-LAB-M6-RLD-00001002, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C5 COLLECTION AND TRANSFER RLD-PMP-00183A
 - 8.19.3** 24590-LAB-M6-RLD-00001003, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C5 COLLECTION AND TRANSFER RLD-PMP-00183B
 - 8.19.4** 24590-LAB-M6-RLD-00001004, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C5 COLLECTION AND TRANSFER VALVE PIT
 - 8.19.5** 24590-LAB-M6-RLD-00002001, Rev. 1, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3 COLLECTION & TRANSFER RLD-VSL-00164
 - 8.19.6** 24590-LAB-M6-RLD-00002003, Rev. 2, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3 COLLECTION & TRANSFER RLD-PMP-00182A/B
 - 8.19.7** 24590-LAB-M6-RLD-00006001, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3 RAD LAB COLLECTION
 - 8.19.8** 24590-LAB-M6-RLD-00006002, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3 RAD LAB COLLECTION
 - 8.19.9** 24590-LAB-M6-RLD-00006003, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3 RAD LAB COLLECTION
 - 8.19.10** 24590-LAB-M6-RLD-00007001, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C3 LEAK DETECTION BOXES
 - 8.19.11** 24590-LAB-M6-RLD-00008001, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM - C5 LEAK DETECTION BOXES

8.19.12 24590-LAB-M6-RLD-00008002, Rev. 0, P&ID - LAB RADIOACTIVE LIQUID WASTE DISPOSAL SYSTEM C5 DRAIN COLLECTION HEADERS

8.20 Piping Isometrics

8.20.1 24590-LAB-P3-RLD-WU02269051, REV. 1, RLD-WU-02269-W11B-4 - LAB FACILITY ISOMETRIC

8.20.2 24590-LAB-P3-RLD-WU02269052, REV. 1, RLD-WU-02269-W11B-4 - LAB FACILITY ISOMETRIC

8.20.3 24590-LAB-P3-RLD-WU02269053, REV. 1, RLD-WU-02269-W11B-4 - LAB FACILITY ISOMETRIC

8.20.4 24590-LAB-P3-RLD-WU02198051, REV. 1, RLD-WU-02198-W11B-4 - LAB FACILITY ISOMETRIC

8.20.5 24590-LAB-P3-RLD-WU02198052, REV. 1, RLD-WU-02198-W11B-6 - LAB FACILITY ISOMETRIC

8.20.6 24590-LAB-P3-RLD-WU02198053, REV. 1, RLD-WU-02198-W11B-6 - LAB FACILITY ISOMETRIC

8.20.7 24590-LAB-P3-RLD-WU02198054, REV. 1, RLD-WU-02198-W11B-6 - LAB FACILITY ISOMETRIC

8.20.8 24590-LAB-P3-RLD-WU02198055, REV. 2, RLD-WU-02198-W11B-6 - LAB FACILITY ISOMETRIC

8.20.9 24590-LAB-P3-RLD-WU02227051, REV. 0, RLD-WU-02227-W11B-6 - LAB FACILITY ISOMETRIC

8.20.10 24590-LAB-P3-RLD-WU02227052, REV. 0, RLD-WU-02227-W11B-6 - LAB FACILITY ISOMETRIC

8.20.11 24590-LAB-P3-RLD-WU02227053, REV. 1, RLD-WU-02227-W11B-6 - LAB FACILITY ISOMETRIC

8.20.12 24590-LAB-P3-RLD-WU02227054, REV. 0, RLD-WU-02227-W11B-6 - LAB FACILITY ISOMETRIC

8.20.13 24590-LAB-P3-RLD-WU02227055, REV. 1, RLD-WU-02227-W11B-6 - LAB FACILITY ISOMETRIC

8.20.14 24590-LAB-P3-RLD-WU02249001, REV. 1, RLD-WU-02249-S11E-1 - LAB FACILITY ISOMETRIC

8.20.15 24590-LAB-P3-RLD-WU02289051, REV. 3, RLD-WU-02289-S32B-6 - LAB FACILITY ISOMETRIC

8.20.16 24590-LAB-P3-RLD-WU02300052, REV. 1, RLD-WU-02300-S32B-10 - LAB FACILITY ISOMETRIC

8.20.17 24590-LAB-P3-RLD-WU02300053, REV. 1, RLD-WU-02300-S32B-10 - LAB FACILITY ISOMETRIC

8.20.18 24590-LAB-P3-RLD-WU02300054, REV. 0, RLD-WU-02300-S32B-10 - LAB FACILITY ISOMETRIC

8.20.19 24590-LAB-P3-RLD-WU02250001, REV. 1, RLD-WU-02250-S11E-1 - LAB FACILITY ISOMETRIC

8.21 Piping Material Class Sheets

- 8.21.1 24590-WTP-3PB-P000-TW11B, Rev 21, PIPING MATERIAL CLASSIFICATION PIPE CLASS W11B
- 8.21.2 24590-WTP-3PB-P000-TS32B, Rev 26, PIPING MATERIAL CLASSIFICATION PIPE CLASS S32B
- 8.21.3 24590-WTP-3PB-P000-TS11E, Rev 12, PIPING MATERIAL CLASSIFICATION PIPE CLASS S11E

8.22 Instrument Data sheets for Thermal Level Switches

- 8.22.1 24590-LAB-JLD-RLD-61180, Rev. 3, RLD-LSH-6118 - THERMAL LEVEL SWITCH
- 8.22.2 24590-LAB-JLD-RLD-61200, Rev. 3, RLD-LSH-6120 - THERMAL LEVEL SWITCH
- 8.22.3 24590-LAB-JLD-RLD-62150, Rev. 3, RLD-LSH-6215 - THERMAL LEVEL SWITCH
- 8.22.4 24590-LAB-JLD-RLD-67010, Rev. 3, RLD-LSH-6701 - THERMAL LEVEL SWITCH
- 8.22.5 24590-LAB-JLD-RLD-67020, Rev. 3, RLD-LSH-6702 - THERMAL LEVEL SWITCH
- 8.22.6 24590-LAB-JLD-RLD-67030, Rev. 3, RLD-LSH-6703 - THERMAL LEVEL SWITCH
- 8.22.7 24590-LAB-JLD-RLD-67040, Rev. 3, RLD-LSH-6704 - THERMAL LEVEL SWITCH
- 8.22.8 24590-LAB-JLD-RLD-68010, Rev. 3, RLD-LSH-6801 - THERMAL LEVEL SWITCH

8.23 Leak Detection Boxes

- 8.23.1 24590-CM-POA-PY00-00003-04-00009, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS
- 8.23.2 24590-CM-POA-PY00-00003-04-00010, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS
- 8.23.3 24590-CM-POA-PY00-00003-04-00011, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS
- 8.23.4 24590-CM-POA-PY00-00003-04-00012, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS
- 8.23.5 24590-CM-POA-PY00-00003-04-00013, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS
- 8.23.6 24590-CM-POA-PY00-00003-04-00014, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS
- 8.23.7 24590-CM-POA-PY00-00003-04-00015, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS
- 8.23.8 24590-CM-POA-PY00-00003-04-00016, Rev. D, DRAWING - LAB SECONDARY CONTAINMENT LEAK DETECTION BOX VESSEL WELDMENTS

8.24 Civil drawings

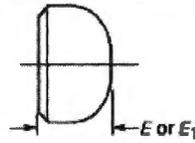
- 8.24.1 24590-LAB-DB-S13T-00018, Rev. 8, Analytical Laboratory C5 Cell Structural Concrete Forming Sections and Details
- 8.24.2 24590-LAB-DB-S13T-00019, Rev. 4, Analytical Laboratory C5 Cell Structural Concrete Forming Plans and Sections

- 8.24.3** 24590-LAB-DB-S13T-00020, Rev. 2, Analytical Laboratory C2 Vault and C3 Cell Structural Concrete Forming Plans and Sections
- 8.24.4** 24590-LAB-DB-S13T-00021, Rev. 2, Analytical Laboratory C2 Vault and C3 Cell Structural Concrete Forming Sections and Details
- 8.24.5** 24590-LAB-DD-S13T-00091, Rev. 0, ANALYTICAL LABORATORY C5 CELL CONCRETE EMBEDMENT GRILLAGE PLANS AND SECTIONS
- 8.24.6** 24590-LAB-DD-S13T-00092, Rev. 0, ANALYTICAL LABORATORY C5 CELL CONCRETE EMBEDMENT GRILLAGE SECTIONS AND DETAILS
- 8.24.7** 24590-LAB-DD-S13T-00093, Rev. 0, ANALYTICAL LABORATORY C3 CELL CONCRETE EMBEDMENT GRILLAGE PLANS AND SECTIONS
- 8.24.8** 24590-LAB-DD-S13T-00094, Rev. 0, ANALYTICAL LABORATORY C3 CELL CONCRETE EMBEDMENT GRILLAGE SECTIONS AND DETAILS
- 8.25** 24590-WTP-GPG-M-019, Rev. 4, Vessel Sizing
- 8.26** 24590-CD-POA-PY00-00009-04-00001, Rev. B, Drawing – Removable Weir Assembly
- 8.27** N/A
- 8.28** CCN 097799, Leak Detection Capability Scoping -Statement, Revision 6, 08/19/2004
- 8.29** 24590-LAB-M6C-RLD-00027, Rev. 1, LAB MINIMUM LEAK RATE, DETECTION CAPABILITIES FOR CELL SUMPS, PIT SUMPS, AND LEAK DETECTION BOXES

Attachment A Pipe Cap Dimensions

ASME B16.9-2007

Table 10 Dimensions of Caps



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Length, E [Note (1)]	Limiting Wall Thickness for Length, E	Length, E ₁ [Note (2)]
1/2	21.3	25	4.57	25
3/4	26.7	25	3.81	25
1	33.4	38	4.57	38
1 1/4	42.2	38	4.83	38
1 1/2	48.3	38	5.08	38
2	60.3	38	5.59	44
2 1/2	73.0	38	7.11	51
3	88.9	51	7.62	64
3 1/2	101.6	64	8.13	76
4	114.3	64	8.64	76
5	141.3	76	9.65	89
6	168.3	89	10.92	102
8	219.1	102	12.70	127
10	273.0	127	12.70	152
12	323.8	152	12.70	178
14	355.6	165	12.70	191
16	406.4	178	12.70	203
18	457.0	203	12.70	229
20	508.0	229	12.70	254
22	559.0	254	12.70	254
24	610.0	267	12.70	305
26	660.0	267	...	...
28	711.0	267	...	...
30	762.0	267	...	...
32	813.0	267	...	...
34	864.0	267	...	...
36	914.0	267	...	...
38	965.0	305	...	...
40	1 016.0	305	...	...
42	1 067.0	305	...	...
44	1 118.0	343	...	...
46	1 168.0	343	...	...
48	1 219.0	343	...	...

GENERAL NOTES:

- (a) All dimensions are in millimeters.
- (b) The shape of these caps shall be ellipsoidal and shall conform to the requirements given in the ASME Boiler and Pressure Vessel Code.

NOTES:

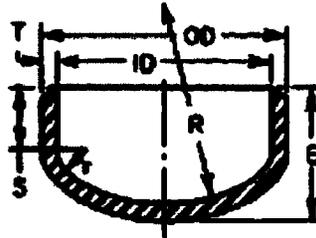
- (1) Length E applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length, E."
- (2) Length E₁ applies for thickness greater than that given in column "Limiting Wall Thickness" for NPS 24 and smaller. For NPS 26 and larger, length E₁ shall be by agreement between the manufacturer and purchaser.



PIPING COMPONENTS

A.79

TABLE A2.15 Dimensions of Typical Commercial Butt-Welding Standard Caps (ASME B16.9-1993 Except as Noted)



Nominal pipe size	Outside diameter (OD)	Inside diameter (ID)	Wall thickness T	Length E	Tangent S	Dish radius R	Knuckle radius r	Pipe schedule number*	Weight (approx) (lb)
½	0.840	0.622	0.109	1	0.74	0.54	0.10	40	0.1
¾	1.050	0.824	0.113	1¼	0.93	0.72	0.14	40	0.2
1	1.315	1.049	0.133	1¼	1.10	0.92	0.17	40	0.3
1¼	1.660	1.390	0.140	1¼	1.02	1.35	0.23	40	0.4
1½	1.900	1.610	0.145	1¼	0.95	1.41	0.27	40	0.4
2	2.375	2.067	0.154	1¼	0.83	1.81	0.34	40	0.6
2½	2.875	2.469	0.203	1¼	0.68	2.15	0.41	40	0.9
3	3.500	3.068	0.216	2	1.02	2.69	0.51	40	1.4
3½	4.000	3.548	0.226	2¼	1.39	3.11	0.59	40	2.1
4	4.500	4.026	0.237	2¼	1.26	3.52	0.67	40	2.5
5	5.563	5.047	0.258	3	1.48	4.42	0.84	40	4.2
6	6.625	6.065	0.280	3¼	1.70	5.31	1.01	40	6.4
8	8.625	7.981	0.322	4	1.68	6.98	1.33	40	11.3
10	10.750	10.020	0.365	5	2.13	8.77	1.67	40	20.0
12	12.750	12.000	0.375	6	2.62	10.50	2.00	Δ†	29.5
14	14.000	13.250	0.375	6¼	2.81	11.60	2.21	30	35.3
16	16.000	15.250	0.375	7	2.81	13.34	2.54	30	44.3
18	18.000	17.250	0.375	8	3.31	15.08	2.88	Δ†	57
20	20.000	19.250	0.375	9	3.81	16.84	3.21	20	71
22	22.000	21.250	0.375	10	4.31	18.60	3.54	20	86
24	24.000	23.250	0.375	10¼	4.31	20.35	3.88	20	102
26	26.000	25.250	0.375	10¼	3.81	22.10	4.21	Δ†	110
28	28.000	27.250	0.375	10¼	3.31	23.85	4.54	Δ†	120
30	30.000	29.250	0.375	10¼	2.81	25.60	4.88	Δ†	125
32	32.000	31.250	0.375	10¼	2.31	27.35	5.21	Δ†	145
34	34.000	33.250	0.375	10¼	1.81	29.10	5.54	Δ†	160
36	36.000	35.250	0.375	10¼	1.31	30.85	5.88	Δ†	175
42	42.000	41.250	0.375	12	1.31	36.10	6.88	Δ†	230

* Pipe schedule numbers in accordance with ASME B36.10M.
† This size and thickness does not correspond with any schedule number.

**WASTE TREATMENT AND IMMOBILIZATION PLANT
APPENDIX 13.0
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Appendices	Modification Date	Modification Number
Appendix 13.0	05/16/2019	24590-BOF-PCN-ENV-18-001 (8C.2019.Q2)
Appendix 13.1	09/05/2017	8C.2017.6F
Appendix 13.2	05/17/2018	8C.2018.2F
Appendix 13.3		
Appendix 13.4	01/31/2018	8C.2017.7F
Appendix 13.5		
Appendix 13.6	05/16/2019	24590-BOF-PCN-ENV-18-001 (8C.2019.Q2)
Appendix 13.7	08/23/2018	8C.2018.4F
Appendix 13.8		
Appendix 13.9	08/23/2018	8C.2018.4F
Appendix 13.10		
Appendix 13.11	08/23/2018	8C.2018.4F
Appendix 13.12		
Appendix 13.13	05/17/2018	8C.2018.2F
Appendix 13.14		
Appendix 13.15		
Appendix 13.16		
Appendix 13.17		
Appendix 13.18	09/05/2017	8C.2017.6F

This page intentionally left blank.

1
2
3
4
5

OPERATING UNIT GROUP 10
APPENDIX 13.0

1
2
3
4
5

This page intentionally left blank.

OPERATING UNIT GROUP 10
APPENDIX 13.0

1
2
3
4
5
6
7
8
9
10
11
12
13

Where information regarding treatment, management, and disposal of the radioactive source, byproduct material, and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954, as amended) has been incorporated into this permit, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit and [chapter 70.105 Revised Code of Washington](#) (RCW). In the event of any conflict between Permit Condition III.10.A and any statement relating to the regulation of source, special nuclear, and byproduct material contained in portions of the permit application that are incorporated into this permit, Permit Condition III.10.A will prevail.

1
2
3
4
5

This page intentionally left blank.

DRAWINGS AND DOCUMENTS
OPERATING UNIT GROUP 10 – APPENDIX 13.6
EFFLUENT MANAGEMENT FACILITY MECHANICAL DIAGRAMS

The documents listed in the following table are incorporated by reference into this permit and are subject to the requirements set forth in Part I Standard Conditions, Part II General Facility Conditions, and Part III Operating Unit Group 10 Conditions. Upon request, copies of the documents can be viewed at the Nuclear Waste Program Resource Center located at 3100 Port of Benton Blvd., Richland, WA. Appointments for viewing can be scheduled by calling (509) 372-7950.

Drawing/Document Number	Description
24590-CM-POA-MVSC-00005-07-00001, Rev 00D	Equipment Assembly Low-Point Drain Vessel DEP-VSL-00001, Sheet 3 of 23 and Sheet 4 of 23
24590-CM-POA-MVSC-00005-07-00002, Rev 00C	Equipment Assembly Evaporator Feed Vessel DEP-VSL-00002, Sheet 3 of 18 and Sheet 4 of 18
24590-CM-POA-MVSC-00005-07-00003, Rev 00D	Equipment Assembly Evaporator Concentrate Vessel DEP-VSL-00003A, Sheet 3 of 18 and Sheet 4 of 18
24590-CM-POA-MVSC-00005-07-00004, Rev 00C	Equipment Assembly Evaporator Concentrate Vessel DEP-VSL-00003B, Sheet 3 of 18 and Sheet 4 of 18
24590-CM-POA-MVSC-00005-07-00005, Rev 00C	Equipment Assembly Evaporator Concentrate Vessel DEP-VSL-00003C, Sheet 3 of 18 and Sheet 4 of 18
24590-CM-POA-MVSC-00007-02-00001, Rev 00C	Equipment Assembly Overhead Sampling Vessel DEP-VSL-00004A, Sheet 1 of 6 and Sheet 2 of 6
24590-CM-POA-MVSC-00007-02-00002, Rev 00C	Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005B, Sheet 1 of 13, Sheet 2 of 13, Sheet 3 of 13, and Sheet 4 of 13
24590-CM-POA-MVSC-00007-02-00003, Rev 00B	Equipment Assembly Overhead Sampling Vessel DEP-VSL-00004B, Sheet 1 of 6 and Sheet 2 of 6
24590-CM-POA-MVSC-00007-02-00004, Rev 00B	Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005A, Sheet 1 of 13, Sheet 2 of 13, Sheet 3 of 13, and Sheet 4 of 13
24590-CM-POA-MEVV-00003-05-00002, Rev 00D	Equipment Assembly DEP Evaporator Separator Vessel DEP-EVAP-00001, Sheet 2 of 6 and Sheet 5 of 6
24590-CM-POA-MEVV-00003-05-00003, Rev 00C	Equipment Assembly DEP Evaporator Reboiler DEP-RBLR-00001, Sheet 2 of 4 and Sheet 3 of 4
24590-CM-POA-MEP0-00006-04-00004, Rev 00A	Equipment Assembly for Heat Exchanger DEP-HX-00001
24590-CM-POA-MEVV-00003-05-00001, Rev 00C	Equipment Assembly DEP Evaporator Primary Condenser DEP-COND-00001, Sheet 2 of 5 and Sheet 3 of 5

Drawing/Document Number	Description
24590-CD-POA-MEE0-00004-02-00001, Rev 00C	Equipment Assembly DVP HEPA Filter Preheater Skid DVP-HTR-00001A/B
24590-CD-POA-MA00-00001-02-00003, Rev 00C	Equipment Assembly DVP Exhauster DVP-EXHR-00001A/B, Sheet 1 of 3
24590-CM-POA-ME00-00003-04-00004, Rev 00C	Equipment Assembly for Inter-Condenser DEP-COND-00002, Sheet 2 of 3 and Sheet 3 of 3
24590-CM-POA-ME00-00003-04-00001, Rev 00C	Equipment Assembly for After-Condenser DEP-COND-00003, Sheet 2 of 3 and Sheet 3 of 3
24590-CD-POA-MKH0-00018-05-00003, Rev 00C	Equipment Assembly DVP HEPA Housings DVP-HEPA-00003A/B and DVP-HEPA-00004A/B, Sheet 1 of 3, Sheet 2 of 3, and Sheet 3 of 3
24590-CM-POA-MLF0-00005-05-00004, Rev 00C	Equipment Assembly for Evaporator Feed Prefilter DEP-FILT-00003, Sheet 1 of 3
24590-BOF-MVD-DEP-00002, Rev 2	Mechanical Data Sheet for Low-Point Drain Vessel DEP-VSL-00001
24590-WTP-SDDR-MS-17-00118	Supplier Deviation Disposition Request – EMF Process Vessels – Applying Corrosion/Erosion Allowance to Internal Vessel Components and Design Life Analysis Exception
24590-CM-POA-MVSC-00005-09-00007, Rev 00B	Mechanical Data Sheet for Evaporator Feed Vessel DEP-VSL-00002
24590-WTP-SDDR-MS-17-00106	Supplier Deviation Disposition Request – EMF Process Vessels – Substitute Seamless Pipe with Welded Pipe
24590-CM-POA-MVSC-00005-09-00005, Rev 00C	Mechanical Data Sheet for Evaporator Concentrate Vessel DEP-VSL-00003A/B/C
24590-WTP-SDDR-MS-17-00128	Supplier Deviation Disposition Request – Educator Configuration for DEP-VSL-00003A/B/C
24590-CM-POA-MVSC-00007-08-00002, Rev 00B	Mechanical Data Sheet for Overhead Sampling Vessel DEP-VSL-00004A/B
24590-CM-POA-MVSC-00007-08-00001, Rev 00B	Mechanical Data Sheet for Process Condensate Lag Storage Vessel DEP-VSL-00005A/B
24590-WTP-SDDR-MS-18-00024	Supplier Deviation Disposition Request – Remove Not-to-Exceed Values from DEP-VSL-00004A/B and DEP-VSL-00004A/B Datasheets
24590-BOF-MKD-DVP-00003, Rev 2	Mechanical Data Sheet for Process Ventilation Exhaust HEPA Filter and Housing DVP-HEPA-00003A/B
24590-BOF-MKD-DVP-00004, Rev 2	Mechanical Data Sheet for Process Ventilation Exhaust HEPA Filter and Housing DVP-HEPA-00004A/B

Drawing/Document Number	Description
24590-WTP-SDDR-MS-17-00065	Supplier Deviation Disposition Request – DVP HEPA Filter Housing Closure Knob Material Change
24590-BOF-MVD-DEP-00009, Rev 1	Mechanical Data Sheet for Evaporator Separator Vessel DEP-EVAP-00001
24590-BOF-MEN-DEP-00001	Material Change for DEP-EVAP-00001 and DEP-RBLR-00001 Body Flanges and Location Change for DEP-EVAP-00001 Trunnions
24590-WTP-SDDR-MS-17-00056	Supplier Deviation Disposition Request – DEP-EVAP-00001 Nozzle N06 Material
24590-WTP-SDDR-MS-17-00097	Supplier Deviation Disposition Request – DEP-EVAP-00001 and DEP-RBLR-00001 Nozzle Materials
24590-BOF-MBD-DEP-00001, Rev 1	Mechanical Data Sheet for Evaporator Reboiler DEP-RBLR-00001
24590-BOF-M0N-DEP-00001	Updating Corrosion Allowance for DEP Evaporator Reboiler and DEP Evaporator Primary Condenser Data Sheets
24590-WTP-SDDR-MS-17-00135	Supplier Deviation Disposition Request – Exceeding NTE Weight for DEP-RBLR-00001
24590-BOF-MED-DVP-00001, Rev 1	Mechanical Data Sheet for Process Ventilation HEPA Preheater DVP-HTR-00001A/B
24590-BOF-MAD-DVP-00001, Rev 1	Mechanical Data Sheet for Process Ventilation Exhauster DVP-EXHR-00001A/B
24590-WTP-SDDR-MS-18-00004	Supplier Deviation Disposition Request for NTE (Not to Exceed) Weight
24590-BOF-MED-DEP-00001, Rev 0	Mechanical Data Sheet for Plate and Frame Heat Exchanger DEP-HX-00001
24590-WTP-SDDR-MS-17-00140	Supplier Deviation Disposition Request – Design Pressure and Temperature for Plate and Frame Heat Exchangers
24590-BOF-MED-DEP-00004, Rev 1	Mechanical Data Sheet for Evaporator Primary Condenser DEP-COND-00001
24590-BOF-MED-DEP-00005, Rev 1	Mechanical Data Sheet for Evaporator Inter-Condenser DEP-COND-00002
24590-WTP-SDDR-MS-17-00131	Supplier Deviation Disposition Request – Exceeding NTE Dimensions and Weights for DEP-COND-00002 and -00003 and Using 300# Flanges for DEP-EJCTR-00001A/B and -00002A/B
24590-WTP-SDDR-MS-17-00139	Supplier Deviation Disposition Request for SA-312 Instead of SA-240 for DEP-COND-00002 and -00003 Shell and Channel

Drawing/Document Number	Description
24590-BOF-MED-DEP-00006, Rev 1	Mechanical Data Sheet for DEP Evaporator After-Condenser DEP-COND-00003
24590-CM-POA-MLF0-00005-08-00001, Rev 00E	Mechanical Data Sheet for Evaporator Feed Pre-Filter DEP-FILT-00003
RESERVED	RESERVED

- 1
- 2 Source documents (which do not include a "P" in the last set of numbers, e.g. "-P0001," or "-TP001")
- 3 should be used in conjunction with any document change notices issued against them.
- 4 We are currently transitioning from permit documents (which do include a "P" in the last set of numbers)
- 5 to source documents. At the end of the transition period, permit submittals will contain source documents
- 6 and will be incorporated into the permit as described in Ecology Publication #07-05-006.



WTP Supplier Document Review Coversheet

NOTE: Contains no restrictive markings.

Submittal No.: 24590-CM-POA-MLF0-00005-08-00001		Revision: 00E	Comments Due: 5/7/2018
<input type="checkbox"/> Cancelled <input type="checkbox"/> Superseded		Component Tag Numbers:	
RE / POC: Erica Poberezny		Date: 5/2/2018	
RE Comments / Notes: No comments		<input type="checkbox"/> None	
Document Status: <input type="checkbox"/> On Document <input checked="" type="checkbox"/> Note Below		<input checked="" type="checkbox"/> Listed Below	
<i>This section is only needed if document does not have a sticker. Mark the appropriate box above.</i>		DEP-FILT-00003	
		G-321-E Document Category(ies): 3.0	
Supplier Document Status:			
<input checked="" type="checkbox"/> Status 1 - Work may proceed.			
<input type="checkbox"/> Status 2 - Revise and resubmit. Work may proceed subject to resolution of indicated comments.			
<input type="checkbox"/> Status 3 - Revise and resubmit. Work may not proceed.			
<input type="checkbox"/> Status 4 - Review not required. Work may proceed.			
Permission to proceed does not constitute approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.			
Supersedes Document No. (when applicable): N/A		Revision: N/A	
Originator By: Jung Shin - jwshin1 Org Name: Bechtel National, Inc. Placed: May 03, 2018			
Accepted by/ Responsible Engineer: Jung Shin <i>Print Name</i>		<i>Signature</i>	
Supervisor: Youssef Mohammad-Zadeh <i>Print Name</i>		<i>Signature</i> <i>Date</i> 5/4/18	
Released by (when applicable): <i>Print Name</i>		<i>Signature</i> <i>Date</i>	
Design Changes Incorporated/Method: <input checked="" type="checkbox"/> N/A			
WTP Document Number	Design Change	Reference	WTP Document Number
N/A	<input type="checkbox"/>	<input type="checkbox"/>	N/A
N/A	<input type="checkbox"/>	<input type="checkbox"/>	N/A
DISTRIBUTION (see instructions for mailbox addresses)			
Indicate the facility/facilities, if applicable: <input type="checkbox"/> LAW <input type="checkbox"/> BOF <input type="checkbox"/> LAB <input type="checkbox"/> HLW <input type="checkbox"/> PTF			Program: <input checked="" type="checkbox"/> DFLAW
Group: NSE See note below: Print Name: Reviewed No Comments Signature: Reviewed No Comments Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review	Group: Print Name: Signature: Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review
Group: Print Name: Signature: Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review	Group: Print Name: Signature: Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review
Group: Print Name: Signature: Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review	Group: Print Name: Signature: Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review

NOTE: N/A-10 Item 8: No SE document required since this vendor submittal conforms to design specifications and requirements provided to the vendor for the procurement of the SSC. Kamlesh Kuamr 05/02/2018.



	A	B	C	D	E	F	G	H	I	J	K	L								
1	 <p style="text-align: center;">Mechanical Data Sheet: Evaporator Feed Pre-Filter</p>							Component No: 24590-BOF-PY-DEP-FILT-00003												
2								River Protection Project Waste Treatment Plant					Data Sheet No: 24590-BOF-PYD-DEP-00002				Rev: 1			
3													Project:	RPP-WTP						
4													Project No:	24590						
5													Project Site:	DOE Hanford						
6													System:	DEP						
7	Building:	25																		
8	Description: Evaporator Feed Pre-Filter																			
14	General/Reference Data																			
16	Parameter			Description				Remarks												
17	Quality Level			CM																
18	Seismic Category			SC-IV																
19	Safety Class			Non-Safety																
21	Design Data																			
22	Parameter			Description				Remarks												
23	Housing Manufacturer / Model			AVANTech Incorporated / 1714-3000																
24	Number of Filter Elements per Unit			151																
25	Element Dimensions (Dia & Length)			1.375" D x 32.08" L																
26	Element Housing Material			ASME SB688 / UNS N08367 (AL-6XN)																
27	Filter Element Manufacturer/Model			AVANTech Inc. / 1714-3010 - Filtrex / 150MF-30-XMR																
28	Filter Element Nominal or Absolute Mean Particle Diameter Capture			5 micron				Reference 16, Section 6.5.5 indicates that piping with particles less than 11 microns and with less than 2 wt% solids is expected to have no erosion. Therefore 5 micron is picked in order to be bounding.												
30	Efficiency (% @ 5 microns)			95*																
31	Maximum Design Flow (gpm)			162				Ref. 10, Section 7.4.3.2, rounded up from 161.8 gpm (See Note 5)												
32	Minimum flowrate (gpm)			10																
33	Minimum pressure required to hold filtered material on the filter media during filtration			1 psi																
34	Batch Volume, Max (gal)			16,000				Ref. 4, Section 8 (See Note 10)												
35	Clean ΔP @ Design Flow (psi)			3																
36	Maximum Dirty ΔP @ Design Flow (psi)			<20				Pressure drop through the filter shall not exceed 20 psi per Ref. 13												
37	Backwash Duration (seconds)			<10				Backwash duration shall not exceed 60 sec.												
38	Number of Units			1																
39	Vessel Pressure (psig)		Op/Max/Design	129 / 173 / 195				(Note 3)												
40	Vessel Temperature (°F)		Op/Max/Design	142 / 166 / 195				(Note 3)												
41	Filter Vessel Lid Bolt Material			316SS - Bolts ASME A193 Gr B8M / Nuts ASME A194 Gr 8M				(Note 2)												
42	Lid Seat Material			UNS N08367 (AL-6XN) - ASME SB462				(Note 2)												
43	Filter Element Material			Mineral Filled Polypropylene																
44	Filter Element Seal Material			N/A				(Note 2)												
45	Design Code			ASME BPVC Section VIII, Div. 1																
46	Code Stamp			ASME U																
47	NB Registraton			Yes																
48	Corrosion/Erosion Allowance (inch)			0.04				Ref. 16, Section 7.1.1												
49	Filter Dimensions / Envelope Dimensions			47-1/8" Diameter x 82-7/8" Height / 53-1/2" x 82-7/8"				Not-to-exceed dimensions: 48" Diameter (Flg Face to Flg Face) x 84" Height Not-to-exceed envelope dimensions: 48" x 126" (Note 13)												
50	Filter Dry Weight / Wet Weight (lbs)			5,018 / 8,030																
51	Connecting Piping Class, Nozzle Location and Schedule																			
53	Piping connections (Ref. 1)		Pipe NPS Size	Material	Pipe Class	Nozzle Location	Nozzle SCH/Rating	Connecting Type												
54	Inlet (N05) (Unfiltered Process Fluid)		3"	UNS N08367 (AL-6XN)	150	Bottom	80S	RF												
55	Inlet (N09) (Unfiltered Process Fluid)		2"	UNS N08367 (AL-6XN)	150	Bottom	80S	RF												
56	Inlet (N10) (Unfiltered Process Fluid)		1"	UNS N08367 (AL-6XN)	150	Bottom	80S	RF												
57	Inlet (N06) (Process Service Air for Backwash)		2"	UNS N08367 (AL-6XN)	150	Top	80S	RF												
58	Outlet (N02) (Filtered Process Fluid)		3"	UNS N08367 (AL-6XN)	150	Top Half	160	RF												
59	Outlet (N03) (Backwash Drain)		3"	UNS N08367 (AL-6XN)	150	Bottom	80S	RF												
60	Spare (N08)		3/4"	UNS N08367 (AL-6XN)	150	Top	160	RF												
61	Pressure Transmitter (N01)		1"	UNS N08367 (AL-6XN)	150	Bottom Half	80S	RF												
62	Level Transmitter (N04)		3"	UNS N08367 (AL-6XN)	150	Top	80S	RF												

	A	B	C	D	E	F	G	H	I	J	K	L
63	Stream flows and fluid characteristics			SBS Condensate (enters N05), Note 11	Lab RLD Vessels (enters N05)	Evaporator Concentrate (enters N10)	Low Point Drain Vessel (enters N09)	Low Point Drain Sump Pump (enters N09)				
64	Operational Mode			Normal (Design Case)	Normal	Off-Normal	Normal	Off-Normal				
65	Flow, GPM			161.8 (Ref. 10, Note 4)	109.1 (Ref. 10, Note 4)	9 (Ref. 13, p. F-7)	70 (Ref. 14, p. 25)	45 (Ref. 9, p. 20)				
66	Suspended Solids (wt%) (Note 10)			0.1-3.0 (Ref. 6, p. B-25)	Negligible < 1 mg/L (Ref. 12, p. 183)	3.4 (Ref. 13, p. 13)	3.4 (Ref. 14, p. 21)	3.4 (Ref. 14, p. 21, Note 14)				
67	Total Solids (wt%)			0.8-4.3 (Ref. 6, p. B-25)	0-0.14 (Ref. 5, p. 14)	19.5 (Note 12)	3.4 (Ref. 14, p. 21)	3.4 (Ref. 14, p. 21, Note 14)				
68	pH			2-13.5 (Ref. 6, p. B-25)	6-8 (Ref. 12, p. 183)	10.3-12.43 (Ref. 15, pg 11, Ref. 11, pg. A-9)	12.27 (Ref. 11, pg. A-4)	12.27 (Ref. 11, pg. A-4, Note 14)				
69	Na ⁺ Molarity (M)			0.1-0.2 (Ref. 6, p. B-25)	0.025 (Ref. 12, p. 182)	-	-	-				
70	Density (lb/ft ³)			62.4-63.7 (Ref. 6, p. B-25)	62.4 (Ref. 12, p. 183)	61.2-84.3 (Ref. 20, p. 18)	61.7-68.6 (Ref. 21, p. 25)	61.7-68.6 (Ref. 21, p. 25, Note 14)				
71	Viscosity (cP)			0.5 (Ref. 6, p. B-25)	-	0.4-15 (Ref. 20, p. 18)	0.54-2.5 (Ref. 21, p. 25)	0.54-2.5 (Ref. 21, p. 25, Note 14)				
72	Total Integrated Dose (Rad)			1.2E+06				(Note 6)				
73	Plant Service Air (PSA) Normal Pressure (psig)			100 (Ref. 22, Section 8.1)				To be used for backwashing filter.				
74	Valves			Number / Make / Type								
75	Manual/Auto isolation			By others								
76	Check			By others								
77	Pressure relief			By others								
78	Instrument isolation			By others								
79	Instrumentation			Number / Make / Type								
80	Pressure transmitter			By others								
81	Level transmitter			By others								
82	Coatings			Type								
83	Skid and support steel			N/A								
84	Other			N/A								
85	Notes											
86												
87	Notes:											
88	1. Supplier to fill in data where indicated with double asterisk (**). Data from Supplier's proposal indicated with asterisk (*). Supplier to confirm all data.											
89	2. All materials shall be fully identified by ASME/ASTM standard and type/grade or UNS.											
90	3. Operating, maximum, and design pressures and temperatures are per Ref. 2 with no additional margin.											
91	4. No margin added to the design flows for the LAW pumps, RLD-PMP-00003A/B and the LAB pumps, RLD-PMP-00182A/B from Ref. 10.											
92	5. Only one of the three inlet nozzles is in use for unfiltered process fluid at a given time.											
93	6. Dose rate is based on process stream, DEPO2 in Ref. 7 (pg. 38). Using total average contact dose rate, DEPO2 contact dose rates for 5 years is 26.8 rad/hr. Over 5 years, this yields a Total Integrated Dose of 26.8 rad/hr x 8760 hr/yr x 5yr = 1.2E+06 rad.											
94	7. Revised to conform with Supplier's offering and update data and references to align with latest design information, where necessary. There are no applicable EIEs.											
95	8. The contents of this document are Dangerous Waste Permit affecting.											
96	9. 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.											
97	10. Filter shall be designed to process 16,000 gallons of process fluid with a solids loading of 0.1 wt% before requiring a back wash.											
98	11. This stream consists of RLD21 from RLD-VSL-00005 and RLD27 from vessel RLD-VSL-00003 (Ref. 6, pg. 5-6).											
99	12. The total solids in the evaporator concentrate vessels is derived from Ref. 17, page 56. For conservatism the No Leach column of the High SO ₄ _TOC_Pb_Hg stream is used and the concentration of all species is added up. This results in a total percentage of 19.5 wt% (rounded to the nearest 1/2 percent). This value includes both dissolved and suspended solids.											
100	13. Envelope dimensions include headspace necessary to lift the top off the vessel during maintenance. This is assumed to be approximately 1/2 the height of the vessel.											
101	14. Low Point Drain Vessel Area Sump contents are assumed to have the same properties as the Low Point Drain Vessel.											
102	Equipment Cyclic Data Sheet (Ref. 23)											
103	Component Plant Item Number	24590-BOF-PY-DEP-FILT-00003										
104	Component Description	Evaporator Feed Pre-Filter										
105		The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.										
106	Materials of Construction	UNS N08367 (AL-6XN)										
107	Design Life	40 years										
108	Component Function and Life Cycle Description	The function of this vessel is to filter various effluents including SBS condensate and evaporator concentrate to a particle diameter of 5 micron.										
109												
110	Load Type		Min	Max	Number of Cycles	Comment						
111	Design Pressure	psig	FV	195	10							
112	Operating Pressure	psig	-0.04	173	32,120	Number of cycles shown has been increased by 10% from design documentation to account for commissioning.						
113	Operating Temperature	"F	59	166	32,120	Number of cycles shown has been increased by 10% from design documentation to account for commissioning.						
114	Contents Specific Gravity	-	0.976	1.10	32,120	Number of cycles shown has been increased by 10% from design documentation to account for commissioning.						
115	Contents Level	inch	N/A	N/A	N/A							
116												
117	Localized Features											
118	Nozzles	N/A										
119	Supports	N/A										

	A	B	C	D	E	F	G	H	I	J	K	L
120	Revision History											
121	Rev.	Description	Originator	Checker	MET Review	Approver	Date					
122	0	Issued for Purchase (Note 7)	E. Poberezny	J. Shin	D. Adler	Y. Mohammad-Zadeh	5/16/2017					
123	1	Revised to Include Equipment Cyclic Data Sheet There are no applicable EIEs.	E. Poberezny	S. Shur		Y. Mohammad-Zadeh						
124	Reference Documents (for internal use only)											
125	1. 24590-BOF-M6-DEP-00002004, Rev. 1			12. 24590-WTP-RPT-PR-04-0001-03, Rev. 0			23. 24590-BOF-MVC-M80T-00001, Rev. A					
126	2. 24590-BOF-M6C-DEP-00009, Rev. B			13. 24590-BOF-MPC-DEP-00007, Rev. A								
127	3. Deleted			14. 24590-BOF-MPC-DEP-00002, Rev. A								
128	4. 24590-LAW-MVC-RLD-00007, Rev. 0			15. 24590-WTP-ICD-MG-01-031, Rev. 0								
129	5. 24590-LAB-M4C-RLD-00002, Rev. 0			16. 24590-WTP-MOC-50-00004, Rev. E								
130	6. 24590-WTP-DB-PET-09-001, Rev. 1			17. 24590-BOF-M4C-V11T-00004, Rev. B								
131	7. 24590-WTP-ZOC-W13T-00010, Rev. G			18. Deleted								
132	8. Deleted			19. Deleted								
133	9. 24590-BOF-M6C-DEP-00001, Rev. B			20. 24590-BOF-MVC-DEP-00010, Rev. A								
134	10. 24590-BOF-M6C-RLD-00001, Rev. A			21. 24590-BOF-MVC-DEP-00011, Rev. B								
135	11. 24590-BOF-RPT-PR-15-001, Rev. 0			22. 24590-BOF-M6C-PSA-00012, Rev. A								

 Mechanical Data Sheet: VESSEL				Plant Item No: 24590-BOF-MV-DEP-VSL-00003A/00003B/00003C			
River Protection Project Waste Treatment and Immobilization Plant				Data Sheet No: 24590-BOF-MVD-DEP-00004		Rev: 1	
Project:	RPP-WTP	P&ID:	24590-BOF-M6-DEP-00005001/00005002/00005003, Rev 1 (Ref. 1)				
Project No:	24590	Process Data:	24590-BOF-MVC-DEP-00010, Rev A (Ref. 2)				
Project Site:	Hanford	Vessel Drawing:	24590-BOF-MV-DEP-00003001,-00004001,-00005001 (Ref. 16, 17, 18)				
Description: Evaporator Concentrate Vessel							
Reference Data							
Charge Vessels (Tag Numbers)		None					
Eductors (Tag Numbers)		24590-BOF-MP-DEP-EDUC-00003A,-00003B,-00003C,-00004A,-00004B,-00004C,-00005A,-00005B,-00005C (Ref. 14)					
Nozzle (Tag Numbers)		24590-BOF-MN-DEP-NOZ-00004,-00009,-00010 (Ref. 1)					
RFDs/Pumps (Tag Numbers)		None					
Design Data							
Quality Level		CM		Fabrication Specs		24590-BOF-3PS-MVSC-T0002 (Ref. 4)	
Seismic Category		SC-IV		Design Code		ASME VIII Div 1	
Service/Contents		Process Radioactive Concentrate		Code Stamp		Yes	
Specific Gravity of fluid (Min/Max)		0.98/1.35 (Ref. 2)		NB Registration		Yes	
Maximum Operating Volume		gal		11800 (Note 10) (Ref. 3)		-5- Weights (lbs)	
Batch Volume		gal		8100 (Note 11) (Ref. 3)		Actual	
Total Volume		gal		14900 (Note 12) (Ref. 3)		Not to exceed wet weight (lbs)	
Area Classification		R4/R3/C1 (Ref. 8) (Note 13)		Not to exceed size (Notes 1 and 2)		14' Diameter x 28' High	
General Data							
Inside Diameter		feet		12 (Ref. 16, Ref. 17, Ref. 18)		Wind Design	
Tangent-to-Tangent (TL - TL)		feet		13.5 (Ref. 16, Ref. 17, Ref. 18)		Snow Design	
		Vessel Operating		Vessel Design		Coil/Jacket Design	
Internal Pressure (psig)		Full Vacuum/0 (Min/Max) (Ref. 2)		15 (Ref. 5)		N/A	
External Pressure (psig)		0		15		N/A	
Temperature (°F)		40/150 (Min/Max) (Ref. 2)		195 (Note 9) (Ref. 6)		N/A	
Min Design Metal Temp. (°F)		-23 (Ref. 10)					
Vessel Turnover		3* (Note 14) (Ref. 12)					
Minimum Mixing Height (ft)		7					
Materials of Construction (Ref. 19)							
Component		Material		Minimum Thickness/Size		Containment	
Top Head		UNS N08367 / SB-688		.584" min		Auxillary	
Shell		UNS N08367 / SB-688		.375" **		Primary	
Bottom Head		UNS N08367 / SB-688		.48" min		Primary	
Support		SA 240 304 (Note 7)		.25" **		N/A	
Jacket/Coils/Half-Pipe Jacket		N/A		N/A		N/A	
Internals		UNS N08367 / SB-688, SB-675		.145" **		Thermocouples Primary	
Internals - Spray Nozzle		Type 316L SS (Note 7)*		.145" **		N/A	
Internals - Piping		UNS N08367 Seamless SB-690, or N10276 / SB-622, or N06022 (SB-575 C22)		.154" **			
Forgings/Bar Stock		UNS N08367 (AL6XN) (Note 29)*		.145" **		Nozzle Necks	
Gaskets (O Ring)		N/A		N/A		N/A	
Bolting		N/A		N/A		N/A	
Vessel Connections (Ref. 1, 16, 17, 18)							
See Note 28							
Miscellaneous Data							
Orientation		Vertical		Support Type (Note 3)		Skirt	
Insulation Function (Note 4)		Freeze Protection		Insulation Density (lb/ft ³)		8 (Ref. 23)	
Insulation Thickness (inch)		3 (Ref. 1)		Internal Finish		Welds descaled as laid	
				External Finish		Welds descaled as laid	
Spray Nozzle Preferred Operating Point (Pressure [psig], Flow [gpm])		71-73,80		Spray Nozzle Available Pressure at Design Flow (Pressure [psig], Flow [gpm])		80, 95 (Ref. 22)	

** See 24590-CM-POA-MVSC-00005-07-00003/4/5 for thicknesses not listed

Remarks

* To be determined/confirmed by the vendor

- Note 1 - Not to exceed size diameter includes allowance for side nozzle protrusion in addition to the vessel ID.
- Note 2 - Not to exceed size height includes allowance for top manway and bottom skirt height dimension, from Top of Concrete (TOC) to bottom of vessel, in addition to total vessel height.
- Note 3 - Skirt must be designed with 12" Internal Diameter Ring Beam attachment in consideration.
- Note 4 - Insulation is required on both the shell and top/bottom head of the vessel.
- Note 5 - The contents of this document are Dangerous Waste Permit affecting.
- Note 6 - 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.
- Note 7 - Max. Carbon content 0.030%.
- Note 8 - Deleted
- Note 9 - Vessel design temperature is found by adding 25 °F to the max vessel operating temperature and rounding to the nearest 5 °F.
- Note 10 - Maximum Operating Volume is rounded up from the 11,703 gal value stated in Reference 3 to 11,800 gal for the purposes of this datasheet.
- Note 11 - Batch Volume is rounded up from the 8,055 gal value stated in Reference 3 to 8,100 gal for the purposes of this datasheet.
- Note 12 - Total Vessel Volume is rounded up from the 14,805 gal value stated in Reference 3 to 14,900 gal for the purposes of this datasheet.
- Note 13 - This equipment is located in R4 radiation area (maximum radiation area) which is designed to have a target radiation level of less than 25 nrem/hr. The average contact dose rate for this equipment is 6.56E+01 Rad/hr. (Ref. 8, 9, 10, and 11)
- Note 14 - Seller to verify three turnovers are adequate to ensure thorough mixing
- Note 15 - Deleted.
- Note 16 - Deleted.
- Note 17 - Deleted.
- Note 18 - Deleted.
- Note 19 - Seller to provide access platform and ladders.
- Note 20 - Vessel is not Black Cell/Hard-to-Reach
- Note 21 - Vessel Discharge Outlet nozzle N07 (Ref. 16, Ref.17, Ref. 18) to be flush with vessel bottom, centered on vessel, and fitted with a vortex breaker.
- Note 22 - For nozzles N12, N16, N18, N20 (Ref. 16, Ref.17, Ref. 18), inlet lines to be extended into the vessel and directed away from the vessel walls in order to prevent liquid from flowing down the vessel walls.
- Note 23 - For nozzles N02 and N03 (Ref. 16, Ref.17, Ref. 18), locate centerline of standpipe at least 3' from inside of vessel wall.
- Note 24 - All internal supports and welds that interact with the primary confinement barrier (vessel) shall maintain equal quality level and seismic category as the vessel.
- Note 25 - For nozzle N11 (Ref. 16, Ref.17, Ref. 18), spray nozzle to be located as close to the center of the top head as possible.
- Note 26 - Vessel vent nozzle (N04,Ref. 16, Ref.17, Ref. 18) to be located at the center of the top head. Intake air nozzle (N10, Ref. 16, Ref.17, Ref. 18) to be located at a maximum radius within the crown region of the head.
- Note 27 - Standpipe provided by vessel vendor for level probe (N03, Ref. 16, Ref.17, Ref. 18)
- Note 28 - Refer to 24590-BOF-MV-DEP-00003001,-00004001,-00005001 for vessel details including dimension, nozzle schedule table and locations/orientations.
- Note 29 - Vendor to fully identify material by ASME Standard and type/grade.
- Note 30 - Refer to Reference 21 for details on instrument standpipe for level instrument.

Revision History

Rev.	Description	Originator	Checker	MET Reviewed	Approver	Date
1	Issued for Purchase. Updated reference for Equipment Assembly Drawings. Added references for level and temperature instruments stilling well welded assembly. Updated available spray nozzle flow and pressure. No EIEs against this data sheet.	Jung Shin 	Erica Poberezny 		Youssef Mohammad-Zadeh 	9/1/17
0	Issued for Purchase. Impacts against this document have been evaluated and EIE, 24590-BOF-EIE-MS-16-0060, Rev. 0 is incorporated in this revision.	Jung Shin	Holden Carroll	Debbie Adler	Youssef Mohammad-Zadeh	1/28/2017

Attachment A – References for Mechanical Datasheet 24590-BOF-MVD-DEP-00004, Rev. 1 (for internal reference except for Ref. 4, 16, 17, 18, 21 & 22)

1. 24590-BOF-M6-DEP-00005001/00005002/00005003, Rev 1 - P&ID - BOF/EMF Direct Feed LAW EMF Process System Evaporator Concentrate Vessel DEP-VSL-00003A/00003B/00003C
2. 24590-BOF-MVC-DEP-00010, Rev A – Process Data for the Evaporator Concentrate Vessels, DEP-VSL-00003A/B/C, and Pumps, DEP-PMP-00003A/B
3. 24590-BOF-MVC-DEP-00006, Rev A - Evaporator Concentrate Vessel (DEP-VSL-00003A/B/C) - Vessel Sizing, Vessel Overflow Sizing, and Plant Wash System Sizing
4. 24590-BOF-3PS-MVSC-T0002, Rev 2 - Engineering Specification for DFLAW Effluent Management Facility Atmospheric Pressure Vessels
5. 24590-BOF-M6C-DEP-00009, Rev B - Design Pressure and Temperature Calculation for the EMF DEP/DVP/AFR/NLD/SHR/SNR Systems
6. 24590-WTP-3DG-M40T-00001, Rev 1 - Design Parameters and Test Pressures for Equipment and Piping
7. Deleted
8. 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 ft – 0 in
9. 24590-BOF-M5-V17T-00013, Rev 0 - Process Flow Diagram Direct Feed Concentrate Transfer (System DEP and DVP)
10. 24590-WTP-DB-ENG-01-001, Rev 5 – Basis of Design
11. 24590-WTP-Z0C-W13T-00010, Rev. G – Contact Dose Rates to Equipment From Beta and Gamma Emitters
12. 24590-BOF-MPC-DEP-00006, Rev A - Mixing Eductor Sizing Calculation for DEP Vessels in the EMF Facility
13. 24590-BOF-MPC-DEP-00007, Rev A - DEP Evaporator Concentrate Vessel Transfer/Recirculation Pump (DEP-PMP-00003A/B) Sizing and Line Sizing
14. 24590-BOF-MPD-DEP-00017, Rev 0 - 24590-BOF-MP-DEP-EDUC-00003A, -00003B, -00003C, -00004A, -00004B, -00004C, -00005A, -00005B, -00005C - Mixing Eductors for Atmospheric Vessels DEP-VSL-00003A/B/C
15. 24590-BOF-MPD-DEP-00002, Rev 0 - DEP-PMP-00003A, DEP-PMP-00003B, Evaporator Concentrate Transfer/Recirc Pumps
16. 24590-BOF-MV-DEP-00003001, Rev 1 - Equipment Assembly Evaporator Concentrate Vessel DEP-VSL-00003A
17. 24590-BOF-MV-DEP-00004001, Rev 1 - Equipment Assembly Evaporator Concentrate Vessel DEP-VSL-00003B
18. 24590-BOF-MV-DEP-00005001, Rev 1 - Equipment Assembly Evaporator Concentrate Vessel DEP-VSL-00003C
19. 24590-BOF-N1D-DEP-00003, Rev 0 - DEP-VSL-00003A/B/C - Evaporator Concentrate Vessels Corrosion Evaluation
20. Deleted
21. 24590-WTP-MV-M59T-00036, Rev 1 - Control and Instrumentation Process Vessel Stilling Well Welded Assembly for Level Instruments
22. 24590-BOF-MPC-DIW-00001, Rev A - Demineralized Water Booster Pump (DIW-PMP-00013), and Discharge Line Sizing
23. 24590-WTP-3PS-NN00-T0001, Rev 3 - Engineering Specification for Thermal Insulation for Mechanical Systems



WTP Supplier Document Review Coversheet

NOTE: Contains no restrictive markings.

Submittal No.: 24590-CM-POA-MVSC-00005-09-00007		Revision: 00B		Comments Due: 9/28/18	
<input type="checkbox"/> Cancelled <input type="checkbox"/> Superseded				Component Tag Numbers: <input type="checkbox"/> None <input checked="" type="checkbox"/> Listed Below DEP-VSL-00002	
RE / POC: Jung Shin		Date: 9/27/18			
RE Comments / Notes: Environmental Protection comment is internally resolved.					
Document Status: <input type="checkbox"/> On Document <input checked="" type="checkbox"/> Note Below					
<i>This section is only needed if document does not have a sticker. Mark the appropriate box above.</i>			G-321-E Document Category(ies): 3.0		
Supplier Document Status: <input checked="" type="checkbox"/> Status 1 - Work may proceed. <input type="checkbox"/> Status 2 - Revise and resubmit. Work may proceed subject to resolution of indicated comments. <input type="checkbox"/> Status 3 - Revise and resubmit. Work may not proceed. <input type="checkbox"/> Status 4 - Review not required. Work may proceed. Permission to proceed does not constitute approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.					
Supersedes Document No. (when applicable): N/A		Originator By: Jung Shin - jwshin1 Org Name: Bechtel National Inc. Placed: Oct 02, 2018		Revision: N/A	
Accepted by/ Responsible Engineer: Jung Shin		Signature: _____		Date: _____	
Supervisor: Youssef Mohammad-Zadeh		Signature: <i>Youssef Zadeh</i>		Date: 10/2/18	
Released by (when applicable): _____		Signature: _____		Date: _____	
Design Changes Incorporated/Method: <input checked="" type="checkbox"/> N/A					
WTP Document Number		Design Change	Reference	WTP Document Number	
N/A		<input type="checkbox"/>	<input type="checkbox"/>	N/A	
N/A		<input type="checkbox"/>	<input type="checkbox"/>	N/A	
DISTRIBUTION (see instructions for mailbox addresses)					
Indicate the facility/facilities, if applicable: <input type="checkbox"/> LAW <input type="checkbox"/> BOF <input type="checkbox"/> LAB <input type="checkbox"/> HLW <input type="checkbox"/> PTF				Program: <input checked="" type="checkbox"/> DFLAW	
Group: NSE Print Name: Aubrey Beck Reviewed with No Comments per email sent on 10/1/18 (NSE 56425). Signature: _____ Date: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Group: Environmental Protection Print Name: Jung Shin for Dan Robertson Signature: <i>[Signature]</i> Date: 10/2/18 <input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review	
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____	
Group: _____ Print Name: _____ Signature: _____ Date: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review	
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____	

Vendor submitted documents support design and are reviewed by Bechtel. The documents do not represent a design change to the LAW facility and has no impact on the LAW DSA, TSR, or Safety Design Basis (CCN 298883). NO SE is required. N/A 10, Item 8.

 Mechanical Data Sheet: VESSEL				Plant Item No: 24590-BOF-MV-DEP-VSL-00002		
River Protection Project Waste Treatment and Immobilization Plant				Data Sheet No: 24590-BOF-MVD-DEP-00003		Rev: 1
Project:	RPP-WTP	P&ID:	24590-BOF-M6-DEP-00002001, Rev 1 (Ref. 1)			
Project No:	24590	Process Data:	24590-BOF-MVC-DEP-00003, Rev A (Ref. 2)			
Project Site:	Hanford	Vessel Drawing:	24590-BOF-MV-DEP-00002001, Rev. 1 (Ref. 17)			
Description: Evaporator Feed Vessel						
Reference Data						
Charge Vessels (Tag Numbers)		None				
Eductors (Tag Numbers)		24590-BOF-MP-DEP-EDUC-00001A, -00001B, -00001C (Ref. 15)				
Nozzle (Tag Numbers)		24590-BOF-MN-DEP-NOZ-00003 (Ref. 1)				
RFDs/Pumps (Tag Numbers)		None				
Design Data						
Quality Level		CM	Fabrication Specs		24590-BOF-3PS-MVSC-T0002 (Ref. 4)	
Seismic Category		SC-IV	Design Code		ASME VIII Div 1	
Service/Contents		Evaporator Feed	Code Stamp		Yes	
Specific Gravity of fluid (Min/Max)		0.98/1.10 (Ref. 2)	NB Registration		Yes	
Maximum Operating Volume	gal	38000 (Ref. 3)	Weights (lbs)		Empty	Operating
Batch Volume	gal	28800 (Ref. 6)	Actual		49,000	398,000
Total Volume	gal	42300 (Ref. 3)	Not to exceed wet weight (lbs)		453,000	
Area Classification		R4/R3/C1 (Ref. 9) (Note 10)	Not to exceed size (Notes 1 and 2)		16' Diameter x 47' High	
General Data						
Inside Diameter	feet	14 (Ref. 17)		Wind Design		ASCE 7 - 1998
Tangent-to-Tangent (TL - TL)	feet	32 (Ref. 17)		Snow Design		ASCE 7 - 1998
	<u>Vessel Operating</u>	<u>Vessel Design</u>	<u>Coil/Jacket Design</u>	Seismic Design		24590-BOF-3PS-MVSC-T0002 (Ref. 4)
Internal Pressure (psig)	Full Vacuum/0 (Min/Max) (Ref. 2)	15 (Ref. 5)	N/A	Postweld Heat Treat		Per Code
External Pressure (psig)	0	15	N/A	Corrosion/Erosion Allowance (inch) (Ref. 18)		0.04
Temperature (°F)	40/166 (Min/Max) (Ref. 2)	195 (Note 9) (Ref. 7)	N/A	Head Type (Top and Bottom)		2:1 Semi-Ellipsoidal
Min Design Metal Temp. (°F)	-23 (Ref. 11)		Mixing Time (Minutes)		71 (Ref. 13)	
Vessel Turnover	3* (Note 11) (Ref. 13)		Maximum Circulating Pump Discharge Pressure (psig)		156 (Ref. 14 and 16)	
Minimum Mixing Height (ft)	8.5		Minimum Mixing Volume (gal)		8,500	
Materials of Construction (Ref. 18)						
Component	Material		Minimum Thickness/Size		Containment	
Top Head	UNS N08367 / SB-688		.64" min		Auxillary	
Shell	UNS N08367 / SB-688		.375" **		Primary	
Bottom Head	UNS N08367 / SB-688		.531" min		Primary	
Support	SA 240 304 (Note 7)		.25" **		N/A	
Jacket/Coils/Half-Pipe Jacket	N/A		N/A		N/A	
Internals	UNS N08367 / SB-688, SB-675		.154" **		Thermocouples Primary	
Internals - Spray Nozzle	Type 316L SS (Note 7)*		.145" **		N/A	
Internals - Piping	UNS N08367 Seamless SB-690, or N10276 / SB-622, or N06022 (SB-575 C22)		.154" **		N/A	
Forgings/Bar Stock	UNS N08367 (AL6XN) (Note 28)*		.145" **		Nozzle Necks	
Gaskets (O Ring)	N/A		N/A		N/A	
Bolting	N/A		N/A		N/A	
Vessel Connections (Ref. 1 and 17)						
See Note 27						
Miscellaneous Data						
Orientation	Vertical		Support Type (Note 3)		Skirt	
Insulation Function (Note 4)	Freeze Protection		Insulation Density (lb/ft^3)		8 (Ref. 22)	
Insulation Thickness (inch)	3 (Ref. 1)		Internal Finish		Welds descaled as laid	
			External Finish		Welds descaled as laid	
Spray Nozzle Preferred Operating Point (Pressure [psig], Flow [gpm])	71-73, 80		Spray Nozzle Available Pressure at Design Flow (Pressure [psig], Flow [gpm])		80, 95 (Ref. 21)	
Remarks						
* To be determined/confirmed by the vendor						
** See 24590-CM-POA-MVSC-00005-07-00002 for thicknesses not listed						
Note 1 - Not to exceed size diameter includes allowance for side nozzle protrusion in addition to the vessel ID.						

Note 2 - Not to exceed size height includes allowance for top manway and bottom skirt height dimension, from Top of Concrete (TOC) to bottom of vessel, in addition to total vessel height.

Note 3 - Skirt must be designed with 14' Internal Diameter Ring Beam attachment in consideration.

Note 4 - Insulation is required on both the shell and top/bottom head of the vessel.

Note 5- The contents of this document are Dangerous Waste Permit affecting.

Note 6 - 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.

Note 7 - Max. Carbon content 0.030%.

Note 8 - Deleted

Note 9 - Vessel design temperature is found by adding 25 °F to the max vessel operating temperature and rounding to the nearest 5 °F.

Note 10 - This equipment is located in R4 radiation area (maximum radiation area) which is designed to have a target radiation level of less than 25 mrem/hr. The average contact dose rate for this equipment is 1.64E+02 Rad/hr. (Ref. 9, 10, 11, and 12)

Note 11 - Seller to verify three turnovers are adequate to ensure thorough mixing.

Note 12 - Deleted.

Note 13 - Deleted.

Note 14 - Deleted.

Note 15 - Deleted.

Note 16 - Deleted.

Note 17 - Seller to provide access platform and ladders.

Note 18 - Vessel is not Black Cell/Hard-to-Reach.

Note 19 - Deleted.

Note 20 - Vessel Discharge Outlet nozzle N09 (Ref. 17) to be flush with vessel bottom, centered on vessel, and fitted with a vortex breaker.

Note 21 - For nozzles N01, N03, N13, N14, N16 (Ref. 17), inlet lines to be extended into the vessel and directed away from the vessel walls in order to prevent liquid from flowing down the vessel walls.

Note 22 - For nozzles N06 (Ref. 17), Seller to locate centerline of standpipe at least 4' from inside of vessel wall.

Note 23 - All internal supports and welds that interact with the primary confinement barrier (vessel) shall maintain equal quality level and seismic category as the vessel.

Note 24 - Vessel vent nozzle (N04) to be located at the center of the top head. Intake air nozzle (N12) to be located at a maximum radius within the crown region of the head.

Note 25 - For nozzles N05 (Ref. 17), spray nozzle to be located as close to the center of the top head as possible.

Note 26 - Standpipe provided by vessel vendor and conductivity level probe (N06, Ref. 17).

Note 27 - Refer to 24590-BOF-MV-DEP-00002001, for vessel details including dimension, nozzle schedule table and locations/orientations

Note 28 - Vendor to fully identify material by ASME Standard and type/grade.

Note 29 - Refer to Reference 20 for details on instrument standpipe.

Revision History						
Rev.	Description	Originator	Checker	MET Reviewed	Approver	Date
1	Issued for Purchase. Updated reference for Equipment Assembly Drawings. Added references for level and temperature instruments stilling well welded assembly. Updated available spray nozzle flow and pressure. No EIEs against this data sheet.	Jung Shin 	Erica Poberezny 		Youssef Mohammad-Zadch <i>YM</i>	9/11/17
0	Issued for Purchase. Impacts against this document have been evaluated and EIE, 24590-BOF-EIE-MS-16-0060, Rev. 0 is incorporated in this revision.	Jung Shin	Holden Carroll	Debbie Adler	Youssef Mohammad-Zadch	01/28/17

Attachment A – References for Mechanical Datasheet 24590-BOF-MVD-DEP-00003, Rev. 1 (for internal reference except for Ref. 4, 17, 20 & 21)

1. 24590-BOF-M6-DEP-00002001, Rev 1 - P&ID - BOF/EMF Direct Feed LAW EMF Process System Evaporator Feed Vessel DEP-VSL-00002
2. 24590-BOF-MVC-DEP-00003, Rev A - Process Data for the Evaporator Feed Vessel (DEP-VSL-00002), Transfer Pumps (DEP-PMP-00002A/B), and Recirculation Pumps (DEP-PMP-00012A/B/C)
3. 24590-BOF-MVC-DEP-00005, Rev A - DEP Evaporator Feed Vessel (DEP-VSL-00002) - Vessel Sizing, Vessel Overflow Nozzle Sizing, and Plant Wash System Sizing
4. 24590-BOF-3PS-MVSC-T0002, Rev 2 - Engineering Specification for DFLAW Effluent Management Facility Atmospheric Pressure Vessels
5. 24590-BOF-M6C-DEP-00009, Rev B - Design Pressure and Temperature Calculation for the EMF DEP/DVP/AFR/NLD/SHR/SNR Systems
6. 24590-BOF-MVC-DEP-00009, Rev C - Batch Sizing Calculation for DEP (Direct Feed LAW Effluent Management Facility Process System) Vessels - DEP-VSL-00001, -00002, -00003A/B/C, -00004A/B, -00005A/B
7. 24590-WTP-3DG-M40T-00001, Rev 1 - Design Parameters and Test Pressures for Equipment and Piping
8. Deleted
9. 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 ft – 0 in
10. 24590-BOF-M5-V17T-00011, Rev 0 - Process Flow Diagram Direct Feed Effluent Transfer (System DEP)
11. 24590-WTP-DB-ENG-01-001, Rev 5 – Basis of Design
12. 24590-WTP-Z0C-W13T-00010, Rev. G – Contact Dose Rates to Equipment From Beta and Gamma Emitters
13. 24590-BOF-MPC-DEP-00006, Rev A - Mixing Eductor Sizing Calculation for DEP Vessels in the EMF Facility
14. 24590-BOF-MPC-DEP-00005, Rev A - DEP Evaporator Feed Vessel Recirculation Pump Sizing (DEP-PMP-00012A/B/C)

15. 24590-BOF-MPD-DEP-00016, Rev 0 - 24590-BOF-MP-DEP-EDUC-00001A, -00001B, -00001C - Mixing Eductors for Atmospheric Vessels DEP-VSL-00002
16. 24590-BOF-MPD-DEP-00006, Rev 0 - DEP-PMP-00012A, 00012B, 00012C BOF EMF Evaporator Feed Vessel Recirculation Pump
17. 24590-BOF-MV-DEP-00002001, Rev 1 - Equipment Assembly Evaporator Feed Vessel DEP-VSL-00002
18. 24590-BOF-N1D-DEP-00002, Rev 0 - DEP-VSL-00002 - Evaporator Feed Vessel Corrosion Evaluation
19. Deleted
20. 24590-WTP-MV-M59T-00036, Rev 1 - Control and Instrumentation Process Vessel Stilling Well Welded Assembly for Level Instruments
21. 24590-BOF-MPC-DIW-00001, Rev A - Demineralized Water Booster Pump (DIW-PMP-00013), and Discharge Line Sizing
22. 24590-WTP-3PS-NN00-T0001, Rev 3 - Engineering Specification for Thermal Insulation for Mechanical Systems



WTP Supplier Document Review Coversheet

NOTE: Contains no restrictive markings.

Submittal No.: 24590-CM-POA-MVSC-00007-08-00001		Revision: 00B		Comments Due: N/A	
<input type="checkbox"/> Cancelled <input type="checkbox"/> Superseded				Component Tag Numbers: <input type="checkbox"/> None <input checked="" type="checkbox"/> Listed Below DEP-VSL-00005A DEP-VSL-00005B	
RE / POC: Ryan Rickenbach		Date: 05/03/2018			
RE Comments / Notes:					
Document Status: <input type="checkbox"/> On Document <input checked="" type="checkbox"/> Note Below					
<i>This section is only needed if document does not have a sticker. Mark the appropriate box above.</i>		G-321-E Document Category(ies): 3.0, 11.0			
Supplier Document Status: <input checked="" type="checkbox"/> Status 1 - Work may proceed. <input type="checkbox"/> Status 2 - Revise and resubmit. Work may proceed subject to resolution of indicated comments. <input type="checkbox"/> Status 3 - Revise and resubmit. Work may not proceed. <input type="checkbox"/> Status 4 - Review not required. Work may proceed. Permission to proceed does not constitute approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.					
Supersedes Document No. (when applicable): N/A		<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Reviewed No Comments <small>By: Ryan Rickenbach - rzricken</small> <small>Placed: May 08, 2018</small> </div> <input checked="" type="checkbox"/>		Revision:	
Accepted by/ Responsible Engineer:	Ryan Rickenbach <i>Print Name</i>	<i>Signature</i>	<i>Date</i>		
Supervisor:	Stan Crow <i>Print Name</i>	<i>Signature</i>	<i>Date</i>		
Released by (when applicable):	N/A <i>Print Name</i>	<i>Signature</i>	<i>Date</i>		
Design Changes Incorporated/Method: <input type="checkbox"/> N/A					
WTP Document Number	Design Change	Reference	WTP Document Number	Design Change	Reference
24590-CM-POA-MVSC-00007-08-00001	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
DISTRIBUTION (see instructions for mailbox addresses)					
Indicate the facility/facilities, if applicable: <input type="checkbox"/> LAW <input type="checkbox"/> BOF <input type="checkbox"/> LAB <input type="checkbox"/> HLW <input type="checkbox"/> PTF				Program: <input checked="" type="checkbox"/> DFLAW	
Group: NSE	<input type="checkbox"/> Information Only	Group:	<input type="checkbox"/> Information Only		
Print Name:	<input type="checkbox"/> Specialist Review	Print Name:	<input type="checkbox"/> Specialist Review		
Signature:	Date: _____	Signature:	Date: _____		
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	_____	Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	_____		
Group:	<input type="checkbox"/> Information Only	Group:	<input type="checkbox"/> Information Only		
Print Name:	<input type="checkbox"/> Specialist Review	Print Name:	<input type="checkbox"/> Specialist Review		
Signature:	Date: _____	Signature:	Date: _____		
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	_____	Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	_____		
Group:	<input type="checkbox"/> Information Only	Group:	<input type="checkbox"/> Information Only		
Print Name:	<input type="checkbox"/> Specialist Review	Print Name:	<input type="checkbox"/> Specialist Review		
Signature:	Date: _____	Signature:	Date: _____		
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	_____	Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN:	_____		

NSE Technical Review / DR Bratzel: No SE required. This SDR pertains to a BOF Mechanical Data Sheet (CM) for work to proceed. It does not alter the facility design or Safety Design Basis. Since BOF is less than a HAZCAT 3 facility, the reviewed document does not represent a proposed change that would require entry into the Safety Evaluation Process



Mechanical Data Sheet: VESSEL

ISSUED BY
RPP-WTP PDC

Plant Item No:
24590-BOF-MV-DEP-VSL-00005A
24590-BOF-MV-DEP-VSL-00005B

△
1

Data Sheet No:
24590-BOF-MVD-DEP-00006

Rev:
1

River Protection Project
Waste Treatment and Immobilization Plant

Project:	RPP-WTP	P&ID:	24590-BOF-M6-DEP-00006001, -00006002 (Ref. 1, 22) △ 1
Project No:	24590	Process Data:	24590-BOF-MVC-DEP-00008 (Ref. 2) △ 1
Project Site:	Hanford	Vessel Drawing:	24590-BOF-MV-DEP-00008001, -00008002, -00009001, -00009002 (Ref. 16, 17, 20, 21)
Description:	Process Condensate Lag Storage Vessel 24590-CM-POA-MVSC-00007-02-00004, 24590-CM-POA-MVSC-00007-02-00002		

Reference Data

Charge Vessels (Tag Numbers)	None
Eductors (Tag Numbers)	24590-BOF-MP-DEP-EDUC-00010 through -00017 (Ref. 1,14, 22) △ 1
Nozzle (Tag Numbers)	None
RFDs/Pumps (Tag Numbers)	None

Design Data

Quality Level	CM	Fabrication Specs	24590-BOF-3PS-MVSC-T0003 (Ref. 4)		
Seismic Category	SC-IV	Design Code	ASME VIII Div 1		
Service/Contents	Process Radioactive Condensate	Code Stamp	Yes (Note 29) △ 1		
Specific Gravity of Fluid	△ 1 0.99/1.05 (Min/Max) (Ref. 2)	NB Registration	Yes		
Maximum Operating Volume	gal	108,208 (Ref. 3)	Weights (lbs)	<u>Empty</u>	<u>Operating</u>
Batch Volume	gal	95,228 (Ref. 3) △ 1	Actual	332,200	1,359,800
Total Volume	gal	127,260 (Ref. 3)			1,380,900
Area Classification	R2/C1 (Ref. 8) (Note 12)				

General Data

Inside Diameter	feet	25 (Ref. 3)		Wind Design	ASCE 7 - 1998
Length/Height (TL - TL) △ 1	feet	29.5 (Ref. 3)		Snow Design	ASCE 7 - 1998
	<u>Vessel Operating</u>	<u>Vessel Design</u>	<u>Coil/Jacket Design</u>	Seismic Design	24590-BOF-3PS-MVSC-T0003 (Ref. 4)
Internal Pressure (psig)	-1.16/0 (Min/Max) (Ref. 23) △ 1	15 (Ref. 6) △ 1	N/A	Postweld Heat Treat	Per Code
External Pressure (psig)	0 (Outdoor Environment Ref. 8) △ 1	15 (Ref. 6)	N/A	Corrosion/Erosion Allowance (inch) (Ref. 19)	0.04
Temperature (°F)	40/125 (Min/Max) (Ref. 2) △ 1	155 (Note 9) (Ref. 6)	N/A	Head Type (Top and Bottom)	100%-6% Flanged & Dished
Min Design Metal Temp. (°F)	-23 (Ref. 10)			Maximum Circulating Pump Discharge Pressure (psig)	142.48 (Ref. 13)

Materials of Construction (Ref. 19)

Component	Material	Minimum Thickness/Size	Containment
Top Head	SA 240 316 (Note 7)	0.92775" ★	Auxiliary △ 1
Shell	SA 240 316 (Note 7)	0.86434" ★	Primary
Bottom Head	SA 240 316 (Note 7)	0.92739" ★	Primary
External Support such as Lifting Lugs and Vessel Skirt △ 1	SA 240 304 (Note 7) △ 1	0.4375" ★★	N/A
Jacket/Coils/Half-Pipe Jacket	SA 240 316 (Note 7)	N/A	N/A
Internals	SA 240 316 / SA 312 TP316 (Note 7)	N/A	Thermocouples Primary
Wash Ring Pipe	SA 312 TP316 Seamless (Note 7) △ 1	N/A	N/A
Internals - Piping	SA 312 TP316 Seamless (Note 7)	N/A	(Note 8)
Forgings/Bar Stock	SA 182 F316 (Note 7)	N/A	N/A
Gaskets	EPDM	N/A	N/A
Bolting	SA-193 Gr. B8M / SA-194 Gr. 8M	N/A	N/A

Vessel Connections (Ref. 1, 16, 17, 20, 21, 22)

See Note 28

Miscellaneous Data

Orientation	Vertical	Support Type (Note 3)	Skirt
Insulation Function (Note 4)	Freeze Protection	Insulation Material	By Buyer
Insulation Thickness (inch)	3 (Ref. 1)	Internal Finish	Welds descaled as laid
		External Finish	Welds descaled as laid
DEP-VSL-00005A Wash Ring Available Pressure at Design Flow (Pressure [psig], Flow [gpm])	42.16, 105 (Ref. 7)		
DEP-VSL-00005B Wash Ring Available Pressure at Design Flow (Pressure [psig], Flow [gpm])	42.11, 105 (Ref. 7)		

Remarks

* To be determined/confirmed by the vendor

Note 1 - Not to exceed size diameter includes allowance for side nozzle protrusion in addition to the vessel ID.

Note 2 - Not to exceed size height includes allowance for top manway and bottom skirt height dimension, from Top of Concrete (TOC) to bottom of vessel, in addition to total vessel height.

Note 3 - Skirt must be designed with 25'-0" Internal Diameter Ring Beam attachment (provided by BUYER) in consideration.

Note 4 - Insulation (by BUYER) is required on both the shell and top/bottom head of the vessel.

Note 5 - The contents of this document are Dangerous Waste Permit affecting.

Note 6 - 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.

Note 7 - Max. Carbon content 0.030%

Note 8 - Nozzle necks below the high operating liquid level are Primary, others Auxiliary.

Note 9 - Vessel design temperature is determined by adding 25 °F to the max vessel operating temperature and rounding up to the nearest 5 °F.

Note 10 - Deleted

Note 11 - Deleted

Note 12 - This equipment is located in R2 radiation area (radiological buffer area) which is designed to have a target radiation level of less than 0.250 mrem/hr. The average contact dose rate for this equipment is 3.1E-04 Rad/hr. (Ref. 8, 10, and 11)

Note 13 - Deleted ▲
1

Note 14 - Deleted

Note 15 - Deleted

Note 16 - Vessel is not Black Cell/Hard-to-Reach.

Note 17 - Deleted

Note 18 - Deleted

Note 19 - Deleted

Note 20 - Deleted

Note 21 - Seller to provide access platform and ladders.

Note 22 - Vessel Discharge Outlet nozzle (N80 for DEP-VSL-00005A and N84 for DEP-VSL-00005B) to be flush with vessel bottom / center wear plate, centered on vessel, and fitted with a vortex breaker. ▲
1 ▲
1

Note 23 - All internal supports and welds that interact with the primary confinement barrier (vessel) shall maintain equal quality level and seismic category as the vessel.

Note 24 - Deleted

Note 25 - Deleted

Note 26 - Deleted

Note 27 - Deleted

Note 28 - Refer to 24590-BOF-MV-DEP-00008001, -00008002, -00009001, -00009002 for vessel details including dimension, nozzle schedule table and locations/orientations.

Note 29 - Include a statement on the Manufacturer's Data Report that over-pressure protection is provided by the system design per ASME Section VIII, Division 1, UG-140(a). ▲
1

Equipment Cyclic Data Sheet (ECDS)

Component Plant Item Number	DEP-VSL-00005A & DEP-VSL-00005B			
Component Description	Process Condensate Lag Storage 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	See Materials of Construction section above for details.			
Design Life	40 years			
Component Function and Life Cycle Description	DEP-VSL-00005A/B receive process condensate from DEP-VSL-00004A/B, and secondary steam blowdown from HPS-HX-00011. DEP-VSL-00005A/B allow for lag storage and characterization before sending to the LERF/ETF. Content agitation and mixing are maintained via educators and recirculation system.			
Load Type	Min	Max	Number of Cycles	Comment
Design Pressure (psig)	-15 (Ref. 6)	15 (Ref. 6)	10 (Ref. 23)	
Operating Pressure (psig)	See Comment	See Comment	0 (Ref. 23)	-1.16/0 (Min/Max) (Ref. 23). Range of pressure variations < 20% of design pressure.
Operating Temperature (°F)	See Comment	See Comment	88 (Ref. 23)	40/125 (Min/Max) (Ref. 2). Number of Cycles include 10% increase to account for commissioning duty.
Contents Specific Gravity	See Comment	See Comment	N/A	0.99/1.05 (Min/Max) (Ref. 2). Specific gravity is based on temperature and pressure.
Contents Level (inch)	0.0 (Ref. 3)	373.6 (Ref. 3)	14,600 (Ref. 23)	
Localized Features				
Internals	N/A			
Nozzles	N/A			
Supports	N/A			

Revision History

Rev.	Description	Originator	Checker	MET Reviewed	Approver	Date
0	Issued for Procurement (to reuse HLP-VSL-00027A/B). EIE, 24590-BOF-EIE-MS-16-0060 is incorporated.	Jung Shin	Ryan Rickenbach	Steven Vail	Youssef Mohammad-Zadeh	6/30/2017
1	Revised Batch Volume, Vessel Maximum Operating Temperature, Material for External Supports & Wash Ring Pipe, Notes 12 & 22, and reference #s 1, 2, 4, 6, 8, 10, 11, 16, 17, 18, 20, 21 & 22; Incorporated 24590-WTP-SDDR-MS-17-00121 rev.NA, 24590-BOF-EIE-PR-17-0006 rev.0, 24590-BOF-EIE-PR-17-0011 rev.0, and 24590-WTP-EIE-ENG-17-0018 rev.0; Added Note 29, ECDS section, and reference # 23.	Kar Wei (Sengwai) Chin 	Ryan Rickenbach 	Debbie Adler 		

Supplier notes:

- ★ - Minimum thickness controlled by external pressure. Refer to calculations (27202-CDC) page 28.
- ★★ - The calculations of the support skirt are based on an allowable stress design method. The minimum thickness of the skirt was determined by iteration using the same method. Refer to calculations (27202-CDC) Load Case 2 page 446 for highest skirt stress ratio.

Attachment A – References for Mechanical Datasheet 24590-BOF-MVD-DEP-00006, Rev. 1

(For internal reference; except for Ref. 4, 14, 16, 17, 20, 21)

1. 24590-BOF-M6-DEP-00006001, Rev 2 - P&ID - BOF/EMF Direct Feed LAW EMF Process System **Process Condensate** Lag Storage Vessel DEP-VSL-00005A 
2. 24590-BOF-MVC-DEP-00008, Rev 0 - Process Data for the Process Condensate Lag Storage Vessels (DEP-VSL-00005A/B), Transfer Pumps (DEP-PMP-00005A/B), and Recirculation Pumps (DEP-PMP-00015A/B/C) 
3. 24590-BOF-MVC-DEP-00004, Rev B - Process Condensate Lag Storage Vessel (DEP-VSL-00005A/B) - Vessel Sizing, Vessel Overflow Sizing, and Wash Ring Sizing
4. 24590-BOF-3PS-MVSC-T0003, Rev 1 - Engineering Specification for DFLAW EMF Lag Storage and Overhead Sampling Vessels 
5. 24590-BOF-M6C-DEP-00009, Rev B - Design Pressure and Temperature Calculation for the EMF DEP/DVP/AFR/NLD/SHR/SNR Systems
6. 24590-WTP-3DG-M40T-00001, Rev 1 - Design Parameters and Test Pressures for Equipment and Piping 
7. 24590-BOF-M6C-PSW-00008, Rev B - EMF Process Service Water (PSW) Line Sizing (PIPE-FLO)
8. 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" 
9. Deleted.
10. 24590-WTP-DB-ENG-01-001, Rev 6 – Basis of Design 
11. 24590-WTP-Z0C-W13T-00010, Rev. H – Contact Dose Rates to Equipment From Beta and Gamma Emitters 
12. Deleted.
13. 24590-BOF-MPC-DEP-00008, Rev A - DEP Process Condensate Lag Storage Vessel Recirculation Pump (DEP-PMP-00015A/B/C) Sizing and Line Sizing
14. 24590-BOF-MPD-DEP-00019, Rev 0 - 24590-BOF-MP-DEP-EDUC-00010, -00011, -00012, -00013, -00014, -00015, -00016, -00017 - Mixing Eductors for Atmospheric Vessels DEP-VSL-00005A/B
15. Deleted.
16. 24590-BOF-MV-DEP-00008001, Rev 2 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005A 
17. 24590-BOF-MV-DEP-00009001, Rev 2 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005B 
18. Deleted. 
19. 24590-BOF-N1D-DEP-00005, Rev 0 - DEP-VSL-00005A/B - Process Condensate Lag Storage Vessel A & B
20. 24590-BOF-MV-DEP-00008002, Rev 1 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005A 
21. 24590-BOF-MV-DEP-00009002, Rev 1 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005B 
22. 24590-BOF-M6-DEP-00006002, Rev 2 - P&ID - BOF/EMF Direct Feed LAW EMF Process System **Process Condensate** Lag Storage Vessel DEP-VSL-00005B 
- 23. 24590-BOF-MVC-M80T-00001, Rev A - DFLAW EMF Vessel Cyclic Datasheet Inputs and Fatigue Evaluation** 



WTP Supplier Document Review Coversheet

NOTE: Contains no restrictive markings.

Submittal No.: 24590-CM-POA-MVSC-00007-08-00002		Revision: 00B		Comments Due: N/A	
<input type="checkbox"/> Cancelled <input type="checkbox"/> Superseded		RE / POC: Ryan Rickenbach		Date: 05/03/2018	
RE Comments / Notes:		Document Status: <input type="checkbox"/> On Document <input checked="" type="checkbox"/> Note Below		Component Tag Numbers: <input type="checkbox"/> None <input checked="" type="checkbox"/> Listed Below DEP-VSL-00004A DEP-VSL-00004B	
<i>This section is only needed if document does not have a sticker. Mark the appropriate box above.</i>		G-321-E Document Category(ies): 3.0, 11.0			
Supplier Document Status: <input checked="" type="checkbox"/> Status 1 - Work may proceed. <input type="checkbox"/> Status 2 - Revise and resubmit. Work may proceed subject to resolution of indicated comments. <input type="checkbox"/> Status 3 - Revise and resubmit. Work may not proceed. <input type="checkbox"/> Status 4 - Review not required. Work may proceed. Permission to proceed does not constitute approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.					
Supersedes Document No. (when applicable): N/A		<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Reviewed No Comments <small>By Ryan Rickenbach - rzricken</small> <small>Org Name: Rickenbach</small> <small>Placed: May 08, 2018</small> </div> <input checked="" type="checkbox"/>		Revision:	
Accepted by/ Responsible Engineer: Ryan Rickenbach		Signature: <i>[Signature]</i>		Date: 5/8/18	
Supervisor: Stan Crow		Signature: <i>[Signature]</i>		Date: 5/8/18	
Released by (when applicable): N/A		Signature: _____		Date: _____	
Design Changes Incorporated/Method: <input type="checkbox"/> N/A					
WTP Document Number		Design Change	Reference	WTP Document Number	
24590-WTP-SDDR-MS-18-00024		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
DISTRIBUTION (see instructions for mailbox addresses)					
Indicate the facility/facilities, if applicable: <input type="checkbox"/> LAW <input type="checkbox"/> BOF <input type="checkbox"/> LAB <input type="checkbox"/> HLW <input type="checkbox"/> PTF				Program: <input checked="" type="checkbox"/> DFLAW	
Group: NSE Print Name: <i>[Signature]</i>		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Group: _____ Print Name: _____	
Signature: _____ Date: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Signature: _____ Date: _____	
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____	
Group: _____ Print Name: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Group: _____ Print Name: _____	
Signature: _____ Date: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Signature: _____ Date: _____	
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____	
Group: _____ Print Name: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Group: _____ Print Name: _____	
Signature: _____ Date: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Signature: _____ Date: _____	
Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____		<input type="checkbox"/> Information Only <input type="checkbox"/> Specialist Review		Distribution: <input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard - MSIN: _____	

NSE Technical Review / DR Bratzel: No SE required. This SDR pertains to a BOF Mechanical Data Sheet (CM) for work to proceed. It does not alter the facility design or Safety Design Basis. Since BOF is less than a HAZCAT 3 facility, the reviewed document does not represent a proposed change that would require entry into the Safety Evaluation Process

Issued by
RPP-WTP PDC**Mechanical Data Sheet:
VESSEL**Plant Item No:
24590-BOF-MV-DEP-VSL-00004A/00004BData Sheet No:
24590-BOF-MVD-DEP-00005Rev:
1River Protection Project
Waste Treatment and Immobilization Plant

Project:	RPP-WTP	P&ID:	24590-BOF-M6-DEP-00004001/-00004002, Rev 1 (Ref. 1, 20)
Project No:	24590	Process Data:	24590-BOF-MVC-DEP-00007, Rev A (Ref. 2)
Project Site:	Hanford	Vessel Drawing:	24590-BOF-MV-DEP-00006001,-00007001 (Ref. 16, 17)
Description: Overhead Sampling Vessel			

Reference Data

Charge Vessels (Tag Numbers)	None
Eductors (Tag Numbers)	24590-BOF-MP-DEP-EDUC-00006, -00007, -00008, -00009 (Ref. 14)
Nozzle (Tag Numbers)	24590-BOF-MN-DEP-NOZ-00005, -00006 (Ref. 1, 20)
RFDs/Pumps (Tag Numbers)	None

Design Data

Quality Level	CM	Fabrication Specs	24590-BOF-3PS-MVSC-T0003 (Ref. 4)		
Seismic Category	SC-IV	Design Code	ASME VIII Div 1		
Service/Contents	Process Radioactive Condensate	Code Stamp	Yes		
Specific Gravity of fluid (Min/Max)	0.99/1.05 (Ref. 2)	NB Registration	Yes		
Maximum Operating Volume	gal	36600 (Ref. 3)	Weights (lbs)	<u>Empty</u>	<u>Operating</u>
Batch Volume	gal	23600 (Ref. 18)	Actual	154,900	486,900
Total Volume	gal	40800 (Ref. 3)			507,100
Area Classification	R2/C1 (Ref. 8) (Note 11)				

General Data

Inside Diameter	feet	14 (Ref. 3)		Wind Design	ASCE 7 - 1998
Length/Height (TL - TH)	feet	30.8 (Ref. 3)		Snow Design	ASCE 7 - 1998
	<u>Vessel Operating</u>	<u>Vessel Design</u>	<u>Coil/Jacket Design</u>	Seismic Design	24590-BOF-3PS-MVSC-T0003 (Ref. 4)
Internal Pressure (psig)	Full Vacuum/0 (Min/Max) (Ref. 2)	15 (Ref. 5, 6)	N/A	Postweld Heat Treat	Per Code
External Pressure (psig)	0	15 (Ref. 6)	N/A	Corrosion/Erosion Allowance (inch)	0.04 (Ref. 19)
Temperature (°F)	40/126 (Min/Max) (Ref. 2)	155 (Note 9) (Ref. 6)	N/A	Head Type (Top and Bottom)	2:1 Semi-Ellipsoidal
Min Design Metal Temp. (°F)	-23 (Ref. 10)		Maximum Circulating Pump Discharge Pressure (psig)	147 (Ref. 13)	

Materials of Construction (Ref. 19)

Component	Material	Minimum Thickness/Size	Containment
Top Head	SA 240 304 (Note 7)	0.488" ★	Auxillary
Shell	SA 240 304 (Note 7)	0.8323" ★	Primary
Bottom Head	SA 240 304 (Note 7)	0.4904" ★	Primary
Support	SA 240 304 (Note 7)	0.3125" ★★	N/A
Jacket/Coils/Half-Pipe Jacket	SA 240 304 (Note 7)	N/A	N/A
Internals	SA 240 304/SA 312 TP304 (Note 7)	N/A	Thermocouples Primary
Internals - Spray Nozzle	Type 316L SS (Note 7)*	N/A	N/A
Internals - Piping	SA 312 TP304 Seamless (Note 7)	N/A	(Note 8)
Forgings/Bar Stock	SA 182 F304 (Note 7)	N/A	N/A
Gaskets	EPDM	N/A	N/A
Bolting	SA-193 Gr. B8M/SA-194 Gr. 8M	N/A	N/A

Vessel Connections (Ref. 1, 16, 17)

See Note 26

Miscellaneous Data

Orientation	Vertical	Support Type (Note 3)	Skirt
Insulation Function (Note 4)	Freeze Protection	Insulation Material	By Buyer
Insulation Thickness (inch)	3 (Ref. 1) (Note 4)	Internal Finish	Welds descaled as laid
		External Finish	Welds descaled as laid
DEP-VSL-00004A Spray Nozzle Preferred Operating Point (Pressure [psig], Flow [gpm])	22 - 44 , 31 - 79	DEP-VSL-00004A Spray Nozzle Available Pressure at Design Flow (Pressure [psig], Flow [gpm])	44.02, 105 (Ref. 7)
DEP-VSL-00004B Spray Nozzle Preferred Operating Point (Pressure [psig], Flow [gpm])	22 - 44 , 31 - 79	DEP-VSL-00004B Spray Nozzle Available Pressure at Design Flow (Pressure [psig], Flow [gpm])	43.85, 105 (Ref. 7)

Remarks

* To be determined/confirmed by the vendor

Note 1 - Not to exceed size diameter includes allowance for cooling jackets and side nozzle protrusion in addition to the vessel ID.

Note 2 - Not to exceed size height includes allowance for top manway and bottom skirt height dimension, from Top of Concrete (TOC) to bottom of vessel, in addition to total vessel height.

Note 3 - Skirt must be designed with 14'-0" Internal Diameter Ring Beam attachment in consideration.

Note 4 - Insulation is required on both the shell and top/bottom head of the vessel (by BUYER).

Note 5 - The contents of this document are Dangerous Waste Permit affecting.

Note 6 - 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.

Note 7 - Max. Carbon content 0.030%.

Note 8 - Nozzle necks below the high operating liquid level are Primary, others Auxiliary.

Note 9 - Vessel design temperature is determined by adding 25 °F to the max vessel operating temperature and rounding up to the nearest 5 °F.

Note 10 - Deleted

Note 11 - This equipment is located in R2 radiation area (radiological buffer area) which is designed to have a target radiation level of less than 0.250 mrem/hr. The average contact dose rate for this equipment is 3.75E-04 Rad/hr. (Ref. 8, 10, and 11)

Note 12 - Deleted

Note 13 - Deleted.

Note 14 - Deleted.

Note 15 - Deleted.

Note 16 - Deleted.

Note 17 - Center line of nozzle N13 (Ref. 16, 17) for level instrumentation must be located at least 54" from the side wall of vessel to allow for stilling well placement.

Note 18 - Seller to provide access platform and ladders.

Note 19 - Vessel is not Black Cell/Hard-to-Reach.

Note 20 - Vessel Discharge Outlet nozzle (N11, Ref. 16, 17) to be flush with vessel bottom, centered on vessel, and fitted with a vortex breaker.

Note 21 - For nozzles N02, N03, N04, N08, N09 (Ref. 16, 17) Inlet lines to be extended into the vessel and directed away from the vessel walls in order to prevent liquid from flowing down the vessel walls.

Note 22 - All internal supports and welds that interact with the primary confinement barrier (vessel) shall maintain equal quality level and seismic category as the vessel.

Note 23 - For Nozzle N07 (Ref. 16, 17), spray nozzle to be located as close to the center of the top head as possible.

Note 24 - Vessel vent nozzle (N12, Ref. 16, 17) to be located at the center of the top head. Intake air nozzle (N06, Ref. 16, 17) to be located at a maximum radius within the crown region of the head.

Note 25 - Deleted.

Note 26 - Refer to 24590-BOF-MV-DEP-00006001,-00007001 for vessel details including dimension, nozzle schedule table and locations/orientations.

Revision History

Rev.	Description	Originator	Checker	MET Reviewed	Approver	Date
1	Issued for Procurement (to reuse UFP-VSL-00002A/B). Major Revision (Revision Bars Not Shown). No EIEs against this document.	Jung Shin 	Ryan Rickenbach 		Youssef Mohammad-Zadeh 	6/30/17
0	Issued for Purchase. Impacts against this document have been evaluated and EIE, 24590-BOF-EIE-MS-16-0060, Rev. 0 is incorporated in this revision.	Jung Shin	Holden Carroll	Debbie Adler	Youssef Mohammad-Zadeh	1/18/2017

Supplier notes:

- ★ - Minimum thickness controlled by external pressure. Refer to calculations (27200-CDC) page 19.
- ★ ★ - The calculations of the support skirt are based on an allowable stress design method. The minimum thickness of the skirt was determined by iteration using the same method. Refer to calculations (27200-CDC) load case 11 page 226 for highest skirt stress ratio.

Attachment A – References for Mechanical Datasheet 24590-BOF-MVD-DEP-00005, Rev. 1
(For internal reference; except for Ref. 4, 14, 16, 17)

1. 24590-BOF-M6-DEP-00004001, Rev 2 - P&ID - BOF/EMF Direct Feed LAW EMF Process System Overhead Sampling Vessel DEP-VSL-00004A
2. 24590-BOF-MVC-DEP-00007, Rev A - Process Data for the Overhead Sampling Vessels (DEP-VSL-00004A/B) and Pumps (DEP-PMP-00004A/B/C)
3. 24590-BOF-MVC-DEP-00002, Rev A - Overhead Sampling Vessel (DEP-VSL-00004A/B) - Vessel Sizing, Vessel Overflow Nozzle Sizing, and Plant Wash System Sizing
4. 24590-BOF-3PS-MVSC-T0003, Rev 0 - Engineering Specification for DFLAW EMF Lag Storage and Overhead Sampling Vessels
5. 24590-BOF-M6C-DEP-00009, Rev B - Design Pressure and Temperature Calculation for the EMF DEP/DVP/AFR/NLD/SHR/SNR Systems
6. 24590-WTP-3DG-M40T-00001, Rev 0 - Design Parameters and Test Pressures for Equipment and Piping
7. 24590-BOF-M6C-PSW-00008, Rev B - EMF Process Service Water (PSW) Line Sizing (PIPE-FLO)
8. 24590-BOF-P1-25-00001, Rev 0 – Balance of Facilities LAW Effluent Process BLDG & LAW Effluent Drain Tank BLDG General Arrangement Plan at Elev 0 ft – 0 in
9. Deleted.
10. 24590-WTP-DB-ENG-01-001, Rev 5 – Basis of Design
11. 24590-WTP-Z0C-W13T-00010, Rev. G – Contact Dose Rates to Equipment From Beta and Gamma Emitters
12. Deleted.
13. 24590-BOF-MPC-DEP-00004, Rev A - BOF DEP Overhead Sampling Vessel Pump (DEP-PMP-00004A/B/C) Sizing and Line Sizing
14. 24590-BOF-MPD-DEP-00018, Rev 0 - 24590-BOF-MP-DEP-EDUC-00006, -00007, -00008, -00009 - Mixing Eductors for Atmospheric Vessels DEP-VSL-00004A/B
15. Deleted.
16. 24590-BOF-MV-DEP-00006001, Rev 1 - Equipment Assembly Overhead Sampling Vessel DEP-VSL-00004A
17. 24590-BOF-MV-DEP-00007001, Rev 1 - Equipment Assembly Overhead Sampling Vessel DEP-VSL-00004B
18. 24590-BOF-MVC-DEP-00009, Rev C - Batch Sizing Calculation of DEP (Direct Feed LAW Effluent Management Facility Process System) Vessels: DEP-VSL-00001, -00002, -00003A/B/C, -00004A/B, -00005A/B
19. 24590-BOF-N1D-DEP-00004, Rev 0 - DEP-VSL-00004A/B - Overhead Sampling Vessel Corrosion Evaluation
20. 24590-BOF-M6-DEP-00004002 - Rev 2 - P&ID - BOF/EMF Direct Feed LAW EMF Process System Overhead Sampling Vessel DEP-VSL-00004B