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

COVERSHEET

For Letter 21-NWP-034
Dated March 10, 2021

Re: Approval of the Proposed Class 2 Permit Modification 8C.2020.8F to the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste*, WA7890008967, Part III, Operating Unit Group 3, Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (ETF), WA7890008967

Due to the Governor's "Safe Start" Order, the Department of Ecology (Ecology) cannot distribute hard copy letters or enclosures, including DVDs, at this time. All letters are being sent electronically with embedded links to the enclosures.

The enclosures are on Ecology's website at https://fortress.wa.gov/ecy/nwp/permitting/8C.2020.8F.

After the Safe Start Order is lifted, Ecology will send all hard copy letters and associated hard copy enclosures or DVDs as appropriate.

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March 10, 2021 21-NWP-034

Brian T. Vance, Manager
Office of River Protection
United States Department of Energy
PO Box 450, MSIN: H6-60
Richland, Washington 99352

John R. Eschenberg, President
Washington River Protection Solutions LLC
PO Box 850, MSIN: H3-04
Richland, Washington 99352

Re: Approval of the Proposed Class 2 Permit Modification 8C.2020.8F to the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste*, WA7890008967, Part III, Operating Unit Group 3, Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (ETF), WA7890008967

Reference: Letter 20-ECD-0061, dated December 1, 2020, "Submittal of Class 2 Permit Modification Notification to the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion for the Liquid Effluent Retention Facility and the 200 Area Effluent Treatment Facility [S-2-8, T-2-6]"

Dear Brian T. Vance and John R. Eschenberg:

The Department of Ecology (Ecology) approves your request for a Class 2 Permit Modification, 8C.2020.8F, to the LERF and 200 Area ETF permit chapter (Reference) in accordance with Washington Administrative Code (WAC) 173-303-830(4)(b)(vi)(A)(I). In accordance with WAC 173-303-840(8)(b), this Class 2 Permit Modification to the LERF and 200 Area ETF permit chapter is effective on April 9, 2021.

With this Class 2 Modification, the Permittees will be able to expand the existing 2025ED Load-In Station, construct the 2025EG Backup Load-In Station container storage and treatment area, and remove two unused tanks (59A-TK-109 and 59A-TK-117) at the 2025ED Load-In Station.

The United States Department of Energy (USDOE) held a public comment period regarding the Class 2 Permit Modification request for the LERF and 200 Area ETF from December 15, 2020 through February 13, 2021. They held a virtual public meeting on January 21, 2021.

Ecology received 31 public comments from USDOE's comment period. We reviewed the comments and wrote a *Response to Comments* document. The *Response to Comments* document is on the enclosed DVD (Ecology Publication 21-05-009) and on Ecology's publication website at https://apps.ecology.wa.gov/publications/summarypages/2105009.html.

As part of the issuance of this permit modification, Ecology is including the following language into Addendum F, Preparedness and Prevention, Section F.3 "Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste":

"*Aqueous waste managed at the LERF may display the characteristics of reactivity or ignitability. Any aqueous waste streams accepted at 200 Area ETF exhibiting these characteristics are immediately sent for blending or mixing at LERF to a concentration where the waste no longer exhibits characteristics of reactivity or ignitability. Aqueous waste streams exhibiting characteristics of ignitability or reactivity are not stored or treated at 200 Area ETF, or in the 2025ED Load-In Station and 2025EG Backup Load-In Station,"*

To be consistent with other unit groups, Ecology is removing the dates listed in "List of Addenda Specific to Operating Unit Group 3" within the LERF and 200 Area ETF Unit Specific Permit Conditions.

The permit modification can be accessed at the Ecology website: https://fortress.wa.gov/ecy/nwp/permitting/8C.2020.8F/.

The permit modification is on the enclosed DVD. A DVD is also at the Hanford Public Information Repositories in Richland, Spokane, and Seattle, Washington, as well as Portland, Oregon. A hard copy is 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 Administrative Record 2440 Stevens Center Place Richland, Washington 99354

Individuals can request copies of the DVD and hard copies by contacting Ecology's Resource Center at (509) 372-7950.

In accordance with WAC 173-303-830(4)(f)(ii), Ecology's decision to grant or deny a Class 2 Permit Modification request under this section may be appealed under the permit appeal procedures of WAC 173-303-845.

Your Right to Appeal

You have a right to appeal this permit modification to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Permit. The appeal process is governed by Chapter 43.21B of the Revised Code of Washington (RCW) and Chapter 371-08 of the WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Permit:

- File your appeal and a copy of this Permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Permit on Ecology in paper form-by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B of the RCW and Chapter 371-08 of the WAC.

1. **To file your appeal with the Pollution Control Hearings Board**

Mail appeal to:	**OR**	**Deliver your appeal in person to:**
The Pollution Control Hearings Board PO Box 40903 Olympia, Washington 98504-0903		The Pollution Control Hearings Board 1111 Israel Road, Southwest, Suite 301 Tumwater, Washington 98501

2. **To serve your appeal on the Department of Ecology**

Mail appeal to:	**OR**	**Deliver your appeal in person to:**
The Department of Ecology Appeals Processor PO Box 47608 Olympia, Washington 98504-7608		The Department of Ecology Appeals Processor 300 Desmond Drive Southeast Lacey, Washington 98503

3. **Send a copy of your appeal to:**

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

If there are any questions, please contact Amena Mayenna, Environmental Engineer, at amena.mayenna@ecy.wa.gov or (509) 372-7940 or John Temple, Project Manager, at john.temple@ecy.wa.gov or (509) 372-7929.

Sincerely,

Stephanie Schleif Digitally signed by Schleif, Stephanie (ECY)

Stephanie Schleif
Deputy Program Manager
Nuclear Waste Program

am/jlg
Enclosure

cc: See page 4

cc electronic w/o enc:

Dave Bartus, EPA
David Einan, EPA
Kaylin Burnett, USDOE-ORP
Rana Evans, USDOE-ORP
Lori Huffman, USDOE-ORP
Christopher Kemp, USDOE-ORP
Glyn Trenchard, USDOE-ORP
Duane Carter, USDOE-RL
Mostafa Kamal, USDOE-RL
Tony McKarns, USDOE-RL
Brian Stickney, USDOE-RL
Sheila Davis, BNI
Brittany Sparks, BNI
Robert Bullock, CPCCo
Marc Jewett, CPCCo
Curt Clement, HMIS
Jon Perry, HMIS
Darci Teel, HMIS
Michael Stephenson, PNNL
Jim Foster, WRPS
Suzette Thompson, WRPS
Eric Van Mason, WRPS
ERWM Staff, YN
Debra Alexander Ecology
Lilyann Bauder, Ecology
David Bowen, Ecology
Jennifer Cantu, Ecology
Annette Carlson, Ecology
Suzanne Dahl, Ecology
Katie Hall, Ecology
Mandy Jones, Ecology
Joseph Lippold, Ecology
Amena Mayenna, Ecology
Nina Menard, Ecology
John Price, Ecology
Stephanie Schleif, Ecology
John Temple, Ecology
Dan Thompson, Ecology

cc electronic w/enc and DVD:

Tim Hamlin, EPA
Tony McKarns, USDOE-RL
Lori Huffman, USDOE-ORP
Sheila Davis, BNI
Brittany Sparks, BNI
Mason Murphy, CTUIR
Jack Bell, NPT
Rex Buck, Jr., Wanapum
Laurene Contreras, YN
Susan Leckband, HAB
David Reeploeg, Hanford Communities
Max Woods, ODOE
Robin Priddy, BCAA
Matthew Drumheller, USACE
Trevor Fox, USFW
Mike Livingston, WDFW
Lauren Jenks, WDOH
John Martell, WDOH
Randy Treadwell, WSDA
Allyson Brooks, WSDAHP
Cindy Preston, WSDNR
BNI Correspondence Control
Environmental Portal
Gonzaga University Foley Center Library
Hanford Administrative Record, Hanford Site-wide Permit
Hanford Facility Operating Record
NWP RIM Coordinators, Ecology
PNNL Correspondence Control
Portland State University Library, Government Information
University of Washington Suzzallo Library, Government Publications
CPCCo Correspondence Control
EPA Region 10 Hanford Field Office, Correspondence Control
HMIS Correspondence Control
USDOE-ORP Correspondence Control
USDOE Public Reading Room, CIC
USDOE-RL Correspondence Control
WRPS Correspondence Control

cc w/enc, DVD and hard copy:

Hanford Administrative Record: Hanford Site-wide Permit
NWP RIM Coordinators, Ecology

cc w/enc, hard copy:

NWP Library: Hanford Site-wide Permit

Response to Comments LERF/ETF Load-In Station Expansion/Backup Facility – Class 2 Permit Modification

Dec. 15, 2020 to Feb. 13, 2021

For the **Nuclear Waste Program**

Washington State Department of Ecology

Richland, Washington

March 2021, Publication 21-05-009

DEPARTMENT OF ECOLOGY State of Washington

Publication Information

This document is available on the Department of Ecology's website at:
https://apps.ecology.wa.gov/publications/summarypages/2105009.html

Ecology publishes this document to meet the requirements of Washington Administrative Code 173-303-840 (9).

COVER PHOTO CREDIT

- Photo by Washington State Dept. of Ecology, July 26, 2020

Contact Information

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Website[1]: Washington State Department of Ecology

ADA Accessibility

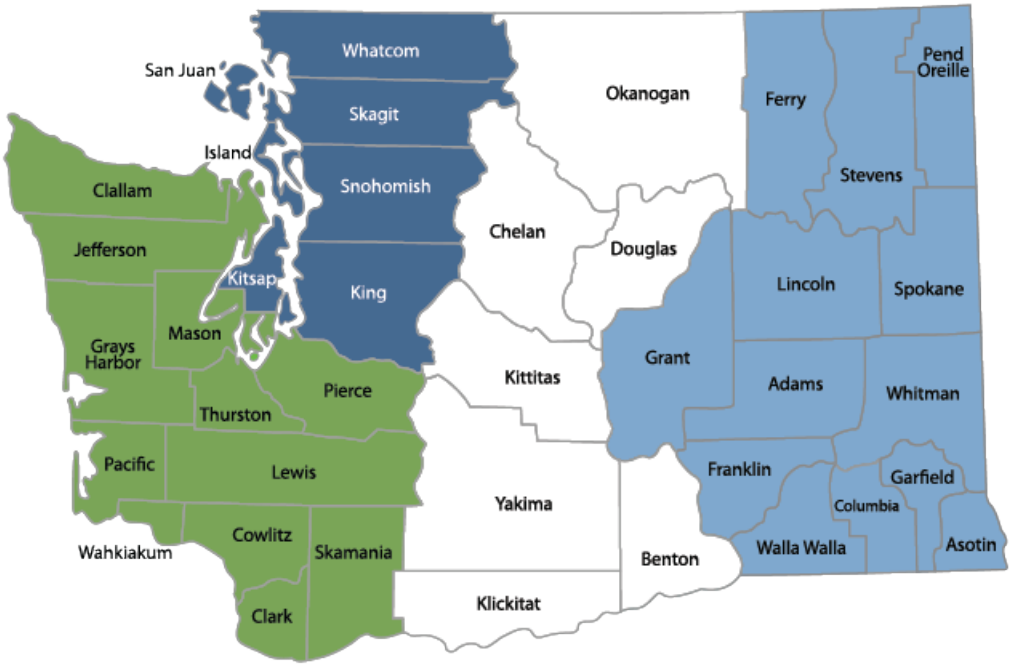
The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request an ADA accommodation, contact Ecology by phone at 509-372-7950 or email at Daina.McFadden@ecy.wa.gov. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit Ecology's website for more information.

[1] www.ecology.wa.gov/contact

Department of Ecology's Regional Offices

MAP OF COUNTIES SERVED



Southwest Region 360-407-6300 | Northwest Region 425-649-7000 | Central Region 509-575-2490 | Eastern Region 509-329-3400

Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	3190 160th Ave SE Bellevue, WA 98008	425-649-7000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

Response to Comments
LERF/ETF Load-In Station Expansion/Backup Facility – Class 2 Permit Modification

Dec. 15, 2020 to Feb. 13, 2021

Nuclear Waste Program
Washington State Department of Ecology
Richland, WA

March 2021 | Publication 21-05-009

DEPARTMENT OF
ECOLOGY
State of Washington

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Appendix A. Copies of All Public Notices

References

Introduction

The Washington State Department of Ecology's Nuclear Waste Program (Ecology) manages dangerous waste within the state by writing permits to regulate its treatment, storage, and disposal. When a new permit or a significant modification to an existing permit is proposed, Ecology holds a public comment period to allow the public to review the change and provide formal feedback. (See Washington Administrative Code [WAC] 173-303-830 for types of permit changes.)

The Response to Comments is the last step before issuing the final permit, and its purpose is to:

- Specify which provisions, if any, of a permit will become effective upon issuance of the final permit, providing reasons for those changes.
- Describe and document public involvement actions.
- List and respond to all significant comments received during the public comment period and any related public hearings.

This Response to Comments is prepared for:

Comment period	LERF/ETF Load-In Station Expansion/Backup Facility – Class 2 Permit Modification, Dec. 15, 2020, to Feb. 13, 2021
Permit	*Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, Liquid Effluent Retention Facility (LERF) and the 200 Area Effluent Treatment Facility (ETF)
Permittees	U.S. Department of Energy
Original Issuance date	03/10/2021
Effective date	04/09/2021

To see more information related to the Hanford Site and nuclear waste in Washington, please visit our webpage, Hanford Cleanup[2].

[2] https://www.ecology.wa.gov/Hanford

Reasons for Issuing the Permit

The proposed Class 2 permit modification affects the Liquid Effluent Retention Facility (LERF) and the 200 Area Effluent Treatment Facility (ETF) portion of the Permit. Modifications are proposed that will improve efficiency and throughput, better enabling the 2025ED Load-In Station to support Hanford mission needs. The changes to the Permit include:

- The 2025ED Load-In Station will be expanded and support systems will be upgraded.
- Tanks 59A-TK-109 and 59A-TK-117 will be removed and the outdoor sump area will be covered.
- A Backup Load-In Station (2025EG) will be constructed and will operate while 2025ED is out of service.

Public Involvement Actions

The U.S. Department of Energy (USDOE) invited public comment on the LERF/ETF Load-In Station Expansion/Backup Facility – Class 2 Permit Modification during a 60-day public comment period held Dec. 15, 2020 through Feb. 13, 2021.

The following actions were taken to notify the public:

- Mailed a public notice announcing the comment period to 1,132 members of the public.
- Distributed copies of the public notice to members of the public at Hanford Advisory Board meetings.
- Placed a public announcement legal classified advertisement in the Tri-City Herald on Dec. 15, 2020.
- Emailed a notice announcing the start of the comment period to the Hanford-Info email list, which has 1,318 recipients.
- Posted the comment period notice on the Washington Department of Ecology – Hanford's Facebook and Twitter pages.

USDOE held a virtual public meeting at 5:30 pm Jan 21, 2021. Twenty-five members of the public attended, and zero comments were collected.

The Hanford information repositories located in Richland, Spokane, and Seattle, Washington, and Portland, Oregon, received the following documents for public review:

- Focus sheet
- Transmittal letter
- Statement of Basis for the proposed LERF/ETF Permit Modification
- Draft LERF/ETF Permit Modification

The following public notices for this comment period are in Appendix A of this document:

- Focus sheet
- Classified advertisement in the Tri-City Herald

- Notices sent to the Hanford-Info email list
- Notices posted on the Washington Department of Ecology – Hanford's Facebook and Twitter pages

List of Commenters

The table below lists the names of organizations or individuals who submitted a comment on the LERF/ETF Load-in Station Permit modification. The comments and responses are in Attachment 1.

Commenter	Organization
George Baggett	Citizen
Judy Pigott	Citizen
Anonymous Citizen	Citizen
Antoinette Bonsignore	Citizen
James Strick	Citizen
Pedro de la Torre III	Citizen
Kathleen Dickeman	Citizen
Kathleen Cain	Citizen
Linda Greene	Citizen
Jeanne Poirier	Citizen
Patricia Morton	Citizen
Laura Feldman	Citizen
Clara Kielkopf	Citizen
Coral Shaffer	Citizen
Mark Wittow	Citizen
Robert Masterson	Citizen
Nancy Arbuckle	Citizen
John Spear	Citizen
Bud Anderson	Citizen
Pamela Howard	Citizen
Mecal Seppalainen	Citizen
Dwight Rousu	Citizen
Beth Sanders	Citizen
Martha Rost	Citizen
Patricia Janesh	Citizen
Peter von Christierson	Citizen
James Millbauer	Citizen
Jean Baker	Citizen
Lori Stole	Citizen
Judy Todd	Citizen
Tom Carpenter	Hanford Challenge

Attachment 1: Comments and Responses

Description of comments:

Ecology accepted comments from Dec. 15, 2020, through Feb. 13, 2021. This section provides a summary of comments that we received during the public comment period and our responses, as required by RCW 34.05.325(6)(a)(iii). Comments are grouped by individual and each comment is addressed separately.

I-1: GEORGE BAGGETT

Comment I-1-1

Having followed the DOE Environmental Restoration projects since the Reconfiguration comment I made regarding the Preliminary Design Report, Priority System for Environmental Restoration, the Hanford projects have received the bulk of my attention. Hanford, being an example of anthropocene has taken on management of a wide variety of environmental issues. The Liquid Effluent Retention and 200 Area Effluent Treatment Facility and the Load-in stations reflect critical thinking associated with the issues and problems they will address. Having a history of working on environmental issues and remediation since the mid-1970s, I note that reading the Hanford documents has continued to be an enlightening and learning experience – evaluating the technologies in use, the chemistry of the plans, and assessment analysis methodology.

When Rick Perry was appointed, and the administration seemed to be unraveling government programs I worried Hanford restoration might become a victim of under-informed political personalities. Reading this document has swayed that concern. Wisdom seems to have prevailed and I commend those who stood in the path of denigrating the science and expertise that has been gained over the years.

Quoting from my 1991 comment:

"We are pleased that the DOE is beginning the arduous process of cleaning up the legacy of the nuclear era. It is our hope that our comment will assist the DOE in reconciling the desires of states, tribes and the U. S. EPA with the interests of local communities and the impact on the environment. We are also pleased to note the suggestion from Congress that the DOE cleanup priority system must rank and weigh in relative importance, health risk as the number one priority during this cleanup process. This is consistent with our goal of pollution prevention. We believe that activities that generate pollutants can be modified or have pollution control equipment installed which will greatly reduce or eliminate the impact on the environment and the health. safety and welfare of those who live near DOE facilities."

Since that time, I was involved with supplying carbide lime slurry to the KC DOE Bannister Road waste treatment facility prior to its closure. It was my great pleasure to see firsthand the professional approach to handling waste treatment with an integrated approach. This approach as permeated the DOE approach to our national issues related to the US nuclear anthropocene from the history of these facilities. My new hope is that long-term thinking along the lines of geological time frames will guide the final resting place of the end products of waste treatment.

Response to I-1-1

Thank you for your comment.

I-2: JUDY PIGOTT

Comment I-2-1

The modifications that are requested SHOULD NOT be permitted. Changes in the make up of the material in the tanks, as requested, will increase chances for accidental seepage, for mistakes to be made for worker safety, and for pollution of the Columbia River.

Response to I-2-1

Thank you for your comment.

Ecology expects the Permittees to ensure safe operations of the LERF/ETF facilities to protect human health and the environment. This permit modification will help to ensure that the facility is operated in a safe manner and that the waste will be treated in a way that is protective of human health and the environment.

I-3: ANONYMOUS CITIZEN

Comment I-3-1

See References for original submission.

Response to I-3-1

Thank you for your comment.

Please see the responses for I-3-2 to I-3-6.

Comment I-3-2

My first comment is that I would appreciate if Ecology would reject ORP's proposal to alter TPA Milestone M-062-50. This milestone was supposed to be an integrated, up to date mass balance, and it was reported to the public as "On Schedule" as a single secondary document, month after month after month. Further, some of the information proposed to be substituted predates the establishment of the milestone, none of it is integrated, and some is presentation slides, which have no QA associated with them, as opposed to formal, checked, TPA documents. Ecology should receive a consistent set of assumptions to check to see if they are reasonable, and a set of results to show volumes and compositions underlying the present permit modification request parameters (such as the capacity of the expanded and new equipment), and also to compare to DOE promises about Double Shell Tank space. For example, a DOE official made an unsupported assertion to the DOE Office of Inspector General (DOE-OIG-20-57) that tank waste operations will "eliminate" the concern regarding sufficient DST space availability. It would help to know whether this conclusion is supported in the mass balance or if volumes of DST waste will pile up during DFLAW.

At a minimum, all reference material (including "Powerpoint" presentations) cited by DOE in letter 20-ECD-0057 should be compiled and made available to the public for review in the TPA administrative record, as a single secondary document, by the due date of January 31, 2021, so we can see for ourselves whether DOE's assumptions are consistently documented and integrated.

Of note is that DOE has not described what they were doing during the months of "on schedule" reporting for the milestone. Was this a case of continued time card fraud because they were not actually working on a mass balance? Or is it a case where the results were something DOE did not like and did not wish to share? It would be helpful for Ecology to hold DOE accountable to the original milestone. Additional comments where a mass balance could improve the current permit modification for LERF/ETF are below.

Response to I-3-2

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Double Shell Tank space:
In June 2019 Ecology issued to DOE milestones for new DSTs. Ecology's unilateral action is currently in the TPA dispute process. This comment's recommendation is an alternate approach to Ecology's position on new DSTs.

Letter 20-ECD-0057:
Ecology's permitting decision is not dependent on acceptance of the milestone as complete. Therefore, Ecology is not including the requested documents as part of this permit modification's administrative record.

Comment I-3-3

Per addendum page B.7, ETF products now include brine as well as powder. Brine is intended for "treatment at an authorized dangerous waste facility." DOE Should identify the facility and verify this is acceptable under the "authorized facility's" permits. If there is no facility with an active valid permits, DOE will have an orphan waste. Is the brine stream affected by the new grout skid that is in design, according to the monthly reports? Can it grout this brine? Please do not send, as was previously identified, ETF brine to PERMA-FIX Northwest in Richland. The brine can generate toxic gases when the pH is adjusted, and, without a mass balance, no one can tell how much ammonia or technetium, or tritium, or NOx sources will be included. Recently a Hanford Tank waste simulant evolved toxic NOx gas when treated improperly, according to the DNFSB2. The same thing could happen much closer to City of Richland residents if treatment occurs at PFNW. Safety and regulatory problems at Perma-Fix Northwest are identified in detail in a new Hanford Challenge report

Response to I-3-3

Generators of dangerous wastes must send their wastes to authorized facilities. Neither generator requirements nor permit requirements (for Treatment, Storage, or Disposal Facilities) need to specify where those wastes must be sent, merely that they must go to an authorized facility. However, Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations.

Depending on the source of the treatment campaign, powder or brine generated from the secondary treatment train may require additional treatment (grout) to meet RCRA Land disposal Restrictions (LDRs), and waste acceptance criteria for the RCRA disposal facility [e.g., Integrated Disposal Facility (IDF)]. DOE stated to Ecology that two alternatives are being considered: (1) on-site treatment or (2) off-site treatment at PERMA-FIX Northwest (PFNW). DOE has not submitted a permit modification request to support either alternative. Ecology is separately preparing a SEPA evaluation (EIS supplement) to support renewal of the PFNW RCRA permit. The PFNW permit renewal will include Waste Acceptance Criteria that would address the potential hazards stated in this comment. The WA State Department of Health separately imposes license limits for PFNW for the radionuclides stated in this comment.

Comment I-3-4

Page addendum C.1 adds "WTP aqueous waste" to the list of wastes to be treated at ETF. As a result, there are new feeds and new products to be considered in this permit request. RPPIQRPE-50074, page 35, identifies Page RPP-RPT-62679, 2020, ETF Truck Load-In Expansion Project Non-Metallic Materials Report, Rev. 1, Washington River Protection Solutions, LLC, Richland, Washington, as the source of information on the "composition of the various ETF waste streams." No stream data are provided. Presumably, an integrated mass balance was used to prepare the waste stream composition. Ecology should ask for a copy of RPP-RPT-62679 to track down the source of the composition inputs to see if they are reliable and complete, and ask that the composition ranges be provided in the permit, similar to tank waste compositions listed for the Hose in Hose Transfer line specification (which is part of the LERF/ETF permit).

Response to I-3-4

Ecology received the document RPP-RPT-62679, 2020, ETF Truck Load-In Expansion Project Non-Metallic Materials Report, Rev. 1 as part of this permit modification package. Section 3.1 of this document states that the acceptance criteria for waste sent to LERF is used as the bounding conditions for the ETF wastewater chemical composition.

The mass balance analysis does not determine a waste streams' acceptability at the LERF and 200 Area ETF. This is determined by the facility's Waste Acceptance Criteria and a Waste Analysis Plan, which are included in this LERF and 200 Area ETF permit modification.

Comment I-3-5

Page Addendum C.13 deletes "39,000" gallons and refers to the "Part A" form in Addendum A for the maximum volume of dangerous waste that can be stored in containers. When I look at the Part A, I found that it says "the container design capacity 39,000 gallons, and the treatment capacity 5,000 gallons are "empirical" numbers based on maximum "anticipated" treatment. The basis for the "anticipated" amounts is not provided, but would be documented with a basis had DOE prepared an integrated mass balance. Ecology should ask for the basis documentation for these "anticipated" values, which include liquids from the current proposed permit modification.

Response to I-3-5

The current Addendum A, Part A Form states "The container design capacity 39,000 gallons is an empirical number based on the equivalent of storing 709, 55-gallon drums within the five-container storage areas." The capacity considers container storage area dimensions and used floor space to determine volume and number of drums that can be stored. Container capacities and treatment capacities are based on design criteria, not on a mass balance.

Comment I-3-6

Page Addendum B.8 states that aqueous waste from the WTP analytical laboratory is also transferred to LERF/ETF. It would help to have the integrated mass balance to provide a basis for the estimated flows of ALL the streams going to ETF/LERF. Was this stream included in the IQRPE report? The proposed permit modification does not say.

Response to I-3-6

The text referred to in the comment is existing permit language for transfers to LERF Basins, and not for transfers to the Load-In facilities. The request for an integrated mass balance for streams going to LERF and 200 Area ETF is outside the scope of this permit modification which addresses the 200 Area ETF Load-In Facility Expansion.

The IQRPE Design Assessment Report for 200 Area ETF Load-In Facility Expansion (RPP-IQRPE-50074) addresses waste compatibility in Section 2.2.2. The report determined that the tank systems are compatible with the wastes transported or otherwise handled in accordance with WAC 173-303-640(3)(a).

I-4: ANTOINETTE BONSIGNORE

Comment I-4-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Antoinette Bonsignore

Response to I-4-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-5: JAMES STRICK

Comment I-5-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments,

James Strick, Professor
Dept. of Earth and Environment
Franklin and Marshall College

Response to I-5-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the

mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-6: PEDRO DE LA TORRE III

Comment I-6-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Pedro de la torre III

Response to I-6-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-7: KATHLEEN DICKEMAN

Comment I-7-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I grew up in Richland, and I care about how Hanford's tank waste is treated. I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments,

Response to I-7-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-8: KATHLEEN CAIN

Comment I-8-1

To Whom It May Concern at the Department of Ecology,

Thank you for allowing me and the many other concerned citizens the opportunity to offer comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

I am asking you that make sure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I grew up in northwestern Montana and in Spokane, Washington (where many of my family members still live) and I now reside in Settle, so I am especially concerned about how Hanford's tank waste is treated. I want a transparent process that clearly and thoroughly documents—in one place— what happens to the tank waste once it begins treatment, where the contaminants will eventually end up and in what specific amounts. I am extremely concerned that there will be no "orphaned waste streams" - waste that has no pathway for further treatment or disposal. My current and future health depends on your actions.

Thank you for considering my comments, Kathleen Cain

Response to I-8-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-9: LINDA GREENE

Comment I-9-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Linda Greene

Response to I-9-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-10: JEANNE POIRIER

Comment I-10-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, stating: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thanks for letting me comment on this. Please do everything you can at Hanford to keep us all safe!

Response to I-10-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-11: PATRICIA MORTON

Comment I-11-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Several of my cousins died of cancer as a result of being exposed to radiation from Hanson site. I care about the remediation of this site deeply.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments.

Response to I-11-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-12: LAURA FELDMAN

Comment I-12-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Laura Feldman

Response to I-12-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-13: CLARA KIELKOPF

Comment I-13-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Clara Kielkopf, Ph.D.

Response to I-13-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-14: CORAL SHAFFER

Comment I-14-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow

from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Coral Shaffer

Response to I-14-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-15: MARK WITTOW

Comment I-15-1

To WA Department of Ecology:

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF.

I recommend that Ecology ensures the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I am concerned as to how Hanford's tank waste is treated. I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up. There should be no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments. Mark Wittow

Response to I-15-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-16: ROBERT MASTERSON

Comment I-16-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Robert V. Masterson

Response to I-16-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though

this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-17: NANCY ARBUCKLE

Comment I-17-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Nancy Arbuckle

Response to I-17-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-18: JOHN SPEAR

Comment I-18-1

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments,

Response to I-18-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-19: BUD ANDERSON

Comment I-19-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to

Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Bud Anderson

Response to I-19-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-20: PAMELA HOWARD

Comment I-20-1

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Pamela Howard

Response to I-20-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-21: MECAL SEPPALAINEN

Comment I-21-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Mecal Seppalainen

Response to I-21-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though

this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-22: DWIGHT ROUSU

Comment I-22-1

Please ensure the USDE meets requirements to submit a Mass Balance Flow as a single secondary document. We need clear and transparent documentation of potentially hazardous waste, which should not be recklessly covered up without due care to future generations.

Response to I-22-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

I-23: BETH SANDERS

Comment I-23-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments,

Response to I-23-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the

mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-24: MARTHA ROST

Comment I-24-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Martha Rost

Response to I-24-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-25: PATRICIA JANESH

Comment I-25-1

Any modifications should NOT be permitted. Changes in the makeup of the material in the tanks will increase the chances for accidental seepage, for mistakes to be made for worker safety and pollution of the Columbia River and its FOOD sources as well as other non-water river food sources adjacent to the tanks.

Response to I-25-1

Thank you for your comment.

Ecology expects the Permittees to ensure safe operations of the LERF/ETF facilities to protect human health and the environment. This permit modification will help to ensure that the facility is operated in a safe manner and that the waste will be treated in a way that is protective of human health and the environment.

I-26: PETER VON CHRISTIERSON

Comment I-26-1

This proposed permit modification is required to expand the existing 2025ED Load-In Station, construct the 2025EG Backup Load-In Station container storage and treatment area, and remove two unused tanks at the 2025ED Load-In Station, all of which are within the permit boundary.

The Load-In Station will be modified to include:

Extending the building footprint to the north sufficient to fit a large tanker

Reworking the concrete floor in the east bay to meet the applicable secondary containment requirements to allow for unloading of large tankers

Upgrading or replacing load in equipment (HVAC, safety shower, fire protection, etc.)

Removal of the abandoned Tanks 59A 109 and 117, and covering the outdoor sump

Designing and implementing a backup Load In Station to be utilized when the facility is out of service.

Response to I-26-1

Thank you for your comment.

I-27: JAMES MILLBAUER

Comment I-27-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments,

Response to I-27-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-28: JEAN BAKER

Comment I-28-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Jean Baker

Response to I-28-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-29: LORI STOLE

Comment I-29-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Lori Stole

Response to I-29-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as

complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

I-30: JUDY TODD

Comment I-30-1

Dear Department of Ecology,

Thank you for the opportunity to provide comments on the Class 2 Permit Modification for LERF/ETF ending Saturday, February 13th.

Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that was due Jan 31, 2021, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms to ETF/LERF. (Note that this milestone number was changed to M-62-50.)

I care about how Hanford's tank waste is treated and I want a transparent process that clearly documents in one place what happens to the tank waste once it starts treatment, where contaminants end up and in what quantity. It is important to me that there are no "orphaned waste streams" - waste that has no pathway for further treatment or disposal.

Thank you for considering my comments, Judy Todd

Response to I-30-1

Thank you for your comment.

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Ecology shares your concern about orphaned waste streams. Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Though this comment is outside the scope of this permit modification, the public will have the opportunity to review relevant permit documentation and provide comments for future permit modifications at LERF and 200 Area ETF.

O-1: HANFORD CHALLENGE

Comment O-1-1

See References for original submission

Response to O-1-1

Please see the responses from O-1-2 to O-1-9.

Comment O-1-2

Require Submittal of Integrated Mass Balance Flow as a Single Secondary Document: Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that states: Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms and to ETF/LERF. (Note that this milestone number was changed to M-62-50).

Response to O-1-2

Ecology accepted DOE's proposal to alter the TPA milestone based on DOE letter 20-ECD-0057 (https://pdw.hanford.gov/document/AR-04401). While Ecology accepted the milestone as complete, it is important to acknowledge that DOE's letter committed to continued work on the mass balance, including submittal of mass balance information related to the permit application and modifications.

Comment O-1-3

More Information Needed re: Addition of "WTP Aqueous Waste" (Addendum C-1, pdf p. 34 of 3641).: DOE should provide RPP-RPT-62679 to Ecology, so that Ecology has the necessary information to track down the source of the composition inputs to make sure they are reliable and complete. Please include the composition ranges for WTP Aqueous Waste in the permit, similar to tank waste compositions listed for the Hose in Hose Transfer line specifications in the LERF/ETF permit.

Response to O-1-3

Ecology received the document RPP-RPT-62679, 2020, ETF Truck Load-In Expansion Project Non-Metallic Materials Report, Rev. 1 as part of this permit modification package. Section 3.1 of this document states that the acceptance criteria for waste sent to LERF is used as the bounding conditions for the ETF wastewater chemical composition.

The mass balance analysis does not determine a waste streams' acceptability at the LERF and 200 Area ETF. This is determined by the facility's Waste Acceptance Criteria and a Waste Analysis Plan, which are included in this LERF and 200 Area ETF permit modification.

Comment O-1-4

Ensure Addition of Brine Will Not Create Orphaned Waste Stream: Brine has been added as an ETF waste product in addition to powder on Addendum B-8 (pdf p. 19 of 3641). Where will this brine be sent for treatment? Hanford Challenge has documented concerns with treating Hanford waste at Perma-Fix Northwest.

Response to O-1-4

Ecology will ensure the disposition of all waste streams is determined prior to commencement of treatment operations. Depending on the source of the treatment campaign, brine generated from the secondary treatment train may require additional treatment (grout) to meet RCRA Land Disposal Restrictions (LDRs), and the waste acceptance criteria for the authorized disposal facility. DOE stated to Ecology that two alternatives are being considered: (1) on-site treatment or (2) off-site treatment at PERMA-FIX Northwest (PFNW). DOE has not submitted a permit modification request to support either alternative. Ecology is separately preparing a SEPA evaluation (EIS supplement) to support renewal of the PFNW RCRA permit.

Comment O-1-5

Double-Shell Tank Waste Space Concerns: Please check the assertion made to the DOE OIG (DOE-OIG-20-57) claiming that tank waste operations will “eliminate” the concern regarding sufficient DST space availability. Is this conclusion supported in the mass balance, or will volumes of DST waste “pile up” during Direct Feed Low Activity Waste operations?

Response to O-1-5

Double-Shell Tank Waste Space is not within the scope of this permit modification. In June 2019 Ecology issued to DOE milestones for new DSTs. Ecology's unilateral action is currently in the TPA dispute process. This comment's recommendation is an alternate approach to Ecology's position on new DSTs.

Comment O-1-6

Build New Tanks - Contingency Planning for Tank Leaks and Backup Storage During DFLAW: Though not the topic of this comment period, Hanford Challenge believes that the agencies should initiate the appropriate actions to build new tanks to ensure that sufficient space is available during tank waste treatment.

Response to O-1-6

Building new tanks for backup storage during tank waste treatment is not within the scope of this permit modification.

Comment O-1-7

Make Reference Materials Accessible to the Public: Please make all reference material cited by DOE in letter 20-ECD-0057, including ,ÄúPowerpoint,Äù presentations, available to the public for review in the TPA administrative record, as a single secondary document.

Response to O-1-7

Ecology's permitting decision is not dependent on acceptance of the milestone as complete. Therefore, Ecology is not including the requested documents as part of this permit modification's administrative record. Ecology will, however, honor this request as a Public Records Act request.

Comment O-1-8

Information Before Approval: Ensure that additional information is provided to Ecology and shared with the public prior to approving these permit modifications.

Response to O-1-8

Ecology shares your concern for maintaining transparency and strives to ensure the public is apprised of the same level of information as the agency.

Appendix A. Copies of All Public Notices

Public notices for this comment period:

- Focus sheet
- Classified advertisement in the Tri-City Herald
- Notices sent to the Hanford-Info email list
- Notices posted on Washington Department of Ecology – Hanford's Facebook and Twitter pages

PUBLIC COMMENT PERIOD
Class 2 Permit Modification to the Hanford Dangerous Waste Permit

Fact Sheet

GET INVOLVED

Comment Period
Dec. 15, 2020 – Feb. 13, 2021

Virtual Public Meeting
Jan. 21, 5:30 p.m. PT
(see page 3 for details)

Send comments by Feb. 13 to
http://nw.ecology.commentinput.com/?id=69PsZ

Administrative Record:
https://pdw.hanford.gov/document/AR-04260

Contact Information
Jennifer Colborn
(509) 528.6687
jennifer_m_colborn@rl.gov

Daina McFadden, Ecology
(509) 372-7950
Hanford@ecy.wa.gov

The U.S. Department of Energy (DOE) is holding a 60-day public comment period on a proposed Class 2 permit modification to the Hanford Dangerous Waste Permit, "Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility" chapter. This proposed permit modification is required to expand the existing 2025ED Load-In Station, construct the 2025EG Backup Load-In Station container storage and treatment area, and remove two unused tanks at the 2025ED Load-In Station, all of which are within the permit boundary.

Background

The Hanford Site is located in southeastern Washington state along the Columbia River. The 580-square-mile site was created in 1943 as part of the Manhattan Project to produce plutonium for the nation's defense program. Today, waste management and environmental cleanup are the main missions at Hanford.

The DOE and its contractor Washington River Protection Solutions are requesting a Class 2 modification to the Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (ETF) operating unit group of the Hanford Dangerous Waste Permit. The LERF and 200 Area ETF are mixed-waste treatment and storage units for treating liquid effluents from operating Hanford cleanup facilities. These facilities include the 242-A Evaporator and the Waste Treatment and Immobilization Plant's Effluent Management Facility (when it becomes operational) to support treating tank waste using the Direct-Feed Low-Activity Waste approach (see map).

PUBLIC COMMENT PERIOD
Class 2 Permit Modification to the Hanford Dangerous Waste Permit

Overview

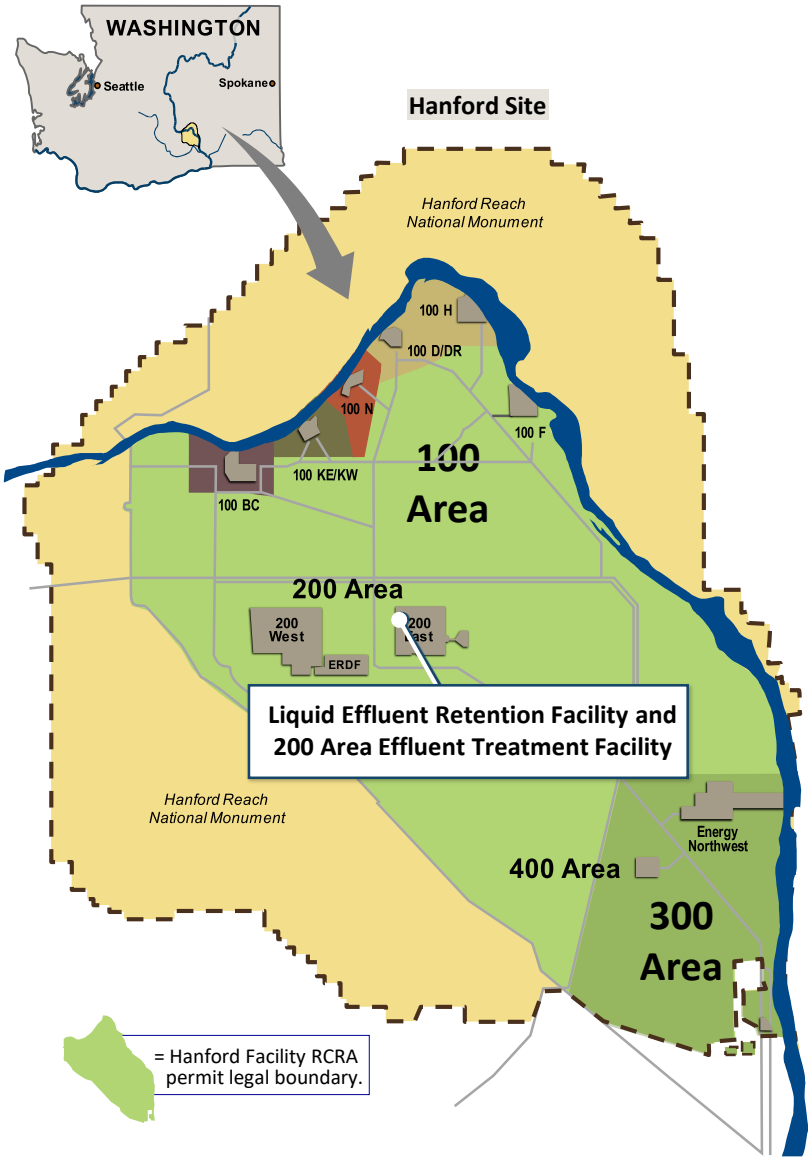
The Hanford Dangerous Waste Permit establishes requirements to ensure that waste management activities protect human health and the environment. DOE is proposing a Class 2 permit modification pursuant to WAC 173-303-830, which requires a 60-day comment period, a public meeting, a newspaper notice, and a mailing list notice. This fact sheet is the mailing notice.

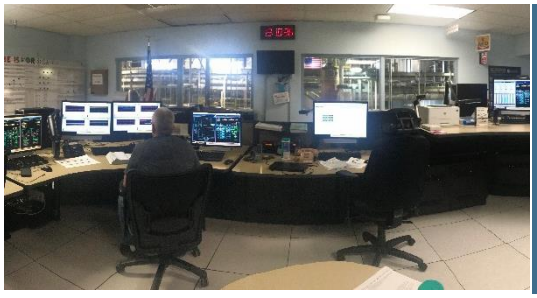
Summary of Changes

If approved, the modification would allow DOE to expand the 2025ED Load-In Station, construct the 2025EG Backup Load-In Station, and remove two unused tanks at the 200 Area ETF.

Permit Chapters Affected by this Modification

- Permit Conditions
- Addendum B, Waste Analysis Plan
- Addendum C, Process Information
- Addendum F, Preparedness and Prevention
- Addendum H, Closure Plan
- Addendum I, Inspection Requirements
- Addendum J, Contingency Plan





The Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility are monitored closely by the operations staff in the control room

Outside the 200 Area Effluent Treatment Facility

PUBLIC COMMENT PERIOD
Class 2 Permit Modification to the Hanford Dangerous Waste Permit

Public Involvement

A 60-day public comment period will begin Dec. 15, 2020, and continue through Feb. 13, 2021. A virtual public meeting will be held Jan. 21, 2021, at 5:30 p.m. PT, and will include a presentation introducing the LERF and 200 Area ETF modification for the expansion of the 2025ED Load-In Station, construction of 2025EG Backup Load-In Station, and removal of two tanks to meet the closure plan requirements.

During the virtual meeting, you can view the presentation, hear the speakers and ask your questions. To participate via GoToWebinar, please follow the instructions below:

Visual (presentation only):
Click the GoToWebinar link: https://attendee.gotowebinar.com/register/9073672840153859598;
ID #: 865-670-531

Audio:
1. Dial (509) 372-3087 (local) or (800) 664-0771 (long distance)
2. Enter Conference ID: 1333#

All comments must be submitted by Feb. 13, 2021, in writing, by mail or electronically (preferred) to:

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, WA 99354
http://nw.ecology.commentinput.com/?id=69PsZ (preferred)

At the conclusion of the public comment period, the Washington State Department of Ecology will address public comments and issue a final permit.

Copies of the proposed plan and supporting documentation will be available online during the public comment period in the Administrative Record at https://pdw.hanford.gov/document/AR-04260. Hanford Public Information Repository locations are listed at https://go.usa.gov/xVDTS.

The permittee's compliance history during the life of the permit being modified is available from the Washington State Department of Ecology contact person.

Please contact Jennifer Colborn, at Jennifer_M_Colborn@rl.gov or (509) 528-6687, at least 10 working days prior to the event to request disability accommodation. DOE makes every effort to honor disability accommodation requests.

Jennifer Colborn
P.O. Box 450, H6-60
Richland, WA 99352

Daina McFadden, Ecology
3100 Port of Benton Boulevard
Richland, WA 99354

Public Involvement Opportunity

We want to hear from you.

Comment Period:

Dec. 15, 2020 – Feb. 13, 2021

Public Meeting: Jan. 21, 5:30 p.m. (see page 3 for details)

Class 2 Permit Modification Fact Sheet
U.S. Department of Energy
P.O. Box 450, H6-60
Richland, WA 99352

NY health workers first to get vaccine in US

BY LAURAN NEERGAARD
Associated Press

The largest vaccination campaign in U.S. history got underway Monday as health workers in select hospitals rolled up their sleeves for shots to protect them from COVID-19 and start beating back the pandemic – even as the nation's death toll neared 300,000.

"I feel hopeful today. Relieved," said critical case nurse Sandra Lindsay after getting a shot in the arm at Long Island Jewish Medical Center in New York. Lindsay reportedly was the first person to receive the shot, according to the New York Times.

Shipments of frozen vials of vaccine made by Pfizer Inc. and its German partner BioNTech began arriving at hospitals around the country Monday.

"This is the light at the end of the tunnel. But it's a long tunnel," New York Gov. Andrew Cuomo said as he watched Lindsay's vaccination via video.

Several other countries also have OK'd the vaccine, including the U.K., which started vaccinating last week.

For health care workers who, along with nursing home residents, will be first in line for vaccination, hope is tempered by grief and the sheer exhaustion of months spent battling a coronavirus that still is surging in the U.S. and around the world.

"This is mile 24 of a marathon. People are fatigued. But we also recognize that this end is in sight," said Dr. Chris Dale of Swedish Health Services in Seattle.

Packed in dry ice to stay at ultra-frozen temperatures, the first of nearly 3 million vaccine doses being shipped in staggered batches this week made their way by truck and plane around the country Sunday from Pfizer's Kalamazoo, Michigan, factory. Once they arrive at distribution centers, each state directs where the doses go next.

More of the Pfizer-BioNTech vaccine will arrive each week. And later this week, the FDA will decide whether to greenlight the world's second rigorously studied COVID-19 vaccine, made by Moderna Inc.

Now the hurdle is to rapidly get vaccine into the arms of millions, not just doctors and nurses but other at-risk health workers such as janitors and food handlers – and then deliver a second dose three weeks later.

"We're also in the middle of a surge, and it's the holidays, and our health care workers have been working at an extraordinary pace," said Sue Mashni, chief pharmacy officer at Mount Sinai Health System in New York City.

Plus, the shots can cause temporary fever, fatigue and aches as they rev up people's immune systems, forcing hospitals to stagger employee vaccinations.

> "THIS IS MILE 24 OF A MARATHON. PEOPLE ARE FATIGUED. BUT WE ALSO RECOGNIZE THAT THIS END IS IN SIGHT.
> *Dr. Chris Dale of Swedish Health Services in Seattle*

A wary public will be watching closely to see whether health workers embrace vaccination. Just half of Americans say they want to get vaccinated, while about a quarter don't and the rest are unsure, according to a recent poll by The Associated Press-NORC Center for Public Health Research.

The FDA, considered the world's most strict medical regulator, said the Pfizer-BioNTech vaccine appears safe and strongly protective – and laid out the data behind it in a public meeting last week for scientists and consumers.

"Please, people, when you look back in a year and you say to yourself, 'Did I do the right thing?' I hope you'll be able to say, 'Yes, because I looked at the evidence,' " Dr. Francis Collins, director of the National Institutes of Health, said Sunday on NBC's "Meet the Press." "People are dying right now. How could you possibly say, 'Let's wait and see'?"

Still, emergency use means the vaccine was cleared for widespread use before a final study in nearly 44,000 people is complete – and that research is continuing to try to answer additional questions. While effective against COVID-19 illness, it's not yet clear whether vaccination will stop the symptomless spread that accounts for half of all cases.

The shots still must be studied in children, and during pregnancy. But the American College of Obstetricians and Gynecologists said late Sunday that vaccination should not be withheld from pregnant women who otherwise would qualify.

While the vaccine was determined to be safe, regulators in the U.K. are investigating several severe allergic reactions. The FDA's instructions tell providers not to give it to those with a known history of severe allergic reactions to any of its ingredients.

Electors cast votes for Biden as next president

BY MARK SHERMAN
Associated Press

WASHINGTON

Presidential electors coast to coast on Monday cast the votes that formally choose Joe Biden as the nation's next president.

Heightened security was in place in some states as electors in Arizona, Georgia, Michigan, Nevada, Pennsylvania and Wisconsin – the six battleground states that Biden won and President Donald Trump contested – gave Biden and Vice President-elect Kamala Harris their votes Monday in low-key proceedings. Nevada's electors met via Zoom because of the coronavirus pandemic.

Monday was the day set by law for the meeting of the Electoral College. In reality, electors were meeting in all 50 states and the District of Columbia to cast their ballots. The results will be sent to Washington and tallied in a Jan. 6 joint session of Congress, over which Vice President Mike Pence will preside.

The electors' votes have drawn more attention than usual this year because President Donald Trump has refused to concede the election and continues to make unsupported allegations of fraud.

When all the votes are in, Biden is expected to have 306 electoral votes to 232 for Trump. It takes 270 to be elected. In the popular vote count, Biden topped Trump by more than 7 million votes nationwide.

"In this battle for the soul of America, democracy prevailed," Biden said in remarks prepared for a Monday evening speech. "We the people voted. Faith in our institutions held. The integrity of our elections remains intact. And so, now it is time to turn the page. To unite. To heal."

Biden renewed his campaign promise to be a president for all Americans, whether they voted for him or not, and said the country has hard work ahead on the virus and economy.

There have been concerns about safety for the electors, virtually unheard of in previous years. In Michigan, lawmakers from both parties reported receiving threats.

Legislative offices there were closed Monday over threats of violence. The 16 electors were to meet in the Senate chamber in a ceremony headed by Democratic Gov. Gretchen Whitmer. Biden won the state by 154,000 votes, or 2.8 percentage points, over Trump.

> WHEN ALL THE VOTES ARE IN, BIDEN IS EXPECTED TO HAVE 306 ELECTORAL VOTES TO 232 FOR TRUMP.

Amber McCann, spokeswoman for Republican Senate Majority Leader Mike Shirkey, said the closures were made on recommendations from law enforcement "based on credible threats of violence."

Georgia state police were out in force at the state Capitol in Atlanta before Democratic electors pledged to Biden met. There were no protesters to be seen less than a hour ahead of the meeting.

Even as the Electoral College was formally confirming Biden's victory, some Republicans continued to refuse to acknowledge that reality. Yet their opposition to Biden had no practical effect on the electoral process, with the Democrat to be sworn in on Jan. 20.

Despite Biden's wins in Georgia, Michigan, Pennsylvania and Wisconsin, Republicans who would have been Trump electors met anyway. Pennsylvania Republicans said they cast a "procedural vote" for Trump and Vice President Mike Pence in case courts that have repeatedly rejected challenges to Biden's victory were to somehow still determine that Trump had won.

In North Carolina, Utah and other states across the country where Trump won, his electors turned out to duly cast their ballots for him. Electors in North Carolina had their temperatures checked before being allowed to enter the Capitol to vote.

Former President Bill Clinton and former Secretary of State Hillary Clinton, whom Trump defeated four years ago, were among New York's 29 electors for Biden and Harris.

In New Hampshire, before the state's four electors voted for Biden at the State House in Concord, 13-year-old Brayden Harrington led the group in the Pledge of Allegiance. He had delivered a moving speech at the Democratic National Convention in August about the struggle with stuttering he shares with Biden.

Vermont's electors were the first in the nation to vote Monday, and they chose Biden and Harris.

Trump, meanwhile, is clinging to his false claims that he won the election, and trying to undermine Biden's presidency before it begins.

"No, I worry about the country having an illegitimate president, that's what I worry about. A president that lost and lost badly," Trump said in a Fox News interview that was taped Saturday.

Following weeks of Republican legal challenges that were easily dismissed by judges, Trump and Republican allies tried to persuade the Supreme Court last week to set aside 62 electoral votes for Biden in four states, which might have thrown the outcome into doubt.

The justices rejected the effort on Friday.

In 32 states and the District of Columbia, laws require electors to vote for the popular-vote winner. The Supreme Court unanimously upheld this arrangement in July.

Electors almost always vote for the state winner anyway because they generally are devoted to their political parties. There's no reason to expect any defections this year. Among prominent electors are Democrat Stacey Abrams of Georgia and Republican Gov. Kristi Noem of South Dakota.

The voting is by paper ballot. Electors cast one vote each for president and vice president.

The Electoral College was the product of compromise during the drafting of the Constitution between those who favored electing the president by popular vote and those who opposed giving the people the power to directly choose their leader.

Each state gets a number of electors equal to its total number of seats in Congress: two senators plus however many members the state has in the House of Representatives. Washington, D.C., has three votes, under a constitutional amendment that was ratified in 1961. With the exception of Maine and Nebraska, states award all their Electoral College votes to the winner of the popular vote in their state.

The bargain struck by the nation's founders has produced five elections in which the president won the electoral votes but did not win the popular vote. Trump was the most recent example in 2016. Biden topped Trump in the popular vote by more than 7 million votes this year.

US COVID-19 deaths top 300,000 just as vaccinations begin

BY ADAM GELLER AND HEATHER HOLLINGSWORTH
Associated Press

The U.S. death toll from the coronavirus topped 300,000 Monday just as the country began dispensing COVID-19 shots in a monumental campaign to conquer the outbreak.

The number of dead rivals the population of St. Louis or Pittsburgh. It is equivalent to repeating a tragedy on the scale of Hurricane Katrina every day for 5 1/2 months. It is more than five times the number of Americans killed in the Vietnam War. It is equal to a 9/11 attack every day for more than 100 days.

"The numbers are staggering – the most impactful respiratory pandemic that we have experienced in over 102 years, since the iconic 1918 Spanish flu," Dr. Anthony Fauci, the government's top infectious-disease expert, said days before the milestone.

The U.S. crossed the threshold on the same day health care workers rolled up their sleeves for Pfizer's COVID-19 shot, marking the start of the biggest vaccination campaign in American history. If a second vaccine is authorized soon, as expected, 20 million people could be immunized by month's end.

The death toll was reported by Johns Hopkins University from data supplied by health authorities across the U.S. The real number of lives lost is believed to be much higher, in part because of deaths that were not accurately recorded as coronavirus-related during the early stages of the crisis.

Globally the virus is blamed for more than 1.6 million deaths.

Experts say it could take well into spring for the shots and other measures to bring cases and deaths under control in the U.S.

THE HANFORD SITE

PUBLIC COMMENT PERIOD: DEC. 15, 2020 – FEB. 13, 2021

Class 2 Permit Modification to the Hanford Dangerous Waste Permit

The U.S. Department of Energy (DOE) is holding a 60-day public comment period on a proposed Class 2 permit modification to the Hanford Dangerous Waste Permit, "Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility" chapter. This proposed permit modification is required to expand the existing 2025ED Load-In Station, construct the 2025EG Backup Load-In Station container storage and treatment area, and remove two unused tanks at the 2025ED Load-In Station, all of which are within the permit boundary.

A virtual public meeting will be held Jan. 21, 2021 at 5:30 p.m. During the virtual meeting, you can view the presentation, hear the speakers and ask your questions. To participate via GoToWebinar, please follow the instructions below:

Visual (presentation only):
https://attendee.gotowebinar.com/register/9073672840153859598;
ID #: 865-670-531

Audio:
1. Dial (509) 372-3087 (local) or (800) 664-0771 (long distance)
2. Enter Conference ID: 1333#

Visit https://pdw.hanford.gov/document/AR-04260 to review details on these proposed changes. All comments must be submitted by Feb. 13, 2021, in writing, by mail or electronically to:

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, WA 99354
eComments (preferred): http://nw.ecology.commentinput.com/?id=69PsZ

Questions? Please contact Jennifer Colborn at jennifer_m_colborn@rl.gov, or Daina McFadden, Washington State Department of Ecology, at Hanford@ecy.wa.gov.

The permittee's compliance history during the application of the relevant permit, is available from the Washington State Department of Ecology contact person.

Contact Jennifer Colborn, jennifer_m_colborn@rl.gov, 509-528-6687 at least 10 working days prior to the event to request disability accommodation.

Learn more about Hanford cleanup at www.hanford.gov

From:	^TPA
To:	HANFORD-INFO@LISTSERV.ECOLOGY.WA.GOV
Subject:	Notice of Upcoming Public Comment Period on Proposed Changes to the Hanford Dangerous Waste Permit
Date:	Thursday, November 12, 2020 8:59:01 AM
Attachments:	image001.png

THE HANFORD SITE

This is a message from the U.S. Department of Energy

Notice of Upcoming Public Comment Period on Proposed Changes to the Hanford Dangerous Waste Permit

The U.S. Department of Energy is planning a 60-day public comment period on a proposed Class 2 permit modification to the Hanford Dangerous Waste Permit. This proposed permit modification is required to expand the 2025ED Load-In Station container storage and treatment area and construct a Backup Load-In Station container storage and treatment area at the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility.

The comment period is expected to begin in December 2020, with a public meeting in January 2021.

The proposed modification and supporting documentation will be available online during the public comment period on the Hanford events calendar, the Hanford Administrative Record, and at the Hanford Public Information Repositories.

A summary fact sheet and details of the public meeting will be provided when the comment period begins.

Questions? Please contact Jennifer Colborn, Mission Support Alliance, at Jennifer_M_Colborn@rl.gov, or Daina McFadden, Washington State Department of Ecology, at Hanford@ecy.wa.gov.

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From:	^TPA
To:	HANFORD-INFO@LISTSERV.ECOLOGY.WA.GOV
Subject:	Public Comment Period Begins Today on Proposed Changes to the Hanford Dangerous Waste Permit
Date:	Tuesday, December 15, 2020 9:13:13 AM
Attachments:	image003.png LERF-ETF_Fact Sheet_Class 2 Load-In Expansion_FINAL.pdf

THE HANFORD SITE

This is a message from the U.S. Department of Energy

Public Comment Period on Proposed Changes to the Hanford Dangerous Waste Permit

The U.S. Department of Energy is holding a 60-day public comment period on a proposed Class 2 permit modification to the Hanford Dangerous Waste Permit, "Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility" chapter. This proposed permit modification is required to expand the existing 2025ED Load-In Station, construct the 2025EG Backup Load-In Station container storage and treatment area, and remove two unused tanks at the 2025ED Load-In Station, all of which are within the permit boundary.

The comment period is from Dec. 15, 2020, through Feb. 13, 2021. A virtual public meeting will be held Jan. 21, 2021, at 5:30 p.m. PT. To participate via GoToWebinar, please follow the instructions below:

Visual (presentation only):
Click the GoToWebinar link:
https://attendee.gotowebinar.com/register/9073672840153859598;
ID #: 865-670-531

Audio:
1. Dial (509) 372-3087 (local) or (800) 664-0771 (long distance)
2. Enter Conference ID: 1333#

Please submit any comments by **Feb. 13**, electronically (preferred) or by mail to:

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Information about the proposed modification and supporting documentation are available online during the public comment period on the Hanford events calendar, the Hanford Administrative Record, and at the Hanford Public Information Repositories. Please see the attached summary fact sheet.

Questions? Please contact Jennifer Colborn, Mission Support Alliance, at Jennifer_M_colborn@rl.gov, or Daina McFadden, Washington State Department of Ecology, at Hanford@ecy.wa.gov.

To request disability accommodation, please contact Jennifer Colborn, jennifer_m_colborn@rl.gov or (509) 376-5840 at least 10 working days prior to the event. DOE makes every effort to honor disability accommodation requests.

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Washington Department of Ecology - Hanford
Published by Ecology Ryan · 23h

A new #Hanford public comment period began yesterday, held by the U.S. Department of Energy, involving the Liquid Effluent Retention Facility and the 200 Area Effluent Treatment Facility.

Read more information about the permit modification and get your comments in by Feb. 13: https://ecology.wa.gov/.../Nuclear.../Public-comment-periods

24 People Reached | 5 Engagements | Boost Post

3

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Comment as Washington Department of Ec...

Ecology - Hanford @ecyHanford · Dec 16

A new #Hanford public comment period held by @HanfordSite/@RiverProtection (@ENERGY) began yesterday, involving the LERF/ETF facilities. Check out more information and submit your comments by Feb. 13: ecology.wa.gov/Waste-Toxics/N... @EcologyWA @EPAnorthwest @EPA

1 4

References

RECEIVED
DEC 28 2020
Department of Ecology
NWP - Richland

December 21, 2020

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, WA 99354

SUBJECT: LERF and ETF Class 2 Modification to the Hanford Dangerous Waste Permit
- Public Comment Period December 15, 2020 to February 13, 2021

Dear Department of Ecology:

The LERF/ETF comment period is materially affected by a recent proposal by DOE regarding TPA milestone M-62-46, (which apparently was subsequently renumbered M-62-50). M-62-46/50 would have provided an integrated DFLAW-ETF tank waste and secondary waste mass balance using a uniform set of assumptions. DOE has, in what appears to be a case of "bait and switch," proposed to fulfill the milestone with old disconnected work, and presentations not subject to quality assurance.

- The Fact Sheet for the LERF/ETF permit modification notes that a load in station will be expanded, and a back-up load in station constructed apparently for LERF (which feeds ETF), and that unused tanks will be removed from ETF.

- The operation of LERF/ETF in support of the DFLAW and LAWPS missions is affected by the overall integrated flowsheet/mass balance flowsheet from the tank farms to low activity waste pretreatment, to low activity waste vitrification (LAW-WTP) to the Effluent Management Facility (EMF), to recycle to tank farms, and to ETF/LERF.

- Ecology was proactive in requesting a formal mass balance for the integrated system, resulting in TPA Milestone M-62-46, which was agreed as a new milestone on **July 11, 2019,** with the document (a secondary TPA document) due on **January 30, 2021**[1]. The text of this milestone is:

  M-62-46: Submit to Ecology <u>as a secondary document</u> a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms <u>and to ETF/LERF</u>.
  [Note, in subsequent letters, this number was changed to M-62-50].

- The contents of milestone M-62-46 would inform Ecology's and the public's review of this LERF/ETF permit modification. Milestone M-62-46 would also be informative of

[1] Letter 19-ORPMGR-0006, Brian Vance to Alexandra Smith, *CORRESPONDENCE REGARDING TANK WASTE RETRIEVAL AND TREATMENT PATHWAY AT HANFORD AND PROPOSED TRI-PARTY AGREEMENT CHANGE PACKAGES*, July 11, 2019, Change Control Form M-62-19-01.

the ongoing dispute between Ecology and DOE as to whether new double shell tanks should be built.

After establishing milestone M-62-46 (aka M-62-50), the Department of Energy reported to Ecology and the public *many times* that the progress on the mass balance secondary document was "on schedule," as listed below.

- December 2019 Office of River Protection TPA Monthly Report, (covering the period through November 2019),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: On Schedule

- January 2020 Office of River Protection TPA Monthly Report, (covering the period through December 2019),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: On Schedule

- February 2020 Office of River Protection TPA Monthly Report (covering the period through January 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: On Schedule

- March 2020 Office of River Protection TPA Monthly Report (covering the period through February 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: On Schedule

- April 2020 Office of River Protection TPA Monthly Report (covering the period through March 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: On Schedule

- May 2020 Office of River Protection TPA Monthly Report (covering the period through April 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: On Schedule

- June 2020 Office of River Protection TPA Monthly Report (covering the period through May 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow

Due January 31, 2021
Status: ***On Schedule***

- July 2020 Office of River Protection TPA Monthly Report (covering the period through June 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: On Schedule

- August 2020 Office of River Protection TPA Monthly Report (covering the period through July 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: ***On Schedule***

- Office of River Protection TPA Project Managers' Meeting Minutes, August 13, 2020. This TPA record shows an Action 1 (with a start date of January 9, 2020) for DOE to "Provide a status update at *next month's* PMM on Milestone M-062-50, "Submit to Ecology as a Secondary Document, a Mass Balance Flow Sheet." The status of this action, established in January, was **OPEN** as of August 13, 2020. Minutes signed by Brian Harkins, DOE-ORP Project Manager.

- September 2020 Office of River Protection TPA Monthly Report (covering the period through August 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: ***On Schedule***

- Office of River Protection TPA Project Managers' Meeting Minutes, September 10, 2020.
  This TPA record shows that Action 1, from January 9, 2020 was completed as follows: Action No. 1 (TF-20-01-01): ORP stated that the status of this action ("Submit to Ecology as a Secondary Document, a Mass Balance Flow Sheet") **<u>is tracked in the monthly TPA report</u>** under Milestone M-062-50, and that it was also providing updates to the Ecology Project Manager. As such, ORP proposed closing the action [without having any input of substance to the TPA meeting minutes]. Ecology agreed.
  The action was closed.

- October 2020 Office of River Protection TPA Monthly Report (covering the period through September 2020),
  M-062-50 Submit to Ecology as a Secondary Document, a Mass Balance Flow
  Due January 31, 2021
  Status: ***On Schedule***

- **December 4, 2020,** Letter 20-ECD-0057, Glynn Trenchard, ORP, to Stephanie Schleif, ECY, "COMPLETION OF TRI-PARTY AGREEMENT MILESTONE M-062-50."

This letter proposes to **do away with the requirement for a separate secondary mass balance document,** and instead reference data from April 2017 for WTP and EMF; from May 2019 for Tank Side Cesium Removal, and from EMF/LERF information provided at meetings/presentations in March, April and October of 2020. This proposal is an attempt to renegotiate a milestone outside of public review.

1. My first comment is that I would appreciate if Ecology would reject ORP's proposal to alter TPA Milestone M-062-50. This milestone was supposed to be an integrated, up to date mass balance, and it was reported to the public as "On Schedule" as a single secondary document, month after month after month. Further, some of the information proposed to be substituted predates the establishment of the milestone, none of it is integrated, and some is presentation slides, which have no QA associated with them, as opposed to formal, checked, TPA documents. Ecology should receive a consistent set of assumptions to check to see if they are reasonable, and a set of results to show volumes and compositions underlying the present permit modification request parameters (such as the capacity of the expanded and new equipment), and also to compare to DOE promises about Double Shell Tank space. For example, a DOE official made an unsupported assertion to the DOE Office of Inspector General (DOE-OIG-20-57) that tank waste operations will "eliminate" the concern regarding sufficient DST space availability. It would help to know whether this conclusion is supported in the mass balance or if volumes of DST waste will pile up during DFLAW.

   At a minimum, all reference material (including "Powerpoint" presentations) cited by DOE in letter **20-ECD-0057** should be compiled and made available to the public for review in the TPA administrative record, as a single secondary document, by the due date of January 31, 2021, so we can see for ourselves whether DOE's assumptions are consistently documented and integrated.

   Of note is that DOE has not described what they were doing during the months of "on schedule" reporting for the milestone. Was this a case of continued time card fraud because they were not actually working on a mass balance? Or is it a case where the results were something DOE did not like and did not wish to share? It would be helpful for Ecology to hold DOE accountable to the original milestone.

   Additional comments where a mass balance could improve the current permit modification for LERF/ETF are below.

2. Per addendum page B.7, ETF products now include brine as well as powder. Brine is intended for "*treatment at an authorized dangerous waste facility*." DOE Should identify the facility and verify this is acceptable under the *"authorized facility's"* permits. If there is no facility with an active valid permits, DOE will have an orphan waste. Is the brine stream affected by the new grout skid that is in design, according to the monthly reports? Can it grout this brine? Please do not send, as was previously identified, ETF brine to PERMA-FIX Northwest in Richland. The brine can generate toxic gases when the pH is adjusted, and, without a mass balance, no one can tell how much ammonia or technetium, or tritium, or NOx sources will be included. Recently a Hanford Tank waste simulant evolved toxic NOx

gas when treated improperly, according to the DNFSB[2]. The same thing could happen much closer to City of Richland residents if treatment occurs at PFNW. Safety and regulatory problems at Perma-Fix Northwest are identified in detail in a new Hanford Challenge report[3].

3. Page addendum C.1 adds "WTP aqueous waste" to the list of wastes to be treated at ETF. As a result, there are new feeds and new products to be considered in this permit request. RPP-IQRPE-50074, page 35, identifies Page RPP-RPT-62679, 2020, *ETF Truck Load-In Expansion Project Non-Metallic Materials Report,* Rev. 1, Washington River Protection Solutions, LLC, Richland, Washington, as the source of information on the *"composition of the various ETF waste streams."* No stream data are provided. Presumably, an integrated mass balance was used to prepare the waste stream composition. Ecology should ask for a copy of RPP-RPT-62679 to track down the source of the composition inputs to see if they are reliable and complete, and ask that the composition ranges be provided in the permit, similar to tank waste compositions listed for the Hose in Hose Transfer line specification (which is part of the LERF/ETF permit).

4. Page Addendum C.13 deletes "39,000" gallons and refers to the "Part A" form in Addendum A for the maximum volume of dangerous waste that can be stored in containers. When I look at the Part A, I found that it says "the container design capacity 39,000 gallons, and the treatment capacity 5,000 gallons are "empirical" numbers based on maximum "anticipated" treatment. The basis for the "anticipated" amounts is not provided, but would be documented with a basis had DOE prepared an integrated mass balance. Ecology should ask for the basis documentation for these "anticipated" values, which include liquids from the current proposed permit modification.

5. Page Addendum B.8 states that aqueous waste from the WTP analytical laboratory is also transferred to LERF/ETF. It would help to have the integrated mass balance to provide a basis for the estimated flows of ALL the streams going to ETF/LERF. Was this stream included in the IQRPE report? The proposed permit modification does not say.

Thank you for considering these comments.

CC: David Bowen,
Stephanie Schleif
Washington Department of Ecology Nuclear Waste Program

---

[2] See DNFSB Hanford Activity Report for the Week Ending November 27, 2020, located at https://www.dnfsb.gov/sites/default/files/document/22431/Hanford%20Week%20Ending%20November%2027%202020.pdf

[3] "Risky Business at Perma-Fix Northwest, The Inside Story on Hanford's Off-Site Radioactive Treatment Facility," Updated December 4, 2020, Located at: https://static1.squarespace.com/static/568adf4125981deb769d96b2/t/5fce533274a40730fbc928bf/1607357241336/2020+12.04+PermaFix+Report+updated.pdf

U.S. Department of Energy
Hanford Site

December 4, 2020

20-ECD-0057

Ms. Stephanie N. Schleif
Acting Program Manager
Nuclear Waste Program
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Ms. Schleif:

COMPLETION OF TRI-PARTY AGREEMENT MILESTONE M-062-50

Tri-Party Agreement (TPA) Milestone M-062-50 states the following:

> "Submit to Ecology, as a secondary document, a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms and to LERF/ETF."

Mass balance information has been submitted with various permit application related to the following facilities include:

- Waste Treatment and Immobilization Plant (WTP) Direct Feed Low-Activity Waste and Effluent Management Facility (EMF) mass balance information was submitted in April 2017.
- Tank Side Cesium Removal mass balance information was submitted in May 2019.
- Erik Olds provided revised information for EMF mass balance to the Liquid Effluent Retention Facility/Effluent Treatment Facility to Washington State Department of Ecology (Ecology) on March 25, 2020. A briefing was provided on April 13, 2020, and a subsequent briefing was provided on October 27, 2020.

In addition to the continued submittal of mass balance information related to the permit application and modifications, which addresses the more near term request related to mass balance information, Ecology has two WTP Interim Compliance Schedule Items, which address the longer-term issue related to mass balance.

Interim Compliance Schedule Item states the following related to mass balance, which were agreed upon in November 2017:

> WTP-47 states: "Within nine (9) months of completion of the Pretreatment Facility (PTF) and High Level Waste (HLW) redesign, complete a gap analysis to determine if the PTF and HLW redesign changes affect the WTP mass balance. The analysis will be submitted to Ecology for inclusion in the Administrative Record." Due date September 30, 2025.
>
> WTP-48 states: "After completing five (5) years of operations under the DFLAW configuration, complete a gap analysis to determine if DFLAW operations affect the WTP mass balance. The analysis will be submitted to Ecology for inclusion in the Administrative Record." Due date June 30, 2029.

U.S. Department of Energy (DOE) believes the requirement to submit mass balance information with permit submittals, and the interim compliance schedule items already in place meet the intent of the TPA milestone. Based on the information presented above, and discussions with John Price on November 2, 2020 DOE and Ecology believe TPA M-62-50 is complete.

If you have any questions, please contact me, or your staff may contact Christopher J. Kemp, Director, Environmental Compliance Division, Office of River Protection, on (509) 373-0649, or Janet Diediker, Low Activity Waste Pretreatment System Federal Project Director, Office of River Protection, on (509) 372-3043.

Sincerely,

Digitally signed by GLYN D. TRENCHARD
DN: c=us, o=u.s. government, ou=department of energy, ou=Energy IT Services, ou=Hanford Site, ou=People, cn=GLYN D. TRENCHARD
Date: 2020.12.04 09:31:12 -08'00'

Glyn D. Trenchard, Assistant Manager
Technical and Regulatory Support
Office of River Protection

ECD:MEB

cc: T. Beam, WRPS
C. Strand, WRPS
S. Dahl, Ecology
M. Jones, Ecology
Administrative Record
Environmental Portal
WRPS Correspondence

February 12, 2021

Comments Submitted Electronically at: http://nw.ecology.commentinput.com/?id=69PsZ

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

To Whom It May Concern,

Thank you for the opportunity to submit comments on the *Class 2 Permit Modification to the Dangerous Waste Permit, "Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility"* chapter. Thank you, also, for holding a virtual public meeting on this comment period on January 21, 2021.

Hanford Challenge is a non-profit, public interest, environmental and worker advocacy organization located at 2719 East Madison Street, Suite 304, Seattle, WA 98112. Hanford Challenge is an independent 501(c)(3) membership organization incorporated in the State of Washington with a mission to create a future for the Hanford Nuclear Site that secures human health and safety, advances accountability, and promotes a sustainable environmental legacy. Hanford Challenge has members who work at the Hanford Site. Other members of Hanford Challenge work and/or recreate near Hanford, where they may also be affected by hazardous materials emitted into the environment by Hanford. All members have a strong interest in ensuring the safe and effective cleanup of the nation's most toxic nuclear site for themselves and for current and future generations, and who are therefore affected by conditions that endanger human health and the environment.

The safe and effective treatment of Hanford's high-level tank waste is essential to the protection of human health and the environment. All facilities that are a part of managing, storing, and treating this waste are a top concern of Hanford Challenge.

Hanford Challenge would like a transparent process that clearly documents in one place the mass balance flow; what happens to Hanford's tank waste once it starts treatment, and where contaminants end up and in what quantity.

It is important to our organization that the assumptions used in DOE and its contractors mass balance flow are clear and publicly accessible. The mass balance is needed to predict the types and quantities of contaminants in different waste streams during the treatment of Hanford's tank waste. It is very important that the tank waste treatment system is prepared for the different waste streams that will be generated during treatment and that there are no "orphaned waste streams" – waste that has no pathway for further treatment or disposal.

The Liquid Effluent Retention Facility (LERF) and Effluent Treatment Facility (ETF) will be accepting some of the least contaminated liquids from the tank waste treatment process, however it is important that we know what is in these "least contaminated liquids." The concentrations of contamination may be lower, but the liquids could contain things like technicium-99 or ammonia. We won't know the concentrations or types of contaminants DOE and its contractors are predicting will be in these liquids without the mass balance and the assumptions they used to produce that document.

Specific Comments include:

- **Require Submittal of Integrated Mass Balance Flow as a Single Secondary Document:** Please ensure that the U.S. Department of Energy meets its requirement to submit a Mass Balance Flow as a single secondary document, as part of the milestone M-62-46, that states: *Submit to Ecology as a secondary document a Mass Balance Flow from Tank Farms to Low Activity Waste Pretreatment Capability to Low Activity Waste to Effluent Management Facility to Recycle to Tank Farms and to ETF/LERF.* (Note that this milestone number was changed to M-62-50).

- **More Information Needed re: Addition of "WTP Aqueous Waste" (Addendum C-1, pdf p. 34 of 3641).**: DOE should provide RPP-RPT-62679 to Ecology, so that Ecology has the necessary information to track down the source of the composition inputs to make sure they are reliable and complete. Please include the composition ranges for WTP Aqueous Waste in the permit, similar to tank waste compositions listed for the Hose in Hose Transfer line specifications in the LERF/ETF permit.

- **Ensure Addition of Brine Will Not Create Orphaned Waste Stream**: Brine has been added as an ETF waste product in addition to powder on Addendum B-8 (pdf p. 19 of 3641). Where will this brine be sent for treatment? Hanford Challenge has documented concerns with treating Hanford waste at Perma-Fix Northwest.[1]

- **Double-Shell Tank Waste Space Concerns**: Please check the assertion made to the DOE OIG (DOE-OIG-20-57) claiming that tank waste operations will "eliminate" the concern regarding sufficient DST space availability. Is this conclusion supported in the mass balance, or will volumes of DST waste "pile up" during Direct Feed Low Activity Waste operations?

- **Build New Tanks – Contingency Planning for Tank Leaks and Backup Storage During DFLAW**: Though not the topic of this comment period, Hanford Challenge believes that

[1] Risky Business at Perma-Fix Northwest: The Inside Story on Hanford's Off-Site Radioactive Treatment Facility, Hanford Challenge, available at https://www.hanfordchallenge.org/pfnw (last accessed, February 12, 2021).

the agencies should initiate the appropriate actions to build new tanks to ensure that sufficient space is available during tank waste treatment.

- **Make Reference Materials Accessible to the Public**: Please make all reference material cited by DOE in letter 20-ECD-0057, including "Powerpoint" presentations, available to the public for review in the TPA administrative record, as a single secondary document.

- **Information Before Approval**: Ensure that additional information is provided to Ecology and shared with the public prior to approving these permit modifications.

Thank you for considering our comments.

Tom Carpenter, Executive Director

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
March 10, 2021

Addenda	Last Modification Date	Modification Number
Unit-Specific Permit Conditions	03/10/2021	8C.2020.8F
A. Part A Form	11/09/2020	PCN-LERF/ETF-2020-04 (8C.2020.Q4)
B. Waste Analysis Plan	03/10/2021	8C.2020.8F
C. Process Information	03/10/2021	8C.2020.8F
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	03/10/2021	8C.2020.8F
G. Personnel Training	06/30/2015	
H. Closure Plan	03/10/2021	8C.2020.8F
I. Inspection Requirements	03/10/2021	8C.2020.8F
J. Contingency Plan	03/10/2021	8C.2020.8F

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Hanford Facility RCRA Permit Change Notice

Part III, Operating Unit Group 3

Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility

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Submitted by WRPS Co-Operator:

Monica Kembel Digitally signed by Monica Kembel Date: 2020.11.10 15:08:23 -08'00'

Monica R. Kembel Date

Reviewed by DOE-ORP Program Office:

Brian A. Harkins Digitally signed by Brian A. Harkins Date: 2020.12.01 08:46:07 -08'00'

Robert G. Hastings Date

Hanford Facility RCRA Permit Change Notice

Unit:	Permit Part
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	**Part III, Operating Unit Group 3**

Description of Modification:

Permit Conditions:

- Update the following List of Addenda Specific to Operating Unit Group 3 with modification approval date:

  Addendum B Waste Analysis Plan~~, dated TBD May 19, 2020~~

  Addendum C Process Information~~, dated TBD June 25, 2020~~

  Addendum F Preparedness and Prevention~~, dated TBD May 19, 2020~~

  Addendum H Closure Plan~~, dated TBD May 19, 2020~~

  Addendum I Inspection Requirements~~, dated TBD May 19, 2020~~

  Addendum J Contingency Plan~~, dated TBD June 24, 2020~~

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

Enter relevant WAC 173-303-830, Appendix I Modification citation number: F.1.a, and G.1.b

Enter wording of WAC 173-303-830, Appendix I Modification citation: F.1.a, Resulting in greater than 25% increase in the facility's container storage capacity;

G.1.b, Modification or addition of tank units resulting in up to 25% increase in the facility's tank capacity

Modification Approved: [X] Yes [ ] No (state reason)

Reason for Non-concurrence:

Ecology removed the dates from the "List of Addenda Specific to Operating Unit Group 3" in the Unit-Specific Permit Conditions as shown above. See attached email for Permittees concurrence.

Reviewed by Ecology:

Stephanie Schleif — Digitally signed by Schleif, Stephanie (ECY) — 03/10/2021

Stephanie Schleif — Date

Hanford Facility RCRA Permit Change Notice

Unit:	Permit Part
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	**Part III, Operating Unit Group 3**

Description of Modification:

Addendum B, Waste Analysis Plan

- Editorial changes.
- Updated descriptions for the 2025ED Load-In Station expansion
- Updated descriptions for the new Backup Load-In Station (2525EG).
- Clarified descriptions for primary and secondary treatment trains.
- Clarified aqueous wastes that are acceptable for treatment and/or storage at the LERF and 200 Area ETF.
- Updated parameters for analysis required to evaluate treatability and operational concerns.
- Updated criteria description for Table B-2 waste acceptance criteria.
- Updated general chemistry parameters in Table B-3.
- Clarified sampling frequency information.
- Clarified “Alkalinity” is used to calculate carbonate/bicarbonate in Table B-6.

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

Enter relevant WAC 173-303-830, Appendix I Modification citation number: F.1.a, and G.1.b

Enter wording of WAC 173-303-830, Appendix I Modification citation: F.1.a, Resulting in greater than 25% increase in the facility's container storage capacity;
G.1.b, Modification or addition of tank units resulting in up to 25% increase in the facility's tank capacity,

Modification Approved: [X] Yes [ ] No (state reason)

Reason for Non-concurrence:

Reviewed by Ecology:

Stephanie Schleif — Digitally signed by Schleif, Stephanie (ECY) — 03/10/2021

Stephanie Schleif — Date

Hanford Facility RCRA Permit Change Notice

Unit:	Permit Part
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	**Part III, Operating Unit Group 3**

Description of Modification:

Addendum C, Process Information

- Editorial changes
- Revised Table C-1 to update tank storage and treatment and container storage and treatment dangerous waste management units (DWMUs)
- Updated description for 2025ED Load-In Station a container storage and treatment.
- Added description for 2025EG Backup Load-In Station container storage and treatment.
- Clarified Influent Receipt/Surge Tank description.
- Revised filtration description to address influent filters
- Clarified storage information for brine totes.
- Updated control of run-on to address 2025EG Backup Load-In Station.
- Updated removal of liquids from containment systems to address 2025EG Backup Load-In Station.
- Updated design requirements to address 2025ED Load-In Station expansion and addition of 2025EG Backup Load-In Station.
- Updated integrity assessment information for 200 Area Effluent Treatment Facility (ETF) tank systems.
- Added references to Addendum I, Inspection Requirements where appropriate.
- Update Table C-4 to update drawings for 2025ED Load-In Station Foundation and Containment, and addition of the 2025EG Backup Load-In Station Foundation and Containment.
- Updated Table C-5 to update drawings for 2025ED Load-In Station and 2025EG Backup Load-In Station.
- Updated Table C-6 and C-7 to add filter drain sump tank 59A-TK-4, and update tank information.
- Updated Table C-8 tank information.
- Updated Table C-9 concrete and masonry coatings
- Updated Figure C-2 to show 2025EG Backup Load-In Station
- Updated Figures C-4 and C-5 for process flow configurations.
- Updated Figure C-15 to add 59A-TK-4.

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

Enter relevant WAC 173-303-830, Appendix I Modification citation number: F.1.a, and G.1.b

Enter wording of WAC 173-303-830, Appendix I Modification citation: F.1.a, Resulting in greater than 25% increase in the facility's container storage capacity;
G.1.b, Modification or addition of tank units resulting in up to 25% increase in the facility's tank capacity.

Modification Approved: [X] Yes [ ] No (state reason)

Reason for Non-concurrence:

Reviewed by Ecology:

Stephanie Schleif — Digitally signed by Schleif, Stephanie (ECY) — 03/10/2021

Stephanie Schleif — Date

Hanford Facility RCRA Permit Change Notice

Unit:	Permit Part
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	**Part III, Operating Unit Group 3**

Description of Modification:

Addendum F, Preparedness & Prevention

- Editorial changes.
- Update unloading operations, spill prevention, and control for 2025EG Backup Load-In Station.
- Added reference to Addendum I, Inspection Requirements.

Ecology deleted the current language in Section F.3 and added the following language: "Aqueous waste managed at the LERF may display the characteristics of reactivity or ignitability. Any aqueous waste streams accepted at 200 Area ETF exhibiting these characteristics are immediately sent for blending or mixing at LERF to a concentration where the waste no longer exhibits characteristics of reactivity or ignitability. Aqueous waste streams exhibiting characteristics of ignitability or reactivity are not stored or treated at 200 Area ETF, or in the 2025ED Load-In Station and 2025EG Backup Load-In Station,"

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

Enter relevant WAC 173-303-830, Appendix I Modification citation number: F.1.a, and G.1.b

Enter wording of WAC 173-303-830, Appendix I Modification citation: F.1.a, Resulting in greater than 25% increase in the facility's container storage capacity;
G.1.b, Modification or addition of tank units resulting in up to 25% increase in the facility's tank capacity.

Modification Approved: [X] Yes [ ] No (state reason)

Reason for denial:

Ecology made the changes as shown above and changed this page from a Class 3 to a Class 2. See attached email for Permittees concurrence.

Reviewed by Ecology:

Stephanie Schleif — Digitally signed by Schleif, Stephanie (ECY)

Stephanie Schleif

03/10/2021

Date

Hanford Facility RCRA Permit Change Notice

Unit:	Permit Part
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	**Part III, Operating Unit Group 3**

Description of Modification:

Addendum H, Closure Plan

- Editorial changes.
- Updated status for Load-In Tanks 59A-TK-109 and 59A-TK-117.
- Added tank closure information for clean closure of 2025-EG Load-In Station unloading components.

Ecology changed "2025-EG Load-In Station" to "2025EG Backup Load-In station" in Section H.5.2.2.

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

Enter relevant WAC 173-303-830, Appendix I Modification citation number: F.1.a, and G.1.b

Enter wording of WAC 173-303-830, Appendix I Modification citation: F.1.a, Resulting in greater than 25% increase in the facility's container storage capacity;
G.1.b, Modification or addition of tank units resulting in up to 25% increase in the facility's tank capacity.

Modification Approved: [X] Yes [ ] No (state reason)

Reason for denial:

Ecology made the changes as shown above. See attached email for Permittees concurrence.

Reviewed by Ecology:

Stephanie Schleif Digitally signed by Schleif, Stephanie (ECY)

Stephanie Schleif

03/10/2021
Date

Hanford Facility RCRA Permit Change Notice

Unit:	Permit Part
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	**Part III, Operating Unit Group 3**

Description of Modification:

Addendum I, Inspection Requirements

- Editorial changes.
- Deleted leak detection information for 242-A Evaporator transfer line.
- Updated Table I.1 visual inspections for the Load-In Station tank system (2025ED), Backup Load-In Station (2025EG), and Filter drain sump tanks 59A-TK-2/59A-TK-3 and 59A-TK-4.
- Updated Table I.2 instrumentation monitoring leak detection for pipeline between Load-In Station (2025ED) and Backup Load-In Station (2025EG); and corrected and added instrumentation identification numbering for Main and Secondary Treatment Trains.

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

Enter relevant WAC 173-303-830, Appendix I Modification citation number: F.1.a, and G.1.b

Enter wording of WAC 173-303-830, Appendix I Modification citation: F.1.a, Resulting in greater than 25% increase in the facility's container storage capacity;
G.1.b, Modification or addition of tank units resulting in up to 25% increase in the facility's tank capacity.

Modification Approved: [X] Yes [ ] No (state reason)

Reason for denial:

Reviewed by Ecology:

Stephanie Schleif — Digitally signed by Schleif, Stephanie (ECY) — 03/10/2021

Stephanie Schleif — Date

Hanford Facility RCRA Permit Change Notice

Unit:	Permit Part
Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility	**Part III, Operating Unit Group 3**

Description of Modification:

Addendum J, Contingency Plan

- Editorial changes.
- Updated to add 2025EG Backup Load-In Station.
- Clarified loss of utility information
- Clarified inventories at 200 Area ETF include brine waste.
- Updated Figure 1 to add 2025EG Backup Load-In Station.
- Clarified fixed emergency equipment locations.
- Updated portable emergency equipment locations.
- Updated spill kits and spill control equipment location information.

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

Enter relevant WAC 173-303-830, Appendix I Modification citation number: F.1.a, and G.1.b

Enter wording of WAC 173-303-830, Appendix I Modification citation: F.1.a, Resulting in greater than 25% increase in the facility's container storage capacity;
G.1.b, Modification or addition of tank units resulting in up to 25% increase in the facility's tank capacity.

Modification Approved: [X] Yes [ ] No (state reason)

Reason for denial:

Reviewed by Ecology:

Stephanie Schleif — Digitally signed by Schleif, Stephanie (ECY) — 03/10/2021

Stephanie Schleif — Date

Remove and replace the following:

- Permit Conditions
- Addendum B, Waste Analysis Plan
- Addendum C, Process Information
- Addendum F, Preparedness & Prevention
- Addendum H, Closure Plan
- Addendum I, Inspection Requirements
- Addendum J, Contingency Plan

From: Evans, Rana
To: Hall, Katie (ECY); Thompson, Suzette A
Cc: Temple, John (ECY); Mayenna, Amena (ECY); Lippold, Joseph (ECY); Cantu, Jennifer (ECY)
Subject: RE: [EXTERNAL]Updates to PCN C2-LERF-ETF-2020-02
Date: Tuesday, February 23, 2021 1:33:43 PM

THIS EMAIL ORIGINATED FROM OUTSIDE THE WASHINGTON STATE EMAIL SYSTEM - Take caution not to open attachments or links unless you know the sender AND were expecting the attachment or the link

Katie,
DOE concurs to all changes as described below.
Resp, Rana

        - Section H.5.2, update text to consistently refer to “2025EG Backup Load-In station” as such.
    - Addendum F:
        - Section F.3, add the following language: “Aqueous waste managed at the LERF may display the characteristics of reactivity or ignitability. Any aqueous waste streams accepted at 200 Area ETF exhibiting these characteristics are immediately sent for blending or mixing at LERF to a concentration where the waste no longer exhibits characteristics of reactivity or ignitability. Aqueous waste streams exhibiting characteristics of ignitability or reactivity are not stored or treated at 200 Area ETF, or in the 2025ED Load-In Station and 2025EG Backup Load-In Station,”
    - Unit Specific Permit Conditions, Page Conditions.3:
        - removing all the dates listed in “List of Addenda Specific to Operating Unit Group 3”—not sure if this one had been previously identified to you in an email or not, but it is something we are doing Site-wide.

Please let us know if you are in disagreement with any of the changes to the PCN form noted above.

Thank you,

Katie Hall
Nuclear Waste Program - Permit Coordinator
Washington State Department of Ecology
D: (509) 372-7885
C: (509) 282-2677

This message originated from an external sender. Use caution when clicking on links or opening attachments.

LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY PART III, OPERATING UNIT GROUP 3 UNIT-SPECIFIC 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
03/10/2021	8C.2020.8F
11/09/2020	PCN-LERF/ETF-2020-04 (8C.2020.Q4)
10/20/2020	PCN-LERF/ETF-2020-03 (8C.2020.Q4)
06/25/2020	PCN-LERF/ETF-2020-01 (8C.2020.Q2)
06/24/2020	8C.2020.5F
05/19/2020	8C.2020.6F
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

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LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY
PART III, OPERATING UNIT GROUP 3
UNIT-SPECIFIC PERMIT CONDITIONS

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PART III, OPERATING UNIT GROUP 3, UNIT-SPECIFIC PERMIT CONDITIONS LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY

UNIT DESCRIPTION

The Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (200 Area ETF) consists of an aqueous waste treatment system that provides treatment, storage integral to the treatment process, and storage of secondary wastes from the treatment process for a variety of aqueous mixed waste. The 200 Area ETF is located in the 200 East Area. Aqueous wastes managed by the 200 Area ETF include process condensate from the LERF and 200 Area ETF and other aqueous waste generated from on-site remediation and waste management activities.

The LERF consists of three lined surface impoundments, or basins. Aqueous waste from LERF is pumped to the 200 Area ETF for treatment in a series of process units, or systems, that remove or destroy essentially all of the dangerous waste constituents. The treated effluent is discharged to a State-Approved Land Disposal Site (SALDS) north of the 200 West Area, under the authority of a Washington State Waste Discharge Permit Number ST0004500 (Ecology 2014) and 200 Area ETF Delisting (40 Code of Federal Regulations [CFR] 261, Appendix IX, Table 2). Construction of the LERF began in 1990. Waste management operations began at LERF in April 1994. Construction of the 200 Area ETF began in 1992. Waste management operations began at 200 Area ETF in November of 1995.

This Chapter provides Unit-Specific Permit Conditions applicable to the dangerous waste management units for LERF and 200 Area ETF.

LIST OF ADDENDA SPECIFIC TO OPERATING UNIT GROUP 3

Addendum A Part A Form

Addendum B Waste Analysis Plan

Addendum C Process Information

Addendum D Groundwater Monitoring

Addendum E Security Requirements

Addendum F Preparedness and Prevention

Addendum G Personnel Training

Addendum H Closure Plan

Addendum I Inspection Requirements

Addendum J Contingency Plan

DEFINITIONS

Flow Equalization: Flow equalization is the process by which concentrations of constituents are homogenized through blending of the wastewater in the LERF Basins, resulting in a more uniform loading of constituents prior to entering the appropriate treatment train.

State and Federal Delisting Actions: The state delisting action pursuant to Washington Administrative Code (WAC) 173-303-910(3), August 8, 2005, and the federal delisting action appearing in 40 CFR 261, Appendix IX, Table 2 applicable to the United States Department of Energy, Richland, Washington.

ACRONYMS

LERF and 200 Area ETF 200 Area Liquids Processing Facility

III.3.A COMPLIANCE WITH UNIT-SPECIFIC PERMIT CONDITIONS

III.3.A.1 The Permittees will comply with all Permit Conditions in this chapter and its addendums with respect to dangerous waste management and dangerous waste management units in LERF and 200 Area ETF, in addition to requirements in Permit Part I and Part II.

III.3.B GENERAL WASTE MANAGEMENT

III.3.B.1 The Permittees are authorized to accept dangerous and/or mixed waste for treatment in dangerous waste management units that satisfies the waste acceptance criteria in Permit Addendum B according to the waste acceptance procedures in Permit Addendum B. (WAC 173-303-300)

III.3.B.2 The Permittees are authorized to manage dangerous and/or mixed wastes physically present in the dangerous waste management units in LERF and 200 Area ETF as of the effective date of this Permit according to the requirements of Permit Condition III.3.B.1.

III.3.B.3 The Permittees are authorized to treat and/or store dangerous/mixed waste in the dangerous waste management units in LERF and 200 Area ETF according to the following requirements:

III.3.B.3.a The Permittees are authorized to treat, and store as necessary in support of treatment, dangerous waste in the 200 Area ETF tank systems identified in Permit Addendum C, Section C.2, and Section C.4 according to the Permit Conditions of this Chapter.

III.3.B.3.b The Permittees are authorized to store and treat those dangerous and/or mixed waste identified in Permit Addendum C, Section C.3, in containers according to the requirements of this Chapter. All container management activities pursuant to this Permit Condition will take place within the container storage areas or within the 200 Area ETF process area identified in Permit Addendum C, Figures C-2 and C-3.

III.3.B.3.c Treatment in containers authorized by Permit Condition III.3.B.3.b is limited to decanting of free liquids, and addition of sorbents to free liquids. The Permittees will ensure that sorbents are compatible with wastes and the containers. Sorbents will be compliant with the requirements of WAC 173-303-140(4)(b)(iv), incorporated by reference.

III.3.B.3.d The Permittees are authorized to treat aqueous waste in LERF Basins (Basins 42, 43 and 44) subject to the following requirements:

III.3.B.3.d.1 Following treatment in a LERF Basin, aqueous wastes must be treated in 200 Area ETF according to Permit Conditions III.3.B.3.a through c; [40 CFR 268.4(2)(iii), incorporated by reference by WAC 173-303-140].

III.3.B.3.d.2 The Permittees must ensure that for each basin, either supernatant is removed on a flow-through basis, to meet the requirement of 40 CFR 268.4(a)(2)(ii) incorporated by reference by WAC 173-303-140, or incoming waste is shown to not contain solids by either: (1) sampling results showing the waste does not contain detectable solids, or (2) filtering through a 10 micron filter; [WAC 173-303-815(2)(b)(ii)].

III.3.B.4 The Permittees will maintain the physical structure of the LERF and 200 Area ETF as documented in the applicable sections of Permit Addendum C, Section C.2. [WAC 173-303-630(7), WAC 173-303-640(3), WAC 173-303-640(4)]

III.3.B.5 The Permittees are authorized to use treated effluent for recycle/makeup water purposes at the 200 Area ETF as outlined in Permit Addendum C, Section C.2.5.5, and the letters dated August 19, 2005, Environmental Protection Agency (EPA) Region 10 to Keith A. Klein; and August 8, 2005, Department of Ecology (Ecology) to Keith A. Klein. [WAC 173-303-815(2)(b)(ii)]

III.3.B.6 The Permittees will maintain and operate systems for the 200 Area ETF documented in Permit Addendum C, Section C.2.5 as necessary for proper operation of the 200 Area ETF, compliance with the conditions of this Permit, and protection of human health and the environment. For purposes of this Permit Condition, the Monitor and Control System (MCS) documented in Permit Addendum C, Section C.2.5.1, is considered to include all indicators, sensors, transducers, actuators and other control devices connected to but remote from the centralized MCS computer.

III.3.B.7 The Permittees must complete the following requirements prior to acceptance for treatment in 200 Area ETF aqueous waste streams with listed waste numbers subject to the requirements of the State and Federal Delisting; [WAC 173-303-815(2)(b)(ii)].

III.3.B.7.a The Permittees will prepare a written waste processing strategy according to the requirements of the State and Federal Delisting Actions Conditions (1)(a)(ii) and (1)(b), incorporated by reference, and Permit Addendum B, Section B.2.2.2.

III.3.B.7.b The waste processing strategy required by Permit Condition III.3.B.7.a, must document the proposed processing configuration for the 200 Area ETF, operating conditions for each processing unit, and the expected treated effluent characteristics based on the process model and treatability envelope data required by State and Federal Delisting Conditions (1)(a)(ii) and (1)(b).

III.3.B.7.c The written waste processing strategy required by Permit Condition III.3.B.7.a must demonstrate that the projected treated effluent characteristics satisfy the delisting exclusion limits in State and Federal Delisting Condition (5) of the State and Federal Delisting Actions, and the discharge limits of the Discharge Permit Number ST0004500 (Ecology 2014).

III.3.B.7.d The Permittees will place a copy of the written waste processing strategy required by Permit Condition III.3.B.7.a in the Hanford Facility Operating Record, LERF and 200 Area ETF file as part of the documentation of waste streams accepted for management at the 200 Area ETF.

III.3.B.8 Treatment of aqueous waste streams in the 200 Area ETF with listed waste numbers that are subject to the requirements of the State and Federal Delisting Actions must comply with the requirements of State and Federal Delisting Condition (1)(c), incorporated by reference. [WAC 173-303-815(2)(b)(ii)]

III.3.B.9 The Permittees will manage treated effluent in the final verification tanks according to the requirements of the State and Federal Delisting Conditions (3) and (5), incorporated by reference. [WAC 173-303-815(2)(b)(ii)]

III.3.B.10 The Permittees will manage treated effluent from the 200 Area ETF according to the requirements of the Discharge Permit Number ST0004500 (Ecology 2014) and State and Federal Delisting Condition (7). [WAC 173-303-815(2)(b)(ii)]

III.3.B.11 The Permittees will ensure compliance with treatment standards (40 CFR 268, incorporated by reference by WAC 173-303-140) applicable to treated effluent prior to discharge to the SALDS, the delisting criteria at 40 CFR 261, Appendix IX, Table 2, and the corresponding state-approved delisting (dated August 8, 2005, all incorporated by reference). Sampling and analysis necessary for these demonstrations must meet the corresponding requirements in Permit Addendum B. [WAC 173-303-140, WAC 173-303-815(2)(b)(ii)]

III.3.C WASTE ANALYSIS

III.3.C.1 The Permittees will comply with requirements in Permit Addendum B for sampling and analysis of all dangerous and/or mixed waste required by conditions in this Chapter. (WAC 173-303-300)

III.3.C.2 The Permittees will have an accurate and complete waste profile as described in Permit Addendum B, Section B.2.1.2, for every waste stream accepted for management in LERF and 200 Area ETF dangerous waste management units. [WAC 173-303-380(1)(a), (b)]

III.3.C.3 The Permittees will place a copy of each waste profile required by Permit Condition III.3.C.2 in the Hanford Facility Operating Record, LERF and 200 Area ETF file required by Permit Condition II.I.1.j. [WAC 173-303-380(1)(a), (b)]

III.3.C.4 The Permittees will make a copy of the waste profile required by Permit Condition III.3.C.2 available upon request. [WAC 173-303-380(1)(a), (b)]

III.3.C.5 Records and results of waste analysis described in this Permit will be maintained in the Hanford Facility Operating Record, LERF and 200 Area ETF file required by Permit Condition II.I.1.b. [WAC 173-303-380(1)(a), (b)]

III.3.D RECORDKEEPING AND REPORTING

III.3.D.1 The Permittees will place the following into the Hanford Facility Operating Record, LERF and 200 Area ETF file required by Permit Condition II.I.1:

III.3.D.1.a Records required by WAC 173-303-380(1)(k), and (o) incorporated by reference.

III.3.D.1.b Records and results of waste analysis, waste determinations (as required by Subpart CC) and trial tests required by WAC 173-303-300, *General waste analysis*, and by 40 CFR §264.1034, §264.1063, §264.1083, §265.1034, §265.1063, §265.1084, §268.4(a), and §268.7; [WAC 173-303-310(2)].

III.3.D.1.c An inspection log, summarizing inspections conducted pursuant to Permit Condition III.3.H.1; [WAC 173-303-380(1)(e)].

III.3.D.1.d Records required by the State and Federal Delisting Condition (6), incorporated by reference; [WAC 173-303-815(2)(b)(ii)].

III.3.E SECURITY

III.3.E.1 The Permittees comply with the Security requirements specific to the LERF and 200 Area ETF in Addendum E and Permit Attachment 3 as required by Permit Condition II.M. [WAC 173-303-310(2)]

III.3.F PREPAREDNESS AND PREVENTION

III.3.F.1 The Permittees will comply with the Preparedness and Prevention requirements specific to LERF and 200 Area ETF in Addendum F. (WAC 173-303-340)

III.3.G CONTINGENCY PLAN

III.3.G.1 The Permittees will comply with Addendum J, “Contingency Plan,” in addition to the requirements of Permit Condition II.A when applicable. (WAC 173-303-350)

III.3.H INSPECTIONS

III.3.H.1 The Permittees will comply with Addendum I in addition to the requirements of Permit Condition II.X. (WAC 173-303-320)

III.3.I TRAINING PLAN

III.3.I.1 The Permittees will include the training requirements described in Addendum G of this Chapter specific to the dangerous waste management units and waste management activities at LERF and 200 Area ETF into the written training plan required by Permit Condition II.C.

III.3.J GENERAL REQUIREMENTS

III.3.J.1 The Permittees will comply with the requirements of WAC 173-303-395(1), incorporated by reference, for prevention of reaction of ignitable, reactive, or incompatible wastes.

III.3.J.2 Within 90 days of the effective date of the permit modification, the Permittee shall demonstrate to the department that the leak detection system for the Waste Treatment and Immobilization Plant-Effluent Management Facility (WTP-EMF) transfer line to LERF Catch Basin 242AL-42 (4”-WTP-001-M17) is designed and operated to detect the presence of liquid in the secondary containment system at the earliest practicable time if the existing detection technologies or site conditions will not allow detection of a release within 24 hours. As part of this demonstration, the Permittees must consider alternative configurations for leak detection and this information will be provided to the department for concurrence. The department will provide a response within 60 days. Comments provided by the department shall be dispositioned through the Review Comment Record process. [WAC 173-303-640(4)(c)(iii)]

III.3.J.2.a Prior to receipt of any dangerous waste in the WTP-EMF transfer line to LERF Catch Basin 242AL-42 (4”-WTP-001-M17), the Permittees will submit the tightness test for 4”-WTP-001-M17 waste transfer system to the department. [WAC 173-303-640(3)(e)]

III.3.J.2.b Tightness test for WTP-EMF transfer line to LERF Catch Basin 242AL-42 (4”-WTP-001-M17) will be performed at a frequency of every 10 years upon completion of Permit Condition III.3.J.2.a.

III.3.J.2.c Prior to receipt of any dangerous waste in the WTP-EMF transfer line to LERF Catch Basin 242AL-42 (4”-WTP-001-M17), the Permittees will submit an installation integrity assessment report.

III.3.J.3 Modifications to the leak detection system for the WTP-EMF transfer line to LERF Catch Basin 242AL-42 (4”-WTP-001-M17) will be made in accordance with Permit Condition I.C.3.

III.3.J.4 The electronic leak detection system for the WTP-EMF transfer line to LERF Catch Basin 242AL-42 (4”-WTP-001-M17) shall be maintained and operated continuously when in use with the following exceptions:

III.3.J.4.a If the electronic leak detection system is not available, visual inspection shall be employed at the sight glass (FG-80W-001), located in LERF Catch Basin 242AL-42.

III.3.J.4.b The department must be notified if the electronic leak detection system is out of service for more than 90 days. This notification must include a schedule for repairing and returning the system to service within 90 days from notification, or longer if approved by the department.

III.3.J.5 Prior to receipt of any dangerous waste in the brine loadout system, the Permittees will submit a revised Addendum A, “Part A Form,” to include photograph of the 2025E Container Storage and Treatment Area.

III.3.J.6 Prior to receipt of any dangerous waste in the brine loadout system, the Permittees will submit functional testing for the automatic shutoff valves (60J-334 and 60J-335) to the department.

III.3.J.7 Prior to operations of the brine loadout system, the Permittees must provide to Ecology for review and approval information demonstrating that the liquid brine waste stream will be shipped to authorized treatment, storage, or disposal facilities for treatment and disposal.

III.3.J.8 The brine loadout system must meet land disposal restriction requirements as specified in Permit Condition II.S and the Hanford Federal Facility Agreement and Consent Order.

III.3.K CLOSURE

III.3.K.1 The Permittees will close dangerous waste management units in the LERF and 200 Area ETF in accordance with Addendum H, "Closure Plan," and Permit Condition II.J. [WAC 173-303-610(3)(a)]

III.3.L POST CLOSURE – RESERVED

III.3.M CRITICAL SYSTEMS – RESERVED

III.3.N RESERVED

III.3.O CONTAINERS

III.3.O.1 Container Storage and Treatment Unit Standards

III.3.O.1.a As part of or in addition to the requirements of Permit Condition III.3.B.2, the Permittees will ensure the integrity of container storage secondary containment and the chemically resistant coating described in Addendum C, Section C.3.4.1 as necessary to ensure any spills or releases to secondary containment do not migrate to the underlying concrete or soils.

III.3.O.1.a.1 Include documentation of any damage and subsequent repairs in the Hanford Facility Operating Record, LERF and 200 Area ETF file required by Permit Condition II.I.I.

III.3.O.2 Container Management Standards

III.3.O.2.a The Permittees will maintain and manage wastes in accordance with the requirements of Addendum C, Section C.3.2. [WAC 173-303-630(2)]

III.3.O.2.b The Permittees will label containers in accordance with the requirements of Addendum C, Section C.3.2, and Section C.3.3. [WAC 173-303-630(3)]

III.3.O.2.c The Permittees will comply with the requirements for managing wastes in containers in WAC 173-303-630(5), incorporated by reference.

III.3.O.2.d The Permittees will ensure wastes are compatible with containers and with other wastes stored or treated in containers within the 200 Area ETF according to the requirements of Addendum C, Section C.3.1 and C.3.4.6. [WAC 173-303-630(4), WAC 173-303-630(9)]

III.3.O.2.e The Permittees may treat wastes in containers via decanting of free liquids and addition of sorbents. The Permittees may not use addition of sorbents for purposes of changing the treatability group of a waste with respect to the land disposal restriction standards of 40 CFR 268, incorporated by reference by WAC 173-303-140.

III.3.O.2.f The Permittees will remove any accumulated liquids from container storage areas in 200 Area ETF according to the requirements of Addendum C, Section C.3.4.5, to ensure containers are not in contact with free liquids and to prevent overflow of the container storage area secondary containment.

III.3.O.2.g The Permittees will comply with the requirements for air emissions from containers in Addendum C, Section C.6.3.2. (WAC 173-303-692)

III.3.O.2.h The accumulation of liquid waste stored in the 2025ED Load-In Station will not be greater than the capacity of the containment pit and sump. [WAC 173-303-630(7)(b), WAC 173-303-630(7)(c)]

III.3.O.2.i Containers with free liquids must be placed on spill pallets when placed in the Outdoor Container Storage Area. (WAC 173-303-630)

III.3.P **TANK SYSTEMS**

III.3.P.1 Tank System Requirements

III.3.P.1.a The Permittees will develop a schedule for conducting Integrity Assessments (IA). The schedule will meet the requirements of Addendum C, Section C.4.1.5, and consideration of the factors in WAC 173-303-640(2)(e) or WAC 173-303-640(3)(b) as applicable:

III.3.P.1.b The Permittees will maintain a copy of the schedule required by Permit Condition III.3.P.1.a, in the Hanford Facility Operating Record, LERF and 200 Area ETF file, and conduct periodic integrity assessments according to the schedule. The Permittees will document results of integrity assessments conducted according to the IA in the Hanford Facility Operating Record, LERF and 200 Area ETF file.

III.3.P.1.c If a tank system is found to be leaking, or is unfit for use, the Permittees must follow the requirements of WAC 173-303-640(7), incorporated by reference. [WAC 173-303-640(3)(b)]

III.3.P.2 Tank System Operating Requirements

III.3.P.2.a The Permittees will comply with the requirements of WAC 173-303-640(5)(a), incorporated by reference.

III.3.P.2.b The Permittees will comply with the requirements of Addendum C, Section C.4.4.2. [WAC 173-303-640(5)(b)]

III.3.P.2.c The Permittees will comply with the requirements of Addendum C, Section C.4.5. [WAC 173-303-640(5)(d)]

III.3.P.2.d The Permittees will comply with the requirements of WAC 173-303-640(7), incorporated by reference, in response to spills or leaks from tanks systems at 200 Area ETF. [WAC 173-303-640(5)(c)]

III.3.P.2.e The Permittees will ensure that the Waste Processing Strategy required by Permit Condition III.3.B.7.a, provides for the immediate treatment or blending of waste accepted for management at the 200 Area ETF such that the resulting waste or mixture is no longer reactive or ignitable when further managed in 200 Area ETF tank systems. [WAC 173-303-640(9)]

III.3.P.2.f The Permittees will comply with the requirements of WAC 173-303-640(10), incorporated by reference.

III.3.Q SURFACE IMPOUNDMENTS

III.3.Q.1 The Permittees will maintain the three LERF Basins according to the requirements of WAC 173-303-650(2)(f), incorporated by reference.

III.3.Q.2 The Permittees will operate the LERF Basins according to the requirements of Addendum C, Section C.5.3, and Addendum I, Section I.1.2.3.1 to prevent overtopping. [WAC 173-303-650(2)(c)]

III.3.Q.3 The Permittees will develop and maintain, and operate the LERF Basins to ensure that any flow of waste into the impoundment can be immediately shut off in the event of overtopping or liner failure. [WAC 173-303-650(2)(d)]

III.3.Q.4 The Permittees will comply with the requirements of WAC 173-303-650(2)(g), incorporated by reference.

III.3.Q.5 The Permittees will comply with the requirements of WAC 173-303-650(4)(b), incorporated by reference.

III.3.Q.6 The Permittees will comply with the requirements of WAC 173-303-650(4)(c), incorporated by reference. The certification required by this Permit Condition must be provided to Ecology no later than seven calendar days after the date of the certification. A copy of the certification will be placed in the Hanford Facility Operating Record, LERF and 200 Area ETF file required by Permit Condition II.I.1. [WAC 173-303-650(4)(c)]

III.3.Q.7 The Permittees will comply with the requirements of WAC 173-303-650(5)(b), incorporated by reference, in response to events in WAC 173-303-650(5)(a), incorporated by reference.

III.3.Q.8 The Permittees will comply with the requirements of WAC 173-303-650(5)(d) for any LERF Basin that has been removed from service in accordance with Permit Condition III.3.Q.7 that the Permittees will restore to service. [WAC 173-303-650(5)(d)]

III.3.Q.9 The Permittees will close any LERF Basin removed from service in accordance with the requirements of Permit Condition III.3.Q.7 or a basin that cannot be repaired or that the Permittees will not to return to service. [WAC 173-303-650(5)(e)]

III.3.Q.10 The Permittees will comply with the requirements of Addendum C, Section C.5.10 with respect to management of ignitable or reactive wastes in the LERF Basins. [WAC 173-303-650(7)]

III.3.Q.11 The Permittees can place incompatible wastes and materials in the same LERF Basin only if in compliance with the requirements of WAC 173-303-395(1)(b), (c). [WAC 173-303-650(8)]

III.3.Q.12 The Permittees will use the action leakage rate in Addendum C, Section C.5.8, for operation of LERF Basins, and comply with the requirements of WAC 173-303-650(10)(b). [WAC 173-303-650(10)]

III.3.Q.13 The Permittees will comply with the requirements of WAC 173-303-650(11), incorporated by reference.

III.3.Q.14 The Permittees will comply with the requirements of 40 CFR 264, Subpart CC, incorporated by reference by WAC 173-303-692.

III.3.R GROUNDWATER

III.3.R.1 The Permittees will comply with the requirements of Addendum D, "Groundwater Monitoring Plan." (WAC 173-303-645)

III.3.R.2 All wells constructed pursuant to this Permit will be constructed in compliance with Chapter 173-160 WAC incorporated by reference through WAC 173-303-645(8)(c).

III.3.R.3 Maintain the *Liquid Effluent Retention Facility Engineering Evaluation and Characterization* report in the Hanford Facility Operating Record, LERF and 200 Area ETF, which satisfies the requirements in WAC 173-303-806 and -645.

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

SIGNATURE PAGE FOR 8C.2020.8F

The enclosed portions of the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste, Revision 8C, were modified on March 10, 2021 and effective on April 9, 2021. These portions are the legal and current version of the permit. It will remain in effect unless modified, revoked and reissued under Washington Administrative Code (WAC) 173-303-830(3), terminated under WAC 173-303-830(5), or continued in accordance with WAC 173-303-806(7). All other portions of the permit remain unchanged.

ISSUED BY:
WASHINGTON STATE DEPARTMENT OF ECOLOGY

Stephanie Schleif Digitally signed by Schleif, Stephanie (ECY)

Date: 03/10/2021

Stephanie Schleif, Deputy Program Manager
Department of Ecology
Nuclear Waste Program

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LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY ADDENDUM B WASTE ANALYSIS 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
03/10/2021	8C.2020.8F
05/19/2020	8C.2020.6F
12/7/2018	PCN-LERF/ETF-2018-01 (8C.2018.Q4)
01/23/2018	PCN-LERF/ETF-2017-01 (8C.2018.Q1)
10/25/2017	8C.2017.3F
08/25/2015	8C.2016.Q2

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ADDENDUM B
WASTE ANALYSIS PLAN

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ADDENDUM B
WASTE ANALYSIS PLAN

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B. WASTE ANALYSIS PLAN

B.1 Introduction

In accordance with the regulations set forth in the Washington State Department of Ecology (Ecology) Dangerous Waste Regulations, Washington Administrative Code (WAC) 173-303-300, this Waste Analysis Plan (WAP) has been prepared for operation of the Liquid Effluent Retention Facility (LERF) and the 200 Area Effluent Treatment Facility (200 Area ETF) that are located in the 200 East Area on the Hanford Site, Richland, Washington.

The purpose of this WAP is to ensure that adequate knowledge as defined in WAC 173-303-040, is obtained for dangerous and/or mixed waste accepted by and managed in LERF and 200 Area ETF. This WAP documents the sampling and analytical methods, and describes the procedures used to obtain this knowledge. This WAP also documents the requirements for generators sending aqueous waste to the LERF or 200 Area ETF for treatment. Throughout this WAP, the term generator includes any Hanford Site source, including Treatment, Storage, and Disposal (TSD) units, whose process produces an aqueous waste.

LERF consists of three surface impoundments, which provide treatment and storage. The 200 Area ETF includes tank systems, which provides treatment and storage, and container management areas, which provides container storage and treatment. Additionally, this WAP discusses the sampling and analytical methods for the treated effluent (treated aqueous waste) that is discharged from 200 Area ETF as a non-dangerous, delisted waste to the State Approved Land Disposal Site (SALDS), and secondary waste that is stored and treated at 200 Area ETF. Specifically, the WAP contains sampling and analysis requirements including quality assurance/quality control (QA/QC) requirements, for the following:

- **Influent Waste Acceptance Process** - determines the acceptability of a particular aqueous waste at the LERF or 200 Area ETF pursuant to applicable permit conditions, regulatory requirements, and operating capabilities prior to acceptance of the waste at the LERF or 200 Area ETF for treatment or storage. This includes documenting that wastes accepted for treatment at 200 Area ETF are within the treatability envelope required by the Final Delisting 200 Area ETF, Permit Condition 1.a.i. Refer to Section B.2.
- **Special Management Requirements** - identifies the special management requirements for aqueous wastes managed in the LERF or 200 Area ETF. Refer to Section B.3.
- **Influent Aqueous Waste Sampling and Analysis** - describes influent sampling and analyses used to characterize an influent aqueous waste to ensure proper management of the waste and for compliance with the special management requirements. Also includes rationale for analyses. Refer to Section B.4.
- **Treated Effluent Sampling and Analysis** - describes sampling and analyses of treated effluent (i.e., treated aqueous waste) for compliance with Discharge Permit Number ST0004500; and Final Delisting 200 Area ETF [40 Code of Federal Regulations (CFR) 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3) and the corresponding State Final Delisting issued pursuant to WAC 173-303-910(3) limits]. Also includes rationale for analyses. Refer to Section B.5.
- **200 Area ETF Generated Waste Sampling and Analysis** - describes the sampling and analyses used to characterize the secondary waste streams generated from the treatment process and to characterize waste generated from maintenance and operations activities. Also includes rationale for analyses. Characterization and designation of wastes generated from maintenance and operations activities are conducted pursuant to WAC 173-303-170 and are not subject to the permit requirements of WAC 173-303-800. These descriptions are included in this WAP for purposes of completeness, but are not enforceable conditions of this WAP or the Permit. Refer to Section B.6.

- **Quality Assurance and Quality Control** - ensures the accuracy and precision of sampling and analysis activities. Refer to Section B.7.

This WAP meets the specific requirements of the following:

- Land Disposal Restrictions (LDR) Treatment Exemption for the LERF under 40 CFR 268.4, U.S. Environmental Protection Agency (EPA), December 6, 1994 Memo, Mr. Dan Duncan, EPA to Ms. June Hennig, U.S. Department of Energy (DOE), "Liquid Effluent Retention Facility (LERF) Land Disposal Restrictions Treatment Exemption – Regulatory Interpretation."
- Final Delisting 200 Area ETF [40 CFR 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3)].
- Corresponding State Final Delisting issued pursuant to WAC 173-303-910(3).
- Discharge Permit Number ST0004500, as amended.
- Hanford Facility Dangerous Waste Permit (Permit) WA7890008967, as amended.

Some Permit requirements from Discharge Permit Number ST0004500 are included in this WAP for completeness. In addition, generator requirements for designation of wastes generated by LERF and 200 Area ETF from operation and maintenance activities are also included in this WAP for completeness. The Discharge Permit Number ST0004500 requirements are not within the scope of Resource Conservation and Recovery Act (RCRA) or WAC 173-303 or subject to the permit requirements of WAC 173-303-800. Therefore, revisions of this WAP that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to review or approval by Ecology. Any other revisions to this WAP will be incorporated through the Permit modification process as necessary to demonstrate compliance with requirements of this Permit, including Permit Conditions I.E.7 and I.E.8.

B.1.1 Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility Description

The LERF and 200 Area ETF comprise an aqueous waste treatment system located in the 200 East Area. Both LERF and 200 Area ETF may receive aqueous waste through several inlets. 200 Area ETF can receive aqueous waste through three inlets. First, 200 Area ETF can receive aqueous waste directly from the LERF. Second, aqueous waste can be transferred from the 2025ED Load-In Station to 200 Area ETF. Third, aqueous waste can be transferred from containers (e.g., carboys, drums) to the 200 Area ETF through either the Secondary Waste Receiving Tanks or the Concentrate Tanks.

The LERF can receive aqueous waste through five inlets. First, aqueous waste can be transferred to LERF through a dedicated pipeline from the 200 West Area. Second, aqueous waste can be transferred through a pipeline that connects LERF with the 242-A Evaporator and Waste Treatment and Immobilization Plant (WTP). Third, aqueous waste also can be transferred to LERF from pipelines that connect LERF to either Load-In Station, or ETF through a distribution point located at the surge tank berm. Fourth, aqueous waste can be transferred into LERF through a series of sample ports located at each basin. Finally, aqueous waste can be transferred through a pipeline that connects LERF with the WTP.

The LERF consists of three lined surface impoundments. Aqueous waste from LERF is pumped to 200 Area ETF through a double-walled fiberglass pipeline. The pipeline is equipped with leak detection located in the annulus between the inner and outer pipes. Each basin is equipped with six available sample risers constructed of 6-inch-perforated pipe. A seventh sample riser in each basin is dedicated to influent waste receipt piping, and an eighth riser in each basin contains liquid level instrumentation. Each riser extends along the sides of each basin from the top to the bottom of the basin. Detailed information on the construction and operation of the LERF is provided in Addendum C, "Process Information."

200 Area ETF is designed to treat the contaminants anticipated in process condensate from the 242-A Evaporator, WTP-EMF (Effluent Management Facility), and other aqueous wastes from the Hanford Site. Section B.1.2 provides more information on the sources of these wastes.

The capabilities of 200 Area ETF were confirmed through pilot plant testing. A pilot plant was used to test surrogate solutions that contained constituents of concern anticipated in aqueous wastes on the Hanford Site. The pilot plant testing served as the basis for a demonstration of the treatment capabilities of 200 Area ETF in the *200 Area Effluent Treatment Facility Delisting Petition* (DOE/RL-92-72).

200 Area ETF consists of a primary and a secondary treatment train (Figure C-4 and C-5 in Addendum C). The primary treatment train removes or destroys dangerous and mixed waste components from the aqueous waste.

In the secondary treatment train, the waste components are concentrated and either dried into a powder or managed as brine from the concentrate tanks. Dry powder waste is containerized, and transferred to an authorized dangerous waste facility, or the Environmental Restoration Disposal Facility (ERDF). Brine waste can be transferred into containers using the brine loadout system for treatment at an authorized dangerous waste facility.

Each treatment train consists of a series of operations. The primary treatment train includes the following:

- Surge tank.
- Filtration.
- Ultraviolet light oxidation (UV/OX).
- pH adjustment.
- Hydrogen peroxide decomposition.
- Degasification.
- Reverse osmosis (RO).
- Ion exchange.
- Verification.

The secondary treatment train uses the following:

- Secondary waste receiving.
- Evaporation (with mechanical vapor recompression).
- Concentrate (brine) staging.
- Thin film drying.
- Brine Loadout.
- Container handling.
- Supporting systems.

A dry powder or brine waste is generated from the secondary treatment train, from the treatment of an aqueous waste. The secondary waste treatment system typically receives and processes by-products generated from the primary treatment train. However, in an alternate operating scenario, some aqueous wastes may be fed to the secondary treatment train before the primary treatment train.

The treated effluent from the primary treatment train is contained in verification tanks where the effluent is sampled to confirm that the effluent meets the delisting criteria. Under 40 CFR 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3), the treated effluent from 200 Area ETF is considered a delisted waste; that is, the treated effluent is no longer a listed dangerous waste subject to the hazardous waste management requirements of RCRA provided that the delisting criteria are satisfied and the treated effluent does not exhibit a dangerous characteristic. The treated effluent is discharged under the Discharge Permit Number ST0004500 as a non-dangerous, delisted waste to the SALDS, located in the 600 Area, north of the 200 West Area. A portion of the treated wastewater from the Verification Tanks is recycled as service water throughout the facility; for example, it is used to dilute bulk acid and caustic to meet processing needs, thereby reducing the demand for process water.

B.1.2 Sources of Aqueous Waste

200 Area ETF was intended and designed to treat a variety of mixed wastes. As cleanup activities at Hanford progress, many of the aqueous wastes generated from site remediation and waste management activities are sent to the LERF and 200 Area ETF for treatment and storage. A brief discussion of waste streams that may be managed by LERF and 200 Area ETF in the future may be found in the *200 Area Effluent Treatment Facility Delisting Petition* (DOE/RL-92-72). Prior to management of any new waste streams, it may be necessary to modify this WAP through the permit modification process to ensure that adequate knowledge of such new waste streams is available prior to management of them in LERF and 200 Area ETF.

The 242-A process condensate is a dangerous waste because it is derived from a listed, dangerous waste stored in the Double-Shell Tank (DST) System. The DST waste is transferred to the 242-A Evaporator where the waste is concentrated through an evaporation process. The concentrated slurry waste is returned to the DST System, and the evaporated portion of the waste is recondensed, collected, and transferred as process condensate to the LERF.

The WTP process condensate is a dangerous waste because it is derived from a listed, dangerous waste stored in the DST System. The DST waste is transferred to WTP for vitrification. Waste derived from the vitrification process is transferred to the EMF for additional treatment. The secondary waste from EMF is transferred to LERF for treatment at ETF. Aqueous waste from the analytical laboratory is also transferred to LERF.

Other aqueous wastes that are acceptable for treatment and/or storage at the LERF and 200 Area ETF include, but are not limited to the following Hanford wastes:

- Contaminated groundwater from pump-and-treat remediation activities such as groundwater from the 200-UP-1 Operable Unit.
- Purgewater from groundwater monitoring activities.
- Water from deactivation activities, such as water from the spent fuel storage basins at deactivated reactors (e.g., N Reactor).
- Laboratory aqueous waste from unused samples and sample analyses.
- Leachates from landfills, such as the Low Level Burial Grounds Trenches 31 and 34, and the Integrated Disposal Facility (IDF). 200 Area ETF remains a backup treatment capability for the ERDF leachate.
- Any dilute waste, which may be accepted for treatment and within the scope of wastewaters that are delisted under terms of the revised delisting [40 CFR 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3)].

Most of these aqueous wastes are accumulated in batches in a LERF Basin for interim storage and treatment through pH and flow equalization before final treatment in 200 Area ETF. However, some aqueous wastes, such as 200-UP-1 Groundwater, may be treated on a flow-through basis in LERF enroute to 200 Area ETF for final treatment. The constituents in these aqueous wastes are common to the Hanford Site and were considered in pilot plant testing or in vendor tests, either as a constituent or as a family of constituents. According to the Final Delisting 200 Area ETF, and Permit Condition III.3.B.7, all wastes accepted for treatment at 200 Area ETF must be within a specified treatability envelope that ensures that wastes will be within the treatment capability of 200 Area ETF.

B.2 Influent Waste Acceptance Process

Throughout the acceptance process, there are specific criteria required for an influent waste (i.e., aqueous waste) to be accepted at the LERF and/or 200 Area ETF. These criteria are identified in the following sections and summarized in Table B-2. The process of accepting a waste into the LERF and 200 Area ETF systems involves a series of steps, as follows.

- **Waste Information:** The generator of an aqueous waste works with LERF and 200 Area ETF personnel to provide characterization data of the waste stream (Section B.2.1).
- **Waste Management Decision Process:** LERF and 200 Area ETF management decision is based on a case-by-case evaluation of whether an aqueous waste stream is acceptable for treatment or storage at LERF and the 200 Area ETF. The evaluation has two categories:
  - **Regulatory Acceptability:** A review to determine if there are any, regulatory concerns that would prohibit the storage or treatment of an aqueous waste in the LERF or 200 Area ETF; e.g., treatment would meet permit conditions that would comply with applicable regulations.
  - **Operational Acceptability:** An evaluation to determine if there are any operational concerns that would prohibit the storage or treatment of an aqueous waste in the LERF or 200 Area ETF and storage of treatment residuals; e.g., determine treatability and compatibility or safety considerations (Section B.2.2.2).

B.2.1 Waste Information

When an aqueous waste stream is identified for treatment or storage in the LERF or 200 Area ETF, the generator is required to characterize the waste stream according to the requirements in Section B.2.1.1 and document the results of characterization on an aqueous waste profile sheet. This requirement is the first waste acceptance criterion.

The LERF and 200 Area ETF personnel work with the generators to ensure that the necessary information is collected for the characterization of a waste stream (i.e., the appropriate analyses or adequate knowledge), and that the information provided on the waste profile sheet is complete. The completed waste profile sheet is maintained in the LERF and 200 Area ETF Operating Record according to Permit Condition II.I.1.j.

B.2.1.1 Waste Characterization

Because the constituents in the individual aqueous waste streams vary, each waste stream is characterized and evaluated for acceptability on a case-by-case basis. The generator is required to designate an aqueous waste, which generally will be based on analytical data. However, a generator may use knowledge to substantiate the waste designation, or for general characterization information. Examples of acceptable knowledge include the following:

- Documented data or information on processes similar to that which generated the aqueous waste stream.
- Information/documentation that the waste stream is from specific, well documented processes, e.g., F-listed wastes.

- Information/documentation that sampling/analyzing a waste stream would pose health and safety risks to personnel.
- Information/documentation that the waste stream does not lend itself to collecting a laboratory sample for example, wastewater collected (e.g., sump, tank) where the source water characterization is documented. Typically, these circumstances occur at decommissioned buildings or locations, not at operating units.

When a generator performs characterization of a dangerous and/or mixed waste stream based on knowledge, LERF and 200 Area ETF personnel review the knowledge as part of the waste acceptance process to ensure the knowledge satisfies the definition of *knowledge* in WAC 173-303-040. Specifically, LERF and 200 Area ETF personnel review the generator's processes to verify the integrity of the knowledge, and determine whether the knowledge is current and consistent with requirements of this WAP. LERF and 200 Area ETF management or their designee determines the final decision on the adequacy of the knowledge. The persons reviewing generator process knowledge and those making decisions on the adequacy of knowledge are trained according to the requirements of Addendum G, "Personnel Training."

The generator is responsible for providing analytical data and/or knowledge that the influent aqueous waste meets the mixed waste exemption to implement Subpart CC emission standards [WAC 173-303-300(5)(i)(i), WAC 173-303-300(5)(i)(ii)]. The LERF Basins rely on the mixed waste exemption to implement Subpart CC emission standards [WAC 173-303-692(1)(b)(vi)]. Should the LERF Basins receive non-radioactive dangerous waste, the volatile organic concentration at the point of waste origination shall be less than 500 parts per million (ppm) by weight [40 CFR 264.1082(c)(1)]. These waste streams may be combined with mixed waste in the LERF Basins without affecting the use of the mixed waste exemption because the non-radioactive dangerous waste streams would be below 500 ppm by weight volatile organic concentration. Non-dangerous radioactive waste, state-only dangerous waste, and non-radioactive/non-dangerous waste may also be combined with mixed waste in the LERF Basins without affecting the use of the mixed waste exemption.

The generator is also responsible for identifying LDRs treatment standards applicable to the influent aqueous waste as part of the characterization, as required under 40 CFR 268.40 incorporated by reference by WAC 173-303-140. Because the 200 Area ETF main treatment train is a Clean Water Act, equivalent treatment unit [40 CFR 268.37(a)] incorporated by reference by WAC 173-303-140, generators are not required to identify underlying hazardous constituents for characteristic wastes pursuant to 40 CFR 268.9, incorporated by reference by WAC 173-303-140, for wastewaters (i.e., <1 percent total suspended solids and <1 percent total organic carbon). The 200 Area ETF secondary waste (e.g., powder) reflects a change in LDR treatability group (i.e., wastewater to non-wastewater) so there is a new LDR point of generation, at which point any characteristic and associated underlying hazardous constituents must be identified. Therefore, generators of a non-wastewater may be required to identify underlying hazardous constituents for characteristic wastes pursuant to 40 CFR 268.9, incorporated by reference by WAC 173-303-140.

When analyzing an aqueous waste stream for LERF and 200 Area ETF waste acceptance characterization, a generator is required to use the target list of parameters identified in Table B-3, of this WAP. This requirement is in addition to any analysis required for purposes of designation under WAC 173-303-070. These data are used by LERF and 200 Area ETF to verify the treatability of an aqueous waste stream, and to develop a treatment plan for the waste after acceptance. Refer to Table B-6, for the corresponding analytical methods. The generator may use knowledge in lieu of some analyses, as determined by LERF and 200 Area ETF management or their designee, if the knowledge satisfies the definition of *knowledge* in WAC 173-303-040. For example if a generator provides information that the process generating an aqueous waste does not include or involve organic chemicals, analyses for organic compounds likely would not be required. Additional analyses could be required if historical information and/or knowledge indicate that an aqueous waste contains constituents not included in the target list of parameters.

The characterization and historical information are documented in the waste profile sheet, which is discussed in the following section and is part of the LERF and 200 Area ETF Operating Record according to Permit Condition II.I.

B.2.1.2 Aqueous Waste Profile Sheet

The waste profile sheet documents the characterization of each new aqueous waste stream. The profile includes a detailed description of the source, volume, waste designation and applicable LDR treatment standards, and physical nature (wastewater or non-wastewater) of the aqueous waste. For an aqueous waste to be accepted for treatment or storage in the LERF or 200 Area ETF, each new waste stream generator is required to complete and provide this form to LERF and 200 Area ETF management. Each generator also is required to provide the analytical data and/or knowledge used to designate the aqueous waste stream according to WAC 173-303-070 and to determine the chemical and physical nature of the waste.

The LERF and 200 Area ETF management determine whether the information on the waste profile sheet is sufficient according to the criteria above. The LERF and 200 Area ETF management use this information to evaluate the acceptability of the aqueous waste stream for storage and treatment in the LERF and 200 Area ETF, and to determine if the secondary waste generated from treatment is acceptable for storage at the 200 Area ETF and has a defined path forward to final disposal.

B.2.2 Waste Management Decision Process

All aqueous waste under consideration for acceptance must be characterized using analytical data and/or knowledge. This information is used to determine the acceptability of an aqueous waste stream. The LERF and 200 Area ETF Facility Manager or their designee is responsible for making the decision to accept or reject an aqueous waste stream. The management decision to accept any aqueous waste stream is based on an evaluation of regulatory acceptability and operational acceptability. Each evaluation uses acceptance criteria, which were developed to ensure that an aqueous waste is managed in a safe, environmentally sound, and in compliance with this Permit. The following sections provide detail on the acceptance evaluation and the acceptance criteria.

An aqueous waste stream could be rejected for one of the following reasons:

- The paperwork and/or laboratory analyses from the generator are insufficient.
- Discrepancies with the regulatory and operational acceptance criteria cannot be reconciled, including:
    - An aqueous waste, which is not allowed under the current Final Delisting 200 Area ETF, and LERF and 200 Area ETF management elect not to pursue an amendment, or the Final Delisting 200 Area ETF cannot be amended (Section B.2.2.1).
    - An aqueous waste is incompatible with LERF liner materials or with other aqueous waste in LERF and no other management method is available (Section B.2.2.3.1).
    - An aqueous waste, which is not allowed under the Subpart CC mixed waste exemption as described in Section B.2.1.1.
- Adequate storage or treatment capacity is not available.

B.2.2.1 Regulatory Acceptability

Each aqueous waste stream is evaluated on a case-by-case basis to determine if there are any regulatory concerns that would preclude the storage or treatment of a waste in the LERF or 200 Area ETF based on the criteria in Sections B.2.2.1.1. Before an aqueous waste can be stored or treated in either the LERF or 200 Area ETF, the waste designation must be determined. Information on the waste designation of an aqueous waste is documented in the waste profile sheet. This information is used to confirm that treating or storing the aqueous waste in the LERF or 200 Area ETF is allowed under and in compliance with

WAC 173-303, Permit (WA7890008967), Final Delisting 200 Area ETF in 40 CFR 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3), and the corresponding State-Issued Delisting for 200 Area ETF.

B.2.2.1.1 Dangerous Waste Regulations, State and Federal Delisting Actions, and Permits

Before an aqueous waste stream is sent to the LERF or 200 Area ETF, the generator will characterize and designate the stream with the appropriate dangerous/hazardous waste numbers according to WAC 173-303-070. Addendum A, the Final Delisting 200 Area ETF and the corresponding State-Issued Delisting identify the specific waste numbers for dangerous/mixed waste that can be managed in the LERF and 200 Area ETF. Dangerous waste designated with waste numbers not specified in these documents cannot be treated or stored in the LERF or 200 Area ETF, unless the documents are appropriately modified.

Additionally, aqueous wastes designated with listed waste numbers identified in the Final Delisting 200 Area ETF and the corresponding State-Issued Delisting will be managed in accordance with the conditions of the delisting, or an amended delisting.

B.2.2.2 Operational Acceptability

Because the operating configuration or operating parameters at the LERF and 200 Area ETF can be adjusted or modified, most aqueous waste streams generated on the Hanford Site can be effectively treated to below Delisting and Discharge Permit limits. Because of this flexibility, it would be impractical to define numerical acceptance or decision limits. Such limits would constrain the acceptance of appropriate aqueous waste streams for treatment at the LERF and 200 Area ETF. The versatility of the LERF and 200 Area ETF is better explained in the following examples:

- The typical operating configuration of 200 Area ETF is to process an aqueous waste through the UV/OX unit first, followed by the RO unit. However, high concentrations of nitrates may interfere with the performance of the UV/OX. In this case, 200 Area ETF could be configured to process the waste in the RO unit prior to the UV/OX unit.
- For a small volume aqueous waste with high concentrations of some anions and metals, the approach may be to first process the waste stream in the secondary treatment train. This approach would prevent premature fouling or scaling of the RO unit. The liquid portion (i.e., untreated overheads from 200 Area ETF evaporator and thin film dryer) would be sent to the primary treatment train.
- An aqueous waste with high concentrations of chlorides and fluorides may cause corrosion problems when concentrated in the secondary treatment train. One approach is to adjust the corrosion control measures in the secondary treatment train. An alternative may be to blend this aqueous waste in a LERF Basin with another aqueous waste, which has sufficient dissolved solids, such that the concentration of the chlorides in the secondary treatment train would not pose a corrosion concern.
- Some metal salts (e.g., barium sulfate) tend to scale the RO membranes. In this situation, descalants used in the treatment process may be increased.
- Any effluent that does not meet these limits in one pass through 200 Area ETF treatment process is recycled to 200 Area ETF for reprocessing.

There are some aqueous wastes, whose chemical and physical properties preclude that waste from being treated or stored at the LERF or 200 Area ETF. Accordingly, an aqueous waste is evaluated to determine if it is treatable, if it would impair the efficiency or integrity of the LERF or 200 Area ETF, and if it is compatible with materials in these units. This evaluation also determines if the aqueous waste is compatible with other aqueous wastes managed in the LERF.

The waste acceptance criteria in this category focus on determining treatability of an aqueous waste stream, and on determining any operational concerns that would prohibit the storage or treatment of an aqueous waste stream in the LERF or 200 Area ETF. The chemical and physical properties of an aqueous waste stream are determined as part of the waste characterization, and are documented on the waste profile sheet and compared to the design of the units to determine whether an aqueous waste stream is appropriate for storage and treatment in the LERF and 200 Area ETF. All decisions and supporting rationale and data will be documented in the LERF and 200 Area ETF Operating Record, according to Permit Condition II.I.

B.2.2.3 Special Requirements Pertaining to Land Disposal Restrictions

Containers of 200 Area ETF secondary waste are transferred to a treatment, storage, or final disposal unit, as appropriate (e.g., to the Central Waste Complex, ERDF). 200 Area ETF personnel provide the analytical characterization data and necessary process knowledge for the waste to be managed by the receiving staff, and the appropriate LDR documentation in accordance with Section B.6.1.1.

Generally, the operating parameters or operating configuration at the LERF or 200 Area ETF can be adjusted or modified to accommodate properties of the secondary waste. However, in those cases where a treatment process or operating configuration cannot be modified, the aqueous waste stream proposed for acceptance will not be accepted for treatment or storage at the LERF or 200 Area ETF. Additionally, an aqueous waste stream is evaluated for the potential to deposit solids in a LERF Basin (i.e., whether an aqueous waste contains sludge or could precipitate solids). This evaluation will also consider whether the blending or mixing of two or more aqueous waste streams will result in the formation of a precipitate. However, because the waste streams managed in the LERF and 200 Area ETF are generally dilute, the potential for mixing waste streams and forming a precipitate is low; no specific compatibility tests are performed. Filtration at the waste source could be required before acceptance into LERF. Waste streams with the potential to form precipitates in LERF or that cannot be blended with other waste streams to avoid precipitate formation are not accepted for treatment at LERF and 200 Area ETF. The 2025ED Load-In Station and 2025EG Backup Load-In Station have the ability to perform filtration on incoming waste streams going to both the LERF and Load In Station tank 59A-TK-1. See additional discussions of precipitate formation and compliance with LDR requirements in Section B.3. Similar filtration requirements could apply to aqueous waste fed directly to 200 Area ETF without interim treatment in LERF.

To determine if an aqueous waste meets the criterion of treatability, specific information is required. Treatability of a waste stream is evaluated from characterization data provided by the generator as verified through the waste acceptance process, the 200 Area waste acceptance criteria, and the treatability envelope for the 200 Area ETF as documented in Tables C-1 and C-2 of the November 29, 2001 delisting petition. Generators will also provide characterization data to identify those physical and chemical properties that would interfere with, or foul 200 Area ETF treatment process in consultation with LERF and 200 Area ETF representatives. In some instances, knowledge that meets the definition of *knowledge* in WAC 173-303-040 is used for purposes of identifying a chemical or physical property that would be of concern. For example, the generator could provide knowledge that the stream has two phases (an oily phase and an aqueous phase). In this case, if the generator could not physically separate the two phases, the aqueous waste stream would be rejected because the oily phase could compromise some of the treatment equipment. Typically, analyses for the following parameters are required to evaluate treatability and operational concerns:

- Total dissolved solids.
- Total organic carbon.
- Total suspended solids.
- Specific conductivity.
- Barium.
- Calcium.
- Carbonate/Bi-carbonate.
- Chloride.
- Nitrate.
- Nitrite.
- Phosphate.
- Potassium.

- pH.
- Acetonitrile.
- Alkalinity.
- Ammonia.
- Fluoride.
- Iron.
- Magnesium.
- Silicon.
- Sodium.
- Sulfate.

These constituents are identified in Table B-2, which is the list of target analytes used for waste characterization and waste acceptance evaluation.

B.2.2.3.1 Compatibility

Corrosion Control. Because of the materials of construction used in 200 Area ETF, corrosion is generally not a concern with new aqueous waste streams. Additionally, these waste streams are managed in a manner that minimizes corrosion. To ensure that a waste will not compromise the integrity of 200 Area ETF tanks and process equipment, each waste stream is assessed for its corrosion potential as part of the compatibility evaluation. This assessment usually focuses on chloride and fluoride concentrations; however, the chemistry of each new waste also is evaluated for other parameters that could cause corrosion.

Compatibility with LERF Liners and Piping. As part of the acceptance process, the criteria of compatibility with the LERF liner materials are evaluated for each aqueous waste stream. This evaluation is performed using knowledge (as defined by WAC 173-303-040) of constituent concentrations in the aqueous waste stream or using constituent concentrations obtained by analyzing the waste stream for the constituents identified in Table B-1 using the analytical methods for these constituents in Section B.8. Then, the constituent concentrations in the waste stream are compared to the decision criteria in Table B-1. If all constituent concentrations are below the decision criteria, then the waste stream is considered compatible with the LERF liners and may be accepted for treatment. Otherwise, the waste stream is considered incompatible with the LERF liners, and it cannot be accepted for treatment in the LERF Basins. However, a waste stream may still be acceptable for treatment in 200 Area ETF if it is fed directly to 200 Area ETF, bypassing the LERF Basins. Results of this evaluation are documented in the, LERF and 200 Area ETF Operating Record according to Permit Condition II.I. The rational for establishing the liner compatibility constituents and decision criteria in Table B-1 is as follows: The high-density polyethylene liners in the LERF Basins potentially are vulnerable to the presence of certain constituents that might be present in some aqueous waste. Using EPA SW-846, Method 9090, the liner materials were tested to evaluate compatibility between aqueous waste stored in the LERF and synthetic liner components. Based on the data from the compatibility test and vendor data on the liner materials, several constituents and parameters were identified as potentially harmful (at high concentrations) to the integrity of the liners. From these data and the application of safety factors, concentration limits in Table B-1 were established.

The strategy for protecting the integrity of a LERF liner is to establish upfront that an aqueous waste is compatible before the waste is accepted into LERF. Characterization data on each new aqueous waste stream are compared to the limits outlined in Table B-1 to ensure compatibility with the LERF liner materials before acceptance into the LERF.

Before a waste stream is processed at the 242-A Evaporator, the generator reviews DST analytical data and a process condensate profile is developed to ensure the process condensate is compatible with the LERF liners. For flow through aqueous wastes like the 200-UP-1 Groundwater, characterization data will be obtained and reviewed every two years to ensure that liner compatibility is maintained. For WTP-EMF waste streams, the generator reviews WTP-EMF analytical data or acceptable process knowledge of the EMF effluent collection tanks to verify that the process condensate waste stream is compatible with the LERF liners.

The LERF or 200 Area ETF, or both, will receive hazardous aqueous waste generated at WTP. The waste will meet the waste acceptance criteria outlined in this "Waste Analysis Plan" (Addendum B). The LERF and 200 Area ETF allow process knowledge to be used in lieu of some analyses in instances where process knowledge is adequate, and a LERF or 200 Area ETF representative will work with a WTP representative to identify the waste acceptance criteria and analyses appropriate for liquid waste characterization.

The WTP will provide analysis data from representative samples to verify the effluent meets the LERF and 200 Area ETF Addendum B waste acceptance criteria. Additional sampling and analysis of EMF effluent will be performed periodically per Section B.2.3, and in the event of a process upset, change in effluent source, compliance purposes, data loss, or as agreed to by WTP and LERF and 200 Area ETF.

The WTP will perform online monitoring of the effluent flow rate, pH, and conductivity, and the data will be transmitted to the LERF Instrument Building. The real-time data will be transmitted to the 200 Area ETF Control Room.

In some instances, knowledge may be adequate to determine that an aqueous waste is compatible with the LERF liners. When knowledge is used, it must satisfy the definition of *knowledge* in WAC 173-303-040. In those instances where knowledge is adequate, the waste characterization would likely not require analysis for these parameters and constituents. Storm water is an example where knowledge is adequate to determine that this aqueous waste is compatible with the LERF liners.

Compatibility with Other Waste. Some aqueous wastes, especially small volume streams, are accumulated in the LERF with other aqueous waste. Before acceptance into the LERF, the aqueous waste stream is evaluated for its compatibility with the resident aqueous waste(s). The evaluation focuses on the potential for an aqueous waste to react with another waste (40 CFR 264, Appendix V, *Examples of Potentially Incompatible Wastes*) including formation of any precipitate in the LERF Basins.

However, the potential for problems associated with commingling aqueous wastes is very low due to the dilute nature of the wastes; this evaluation confirms the compatibility of two or more aqueous wastes from different sources. Compatibility is determined by evaluating parameters such as pH, ammonia, and chloride. No specific analytical test for compatibility is performed.

If it is determined that an aqueous waste stream is incompatible with other aqueous waste streams, alternate management scenarios are available. For example, another LERF Basin that contains a compatible aqueous waste(s) might be used, or the aqueous waste stream might be fed directly into 200 Area ETF for treatment. In any case, potentially incompatible waste streams are not mixed, and all aqueous waste is managed in a way that precludes a reaction, degradation of the liner, or interference with 200 Area ETF treatment process.

B.2.3 Periodic Review Process

In accordance with WAC 173-303-300(4)(a), an influent aqueous waste will be periodically reviewed as necessary to ensure that the characterization is accurate and current. At a minimum, an aqueous waste stream will be reviewed in the following situations.

- The LERF and 200 Area ETF management have been notified, or have reason to believe that the process generating the waste has changed.
- The LERF and 200 Area ETF management note an increase or decrease in the concentration of a constituent in an aqueous waste stream, beyond the range of concentrations that was described or predicted in the waste characterization.
- Waste streams will be reviewed every two years.

In these situations, LERF and 200 Area ETF management will review the available information. If existing analytical information is not sufficient, the generator may be asked to review and update the current waste characterization, to supply a new Waste Profile Sheet (WPS), or resample and reanalyze the aqueous waste, as necessary. Other situations that might require a reevaluation of a waste stream are discussed in the following sections.

B.2.4 Record/Information and Decision

The information and data collected throughout the acceptance process, and the evaluation and decision on whether to accept an influent aqueous waste stream for treatment or storage in the LERF or 200 Area ETF are documented as part of LERF and 200 Area ETF Operating Record pursuant to Permit Condition II.I. Specifically, the LERF and 200 Area ETF Operating Record contains the following components on a new influent aqueous waste stream:

- The signed WPS for each aqueous waste stream and analytical data.
- Knowledge used to characterize a dangerous/mixed waste (under WAC 173-303-090), and information supporting the adequacy of the knowledge.
- The evaluation on whether an aqueous waste stream meets the waste acceptance criteria, including:
  - The evaluation for regulatory acceptability including appropriate regulatory approvals.
  - The evaluation for LERF liner materials compatibility and for compatibility with other aqueous waste.

Table B-1 General Limits for Liner Compatibility

Chemical Family	Constituent(s) or Parameter(s)[1]	Limit[2] (sum of constituent concentrations)
Alcohol/Glycol	1-Butanol	500,000 mg/L 500,000 ppm
Alkanone[3]	Acetone	200,000 mg/L 200,000 ppm
Alkenone[4]	None targeted	N/A
Aromatic/Cyclic hydrocarbon	Acetophenone, benzene, carbozole, chrysene, cresol, di-n-octyl phthalate, diphenylamine, isophorone, pyridine, tetrahydrofuran	2,000 mg/L 2,000 ppm
Halogenated hydrocarbon	Arochlors, carbon tetrachloride, chloroform, hexachlorobenzene, lindane (gamma-BHC), hexachlorocyclopentadiene, methylene chloride, p-chloroaniline, tetrachloroethylene, 2,4,6-trichlorophenol	2,000 mg/L 2,000 ppm
Aliphatic hydrocarbon	None targeted	N/A
Ether	Dichloroisopropyl ether	2,000 mg/L 2,000 ppm

Table B-1 General Limits for Liner Compatibility

Chemical Family	Constituent(s) or Parameter(s)[1]	Limit[2] (sum of constituent concentrations)
Other hydrocarbons	Acetontrile, carbon disulfide, n-nitrosodimethylamine, tributyl phosphate	2,000 mg/L 2,000 ppm
Oxidizers	None targeted	N/A
Acids, Bases, Salts	Ammonia, cyanide, anions, cations	100,000 mg/L 100,000 ppm
pH	pH	0.5 < pH < 13.0

[1]Analytical methods for the parameters and constituents are provided in Section B.8.

[2]Analytical data are evaluated using the following 'sum of the fraction' technique. The individual constituent concentration is evaluated against the compatibility limit for its chemical family. The sum of the evaluations must be less than 1. pH is not part of this evaluation.

$$\sum_{n=1}^{i}\left(\frac{Conc_n}{LIMIT_n}\right) \leq 1$$

[3]Ketone containing saturated alkyl group(s).

[4]Ketone containing unsaturated alkyl group(s).

Where "I" is the number of organic constituents detected.

mg/L = milligrams per liter.

ppm = parts per million.

N/A = not applicable.

Table B-2 Waste Acceptance Criteria

General Criteria Category	Criteria Description
1. Characterization	A. Each generator must provide an aqueous waste profile.
	B. Each generator must designate the aqueous waste stream.
	C. Each generator must provide analytical data and/or knowledge.
2. Regulatory acceptability	A. The LERF and 200 Area ETF can store and treat influent aqueous wastes with waste numbers identified in Addendum A for the LERF and 200 Area ETF, and the Final Delisting 200 Area ETF, 40 CFR 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3).
	B. The aqueous waste must comply with conditions of the Discharge Permit.
	C. An aqueous waste must comply with the conditions described in Section B.2.1.1 for Subpart CC compliance.
3. Operational acceptability	A. Determine whether an aqueous waste stream is treatable, considering: 1. Whether the removal and destruction efficiencies on the constituents of concern will be adequate to meet the Discharge Permit and Delisting levels.

Table B-2 Waste Acceptance Criteria

General Criteria Category	Criteria Description
	2. Other treatability concerns; analyses for this evaluation may include: Total dissolved solids — Fluoride Total organic carbon — Iron Total suspended solids — Magnesium Specific conductivity — Nitrate Acetonitrile — Nitrite Alkalinity — Phosphate Ammonia — Potassium Barium — Silicon Calcium — Sodium Carbonate/bicarbonate — Sulfate Chloride — pH
	B. Determine whether an aqueous waste stream is compatible, considering: 1. Whether an aqueous waste stream presents corrosion concerns with respect to 200 Area ETF; analysis may include chloride and fluoride. 2. Whether an aqueous waste stream is compatible with LERF liner materials, compare characterization data to the liner compatibility limits (Table B-1). 3. Whether an aqueous waste stream is compatible with other aqueous waste(s), 40 CFR 264, Appendix V, comparison will be used.

B.3 Special Management Requirements

Special management requirements for aqueous wastes that are managed in the LERF or 200 Area ETF are discussed in the following section.

B.3.1 Land Disposal Restriction Compliance at Liquid Effluent Retention Facility

Because LERF provides treatment through flow and pH equalization, a surface impoundment treatment exemption from the LDRs was granted in accordance with 40 CFR 268.4, and WAC 173-303-040. This treatment exemption is subject to several conditions, including a requirement that the WAP address the sampling and analysis of the treatment "residue" [40 CFR 268.4(a)(2)(i) and WAC 173-303-300(5)(h)(i) and (ii)] to ensure the "residue" meets applicable treatment standards. Though the term "residue" is not specifically defined, this condition further requires that sampling must be designed to represent the "sludge and the supernatant" indicating that a residue may have a sludge (solid) and supernatant (liquid) component.

Solid residue is not anticipated to accumulate in a LERF Basin for the following reasons:

- Aqueous waste streams containing sludge would not be accepted into LERF under the acceptance criteria of treatability (Section B.2.2.3.1).
- No solid residue was reported from process condensate discharged to LERF in 1995.
- The LERF Basins are covered and all incoming air first passes through a breather filter.
- No precipitating or flocculating chemicals are used in flow and pH equalization.
- Multiple waste streams managed in a single LERF Basin are evaluated for the formation of precipitates. Wastes that would form precipitates are not accepted for treatment at LERF.

Therefore, the residue component subject to this condition is the supernatant (liquid component). Additionally, an aqueous waste stream is evaluated for the potential to deposit solids in a LERF Basin (i.e., an aqueous waste that contains suspended solids). If necessary, filtration at the waste source could be required before acceptance into LERF. Therefore, the residue component in LERF subject to this condition is the supernatant (liquid component). The contingency for removal of solids will be addressed during closure in Addendum H, "Closure Plan."

The conditions of the treatment exemption also require that treatment residues (i.e., aqueous wastes), which do not meet the LDR treatment standards "must be removed at least annually" [40 CFR 268.4(a)(2)(ii) incorporated by reference by WAC 173-303-140]. To address the conditions of this exemption, an influent aqueous waste is sampled and analyzed and the LDR status of the aqueous waste is established as part of the acceptance process. The LERF Basins are then managed such that any aqueous waste(s), which exceeds an LDR standard, is removed annually from a LERF Basin, except for a heel of approximately 3 feet. A heel is required to stabilize the LERF liner. The volume of the heel is approximately 550,000 gallons.

B.4 Influent Aqueous Waste Sampling and Analysis

The following sections provide a summary of the sampling procedures, frequencies, and analytical parameters for characterization of influent aqueous waste (Section B.2) and in support of the special management requirements for aqueous waste in the LERF (Section B.3).

B.4.1 Sampling Procedures

With a few exceptions, generators are responsible for the characterization, including sampling and analysis, of an influent aqueous waste. Process condensate is either sampled at the 242-A Evaporator or accumulated in a LERF Basin following a 242-A Evaporator campaign and sampled. Other exceptions will be handled on a case-by-case basis and the, LERF and 200 Area ETF Operating Record will be maintained at the unit for inspection by Ecology. The following section discusses the sampling locations, methodologies, and frequencies for these aqueous wastes. For samples collected at the LERF and 200 Area ETF, unit-specific sampling protocol is followed. The sample containers, preservation materials, and holding times for each analysis are listed in Section B.8.

B.4.1.1 Batch Samples

In those cases where an aqueous waste is sampled in a LERF Basin, samples are collected from four of the six available sample risers located in each basin, i.e., four separate samples. When LERF levels are low, fewer than four samples can be taken if the sampling approach is still representative. Though there are eight sample risers at each basin, one is dedicated to liquid level instrumentation and another is dedicated as an influent port. Operating experience indicates that four samples adequately capture the spatial variability of an aqueous waste stream in the LERF Basin. Specifically, sections of stainless steel (or other compatible material) tubing are inserted into the sample riser to an appropriate depth. Using a portable pump, the sample line is flushed with the aqueous waste and the sample collected. The grab

sample containers typically are filled for volatile organic compounds (VOC) analysis first, followed by the remainder of the containers for the other parameters.

Several sample ports are also located at 200 Area ETF, including a valve on the recirculation line at 200 Area ETF surge tank. All samples are obtained at the LERF or 200 Area ETF are collected in a manner consistent with SW-846 procedures (EPA as amended).

B.4.2 Analytical Rationale

As stated previously, each generator is responsible for designating and characterizing an aqueous waste stream. Accordingly, each generator samples and analyzes an influent waste stream using the target list of parameters (Table B-3) for the waste acceptance process. At the discretion of the LERF and 200 Area ETF management, a generator may provide knowledge in lieu of some analyses as discussed in Section B.2.1.1. The LERF and 200 Area ETF personnel will work with the generator to determine which parameters are appropriate for the characterization.

The analytical methods for these parameters are provided in Section B.8. All methods are EPA methods satisfying the requirements of WAC 173-303-110(3). Additional analyses may be required if historical information and knowledge indicate that an influent aqueous waste contains constituents not included in the target list of parameters. For example, if knowledge indicates that an aqueous waste contains a parameter that is regulated by the Groundwater Quality Criteria (WAC 173-200), that parameter(s) would be added to the suite of analyses required for that aqueous waste stream.

The analytical data for the parameters presented in Table B-3, including VOC, Semi-volatile Organic Compound (SVOC), metals, anions, and general chemistry parameters are used to define the physical and chemical properties of the aqueous waste for the following:

- Set operating conditions in the LERF and 200 Area ETF (e.g., to determine operating configuration, refer to Section B.2.2.2).
- Identify concentrations of some constituents which may also interfere with, or foul 200 Area ETF treatment process (e.g., fouling of the RO membranes, refer to Section B.2.2.2).
- Evaluate LERF liner and piping materials compatibility.
- Determine treatability to evaluate if applicable constituents in the treated effluent will meet Discharge Permit and Delisting limits.
- Estimate concentrations of some constituents in the waste generated in the secondary treatment train (i.e., dry powder waste).

Table B-3 Target Parameters for Influent Aqueous Waste Analyses

Volatile Organic Compounds	Semi-volatile Organic Compounds
Acetone	Acetophenone
Acetonitrile	Cresol (o, p, m)
Benzene	Dichloroisopropyl ether (bis [2-chloropropyl] ether)
1-Butanol	Di-n-octyl phthalate
Carbon disulfide	Diphenylamine
Carbon tetrachloride	Hexachlorobenzene
Chloroform	Hexachlorocyclopentadiene
Methylenechloride	Iosophorone
Tetrachloroethylene	Lindane (gamma-BHC)

Table B-3 Target Parameters for Influent Aqueous Waste Analyses

Volatile Organic Compounds		Semi-volatile Organic Compounds
Tetrahydrofuran		N-nitrosodimethylamine Pyridine Tributyl phosphate 2,4,6-Trichlorophenol
Total Metals		**Anions**
Arsenic	Magnesium	Chloride
Barium	Mercury	Fluoride
Beryllium	Nickel	Nitrate
Cadmium	Potassium	Nitrite
Calcium	Selenium	Phosphate
Chromium	Silicon	Sulfate
Copper	Silver	**General Chemistry Parameters**
Iron	Sodium	Alkalinity
Lead	Vanadium	Ammonia
	Zinc	Carbonate/Bi-carbonate (calculated from Alkalinity)
		Cyanide
		pH
		Total suspended solids
		Total dissolved solids
		Total organic carbon
		Specific conductivity

B.5 Treated Effluent Sampling and Analysis

The treated aqueous waste, or effluent, from 200 Area ETF is collected in three verification tanks before discharge to the SALDS. To determine whether the discharge limits, and the Final Delisting 200 Area ETF criteria are met, the effluent routinely is sampled at the verification tanks. The sampling and analyses performed are described in the following sections.

B.5.1 Rationale for Effluent Analysis Parameter Selection

The parameters measured in the treated effluent are required by the following regulatory documents:

- Delisting criteria from the Final Delisting 200 Area ETF [40 CFR 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3)].
- Corresponding State Final Delisting issued pursuant to WAC 173-303-910(3).
- Effluent limits from the Discharge Permit Number ST0004500.
- The Final Delisting 200 Area ETF provides two testing regimes for the treated effluent. Initial verification testing is performed when a new influent waste stream is processed through the 200 Area ETF. For each 200 Area ETF influent waste stream, the first generated verification tank must be sampled and analyzed for all delisting constituents and conductivity. Subsequent verification sampling and analysis of all delisting parameters is performed on every 15th tank of

that 200 Area ETF influent waste stream. If the concentration of any analyte is found to exceed a Discharge Permit Number ST0004500, enforcement limit or a Delisting criterion, the contents of the verification tank are reprocessed and/or reanalyzed. The next verification tank generated is also sampled for all delisting constituents.

B.5.2 Effluent Sampling Strategy: Methods, Location, Analyses, and Frequency

Effluent sampling methods and locations, the analyses performed, and frequency of sampling are discussed in the following sections.

B.5.2.1 Effluent Sampling Method and Location

Samples of treated effluent are collected and analyzed to verify the treatment process using 200 Area ETF specific sampling protocol. These verification samples are collected at a sampling port on the verification tank recirculation line. Section B.8 presents the sample containers, preservatives, and holding times for each parameter monitored in the effluent.

B.5.2.2 Analyses of Effluent

The parameters required by the current Discharge Permit Number ST0004500, and Final Delisting 200 Area ETF, conditions are presented in Table B-4. The analytical methods and Practical Quantitation Limits (PQLs) associated with each parameter are provided in Section B.8. The methods and PQLs are equivalent to those used in the analysis of influent aqueous waste.

B.5.2.3 Frequency of Sampling

Treated effluent is tested for all parameters listed in Table B-4 on a frequency satisfying the permit conditions of the Discharge Permit Number ST0004500, and the Final Delisting 200 Area ETF. This effluent must meet the Discharge Permit Number ST0004500, and Final Delisting 200 Area ETF limits associated with these parameters. Grab samples are collected from each verification tank.

During operation of 200 Area ETF, if one or more of the constituents exceeds a Delisting criterion, the Delisting conditions require:

- The characterization data and processing strategy of the influent waste stream be reviewed and changed accordingly to ensure the contents of subsequent tanks do not exceed the Delisting criteria.
- The contents of the verification tank are recycled for additional treatment. The contents that are recycled are resampled after treatment to ensure no constituents exceed a Delisting criteria.
- The contents of the following verification tank are sampled for compliance with the Delisting criteria.
- Treated effluent that does not meet Discharge Permit Number ST0004500 is not discharged to the SALDS until the tank has been retreated and/or reanalyzed.

B.6 Effluent Treatment Facility Generated Waste Sampling and Analysis

The wastes discussed in this section include the wastes generated at 200 Area ETF and are managed in the container storage areas of 200 Area ETF. This section describes the characterization of the following secondary waste streams generated within 200 Area ETF:

- Secondary waste generated from the treatment process, including the following waste forms:
  - Dry powder waste.
  - Concentrated brine.
  - Sludge removed from process tanks.
- Waste generated by operations and maintenance activities.

- Miscellaneous waste generated within 200 Area ETF.

For each waste stream described, a characterization methodology and rationale are provided, and sampling requirements are addressed.

B.6.1 Secondary Waste Generated from Treatment Processes

The following terms used in this section, including powder, dry powder, waste powder, and dry waste powder, are equivalent to the term "dry powder waste." Similarly, terms like concentrate, concentrate waste, slurry, and brine, are equivalent to "brine waste."

The 200 Area ETF generates secondary waste from the primary and secondary treatment trains. The secondary waste is either a dry powder or concentrate tank slurry (brine) waste. To generate this secondary waste, the primary treatment train waste is received in the secondary treatment train in waste receiving tanks where it is fed into an evaporator. Concentrate waste from the evaporator is then fed to a concentrate tank. From the concentrate tanks, there are two alternatives for treatment of the concentrate waste: either the thin film dryer or the brine loadout system.

If the waste is fed to the thin film dryer, the waste is dried into a powder, and collected into containers. The containers are filled via a remotely controlled system. The condensed overheads from the evaporator and thin film dryer are returned to the surge tank to be fed to the primary treatment train.

If the waste is fed to the brine loadout system, the brine waste is transferred to containers using the brine loadout system. The containers holding the aqueous brine waste are stored and transferred to an authorized dangerous waste facility for additional treatment.

Occasionally, salts from the treatment process (e.g., calcium sulfate and magnesium hydroxide) accumulate in process tanks as sludge. The sludge is removed and placed in containers. The sludge is dewatered and the supernate is pumped back to 200 Area ETF for treatment.

The secondary treatment system typically receives and processes the following by-products generated from the primary treatment train:

- Concentrate from the first RO stage.
- Backwash and cleaning concentrate from the rough and fine filters.
- Regeneration waste from the ion exchange system.
- Spillage or overflow collected in the process sumps.

In an alternate operating scenario, some aqueous wastes may be fed to the secondary treatment train before the primary treatment train.

B.6.1.1 Special Requirements Pertaining to Land Disposal Restrictions

Containers of 200 Area ETF secondary waste are transferred to a treatment, storage or final disposal unit, as appropriate (e.g., the Central Waste Complex or to the ERDF). 200 Area ETF personnel provide the analytical characterization data and necessary knowledge for the waste to be managed by the receiving staff, and for the appropriate LDR documentation.

The following information on the secondary waste is included on the LDR documentation provided to the receiving unit:

- Dangerous waste numbers (as applicable).
- Determination on whether the waste is restricted from land disposal according to the requirements of 40 CFR 268 incorporated by reference by WAC 173-303-140 (i.e., the LDR status of the waste).

The waste tracking information associated with the transfer of waste:

- Waste analysis results.

B.6.1.2 Sampling Methods

Secondary waste is accumulated and chemically adjusted in the concentrate tanks before being fed to the thin film dryer or loaded into containers. The concentrate tanks have agitators for mixing of liquid and suspended solids that may be present. The agitators will be operated during sampling when suspended solids are expected to be present. This ensures all powder waste drums or brine waste containers will be uniform, eliminating the need for multiple samples or spatial sampling equipment.

The dry powder waste and containerized sludge are sampled from containers using the principles presented in SW-846 (EPA as amended) and American Society for Testing Materials (ASTM) Methods, such as those referenced in WAC 173-303-110(2). Sampling methods are discussed in Section B.7.3.1. Methods include, but are not limited to, scoop and thief sampling. The sample container requirements, sample preservation requirements, and maximum holding times for each of the parameters analyzed in either matrix are presented in Section B.8.

Concentrate tank waste samples are collected from recirculation lines. The protocol for concentrate tank sampling prescribes opening a sample port in the recirculation line to collect samples directly into sample containers. The sample port line is flushed before collecting a grab sample. In some cases, it is necessary to sample brine waste in containers after filling. These containers are sampled using ATSM Methods, such as those referenced in WAC 173-303-110(2). Sampling is performed using a thief sampler or peristaltic sample pump. When using a peristaltic pump, the sample tubing is flushed before collecting a grab sample.

The VOC sampling typically is performed first for grab samples. Each VOC sample container will be filled such that cavitation at the sample valve is minimized and the container has no headspace. The remainder of the containers for the other parameters will be filled next.

Table B-4 Rationale for Parameters to be Monitored in Treated Effluent

Parameter	(CAS No.)	Final Delisting 200 Area ETF Delisting[1]	ST0004500 Discharge Permit[2]
			Effluent Limit
Volatile Organic Compounds			
Acetone	(67-64-1)	X	X
Acetonitrile	(75-05-8)	X	
Benzene	(71-43-2)	X	X
1-Butanol	(71-36-3)	X	
Carbon disulfide	(75-15-0)	X	
Carbon tetrachloride	(56-23-5)	X	X
Chloroform	(67-66-3)		X
Methylene Chloride	(75-09-2)		M
Tetrachloroethylene	(127-18-4)		X
Tetrahydrofuran	(109-99-9)	X	X

Table B-4 Rationale for Parameters to be Monitored in Treated Effluent

Parameter	(CAS No.)	Final Delisting 200 Area ETF Delisting[1]	ST0004500 Discharge Permit[2] Effluent Limit
Semi-volatile Organic Compounds			
Acetophenone	(98-86-2)		X
Carbazole	(86-74-8)	X	
p-Chloroaniline	(106-47-8)	X	
Chrysene	(218-01-9)	X	
Cresol (total)	(1319-77-3)	X	
Dichloroisopropyl ether (bis [2-chloroisopropyl] ether)	(108-60-1)	X	
Di-n-octyl phthalate	(117-84-0)	X	
Diphenylamine	(122-39-4)	X	
Hexachlorobenzene	(118-74-1)	X	
Hexachlorocyclopentadiene	(77-47-4)	X	
Isophorone	(78-59-1)	X	
Lindane (gamma-BHC)	(58-89-9)	X	
N-nitrosodimethylamine	(62-75-9)	X	X
Pyridine	(110-86-1)	X	
Tributyl phosphate	(126-73-8)	X	
2,4,6-Trichlorophenol	(88-06-2)	X	
Polychlorinated Biphenyls			
Aroclor 1016	(12674-11-2)	X	
Aroclor 1221	(11104-28-2)	X	
Aroclor 1232	(11141-16-5)	X	
Aroclor 1242	(53469-21-9)	X	
Aroclor 1248	(12672-29-6)	X	
Aroclor 1254	(11097-69-1)	X	
Aroclor 1260	(11096-82-5)	X	
Total Metals[3]			
Arsenic	(7440-38-2)	X	X
Barium	(7440-39-3)	X	
Beryllium	(7740-41-7)	X	X
Cadmium	(7440-43-9)	X	X
Chromium	(7440-47-3)	X	X
Copper	(7440-50-8)		X
Lead	(7439-92-1)	X	X

Table B-4 Rationale for Parameters to be Monitored in Treated Effluent

Parameter	(CAS No.)	Final Delisting 200 Area ETF Delisting[1]	ST0004500 Discharge Permit[2] Effluent Limit
Mercury	(7439-97-6)	X	X
Nickel	(7440-02-0)	X	
Selenium	(7782-49-2)	X	
Silver	(7440-22-4)	X	
Vanadium	(7440-62-2)	X	
Zinc	(7440-66-6)	X	
Anions			
Chloride	(16887-00-6)		X
Fluoride	(16984-48-8)	X	
Nitrate (as N)	(14797-55-8)		X
Nitrite (as N)	(1479765-0)		X
Sulfate	(14808-79-8)		X
Other Analyses			
Ammonia	(7664-41-7)	X	X
Cyanide	(57-12-5)	X	
Total dissolved solids			X
Total organic carbon			X
Total suspended solids			X
Specific conductivity			M

[1]Parameters required by the current conditions of the Final Delisting 200 Area ETF, 40 CFR 261, Appendix IX, Table 2 incorporated by reference by WAC 173-303-910(3),70 Federal Register 44496 (EPA 2005).

[2]Parameters required by the current conditions of the Discharge Permit Number ST0004500.

[3]Metals reported as total concentrations.

X = Rationale for measuring this parameter in treated effluent.

M = Monitor only; no limit defined.

B.6.1.3 Sampling Frequency

When designation or identification of applicable LDR treatment standards of the 200 Area ETF secondary waste cannot be based on influent characterization data or knowledge as described in Section B.6.1.1, 200 Area ETF secondary waste is sampled on a batch basis. A batch is defined as any volume of aqueous waste that is being treated under consistent and constant process conditions.

When personnel exposures are of concern, one representative sample will be collected from the concentrate tank. A representative sample of the influent may be taken as an alternative, if the waste from the Concentrate Tank also poses an exposure concern. The sample will be analyzed for the appropriate parameters identified in Table B-5 based on the needs identified from evaluating influent waste analysis data. If sampling of the concentrate tank is not technically practicable for purposes of designating the

powder, direct sampling of the dry powder will be used to make determinations on the dry powder. The dry powder or concentrate tanks will be resampled in the following situations:

- Change in influent characterization.
- Change in process chemistry, as indicated by in-line monitoring of conductivity and pH.
- The LERF and 200 Area ETF management have been notified, or have reason to believe that the process generating the waste has changed (for example, a source change such as a change in the well-head for groundwater that significantly changes the aqueous waste characterization).
- The LERF and 200 Area ETF management note an increase or decrease in the concentration of a constituent in an aqueous waste stream, beyond the range of concentrations that was described or predicted in the waste characterization.

B.6.2 Operations and Maintenance Waste Generated at the 200 Area Effluent Treatment Facility

Operation and maintenance of process and ancillary equipment generates additional routine waste. These waste materials are segregated to ensure proper handling and disposition, and to minimize the commingling of potentially dangerous waste with non-dangerous waste. The following waste streams are anticipated to be generated during routine operation and maintenance of 200 Area ETF. This waste might or might not be dangerous waste, depending on the nature of the material and its exposure to a dangerous waste.

- Spent lubricating oils and paint waste from pumps, the dryer rotor, compressors, blowers, and general maintenance activities.
- Spent filter media and process filters.
- Spent ion exchange resin.
- High Efficiency Particulate Air (HEPA) filters.
- UV light tubes.
- RO membranes.
- Equipment that cannot be returned to service.
- Other miscellaneous waste that might contact a dangerous waste (e.g., plastic sheeting, glass, rags, paper, waste solvent, or aerosol cans).

These waste streams are stored at 200 Area ETF before being transferred for final treatment, storage, or disposal as appropriate.

This waste is characterized and designated using knowledge (from previously determined influent aqueous waste composition information); analytical data; and Safety Data Sheet (SDS)/Material Safety Data Sheets (MSDS) of the chemical products present in the waste or used (the data sheets are maintained at 200 Area ETF). Sampling of these waste streams is not anticipated; however, if an unidentified or unlabeled waste is discovered, that waste is sampled. This “unknown” waste is sampled and analyzed for the parameters in Table B-5 as appropriate, and will be designated according to WAC 173-303-070. The specific analytical methods for these analyses are provided in Section B.8.

B.6.3 Other Waste Generated at the 200 Area Effluent Treatment Facility

There are two other potential sources of waste at 200 Area ETF: spills and/or overflows, and discarded chemical products. Spills may be subject to the requirements of Permit Condition II.E. Spilled material that potentially might be dangerous waste generally is either containerized or routed to 200 Area ETF sumps where the material is transferred either to the surge tank for treatment or to the secondary treatment train. In most cases, knowledge and the use of SDS/MSDS are sufficient to designate the waste material. If the source of the spilled material is unknown and the material cannot be routed to 200 Area ETF sumps,

a sample of the waste is collected and analyzed according to Table B-5, as necessary, for appropriate characterization of the waste. Unknown wastes will be designated according to WAC 173-303-070. The specific analytical methods for these analyses are provided in Section B.8.

A discarded chemical product waste stream could be generated if process chemicals, cleaning agents, or maintenance products become contaminated or are otherwise rendered unusable. In all cases, these materials are appropriately containerized and designated. Sampling is performed, as appropriate, for waste designation.

Table B-5 200 Area Effluent Treatment Facility Generated Waste - Sampling and Analysis

Parameter[1]	Rationale
• Total solids or percent water[2].	• Calculate dry weight concentrations.
• VOCs[3].	• LDR - verify treatment standards.
• SVOCs[3].	• LDR - verify treatment standards.
• Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver).	• Waste designation. • LDR - verify treatment standards.
• Cation and anions of concern.	• Address receiving TSD unit waste acceptance requirements.
• pH.	• Waste designation.

[1]For influent and concentrate tank samples, the total sample (solid plus liquid) is analyzed and the analytical result is expressed on a dry weight basis. The result for toxicity characteristic metal and organic is divided by a factor of 20 and compared to the toxicity characteristic (TC) constituent limits [WAC 173-303-090(8)]. If the TC limit is met or exceeded, the waste is designated accordingly. All measured parameters are compared against the corresponding treatment standards.

[2]Total solids or percent water are not determined for unknown waste and dry powder waste samples and are analyzed in maintenance waste and sludge samples, as appropriate (i.e., percent water might not be required for such routine maintenance waste as aerosol cans, fluorescent tubes, waste oils, batteries, etc., or sludge that has dried).

[3]VOC and/or SVOC analysis of secondary waste is required unless influent characterization data and knowledge indicate that the constituent will not be in the final secondary waste at or above the LDR.

B.7 Quality Assurance/Quality Control

The following QA/QC plan for LERF and 200 Area ETF is provided as required by WAC 173-303-810(6) and follows the guidelines of EPA QA/G-5.

B.7.1 Project Management

The following sections address project administrative functions and approaches.

B.7.1.1 Project Organization

Overall management of the LERF and 200 Area ETF is performed by the Facility Manager, who is responsible for safe operation of the facility, including implementation of this QA/QC plan and compliance with applicable permits and regulations. The Facility Manager also provides retention of project records in accordance with this plan. Assisting the Facility Manager is an Environmental Field Representative that monitors compliance, reviews new requirements and regulations, and interfaces with EPA and Ecology. Also assisting the Facility Manager is a QA representative who is responsible for implementing the QA program at the facility.

Reporting to the Facility Manager are several support groups. The Operations group consists of trained personnel who operate the plant, including operators performing sampling activities such as collection, packaging, and transportation of samples to the laboratory. The Maintenance group is responsible for performing calibrations and preventative maintenance on facility equipment, including pH, conductivity, and flow meters required by environmental permits. The Engineering group monitors the process with online instruments and sampling for process control. The Engineering group also performs waste acceptance, and environmental compliance activities, including scheduling sampling, generating data forms, and reviewing data.

B.7.1.2 Special Training

Individuals involved in sampling, analysis, and data review will be trained and qualified to implement safely the activities addressed in this WAP and QA/QC plan. Training will conform to the training requirements specified in WAC 173-303-330 and Addendum F, "Personnel Training." Training records will be maintained in accordance with Section B.7.1.3.

B.7.1.3 Documentation and Records

Sample records are documented as part of the LERF and 200 Area ETF Operating Record pursuant to Permit Condition II.I. These documents and records include the following:

- Training.
- Chains of Custody for all regulatory sampling performed by LERF and 200 Area ETF.
- Data Summary Reports.
- QA/QC reports.
- Assessment reports.
- Instrument inspection, maintenance, and calibration logs.

B.7.2 Data Quality Parameters and Criteria

Data quality parameters are listed by EPA QA/G-5S, *Guidance for Choosing a Sampling Design for Environmental Data Collection* as:

- Purpose of Data Collection (e.g. determining if a parameter exceeds a threshold level).
- Spatial and Temporal Boundaries of Study.
- Preliminary Estimation of Sample Support (volume that each sample represents).
- Statistical Parameter of Interest (e.g. mean, percentile, percentage).
- Limits on Decision Error/Precision (e.g. false acceptance error, false rejection error).

The parameters for the first four bullets (limits, sample points, frequency of samples, etc.) are already established in the permits, delisting petition, and this WAP. The focus of this QA/QC plan is on limits on decision error/precision.

The data quality parameters were chosen to ensure Limits on Decision Error/Precision are appropriate for purposes of using the data to demonstrate compliance with permits, delisting exclusion limits, and this WAP. The principal quality parameters are precision, accuracy, representativeness, comparability, and completeness. Secondary data parameters of importance include sensitivity and detection levels. The data quality parameters and the data acceptance criteria are discussed below.

B.7.2.1 Precision

Precision is a measure of agreement among replicate measurements of the same property, under prescribed similar conditions. Precision is expressed in terms of the relative percent difference (RPD) for duplicate measurements. QA/QC sample types that test precision include field and laboratory duplicates and spike duplicates. The RPDs for laboratory duplicates and/or matrix spike duplicates will be routinely calculated.

$$\text{RPD} = (100)\textit{absolute value of}\left(\frac{\text{sample result} - \text{duplicate sample result}}{\text{average of sample result} + \text{duplicate sample result}}\right)$$

Matrix spike duplicates are replicates of matrix spike samples that are analyzed with every analytical batch that contains a 200 Area ETF treated effluent sample. The precision of the analytical methods are estimated from the results of the Matrix Spike (MS) and the Matrix Spike Duplicate (MSD) for selected analytes. Matrix spike analyses cannot be performed for certain analytical methods, including conductivity, pH, and total dissolved solids. Duplicate analyses are used to determine the RPD for these methods. The precision acceptance criteria are specified in Table B-6.

B.7.2.2 Accuracy

Accuracy assesses the closeness of the measured value to an accepted reference value. Accuracy of analytical results is typically assessed using matrix spikes. A matrix spike is the addition of a known amount of the analyte to the sample matrix being analyzed. Accuracy is expressed as a percent recovery of the spiked samples.

$$\text{Percent Recovery} = 100\left(\frac{\text{matrix spike sample result} - \text{sample result}}{\text{spiked amount}}\right)$$

Matrix spike analyses cannot be performed on certain analytical methods, including conductivity, pH, and total dissolved solids. The percent recovery for the laboratory control standard samples demonstrates that these methods are working properly and gives an estimate of the method's accuracy. The percent recovery will be routinely calculated.

Accuracy criteria are established to provide confidence that the result is below the action level. Therefore the closer the result is to the action level the higher the degree of accuracy needed. The upper and lower accuracy acceptance criteria are specified in Table B-6. The criteria are reasonable values based on previous analysis of constituents in the delisting exclusion, or similar constituents.

B.7.2.3 Representativeness

Representativeness expresses the degree to which data accurately and precisely represent selected characteristics of a parameter at a sampling point or process condition. Because of the matrix being analyzed, dilute aqueous solution, it is not expected that representativeness will be of concern, except when there are potential for changes to process conditions such as the facility influent concentrations or waste processing strategy. Sampling due to these changes in process conditions is addressed in Section B.6.1.3.

The representativeness of a sample may be compromised by the presence of contaminants introduced in the field or the laboratory. To determine if contamination may be present, a blank sample of reagent water is analyzed. A method blank is performed by the laboratory on every batch of 20 samples being analyzed at the same time. The presence of a constituent in the sample and the blank sample indicates contamination has occurred.

B.7.2.4 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system, expressed as a percentage of the number of valid measurements that were planned to be collected. Lack of completeness is sometimes caused by loss of a sample, loss of data, or inability to collect the planned number of samples. Incompleteness also occurs when data are discarded because they are of unknown or unacceptable quality. Since most regulatory sampling events performed by LERF and 200 Area ETF involve a single sample, all analysis must be complete and valid.

B.7.2.5 Comparability

Comparability is the confidence with which one data set can be compared to another. Comparability is achieved by using sampling and analytical techniques, which provide for measurements that are consistent and representative of the media and conditions measured. In laboratory analysis, the term comparability focuses on method type, holding times, stability issues, and aspects of overall analytical quantitation.

B.7.2.6 Sensitivity and Detection Levels

Sensitivity is the measure of the concentration at which an analytical method can positively identify and report analytical results. Sensitivity represents the maximum value for a detection level that will reasonably assure the results are below the established limits. The analytical method selected by LERF and 200 Area ETF should have a detection level for each constituent that is below the sensitivity. The preferred detection level is the Practical Quantitation Limit (PQL), which is lowest concentration that can be reliably measured during routine laboratory conditions. If the method PQL cannot meet the sensitivity for some constituents, the minimum concentration or attribute that can be measured by a method (method detection limit) or by an instrument (instrument detection limit) may be used. The sensitivity levels, specified in Table B-6, are derived from the delisting limits, water discharge limits, and uncertainty values, which are based on the required precision and accuracy for each constituent.

B.7.3 Data Generation and Acquisition

The following section addresses QA requirements for data generation and acquisition.

B.7.3.1 Sampling Method

LERF and 200 Area ETF samples required by the permits and delisting are collected as grab samples. Sampling for the purpose of waste designation of secondary waste is performed using grab, composite, thief, scoop, or Composite Liquid Waste Sampler (COLIWASA). The selection of the sample collection device depends on the type of sample, the sample container, the sampling location, and the nature and distribution of the waste components. In general, the methodologies used for specific materials correspond to those referenced to WAC 173-303-110(2). The selection and use of the sampling device is supervised or performed by a person thoroughly familiar with the sampling requirements.

The following protocol applies to all sampling methods:

- All containers will be filled within as short a time period as reasonably achievable.
- Volatile Organic Analysis (VOA) sample containers will be filled first, and prior to any subdividing of a composited sample.
- VOA samples consisting of a set of two or more sample containers will be filled sequentially. The sample containers are considered equivalent and given identical sampling times.
- All VOA sample containers must have no headspace and be free of trapped air bubbles.
- Grab sample protocol includes:
  - Sample lines should be as short as reasonably achievable and free of traps and pockets in which solids might settle.

- The sample line should be flushed before sampling with a minimum volume equivalent to three times the sample line volume.
- Contamination to the sample from contact with the internal and external surfaces of the tap should be minimized.

Thief and COLIWASA samplers are used to sample liquid waste containers such as drums. Scoop samplers are used to sample powder waste generated in the thin-film dryer. Sample requirements for these samples include:

- Thief or COLIWASA sampler, the sampler should be lowered into the liquid slowly so the level of the liquid inside and outside the sampler tube remain about the same.
- When lifting the thief or COLIWASA sampler from the solution, the outside should be wiped down, or the excess water allowed to drip off, before filling the sample container.

B.7.3.2 Sample Handling, Custody, and Shipping

The proper handling of sample bottles after sampling is important to ensure the samples are free of contamination and to demonstrate the samples have not been tampered with.

B.7.3.2.1 Chain-of-Custody

Evidence of collection, shipment, receipt at the laboratory, and laboratory custody until disposal will be documented using a Chain-of-Custody (COC) form. The COC form will, as a minimum identify sample identification number, sampling date and time, sampling location, sample bottle type and number, analyses to be performed, and preservation method.

The operations person who signs as the collector on the COC is the first custodian of the samples. A custodian must maintain continuous custody of sample containers at all times from the time the sample is taken until delivery to the laboratory or until delivery to a common carrier for shipment to an off-site location. Custody is maintained by any of the following:

- The custodian has the samples in view, or has placed the samples in locked storage, or keeps the samples within a secured area (e.g., controlled by authorized personnel only), or has applied a tamper-indicating device, such as evidence tape, to the sample containers or shipping containers.
- The custodian has taken physical possession of the samples or the shipping containers sealed with an intact tamper-indicating device, such as evidence tape.

B.7.3.2.2 Sample Preservation, Containers, and Holding Time

Table B-6 lists the sample container, preservation method, and holding time requirements for different types of analyses. These parameters are based on the requirements of 40 CFR 136, Table II.

B.7.3.3 Instrument Calibration and Preventive Maintenance

LERF and 200 Area ETF uses instruments to monitor operations and meet regulatory requirements. This includes continuous pH and conductivity monitors required by facility permits and delisting. All instruments are calibrated according to frequencies and tolerances established by the LERF and 200 Area ETF engineering group. Calibrations and other maintenance actions are scheduled and tracked by LERF and 200 Area ETF maintenance group using a preventive maintenance database. Measuring and test equipment used for instrument calibration is controlled, calibrated at specified intervals, and maintained to establish accuracy limits.

B.7.4 Assessment and Oversight

Quality programs can only be effective if meaningful assessments are performed to monitor and respond to issues associated with program performance. Routine assessment of data is performed as part of the validation process discussed in Section B.7.5.1.

B.7.4.1 Assessments and Response

Management assessments are conducted by first line management and subject matter experts, focusing on procedural adequacy, compliance, and overall effectiveness of the program. Management assessments of the sample program typically include the LERF and 200 Area ETF QA representative. Each management assessment has a performance objective or lines of inquiry. Examples may include personnel training, proper performance of sample custody, or completeness of sampling records.

B.7.4.2 Reports to Management

Results of performance assessments, including any issues identified, are provided to the LERF and 200 Area ETF Facility Manager in a written report. The Facility Manager is responsible to correct all findings from the report.

B.7.5 Verification and Validation of Analytical Data

The data verification and validation processes will ensure that the data resulting from the selected analytical method are consistent with requirements specified in this QA/QC plan.

B.7.5.1 Data Verification

The primary data reporting will be by electronic data systems. Data verification will be performed on laboratory data packages that support environmental compliance to ensure that their content is complete and in order. A review of the data package will be performed to ensure that:

- The data package contains the required technical information.
- Deficiencies are identified and documented.
- Identified deficiencies are corrected by the laboratory and the appropriate revisions are made.
- Deficient pages are replaced with the laboratory corrections.
- A copy of the completed verification report is placed in the data file.

B.7.5.2 Data Validation

Data validation ensures that the data resulting from analytical measurements meet the quality requirements specified in the QA/QC plan. Data validation will be performed on data packages that support environmental compliance.

The following are included in data validation:

- COC - Verify the COC shows unbroken custody from sampling through receipt at the laboratory.
- Request analysis - Review the sample results to verify the requested analysis was performed. If an alternate method was used, verify permit-required detection limits were met.
- Holding times - Review the sample results to verify the analyses were performed within required holing times and where applicable, extraction times.
- Blank - Review the results of trip, field, and equipment blank samples to verify the sample results are not compromised by contamination.
- Laboratory QC - Verify the laboratory QC was completed and there are no outstanding problems.

B.8 Analytical Methods, Sample Containers, Preservative Methods, and Holding Times

Table B-6 Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent

Parameter	Analytical Method[1]	Method Practical Quantitation Limits Sensitivity[2]	Accuracy/ Precision for Method[3] (Percent)	Sample Container[4]/ Preservative[4]/ Holding Time[5]
Volatile Organic Compounds				
Acetone	SW-846 8260 or EPA-600 624	40	60-120 / 20	Sample container 3 x 40-mL amber glass with septum Preservative HCl to pH<2; 4°C Holding time 14 days
Acetonitrile		820	60-120 / 20	
Benzene		5	60-120 / 20	
1-Butanol		1600	60-120 / 20	
Carbon disulfide		1500	60-120 / 20	
Carbon tetrachloride		5	60-120 / 20	
Chloroform		5	50-130 / 20	
Methylene chloride		5	50-150 / 20	
Tetrachloroethylene		5	65-140 / 20	
Tetrahydrofuran		100	60-120 / 20	
Semi-volatile Organic Compounds				
Acetophenone	SW-846 8270 or EPA-600 625	10	70-110 / 25	Sample container 4 x 1-liter amber glass Preservative 4°C Holding time 7 days for extraction; 40 days for analysis after extraction
Carbazole		110	50-120 / 25	
p-Chloroaniline		76	50-120 / 25	
Chrysene		350	50-120 / 25	
Cresol (o, p, m)		760	50-120 / 25	
Di-n-octyl phthalate		300	50-120 / 25	
Diphenylamine		350	50-120 / 25	
Hexachlorobenzene		2	50-120 / 25	
Hexachlorocyclopentadiene		110	50-120 / 25	
Isophorone		2600	50-120 / 25	

Table B-6 Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent

Parameter	Analytical Method[1]	Method Practical Quantitation Limits Sensitivity[2]	Accuracy/ Precision for Method[3] (Percent)	Sample Container[4]/ Preservative[4]/ Holding Time[5]
Lindane (gamma-BHC)		1.9	50-120 / 25	
N-nitrosodimethylamine		12	50-120 / 25	
Pyridine		15	50-120 / 25	
Tributyl phosphate		76	50-120 / 25	
2.4.6-Trichlorophenol		230	50-120 / 25	
Polychlorinated Biphenyls				
Aroclor-1016	SW-846 8082	0.4	50-110 / 25	Sample container 4 x 1-liter amber glass Preservative 4°C Holding time 1 year for extraction; 1 year for analysis after extraction
Aroclor-1221		0.4	50-110 / 25	
Aroclor-1232		0.4	50-110 / 25	
Aroclor-1242		0.4	50-110 / 25	
Aroclor-1248		0.4	50-110 / 25	
Aroclor-1254		0.4	50-110 / 25	
Aroclor-1260		0.4	50-110 / 25	
Total Metals				
Arsenic	EPA-600 200.8	11	70-130 / 20	Sample container 1 x 0.5-liter plastic/glass Preservative 1:1 HNO_3 to pH<2 Holding time 180 days; mercury 28 days
Beryllium		34	75-125 / 20	
Cadmium		5	70-130 / 20	
Chromium		20	70-130 / 20	
Copper		70	70-130 / 20	
Lead		10	70-130 / 20	
Selenium		20	70-130 / 20	
Barium	SW-846 6010/ EPA-600 200.7	1200	75-125 / 20	
Calcium		200	75-125 / 20	
Iron		100	75-125 / 20	
Magnesium		400	75-125 / 20	

Table B-6 Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent

Parameter	Analytical Method[1]	Method Practical Quantitation Limits Sensitivity[2]	Accuracy/ Precision for Method[3] (Percent)	Sample Container[4]/ Preservative[4]/ Holding Time[5]
Nickel		340	75-125 / 20	
Potassium		10,000	75-125 / 20	
Silicon		580	75-125 / 20	
Silver		83	75-125 / 20	
Sodium		2500	75-125 / 20	
Vanadium		120	75-125 / 20	
Zinc		5100	75-125 / 20	
Mercury	SW-846 7470, or EPA-600 245.1	2	70-130 / 20	
General Chemistry				
Chloride	EPA-600 300.0	1000	70-130 / 20	Sample container 1 x 60-mL plastic/glass Preservative 4°C Holding time 28 days; nitrate and nitrite 48 hours
Fluoride		880	70-130 / 20	
Formate		1250	70-130	
Nitrate (as N)		100	70-130 / 20	
Nitrite (as N)		100	70-130 / 20	
Phosphate		1500	70-130 / 20	
Sulfate		10,000	70-130 / 20	
Ammonia (as N)	EPA-600, 300.7, or EPA-600 350.1	40	70-130 / 20	Sample container 1 x 50-mL glass or plastic Preservative H_2SO_4 to pH<2; 4°C Holding time 28 days
Cyanide	EPA-600 335.2/335.3	350	70-130 / 20	Sample container 1 x 250-mL glass or plastic Preservative NaOH to pH>12; 4°C Holding time 14 days

Table B-6 Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent

Parameter	Analytical Method[1]	Method Practical Quantitation Limits Sensitivity[2]	Accuracy/ Precision for Method[3] (Percent)	Sample Container[4]/ Preservative[4]/ Holding Time[5]
Alkalinity (used to calculate carbonate/bicarbonate)	EPA-600 310.1/310.2	ND	ND	Sample container 1 x 50-mL glass or plastic Preservative 4°C Holding time 14 days
Total dissolved solids	EPA-600 160.1 or SM2540C	ND	ND	Sample container 1 x 500-mL glass or plastic Preservative 4°C Holding time 7 days
Total suspended solids	EPA-600 160.2 or SM2540D	ND	ND	Sample container 1 x 1-L glass or plastic Preservative 4°C Holding time 7 days
Specific conductivity	EPA-600 120.1 (in lab) or SM2510B	ND	ND	Sample container 1 x 50-mL glass or plastic Preservative 4°C Holding time 28 days
pH[7]	EPA-600 150.1 or SM4500-H^+B	ND	ND	Sample container 1 x 60-mL glass or plastic Preservative None Holding time Analyze immediately

Table B-6 Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent

Parameter	Analytical Method[1]	Method Practical Quantitation Limits Sensitivity[2]	Accuracy/ Precision for Method[3] (Percent)	Sample Container[4]/ Preservative[4]/ Holding Time[5]
Total organic carbon	SW-846 9060 or SMC5310	ND	ND	Sample container 1 x 250-mL amber glass Preservative H_2SO_4 to pH<2; 4°C Holding time 28 days

[1]SW-846 or EPA-600 methods are presented unless otherwise noted. Other methods might be substituted if the applicable PQL can be met.

[2]ST0004500 required method PQL or Delisting Exclusion condition 2 report sensitivity/detection level, whichever is lower. Units are parts per billion unless otherwise noted.

[3]Accuracy/precision used to confirm or reestablish MDL.

[4]Sample bottle, volumes, and preservatives could be adjusted, as applicable, for safety reasons.

[5]Holding time = time between sampling and analysis.

[7]pH monitored in influent aqueous waste only.

N/A = not applicable.

ND = not determined.

MDL = method detection level.

RL = reporting limit.

Table B-7 Sample Containers, Preservative Methods, and Holding Times for 200 Area Effluent Treatment Facility Generated Waste

Parameter	Analytical Method[1]	Method Practical Quantitation Limits	Accuracy/ Precision for Method (Percent)	Sample Container[2]/ Preservative[2]/ Holding Time[3]
Liquid Matrix				
For methods other than total solids, analyze using the methods and QA/QC in Table B-6. For each method, analyze the target compound list.				
Total solids[4]	EPA-600 160.3	ND	ND	Sample container 1 x 500-mL glass or plastic Preservative – 4°C Holding time –7 days
Solid Matrix				
VOCs (combined method target compound lists)	SW-846 8260	Refer to Table B-6	Refer to Table B-6	Sample container 1 x 40-mL amber glass with septum Preservative – 4°C Holding time – 14 days

Table B-7 Sample Containers, Preservative Methods, and Holding Times for 200 Area Effluent Treatment Facility Generated Waste

Parameter	Analytical Method[1]	Method Practical Quantitation Limits	Accuracy/ Precision for Method (Percent)	Sample Container[2]/ Preservative[2]/ Holding Time[3]
SVOCs (method target compound list)	SW-846 8270	Refer to Table B-6	Refer to Table B-6	Sample container 1 x 125-mL amber glass Preservative – 4°C Holding time – 14 days for extraction; 40 days for analysis after extraction.
Polychlorinated Biphenyls (method target compound list)	SW-846 8082	Refer to Table B-6	Refer to Table B-6	Sample container Amber glass – 50 g of sample Preservative – 4°C Holding time – 1 year for extraction; 1 year for analysis after extraction.
RCRA Metals (method target compound list)	EPA-600 200.8	Refer to Table B-6	Refer to Table B-6	Sample container Glass or plastic – 10 g of sample Preservative – none, mercury 4°C Holding time – 180 days; mercury 28 days.
Total Metals (method target compound list)	SW-846 6010	Refer to Table B-6	Refer to Table B-6	
Anions (method target compound list)	EPA-600 300.0	Refer to Table B-6	Refer to Table B-6	Sample container Glass or plastic – 25 g of sample Preservative – none Holding time – 6 months for extraction; 28 days for analysis after extraction, nitrate and nitrite 48 hours for analysis after extraction.
Ammonia	EPA-600 300.7	Refer to Table B-6	Refer to Table B-6	Sample container Glass or plastic – 25 g of sample Preservative – none Holding time – 6 months for extraction; 28 days for analysis after extraction.

Table B-7 Sample Containers, Preservative Methods, and Holding Times for 200 Area Effluent Treatment Facility Generated Waste

Parameter	Analytical Method[1]	Method Practical Quantitation Limits	Accuracy/ Precision for Method (Percent)	Sample Container[2]/ Preservative[2]/ Holding Time[3]
pH	SW-846 9045	ND	ND	Sample container Glass or plastic – 50 g of sample Preservative – none Holding time – none
Toxicity Characteristic Leaching Procedure[5]	SW-846 1311	N/A	N/A	Sample container Refer to specific method being performed after TCLP – 125 g of sample. Preservative – None (after TCLP, preserve extract per method being performed). Holding time – Metals: 180 days for TCLP extraction, mercury 28 days for TCLP extraction. Semi-volatile organics analysis (SVOA): 14 days for TCLP extraction (after TCLP, refer to specific methods for time for analysis after extraction).

[1]SW-846 or EPA-600 methods are presented unless otherwise noted. Other methods might be substituted if the applicable PQL can be met.

[2]Sample bottle, volumes, and preservatives could be adjusted, as applicable, for safety reasons.

[3]Holding time equals time between sampling and analysis.

[4]Total dissolved solids and total suspended solids may be performed in place of total solids. The requirements for containers, preservatives, and methods are provided in Table B-6.

[5]Extraction procedure, as applicable; extract analyzed by referenced methods [WAC 173-303-110(3)(c)].

N/A = not applicable.

ND = not determined.

TCLP = Toxicity Characteristic Leaching Procedure.

LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY
ADDENDUM C
PROCESS INFORMATION

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
03/10/2021	8C.2020.8F
10/20/2020	PCN-LERF/ETF-2020-03 (8C.2020.Q4)
06/25/2020	PCN-LERF/ETF-2020-01 (8C.2020.Q2)
05/19/2020	8C.2020.6F
12/7/2018	PCN-LERF/ETF-2018-01 (8C.2018.Q4)
01/23/2018	PCN-LERF/ETF-2017-02 (8C.2018.Q1)
10/25/2017	8C.2017.3F
08/25/2016	8C.2016.Q2

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C PROCESS INFORMATION

This addendum provides a detailed discussion of the Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (200 Area ETF) processes and equipment. The LERF and 200 Area ETF comprise an aqueous waste treatment system located in the 200 East Area that provides storage and treatment for a variety of aqueous mixed waste. This aqueous waste includes process condensate from the 242-A Evaporator, Waste Treatment and Immobilization Plant (WTP) aqueous waste, and other aqueous waste generated from on-site remediation and waste management activities.

The LERF consists of three lined surface impoundments, or basins. Aqueous waste from LERF is pumped to the 200 Area ETF for treatment in a series of process units, or systems, that remove or destroy essentially all of the dangerous waste constituents. The treated effluent is discharged to a State-Approved Land Disposal Site (SALDS) north of the 200 West Area, under the authority of a Washington State Waste Discharge Permit ST0004500 and the Final Delisting 200 Area ETF (40 Code of Federal Regulations [CFR] 261, Appendix IX, Table 2).

Both LERF and 200 Area ETF waste processing operations are controlled in a central Control Room located in the 2025E building. The 200 Area ETF Control Room is staffed continuously during 200 Area ETF processing operations. Processing operations are defined as when liquid transfers of any sort are occurring to/from/within the LERF and 200 Area ETF or when wastes are being treated at 200 Area ETF[1]. Examples of processing operations include, but are not limited to, when liquid waste are transferred to/from the LERF Basins (see Section C.1), during active liquid waste treatment/processing at the 200 Area ETF (e.g., liquid waste treatment in tanks and liquid waste movement between primary and secondary treatment train processes and/or other 200 Area ETF tanks [see Section C.2], and liquid waste receipts at the Load-In Station [see Section C.2.1]). Section C.2.5.1 describes the centralized computer system (i.e., monitor and control system or MCS) that is located at the 200 Area ETF Control Room and other locations at the 200 Area ETF. The MCS monitors the performance of the 200 Area ETF operations and records alarms from various equipment as described in this Addendum C and Addendum I, "Inspection Requirements." At times when processing operations are not occurring, the 200 Area ETF Control Room is not manned continuously, and alarms are monitored daily as specified in Addendum I.

The hazardous waste management activities for each Dangerous Waste Management Unit (DWMU) are identified in Table C-1 and Addendum A, "Part A Form." Storage containers can be moved between the DWMUs identified in Table C-1 to support LERF and 200 Area ETF waste management processes. Additional information on waste generation and designation is provided in Section B.6. The waste streams are stored and some are treated at 200 Area ETF before being transferred for final treatment, storage, or disposal as appropriate.

[1]Liquid transfers does not include standard facility operations of liquid recirculation (e.g. for pump seals), sanitary water and cooling water, and outdoor rainwater management activities.

Table C-1 Summary of Liquid Effluent Retention Facility and 200 Area Dangerous Waste Management Units

Management Type	Dangerous Waste Management Units	Part A Treatment	Part A Storage
Surface Impoundment (storage and treatment)	1. LERF Basin 42. 2. LERF Basin 43. 3. LERF Basin 44.	T02 Surface Impoundment Treatment	S04 Surface Impoundment Storage
Container (storage and treatment)	1. 2025E Container Storage Area. 2. 2025E Process Area. 3. 2025E Truck Bay. 4. Outside Container Storage Area. 5. 2025ED Load-In Station. 6. 2025EG Backup Load-In Station.	T04 Container Treatment	S01 Container Storage
Tank (storage and treatment)	1. 20B-TK-1, Sump Tank 1. 2. 20B-TK-2, Sump Tank 2. 3. 59A-TK-1, Load-In Station Tank. 4. 60A-TK-1, Surge Tank. 5. 60C-TK-1, pH Adjust Tank. 6. 60C-TK-2, Effluent pH Adjust Tank. 7. 60F-TK-1, 1st Reverse Osmosis (RO) Feed Tank. 8. 60F-TK-2, 2nd RO Feed Tank. 9. 60H-TK-1A, Verification Tank. 10. 60H-TK-1B, Verification Tank. 11. 60H-TK-1C, Verification Tank. 12. 60I-EV-1, Evaporator Vapor Body Vessel. 13. 60I-TK-1A, Secondary Waste Receiving Tank. 14. 60I-TK-1B, Secondary Waste Receiving Tank. 15. 60I-TK-2, Distillate Flash Tank. 16. 60J-TK-1A, Concentrate Tank. 17. 60J-TK-1B, Concentrate Tank. 18. 59A-TK-2, Sump Tank. 19. 59A-TK-3, Sump Tank. 20. 59A-TK-4, Sump Tank.	T01 Tank Treatment	S02 Tank Storage

The following sections provide a description of each of the authorized DWMUs within the LERF and 200 Area ETF.

C.1 Liquid Effluent Retention Facility Process Description

Each of the three LERF Basins has an operating capacity of 7.8 million gallons. The LERF receives aqueous waste through several inlets including the following:

- PC-5000 pipeline (3”-EVAP_COND-PC5000-M17) that connects LERF Catch Basin 242AL-43 with the 242-A Evaporator.
- 4”-WTP-001-M17 pipeline that connects LERF Catch Basin 242-AL-42 with the WTP-Effluent Management Facility (EMF).
- A pipeline from the 200 West Area.
- A pipeline that connects LERF to the Load-In Station (2025ED).
- A series of sample ports located at each basin.

Figure C-1 presents a general layout of LERF and associated pipelines. Aqueous waste from LERF is pumped to the 200 Area ETF through one of two double-walled fiberglass transfer pipelines. Effluent from the 200 Area ETF also can be transferred back to the LERF through one of these transfer pipelines. These pipelines are equipped with leak detection located in the annulus between the inner and outer pipes. In the event that these leak detectors are not in service, the pipelines are visually inspected during transfers for leakage by opening the secondary containment drain lines located at the 200 Area ETF end of the transfer pipelines.

Each basin is equipped with six available sample risers constructed of 6-inch perforated pipe. A seventh sample riser in each basin is dedicated to influent aqueous waste receipt piping (except for aqueous waste received from the 242-A Evaporator), and an eighth riser in each basin contains liquid level instrumentation.

Each riser extends along the sides of each basin from the top to the bottom of the basin and allows samples to be collected from any depth. Personnel access to these sample ports is from the perimeter area of the basins. A catch basin is provided at the northwest corner of each LERF Basin for aboveground piping and manifolds for transfer pumps. Aqueous waste from the 242-A Evaporator is transferred through piping which ties into piping at the LERF Catch Basin 242AL-43. Aqueous waste from the WTP-EMF is transferred through a pipeline (4”-WTP-001-M17) that ties into piping at the LERF Catch Basin 242AL-42. Under routine operations, a submersible pump is used to transfer aqueous waste from a LERF Basin to the 200 Area ETF for processing or for basin-to-basin transfers. This pump is connected to a fixed manifold on one of four available risers.

Each basin consists of a multilayer liner system supported by a concrete anchor wall around the basin perimeter and a soil-bentonite clay underlayment. The multilayer liner system consists of a primary liner in contact with the aqueous waste, a layer of bentonite carpet, a geonet, a geotextile, a gravel layer, and a secondary liner that rests on the bentonite underlayment. Any aqueous waste leakage through the primary liner flows through the geonet and gravel to a leachate collection system. The leachate flows to a sump at the northwest corner of each basin, where the leachate is pumped up the side slope and back into the basin above the primary liner. Each liner is constructed of high-density polyethylene. A floating cover is stretched over each basin above the primary liner. These covers serve to keep unwanted material from entering the basins, and to minimize evaporation of the liquid contents.

C.2 200 Area Effluent Treatment Facility Process Description

The 200 Area ETF is designed as a flexible treatment system that provides treatment for contaminants anticipated in process condensate and other on-site aqueous waste. The design influent flow rate into the 200 Area ETF is approximately 150 gallons per minute, with planned outages for activities such as maintenance on the 200 Area ETF systems. Maintenance outages typically are scheduled between treating a batch of aqueous waste, referred to as treatment campaigns. The effluent flow (or volume) is equivalent to the influent flow (or volume).

The 200 Area ETF generally receives aqueous waste directly from the LERF. However, aqueous waste also can be transferred from tanker trucks at the 2025ED Load-In Station, 2025EG Backup Load-In Station, and from containers (e.g., carboys, drums) directly to building 2025E. Aqueous waste is treated and stored in 2025E Process Areas in a series of tank systems, and process units. Within building 2025E, waste also is managed in containers through treatment and/or storage. Figures C-2 and C-3 provide the relative locations of the process and container storage areas within the 200 Area ETF.

The process units are grouped in either the primary or the secondary treatment train. The primary treatment train provides for the removal or destruction of contaminants. Typically, the secondary treatment train processes the waste by-products from the primary treatment train by reducing the volume of waste. In the secondary treatment train, contaminants are concentrated to a brine, or dried to a powder. The liquid fraction from the secondary treatment train is routed to the primary treatment train. Figure C-2 provides an overview of the layout of the 2025E building, and the 2025ED Load-In Station, and 2025EG Backup Load-In Station. Figure C-3 presents the Building 2025E Ground Floor Plan, which includes the relative locations of the individual process units, and associated tanks.

The brine waste, dry powder waste, and maintenance and operations waste are containerized and stored or treated in the container storage areas, or accumulated in process containers. Container secondary containment requirements are discussed in Section C.3.9 and removal of liquids is discussed in Section C.3.9.3. Secondary containment requirements for all tank systems is discussed in Section C.4.3.1.

In the following sections, several figures are provided that present general illustrations of the treatment units and the relation to the process.

C.2.1 2025ED Load-In Station and 2025EG Backup Load-In Station

The 200 Area ETF receives aqueous waste from LERF, 2025ED Load-In Station, or 2025EG Backup Load-In Station.

2025ED Load-In Station. The 2025ED Load-In Station, located due east of the surge tank (Figure C-2), was designed and constructed to provide the capability to unload, store, and transfer aqueous waste to the LERF or 200 Area ETF from tanker trucks and other containers (such as drums). The 2025ED Load-In Station consists of two truck bays equipped with Load-In Station tank 59A-TK-1, transfer pumps, filtration system, level instrumentation for tanker trucks, leak detection capabilities for the containment basin and transfer line, and an underground transfer line that connects to lines in the surge tank berm, allowing transfers to either the surge tank or LERF. The 2025ED Load-In Station is covered with a steel building for weather protection. Tanker trucks and other containers are used to unload aqueous waste at the 2025ED Load-In Station. To perform unloading, the tanker truck is positioned on a truck pad, a "load-in" transfer line is connected to the truck, and the tanker contents are pumped into the surge tank, or directly to the LERF. For container and small tanker truck unloading, the container is placed on the pad and the container contents are transferred to Load-In Station tank 59A-TK-1, ETF, or to the LERF.

During unloading operations, solids may be removed from the waste by pumping the contents of the tanker truck or container through a filtration system. If solids removal is not needed, the filtration system is not used and the solution is transferred to Load-In Station tank 59A-TK-1, ETF, or to the LERF. Sump tank 59A-TK-3 is operated until construction of the 2025ED Load-In expansion commences, during which it will be removed from service.

Any leaks at the 2025ED Load-In Station drain to the sump. A leak detector in the sump alarms locally and in the 200 Area ETF Control Room. Alarms are monitored continuously in the 200 Area ETF Control Room during Load-In Station transfers. Alternatively, leaks can be visually detected, if continuous monitoring is not operable. The container storage areas are inspected daily for leaks, spills, accumulated liquids, and open or improperly sealed containers.

2025EG Backup Load-In Station. The 2025EG Backup Load-In Station is located southwest of the 2025ED Load-In Station (Figure C-2). This area is used to store aqueous waste in tanker trucks and other containers (such as drums, or totes) until the waste is transferred into the 200 Area ETF, or LERF. This area can also be used to store waste generated from maintenance and operations activities. Treatment activities in this area include decanting and the use of absorbents for liquid stabilization. The 2025EG Backup Load-In Station consists of a single truck bay equipped with transfer pumps, filtration system, level instrumentation for tanker trucks, drive-on secondary containment system, and load-in transfer line (hose-in-hose) that allows transfers to either ETF, or LERF via a connection to 2025ED transfer piping located in the 2025ED secondary containment pit. To perform unloading, the tanker truck is positioned on a portable secondary containment berm, a load-in transfer line (hose-in-hose) is connected to the truck, and the tanker contents are pumped to either ETF, or LERF. For container unloading, the container is positioned on the portable secondary containment berm and the container contents are pumped to ETF, or LERF. During unloading operations, solids may be removed from the waste by pumping the contents of the tanker truck through a filtration system. If solids removal is not needed, the filtration system is not used and the solution is transferred directly to the LERF, or ETF.

Leaks at the 2025EG Backup Load-In Station are contained by the portable secondary containment berm and/or by the 4-inch berm on the outer perimeter of building 2025EG. In the event of a leak, a portable pumping system will be used to empty the secondary containment. During 2025EG Load-In Station transfers, the secondary containment is visually inspected daily. If solids removal is not needed, the filtration system is not used and the solution is transferred directly to the ETF, or to LERF. The container storage areas are inspected daily for leaks, spills, accumulated liquids, and open or improperly sealed containers.

C.2.2 200 Area Effluent Treatment Facility Operating Configuration

Because the operating configuration of the 200 Area ETF can be adjusted or modified, most aqueous waste streams can be effectively treated to below permitting limits. The operating configuration of the 200 Area ETF depends on the unique chemistry of an aqueous waste stream(s). Before an aqueous waste stream is accepted for treatment, the waste is characterized and evaluated. Information from the characterization is used to adjust the treatment process or change the configuration of the 200 Area ETF process units, as necessary, to optimize the treatment process for a particular aqueous waste stream.

Typically, an aqueous waste is processed first in the primary treatment train, where the 200 Area ETF is configured to process an aqueous waste through the Ultraviolet Light/Oxidation (UV/OX) unit first, followed by the RO unit. However, under an alternate configuration, an aqueous waste could be processed in the RO unit first. For example, high concentrations of nitrates in an aqueous waste might interfere with the performance of the UV/OX. In this case, the 200 Area ETF could be configured to process the waste in the RO unit before the UV/OX unit.

The flexibility of the 200 Area ETF also allows some aqueous waste to be processed in the secondary treatment train first. For example, for small volume aqueous waste with high concentrations of some anions and metals, the approach could be to first process the waste stream in the secondary treatment train. This approach would prevent premature fouling or scaling of the RO unit. The liquid portion (i.e., untreated overheads from the Evaporator Vapor Body Vessel [60I-EV-1] and thin film dryer) would be sent to the primary treatment train.

Figures C-4 and C-5 provide example process flow diagrams for two different operating configurations.

C.2.3 Primary Treatment Train

The primary treatment train consists of the following processes:

- Chemical injection.
- Influent Receipt/Surge tank - inlet, surge capacity.
- Filtration - for suspended solids removal.
- UV/OX - organic destruction.
- pH adjustment - waste neutralization.
- Hydrogen peroxide decomposition - removal of excess hydrogen peroxide.
- Degasification - removal of carbon dioxide.
- RO - removal of dissolved solids.
- Ion Exchange (IX) - removal of dissolved solids.
- Verification - holding tanks during verification.

Influent Receipt/Surge Tank. Depending on the configuration of the 200 Area ETF, the surge tank is one inlet used to feed an aqueous waste into the 200 Area ETF for treatment. In Configuration 1 (Figure C-4), the surge tank is the second component downstream of the LERF. The surge tank provides a storage/surge volume for chemical pretreatment and controls feed flow rates from the LERF to the 200 Area ETF. However, in Configuration 2 (Figure C-5), aqueous waste from LERF is fed directly into the treatment units. In this configuration, the surge tank receives aqueous waste, which has already been treated by filtration, degasification, and RO units. The surge tank then provides feed to the remaining units in the primary treatment train. In yet another configuration, some small volume aqueous waste could be received into the secondary treatment train first for processing. In this case, the aqueous waste would be received directly into the secondary waste receiving tanks. Finally, the surge tank also receives waste extracted from various systems within the primary and secondary treatment train while in operation.

The surge tank is located outside building 2025E on the south side. In the surge tank (Figure C-6), the pH of an aqueous waste is adjusted using the metered addition of sulfuric acid and sodium hydroxide, as necessary, to prepare the waste for treatment in downstream processes. In addition, hydrogen peroxide or biocides could be added to control biological growth in the surge tank. A pump recirculates the contents in the surge tank, mixing the chemical reagents with the waste to a uniform pH.

Filtration. Two primary filter systems remove suspended particles in an aqueous waste: a rough filter removes the larger particulates, while a fine filter removes the smaller particulates. The location of these filters depends on the configuration of the primary treatment train. However, the filters normally are located upstream of the RO units.

The solids accumulating on these filter elements are backwashed to the secondary waste receiving tanks with pulses of compressed air and water, forcing water back through the filter. The backwash operation can be initiated either automatically by a rise in differential pressure across the filter or manually by an operator. The filters are cleaned chemically when the backwashing process does not facilitate acceptable filter performance.

The influent filters provide initial filtration of the feed to ETF. The auxiliary filter (disposable filter) provides filtration capabilities during cleaning/maintenance of the primary fine and rough filters. Figure C-4 shows the location of these filters in the normal treatment configuration.

Ultraviolet Light/Oxidation. Organic compounds contained in an aqueous waste stream are destroyed in the UV/OX system (Figure C-7). Hydrogen peroxide is mixed with the waste. The UV/OX system uses the photochemical reaction of UV light on hydrogen peroxide to form hydroxyl radicals and other reactive species that oxidize the organic compounds. The final products of the complete reaction are carbon dioxide, water, and inorganic ions.

Organic destruction is accomplished in UV/OX units operating in parallel. During the UV/OX process, the aqueous waste passes through reaction chambers where hydrogen peroxide is added. While in the UV/OX system, the temperature of an aqueous waste is monitored. Heat exchangers are used to reduce the temperature of the waste should the temperature of the waste approach the upper limits for the UV/OX or RO systems.

pH Adjustment. The pH of a waste stream is monitored and controlled at different points throughout the treatment process. Within the primary treatment train, the pH of a waste can be adjusted with sulfuric acid or sodium hydroxide to optimize operation of downstream treatment processes or adjusted before final discharge. For example, the pH of an aqueous waste would be adjusted in the pH adjustment tank after the UV/OX process and before the RO process. In this example, pH is adjusted to cause certain chemical species such as ammonia to form ammonium sulfate, thereby increasing the rejection rate of the RO.

Hydrogen Peroxide Decomposition. Typically, hydrogen peroxide added into the UV/OX system is not consumed completely by the system. Because hydrogen peroxide is a strong oxidizer, the residual hydrogen peroxide from the UV/OX system is removed to protect the downstream equipment. The hydrogen peroxide decomposer uses a catalyst to break down the hydrogen peroxide that is not consumed completely in the process of organic destruction. The aqueous waste is sent through a column that breaks down the hydrogen peroxide into water and oxygen. The gas generated by the decomposition of the hydrogen peroxide is vented to the volatile organic compounds (VOC) system.

Degasification. The degasification column is used to purge dissolved carbon dioxide from the aqueous waste to reduce the carbonate loading to downstream dissolved solids removal processes within the 200 Area ETF primary treatment train. The purged carbon dioxide is vented to the VOC system.

Reverse Osmosis. The RO system (Figure C-8) uses pressure to force clean water molecules through semi-permeable membranes while keeping the larger molecule contaminants, such as dissolved solids, and large molecular weight organic materials, in the membrane. The RO process uses a staged configuration to maximize water recovery. The process produces two separate streams, including a clean "permeate" and a concentrate (or retentate), which are concentrated as much as possible to minimize the amount of secondary waste produced.

The RO process is divided into first and second stages. Aqueous waste is fed to the first RO stage from the RO feed tank. The secondary waste receiving tanks of the secondary treatment train receive the retentate removed from the first RO stage, while the second RO stage receives the permeate (i.e., "treated" aqueous waste from the first RO stage). In the second RO stage, the retentate is sent to the first stage RO feed tank while the permeate is sent to the IX system or to the surge tank, depending on the configuration of the 200 Area ETF.

Two support systems facilitate this process. An anti-scale system injects scale inhibitors as needed into the feed waste to prevent scale from forming on the membrane surface. A clean-in-place system using cleaning agents, such as descalants and surfactants, cleans the membrane pores of surface and subsurface deposits that have fouled the membranes.

Ion Exchange. Because the RO process removes most of the dissolved solids in an aqueous waste, the IX process (Figure C-9) acts as a polishing unit. The IX system consists of three columns containing beds of cation and/or anion resins. This system is designed to allow for regeneration of resins and maintenance of one column while the other two are in operation. Though the two columns generally are operated in series, the two columns also can be operated in parallel or individually.

Typically, the two columns in operation are arranged in a primary/secondary (lead/lag) configuration, and the third (regenerated) column is maintained in standby.

When dissolved solids breakthrough the first IX column and are detected by a conductivity sensor, this column is removed from service for regeneration, and the second column replaces the first column and the third column is placed into service. The column normally is regenerated using sulfuric acid and sodium hydroxide. The resulting regeneration waste is collected in the secondary waste receiving tanks.

Spent resins are transferred into a disposal container should regeneration of the IX resins become inefficient. Free water is removed from the container and returned to the surge tank. Dewatered resins are transferred to a final storage/disposal point.

Verification. The three verification tanks (Figure C-10) are used to hold the treated effluent while a determination is made that the effluent meets discharge limits. The effluent can be returned to the primary treatment train for additional treatment, or to the LERF, should a treated effluent not meet Waste Discharge Permit ST0004500 requirements.

The three verification tanks alternate between three operating modes: receiving treated effluent, holding treated effluent during laboratory analysis and verification, or discharging verified effluent. Treated effluent may also be returned to the 200 Area ETF to provide “clean” service water for operational and maintenance functions, e.g., for boiler water and for backwashing the filters. This recycling keeps the quantity of fresh water used to a minimum.

C.2.4 Secondary Treatment Train

The secondary treatment system typically receives and processes the following by-products generated from the primary treatment train: concentrate from the first RO stage, filter backwash, regeneration waste from the IX system, and spillage or overflow received into the process sumps. Depending on the operating configuration; however, some aqueous waste could be processed in the secondary treatment train before the primary treatment train (refer to Figures C-4 and C-5 for example operating configurations).

The secondary treatment train provides the following processes:

- Secondary waste receiving - tank receiving and chemical addition.
- Evaporation - concentrates secondary waste streams.
- Concentrate staging - concentrate (brine) receipt, pH adjustment, and chemical addition.
- Brine loadout system - transfers brine waste into containers (totes).
- Thin film drying - dewatering of secondary waste streams.
- Container handling - packaging of dewatered secondary waste.

Secondary Waste Receiving. Waste to be processed in the secondary treatment train is received into two secondary waste receiving tanks, where the pH can be adjusted with sulfuric acid or sodium hydroxide for optimum evaporator performance. Chemicals, such as reducing agents, may be added to waste in the secondary waste receiving tanks to reduce the toxicity or mobility of constituents in the powder.

Evaporation. The Evaporator Vapor Body Vessel (60I-EV-1) is fed alternately by the two secondary waste receiving tanks. One tank serves as a waste receiver while the other tank is operated as the feed tank. The Evaporator Vapor Body Vessel (also referred to as the vapor body) is the principal component of the evaporation process (Figure C-11).

Feed from the secondary waste receiving tanks is pumped through a heater to the recirculation loop of the 200 Area ETF Evaporator. In this loop, concentrated waste is recirculated from the Evaporator Vapor Body Vessel, to a heater, and back into the evaporator where vaporization occurs. As water leaves the evaporator system in the vapor phase, the concentration of the waste in the evaporator increases. When the concentration of the waste reaches the appropriate density, a portion of the concentrate (brine) is pumped to one of the concentrate tanks.

The vapor that is released from the Evaporator Vapor Body Vessel is routed to the entrainment separator, where water droplets and/or particulates are separated from the vapor. The “cleaned” vapor is routed to the vapor compressor and converted to steam.

The steam from the vapor compressor is sent to the heater (reboiler) and used to heat the recirculating concentrate in the Evaporator Vapor Body Vessel. From the heater, the steam is condensed and fed to the distillate flash tank, where the saturated condensate received from the heater drops to atmospheric pressure and cools to the normal boiling point through partial flashing (rapid vaporization caused by a pressure reduction). The resulting distillate is routed to the surge tank. The non-condensable vapors, such as air, are vented through a vent gas cooler to the VOC system.

Concentrate Staging. The concentrate tanks are upstream of the thin film drying process. From the Evaporator Vapor Body Vessel, concentrate (e.g. brine) is pumped into two concentrate tanks, and pH adjusted chemicals, such as reducing agents, may be added to reduce the toxicity or mobility of constituents as a brine, or when converted to powder. Excess heat can be removed from the concentrate waste by water-cooled heat exchangers. Each concentrate tank has a pair of heat exchangers installed in the concentrate recirculation line (see Drawing H-2-88988, Sheet 1 and 2). The cooling water is a closed recirculation loop to the cooling tower.

Waste is transferred from the concentrate tanks to either the brine loadout system, or thin film dryer for conversion to a powder. The concentrate tanks function alternately between concentrate receiver and feed tank for the brine loadout system, or thin film dryer. However, one tank may serve as both concentrate receiver and feed tank.

Because low solubility solids (i.e., calcium and magnesium sulfate) tend to settle in the concentrate tanks, these solids must be removed to prevent fouling, mitigate downstream system impacts, and to maintain concentrate tank capacity.

Brine Loadout System. The brine loadout system is located within the 2025E Container Storage Area, and is ancillary equipment to the concentrate (brine) tanks. The brine loadout system includes three tote loading stations, three reusable tote fill lids, valve manifold system (connection for fill line and vessel off gas [VOG] system), control panel, and operator access platform.

The tote loading stations are designed to accommodate three intermediate bulk containers (totes). The tote loading platform serves as a drip pan to simplify the cleanup of spills and leaks; and drains to Sump Tank 1. The tote loading platform and grating is stainless steel that is compatible with the dangerous waste. The totes use fill lids and shipping lids. The fill lids are reusable, and have flexible hoses for connecting to the brine tote-fill line from the concentrate tank recirculation loops, and the VOG system before filling. When changing between waste streams the brine loadout system and the reusable fill lids are flushed. The totes are filled with brine from the concentrate tank system (Figure C-12). The VOG system draws vapors and gasses off the totes through the tote fill lid flexible connection.

The brine loadout system uses an inline flowmeter with volume totalizer to fill the totes to a predetermined volume. Once the totes are filled, the shutoff valve automatically closes preventing overfill. After filling, the tote fill lid flexible connection is disconnected, and the fill lid is replaced with a shipping lid. When changing between waste streams the fill heads will be flushed to the totes prior to removal along with the rest of the system. The totes are stored in the 2025E Container Storage Area, or moved by forklift to the 2025E Truck Bay, or the Outdoor Container Storage Area.

Once filled totes are moved, empty totes are placed in the brine loading station using a forklift. The reusable tote fill lids are placed on the empty totes and manually connected to the concentrate tank fill line using flexible hoses. The concentrate tank fill line connects to the concentrate tanks recirculation loop piping.

Thin Film Drying. As an alternative to the brine loadout system, the brine may be converted to a powder in the thin film dryer. From the concentrate tanks, feed can be pumped to the thin film dryer (Figure C-12) that is heated by steam. As the concentrated waste flows down the length of the dryer, the waste is dried. The dried film, or powder, is scraped off the dryer cylinder by blades attached to a rotating shaft. The powder is funneled through a cone-shaped powder hopper at the bottom of the dryer and into the Container Handling System.

Overhead vapor released by the drying of the concentrate is condensed in the distillate condenser. Excess heat is removed from the distillate by a water-cooled heat exchanger. Part of the distillate is circulated back to the condenser spray nozzles. The remaining distillate is pumped to the surge tank. Any noncondensable vapors and particulates from the spray condenser are exhausted to the VOC system.

Before an empty container is moved into the Thin Film Dryer Container Handling System (Figure C-13), located in the container handling room (Figure C-2) the lid is removed and the container is placed on a conveyor. The containers are moved into the container filling area after passing through an air lock. The empty container is located under the thin film dryer, and raised into position. The container is sealed to the thin film dryer and a rotary valve begins the transfer of powder to the empty container. Air displaced from the container is vented to the distillate condenser attached to the Evaporator Vapor Body Vessel that exhausts to the VOC system.

The container is filled to a predetermined level, then lowered from the thin film dryer and moved along a conveyor. The filled container is manually recapped, and moved along the conveyor to the airlock. At the airlock, the container is moved onto the conveyor by remote control. The airlock is opened, the smear sample (surface wipe) is taken, and the contamination level counted. A “C” ring is installed to secure the container lid. If the container has contaminated material on the outside, the container is wiped down and retested. Filled containers that pass the smear test are labeled, placed on pallets, and can be moved by forklift to any of the 5 Container Storage and Treatment areas; normally they are moved to the 2025E Container Storage Area. Section C.3 provides a more detailed discussion of container handling.

C.2.5 Other 200 Area Effluent Treatment Facility Systems

The 200 Area ETF is provided with support systems that facilitate treatment in the primary and secondary treatment trains and that provide for worker safety and environmental protection. An overview of the following systems is provided:

- MCS.
- VOC system.
- Sump collection system.
- Chemical injection feed system.

- Verification tank recycle system.
- Laboratory Area.
- Utilities.

C.2.5.1 Monitor and Control System

The operation of the 200 Area ETF is monitored and controlled by a centralized computer system (i.e., MCS). The MCS continuously monitors data from various field indicators, such as pH, flow, tank level, temperature, pressure, conductivity, alarm status, and valve switch positions. Data gathered by the MCS enable operations and engineering personnel to document and adjust the operation of the 200 Area ETF.

Emergency communications equipment and warning systems (e.g. fire alarms and evacuation alarms) are included in Addendum J, "Contingency Plan." These emergency response notification alarms are monitored continuously at central Hanford Facility locations (e.g. Hanford Fire Station) and do not rely on staff being present in the 200 Area ETF Control Room for notification and response.

C.2.5.2 Vessel Off Gas System

Ventilation for various tanks and vessels is provided through the VOC system. The system includes a moisture separator, duct heater, pre-filter, high-efficiency particulate air filters, carbon absorber (when required to reduce organic emissions), exhaust fans, and ductwork. Gasses ventilated from the tanks and vessels enter the exhaust system through the connected ductwork. The VOC system draws vapors and gasses off the following tanks and treatment systems:

- Surge tank (60A-TK-1).
- Vent gas cooler (off the Evaporator Vapor Body Vessel [60I-EV-1]/distillate flash tank) (60I-TK-2).
- pH adjustment tank (60C-TK-1).
- Concentrate tanks (2025E-60J-TK-1A/2025E-60J-TK-1B).
- Degasification system.
- First and second RO stages.
- Dry powder hopper.
- Brine loadout system.
- Effluent pH adjustment tank (60C-TK-2).
- Drum capping station.
- Secondary waste receiving tanks (60I-TK-1A/60I-TK-1B).
- Distillate condenser (off the thin film dryer).
- Sump tanks 1 and 2.

The VOC system maintains a negative pressure with respect to the atmosphere, which produces a slight vacuum within tanks, vessels, and ancillary equipment for the containment of gas vapor. This system also provides for the collection, monitoring, and treatment of confined airborne in-vessel contaminants to preclude over-pressurization. The high-efficiency particulate air filters remove particulates and condensate from the air stream before these are discharged to the heating, ventilation, and air conditioning system.

C.2.5.3 Sump Collection System

Sump Tanks 1 and 2 compose the sump collection system that provides containment of waste streams and liquid overflow associated with the 200 Area ETF processes. The 2025E Process Area floor is sloped to two separate trenches that each drain to a sump tank located under the floor of building 2025E (Figure C-14). One trench runs the length of the primary treatment train and drains to Sump Tank 2, located underneath the verification tank pump floor. The second trench collects spillage primarily from the secondary treatment train and flows to Sump Tank 1, located near the Evaporator Vapor Body Vessel. Sump Tanks 1 and 2 are located below floor level (Figure C-14). An eductor in these tanks prevents sludge from accumulating.

C.2.5.4 Chemical Injection Feed System

At several points within the primary and secondary treatment trains, sulfuric acid and sodium hydroxide (or dilute solutions of these reagents) are metered into specific process units to adjust the pH. For example, a dilute solution of 4 percent sulfuric acid and 4 percent sodium hydroxide could be added to the secondary waste receiving tanks to optimize the evaporation process.

C.2.5.5 Verification Tank Recycle System

To reduce the amount of water added to the process, verification tank water (i.e., verified effluent) is recycled throughout the 200 Area ETF process. Tanks and ancillary equipment that use verification tank water include:

- 4 percent H_2SO_4 solution tank and ancillary equipment.
- 4 percent NaOH solution tank and ancillary equipment.
- Clean-in-place tank and ancillary equipment.
- IX columns (during resin regeneration).
- Boilers and ancillary equipment.
- Seal water system.

In addition, verification tank water is used extensively during maintenance activities. For example, it may be used to flush piping systems or to confirm the integrity of piping, a process tank, or tank truck.

C.2.5.6 Laboratory Area

The Laboratory Area is located adjacent to the 2025E Process Area. The Laboratory Area includes two sinks that drain to Sump Tank 2. The sinks are used to clean and rinse equipment that has come in contact with process waste.

C.2.5.7 Utilities

The 200 Area ETF maintains the following utility supply systems required for the operation:

- Cooling water system - removes heat from process water via heat exchangers and a cooling tower.
- Compressed air system - provides air to process equipment and instrumentation.
- Seal water system - provides cool, clean, pressurized water to process equipment for pump seal cooling and pump seal lubrication, and provides protection against failure and fluid leakage.
- Demineralized water system - removes solids from raw water system to produce high quality, low ion-content, water for steam boilers, and for the hydrogen peroxide feed system.
- Heating, ventilation, and air conditioning system - provides continuous heating, cooling, and air humidity control throughout building 2025E.

The following utilities support 200 Area ETF activities:

- Electrical power.
- Sanitary water.
- Communication systems.
- Raw water.
- Steam supply.

C.3 Containers

This section provides specific information on container storage and treatment operations at the 200 Area ETF, including descriptions of containers, labeling, and secondary containment structures. See Figures C-2 and C-3 for layout of Building 2025E.

The maximum volume of dangerous and/or mixed waste that can be stored in containers is identified in Addendum A, "Part A Form." A list of dangerous and/or mixed waste managed in containers at the 200 Area ETF is also provided in Addendum A, "Part A Form." The types of dangerous and/or mixed waste managed in containers in the 200 Area ETF could include:

- Secondary waste powder generated from the treatment process.
- Secondary waste brine generated from the treatment process.
- Aqueous waste received from other Hanford site sources awaiting treatment.
- Miscellaneous waste generated by operations and maintenance activities. The waste could include process waste, such as used filter elements; spent RO membranes; damaged equipment, and decontamination and maintenance waste, such as contaminated rags, gloves, and other personal protective equipment. Containers of miscellaneous solid waste (e.g., debris) that may contain free liquids are packaged with absorbents.

The secondary treatment train processes the waste by-products from the primary treatment train, through the brine loadout system or thin film dryer. Containers are filled with brine waste or dry powder waste from the thin film dryer. Containers of aqueous waste received from other Hanford Site sources are stored at 200 Area ETF until their contents can be transferred to the process for treatment. The waste is usually transferred to the secondary waste receiving or concentration tanks.

The contents of the containers at the 2025ED Load-In Station are transferred to Load-In Station tank 59A-TK-1, ETF, or to LERF. The container contents at the 2025EG Backup Load-In Station are transferred to ETF, or to LERF.

As indicated in Table C-1 and Addendum A, "Part A Form," waste is also placed in containers for treatment. The types of treatment performed in containers at the 200 Area ETF includes, but is not limited to the following:

- Adding absorbent material to waste in a container or adding waste to absorbent material in a container to soak up free liquids. For example, containers of miscellaneous solid waste (i.e., debris) that may contain free liquids are packaged with absorbents.
- Decanting free liquids from the containers to 200 Area ETF tanks or other containers before absorbents are added.
- Repackaging previously containerized waste into new containers.

Following treatment, the containerized waste either is stored at the 200 Area ETF or transferred to another Treatment, Storage, and Disposal (TSD) operating unit.

C.3.1 2025E Process Area

The waste primarily consists of containers that function as part of the waste management process. Waste streams are accumulated into Department of Transportation (DOT) compliant containers near a specific operation within the 2025E Process Area. The containers primarily store miscellaneous waste generated from maintenance and operations activities. Treatment activities include decanting and the use of absorbents for liquid stabilization. Another function of the waste management process is to store aqueous waste containers from other Hanford Site sources in the 2025E Process Area and transfer the waste into the 200 Area ETF tanks for processing. Once the 2025E Process Area containers are full, the containers are moved to the 2025E Container Storage Area, the Outside Container Storage Area, another TSD Facility, Integrated Disposal Facility (IDF), or the Environmental Restoration Disposal Facility (ERDF).

C.3.2 2025E Truck Bay

The 2025E Truck Bay is primarily used to store containers that are transported between the 2025E Process Area, 2025E Container Storage Area, and Outside Container Storage Area; and to store and treat containers transported from the thin film dryer room. The containerized waste primarily consists of brine and dry powder, aqueous wastes received for treatment, and waste generated from maintenance and operations activities. Treatment activities in this area include decanting and the use of absorbents for liquid stabilization. Dry powder and containers of miscellaneous waste are removed from the Container Handling System to the 2025E Truck Bay; weighed and placed on pallets before transfer to the 2025E Container Storage Area or the Outside Container Storage Area. Brine totes from the brine loadout system are weighed before transfer to the 2025E Container Storage Area, Outside Container Storage Area, 2025ED Load-In Station, or the 2025EG Backup Load-In Station. Additionally, the 2025E Truck Bay supports truck unloading of aqueous waste containers from other Hanford Site sources, and loading of powder and miscellaneous waste containers.

Container treatment is described in Section C.3. However, container storage and treatment are not typically performed because of the limited space available in the 2025E Truck Bay. The 2025E Truck Bay is a 53.3 x 27.9-foot room with large openings to the 2025E Process Area to the west, outside Container Storage Area to the east, and 2025E Container Storage Area to the south. The first two openings include roll up doors for ventilation control.

C.3.3 2025E Container Storage Area

The 2025E Container Storage Area containerized waste primarily consists of brine, dry powder, aqueous wastes received for treatment, and waste generated from maintenance and operations activities. The 2025E Container Storage Area is used to fill containers using the brine loadout system. Treatment activities in this area include decanting and the use of absorbents for liquid stabilization of waste from maintenance and operations activities. The 2025E Container Storage Area is a 75 x 27.9-foot room located adjacent to the 2025E Process Area (see Figure C-2).

C.3.4 Outside Container Storage Area

The Outside Container Storage Area is used for storage and treatment of containerized waste (see Figure C-2). The Outside Container Storage Area includes containerized waste that primarily consists of brine, dry powder, and waste generated from maintenance and operations activities. Treatment activities in this area include the use of absorbents for liquid stabilization of waste from maintenance and operations activities. The Outside Container Storage Area does not have secondary containment; therefore, in the case where storage or treatment of containers with free liquids is needed, portable secondary containment would be installed as described in Section C.3.9.

Containers are transferred from LERF and other 200 Area ETF locations to the Outside Container Storage Area in preparation for transport to another TSD Facility. Containers may be transferred by forklift, approved transport vehicle, or by hand. The Outside Container Storage Area is located northeast of the 2025E Building, and includes an area east of the Verification Tank berm. The asphalt is labeled to identify the western and southern boundaries of the Outside Container Storage Area.

C.3.5 2025ED Load-In Station

The 2025ED Load-In Station is primarily used to store aqueous waste in tanker trucks and other containers (such as drums, or totes) from other Hanford Site sources until the waste is transferred to the Load-In Station tank 59A-TK-1, ETF, or to LERF. The waste streams received and stored at the 2025ED Load-In Station have been evaluated and determined to meet the waste acceptance criteria. Containers at the 2025ED Load-In Station are managed in two truck bays located in a steel building for weather protection.

Miscellaneous waste (e.g., debris), and waste generated from maintenance and operations activities is also stored and treated at the 2025ED Load-In Station. Containers of miscellaneous solid waste that may contain free liquids are packaged with absorbents. Refer to Section C.3 for types of treatment performed in containers.

C.3.6 2025EG Backup Load-in Station

The 2025EG Backup Load-In Station is a container storage and treatment facility. During expansion of the 2025ED Load-In Station, the 2025EG Backup Load-In Station will be used for transfer of aqueous waste from tanker trucks and other containers from other Hanford Site sources to the 200 Area ETF or LERF; and storage and treatment of miscellaneous waste. Once the 2025ED Load-In Station expansion project is complete, the 2025EG Backup Load-In Station unloading components will be disconnected, removed, and dispositioned as appropriate. Building 2025EG is a steel building with one truck bay.

Miscellaneous waste (e.g., debris) includes waste generated from maintenance and operations activities. Containers of miscellaneous solid waste that may contain free liquids are packaged with absorbents. Refer to Section C.3 for types of treatment performed in containers.

The waste streams received at the 2025EG Backup Load-In Station must be evaluated and determined to meet the waste acceptance criteria described in Addendum B, “Waste Analysis Plan.”

C.3.7 Description of Containers

A compatibility assessment is performed to determine if a container’s materials are compatible with the waste prior to use, in accordance with Washington Administrative Code (WAC) 173-303-630(4). Containers (totes) used to collect and store brine waste are plastic or stainless steel, and can range in size from 260 to 330 gallons. The containers used to collect and store dry powder waste are 55-gallon steel containers. Containers used to store most of the aqueous waste received at 200 Area ETF are 55-gallon steel or plastic containers; however, in a few cases, the size of the container could vary to accommodate the size of a particular waste. For example, aqueous waste may be received in totes containing approximately 350 gallons. Tanker trucks used to receive aqueous waste at the 2025ED Load-In Station or 2025EG Backup Load-In Station may be steel or plastic, with sizes varying from 200 to 10,000 gallons.

Containers used to store maintenance and operation waste generated at 200 Area ETF may be placed in a wide variety of containers, depending on size and quantity of the waste involved. In addition to 55-gallon steel or plastic containers, hard or soft-sided containers of various sizes may be used; the typical size of a soft-sided container is 4 x 4 x 4 feet. When large amounts of waste are generated, such as a major equipment replacement, larger containers, such as 23 x 8 x 5-foot roll-off boxes, may be used. In the case of spent resin from the IX columns, the resin is dewatered, and could be packaged in a special disposal container. In these few cases, specially sized containers could be required. In all cases, however, only

approved containers are used and are compatible with the associated waste. Typically, 55-gallon steel or plastic containers are used for treatment.

Current operating practices indicate the use of new 55-gallon steel or plastic containers that have either a polyethylene liner or a protective coating. Any reused or reconditioned container is inspected for container integrity before use. Overpack containers are available for use with damaged containers. Overpack containers typically are unlined steel or polyethylene.

C.3.8 Container Management Practices

Storage containers can be moved between the DWMUs identified in Table C-1 to support LERF and 200 Area ETF waste management processes. Before use, each container is checked for signs of damage such as dents, distortion, corrosion, or scratched coating.

For brine loading, empty intermediate bulk containers (totes) are raised by a forklift and manually placed on the brine loadout system in the 2025E Container Storage Area. The reusable tote fill lids are manually placed on the totes. After filling, the reusable fill lids are manually removed from the totes and replaced with shipping lids. The totes are moved by forklift to the 2025E Truck Bay, 2025E Container Storage Area, or Outside Container Storage Area. When the totes are stored in the 2025E Container Storage Area, the tote storage racks will be located at least 6 inches away from the wall, and the spacing between storage racks will be at least 6 inches to allow inspection. Refer to Section C.2.4 for additional information on the brine loadout system.

For dry powder loading, empty containers on pallets are raised by a forklift and manually placed on the conveyor that transports the containers to the automatic filling station in the container handling room (Figure C-2). The container lids are removed and replaced manually following the filling sequence. After filling, containers exit the container handling room via the filled drum conveyor, the locking rings are installed, and the container label is affixed. The containers are moved by dolly or forklift to the 2025E Truck Bay, 2025E Container Storage Area, or Outside Container Storage Area.

Before receipt at 200 Area ETF, each container from other Hanford Site sources is inspected for leaks, signs of damage, and a loose lid. The identification number on each container is checked to ensure the proper container is received. The containers are typically placed on pallets in the 2025E Truck Bay and moved by dolly or forklift to the 2025E Container Storage Area. These containers are later moved to the 2025E Process Area and the contents transferred to the process for treatment.

2025E Process Area containers used for storing and treating maintenance and operations secondary waste are labeled before being placed in the container storage areas. Lids are secured on these containers when not being filled. When the containers in the 2025E Process Area are full, the containers are transferred by dolly or forklift to the 2025E Container Storage Area, Outside Container Storage Area, or to an appropriate TSD Facility. The lids on these containers are removed as required to allow for treatment. During treatment, access to these containers is controlled through physical barriers and/or administrative controls.

The filled containers in the container storage areas are inventoried, checked for proper labeling, and placed on pallets or in a separate containment device as necessary (refer to Section C.3.9.4, Prevention of Ignitable, Reactive, and Incompatible Wastes in Containers). Each pallet is moved by forklift. Within the container storage areas, palletized containers are stacked no more than three pallets high and in rows no more than two containers wide. Aisles are unobstructed with a minimum of 30-inch aisle space between rows.

C.3.9 Container Labeling

Labels are affixed on containers used to store dry powder when the containers leave the container handling room. Labels are affixed on containers used to store brine waste after the containers are filled and decontaminated; if filling is interrupted, the container will be labeled at the brine loadout system. Labels are affixed on other waste containers before use. Every container is labeled with the date that the container was filled. Appropriate major risk labels, such as “corrosive,” “toxic,” or “F-listed,” also are added. Each container also has a label with an identification number for tracking purposes.

C.3.10 Container Secondary Containment Requirements/Design

Secondary containment is provided in the container storage and/or treatment areas in building 2025E (2025E Process Area, 2025E Truck Bay, and 2025E Container Storage Area). The 2025E secondary containment for the container storage and/or treatment areas is also shared with the tank systems, and ancillary equipment of the primary and secondary treatment trains. Secondary containment systems, such as spill pallets, will be used for incompatible waste to ensure separation of the incompatible waste. The 2025E building roof and walls protect all containers from exposure to the elements.

The 2025E building floor, trenches, and a 6-inch rise (berm) along the walls of the 2025E Process Area and 2025E Container Storage Area provides secondary containment for the 2025E container storage and/or treatment areas. The floor is a jointed cast-in-place, pre-formed reinforced concrete slab floor. This floor is a minimum of 6 inches thick. All slab joints and floor and wall joints have water stops installed at the mid-depth of the slab. In addition, filler was applied to each joint. The floor and berms are coated with a chemically resistant high-solids impermeable coating system. This coating material is compatible with the waste managed in containers and is an integral part of the secondary containment system for containers. The doorsills are 6 inches high to contain liquid leaks and spills.

The floor is sloped to drain any solution in the 2025E Truck Bay and 2025E Container Storage Area to floor drains along the west wall. Each floor drain consists of a grating over an 8-inch diameter drain port connected to a 4-inch polyvinyl chloride transfer pipe. The pipe passes under this wall and connects to a trench running along the east wall of the adjacent 2025E Process Area. This trench drains solution to Sump Tank 1.

The 2025E Truck Bay and 2025E Container Storage Area are separated from the 2025E Process Area by a common wall and a door for access to the two areas (Figure C-2). These two areas also share a common floor and trenches that, with the 6-inch rise of the containing walls, form the secondary containment system for the 2025E Process Area and the 2025E Container Storage Area.

The 2025E Process Area, 2025E Truck Bay, and 2025E Container Storage Area have interconnected floor drains. The combined volume available for secondary containment is 24,600 gallons. This volume is greater than 10 percent of the maximum total volume of containers allowed for storage in the building 2025E (reference CHPRC-01900). All systems were designed to national codes and standards (e.g., American Society for Testing Materials [ASTM], American Concrete Institute standards).

- 2025E Process Area secondary containment volume is approximately 17,800 gallons.
- 2025E Container Storage Area secondary containment volume is approximately is 4,000 gallons.
- 2025E Truck Bay secondary containment volume is approximately is 2,800 gallons.

The Outside Container Storage Area does not have a constructed secondary containment system. In the rare cases where storage or treatment of containers with free liquids is needed, waste containers, requiring secondary containment for liquid will be stored over portable secondary containment. When waste is stored on portable secondary containment, the drain plug (if existing) is kept closed. The secondary containment systems will be designed to be elevated to protect from accumulated liquids, contain over 10 percent of the volume of all containers or 100 percent of the largest container, whichever is greater;

and the additional volume that would result from precipitation of a maximum 25-year storm of 24 hours duration in accordance with WAC 173-303-630(7)(c).

The 2025ED Load-In Station has 10-inch-thick reinforced concrete truck pads in the east and west bays that provide secondary containment for the 2025ED Load-In Station container storage areas. The pads gently slope to a collection drain locate in the center of each pad. A trench connects the east collection to the west bay, then continues to the collection sump located outside and adjacent to the west side of 2025ED. Configuration of the truck pads is depicted in H-2-838968, sheet 1. The 2025ED building floor has an impermeable coating. Both truck pads are inside the metal 2025ED Load-In Station building and are sloped to drain to the Load-In Station tank 59A-TK-1 secondary containment pit through a drainpipe located in the east wall of the containment basin. The Load-In Station tank 59A-TK-1 secondary containment pit is described in Section C.4.3.1.2. The volume of the pit is 19,300 gallons, which is greater than the volume of the largest container (tanker) expected to be received. A leak detector in the 2025ED Load-In Station containment pit sump alarms locally and in the 200 Area ETF Control Room. Alarms are monitored continuously in the 200 Area ETF Control Room during 2025ED Load-In Station transfers. Alternatively, leaks can be visually detected.

The 2025EG Backup Load-In Station building has a 10-inch-thick reinforced concrete floor with a 4-inch curb around the exterior to contain liquid spills. The 2025EG building has a single truck bay with a portable secondary containment berm. The portable secondary containment berm is constructed of a vinyl-coated fabric with an open-cell foam core. The secondary containment volume is 9,000 gallons, greater than the volume of the largest container (tanker) allowed to be received. The portable secondary containment system is visually inspected daily for leaks during unloading operations.

C.3.10.1 Structural Integrity of Base

Engineering calculations were performed showing the floor of the 2025E Container Storage Area is capable of supporting the weight of containers. These calculations were reviewed and certified by a professional engineer (*Final RCRA Information Needs Report*, Mausshardt 1995). The concrete was inspected for damage during construction. Cracks were identified and repaired to the satisfaction of the professional engineer. Documentation of these certifications is included in the engineering assessment (*Final RCRA Information Needs Report*, Mausshardt 1995). Engineering calculations were performed showing the floor of the 2025ED and 2025EG Container Storage Areas are capable of supporting the weight of containers (RPP-CALC-64203, *ETF Load-In Expansion Structural Calculation*; and RPP-CALC-64090, *ETF Load-In Backup STA Structural Calculation).*

C.3.10.2 Control of Run-on

Building 2025E serves to prevent run-on of precipitation for the container management areas that are located within building 2025E. Building 2025ED serves to prevent run-on of precipitation for the 2025ED Load-In Station container management areas. Building 2025EG serves to prevent run-on of precipitation for the 2025EG Backup Load-In Station container management areas within building 2025EG.

The Outside Container Storage Area run-on will be controlled by drainage sloping away from the storage area. Waste containers stored without secondary containment in the Outside Container Storage Area will be elevated to prevent contact with any run-on or accumulated liquids.

C.3.10.3 Removal of Liquids from Containment Systems

The 2025E Container Storage Area is equipped with drains that route solution to a trench in the 2025E Process Area, which drains to Sump Tank 1. The sump tanks are equipped with alarms that notify operating personnel that a leak is occurring. The sump tanks also are equipped with pumps to transfer waste to the surge tank or the secondary treatment train. Additional information on removal of liquids is provided in Section C.2, and Section C.4.3.1.2.

Spilled or leaked material (i.e., waste) from Sump Tank 1 or Sump Tank 2 is fed to either the surge tank and processed in the primary treatment train or to the secondary waste receiving tanks and processed in the secondary treatment train.

2025E Process Area. The floor of the 2025E Process Area is sloped to drain liquids to two trenches that drain to Sump Tanks 1 and 2. The sump tanks are equipped with level monitoring and detection alarms that notify operating personnel that a leak is occurring. The sump tanks also are equipped with pumps to transfer waste to the surge tank or the secondary treatment train.

2025E Truck Bay. Liquids from the 2025E Truck Bay are routed to a trench that drains to Sump Tank 1. The sump tank is equipped with level monitoring and a detection alarm that notifies operating personnel that a leak is occurring. The sump tank also is equipped with a pump to transfer waste to the surge tank or the secondary treatment train.

2025E Container Storage Area. The 2025E Container Storage Area is equipped with drains that route solution to a trench in the 2025E Process Area, which drains to Sump Tank 1. The sump tank is equipped with level monitoring and a detection alarm that notifies operating personnel that a leak is occurring. The sump tank also is equipped with a pump to transfer waste to the surge tank or the secondary treatment train.

Outside Container Storage Area. The Outside Container Storage Area does not have a secondary containment system. For control of run-on, refer to Section C.3.9.2.

2025ED Load-In Station. The container unloading and storage areas in the 2025ED Load-In Station are designed to drain to the Load-In Station tank 59A-TK-1 secondary containment pit. The pit is equipped with a leak detector and a pump to transfer waste to Load-In Station tank 59A-TK-1, ETF, or LERF.

2025EG Backup Loading Station. The container management areas are provided with portable secondary containment. A portable pumping system can be used to transfer waste from the portable containment system in the event of a leak to the 2025ED Load-In Station, ETF or LERF.

C.3.10.4 Prevention of Ignitable, Reactive, and Incompatible Wastes in Containers

Typically, aqueous waste managed at the LERF and 200 Area ETF does not display the characteristics of ignitability or reactivity. Containers of incompatible wastes may be managed in any of the permitted container storage areas and must meet the requirements listed in WAC 173-303-630(8) and as described in this section. Individual waste types (i.e., ignitable, corrosive, and reactive) are stored in separate containers. A waste that could be incompatible with other wastes is separated and protected from the incompatible waste. Incompatible wastes are evaluated using the methodology documented in 40 CFR 264, Appendix V. For example, acidic and caustic wastes are stored in separate containers. Free liquids are absorbed in miscellaneous waste containers that hold incompatible waste. Additionally, 200 Area ETF-specific packaging requirements for these types of waste provide extra containment with each individual container. For example, each item of acidic waste is individually bagged and sealed within a lined container.

C.4 Tank Systems

This section provides specific information on tank systems and process units. This section also includes a discussion on the types of waste to be managed in the tanks, tank design information, integrity assessments, and additional information on the 200 Area ETF tanks that treat and store dangerous and/or mixed waste. The 200 Area ETF dangerous waste tanks are identified in Section C.4.1.1. Table C-6, 200 Area ETF Tank Systems Information, Table C-7, 200 Area ETF Additional Tank System Information, and Table C-8, Ancillary Equipment and Material Data provides individual tank volumes, dimensions, and construction materials. The relative locations of the tanks and process units are presented in Figures C-2 and C-3.

C.4.1 Design Requirements

The following sections provide an overview of the design specifications for the tanks within the 200 Area ETF. A separate discussion on the design of the process units also is provided. In accordance with the new tank system requirements of WAC 173-303-640(3), the following tank components and specifications were assessed:

- Dimensions, capacities, wall thicknesses, and pipe connections.
- Materials of construction and linings and compatibility of materials with the waste being processed.
- Materials of construction of foundations and structural supports.
- Design codes and standards used in construction.
- Structural design calculations, including seismic design basis.
- Waste characteristics and the effects of waste on corrosion.

This assessment was documented in the *Final RCRA Information Needs Report* (Mausshardt 1995); the engineering assessment performed for the 200 Area ETF tank systems by an independent professional engineer. An assessment was also performed when Load-In Station tank 59A-TK-1 was placed into service for receipt of dangerous and mixed wastes. The assessment is documented in the *200 Area Effluent Treatment Facility Purgewater Unloading Facility Tank System Integrity Assessment* (HNF-41604, 2009), and subsequent assessment *FY19 Effluent Treatment Facility IQRPE Integrity Assessment* (RPP-IQRPE-50043, 2019).

The specifications for the preparation, design, and construction of the tank systems at the 200 Area ETF are documented in the *Design Construction Specification, Project C-018H, 242-A Evaporator/PUREX Plant Process Condensate Treatment Facility* (V-C018HC1-001, WHC 1992). The preparation, design, and construction of Load-In Station tank 59A-TK-1 is documented in the *Purgewater Unloading Facility Project Documentation* (HNF-39966, 2009).

Most of the tanks in the 200 Area ETF are constructed of stainless steel. According to the design of the 200 Area ETF, it was determined stainless steel would provide adequate corrosion protection for these tanks. Exceptions include Load-In Station tank 59A-TK-1, which is constructed of fiberglass-reinforced plastic and the verification tanks, which are constructed of carbon steel with an impermeable coating. The Evaporator Vapor Body Vessel (and the internal surfaces of the thin film dryer) is constructed of a corrosion resistant alloy, known as alloy 625, to address the specific corrosion concerns in the secondary treatment train. Finally, the hydrogen peroxide decomposer vessels are constructed of 316 stainless steel.

The shell thicknesses of the tanks identified in Table C-6 represent a nominal thickness of a new tank when placed into operation. The tank capacities identified in this table represent the maximum volumes. Nominal tank volumes discussed below represent the maximum volume in a tank unit during normal operations.

C.4.1.1 Codes and Standards for Tank System Construction

Specific standards for the manufacture of tanks and process systems installed in the 200 Area ETF are briefly discussed in the following sections. In addition to these codes and industrial standards, a seismic analysis for each tank and process system is required [WAC 173-303-806(4)(a)(xi)]. The seismic analysis was performed in accordance with UCRL-15910 *Design and Evaluation Guidelines for Department of Energy Facilities Subjected to Natural Phenomena Hazards*, Section 4 (UCRL 1987). The results of the seismic analyses are summarized in the engineering assessment of the 200 Area ETF tank systems (*Final RCRA Information Needs Report*, Mausshardt 1995).

Storage and Treatment Tanks. The following tanks store and/or treat dangerous waste at the 200 Area ETF.

Tank Name	Tank Number
Surge tank	60A-TK-1
pH adjustment tank	60C-TK-1
Effluent pH adjustment tank	60C-TK-2
First RO feed tank	60F-TK-1
Second RO feed tank	60F-TK-2
Verification tanks (three)	60H-TK-1A/1B/1C
Secondary waste receiving tanks (two)	60I-TK-1A/1B
Evaporator Vapor Body Vessel	601-EV-1
Concentrate tanks (two)	60J-TK-1A/60J-TK-1B
Sump tanks (two)	20B-TK-1/2
Distillate flash tank	60I-TK-2
Load-In Station tank	59A-TK-1
2025ED Load-In Station Sump Tanks	59A-TK-2/59A-TK-3
2025EG Load-In Station Sump Tank	59A-TK-4

The relative location of these tanks is presented in Figure C-3. These tanks are maintained at or near atmospheric pressure. The codes and standards applicable to the design, construction, and testing of the above tanks and ancillary piping systems are as follows:

ASME - B31.3	Chemical Plant and Petroleum Refinery Piping (American Society of Mechanical Engineers [ASME] 1990)
ASME Sect. VIII, Division I	Pressure Vessels (*Boiler and Pressure Vessel Code*, ASME 1992)
AWS - D1.1	Structural Welding Code - Steel (American Welding Society [AWS] 1992)
ANSI - B16.5	Pipe Flanges and Flanged Fittings (American National Standards Institute [ANSI] 1992)
ASME Sect. IX	Welding and Brazing Qualifications (*Boiler and Pressure Vessel Code*, ASME 1992)
API 620	Design and Construction of Large Welded Low Pressure Storage Tanks (American Petroleum Institute [API] 1990)
AWWA - D100	Welded Steel Tanks for Water Storage (American Water Works Association [AWWA] 1989)
AWWA - D103	Factory-Coated Bolted Steel Tanks for Water Storage (AWWA 1987)
AWWA - D120	Thermosetting Fiberglass-Reinforced Plastic Tanks (AWWA 1984)
ASTM - D3299	Filament Wound Glass-Fiber-Reinforced Thermoset Resin Corrosion Resistant Tanks

The application of these standards to the construction of 200 Area ETF tanks and independent verification of completed systems ensured that the tank and tank supports had sufficient structural strength and that seams and connections were adequate to ensure tank integrity. In addition, each tank met strict quality assurance requirements. Each tank, constructed offsite was tested for integrity and leak tightness before shipment to the Hanford Facility. Following installation, the systems were inspected for damage to

ensure against leakage and to verify proper operation. If a tank was damaged during shipment or installation, leak tightness testing was repeated on-site.

C.4.1.2 Design Information for Tanks Located Outside of Building 2025E

The Load-In Station tank 59A-TK-1, surge tank, and verification tanks are located outside building 2025E. These tanks are located within concrete structures that provide secondary containment. Table C-6, 200 Area ETF Tank Systems Information, provides individual tank volumes, dimensions, and construction materials for tanks located outside building 2025E.

Load-In Station Tank 59A-TK-1 and Ancillary Equipment. Load-In Station tank 59A-TK-1 is located inside the 2025ED Load-In Station building. Ancillary equipment includes transfer pumps, filtration systems (filter skids), a double encased, fiberglass transfer pipeline, level instruments for tanker trucks, and leak detection equipment. The waste from the sump tanks is transferred to Load-In Station tank 59A-TK-1, ETF, or to LERF.

The 200 Area ETF receives a portion of its waste transfers via tanker trucks. The tanker trucks are unloaded at the 2025ED Load-In Station; or 2025EG Backup Load-In Station. The waste is pumped out of the tanker trucks, through particulate filters, and transferred to ETF, LERF, or Load-In Station tank 59A-TK-1.

From the 2025ED Load-In Station, aqueous waste can be routed to the ETF or to the LERF through a double-encased line. Secondary containment for the 2025ED Load-In Station tank 59A-TK-1 is discussed in Section C.4.3.1.2.

2025EG Backup Load-In Station Ancillary Equipment. Ancillary equipment includes the tanker unloading transfer line (hose-in-hose), transfer pumps, filtration system, and level instruments for tanker trucks. The waste is pumped out of the tanker trucks, through particulate filters, and transferred to ETF, or LERF via connection to the 2025ED transfer piping in the 2025ED Load-In Station secondary containment pit.

Load-In Filter Sump Tanks 59A-TK-2, 59A-TK-3, 59A-TK-4 and Ancillary Equipment. Sump tanks 59A-TK-2, 59A-TK-3, and 59A-TK-4 are located in buildings 2025ED and 2025EG respectively. The 2025ED Load-In Station floor is sloped to drain to the 2025ED Load-In Station tank 59A-TK-1 secondary containment pit. The sump tanks collect waste drained from the 2025ED and 2025EG Load-In Station filters to allow filter cartridge change out. The waste is pumped back into the system. The sump tanks are normally empty. Sump tank 59A-TK-2 has a level switch integral to pump 59A-P-2. Sump Tank 59A-TK-3 is equipped with a sight glass to indicate level.

Surge Tank (60A-TK-1) and Ancillary Equipment. The surge tank is located outside on the south side of building 2025E. Ancillary equipment to the surge tank includes two underground double encased (i.e., pipe-within-a-pipe) transfer lines connecting to LERF and three pumps for transferring aqueous waste to the primary treatment train. The surge tank is located at the south end of building 2025E. The surge tank is insulated and the contents heated to prevent freezing. Eductors in the tank provide mixing.

Verification Tanks (60H-TK-1A/60H-TK-1B/60H-TK-1C) and Ancillary Equipment. The verification tanks are located outside and north of building 2025E. For support, the tanks have a center post with a webbing of beams that extend from the center post to the sides of the tank. The roof is constructed of epoxy-covered carbon steel that is attached to the cross beams of the webbing. The tank floor also is constructed of epoxy-covered carbon steel and is sloped. Eductors are installed in each tank to provide mixing.

Ancillary equipment includes a return pump that provides circulation of treated effluent through the eductors. The return pump also recycles effluent back to the 200 Area ETF for retreatment and can provide service water for 200 Area ETF functions. Two transfer pumps are used to discharge treated effluent to SALDS or back to the LERF.

C.4.1.3 Design Information for Tanks Located Inside Building 2025E

Most of the tanks and ancillary equipment that store or treat dangerous and/or mixed waste are located within building 2025E. The structure serves as secondary containment for the tank systems. Table C-6, 200 Area ETF Tank Systems Information, provides individual tank volumes, dimensions, and construction materials for tanks located outside building 2025E.

pH Adjustment Tank (60C-TK-1) and Ancillary Equipment. Ancillary equipment for the pH adjustment tank includes overflow lines to a sump tank and pumps to transfer waste to other units in the main treatment train.

Effluent pH Adjustment Tank (60C-TK-2) and Ancillary Equipment. Ancillary equipment for the effluent pH adjustment tank includes overflow lines to a sump tank and pumps to transfer waste to the verification tanks.

First Reverse Osmosis Feed Tank (60F-TK-1) and Second Reverse Osmosis Feed Tank (60F-TK-2) and Ancillary Equipment. The first RO feed tank is a vertical, stainless steel tank with a round bottom. Conversely, the second RO feed tank is a rectangular vessel with the bottom of the tank sloping sharply to a single outlet in the bottom center. Each RO tank has a pump to transfer waste to the RO arrays. Overflow lines are routed to a sump tank.

Secondary Waste Receiving Tanks (60I-TK-1A/30I-TK-1B) and Ancillary Equipment. Two secondary waste receiving tanks collect waste from the units in the main treatment train, such as concentrate solution (retentate) from the RO units and regeneration solution from the IX columns. These are vertical, cylindrical tanks with a semi-elliptical bottom and a flat top. Ancillary equipment includes overflow lines to a sump tank and pumps to transfer aqueous waste to the Evaporator Vapor Body Vessel.

Evaporator Vapor Body Vessel (60I-EV-1) and Ancillary Equipment. The Evaporator Vapor Body Vessel, the principal component of the evaporation process, is a cylindrical pressure vessel with a conical bottom. Aqueous waste is fed into the lower portion of the vessel. The top of the vessel is domed and the vapor outlet is configured to prevent carryover of liquid during the foaming or bumping (violent boiling) at the liquid surface. The Evaporator Vapor Body Vessel is designed to meet the requirements of ASME Section VIII, Division I, Pressure Vessels (*Boiler and Pressure Vessel Code*, ASME 1992), and applicable codes and standards. The Evaporator Vapor Body Vessel piping meets the requirements of ASME B31.3, *Chemical Plant and Petroleum Refinery Piping* (ASME 1990).

The Evaporator Vapor Body Vessel includes the following ancillary equipment:

- Preheater.
- Recirculation pump.
- Waste heater with steam level control tank.
- Concentrate transfer pump.
- Entrainment separator.
- Vapor compressor with silencers.
- Silencer drain pump.

Distillate Flash Tank (60I-TK-2) and Ancillary Equipment. The distillate flash tank is a horizontal tank. Ancillary equipment includes a pump to transfer the distillate to the surge tank for reprocessing.

Concentrate Tanks (60J-TK-1A and 60J-TK-1B) and Ancillary Equipment. Ancillary equipment for the two concentrate tanks includes overflow lines to a sump tank and pumps for recirculation and transfer.

Sump Tanks. Sump Tanks 1 and 2 are located below floor level. Both sump tanks are double-walled, rectangular tanks, placed inside concrete vaults. The sump tanks are located in pits below grade to allow gravity drain of solutions to the tanks. Each sump tank has two vertical pumps for transfer of waste to the secondary waste receiving tanks or to the surge tank for reprocessing.

C.4.1.4 Design Information for 200 Area Effluent Treatment Facility Process Units

As with the 200 Area ETF tanks, process units that treat and/or store dangerous and/or mixed waste are maintained at or near atmospheric pressure. These units were constructed to meet a series of design standards, as discussed in the following sections. Table C-7 presents the materials of construction and the ancillary equipment associated with these process units. All piping systems are designed to withstand the effects of internal pressure, weight, thermal expansion and contraction, and any pulsating flow. The design and integrity of these units are presented in the engineering assessment (*Final RCRA Information Needs Report*, Mausshardt 1995).

Filters. The Load-In, rough and fine filters, influent and auxiliary filters are designed to comply with the ASME Section VIII, Division I, Pressure Vessels (*Boiler and Pressure Vessel Code)*. The application of these standards to the construction of the 200 Area ETF filter system and independent inspection ensure that the filter and filter supports have sufficient structural strength and that the seams and connections are adequate to ensure the integrity of the filter vessels.

Ultraviolet Oxidation System. The UV/OX reaction chamber is designed to comply with manufacturers standards.

Degasification System. The codes and standards applicable to the design, fabrication, and testing of the degasification column are identified as follows:

- ASME - B31.3, Chemical Plant and Petroleum Refinery Piping (ASME 1990).
- AWS - D1.1, Structural Welding Code - Steel (AWS 1992).
- ANSI - B16.5, Pipe Flanges and Flanged Fittings (ANSI 1992).

Reverse Osmosis System. The pressure vessels in the RO unit are designed to comply with ASME Section VIII, Division I, Pressure Vessels (*Boiler and Pressure Vessel Code*, ASME 1992), and applicable codes and standards.

Ion Exchange (Polishers). The IX columns are designed in accordance with ASME Section VIII, Division I, Pressure Vessels (*Boiler and Pressure Vessel Code*, ASME 1992), and applicable codes and standards. Polisher piping is fabricated of type 304 stainless steel or polyvinyl chloride (PVC) and meets the requirements of ASME B31.3, *Chemical Plant and Petroleum Refinery Piping* (ASME 1990).

Thin Film Dryer System. The thin film dryer is designed to meet the requirements of ASME Section VIII, Division I, *Boiler and Pressure Vessel Code* (Pressure Vessels, ASME 1992), and applicable codes and standards. The piping meets the requirements of ASME B31.3, *Chemical Plant and Petroleum Refinery Piping* (ASME 1990).

C.4.1.5 Integrity Assessment

A copy of each integrity assessment is kept in the LERF and 200 Area ETF Operating Record. The schedule for integrity assessments over the life of the facility is addressed in Addendum I, "Inspection Requirements." This schedule is based on the results of past integrity assessments and inspection results, age of the tank system, materials of construction, and characteristics of the waste.

The integrity assessments are certified by an Independent, Qualified, Registered Professional Engineer (IQRPE). A certified tank integrity assessment will be prepared for any replacement tank in accordance with WAC 173-303-640(3)(a), and will demonstrate that the tank is properly designed and meets integrity requirements as specified in WAC 173-303-640(3)(a). Preventive and corrective maintenance, including some replacement in kind activities or work that does not change the form, fit, or function of existing equipment, do not require an IQRPE review under either WAC 173-303-640(7)(f) or WAC 173-303-640(2)(a).

Subsequent integrity assessments will be conducted in accordance with WAC 173-303-640(3)(b), and the assessment must determine that the tank system is adequately designed and has sufficient structural strength and compatibility with the waste to be stored or treated, to ensure that it will not collapse, rupture, or fail; at a minimum, the assessment must include the requirements as specified in WAC 173-303-640(3)(a).

The initial integrity assessment for 200 Area ETF is documented in *Final RCRA Information Needs Report* (Mausshardt, 1995) and *200 Area Effluent Treatment Facility Purgewater Unloading Facility Tank System Integrity Assessment* (HNF-41604, 2009) for Load-In Station tank 59A-TK-1. The subsequent integrity assessments are documented in *FY19 Effluent Treatment Facility IQRPE Integrity Assessment* (RPP-IQRPE-50043, 2019). Specifically, the assessment documents the following considerations:

- Adequacy of the standards used during design and construction of the facility.
- Characteristics of the solution in each tank.
- Adequacy of the materials of construction to provide corrosion protection from the solution in each tank.
- Results of the leak tests and visual inspections.

The results of these assessments demonstrate that tanks and ancillary equipment have sufficient structural integrity and are acceptable for storing and treating dangerous and/or mixed waste. The assessments also state that the tanks and building were designed and constructed to withstand a design-basis earthquake. IQRPEs certified these tank assessments.

The scope of the 200 Area ETF tank integrity assessment was based on characterization data from the 242-A Evaporator process condensate. To assess the effect that other aqueous waste might have on the integrity of the 200 Area ETF tanks, the chemistry of an aqueous waste will be evaluated for its potential to corrode a tank (e.g., chloride concentrations will be evaluated).

Consistent with the recommendations of the integrity assessment, a corrosion inspection program was developed. Periodic integrity assessments are scheduled for those tanks predicted to have the highest potential for corrosion. These inspections are scheduled annually or longer, based on age of the tank system, materials of construction, characteristics of the waste, operating experience, and recommendations of the initial integrity assessment. These “indicator tanks” include the concentrate tanks, secondary waste receiving tanks, and verification tanks. One of each of these tanks will be inspected yearly to determine if corrosion or coating failure has occurred. Should significant corrosion or coating failure be found, an additional tank of the same type would be inspected during the same year.

In the case of the verification tanks, if corrosion or coating failure is found in the second tank, the third tank also will be inspected. If significant corrosion were observed in all three sets of tanks, the balance of the 200 Area ETF tanks would be considered for inspection. For tanks predicted to have lower potential for corrosion, inspections also are performed nonroutinely as part of the corrective maintenance program.

C.4.2 Additional Requirements for New Tanks

Procedures for proper installation of tanks, tank supports, piping, concrete, etc., are included in *Construction Specification*, *Project C-018H*, *242-A Evaporator/PUREX Plant Process Condensate Treatment Facility* (V-C018HC1-001, WHC 1992). For the Load-In Station tank 59A-TK-1, procedures are included in the construction specifications in *Purgewater Unloading Facility Project Documentation* (HNF-39966, 2009). Following installation, an IQRPE inspected the tanks and secondary containment. Deficiencies identified included damage to the surge tank, damage to the verification tank liners, and 200 Area ETF secondary containment concrete surface cracking. All deficiencies were repaired to the satisfaction of the engineer. The tanks and ancillary equipment were leak tested as part of acceptance of the system from the construction contractor. Information on the inspections and leak tests are included in the engineering assessment (*Final RCRA Information Needs Report*, Mausshardt 1995). No deficiencies were identified during installation of the Load-In Station tank 59A-TK-1 and ancillary equipment (*200 Area Effluent Treatment Facility Purgewater Unloading Facility Tank System Integrity Assessment* [HNF-41604, 2009]). The subsequent integrity assessments are documented in *FY19 Effluent Treatment Facility IQRPE Integrity Assessment* (RPP-IQRPE-50043, 2019).

C.4.3 Secondary Containment and Release Detection for Tank Systems

This section describes the design and operation of secondary containment and leak detection systems at the 200 Area ETF.

C.4.3.1 Secondary Containment Requirements for All Tank Systems

The specifications for the preparation, design, and construction of the secondary containment systems at the 200 Area ETF are documented in *Design Construction Specification*, *Project C-018H*, *242-A Evaporator/PUREX Plant Process Condensate Treatment Facility* (V-C018HC1-001, WHC 1992). The preparation, design, and construction of the secondary containment for the Load-In Station tank 59A-TK-1 is provided in the construction *Purgewater Unloading Facility Project Documentation* (HNF-39966, 2009). All systems were designed to national codes and standards. Constructing the 200 Area ETF per these specifications ensured that foundations are capable of supporting tank and secondary containment systems and that uneven settling and failures from pressure gradients should not occur.

C.4.3.1.1 Common Elements

The following text describes elements of secondary containment that are common to all 200 Area ETF tank systems. Details on the secondary containment for specific tanks, including leak detection systems and liquids removal, are provided in Section C.4.3.1.2.

Foundation and Construction. For the tanks within the 2025E building, except for the sump tanks, secondary containment is provided by a coated concrete floor and a 6-inch rise (berm) along the containing walls. The double-wall construction of the sump tanks provides secondary containment. Additionally, trenches are provided in the floor that also provides containment and drainage of any liquid to a sump pit. For tanks outside building 2025E, secondary containment also is provided with coated concrete floors in a containment pit (Load-In Station tank 59A-TK-1) or surrounded by concrete dikes (the surge tank and verification tanks).

The transfer piping that carries aqueous waste into the 200 Area ETF is pipe-within-a-pipe construction, and is buried approximately 4 feet below ground surface. The pipes between the verification tanks and the verification tank pumps within building 2025E are located in a concrete pipe trench.

For this discussion, there are five discrete secondary containment systems associated with the following tanks and ancillary equipment that treat or store dangerous waste:

- Load-In Station tank 59A-TK-1.
- Surge tank.
- 2025E Process Area.
- Sump tanks.
- Verification tanks.
- Transfer piping and pipe trenches.

All of the secondary containment systems are designed with reinforcing steel and base and berm thickness to minimize failure caused by pressure gradients, physical contact with the waste, and climatic conditions. Classical theories of structural analysis, soil mechanics, and concrete and structural steel design were used in the design calculations for the foundations and structures. These calculations are maintained at the 200 Area ETF. In each of the analyses, the major design criteria from the following documents were included:

V-C018HC1-001, WHC 1992	*Design Construction Specification*, *Project C-018H, 242-A Evaporator/PUREX Plant Process Condensate Treatment Facility*
DOE Order 6430.1A	General Design Criteria
HPS-SDC-4.1, Revision 11	"Design Load for Structures," *Hanford Plant Standards*
UCRL-15910 LLNL 1987	*Design and Evaluation Guidelines for Department of Energy Facilities Subjected to Natural Phenomena Hazards*, Lawrence Livermore National Laboratory, Livermore, California
UBC-91 UBC-97	Uniform Building Code, 1991 Edition (ICBO 1991) Uniform Building Code, 1997 Edition (ICC 1997, for Load-In Station tank 59A-TK-1)

The design and structural analysis calculations substantiate the structural designs in the referenced drawings. The conclusions drawn from these calculations indicate that the designs are sound and that the specified structural design criteria were met. This conclusion is verified in the independent design review that was part of the engineering assessment (*Final RCRA Information Needs Report* [Mausshardt 1995]; and *200 Area Effluent Treatment Facility Purgewater Unloading Facility Tank System Integrity Assessment* [HNF-41604, 2009]). The subsequent integrity assessments are documented in *FY19 Effluent Treatment Facility IQRPE Integrity Assessment* (RPP-IQRPE-50043, 2019).

Containment Materials. The concrete floor consists of cast-in-place and preformed concrete slabs. All slab joints and floor and wall joints have water stops installed at the mid-depth of the slab. In addition, filler was applied to each joint.

Except for the sump tank vaults, all of the concrete surfaces in the secondary containment system, including berms, trenches, and pits, are coated with a chemical-resistant, high-solids, impermeable coating. This coating material is compatible with the waste being treated, and with the sulfuric acid, sodium hydroxide, and hydrogen peroxide additives to the process. The coating protects the concrete from contact with any chemical materials that might be harmful to concrete and prevents the concrete from being in contact with waste material. Table C-9 summarizes the specific types of primer and top

coats specified for the concrete and masonry surfaces in the 200 Area ETF. The impermeable coating is considered integral to the secondary containment system for the tanks and ancillary equipment.

The concrete containment systems are maintained such that any cracks, gaps, holes, and other imperfections are repaired in a timely manner. Thus, the concrete containment systems do not allow spilled liquid to reach soil or groundwater. There are a number of personnel doorways and vehicle access points into the 2025E Process Area. Releases of any spilled or leaked material to the environment from these access points are prevented by 6-inch concrete curbs, sloped areas of the floor (e.g., truck ramp), or trenches.

Containment Capacity and Maintenance. Each of these containment areas is designed to contain more than 100 percent of the volume of the largest tank in each respective system. Secondary containment systems for the surge tank, and the verification tanks, which are outside building 2025E, also are large enough to include the additional volume from a 25-year, 24-hour storm event; i.e., 2 inches of precipitation.

Sprinkler System. The sprinkler system within the building 2025E supplies firewater protection to the 2025E Process Area and the 2025E Container Storage Area. This system is connected to a site-wide water supply system and has the capacity to supply sufficient water to suppress a fire. However, in the event of failure, the sprinkler system can be hooked up to another water source (e.g., tanker truck).

C.4.3.1.2 Secondary Containment Tank Systems

The following discussion presents a description of the individual containment systems associated with specific tank systems.

Load-In Station Tank 59A-TK-1 Secondary Containment. Integral to the 2025ED Load-In Station secondary containment is the Load-In Station tank 59A-TK-1 secondary containment pit, which receives drainage from all areas of the 2025ED Load-In Station. The secondary containment pit is covered, and has 12-inch-thick walls and a floor constructed of reinforced concrete and is sloped to drain solution to a sump. The depth of the pit varies with the slope of the floor, with an average thickness of about 3.5 feet. Leaks are detected by a leak detector that alarms locally, in the 200 Area ETF Control Room, and by visual inspection of the secondary containment. Alarms are monitored continuously in the 200 Area ETF Control Room during 2025ED Load-In Station transfers or by approved alternate methods during transfers (refer to Addendum I).

Adjacent to the pit is a 10-inch-thick reinforced concrete pad that serves as secondary containment for the 2025ED Load-In Station tanker trucks, containers, transfer pumps, and filter system including 59A-TK-2 filter sump tank that serve as the first tanker truck unloading bay. The pad is inside the 2025ED Load-In Station Building and is below grade with north and south walls gently sloped to allow truck access. The pad has a drainpipe to route waste solution to the adjacent Load-In Station tank pit. The bays in the 2025ED Load-In Station building are sloped to channel spills or leaks from containers to the Load-In Station tank 59A-TK-1 secondary containment pit. Table C-9 provides additional information on the protective coating for the concrete pad.

Load-In Station tank 59A-TK-1 is located on a 10-inch-thick reinforced concrete slab (Drawing H-2-838975, Sheet 2) inside the 2025ED Load-In Station building. The tank has a flat bottom that sits on a concrete slab in the secondary containment. Secondary containment for the tank, filter system including 59A-TK-2 filter sump tank, and unloading pumps and piping is provided by an impermeable coated floor and tank pit. The floor is sloped to route leaks and spills from the floor through a trench to the adjacent tank pit. The volume of the combined secondary containment of these two systems is 26,600 gallons, which is capable of holding the volume of tank 59A-TK-1.

Surge Tank Secondary Containment. The surge tank is mounted on a reinforced concrete ringwall. Inside the ringwall, the flat-bottomed tank is supported by a bed of compacted sand and gravel with a high-density polyethylene liner bonded to the ringwall. The liner prevents galvanic corrosion between the soil and the tank. The secondary containment is reinforced concrete with a 6-inch-thick floor and an 8-inch-thick dike. The secondary containment area shares part of the southern wall of the main 2025E Process Area. The dike is 9.5 feet tall and provides 226,000 gallons of secondary containment.

The floor of the secondary containment slopes to a sump in the northwest corner of the containment area. Leaks into the secondary containment are detected by level instrumentation in the sump, which alarms in the 200 Area ETF Control Room and/or by routine visual inspections. Sump alarms are monitored continuously in the 200 Area ETF Control Room during 200 Area ETF processing operations or by approved alternate methods during transfers (refer to Addendum I). A sump pump is used to transfer solution in the secondary containment to a sump tank.

2025E Process Area Secondary Containment. The 2025E Process Area contains the tanks and ancillary equipment of the primary and secondary treatment trains, and has a jointed, reinforced concrete slab floor. The concrete floor of the 2025E Process Area and sump tanks provide the secondary containment. This floor is a minimum of 6 inches thick. With doorsills 6 inches high, the 2025E Process Area (including the 2025E Truck Bay loading area and 2025E Container Storage Area) has a containment volume of approximately 24,600 gallons (see Section C.3.4.3).

The floor of the 2025E Process Area is sloped to drain liquids to two trenches that drain to sumps. Each trench is approximately 15 inches wide with a sloped trough varying from 15.5 to 30 inches deep. Leaks into the secondary containment are detected by routine visual inspections of the floor area near the tanks, ancillary equipment, and in the trenches.

A small dam was placed in the trench that comes from the thin film dryer room to contain minor liquid spills originating in the dryer room to minimize the spread of contamination into the 2025E Process Area. The dryer room is inspected for leaks in accordance with the inspection schedule in Addendum I, "Inspection Requirements." Operators clean up these minor spills by removing the liquid waste and decontaminating the spill area.

A small dam was also placed in the trench adjacent to the chemical feed skid when the chemical berm area was expanded to accommodate acid and caustic pumps, which were moved indoors from the top of the surge tank to resolve a safety concern. This dam was designed to contain minor spills originating in the chemical berm area and prevent them from entering the process sump.

The northwest corner of the 2025E Process Area consists of a pump pit containing the pumps and piping for transferring treated effluent from the verification tanks to SALDS. The pit is built 4.5 feet below the 2025E Process Area floor level and is sloped to drain to a trench built along its north wall that routes liquid to Sump Tank 2. Leaks into the secondary containment of the pump pit are detected by routine visual inspections.

Sump Tanks. The sump tanks support the secondary containment system, and collect waste from several sources, including:

- 2025E Process Area drain trenches.
- Tank overflows and drains.
- Container washing water.
- Resin dewatering solution.
- Steam boiler blow down.
- Sampler system drains.

These double-contained tanks are located within unlined, concrete vaults. The sump tank levels are monitored by remote level indicators or through visual inspections from the sump covers. These indicators are connected to high- and low-level alarms that are monitored in the 200 Area ETF Control Room during ETF processing operations or by approved alternate methods during transfers (refer to Addendum I). When a high-level alarm is activated, a pump is activated and the sump tank contents usually are routed to the secondary treatment train for processing. The contents also could be routed to the surge tank for treatment in the primary treatment train. In the event of an abnormally high inflow rate, a second sump pump is initiated automatically.

Verification Tanks Secondary Containment. The three verification tanks (60H-TK-1A/60H-TK-1B/60H-TK-1C) are each mounted on ringwalls with high-density polyethylene liners similar to the surge tank. The secondary containment for the three tanks is reinforced concrete with a 6-inch-thick floor and an 8-inch-thick dike. The dike extends up 8 feet to provide a containment of approximately 894,000 gallons exceeding the capacity of a single verification tank (See Table C-6).

The floor of the secondary containment slopes to a sump along the southern wall of the dike. Leaks into the secondary containment are detected by level instrumentation in the sump and/or by routine visual inspections. Sump alarms are monitored continuously in the 200 Area ETF Control Room during 200 Area ETF processing operations or by approved alternate methods during transfers (refer to Addendum I). A sump pump is used to transfer solution in the secondary containment to a sump tank.

C.4.3.2 Additional Requirements for Specific Types of Systems

This section addresses additional requirements in WAC 173-303-640 for double-walled tanks like the sump tanks and secondary containment for ancillary equipment and piping associated with the tank systems.

C.4.3.2.1 Double-Walled Tanks

The sump tanks are the only tanks in the 200 Area ETF classified as “double-walled” tanks. These tanks are located in unlined concrete vaults and support the secondary containment system for the 2025E Process Area. The sump tanks are equipped with a leak detector between the walls of the tanks that provide continuous monitoring for leaks. The leak detector alarms are monitored in the 200 Area ETF Control Room. These sump tank alarms are monitored continuously during 200 Area ETF processing operations or by approved alternate methods during transfers (refer to Addendum I). The inner tanks are contained completely within the outer shells. The tanks are contained completely within the concrete structure of building 2025E so corrosion protection from external galvanic corrosion is not necessary.

C.4.3.2.2 Ancillary Equipment Secondary Containment

The secondary containment provided for the tanks and process systems also serves as secondary containment for the ancillary equipment associated with these systems.

Ancillary Equipment. Section C.4.3.1.2 describes the secondary containment systems that also serve most of the ancillary equipment within the 200 Area ETF. Between building 2025E and the verification tanks, a pipeline trench provides secondary containment for four pipelines connecting the transfer pumps (i.e., discharge and return pumps) in the 200 Area ETF with the verification tanks (Figure C-2, Table C-7, and Table C-8). This concrete trench crosses under the road and extends from the verification tank pumps to the verification tanks. Treated effluent flows through these pipelines from the verification tank pumps to the verification tanks. The return pump is used to return effluent to the 200 Area ETF for use as service water or for reprocessing.

For all of the ancillary equipment housed within building 2025E, the concrete floor, trenches, and berms form the secondary containment system. For the ancillary equipment of the surge tank and the verification tanks, secondary containment is provided by the concrete floors and dikes associated with these tanks. The concrete floor and pit provide secondary containment for the ancillary equipment of the Load-In Station tank 59A-TK-1.

Transfer Piping and Pipe Trenches. The two buried transfer lines between LERF and the surge tank have secondary containment in a pipe-within-a-pipe arrangement. The 4-inch transfer line has an 8-inch outer pipe, while the 3-inch transfer, line has a 6-inch outer pipe. The pipes are fiberglass and are sloped towards the surge tank. The outer piping ends with a drain valve in the surge tank secondary containment.

These pipelines are equipped with leak detection located in the annulus between the inner and outer pipes; the leak detection equipment can continuously "inspect" the pipelines during aqueous waste transfers. The alarms on the leak detection system are monitored in the 200 Area ETF Control Room. The 200 Area Control Room alarms are monitored continuously during aqueous waste transfers between LERF and the 200 Area ETF surge tank or by approved alternate methods during transfers (refer to Addendum I). A low-volume air purge of the annulus is provided to prevent condensation buildup and minimize false alarms by the leak detection system. In the event that these leak detectors are not in service, the pipelines are inspected during transfers by opening a drain valve to check for solution in the annular space between the inner and outer pipe.

The 3-inch transfer line between the Load-In Station tank 59A-TK-1 and the surge tank has a 6-inch outer pipe in a pipe-within-a-pipe arrangement. The piping is made of fiberglass-reinforced plastic and slopes towards the Load-In Station tank 59A-TK-1 secondary containment pit. The drain valve and leak detection system for the Load-In Station tank 59A-TK-1 pipelines are operated similarly to the leak detection system for the LERF to 200 Area ETF pipelines.

As previously indicated, a reinforced concrete pipe trench provides secondary containment for piping under the roadway between the 200 Area ETF and the verification tanks (60H-TK-1A/60H-TK-1B/ 60H-TK-1C). Three 6-inch-thick reinforced concrete partitions divide the trench into four portions and support metal gratings over the trench. Each portion of the trench is 4 feet wide, 2.5 feet deep, and slopes to route any solution present to 4-inch drain lines through the north wall of building 2025E. These drain lines route solution to Sump Tank 2 in building 2025E. The floor of the pipe trench is 12 inches thick and the sides are 6 inches thick. The concrete trenches are coated with water sealant and covered with metal gratings at ground level to allow vehicle traffic on the roadway.

C.4.4 Tank Management Practices

When an aqueous waste stream is identified for treatment or storage at 200 Area ETF, the generating unit is required to characterize the waste. Based on characterization data, the waste stream is evaluated to determine if the stream is acceptable for treatment or storage. Specific tank management practices are discussed in the following sections.

C.4.4.1.1 Rupture, Leakage, Corrosion Prevention

Most aqueous waste streams can be managed such that corrosion would not be a concern. For example, an aqueous waste stream with high concentrations of chloride might cause corrosion problems when concentrated in the secondary treatment train. One approach is to adjust the corrosion control measures in the secondary treatment train. An alternative might be to blend this aqueous waste through flow equalization in a LERF Basin with another aqueous waste that has sufficient dissolved solids, such that the concentration of the chlorides in the secondary treatment train would not pose a corrosion concern.

Additionally, the materials of construction used in the tanks systems (Table C-6) make it unlikely that an aqueous waste would corrode a tank. For more information on corrosion prevention, refer to Addendum B, "Waste Analysis Plan."

If operating experience suggests that most aqueous waste streams can be managed such that corrosion would not be a concern, operating practices and integrity assessment schedules and requirements will be reviewed and modified as appropriate.

When a leak in a tank system is discovered, the leak is immediately contained or stopped by isolating the leaking component. Following containment, the requirements of WAC 173-303-640(7), incorporated by reference, are followed. These requirements include repair or closure of the tank/tank system component, and certification of any major repairs.

C.4.4.2 Overfilling Prevention

Operating practices and administrative controls used at the 200 Area ETF to prevent overfilling a tank are discussed in the following paragraphs. The 200 Area ETF process is controlled by the MCS. The MCS monitors liquid levels in the 200 Area ETF tanks and has alarms that annunciate on high-liquid level to notify operators that actions must be taken to prevent overfilling of these vessels. As an additional precaution to prevent spills, many tanks are equipped with overflow lines that route solutions to Sump Tanks 1 and 2 to prevent the tank from overflowing into the secondary containment. These tanks include the pH adjustment tank; RO feed tanks, effluent pH adjustment tank, secondary waste receiving tanks, and concentrate tanks.

The following section discusses feed systems, safety cutoff devices, bypass systems, and pressure controls for specific tanks and process systems.

Tanks. All tanks (excluding 59A-TK-2, 59A-TK-3, and 59A-TK-4) are equipped with liquid level sensors that give a reading of the tank liquid volume. All of these tanks are equipped further with liquid level alarms that are actuated if the liquid volume is near the tank overflow capacity. In the actuation of the surge tank alarm, a liquid level switch trips, sending a signal to the valve actuator on the tank influent lines, and causing the influent valves to close. To prevent tank overflows when liquid level monitors are out of service, the tank system is placed in a safe configuration by isolating the tank from influent flow until the liquid level monitoring is restored to service or daily sump level readings may be taken for tanks that overflow to Sump Tanks 1 and 2.

The operating mode for each verification tank, i.e., receiving, holding, or discharging, can be designated through the MCS; modes also switch automatically. When the high-level set point on the receiving verification tank is reached, the flow to this tank is diverted and another tank becomes the receiver. The full tank is switched into verification mode. The third tank is reserved for discharge mode.

The liquid levels in the pH adjustment, first and second RO feed, and effluent pH adjustment tanks are maintained within predetermined operating ranges. Should any of the tanks overflow, the excess waste is piped along with any leakage from the feed pumps to a sump tank.

When waste in a secondary waste-receiving tank reaches the high-level set point, the influent flow of waste is redirected to the second tank. In a similar fashion, the concentrate tanks switch receipt modes when the high-level set point of one tank is reached.

The small Load-In filter drain sump tanks (59A-TK-2, 59A-TK-3, and 59A-TK-4) are used for holding waste drained from the filter housings during filter media replacement, and are sized to hold the discrete batch volume of the housings being drained. Sump tank 59A-TK-2 includes a high-level switch that automatically starts the pump when activated for overfill protection. Sump tank 59A-TK-3 has a sight glass to indicate level, and a pump to empty the tank back into the filter housings when the media change is complete.

Filter Systems. All filters at 200 Area ETF (i.e., the 2025ED Load-In Station, rough, fine, and auxiliary filter systems) are in leak-tight steel casings. For the rough and fine filters, a high differential pressure, which could damage the filter element, activates a valve that shuts off liquid flow to protect the filter element from possible damage. To prevent a high-pressure situation, the filters are cleaned routinely with pulses of compressed air that force water back through the filter. Cleaning is terminated automatically by shutting off the compressed air supply if high pressure develops. The differential pressure across the auxiliary filters also is monitored. A high differential pressure in these filters would result in a system shutdown to allow the filters to be changed out.

The 2025ED Load-In Station and 2025EG Backup Load-In Station filtration systems have pressure gauges for monitoring the differential pressure across each filter. A high differential pressure would result in discontinuing filter operation until the filter is replaced.

Ultraviolet Light/Oxidation System and Decomposers. A rupture disk on the inlet piping to each of the UV/OX reaction vessels relieves to the pH adjustment tank in the event of excessive pressure developing in the piping system. Should the rupture disk fail, the aqueous waste would trip the moisture sensor, shut down the UV lamps, and close the surge tank feed valve. Also provided is a level sensor to protect UV lamps against the risk of exposure to air. Should those sensors be actuated, the UV lamps would be shut down immediately.

The piping and valving for the hydrogen peroxide decomposers are configured to split the waste flow: half flows to one decomposer and half flows to the other decomposer. Alternatively, the total flow of waste can be treated in one decomposer or both decomposers can be bypassed. A safety relief valve on each decomposer vessel can relieve excess system pressure to a sump tank.

Degasification System. The degasification column is typically supplied aqueous waste feed by the pH adjustment tank feed pump. This pump transfers waste solution through the hydrogen peroxide decomposer, the fine filter, and the degasification column to the first RO feed tank.

The degasification column is designed for operation at a partial vacuum. A pressure sensor in the outlet of the column detects the column pressure. The vacuum in the degasification column is maintained by a blower connected to the VOC system. The column is protected from extremely low pressure developed by the column blower by the use of an intake vent that is maintained in the open position during operation. The column liquid level is regulated by a flow control system with a high- and low-level alarm. Plate-type heat exchanger cools the waste solution fed to the degasification column.

Reverse Osmosis System. The flow through the first and second RO stages is controlled to maintain constant liquid levels in the first and second stage RO feed tanks.

Polisher. Typically, two of the three columns are in operation (lead/lag) and the third (regenerated) column is in standby. When the capacity of the resin in the first column is exceeded, as detected by an increase in the conductivity of the column effluent, the third column, containing freshly regenerated IX resin, is brought online. The first column is taken offline, and the waste is rerouted to the second column, and to the third. Liquid level instrumentation and automatically operated valves are provided in the IX system to prevent overfilling.

Evaporator Vapor Body Vessel. Liquid level instrumentation in the secondary waste receiving tanks is designed to preclude a tank overflow. A liquid level switch actuated by a high-tank liquid level causes the valves to reposition, closing off flow to the secondary waste receiving tanks. Secondary containment for these tanks routes liquids to a sump tank.

Valves in the Evaporator Vapor Body Vessel feed line can be positioned to bypass the secondary waste around the Evaporator Vapor Body Vessel and to transfer the secondary waste to the concentrate tanks (60J-TK-1A/60J-TK-1B).

Thin Film Dryer. The two concentrate tanks alternately feed the thin film dryer. Typically, one tank serves as a concentrate waste receiver while the other tank serves as the dryer feed tank. One tank may serve as both concentrate waste receiver and dryer feed tank. Liquid level instrumentation prevents tank overflow by diverting the concentrate flow from the full concentrate tank to the other concentrate tank. Secondary containment for these tanks routes liquids to a sump tank.

An alternate route is provided from the concentrate receiver tank to the secondary waste receiving tanks. Dilute concentrate in the concentrate receiver tank can be reprocessed through the Evaporator Vapor Body Vessel by transferring the concentrate back to a secondary waste-receiving tank.

C.4.5 Labels or Signs

Each tank or process unit in the 200 Area ETF is identified by a nameplate attached in a readily visible location. Included on the nameplate are the equipment number and the equipment title. Those tanks that store or treat dangerous waste at the 200 Area ETF (Section C.4.1.1) are identified with a label, which reads “Process Water/Waste.” The labels are legible at a distance of at least fifty feet or as appropriate for legibility within the 200 Area ETF. Additionally, these tanks bear a legend that identifies the waste in a manner, which adequately warns employees, emergency personnel, and the public of the major risk(s) associated with the waste being stored or treated in the tank system(s).

Caution plates are used to show possible hazards and warn that precautions are necessary. Caution signs have a yellow background and black panel with yellow letters and bear the word “Caution.” Danger signs show immediate danger and signify that special precautions are necessary. These signs are red, black, and white and bear the word “Danger.”

Tanks and vessels containing corrosive chemicals are posted with black and white signs bearing the word “Corrosive.” “Danger—Unauthorized Personnel Keep Out” signs are posted on all exterior doors of building 2025E, and on each interior door leading into the 2025E Process Area. Tank ancillary piping is also labeled “Process Water” or “Process Liquid” to alert personnel which pipes in the 2025E Process Area contains dangerous and/or mixed waste.

All tank systems holding dangerous waste are marked with labels or signs to identify the waste contained in the tanks. The labels or signs are legible at a distance of at least 50 feet and bear a legend that identifies the waste in a manner that adequately warns employees, emergency response personnel, and the public, of the major risk(s) associated with the waste being stored or treated in the tank system(s).

C.4.6 Air Emissions

Tank systems that contain extremely hazardous waste that is acutely toxic by inhalation must be designed to prevent the escape of such vapors. To date, no extremely hazardous waste has been managed in 200 Area ETF tanks and is not anticipated. However, the 200 Area ETF tanks have forced ventilation that draws air from the tank vapor spaces to prevent exposure of operating personnel to any toxic vapors that might be present. The vapor passes through a charcoal filter and two sets of high-efficiency particulate air filters before discharge to the environment. The Load-In Station tank 59A-TK-1 and verification tanks are vented to the atmosphere.

C.4.7 Management of Ignitable or Reactive Wastes in Tanks Systems

Although the 200 Area ETF is permitted to accept waste that is designated ignitable or reactive, such waste would be treated or blended immediately after placement in the tank system so that the resulting waste mixture is no longer ignitable or reactive. Aqueous waste received does not meet the definition of a combustible or flammable liquid given in National Fire Protection Association (NFPA) code number 30 (NFPA 1996).

The buffer zone requirements in NFPA-30, which require tanks containing combustible or flammable solutions be a safe distance from each other and from public way, are not applicable.

C.4.8 Management of Incompatible Wastes in Tanks Systems

The 200 Area ETF manages dilute solutions that can be mixed without compatibility issues. The 200 Area ETF is equipped with several systems that can adjust the pH of the waste for treatment activities. Sulfuric acid and sodium hydroxide are added to the process through the MCS for pH adjustment to ensure there will be no large pH fluctuations and adverse reactions in the tank systems.

C.5 Liquid Effluent Retention Facility Surface Impoundment Operations

This section provides specific information on surface impoundment operations at the LERF, including descriptions of the liners and secondary containment structures, as required by WAC 173-303-650 and WAC 173-303-806(4)(d).

The LERF consists of three lined surface impoundments (basins) with a design capacity of 7.8 million gallons each. Each basin would overflow when the basin's volume reaches 9 million gallons. The dimensions of each basin at the anchor wall are approximately 338 x 278 feet. The typical top dimensions of the wetted area are approximately 292 x 233 feet, while the bottom dimensions are approximately 188 x 124 feet. Total depth from the top of the dike to the bottom of the basin is approximately 26.4 feet at the deepest point. The typical finished basin bottoms lie at about 15 feet below the initial grade and 593 feet above sea level. The dikes separating the basins have a typical height of 10 feet and typical top width of 38 feet around the perimeter of the impoundments.

C.5.1 List of Dangerous Waste

A list of dangerous and/or mixed aqueous waste that can be stored in LERF is presented in Addendum A. Addendum B, "Waste Analysis Plan," also provides a discussion of the types of waste that are managed in the LERF.

C.5.2 Construction, Operation, and Maintenance of Liner System

General information concerning the liner system is presented in the following sections. Information regarding loads on the liner, liner coverage, UV light exposure prevention, and location relative to the water table are discussed.

C.5.2.1 Liner Construction Materials

The LERF employs a double-composite liner system with a leachate detection, collection, and removal system between the primary and secondary liners. Each basin is constructed with an upper or primary liner consisting of a high-density polyethylene geomembrane laid over a bentonite carpet liner. The lower or secondary liner in each basin is a composite of a geomembrane laid over a layer of soil/bentonite admixture with a hydraulic conductivity less than 3.9E-08 inches per second. The synthetic liners extend up the dike wall to a concrete anchor wall that surrounds the basin at the top of the dike. A batten system bolts the layers in place to the anchor wall (Figure C-16).

Figure C-17 is a schematic cross-section of the liner system. The liner components, listed from the top to the bottom of the liner system, are the following:

- Primary 60-mil high-density polyethylene geomembrane.
- Bentonite carpet liner.
- Geotextile.
- Drainage gravel (bottom) and geonet (sides).
- Geotextile.
- Secondary 60-mil high-density polyethylene geomembrane.
- Soil/bentonite admixture (36 inches on the bottom, 42 inches on the sides).
- Geotextile.

The primary geomembrane, made of 60-mil (0.06 inch) high-density polyethylene, forms the basin surface that holds the aqueous waste. The secondary geomembrane, also 60-mil (0.06 inch) high-density polyethylene, forms a barrier surface for leachate that might penetrate the primary liner. The high-density polyethylene chemically is resistant to constituents in the aqueous waste and has a relatively high strength compared to other lining materials. The high-density polyethylene resin specified for the LERF contains carbon black, antioxidants, and heat stabilizers to enhance its resistance to the degrading effects of UV light. The approach to ensuring the compatibility of aqueous waste streams with the LERF liner materials and piping is discussed in Addendum B, "Waste Analysis Plan."

Three geotextile layers are used in the LERF liner system. The layers are thin, nonwoven polypropylene fabric that chemically is resistant, highly permeable, and resistant to microbiological growth. The first two layers prevent fine soil particles from infiltrating and clogging the drainage layer. The second geotextile also provides limited protection for the secondary geomembrane from the drainage rock. The third geotextile layer prevents the mixing of the soil/bentonite admixture with the much more porous and granular foundation material.

A 12-inch-thick gravel drainage layer on the bottom of the basins between the primary and secondary liners provides a flow path for liquid to the leachate detection, collection, and removal system. A geonet (or drainage net) is located immediately above the secondary geomembrane on the basin sidewalls. The geonet functions as a preferential flow path for liquid between the liners, carrying liquid down to the gravel drainage layer and subsequently to the leachate sump. The geonet is a mesh made of high-density polyethylene, with approximately 0.5-inch openings.

The soil/bentonite layer is 36 inches thick on the bottom of the basins and 42 inches thick on the basin sidewalls; its permeability is less than 3.9E-08 inches per second. This composite liner design, consisting of a geomembrane laid over essentially impermeable soil/bentonite, is considered best available technology for solid waste landfills and surface impoundments. The combination of synthetic and clay liners is reported in the literature to provide the maximum protection from waste migration (*Flexible Membrane Liners for Solid and Hazardous Waste Landfills - A State of the Art Review*, Forseth and Kmet 1983).

A number of laboratory tests were conducted to measure the engineering properties of the soil/bentonite admixture, in addition to extensive field tests performed on three test fills constructed near the LERF site. For establishing an optimum ratio of bentonite to soil for the soil/bentonite admixture, mixtures of various ratios were tested to determine permeability and shear strength. A mixture of 12 percent bentonite was selected for the soil/bentonite liner and tests described in the following paragraphs demonstrated that the admixture meets the desired permeability of less than 3.9E-08 inches per second. Detailed discussion of test procedures and results is provided in *Report of Geotechnical Investigation*, *242-A Evaporation and PUREX Interim Storage Basins*, *W-105*, *Project Number 90-1901* (Chen-Northern 1990).

Direct shear tests were performed according to ASTM D3080 test procedures (*Standard Test Method for Direct Shear Test of Soils Under Consolidation Drained Conditions*, ASTM 1990) on soil/bentonite samples of various ratios. Based on these results, the conservative minimum Mohr-Coulomb shear strength value of 30 degrees was estimated for a soil/bentonite admixture containing 12 percent bentonite.

The high degree of compaction of the soil/bentonite layer (92 percent per ASTM D1557 [*Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 feet-pound/feet)*, ASTM 1991]) was expected to maximize the bonding forces between the clay particles, thereby minimizing moisture transport through the liner. With respect to particle movement ("piping"), estimated fluid velocities in this low-permeability material are too low to move the soil particles. Therefore, piping is not considered a problem.

For the soil/bentonite layer, three test fills were constructed to demonstrate that materials, methods, and procedures used would produce a soil/bentonite liner that meets the Environmental Protection Agency (EPA) permeability requirement of less than 3.9E-08 inches per second. All test fills met the EPA requirements. A thorough discussion of construction procedures, testing, and results is provided in *Report of Permeability Testing, Soil-bentonite Test Fill, KEH W-105, Project No 86-19005* (Chen-Northern 1991).

The aqueous waste stored in the LERF is typically a dilute mixture of organic and inorganic constituents. Though isolated instances of soil liner incompatibility have been documented in the literature (*Flexible Membrane Liners for Solid and Hazardous Waste Landfills - A State of the Art Review*, Forseth and Kmet 1983), these instances have occurred with concentrated solutions that were incompatible with the geomembrane liners in which the solutions were contained. Considering the dilute nature of the aqueous waste that is and will be stored in LERF and the moderate pH, and test results demonstrating the compatibility of the high-density polyethylene liners with the aqueous waste (9090 Test Results [WHC-SD-Wl05-TD-001, 1991]), gross failure of the soil/bentonite layer is not probable.

C.5.2.1.1 Material Specifications

Material specifications for the liner system and leachate collection system, including liners, drainage gravel, and drainage net are discussed in the following sections. Material specifications are documented in the *Final Specifications 242-A Evaporator and PUREX Interim Retention Basins* (W-105/83360/ER-0156, KEH 1990) and *Construction Specifications for 242-A Evaporator and PUREX Interim Retention Basins* (W-105, KEH 1990).

Geomembrane Liners. The high-density polyethylene resin for geomembranes for the LERF meets the material specifications listed in Table C-10. Key physical properties include thickness 60-mil (0.06-inch) and impermeability (hydrostatic resistance of over 450 pounds per square inch). Physical properties meet National Sanitation Foundation Standard 54 (*Flexible Membrane Liners*, NSF 1985). Testing to determine if the liner material is compatible with typical dilute waste solutions was performed and documented in *9090 Test Results* (WHC-SD-Wl05-TD-001, 1991).

Soil/Bentonite Liner. The soil/bentonite admixture consists of 11.5 to 14.5 percent bentonite mixed into well-graded silty sand with a maximum particle size of 0.187 inch (No. 4 sieve). Test fills were performed to confirm the soil/bentonite admixture applied at LERF has hydraulic conductivity less than 3.9E-08 inches per second, as required by WAC 173-303-650(2)(j) for new surface impoundments.

Bentonite Carpet Liner. The bentonite carpet liner consists of bentonite (90 percent sodium montmorillonite clay) in a primary backing of woven polypropylene with nylon filler fiber, and a cover fabric of open weave spunlace polyester. The montmorillonite is anticipated to retard migration of solution through the liner, exhibiting a favorable cation exchange for adsorption of some constituents (such as ammonium). Based on composition of the bentonite carpet and of the type of aqueous waste stored at LERF, no chemical attack, dissolution, or degradation of the bentonite carpet liner is anticipated.

Geotextile. The nonwoven geotextile layers consist of long-chain polypropylene polymers containing stabilizers and inhibitors to make the filaments resistant to deterioration from UV light and heat exposure. The geotextile layers consist of continuous geotextile sheets held together by needle punching. Edges of the fabric are sealed or otherwise finished to prevent outer material from pulling away from the fabric or raveling.

Drainage Gravel. The drainage layer consists of thoroughly washed and screened, naturally occurring rock meeting the size specifications for Grading Number 5 in Washington State Department of Transportation (WSDOT) construction specifications (*Standard Specification for Road, Bridge, and Municipal Construction*, WSDOT 1988). The specifications for the drainage layer are given in Table C-11. Hydraulic conductivity tests (*Tests of Drainage Rock for the V797 Project, Hanford, Washington; Tests of Drainage Rock for the W105 Project, Hanford, Washington; Tests of Drainage Rock*

for the W105 Project, Hanford, Washington, CNI Word Order No. 2527, Chen-Northern 1992) showed the drainage rock used at LERF met the sieve requirements and had a hydraulic conductivity of at least 0.4 inches per second, which exceeded the minimum of at least 0.04 inches per second required by WAC 173-303-650(2)(j) for new surface impoundments.

Geonet. The geonet is fabricated from two sets of parallel high-density polyethylene strands, spaced 0.5 inches center-to-center maximum to form a mesh with minimum two strands per 1 inch in each direction. The geonet is located between the liners on the sloping sidewalls to provide a preferential flow path for leachate to the drainage gravel and subsequently to the leachate sump.

Leachate Collection Sump. Materials used to line the 10 x 6 x 1-feet-deep leachate sump, at the bottom of each basin in the northwest corner, include (from top to bottom [Figure C-18]):

- 1-inch high-density polyethylene flat stock (supporting the leachate riser pipe).
- Geotextile.
- 60-mil (0.06 inch) high-density polyethylene rub sheet.
- Secondary composite liner:
  - 60-mil (0.06 inch) high-density polyethylene geomembrane.
- 3 feet of soil/bentonite admixture.
- Geotextile.

Specifications for these materials are identical to those discussed previously.

Leachate System Risers. Risers for the leachate system consist of 10-inch and 4-inch pipes from the leachate collection sump to the catch basin northwest of each basin (Figure C-18). The risers lay below the primary liner in a gravel-filled trench that also extends from the sump to the concrete catch basin (Figure C-18).

The risers are high-density polyethylene pipes fabricated to meet the requirements in ASTM D1248 (ASTM 1989). The 10-inch riser pipe is perforated every 8 inches with 0.5-inch holes around the diameter. Level sensors and leachate pump are inserted in the 10-inch riser pipe to monitor and remove leachate from the sump. To prevent clogging of the pump and piping with fine particulate, the end of the riser is encased in a gravel-filled box constructed of high-density polyethylene geonet and wrapped in geotextile. The 4-inch riser pipe is perforated every 4 inches with 1/4-inch holes around the diameter. A level detector is inserted in the 4-inch riser pipe.

Leachate Pump. A deep-well submersible pump, designed to deliver approximately 5 gallons per minute, is installed in the 10-inch leachate riser in each basin. Wetted parts of the leachate pump are made of 316L stainless steel, providing both corrosion resistance and durability.

C.5.2.1.2 Loads on Liner System

The LERF liner system is subjected to the following types of stresses.

Stresses from Installation or Construction Operations. Contractors were required to submit construction quality control plans that included procedures, techniques, tools, and equipment used for the construction and care of liner and leachate system. Methods for installation of all components were screened to ensure that the stresses on the liner system were kept to a minimum.

Calculations were performed to estimate the risk of damage to the secondary high-density polyethylene liner during construction (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997). The greatest risk expected was from spreading the gravel layer over the geotextile layer and secondary geomembrane. The results of the calculations show that the strength of the geotextile was sufficiently high to withstand the stress of a small gravel spreader driving on a minimum

of 6 inches of gravel over the geotextile and geomembrane. The likelihood of damage to the geomembrane lying under the geotextile was considered low.

To avoid driving heavy machinery directly on the secondary liner, a 90-foot conveyer was used to deliver the drainage gravel into the basins. The gravel was spread and consolidated by hand tools and a bulldozer. The bulldozer traveled on a minimum thickness of 12 inches of gravel. Where the conveyer assembly was placed on top of the liner, cribbing was placed to distribute the conveyer weight. No heavy equipment was allowed for use directly in contact with the geomembranes.

Additional calculations were performed to estimate the ability of the leachate riser pipe to withstand the static and dynamic loading imposed by lightweight construction equipment riding on the gravel layer (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997). Those calculations demonstrated that the pipe could buckle under the dynamic loading of small construction equipment; therefore, the pipe was avoided by equipment during spreading of the drainage gravel.

Installation of synthetic lining materials proceeded only when winds were less than 15 miles per hour, and not during precipitation. The minimum ambient air temperature for unfolding or unrolling the high-density polyethylene sheets was 14°Fahrenheit (F), and a minimum temperature of 32°F was required for seaming the high-density polyethylene sheets. Between shifts, geomembranes and geotextile were anchored with sandbags to prevent lifting by wind. Calculations were performed to determine the appropriate spacing of sandbags on the geomembrane to resist lifting caused by 80-mile per hour winds (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997). All of the synthetic components contain UV light inhibitors and no impairment of performance is anticipated from the short-term UV light exposure during construction. Section C.5.2.4 provides further detail on exposure prevention.

During the laying of the soil/bentonite layer and the overlying geomembrane, moisture content of the admixture was monitored and adjusted to ensure optimum compaction and to avoid development of cracks.

C.5.2.1.3 Static and Dynamic Loads and Stresses from the Maximum Quantity of Waste

When a LERF Basin is full, liquid depth is approximately 22.2 feet. Static load on the primary liner is roughly 9.1 pounds per square inch. Load on the secondary liner is slightly higher because of the weight of the gravel drainage layer. Assuming a density of 50 pounds per cubic foot for the drainage gravel (conservative estimate based on specific gravity of 2.65 [*Simplified Design of Building Foundations*, Ambrose 1988]), the secondary high-density polyethylene liner carries approximately 10.2 pounds per square inch of load when a basin is full.

Side slope liner stresses were calculated for each of the layers in the basin sidewalls and for the pipe trench on the northwest corner of each basin (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997). Results of these calculations indicate factors of safety against shear were 1.5 or greater for the primary geomembrane, geotextile, geonet, and secondary geomembrane.

Because the LERF is not located in an area of seismic concern, as identified in Appendix VI of 40 CFR 264 and WAC 173-303-282(6)(a)(I), discussion and calculation of potential seismic events are not required.

C.5.2.1.4 Stresses Resulting from Settlement, Subsidence, or Uplift

Uplift stresses from natural sources are expected to have negligible impact on the liner. Groundwater lies approximately 200 feet below the LERF, average annual precipitation is only 6.3 inches, and the average unsaturated permeability of the soils near the basin bottoms is high, ranging from about 2.2E-04 inches per second to about 0.4 inches per second (*Additional Information for Project W-105*, *Part B Permit*

Application, Chen-Northern 1991). Therefore, no hydrostatic uplift forces are expected to develop in the soil underneath the basins. In addition, the soil under the basins consists primarily of gravel and sand, and contains few or no organic constituents. Therefore, uplift caused by gas production from organic degradation is not anticipated.

Based on the design of the soil-bentonite liner, no structural uplift stresses are present within the lining system (*Additional Information for Project W-105*, *Part B Permit Application*, Chen-Northern 1991).

Regional subsidence is not anticipated because neither petroleum nor extractable economic minerals are present in the strata underlying the LERF Basins, nor is karst (erosive limestone) topography present.

Dike soils and soil/bentonite layers were compacted thoroughly and proof-rolled during construction. Calculation of settlement potential showed that combined settlement for the foundation and soil/bentonite layer is expected to be about 1.1 inches. Settlement impact on the liner and basin stability is expected to be minimal (*Additional Information for Project W-105*, *Part B Permit Application*, Chen-Northern 1991).

C.5.2.1.5 Internal and External Pressure Gradients

Pressure gradients across the liner system from groundwater are anticipated to be negligible. The LERF is about 200 feet above the seasonal high water table, which prevents buildup of water pressure below the liner. The native gravel foundation materials of the LERF are relatively permeable and free draining. The 2 percent slope of the secondary liner prevents the pooling of liquids on top of the secondary liner. Finally, the fill rate of the basins is slow enough (average 50 gallons per minute) that the load of the liquid waste on the primary liner is gradually and evenly distributed.

To prevent the buildup of gas between the liners, each basin is equipped with 21 vents in the primary geomembrane located above the maximum water level that allow the reduction of any excess gas pressure. Gas passing through these vents exit through a single pipe that penetrates the anchor wall into a carbon adsorption filter. This filter extracts nearly all of the organic compounds, ensuring that emissions to the air from the basins are not toxic.

C.5.2.2 Liner System Location Relative to High-Water Table

The lowest point of each LERF Basin is the northwest corner of the sump, where the typical subgrade elevation is 574 feet above mean sea level. Based on data collected from the groundwater monitoring wells at the LERF site, the seasonal high-water table is located approximately 200 feet or more below the lowest point of the basins. This substantial thickness of unsaturated strata beneath the LERF provides ample protection to the liner from hydrostatic pressure because of groundwater intrusion into the soil/bentonite layer. Further discussion of the unsaturated zone and site hydrogeology is provided in Addendum D, “Groundwater Monitoring Plan.”

C.5.2.3 Liner System Foundation

Foundation materials are primarily gravels and cobbles with some sand and silt. The native soils on-site are derived from unconsolidated Holocene sediments. These sediments are fluvial and glaciofluvial sands and gravels deposited during the most recent glacial and postglacial event. Grain-size distributions and shape analyses of the sediments indicate that deposition occurred in a high-energy environment (*Report of Geotechnical Investigation*, *242-A Evaporator and PUREX Interim Storage Basins*, *Hanford Federal Reservation*, W-105, Project No 90-1901, Chen-Northern 1990).

Analysis of five soil borings from the LERF site was conducted to characterize the natural foundation materials and to determine the suitability of on-site soils for construction of the impoundment dikes and determine optimal design factors. Well-graded gravel containing varying amounts of silt, sand, and cobbles comprises the layer in which the basins were excavated. This gravel layer extends to depths of 33 to 36 feet below land surface (*Report of Geotechnical Investigation*, *242-A Evaporator and PUREX Interim Storage Basins*, *Hanford Federal Reservation*, W-105, Project No 90-1901, Chen-Northern 1990).

The basins are constructed directly on the subgrade. Excavated soils were screened to remove oversize cobbles (greater than 6 inches in the largest dimension) and used to construct the dikes.

Settlement potential of the foundation material and soil/bentonite layer was found to be low. The foundation is comprised of undisturbed native soils. The bottom of the basin excavation lies within the well-graded gravel layer, and is dense to very dense. Below the gravel is a layer of dense to very dense poorly-graded and well-graded sand. Settlement was calculated for the gravel foundation soils and for the soil/bentonite layer, under the condition of hydrostatic loading from 22.2 feet of fluid depth. The combined settlement for the soils and the soil/bentonite layer is estimated to be about 1.1 inches. This amount of settlement is expected to have minimal impact on overall liner or basin stability (*Additional Information for Project W-105*, *Part B Permit Application*, Chen-Northern 1991). Settlement calculations are provided in *Calculations for Liquid Effluent Retention Facility Part B Permit Application* (HNF-SD-LEF-TI-005, 1997).

The load bearing capacity of the foundation material, based on the soil analysis discussed previously, is estimated at about 69 pounds per square inch (maximum advisable presumptive bearing capacity [*Basic Soils Engineering*, Hough 1969]). Anticipated static and dynamic loading from a full basin is estimated to be less than 13 pounds per square inch (Section C.5.2.1.3), which provides an ample factor of safety.

When the basins are empty, excess hydrostatic pressure in the foundation materials under the liner system theoretically could result in uplift and damage. However, because the native soil forming the foundations is unsaturated and relatively permeable, and because the water table is located at a considerable depth beneath the basins, any infiltration of surface water at the edge of the basin is expected to travel predominantly downward and away from the basins, rather than collecting under the excavation itself. No gas is expected in the foundation because gas-generating organic materials are not present.

Subsidence of undisturbed foundation materials is generally the result of fluid extraction (water or petroleum), mining, or karst topography. Neither petroleum, mineral resources, nor karst are believed to be present in the sediments overlying the Columbia River basalts. Potential groundwater resources do exist below the LERF. Even if these sediments were to consolidate from fluid withdrawal, their depth most likely would produce a broad, gently sloping area of subsidence that would not cause significant strains in the LERF liner system. Consequently, the potential for subsidence related failures are expected to be negligible.

Borings at the LERF site, and extensive additional borings in the 200 East Area, have not identified any significant quantities of soluble materials in the foundation soil or underlying sediments (*Hydrogeology of the 200 Area Low-Level Burial Grounds - An Interim Report*, PNL-6820, 1989). Consequently, the potential for sinkholes is considered negligible.

C.5.2.4 Liner System Exposure Prevention

Both primary and secondary geomembranes and the floating cover are stabilized with carbon black to prevent degradation from UV light. Furthermore, none of the liner layers experience long-term exposure to the elements. During construction, thin polyethylene sheeting was used to maintain optimum moisture content and provide protection from the wind for the soil/bentonite layer until the secondary geomembrane was laid in place. The secondary geomembrane was covered by the geonet and geotextile as soon as quality control testing was complete. Once the geotextile layer was completed, drainage material immediately was placed over the geotextile. The final (upper) geotextile layer was placed over the drainage gravel and immediately covered by the bentonite carpet liner. This was covered immediately, in turn, by the primary high-density polyethylene liner.

Both high-density polyethylene liners, geotextile layers, and geonet are anchored permanently to a concrete wall at the top of the basin berm. During construction, liners were held in place with many sandbags on both the basin bottoms and side slopes to prevent wind from lifting and damaging the materials. Calculations were performed to determine the amount of fluid needed in a basin to prevent wind lift damage to the primary geomembrane. Approximately 6 to 8 inches of solution are kept in each basin to minimize the potential for uplifting the primary liner (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997).

The upper 11 to 15 feet of the sidewall liner also could experience stresses in response to temperature changes. Accommodation of thermal influences for the LERF geosynthetic layers is affected by inclusion of sufficient slack as the liners were installed. Calculations demonstrate that approximately 2.2 feet of slack is required in the long basin bottom dimension, 1.5 feet across the basin, and 1.1 feet from the bottom of the basin to the top of the basin wall (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997).

The entire lining system is covered by a floating cover that is bolted to the concrete anchor wall (see Section C.5.11).

C.5.2.4.1 Liner Repairs During Operations

Should repair of a basin liner be required while the basin is in operation, a sufficient quantity of the basin contents will be transferred to the 200 Area ETF or another available basin to allow access for the repair activities. After the liner around the leaking or damaged section is cleaned, repairs to the geomembrane will be made as recommended by the liner vendor or others knowledgeable in liner repair; such as a professional engineer that has adequate knowledge and experience to make recommendations in liner repairs. The criteria for selecting a person or company to make liner repair recommendations is determined by the Permittees for the LERF Basins. Selection criteria could include educational background, related experience, and professional qualifications.

C.5.2.4.2 Control of Air Emissions

The LERF Basins use a floating membrane cover that is stretched over each basin to form a continuous barrier over the entire surface area. These covers serve to keep unwanted material from entering the basins, and minimize evaporation of the aqueous waste contents. The covers have chemical/physical properties that maintain the material integrity for the intended service life of the material.

To accommodate volumetric changes in the air between the fluid in the basin and the cover, and to avoid problems related to “sealing” the basins too tightly, each basin is equipped with a carbon filter breather vent system. Any air escaping from the basins must pass through this vent, consisting of a pipe that penetrates the anchor wall and extends into a carbon adsorption filter unit.

C.5.2.5 Liner Coverage

The liner system covers the entire ground surface that underlies the retention basins. The primary liner extends up the side slopes to a concrete anchor wall at the top of the dike encircling the entire basin (Figure C-16).

C.5.3 Prevention of Overtopping

Overtopping prevention is accomplished through administrative controls and liquid-level instrumentation installed in each basin. The instrumentation includes local liquid-level indication as well as remote indication at the 200 Area ETF. Before an aqueous waste is transferred into a basin, administrative controls are implemented to ensure overtopping will not occur during the transfer. The volume of feed to be transferred is compared to the available volume in the receiving basin. The transfer is not initiated unless there is sufficient volume available in the receiving basin or a cut-off level is established. The transfer into the basin would be stopped when this cut-off level is reached.

In the event of a 25-year, 24-hour storm event, precipitation would accumulate on the basin covers. Through the self-tensioning design of the basin covers and maintenance of adequate freeboard, all accumulated precipitation would be contained on the covers and none would flow over the dikes or anchor walls. The 25-year, 24-hour storm is expected to deliver 2.1 inches of rain or approximately 2 feet of snow. Cover specifications include the requirement that the covers be able to withstand the load from this amount of precipitation. Because the cover floats on the surface of the fluid in the basin, the fluid itself provides the primary support for the weight of the accumulated precipitation. Through the cover self-tensioning mechanism, there is ample "give" to accommodate the overlying load without overstressing the anchor and attachment points.

Rainwater and snow evaporate readily from the cover, particularly in the arid Hanford Facility climate, where evaporation rates exceed precipitation rates for most months of the year. The black color of the cover further enhances evaporation. Thus, the floating cover prevents the intrusion of precipitation into the basin and provides for evaporation of accumulated rain or snow.

C.5.3.1 Freeboard

Under current operating conditions, 2 feet of freeboard is maintained at each LERF Basin, which corresponds to an operating level of 22.2 feet, or operating capacity 7.8 million gallons.

C.5.3.2 Immediate Flow Shutoff

The mechanism for transferring aqueous waste is either through pump transfers with on/off switches or through gravity transfers with isolation valves. These methods provide positive ability to shut off transfers immediately in the event of overtopping. Overtopping a basin during a transfer is very unlikely because the low flow rate into the basin provides long response times. At a flow rate of 75 gallons per minute, approximately 11 days would be required to fill a LERF Basin from the maximum operating level to overflow level.

C.5.3.3 Outflow Destination

Aqueous waste in the LERF is transferred routinely to 200 Area ETF for treatment. However, should it be necessary to immediately empty a basin, the aqueous waste either would be transferred to the 200 Area ETF for treatment or transferred to another basin (or basins), whichever is faster. If necessary, a temporary pumping system may be installed to increase the transfer rate.

C.5.4 Structural Integrity of Dikes

The structural integrity of the dikes was certified attesting to the structural integrity of the dikes, signed by a qualified, registered professional engineer.

C.5.4.1 Dike Design, Construction, and Maintenance

The dikes of the LERF are constructed of on-site native soils, generally consisting of cobbles and gravels. Well-graded mixtures were specified, with cobbles up to 6 inches in the largest dimension, but not constituting more than 20 percent of the volume of the fill. The dikes are designed with a 3:1 (3 units horizontal to 1 unit vertical) slope on the basin side, and 2.25:1 on the exterior side. The dikes are approximately 26.9 feet high from the bottom of the basin, and 10 feet above grade.

Calculations were performed to verify the structural integrity of the dikes (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997). The calculations demonstrate that the structural strength of the dikes is such that, without dependence on any lining system, the sides of the basins can withstand the pressure exerted by the maximum allowable quantity of fluid in the impoundment. The dikes have a factor of safety greater than 2.5 against failure by sliding.

C.5.4.2 Dike Stability and Protection

In the following paragraphs, various aspects of stability for the LERF dikes and the concrete anchor wall are presented, including slope failure, hydrostatic pressure, and protection from the environment.

Failure in Dike/Impoundment Cut Slopes. A slope stability analysis was performed to determine the factor of safety against slope failure. The computer program PCSTABL5 from Purdue University, using the modified Janbu Method, was employed to evaluate slope stability under both static and seismic loading cases. One hundred surfaces per run were generated and analyzed. The assumptions used were as follows (*Additional Information for Project W-105*, *Part B Permit Application*, Chen-Northern 1991):

- Weight of gravel: 35 pounds per cubic foot.
- Maximum dry density of gravel: 44.5 pounds per cubic foot.
- Mohr-Coulomb shear strength angle for gravel: minimum 33 degrees.
- Weight of soil/bentonite: 100 pounds per cubic foot.
- Mohr-Coulomb shear strength angle for soil/bentonite: minimum 30 degrees.
- Slope: 3 horizontal: 1 vertical.
- No fluid in impoundment (worst case for stability).
- Soils at in-place moisture (not saturated conditions).

Results of the static stability analysis showed that the dike slopes were stable with a minimum factor of safety of 1.77 (*Additional Information for Project W-105*, *Part B Permit Application*, Chen-Northern 1991).

The standard horizontal acceleration required in the *Hanford Plant Standards*, "Standard Architectural-Civil Design Criteria, Design Loads for Facilities" (HPS-SDC-4.1, DOE-RL 1988), for structures on the Hanford Site is 0.12 g-force. Adequate factors of safety for cut slopes in units of this type generally are considered 1.5 for static conditions and 1.1 for dynamic stability (*Site Investigation Report*, *Non-Drag-Off Landfill Site Low-Level Burial Area No. 5*, *200 West Area*, Golder 1989). Results of the stability analysis showed that the LERF Basin slopes were stable under horizontal accelerations of 0.10 and 0.15 g-force, with minimum factors of safety of 1.32 and 1.17, respectively (*Additional Information for Project W-105*, *Part B Permit Application*, Chen-Northern 1991). Printouts from the PCSTABL5 program are provided in *Calculations for Liquid Effluent Retention Facility Part B Permit Application* (HNF-SD-LEF-TI-005, 1997).

Hydrostatic Pressure. Failure of the dikes due to buildup of hydrostatic pressure, caused by failure of the leachate system or liners, is very unlikely. The liner system is constructed with two essentially impermeable layers consisting of a synthetic layer overlying a soil layer with low-hydraulic conductivity. It would require a catastrophic failure of both liners to cause hydrostatic pressures that could endanger dike integrity. Routine inspections of the leachate detection system, indicating quantities of leachate removed from the basins, provide an early warning of leakage or operational problems that could lead to excessive hydrostatic pressure. A significant precipitation event (e.g., a 25-year, 24-hour storm) will not create a hydrostatic problem because the interior sidewalls of the basins are covered completely by the liners. The covers can accommodate this volume of precipitation without overtopping the dike (Section C.5.3), and the coarse nature of the dike and foundation materials on the exterior walls provides for rapid drainage of precipitation away from the basins.

Protection from Root Systems. Risk to structural integrity of the dikes because of penetrating root systems is minimal. Excavation and construction removed all vegetation on and around the impoundments, and native plants (such as sagebrush) grow very slowly. The large grain size of the cobbles and gravel used as dike construction material do not provide an advantageous germination medium for native plants. Should plants with extending roots become apparent on the dike walls, the plants will be controlled with appropriate herbicide application.

Protection from Burrowing Mammals. The cobble size materials that make up the dike construction material and the exposed nature of the dike sidewalls do not offer an advantageous habitat for burrowing mammals. Lack of vegetation on the LERF site discourages foraging. The risk to structural integrity of the dikes from burrowing mammals is therefore minimal. Periodic visual inspections of the dikes provide observations of any animals present. Should burrowing mammals be noted on-site, appropriate pest control methods such as trapping or application of rodenticides will be employed.

Protective Cover. Approximately 3 inches of crushed gravel serve as the cover of the exterior dike walls. This coarse material is inherently resistant to the effect of wind because of its large grain size. Total annual precipitation is low (6.3 inches) and a significant storm event (e.g., a 25-year, 24-hour storm) could result in about 2.1 inches of precipitation in a 24-hour period. The absorbent capacity of the soil exceeds this precipitation rate; therefore, the impact of wind and precipitation run-on to the exterior dike walls will be minimal.

C.5.5 Transfer Lines Secondary Containment and Leak Detection

2025ED Load-In Station to Surge Tank Distribution Point. Aqueous waste is transferred from a pipeline at the 2025ED Load-In Station to either the surge tank or LERF through a distribution point located at the surge tank berm. Leak detection consists of low-point electronic leak detection elements. The leak detection system alarms in the 200 Area ETF Control Room if a leak develops. If the electronic leak detection system is not available, visual inspection can be employed by opening a drain valve in the Load-In Station tank 59A-TK-1 secondary containment pit/sump to check for liquid in the annular space between the inner and outer pipe.

LERF Basins to/from 200 Area ETF. Aqueous waste from the LERF basins to the 200 Area ETF surge tank is transferred through one of two buried fiberglass pipelines interfacing with LERF Catch Basin 242AL-43 or LERF Catch Basin 242AL-44. Leak detection consists of low-point electronic leak detection elements. The leak detection system alarms in the 200 Area Control Room if a leak develops. If the electronic leak detection system is not available, visual inspection can be employed by opening a drain valve in the surge tank secondary containment (200 Area ETF end of the transfer pipelines) to check for no liquid in the annular space between the inner and outer pipe during waste transfers.

Inter-Basin Transfers. Within the LERF catch basins, aboveground piping serves to transfer waste from one basin to another. Inter-basin piping interfaces at each catch basin. Drawing H-2-88766, Sheets 1 through 4, provide schematic diagrams of the piping system at LERF. Inter-basin piping is sloped from Basin 42 toward Basin 44. Leak detection consists of single-low point electronic leak detection elements located at the end of the encasement pipe at Basin 43 and Basin 44, which alarm in the 200 Area ETF Control Room. A catch basin is provided at the northwest corner of each basin where the inlet pipes, leachate risers, and transfer pipe risers emerge from the basin. The catch basin consists of an 8-inch-thick concrete pad at the top of the dike. The perimeter of the catch basin has an 8-inch-high curb and the concrete is coated with a chemical resistant epoxy sealant. The concrete pad, which has an electronic leak detection element, is sloped so that any leaks or spills from the piping or pipe connections will drain into the basin, which have electronic leak detection elements that alarm in the ETF Control Room. The catch basin provides an access point for inspecting, servicing, and operating various systems such as transfer valving, leachate level instrumentation, and leachate pump. Drawing H-2-79593 provides a schematic diagram of the catch basins.

WTP-EMF to LERF Catch Basin 242AL-42. The process condensate transfer line (4”-WTP-001-M17) from WTP-EMF to LERF Catch Basin 242AL-42 is centrifugally cast from LERF Basin 42 to Node 8A and is stainless steel from Node 8A to WTP-EMF. The piping material is ASTM D-2296, “Filament Wound Fiberglass Resin Pipe.” The 4-inch carrier piping is centered and supported within 8-inch containment piping. Pipe supports are fabricated of the same material as the pipe, and meet the strength requirements of ASME B31.3 (ASME 1996) for dead weight, thermal, and seismic loads. The transfer line (4”-WTP-001-M17) leaving the WTP-EMF tank system is considered ancillary equipment to the LERF and 200 Area ETF, from the WTP fence line up to LERF Catch Basin 242AL-42, valve 80W-005; after valve 80W-005the components belong to the surface impoundment.

The process condensate from WTP-EMF can be transferred to LERF by using a pump located at WTP-EMF, and approximately 6,340 feet of pipe (from Node 8A to LERF), consisting of a 4-inch carrier pipe within an 8-inch outer containment pipeline. The encased fiberglass transfer line (4”-WTP-001-M17) slopes toward LERF Catch Basin 242AL-42, and runs below grade up to the LERF Basins. The encasement line (8”-ENC-M17) and WTP-EMF transfer line (4”-WTP-001-M17) is equipped with a single-point electronic leak detection element at Catch Basin 242AL-42, and sight glass (FG-80W-001), located in close proximity to the electronic leak detection element at LERF Catch Basin 242AL-42.

If a leak develops in the primary pipe, fluid will travel down the interior of the secondary containment pipe to a leak detection system located at LERF Catch Basin 242AL-42. Upon detection of a leak, a general alarm sounds in the 200 Area ETF Control Room. Any leaked waste into the encasement line is gravity drained to LERF Basin 42. If the electronic leak detection system is not available, visual inspection can be employed at the sight glass (FG-80W-001), located in LERF Catch Basin 242AL-42. Upon verification of a leak, the 200 Area ETF shift manager will direct shutdown of the aqueous waste through the transfer line(s). The pump located at WTP-EMF is shut down, stopping the flow of aqueous waste through the transfer pipeline.

242-A Evaporator to LERF. The PC-5000 transfer line is described in the 242-A Evaporator Permit. Aqueous waste from the 242-A Evaporator is transferred to the LERF using the PC-5000 transfer line. The PC-5000 transfer line leaving the 242-A Evaporator is considered ancillary equipment to the 242-A Evaporator up to LERF Catch Basin 242AL-43. The 242-A Evaporator is responsible for monitoring of the PC-5000 transfer line.

WTP-EMF Backup Transfer Line. The WTP-EMF Backup Transfer Line to PC-5000 to LERF Catch Basin 242AL-43 is described in the 242-A Evaporator Permit. Aqueous waste from WTP-EMF can be transferred to PC-5000 to LERF using the backup transfer pipeline (3”-WTP-002-M17) that connects to PC-5000 for transfer to LERF Basin 242AL-43. The backup transfer pipeline is ancillary equipment to the 242-A Evaporator up to LERF Catch Basin 242AL-43. The 242-A Evaporator is responsible for monitoring the backup transfer line.

If a leak or spill of dangerous and/or mixed waste is detected in the secondary containment, the following actions will be taken:

- Immediately and safely contain or stop the flow of dangerous waste into the tank or secondary containment.
- Determine the source of the dangerous waste.
- Remove the dangerous waste from secondary containment pursuant to WAC 173-303-640(7)(b). The waste removed from secondary containment areas will be managed as dangerous and/or mixed waste.
- If the cause of the release has not damaged the integrity of the tank system, the Permittee may return the tank system to service pursuant to WAC 173-303-640(7)(e)(ii). In such a case, the Permittee will take action to ensure the incident that caused liquid to enter the secondary containment will not reoccur.

- If the source of the dangerous waste and/or mixed waste is determined to be a leak from the primary containment, or the tank system is unfit for use as determined through an integrity assessment or other inspection, the Permittee must comply with the requirements of WAC 173-303-640(7) and take the following actions [WAC 173-303-640(5)(c)]:
  - Close the tank system according to procedures in WAC 173-303-640(7)(e)(i); or
  - Repair and re-certify [in accordance with WAC 173-303-810(13)(a)] the tank system before the tank system is placed back into service [WAC 173-303-640(7)(e) and (f) and WAC 173-303-806(4)(c)(vii)].
- The Permittees will notify and report to Washington State Department of Ecology (Ecology) any releases to the environment in accordance with Permit Conditions I.E.15 and I.E.16 [WAC 173-303-640(7)(d)].
- If liquids (e.g. dangerous and/or mixed waste, leaks and spills, precipitation, firewater, liquids from damaged or broken pipes) cannot be removed from the secondary containment system within 24 hours, Ecology will be verbally notified within 24 hours of determination that the liquid cannot be removed.
- If the liquids cannot be removed within 24 hours, the Permittees will provide Ecology with a written demonstration within seven business days, in accordance with WAC 173-303-640(4)(c)(iv), WAC 173-303-640(7)(b)(ii), and WAC 173-303-806(4)(c)(vii). The written demonstration will identify at a minimum:
  - Reasons for delayed removal.
  - Measures implemented to ensure continued protection of human health and the environment.
  - Current actions being taken to remove liquids from secondary containment.
- The Permittees will document in the Operating Record the actions/procedures taken to comply with the above conditions in accordance with WAC 173-303-640(6)(d).

C.5.5.1 Integrity Assessment

Although an integrity assessment is not required for piping associated with surface impoundments, an assessment of the transfer lines was performed, including a hydrostatic leak/pressure test at 150 pounds per square inch gauge. A statement by an IQRPE attesting to the integrity of the piping system is included in *Integrity Assessment Report for the 242-A Evaporator/LERF Waste Transfer Piping, Project W105* (WHC-SD-WM-ER-112, 1993), along with the results of the leak/pressure test.

C.5.6 Double Liner and Leak Detection, Collection, and Removal System

The double-liner system for LERF is discussed in Section C.5.2. The leachate detection, collection, and removal system (Figures C-16 and C-17) as designed and constructed to remove leachate that might permeate the primary liner. System components for each basin include:

- 12-inch layer of drainage gravel below the primary liner at the bottom of the basin.
- Geonet below the primary liner on the sidewalls to direct leachate to the gravel layer.
- 10 x 6 x 1-feet-deep leachate collection sump consisting of a 1-inch high-density polyethylene flat stock, geotextile to trap large particles in the leachate, and 60-mil (0.06 inch) high-density polyethylene rub sheet set on the secondary liner.
- 10-inch and 4-inch perforated leachate high-density polyethylene riser pipes from the leachate collection sump to the catch basin northwest of the basin.
- Leachate collection sump level instrumentation installed in the 4-inch riser pipe.
- Level sensors, submersible leachate pump, and 1.5-inch fiberglass-reinforced epoxy thermoset resin pressure piping installed in the 10-inch riser pipe.

- Piping at the catch basin to route the leachate through 1.5-inch high-density polyethylene pipe back to the basins.

The bottom of the basins has a two percent slope to allow gravity flow of leachate to the leachate collection sump. This exceeds the minimum of 1 percent slope required by WAC 173-303-650(j) for new surface impoundments. Material specifications for the leachate collection system are given in Section C.5.2.1.1.

Calculations demonstrate that fluid from a small hole (0.08 inch) (*Requirements for Hazardous Waste Landfill Design, Construction, and Closure*, EPA/625/4-89/022, 1989, p. 122) at the furthest end of the basin, under a low head situation, would travel to the sump in less than 24 hours (*Calculations for Liquid Effluent Retention Facility Part B Permit Application*, HNF-SD-LEF-TI-005, 1997). Additional calculations indicate the capacity of the pump to remove leachate is sufficient to allow time to readily identify a leak and activate emergency procedures (HNF-SD-LEF-TI-005, 1997).

The fluid level in each leachate sump is required to be maintained below 13 inches to prevent significant liquid backup into the drainage layer. The leachate pump is activated when the liquid level in the sump reaches about 11 inches, and is shut off when the sump liquid level reaches about 7 inches. This operation may be done either manually or automatically. Liquid level control is accomplished with conductivity probes that trigger relays selected specifically for application to submersible pumps and leachate fluids. A flow meter/totalizer on the leachate return pipe measures fluid volumes pumped and pumping rate from the leachate collection sumps, and indicates volume and flow rate on local readouts. In addition, a timer on the leachate pump tracks the cumulative pump operating time. Other instrumentation provided is real-time continuous level monitoring with readout at the catch basin. Leachate levels are monitored at least weekly. A sampling port is provided in the leachate piping system at the catch basin. The leak rate through the primary liner can be calculated using two methods: 1) measured as the leachate flow meter/totalizer readings (flow meters/totalizers are located on the outflow line from the collection sumps in the bottom of the LERF Basins), and 2) calculated using the pump operating time readings multiplied by the pump flow rate (the pump runs at a constant flow rate). Calculations using either method are sufficient for compliance. For more information on inspections, refer to Addendum I.

The stainless steel leachate pump delivers 5 gallons per minute. The leachate pump returns draw liquid from the sump via 1.5-inch pipe and discharges into the basin through 1.5-inch high-density polyethylene pipe.

C.5.7 Construction Quality Assurance

The construction quality assurance plan and complete report of construction quality assurance inspection and testing results are provided in *242-A Evaporator Interim Retention Basin Construction Quality Assurance Plan* (CQAPLN2.QS.1149, Rev. 4, KEH 1991). A general description of construction quality assurance procedures is outlined in the following paragraphs.

For excavation of the basins and construction of the dikes, regular inspections were conducted to ensure compliance with procedures and drawings, and compaction tests were performed on the dike soils.

For the soil/bentonite layer, test fills were first conducted in accordance with EPA guidance to demonstrate compaction procedures and to confirm compaction and permeability requirements can be met. The ratio of bentonite to soil and moisture content was monitored; lifts did not exceed 6 inches before compaction, and specific compaction procedures were followed. Laboratory and field tests of soil properties were performed for each lift and for the completed test fill. The same suite of tests was conducted for each lift during the laying of the soil/bentonite admixture in the basins.

Geotextiles and geomembranes were laid in accordance with detailed procedures and quality assurance programs provided by the manufacturers and installers. These included destructive and nondestructive tests on the geomembrane seams, and documentation of field test results and repairs.

C.5.8 Proposed Action Leakage Rate and Response Action Plan

An action leakage rate limit is established where action must be taken due to excessive leakage from the primary liner. The action leak rate is based on the maximum design flow rate the leak detection system can remove without the fluid head on the bottom liner exceeding 12 inches. The limiting factor in the leachate removal rate is the hydraulic conductivity of the drainage gravel. An action leakage rate (also called the rapid or large leak rate) of 2,100 gallons per acre per day was calculated for each basin (*Calculation of the Rapid or Large Leak Rate for LERF Basins in the 200 East Area*, WHC-SD-EN-TI-009, 1992).

When it is determined that the action leakage rate has been exceeded, the response action plan will follow the actions in WAC 173-303-650(11)(b) and (c), which includes notification of Ecology in writing within 7 days, assessing possible causes of the leak, and determining whether waste receipt should be curtailed and/or the basin emptied.

C.5.9 Dike Structural Integrity Engineering Certification

The structural integrity of the dikes was certified attesting to the structural integrity of the dikes, signed by a qualified, registered professional engineer.

C.5.10 Management of Ignitable, Reactive, or Incompatible Wastes

Although ignitable or reactive aqueous waste might be received in small quantities at LERF, such aqueous waste is mixed with dilute solutions in the basins, removing the ignitable or reactive characteristics. For compatibility requirements with the LERF liner, refer to Addendum B, “Waste Analysis Plan.”

C.5.11 Cover Construction, Materials, and Operation

Each basin is equipped with a floating cover stretched over each basin above the primary liner. The floating covers prevent evaporation and intrusion from dust, precipitation, vegetation, animals, and birds. The three LERF Basins 42, 43, and 44 either have a very low-density polyethylene cover (VLDPE), or a chlorosulfonated polyethylene (CSPE) cover.

Both VLDPE and CSPE covers contain carbon black for UV light protection, and anti-oxidants to prevent heat degradation. Both cover materials were determined to be compatible with the LERF Basin waste acceptance criteria. The VLDPE covers have seaming enhancers to improve the covers ability to be welded; while the CSPE cover uses modern seaming equipment that does not need seaming enhancers for the material to perform its required function. Typical manufacturer's limited warranty for weathering of VLDPE products is 20 years (Poly America, undated), whereas CSPE provides a 30-year limited manufacturer's warranty for weathering. This provides a margin of safety for the anticipated use of the LERF for aqueous waste storage.

The covers are anchored and tensioned at the concrete wall at the top of the dikes, using a patented mechanical tensioning system. Figure C-16 depicts the tension mechanism and the anchor wall at the perimeter of each basin. A patented tensioning system is employed to prevent wind from lifting the cover and automatically accommodate changes in liquid level in the basins. The cover tension mechanism consists of a cable running from the flexible geosynthetic cover over a pulley on the tension tower (located on the concrete anchor wall) to a dead man anchor. These anchors (blocks) hang from the cables inside of the tension towers. The anchor wall also provides for solid attachment of the liner layers and the cover, using a 1/4-inch batten and neoprene gasket to bolt the layers to the concrete wall, effectively sealing the basin from the intrusion of light, precipitation, and airborne dust (Figure C-16). Thermal stresses also are experienced by the floating cover. Sufficient slack was included in the design to accommodate thermal contraction and expansion.

C.6 Air Emissions Control

This section addresses the 200 Area ETF requirements of Air Emission Standards for Process Vents, under 40 CFR 264, Subpart AA (WAC 173-303-690 incorporated by reference) and Subpart CC. The requirements of 40 CFR 264, Subpart BB (WAC 173-303-691) is not applicable because aqueous waste with 10 percent or greater organic concentration would not be acceptable for processing at the ETF.

C.6.1 Applicability of Subpart AA Standards

The Evaporator Vapor Body Vessel and thin film dryer perform operations that specifically require evaluation for applicability of WAC 173-303-690. Aqueous waste in these units routinely contains greater than 10 parts per million (ppm) concentrations of organic compounds and are, therefore, subject to air emission requirements under WAC 173-303-690. Organic emissions from all affected process vents on the Hanford Facility must be less than 3 pounds per hour and 3.1 tons per year, or control devices must be installed to reduce organic emissions by 95 percent.

The VOC system provides a process vent system. This system provides a slight vacuum on the 200 Area ETF process vessels and tanks (see Section C.2.5.2). Two vessel vent header pipes combine and enter the VOC system filter unit consisting of a demister, electric heater, prefilter, high-efficiency particulate air filters, activated carbon absorber, and two exhaust fans (one fan in service while the other is backup). The VOC system filter unit is located in the high-efficiency particulate air filter room west of the 2025E Process Area. The VOC system exhaust discharges into the larger building ventilation system, with the exhaust fans and stack located outside and immediately west of the ETF. The exhaust stack discharge point is 51 feet above ground level.

The annual average flow rate for the 200 Area ETF stack (which is the combined VOC and building exhaust flow rates) is 56,000 cubic feet per minute with a total annual flow of approximately 2.9E+10 cubic feet. During waste processing, the airflow through just the VOC system is about 800 standard cubic feet per minute.

Organic emissions occur during waste processing, which occurs less than 310 days each year (i.e., 85 percent operating efficiency). This operating efficiency represents the maximum annual operating time for the ETF, as shutdowns are required during the year for planned maintenance outages and for reconfiguring the 200 Area ETF to accommodate different aqueous waste.

C.6.2 Process Vents - Demonstrating Compliance

This section outlines how the 200 Area ETF complies with the requirements and includes a discussion of the basis for meeting the organic emissions limits, calculations demonstrating compliance, and conditions for reevaluation.

C.6.2.1 Basis for Meeting Limits/Reductions

The 242-A Evaporator and the 200 Area ETF are currently the only operating TSD units that contribute to the Hanford Facility volatile organic emissions under 40 CFR 264, Subpart AA. The combined release rate is currently well below the threshold of 3 pounds per hour and 3.1 tons per year of volatile organic compounds. As a result, the 200 Area ETF meets these standards without the use of air pollution control devices.

The amount of organic emissions could change as waste streams are changed, or TSD units are brought online or are deactivated. The organic air emissions summation will be re-evaluated periodically as condition warrants. Operations of the TSD units operating under 40 CFR 264, Subpart AA, will be controlled to maintain Hanford Facility emissions below the threshold limits or pollution control device(s) will be added, as necessary, to achieve the reduction standards specified under 40 CFR 264, Subpart AA.

C.6.2.2 Demonstrating Compliance

Calculations to determine organic emissions are performed using the following assumptions:

- Maximum flow rate from LERF to 200 Area ETF is 150 gallons per minute.
- Emissions of organics from tanks and vessels upstream of the UV/OX process are determined from flow and transfer rates given in *Clean Air Act Requirements*, *WAC 173-400*, *and As-built Documentation*, *Project C-018H*, *242-A Evaporator/PUREX Plant Process Condensate Treatment Facility* (Adtechs 1995).
- UV/OX reaction rate constants and residence times are used to determine the amount of organics, which are destroyed in the UV/OX process. These constants are given in *200 Area Effluent Treatment Facility Delisting Petition* (DOE/RL-92-72, 1993).
- All organic compounds that are not destroyed in the UV/OX process are assumed to be emitted from the tanks and vessels into the VOC system.
- No credit for removal of organic compounds in the VOC system carbon absorber unit is taken. The activated carbon absorbers are used if required to reduce organic emissions.

The calculation to determine organic emissions consists of the following steps:

1. Determine the quantity of organics emitted from the tanks or vessels upstream of the UV/OX process, using transfer rate values.
2. Determine the concentration of organics in the waste after the UV/OX process using UV/OX reaction rates and residence times. If the 200 Area ETF is configured such that the UV/OX process is not used, a residence time of zero is used in the calculations (i.e., none of the organics are destroyed).
3. Assuming all the remaining organics are emitted, determine the rate, which the organics are emitted using the feed flow rate and the concentrations of organics after the UV/OX process.
4. The amount of organics emitted from the VOC system is the sum of the amount calculated in steps 1 and 3.

The organic emission rates and quantity of organics emitted during processing are determined using these calculations and are included in the Hanford Facility Operating Record, LERF and 200 Area ETF file.

C.6.2.3 Reevaluating Compliance with Subpart AA Standards

Calculations to determine compliance with Subpart AA will be reviewed when any of the following conditions occur at the 200 Area ETF:

- Changes in the maximum feed rate to the 200 Area ETF (i.e., greater than the 150 gallons per minute flow rate).
- Changes in the configuration or operation of the 200 Area ETF that would modify the assumptions given in Section C.6.2.2 (e.g., taking credit for the carbon absorbers as a control device).
- Annual operating time exceeds 310 days.

C.6.3 Applicability of Subpart CC Standards

The air emission standards of 40 CFR 264, Subpart CC apply to tank, surface impoundment, and container storage units that manage wastes with average volatile organic concentrations equal to or exceeding 500 ppm by weight, based on the hazardous waste composition at the point of origination (61 Federal Register [FR] 59972). However, TSD units that are used solely for management of radioactive mixed waste are exempt. Mixed waste is managed at the LERF and 200 Area ETF and dangerous waste could be treated and stored at these TSD units.

C.6.3.1 Demonstrating Compliance with Subpart CC for Tanks

Since the 200 Area ETF tanks already have process vents regulated under 40 CFR 264, Subpart AA (WAC 173-303-690), they are exempt from Subpart CC [40 CFR 264.1080(b)(8)].

C.6.3.2 Demonstrating Compliance with Subpart CC for Containers

Container Level 1 and Level 2 standards are met at the 200 Area ETF by managing all dangerous and/or mixed wastes in DOT containers [40 CFR 264.1086(f)]. Level 1 containers are those that store more than 3.5 cubic feet and less than or equal to 16 cubic feet, and those that store more than 121 gallons that are not in light material service with a total organic concentration less than 20 percent by weight. Level 2 containers are used to store more than 16 cubic feet of waste, which are in "light material service." Light material service is defined where a waste in the container has one or more organic constituents with a vapor pressure greater than 0.04 pounds per square inch at 68˚F, and the total concentration of such constituents is greater than or equal to 20 percent by weight.

The monitoring requirements for Level 1 and Level 2 containers must include a visual inspection when the container is received at the 200 Area ETF, when waste is initially placed in the container, and at least once every 12 months when stored on-site for 1 year or more.

If compliant containers are not used at the 200 Area ETF, alternate container management practices are used that comply with the Level 1 standards. Specifically, the Level 1 standards allow for "A container equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position there are no visible holes, gaps, or other open spaces into the interior of the container. The cover may be a separate cover installed on the container...or may be an integral part of the container structural design…" [40 CFR 264.1086(c)(1)(ii)]. An organic-vapor-suppressing barrier, such as foam, may also be used [40 CFR 264.1086(c)(1)(iii)]. Section C.3 provides detail on container management practices at the 200 Area ETF.

Container Level 3 standards apply when a container is used for the "…treatment of a hazardous waste by a waste stabilization process…" [40 CFR 264.1086(2)]. Because treatment in containers using the stabilization process is not provided at the 200 Area ETF, these standards do not apply.

C.6.3.3 Demonstrating Compliance with Subpart CC for Surface Impoundments

The LERF Basins rely on the mixed waste exemption to implement Subpart CC emission standards [WAC 173-303-692(1)(b)(vi)]. Should the LERF Basins receive non-radioactive dangerous waste, the volatile organic concentration at the point of waste origination shall be less than 500 ppm by weight [40 CFR 264.1082(c)(1)]. These waste streams may be combined with mixed waste in the LERF Basins without affecting the use of the mixed waste exemption because the non-radioactive dangerous waste streams would be below 500 ppm by weight volatile organic concentration, as designated at the point of origin. Non-dangerous radioactive waste, state-only dangerous waste, and non-radioactive/non-dangerous waste may also be combined with mixed waste in the LERF Basins without affecting the use of the mixed waste exemption.

C.7 Engineering Drawings

C.7.1 Liquid Effluent Retention Facility

Drawings of the containment systems at the LERF are summarized in Table C-2. Because the failure of these containment systems at LERF could lead to the release of dangerous waste into the environment, modifications that affect these containment systems will be submitted to Ecology, as a Class 1, 2, or 3 Permit modification, as required by WAC 173-303-830.

Table C-2 Liquid Effluent Retention Facility Containment System

LERF System	Drawing Number	Drawing Title
Bottom Liner	H-2-79590, Sheet 1	Civil Plan, Sections & Det; Cell Basin Bottom Liner
Top Liner	H-2-79591, Sheet 1	Civil Plan, Sections & Det; Cell Basin Top Liner
Catch Basin	H-2-79593, Sheet 1, 3-5	Civil Plan, Sections & Det; Catch Basin

The drawings identified in Table C-3 illustrate the piping and instrumentation configuration within LERF, and of the transfer piping systems between the LERF and the 242-A Evaporator. These drawings are provided for general information, and to demonstrate the adequacy of the design of the LERF as a surface impoundment.

Table C-3 Liquid Effluent Retention Facility Piping and Instrumentation

LERF System	Drawing Number	Drawing Title
Transfer piping LERF Catch Basin 242AL-42 to WTP	H-2-838045, Sheet 2	Civil, Piping Plan Radioactive Process Condensate 4”-WTP-001-M17
LERF Piping and Instrumentation	H-2-88766, Sheet 1	Piping and Instrumentation Diagram (P&ID); LERF Basin & ETF Influent Evaporator
	H-2-88766, Sheet 2	P&ID; LERF Basin & ETF Influent
	H-2-88766, Sheet 3	P&ID; LERF Basin & ETF Influent
	H-2-88766, Sheet 4	P&ID; LERF Basin & ETF Influent
Legend	H-2-89351, Sheet 1	P&ID - Legend

C.7.2 200 Area Effluent Treatment Facility

Drawings of the secondary containment systems for the 200 Area ETF containers, and tanks and process units, and for Load-In Station tank 59A-TK-1 are summarized in Table C-4. Because the failure of the secondary containment systems could lead to the release of dangerous waste into the environment, modifications, which affect the secondary containment systems, will be submitted to the Ecology, as a Class 1, 2, or 3 Permit modification, as required by WAC 173-303-830.

Table C-4 200 Area Effluent Treatment Facility Secondary Containment Systems

200 Area ETF Process Unit	Drawing Number	Drawing Title
Surge Tank, Process/2025E Container Storage Areas and Trenches - Foundation and Containment	H-2-89063, Sheet 1	Structural Foundation & Grade Beam Plan
Sump Tank Containment	H-2-89065, Sheet 1	Structural Foundation, Sections & Details
Verification Tank Foundation and Containment	H-2-89068, Sheet 1	Structural Verification Tank Foundations
2025ED Load-In Station Foundation and Containment	H-2-838968, Sheet 1	Structural ETF Load-In Expansion Concrete Pad Design
	H-2-817970, Sheet 1	Structural ETF Truck Load-In Facility Plans and Sections
2025EG Backup Load-In Station Foundation and Containment	H-2-838970, Sheet 1	Structural ETF Load-In Backup STA Foundation and Slab Plan
	H-2-838970, Sheet 2	Structural ETF Load-In Backup STA Section and Details

The drawings identified in Table C-5 provide an illustration of the piping and instrumentation configuration for the major process units and tanks at the 200 Area ETF, and Load-In Station tank 59A-TK-1. Drawings of the transfer piping systems between the LERF and 200 Area ETF, and between the 2025ED Load-In Station, 2025EG Backup Load-In Station, and the 200 Area ETF also are presented in this table. These drawings are provided for general information, and to demonstrate the adequacy of the design of the tank systems.

Table C-5 Major Process Units and Tanks at 200 Area Effluent Treatment Facility

200 Area ETF Process Unit	Drawing Number	Drawing Title
2025ED Load-In Station	H-2-817974, Sheets 1 & 2	Mechanical ETF Load-In Expansion P&ID
2025EG Backup Load-In Station	H-2-838984, Sheets 1, 2, & 3	Mechanical ETF Load-In Backup STA P&ID
Surge Tank	H-2-89337, Sheet 1	P&ID - Surge Tank System
UV/Oxidation	H-2-88976, Sheet 1	P&ID - UV Oxidizer Part 1
UV/OX	H-2-89342, Sheet 1	P&ID - UV Oxidizer Part 2
RO	H-2-88980, Sheet 1	P&ID - 1st RO Stage
RO	H-2-88982, Sheet 1	P&ID - 2nd RO Stage
IX/Polishers	H-2-88983, Sheet 1	P&ID - Polisher
Verification Tanks	H-2-88985, Sheet 1	P&ID - Verification Tank System
Concentrate Tanks	H-2-88988, Sheets 1 & 2	P&ID - Concentrate Receiving System
Evaporator Vapor Body Vessel	H-2-89335, Sheet 1	P&ID - Evaporator
Thin Film Dryer	H-2-88989, Sheet 1	P&ID - Thin Film Dryer

Table C-5 Major Process Units and Tanks at 200 Area Effluent Treatment Facility

200 Area ETF Process Unit	Drawing Number	Drawing Title
Transfer Piping from LERF to Building 2025E	H-2-88768, Sheet 1	Piping Plan/Profile 4"-60M-002-M17 and 3"-60M-001-M17
Transfer Piping from 2025ED Load-In Station to Building 2025E	H-2-817969, Sheet 1	Civil - ETF Truck Load-In Facility Site Plan

1

Table C-6 200 Area Effluent Treatment Facility Tank Systems Information

Tank Description	Material of Construction[1]	Maximum Tank Capacity[2] (gallons)	Inner (feet)	Height (feet)	Shell Thickness[3] inch
Load-In Station Tank 59A-TK-1	FRP	6,900	10	11.5	1/4
Filter Drain Sump Tank 59A-TK-2	304 SS	145	2.6	5.15	0.105
Filter Drain Sump Tank 59A-TK-3	304 SS	45	2 x 2	1.5	0.105
Filter Drain Sump Tank 59A-TK-4	304 SS	145	2.6	5.15	0.105
Surge Tank 60A-TK-1	304 SS	122,000	26	30	3/16
pH Adjustment Tank 60C-TK-1	304 SS	4,400	10	8	1/4
First RO Feed Tank 60F-TK-l	304 SS	5,400	10	10.5	1/4
Second RO Feed Tank 60F-TK-2	304 SS	2,300	10 x 5	5	1/4
Effluent pH Adjustment Tank 60C-TK-2	304 SS	3,800	10	8	1/4
Verification Tanks 60H-TK-1A 60H-TK-1B 60H-TK-1C	Carbon Steel with Epoxy Lining	799,000	60	37.5	5/16 lower course, 1/4 all other
Secondary Waste Receiving Tanks 60I-TK-1A 60I-TK-1B	304 SS	19,500	14	18.7	1/4
Concentrate Tanks 60J-TK-1A 60J-TK-1B	316L SS	6,600	10	12.5	1/4

Table C-6 200 Area Effluent Treatment Facility Tank Systems Information

Tank Description	Material of Construction[1]	Maximum Tank Capacity[2] (gallons)	Inner (feet)	Height (feet)	Shell Thickness[3] inch
Evaporator Vapor Body Vessel 60I-EV-1	Alloy 625	5,000	8	22	3/16
Distillate Flash Tank 60I-TK-2	304 SS	250	2.5	7	3/16
Sump Tank 1 20B-TK-l	304 SS	1,800	5 x 5	11.08	3/16
Sump Tank 2 20B-TK-2	304 SS	1,800	5 x 5	10.25	3/16

[1]Type 304 SS, 304L, 316 SS and alloy 625 provide corrosion protection.

[2]The structural design capacity is based on the tank dimensions (reference CHPRC-01900), excluding tanks 59A-TK-3, and 59A-TK-4.

[3]The nominal thickness of 200 Area ETF tanks is represented.

304 SS = stainless steel type 304 or 304L. 316L SS = stainless steel type 316L.

FRP = Fiberglass-reinforced plastic.

Table C-7 200 Area Effluent Treatment Facility Additional Tank System Information

Tank Description	Liner Material	Pressure Control	Foundation Material	Structural Support	Seam	Connection
Load-In Station Tank 59A-TK-1	None	Vent to Atmosphere	Concrete Slab	Bolted to Concrete	FRP	Flanged
Filter Drain Sump Tanks 59A-TK-2 59A-TK-3 59A-TK-4	None	304 SS	Concrete Slab	Bolted to Concrete	Welded	Flanged
Surge Tank 60A-TK-1	None	Pressure indicator and Vacuum Breaker Valve/Vent to VOG	Reinforced Concrete Ring Plus Concrete Slab	Anchor chairs welded to shell	Welded	Flanged
pH Adjustment Tank 60C-TK-1	None	Pressure indicator/ Vent to VOG	Concrete Slab	Saddle support material 304 SS	Welded	Flanged
First RO Feed Tank 60F-TK-l	None	Pressure indicator/ Vent to VOG	Concrete Slab	Saddle material Carbon Steel, support material 304 SS	Welded	Flanged
Second RO Feed Tank 60F-TK-2	None	Pressure indicator/Vent to VOG	Skid on 6” Concrete Slab	Saddle material Carbon Steel, support material 304 SS	Welded	Flanged

Table C-7 200 Area Effluent Treatment Facility Additional Tank System Information

Tank Description	Liner Material	Pressure Control	Foundation Material	Structural Support	Seam	Connection
Effluent pH Adjustment Tank 60C-TK-2	None	Pressure indicator/Vent to VOG	Concrete pad on Concrete Slab	304 SS	Welded	Flanged
Verification Tanks 60H-TK-lA 60H-TK-1B 60H-TK-1C	Epoxy	Pressure indicator/ Filtered Vent to Atmosphere	Tank bottom resting on a sand filled base with HDPE. HDPE liner is attached to reinforced concrete ring beam with drain to secondary containment.	Reinforced concrete ring beam	Welded	Flanged
Secondary Waste Receiving Tanks 60I-TK-1A 60I-TK-1B	None	Pressure indicator/Vent to VOG	6” Concrete Slab	Saddle material Carbon Steel, support material 304 SS	Welded	Flanged
Concentrate Tanks 60J-TK-1A 60J-TK-1B	None	Pressure indicator/Vent to VOG	6” Concrete Slab	Saddle and support material Carbon Steel	Welded	Flanged
Evaporator Vapor Body Vessel 60I-EV-1	None	Pressure Control Valve Vapor/Vent to DFT/VOG	18” Concrete Slab	Skid mounted	Welded	Flanged
Distillate Flash Tank 60I-TK-2	None	Pressure Relief Valve/ Vent to Vent Gas Cooler/ VOG	18” Concrete Slab	Saddle mounted Carbon Steel I-Beam and Cradle	Welded	Flanged
Sump Tank 1 20B-TK-l	None	Vent to VOG	In-ground Concrete slab and wall enclosed system	Reinforced Concrete	Welded	Flanged
Sump Tank 2 20B-TK-2	None	Vent to VOG	In-ground Concrete slab and wall enclosed system	Reinforced Concrete	Welded	Flanged

DFT = distillate flash tank.

VOG = vessel off gas system.

Table C-8 Ancillary Equipment and Material Data

System	Ancillary Equipment	Number	Material
Load-In Station Tank 59A-TK-1	Load-In Station/ Transfer Pumps (2)	P-103A/-103B	316 SS
		P-001A/-001B	Cast Iron
	Load-In Station Filters (6)	59A-FL-001/-002/ -003/-004/-005/-006	304 SS
2025ED Load-In Filter Sump Tanks 59A-TK-2/ 59A-TK-3	Transfer pumps (2)	59A-P-2/59A-P-3	Cast Iron/SS
	59A-TK-2 sight glass	LI-59A-101	SS
	59A-TK-3 level gauge	LI-59A-303	SS
2025EG Load-In Filter Sump Tank 59A-TK-4	59A-TK-4 sight glass	LI-59A-201	SS
Surge Tank	Surge Tank Pumps (3)	60A-P-1A/-1B/-1C	Cast Iron Steel (CS) with ETFE coating
Rough Filter	Rough Filter	60B-FL-1	304 SS
UV/OX	UV Oxidation Inlet Cooler	60B-E-1	316 SS
	UV Oxidizers (4)	60D-UV-1A/-1B/ -2A/-2B	316 SS
pH Adjustment	pH Adjustment Pumps (2)	60C-P-1A/-1B	304 SS
Peroxide Decomposer	H2O2 Decomposers (2)	60D-CO-1A/-1B	316 SS
Fine Filter	Fine Filter	60B-FL-2	304 SS
Degasification	Degasification Column Inlet Cooler	60E-E-1	316 SS
	Degasification Column	60E-CO-1	FRP
	Degasification Pumps (2)	60E-P-1A/-1B	316 SS
RO	Feed/Booster Pumps (6)	60F-P-1A/-1B/-2A/ -2B/-3A/-3B	304 SS
	RO Arrays (21)	60F-RO-01 through -21	Membranes: Polyamide Outer Piping: 304 SS
	Clean-in-place system	60F-TK-3	Polyethylene
IX/Polishers	Polishers (3)	60G-IX-1A/-1B/-1C	CS with Epoxy Coating
	Resins Strainers (3)	60G-S-1A/-1B/-1C	304 SS
Effluent pH Adjustment	Recirculation/Transfer Pumps (2)	60C-P-2A/-2B	304 SS/PVC
Verification Tanks	Return Pump	60H-P-1	304 SS
	Transfer Pumps (2)	60H-P-2A/-2B	60-40-18 ductile iron bodies 316 SS shafts/ impellers
Secondary Waste Receiving Tanks	Secondary Waste Feed Pumps (2)	60I-P-1A/-1B	304 SS

Table C-8 Ancillary Equipment and Material Data

System	Ancillary Equipment	Number	Material
Evaporator Vapor Body Vessel System	Feed/Distillate Heat Exchanger	60I-E-02	Tubes: 316 SS Shell: 304 SS
	Heater (Reboiler)	60I-E-01	Tubes: Alloy 625 Shell: 304 SS
	Recirculation Pump	60I-P-02	316 SS
	Concentrate Transfer Pump	60I-P-04	316 SS
	Entrainment Separator	60I-DE-01	Top Section: 316 SS Bottom Section: Alloy 625
	Vapor Compressor (Incl. Silencers)	60I-C-01	304 SS
	Silencer Drain Pump	60I-P-06	316 SS
	Level Control Tank	60I-TK-5	304 SS
	Distillate Flash Tank Pump	60I-P-03	316 SS
Concentrate Tanks	Concentrate Circulation Pumps (2)	60J-P-1A/-1B	316 SS
	Concentrate heat exchanger (4)	60J-E-02A 60J-E-02B 60J-E-03A 60J-E-03B	316L SS
Brine Loadout System	Tote fill lid	N/A	Plastic/316 SS
	Inline flowmeter	60J-333	SS/ETFE liner
	Automatic shutoff valve	60J-334/60J-335	316 SS
Thin Film Dryer	Concentrate Feed Pump	60J-P-2	316 SS
	Thin Film Dryer	60J-D-1	Interior Surfaces: Alloy 625 Rotor and Blades: 316 SS
	Powder Hopper	60J-H-1	316 SS
	Spray Condenser	60J-DE-01	316 SS
	Distillate Condenser	60J-CND-01	Tubes: 304 SS Shell: CS
	Dryer Distillate Pump	60J-P-3	316 SS
Resin Dewatering	Portable Pump	60G-P-1	Plastic

ETFE = ethylene tetrafluoroethylene. ETFE is a Teflon product.

Table C-9 Concrete and Masonry Coatings

Location	Product Name	Applied Film Thickness, Estimated
		Mils
2025E Process Area, Truck Bay, and Container Storage Area		
Floor and Walls to 7 feet, Doors & Jambs: Topcoat	Chemproof PermaCoat 4000[1]	2 coats at 12-16 mils
2025ED Load-In Station Tank Pit and Container Storage Areas		
Floor and Walls Topcoat	Elasti-Liner I/II[2,3] or Chemproof PermaCoat 4000[1]	80 mils
Floor and Walls: Primer	Techni-Plus E[2] or Chemproof PermaCoat 4000[1]	5.0-7.0 mils
2025EG Load-In Station Container Storage Areas		
Floor Topcoat	Chemproof PermaCoat 4000[1]	2 coats at 12-16 mils
Surge Tank and Verification Tank Berms		
Floors (and Walls at Surge Tank): Topcoat	Elasti-Liner I[2] or Chemproof PermaCoat 4000[1]	80 mils
Floors (and Walls at Surge Tank): Primer	Techni-Plus E3[2] or Chemproof PermaCoat 4000[1]	5.0-7.0 mils

[1]PermaCoat is a trademark of Chemproof Polymers, Inc.

[2]Elasti-Liner and Techni-Plus are trademarks of KCC Corrosion Control, Inc.

[3]Elasti-Liner I or a combination of Elasti-liner I and Elasti-liner II.

Table C-10 Geomembrane Material Specifications

Property	Value
Specific Gravity	0.932 to 0.950
Melt Flow Index	0.04 ounce/10 minute, maximum
Thickness (thickness of flow marks shall not exceed 200 percent of the nominal liner thickness)	1.5 millimeter 0.06 inches ± 10%
Carbon Black Content	1.8 to 3%, bottom liner 2 to 3% top liner
Tensile Properties (Each Direction)	
Tensile Strength at Yield	120 pounds/inch width, minimum
Tensile Strength at Break	180 pounds/inch width, minimum
Elongation at Yield	10%, minimum
Elongation at Break	500%, minimum
Tear Resistance	30 pounds, minimum
Puncture Resistance	69 pounds, minimum
Low Temperature/Brittleness	-688°F, maximum

Table C-10 Geomembrane Material Specifications

Property	Value
Dimensional Percent Change (each direction)	±2%, maximum
Environmental Stress Crack	750 hour, minimum
Water Absorption	0.1% maximum and weight change
Hydrostatic Resistance	450 pounds/inch^2
Oxidation Induction Time (200 C/l atm. O_2)	90 minutes

Reference: *Construction Specifications for 242-A Evaporator and PUREX Interim Retention Basins* (W 105, KEH 1990). Format uses NSF 54 table for high-density polyethylene as a guide (NSF 1985). However, Resource Conservation and Recovery Act values for dimensional stability and environmental stress crack have been added.

Table C-11 Drainage Gravel Specifications

Property	Value
Sieve Size	
1 inch	100 wt. % passing
0.75 inches	80 - 100 wt. % passing
0.375 inches	10 - 40 wt. % passing
0.187 inches	0 - 4 wt. % passing
Permeability	0.04 inches/second, minimum

Reference: Sieve size is from WSDOT M41-10-88, Section 9.03.1(3)C for Grading No. 5 (WSDOT 1988). Permeability requirement is from WAC 173-303-650(2)(j) for new surface impoundments.

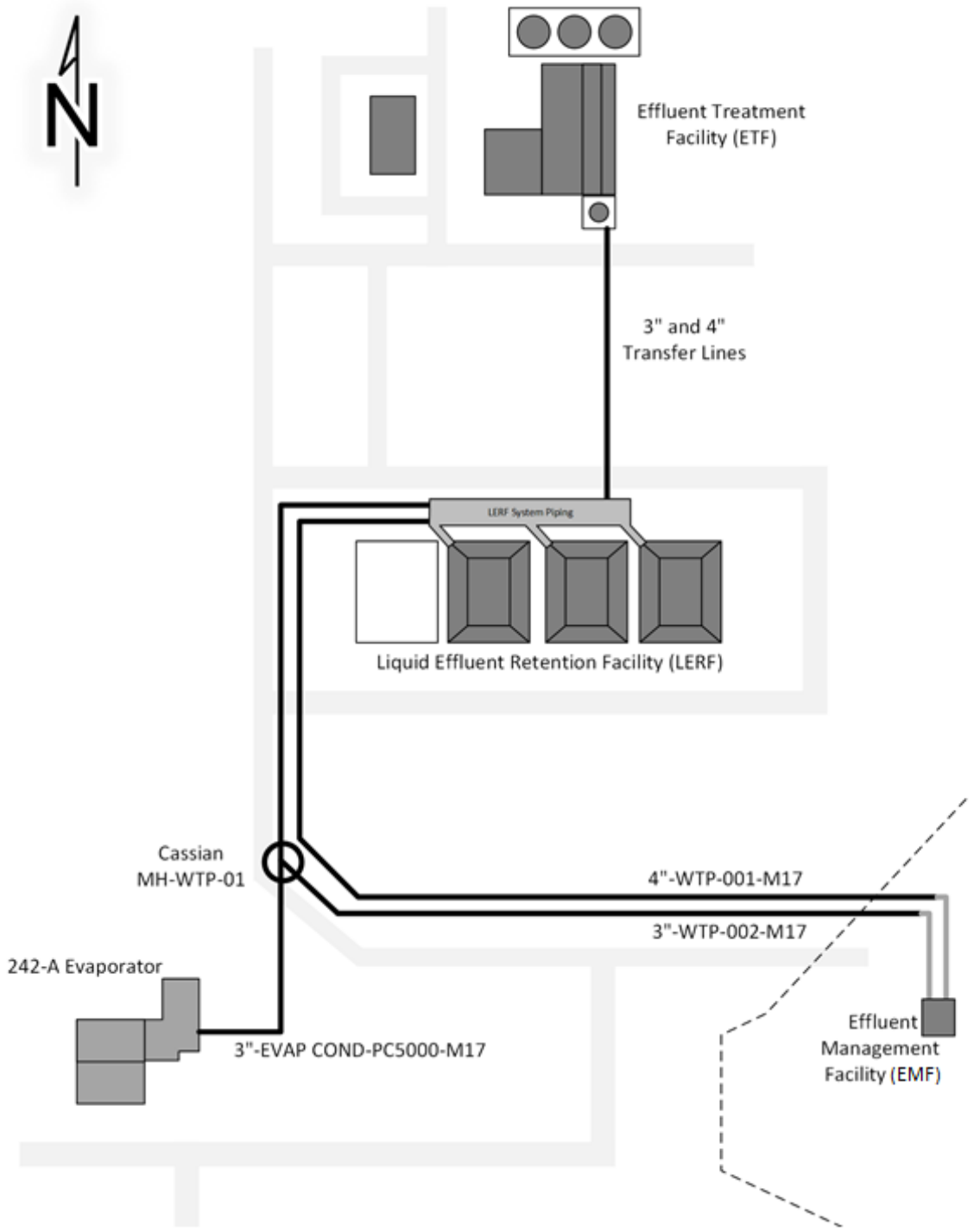


Figure C-1 Liquid Effluent Retention Facility Layout

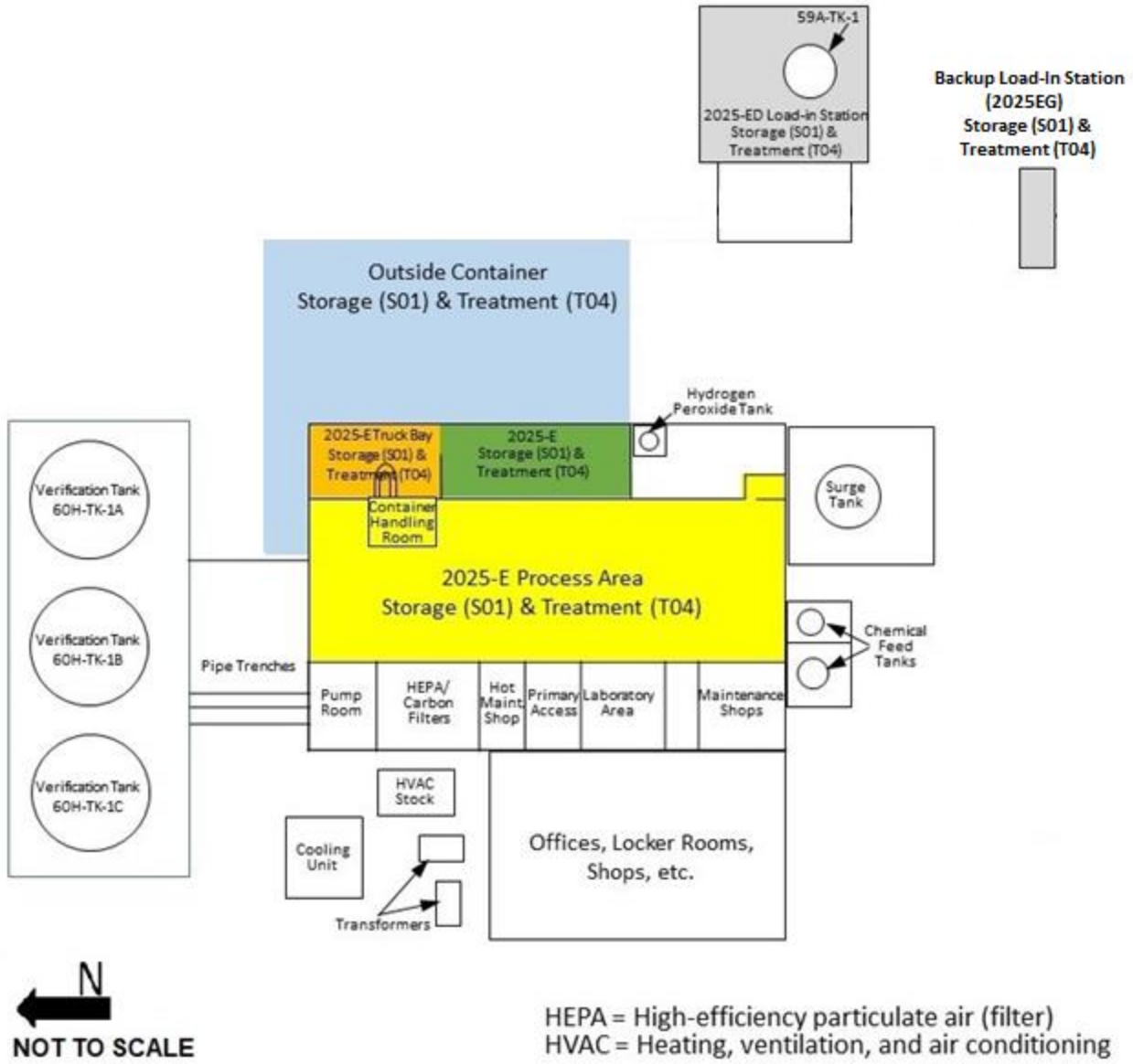


Figure C-2 Plan View of the Container Storage and Treatment Areas at 200 Area Effluent Treatment Facility

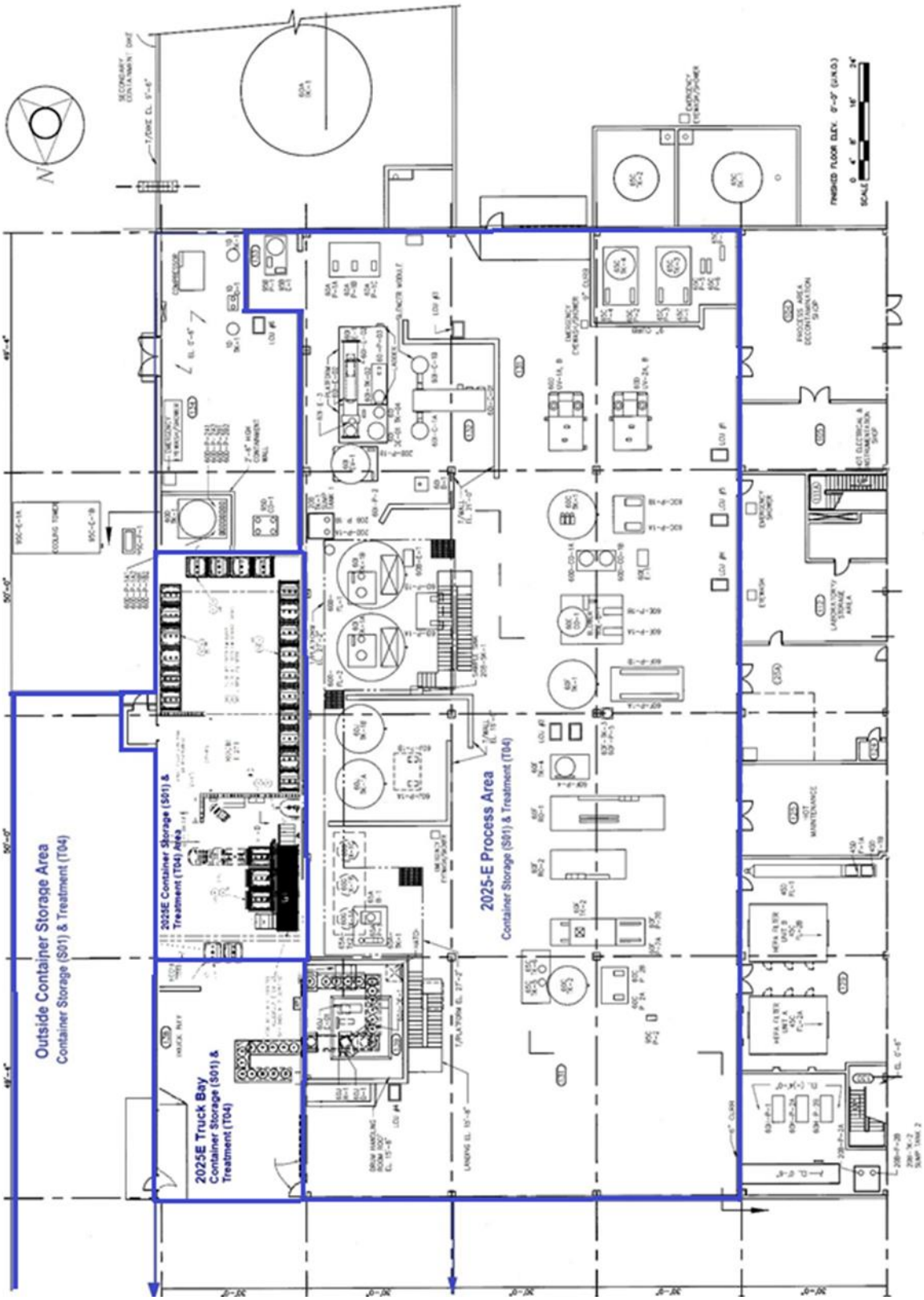


Figure C-3 Building 2025E Ground Floor Plan

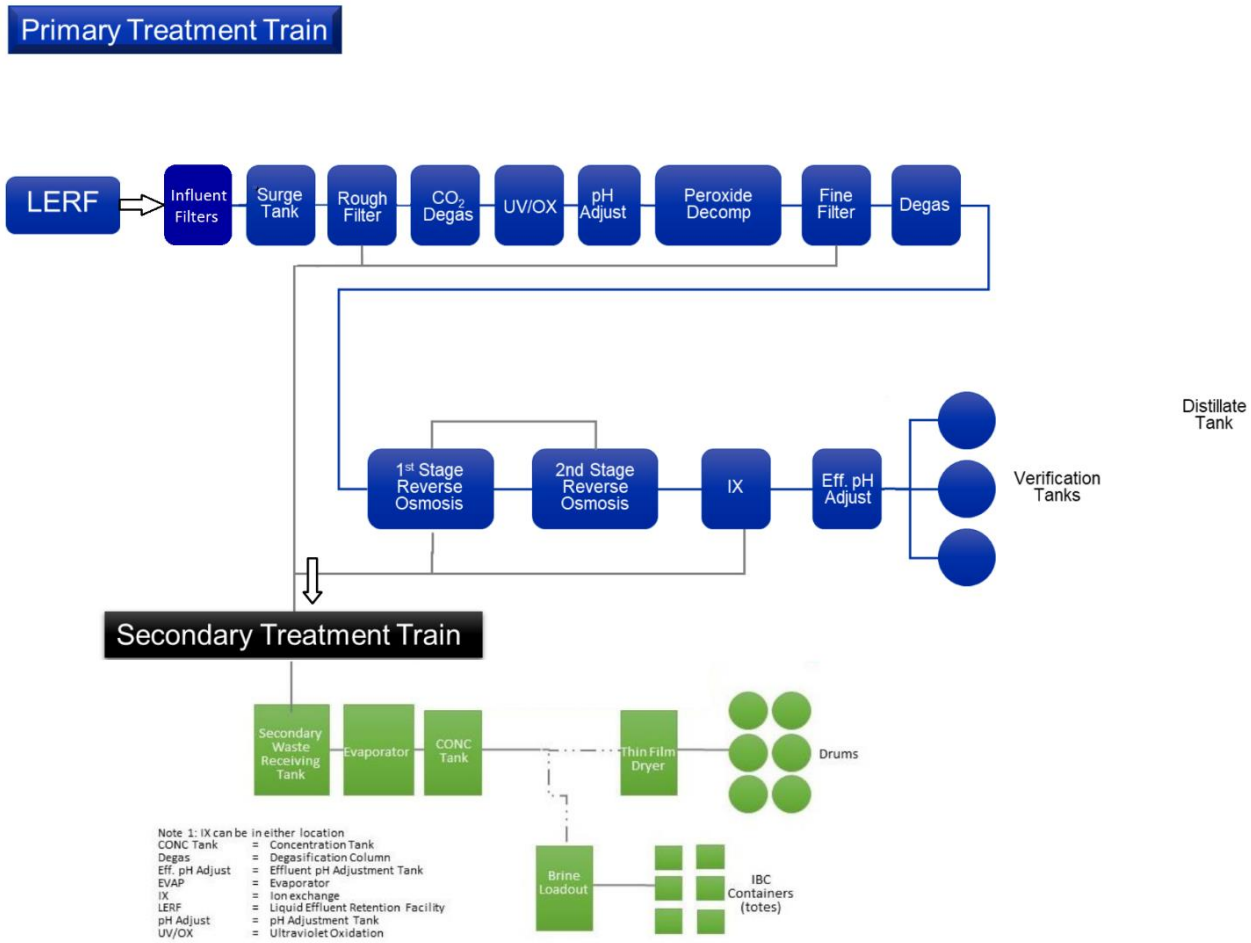


Figure C-4 Example – 200 Area Effluent Treatment Facility Configuration 1

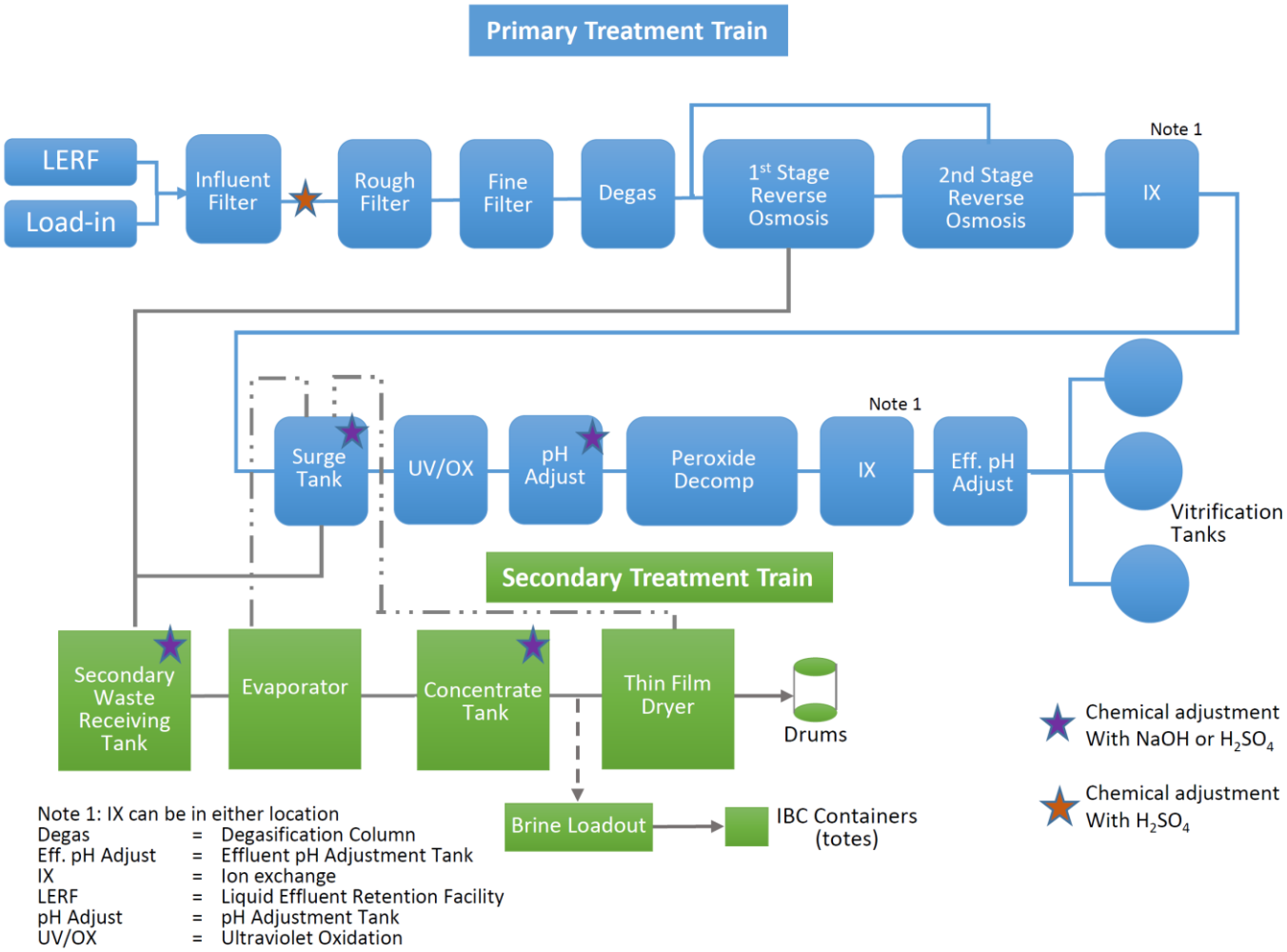


Figure C-5 Example – 200 Area Effluent Treatment Facility Configuration 2

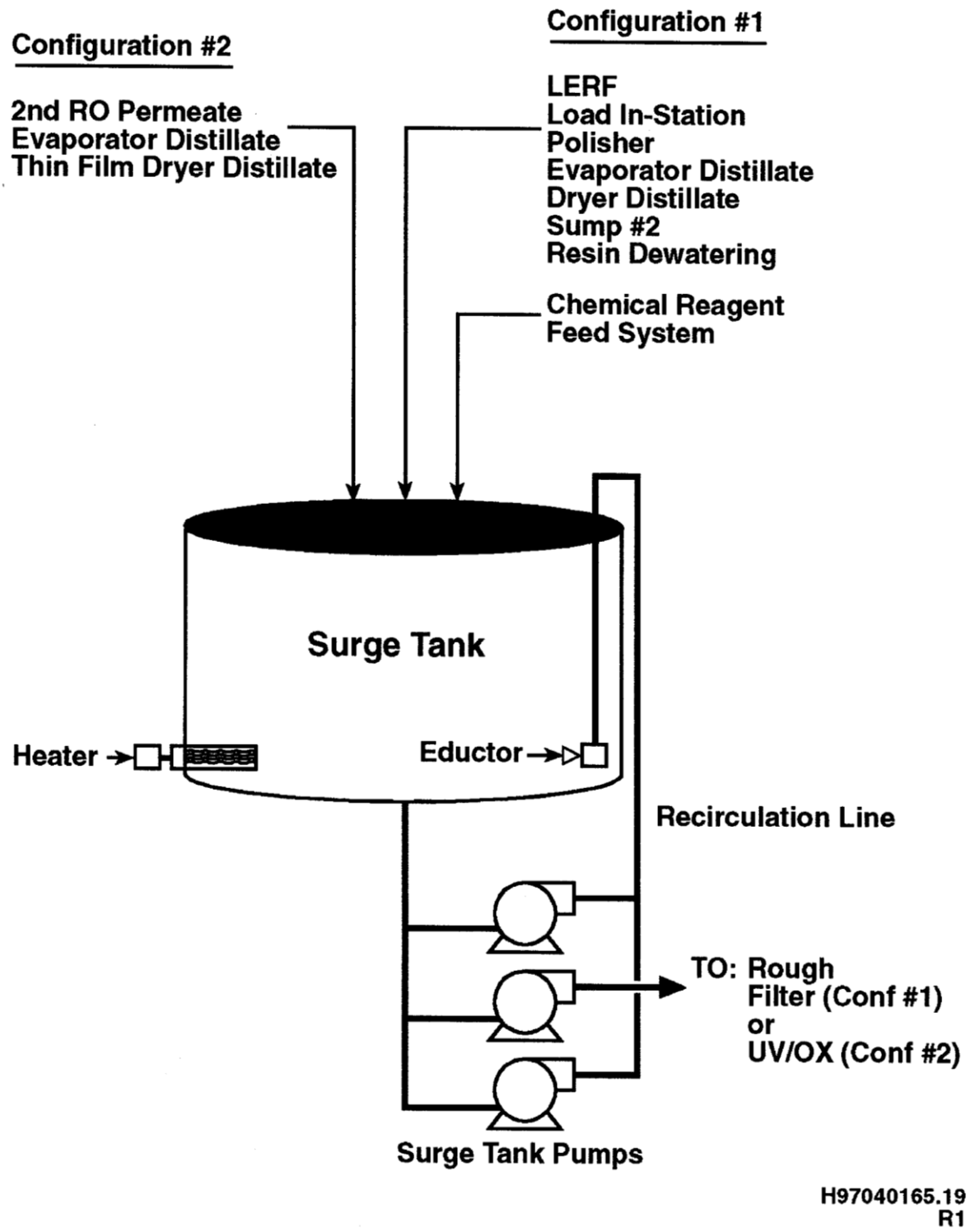


Figure C-6 Surge Tank

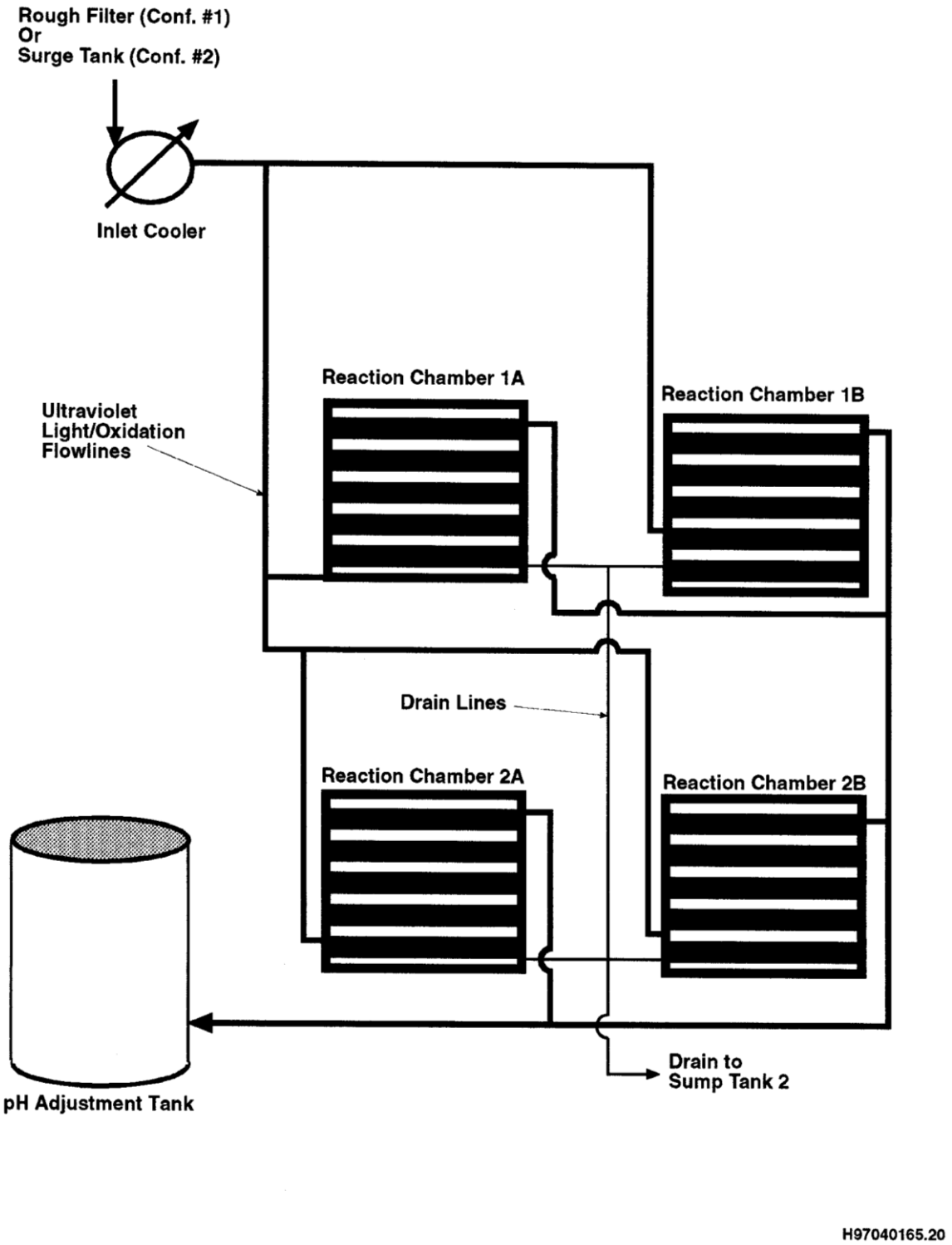


Figure C-7 Ultraviolet Light/Oxidation Unit

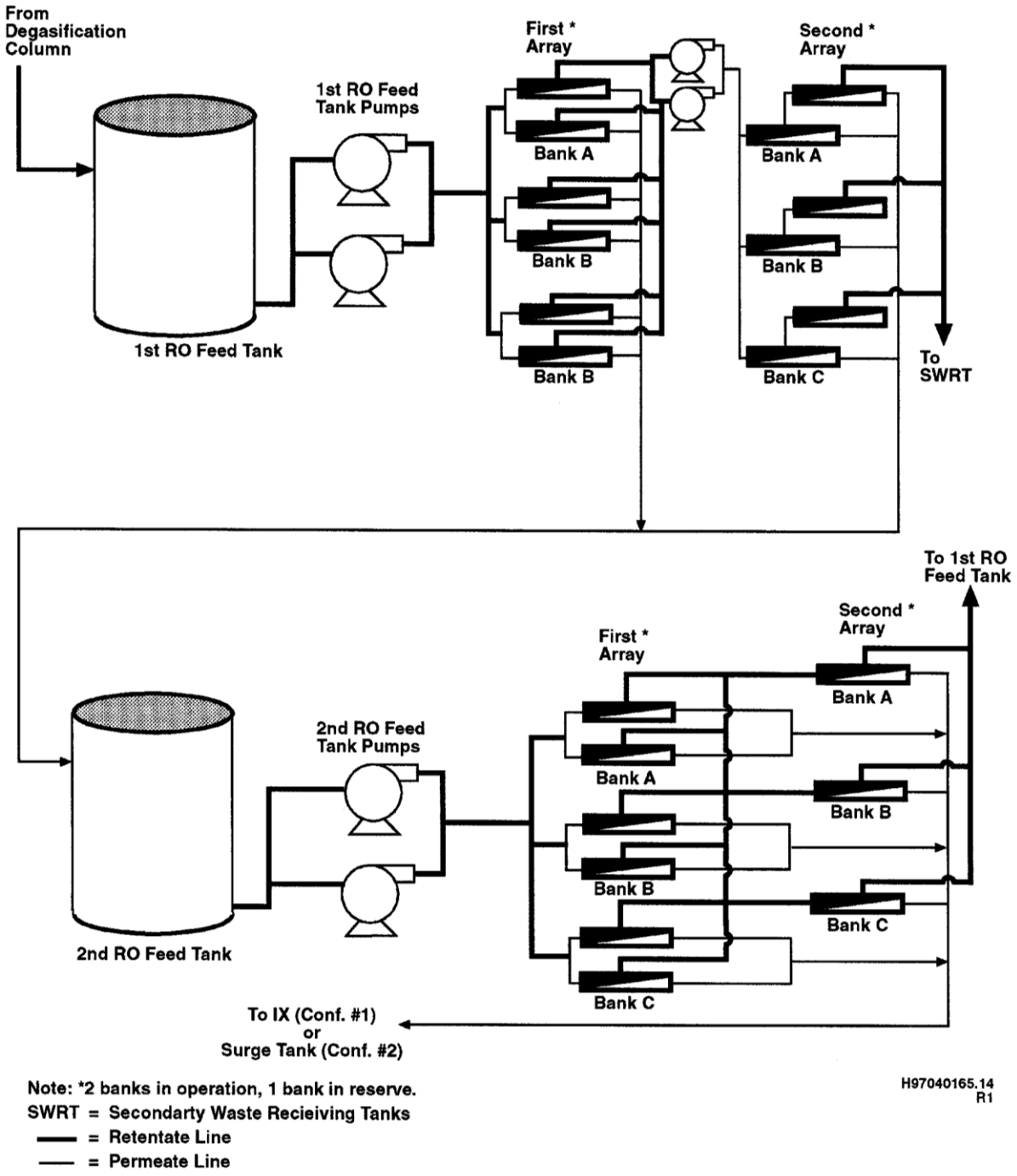
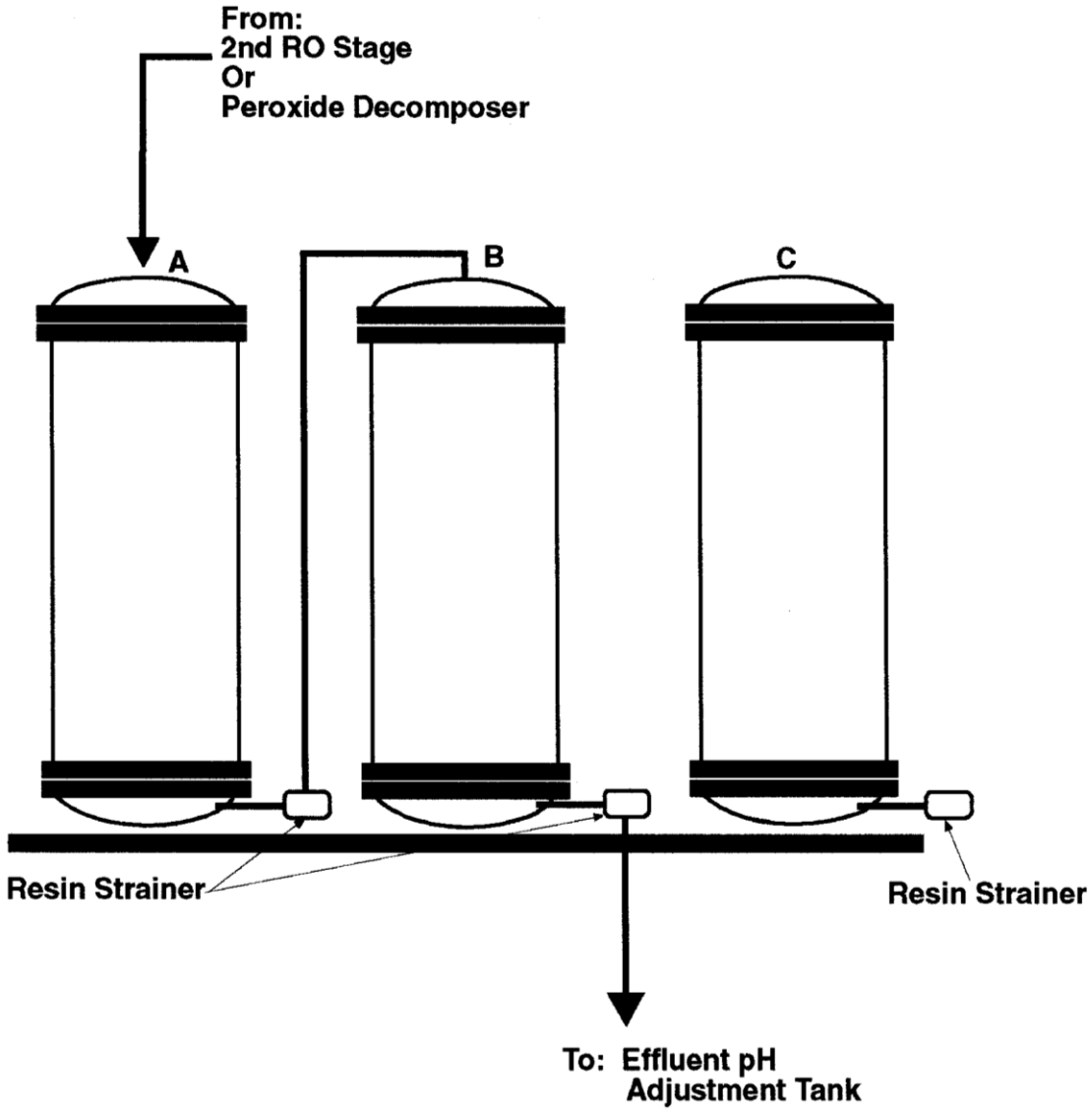


Figure C-8 Reverse Osmosis Unit



NOTE: Example Configuration- Column A and B in Operation, Column C in Standby Mode

H97040165.18

Figure C-9 Ion Exchange Unit

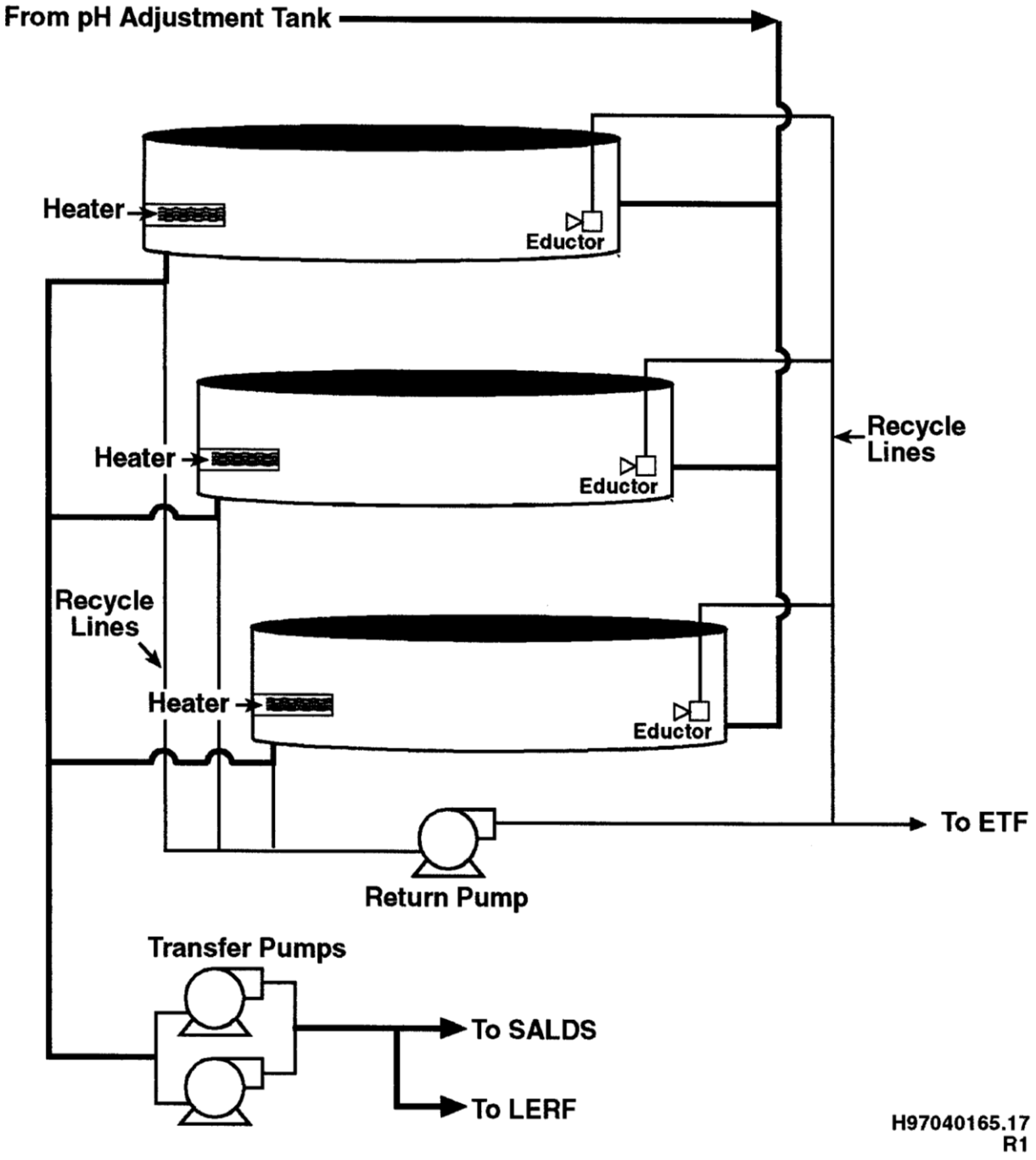


Figure C-10 Verification Tanks

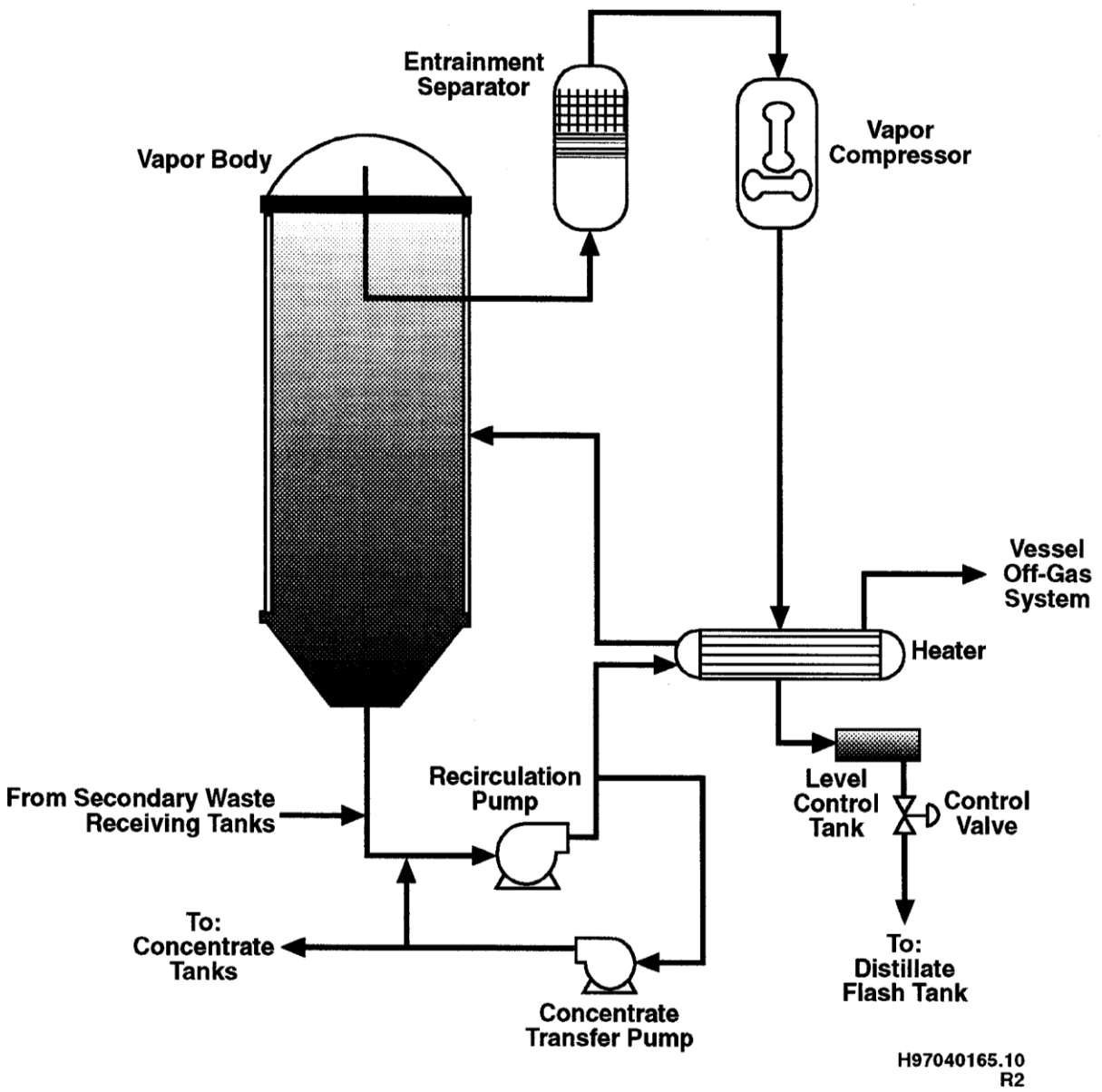


Figure C-11 200 Area Effluent Treatment Facility Evaporator

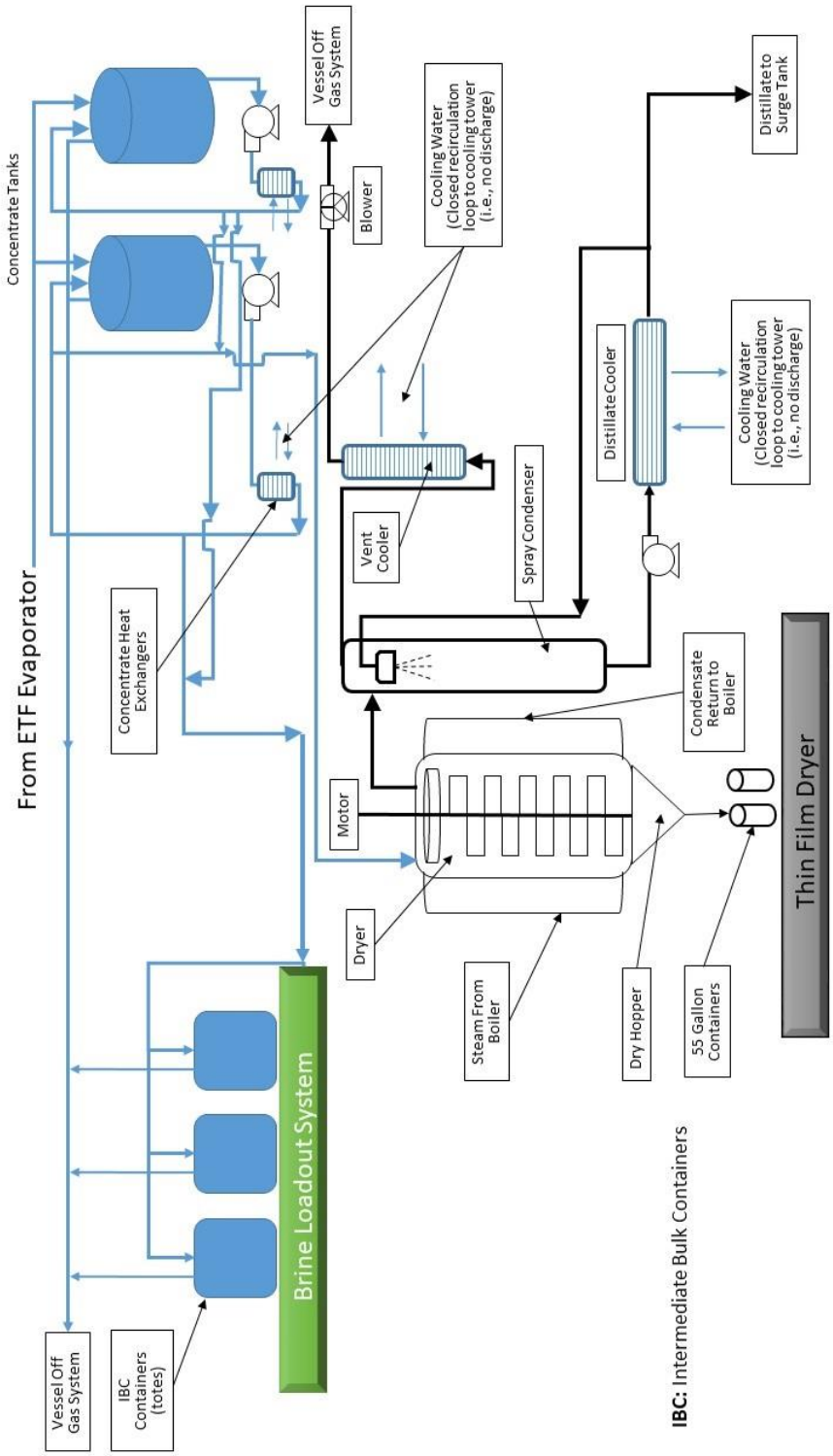


Figure C-12 Brine Loadout System and Thin Film Dryer

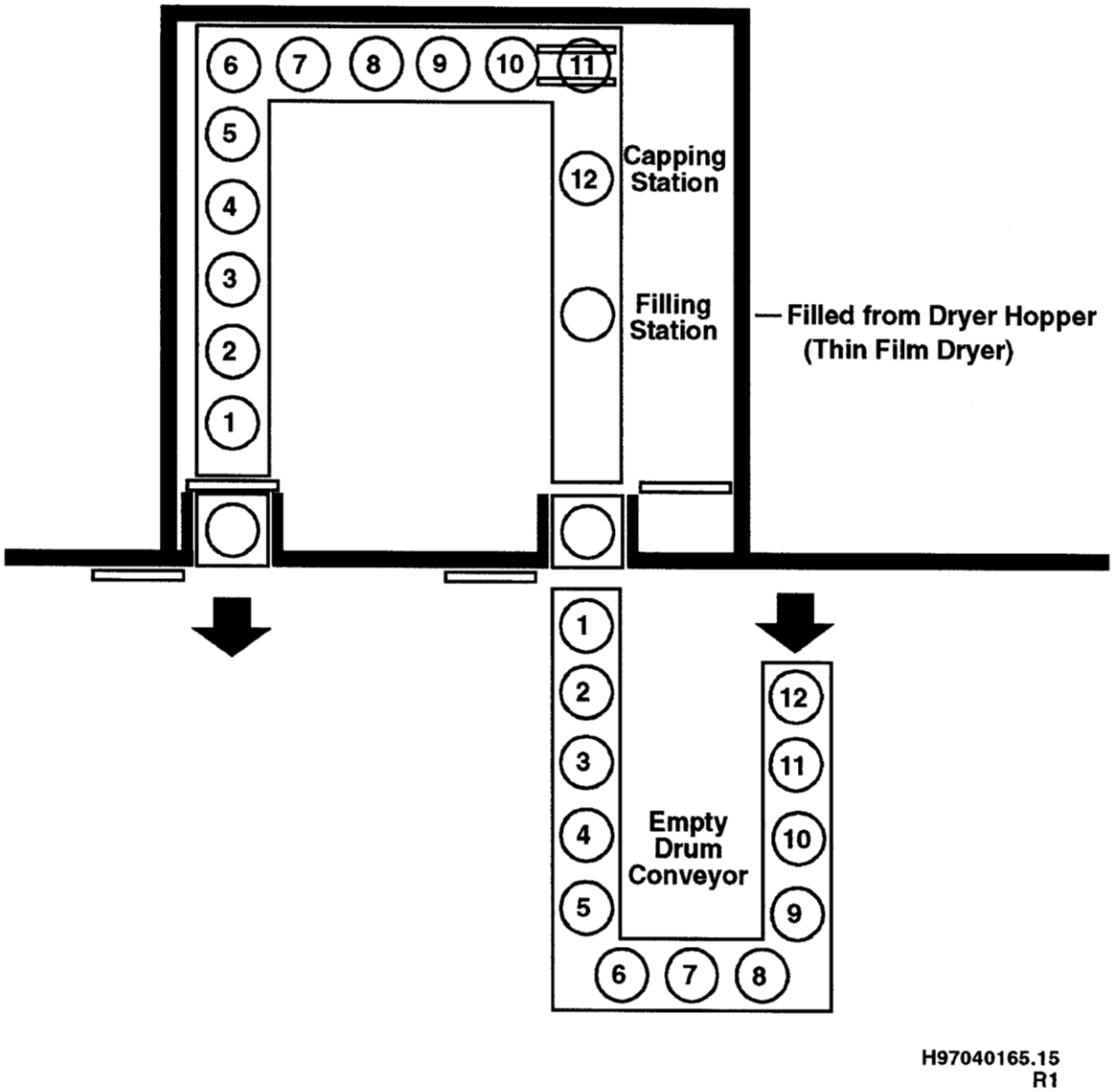
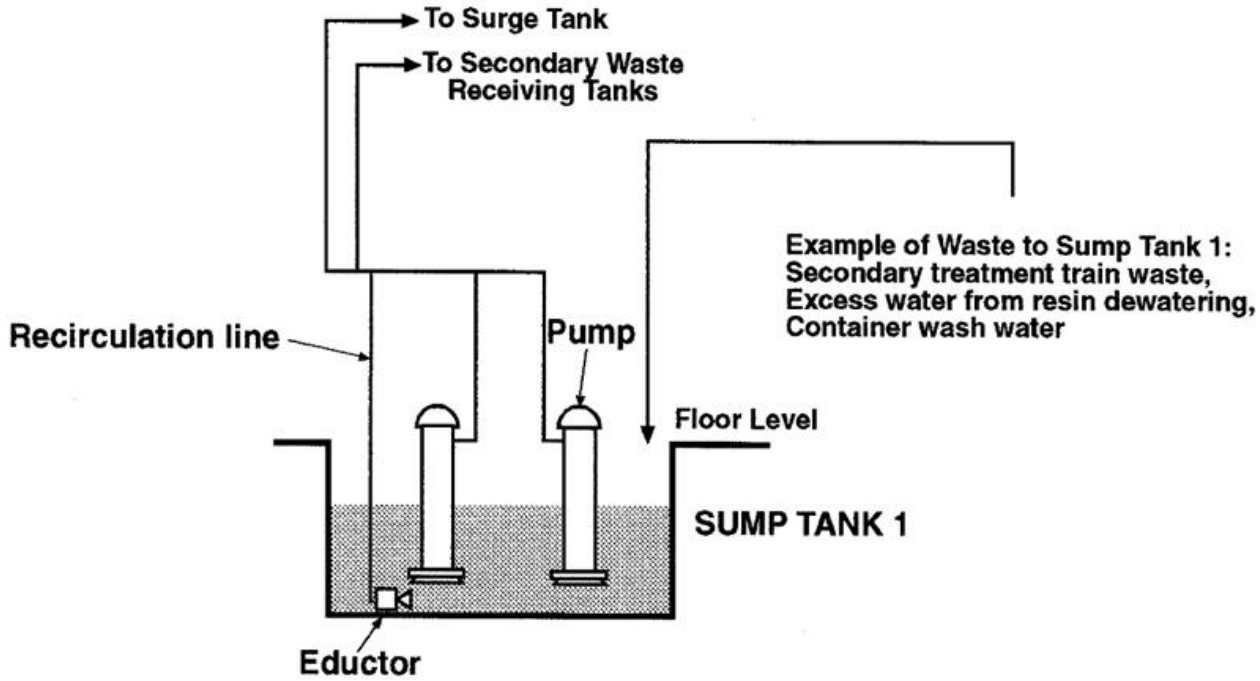


Figure C-13 Thin Film Dryer Container Handling System



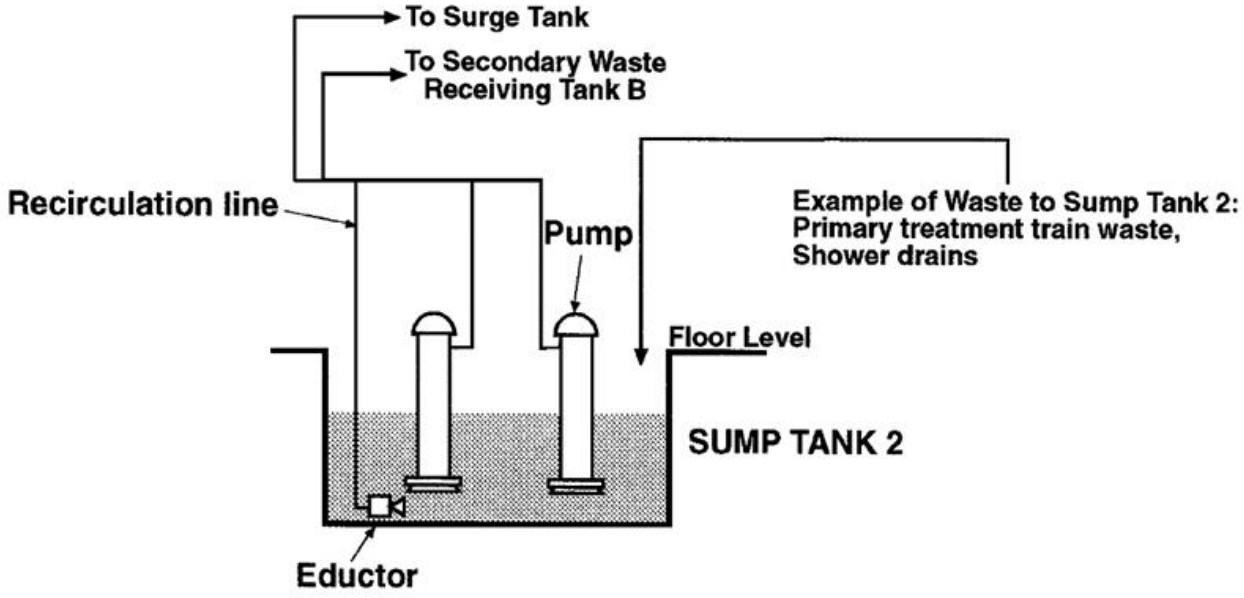


Figure C-14 200 Area Effluent Treatment Facility Sump Tanks

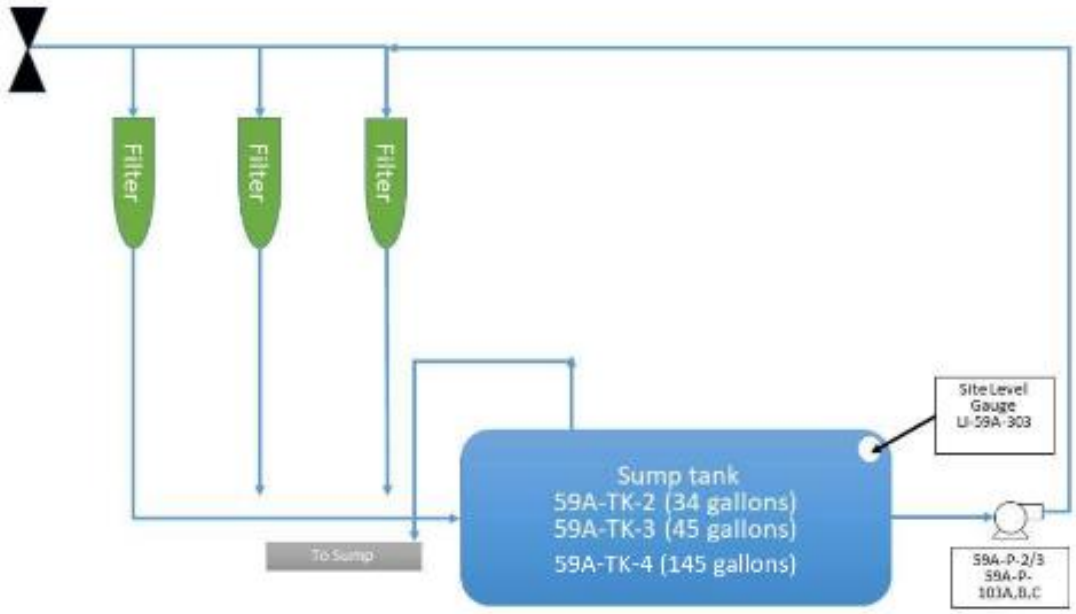


Figure C-15 Process Flow Filter Change Out (Filtration and Filter Drain Sump Tanks)

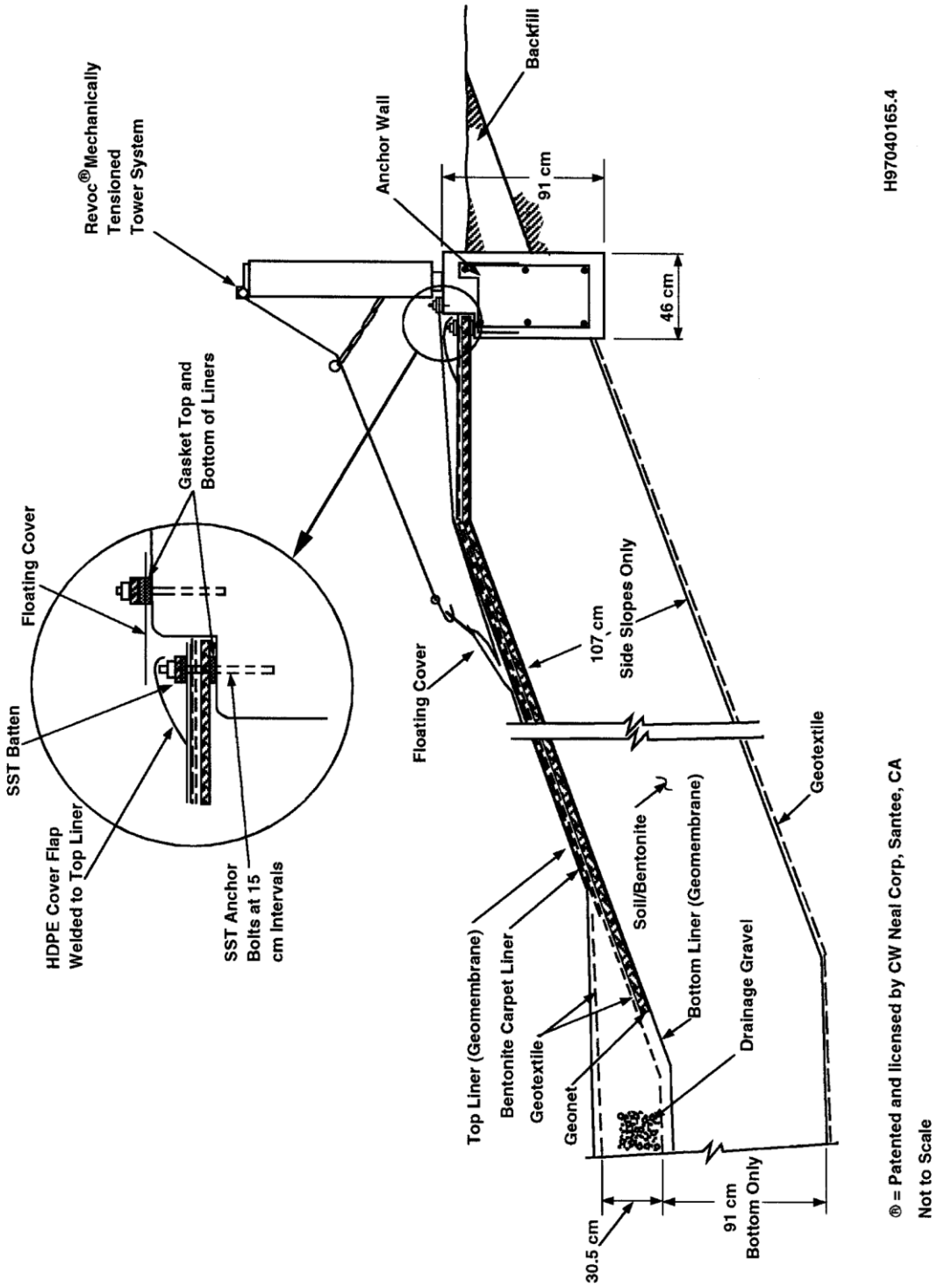


Figure C-16 Liner Anchor Wall and Cover Tension System

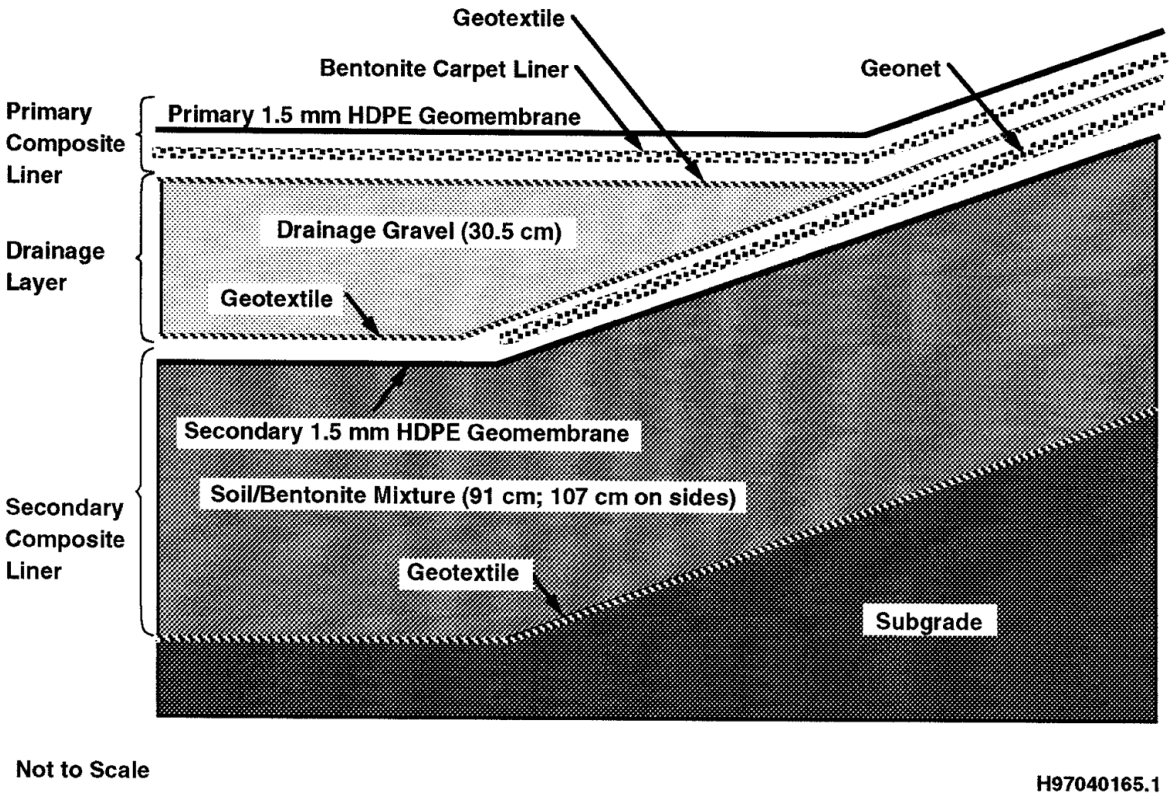


Figure C-17 Liner System Schematic

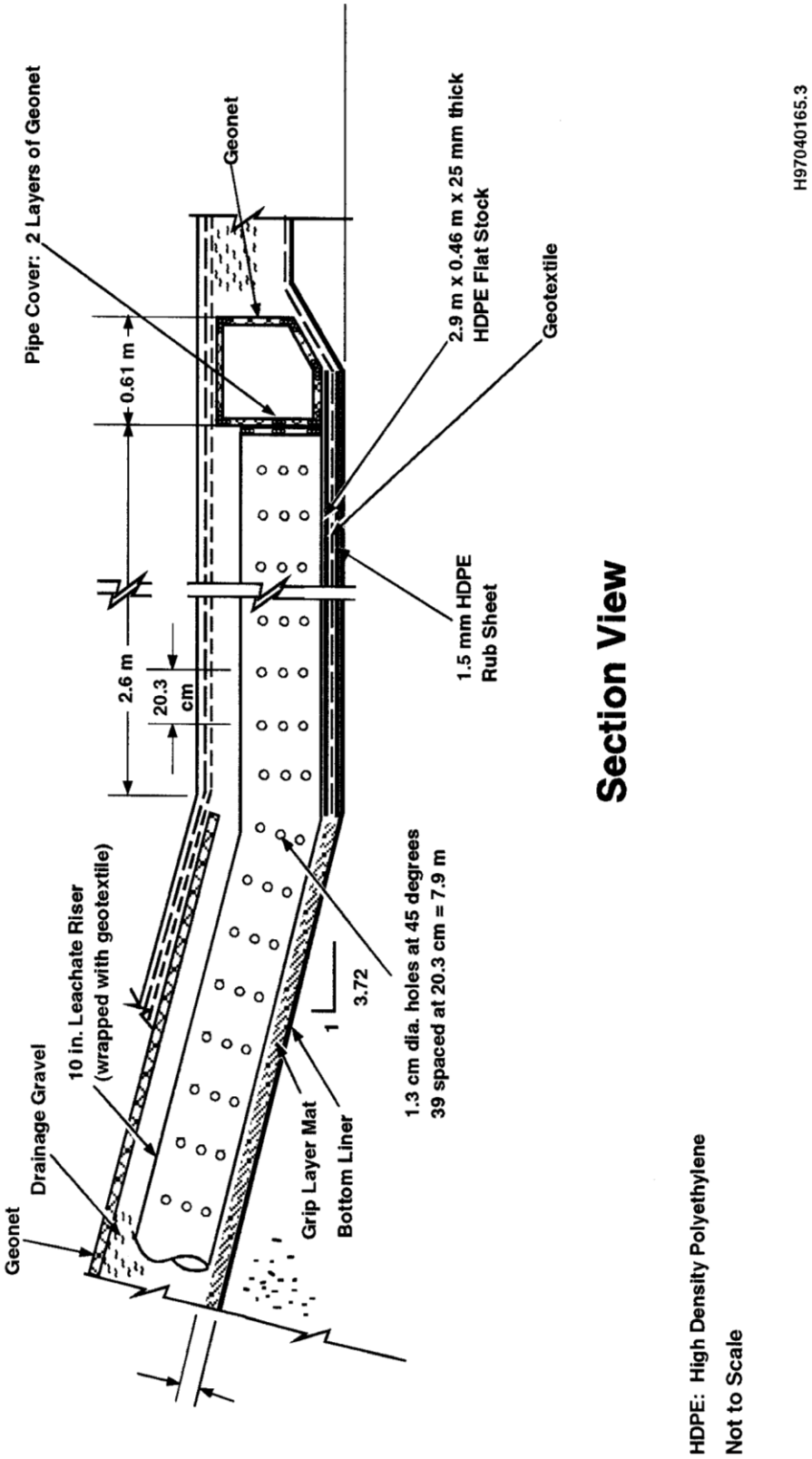


Figure C-18 Detail of Leachate Collection Sump

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LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY
ADDENDUM F
PREPAREDNESS AND PREVENTION

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
03/10/2021	8C.2020.8F
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ADDENDUM F
PREPAREDNESS AND PREVENTION

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ADDENDUM F
PREPAREDNESS AND PREVENTION

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F. PREPAREDNESS AND PREVENTION

F.1 Preparedness and Prevention Requirements

The following sections document the preparedness and prevention measures taken at the Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (ETF).

F.1.1 Equipment Requirements

The following sections describe the internal and external communications systems and the emergency equipment required that could be activated by the LERF and 200 Area ETF Building Emergency Director (BED).

F.1.1.1 Internal Communications

When operators are present at the LERF, the operators carry two-way radios to maintain contact with 200 Area ETF personnel. The operators at LERF are informed of emergencies (e.g., building and/or area evacuations, take-cover events, high airborne contamination, fire, and/or explosion), and are provided with emergency instructions by several systems. These systems include the mobile two-way radios, and the telephone in the LERF instrument building.

The 200 Area ETF is equipped with an internal communication system to provide immediate emergency instruction to personnel. The on-site communication system at the 200 Area ETF includes telephones, mobile two-way radios, a public address system, and alarm systems. The telephone and radio systems provide for internal and external communication. Alarm systems exist to allow personnel to respond appropriately to various emergencies, including building evacuations, take cover events, and fire and/or explosion. Addendum J provides additional information on the response activities.

F.1.1.2 External Communications

The LERF and its operators are equipped with devices for summoning emergency assistance from the Hanford Fire Department, the Hazardous Materials Response Team, and/or Hanford patrol, as necessary. External communication to summon emergency assistance is made by a normal telephone system or mobile two-way radios. The LERF telephone is available in the instrumentation building. The 200 Area ETF uses fire alarm pull boxes and telephones for external communication and are located at numerous locations throughout the 200 Area ETF.

F.1.1.3 Emergency Equipment

The LERF and 200 Area ETF rely primarily on the Hanford Fire Department to respond to fires and other emergencies as described in Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02). All LERF and 200 Area ETF operators are familiar with the LERF and 200 Area ETF contingency plans (Addendum J) and are trained in the use of emergency pumping of LERF and 200 Area ETF systems, fire, and communications equipment.

Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment is available at various locations in the 200 Area ETF.

The 200 Area ETF has fire extinguishers, automatic fire suppression systems (200 Area ETF Control Room and electrical room), fire alarm pull boxes, and a water spray system (200 Area ETF operating and administrative portions).

Respirators, hazardous material protective gear, and special work procedure clothing for 200 Area ETF personnel are kept in the change room at the 200 Area ETF. Safety showers are located in convenient locations in the 200 Area ETF, and emergency eyewashes are available for use. Water for these devices is supplied from the 200 Area ETF sanitary water system.

F.1.1.4 Water for Fire Control

A water main is not provided to the LERF. The Hanford Fire Department is equipped with fire engines for fire control for fires requiring high water volume and pressure. The 200 Area ETF is serviced by two 12-inch raw water lines that are tied into the 200 East Area raw water distribution grids. These lines provide a looped configuration that supplies two independent sources of raw water for fire protection and raw water uses. Connections from the 200 Area ETF raw water system supply fire hydrants and the wet pipe sprinkler system. In the event that water pressure is lost, the Hanford Fire Department is equipped with fire engines to provide needed water.

F.1.2 Aisle Space Requirement

The operation of the LERF does not involve aisle space. Nevertheless, the LERF and the individual basins are easily accessible to emergency response personnel and vehicles. A 20-feet-wide service road runs along the base of the basin area on the east, south, and west sides within the operational security fence.

Aisle spacing at 200 Area ETF is sufficient to allow the movement of personnel and fire protection equipment in and around the containers. This storage arrangement also meets the requirements of the National Fire Protection Association (NFPA 1996) for the protection of personnel and the environment. A minimum 30-inch aisle space is maintained between rows of containers as required by Washington Administrative Code (WAC) 173-303-630(5)(c).

F.2 Preventive Procedures, Structures, and Equipment

The following sections describe preventive procedures, structures, and equipment.

F.2.1 Unloading Operations, Spill Prevention, and Control

Underground pipelines that transfer aqueous waste to and from the LERF are encased in a secondary pipe. If a leak is detected in a pipeline, flow in the pipeline will be stopped and the cause of the leak investigated and remediated.

If it is required to transfer aqueous waste from one LERF basin to another, existing transfer pumps are used as described in Addendum C.

The 2025ED Load-in Station and 2025EG Backup Load-In Station are monitored continuously during tank and container-filling operations. If a leak or spill occurs, filling is stopped immediately, and the spilled or leaked waste is removed from the secondary containment system and disposed of in accordance with approved management procedures. Any leak/spill that is determined to be a dangerous waste will be managed according to the requirements of WAC 173-303-170.

F.2.2 Runoff

The LERF is constructed and operated to ensure that all aqueous waste is contained within the basins. The basins are designed and operated to prevent overtopping. Furthermore, the basins are provided with floating covers to prevent the introduction of precipitation into the basins. The basins also are graded to ensure that all precipitation outside the basins is directed away from the surface impoundments.

The basins are constructed so that the top of the basin dikes are approximately 9.8 feet above grade. The exterior side slopes of the basins have a 2.25 (horizontal) to 1 (vertical) slope. Run-on of precipitation to the basins from the surrounding area is not possible because the surrounding area slopes away from the LERF.

Dangerous waste and hazardous chemical handling areas at the 200 Area ETF are designed to contain spills, leaks, and wash water, thereby preventing runoff and subsequent releases. All dangerous and/or mixed waste loading and unloading areas are provided with secondary containment structures as described in Addendum C, “Process Information.”

F.2.3 Water Supplies

The LERF uses operating practices, structures, and equipment to prevent the contamination of natural water supplies (i.e., groundwater and surface water). The LERF is monitored continuously in the 200 Area ETF Control Room during liquid waste transfers and at least daily when waste transfers are not occurring to detect abnormal conditions (e.g., leaks), and regularly inspected to detect equipment and structural deteriorations that could allow possible water supply contamination. The basins are provided with a leachate collection system that is designed to contain any leachate generated. These systems, in conjunction with the double-composite liner system and underlying low permeable clay liner, ensure that should a release occur, the release will be fully contained within the basin configuration and, therefore, water supplies will be protected. Addendum J, "Contingency Plan," provides information on procedures that are implemented if a release is detected at the LERF.

There are no drinking water wells near the 200 Area ETF. Therefore, a release would not immediately contaminate drinking water supplies. The 200 Area ETF uses operating practices, structures, and equipment to prevent the contamination of natural water supplies (i.e., groundwater and surface water). The 200 Area ETF is monitored and inspected in accordance with Addendum I, Inspection Requirements to detect equipment and structural deteriorations that could allow spills to the environment. Areas in contact with dangerous and/or mixed waste are monitored continuously in the 200 Area ETF Control Room during Load-in Station and/or 200 Area ETF processing operations through a series of level and pressure indicators, leak detection alarms, equipment failure alarms, and control panel readouts. In addition, the 200 Area ETF is inspected regularly for the presence of leaks or other off normal conditions wherever possible (in all areas that can be safely entered).

In addition to detailed operating practices, structures and equipment are used at the 200 Area ETF to prevent contamination of water supplies. The structures and equipment designed to prevent contamination of water supplies are the same as the structures and equipment used to prevent runoff from dangerous and/or mixed waste handling areas.

F.2.4 Equipment and Power Failure

The storage function of the LERF is not affected by loss of power and a temporary loss of power would not pose a threat to the environment. Loss of electrical power would not cause the storage of the waste to be jeopardized. For process condensate transferred from the 242-A Evaporator, appropriate valving procedures are followed to ensure a smooth restart of the flow to the LERF in the event of a power failure at the 242-A Evaporator.

The 200 Area ETF does not have a standby power source. Power to selected lighting, computers, and process controls are configured with an uninterruptible power supply. During partial loss of normal power, the affected pumps and subsystems will be shut down. Complete loss of power to the 200 Area ETF shuts down the entire 200 Area ETF except for the instruments, connected to the uninterruptible power supply at 200 Area ETF. The uninterruptible power supply provides temporary power to some systems to assist in an orderly shutdown of the process in the event power cannot be restored quickly. Redundant pumps allow the process to continue to operate when only one component is out of service.

When power at the 200 Area ETF is lost, the valves assume a fail-safe position to allow the process to remain in a safe shutdown mode until restoration of power. This action allows the operators to perform equipment surveys during shutdown and to confirm that there are no safety issues because the 200 Area ETF is shut down. Because a power failure would also shut off flow into the 200 Area ETF, there will not be any increase in volume in any of the holdup basins, tanks, or other systems.

A combination of reliability, redundancy, maintenance, and repair features are used in the 200 Area ETF equipment and systems to minimize random failure of equipment. For crucial systems such as ventilation filters, redundant trains are provided to mitigate equipment and system failure. Spare parts are maintained for essential production and safety equipment.

F.2.5 Personnel Exposure

At the LERF and 200 Area ETF, operating practices, structures, and equipment are used to prevent undue exposure of personnel to dangerous and/or mixed waste. All personnel handling waste use protective clothing and equipment. All operations are conducted so that exposure to dangerous and/or mixed waste and hazardous materials are maintained as low as reasonably achievable (ALARA).

Protective clothing and equipment are prescribed for personnel handling chemicals or dangerous waste. Before the start of any operation that could expose personnel to the risk of injury or illness, a review of the operation is performed to ensure that the nature of hazards that might be encountered is considered and appropriate protective gear is selected. Personnel are instructed to wear personal protective equipment in accordance with training, posting, and instructions.

A change trailer at LERF is located between Basins 42 and 43. Exits within the change trailer are clearly marked. A storage building is located within the perimeter fence, northwest of the basins. The LERF storage building also is provided with separate storage areas for clean and contaminated equipment. A decontamination shower is located at the 272AW Building, approximately 1 mile from the LERF or at the 200 Area ETF.

The 200 Area ETF has eyewash stations and safety showers in convenient locations for use by personnel. The following structures and equipment were incorporated into the 200 Area ETF design to minimize personnel exposure.

- Offices, 200 Area ETF Control Room, clean- and soiled-clothes storage areas, change rooms, and the lunchroom are situated to minimize casual exposure of personnel.
- Building exit pathways are located to provide rapid egress in emergency evacuations.
- Emergency lighting devices are located strategically throughout the 200 Area ETF.
- Audio and/or visual alarms are provided for all room air samplers, area alarms, and liquid monitors. Visual readouts for these alarm systems are located in less contaminated areas to minimize exposure to personnel.
- Areas for decontaminating and maintaining equipment are provided in contaminated areas to limit the spread of contamination to uncontaminated areas such as the 200 Area ETF Control Room.
- Instrument interlock systems automatically return process operations to a safe condition if an unsafe condition should occur.
- The 200 Area ETF ventilation systems are designed to provide airflow from uncontaminated zones to progressively more contaminated zones.

Whenever possible, exposures to hazards are controlled by accepted engineering and/or administrative controls. Protective gear is used where effective engineering or administrative controls are not feasible.

F.3 Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste

Aqueous waste managed at the LERF may display the characteristics of reactivity or ignitability. Any aqueous waste streams accepted at 200 Area ETF exhibiting these characteristics are immediately sent for blending or mixing at LERF to a concentration where the waste no longer exhibits characteristics of reactivity or ignitability. Aqueous waste streams exhibiting characteristics of ignitability or reactivity are not stored or treated at 200 Area ETF, or in the 2025ED Load-In Station and 2025EG Backup Load-In Station.

LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY
ADDENDUM H
CLOSURE PLAN

CHANGE CONTROL LOG

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03/10/2021	8C.2020.8F
05/19/2020	8C.2020.6F
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CLOSURE PLAN

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H CLOSURE PLAN

This addendum describes the planned activities and performance standards for closing Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (ETF).

H.1 Closure Plan

The LERF and 200 Area ETF will be closed by removal or decontamination with respect to dangerous waste contamination that resulted from operation as Treatment, Storage, and Disposal (TSD) units, with closure of LERF occurring first. To facilitate closure, the LERF retention basins are being viewed as consisting of seven components: the covers and primary liner, drainage layer system/bentonite carpet liner, secondary liner, soil/bentonite, internal and/or external piping, ancillary equipment, and concrete basins. To facilitate closure of 200 Area ETF, the 200 Area ETF is being viewed as consisting of six components: tanks, internal and/or external piping, ancillary equipment, concrete floors/dikes/encasements, structures, and soil directly beneath the structure. If it is determined that closure by removal or decontamination is not possible, the closure plan will be modified to address required post closure activities.

Uncontaminated structures will be left for future use or disassembled, dismantled, and removed for disposal. Uncontaminated equipment and structures could include aqueous makeup, Heating, Ventilation, and Air Conditioning (HVAC) and piping, steam condensate and cooling water piping, and the 200 Area ETF Control Room and office areas.

Closure by removal or decontamination requires decontamination or removal and disposal of all dangerous waste, waste residues, contaminated equipment, soil, or other material established in accordance with the removal or decontamination closure performance standards of Washington Administrative Code (WAC) 173-303-610(2). This and future closure plan revisions will provide for compliance with these performance standards.

H.2 Closure Performance Standard

Closure by removal or decontamination, as provided for in this plan based on the requirements of WAC 173-303-610(2), will eliminate future maintenance and will be protective of human health and the environment by removing or reducing chemical contamination at LERF and 200 Area ETF to levels that are below concern with respect to human health and the environment.

This plan proposes to leave clean structures and equipment in place after closure for potential use in future operations. This need will be evaluated at the time of closure.

H.2.1 Closure Standards for Metal Surfaces, Rubber, Tanks, and Concrete

This closure plan proposes use of a “clean debris surface” (defined in the following paragraph) as the clean closure performance standard for the metal surfaces, rubber (i.e., basin covers, liners, etc.), tanks, and concrete that will remain after closure. This approach is consistent with the Washington State Department of Ecology (Ecology) guidance (Publication #94-111, Ecology 2005) for achievement of clean closure. Additionally, adherence to this guidance ensures that all residues have been removed as required by WAC 173-303-640 for closure of the 200 Area ETF tank systems.

The clean debris surface standard is verified visually.

> “Clean debris surface” means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area. (40 Code of Federal Regulations [CFR] 268.45)

When a physical extraction method is used on concrete, the performance standard is based on removal of the contaminated layer of debris. The physical extraction performance standard for concrete is removal of 0.25 inches of the surface layer and treatment to a clean debris surface. Inspections to verify achievement of a clean debris surface will be performed and documented.

H.2.2 Closure Standards for Piping and Ancillary Equipment

The internal and external piping of both LERF and 200 Area ETF that has contacted dangerous waste will be flushed and drained as part of closure. When practical, ancillary equipment, which has contacted dangerous waste will also be flushed and drained. For piping and ancillary equipment where the contaminated surfaces can be inspected, an inspection will be performed to see if the surfaces meets the clean debris surface standard in 40 CFR 268.45, incorporated by reference by WAC 173-303-140, and can be declared non-dangerous in accordance with WAC 173-303-071(3)(qq). If it is not possible to inspect the contaminated surfaces or meet the clean debris surface performance standard, the particular piping or ancillary equipment of concern will be removed, designated, and disposed of accordingly.

Dangerous and/or mixed-waste materials generated during closure activities will be managed in accordance with WAC 173-303-610(5). Removal of any dangerous wastes or dangerous constituents during partial or final closure will be handled in accordance with applicable requirements of WAC 173-303-610(5).

H.2.3 Closure Standards for Underlying Soils

The LERF retention basins have a leachate collection system that channels the leachate to sumps at the bottom of the basins. The collected liquid is pumped back into the basins, thereby limiting fluid head on the secondary liner. The secondary liner is comprised of several protective layers, including a high-density polyethylene geomembrane and a soil/bentonite admixture. The soil below the LERF only could be contaminated if the layers of the secondary liner had failed. The primary liner and the drainage gravel, geotextile, and geonet between the primary and secondary liners cannot easily be decontaminated. The high-density polyethylene layer of the secondary liner also cannot be decontaminated. These materials will be removed and disposed according to the requirements of WAC 173-303-170. The soil/bentonite admixture will be sampled and analyzed for constituents of concerns according to the sampling and analysis plan developed prior to the time of closure. If the analytical results determine that the constituents of concern are at or below the levels in WAC 173-303-610(2)(b)(i), or background levels for Hanford soil if background is greater, the soil/bentonite admixture and the soil below LERF will be considered clean closed.

Clean closure of soil under the 200 Area ETF will be accomplished by demonstrating that the coated concrete floor kept contaminants from reaching the soil. The coated concrete floor provided secondary containment for all the tanks and process piping. Unless inspections identify potential through-thickness cracks indicating containment failure and a subsequent potential for soil contamination from TSD unit operations, the soil will be considered clean closed. However, if inspections identify such cracks and there have been documented spills in the vicinity, potential soil contamination will be investigated. Soils will be sampled and analyzed for constituents of concern according to the sampling and analysis plan. The sampling and analysis plan will be prepared following the completion of a data quality objectives process in accordance with EPA/600/R-96/055 (QA/G-4), *Data Quality Objectives Process*, as amended. The data quality objectives process will be initiated prior to closure on a schedule to ensure timely closure of LERF. The sampling and analysis plan will be submitted to Ecology as part of a permit modification request meeting the requirements of WAC 173-303-830. The sampling and analysis plan will be prepared consistent with EPA/240/B-01/003 (EPA QA/R-5), *EPA Requirements for Quality Assurance Project Plans*, as amended.

If the soil analytical results determine that the constituents of concern are at or below the levels in WAC 173-303-610(2)(b)(i), or background levels in the Hanford soil if background is greater, the soil will be considered clean closed. If the constituents of concern exceed background levels, the soil will be closed per the standards of WAC 173-303-610(2)(b).

H.3 Closure Activities

At the time of closure, the closure plan will be modified as necessary to reflect current regulation or informational revisions in accordance with WAC 173-303-610(3)(b). If it is determined that clean closure is not possible, the closure plan will be modified to address required post closure activities.

H.3.1 General Closure Activities

The approach to LERF closure is to dispose of accumulated basin aqueous waste by processing the waste through 200 Area ETF. Primary basin liners, covers, drainage gravel, geonets, and secondary High Density Polyethylene (HDPE) liners will be removed, designated, and disposed of as described in Sections H.3.4.1 and H.3.4.2. Any remaining solids (residue) within the basins will also be removed, designated, and disposed of accordingly. Piping associated with LERF closure is intended to be decontaminated, drained, and inspected. Piping that meets the closure standard in Section H.2.2 will be left in place. Piping that does not meet the closure standard, or cannot be inspected, will be disposed of accordingly. Rinsate generated during decontamination also will be disposed of through 200 Area ETF. Sampling will assess whether contamination beneath the secondary HDPE liner has occurred. Contamination above background levels, if present, will be removed or decontaminated to meet the regulatory requirements of WAC 173-303-610(2)(b).

The approach to 200 Area ETF closure is to process any aqueous waste through the effluent treatment system. Any waste, which cannot be treated at 200 Area ETF as the facility is being closed, will be transferred to other TSD units or off-site TSD facility. Piping will be rerouted and temporary piping installed to allow the isolation of tanks and ancillary equipment for draining, decontamination, and closure. Rerouted and temporary piping will be closed in the same manner as process piping. All structures and equipment will be decontaminated to the closure standards in Section H.2.2 or disposed. Piping associated with 200 Area ETF closure is intended to be decontaminated, drained, and inspected. Piping that meets the closure standard in Section H.2.2 will be left in place. Piping that does not meet the closure standard, or cannot be inspected, will be disposed of accordingly. Contamination, if present, will be managed in compliance with regulatory requirements.

Equipment or materials used in performing closure activities will be decontaminated or disposed at a permitted facility.

H.3.2 Constituents of Concern for Closure for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility

Using the list of dangerous waste numbers in the Addendum A, “Part A Form,” constituents in the final delisting in 40 CFR 261 Appendix IX, sample results from wastes added to LERF and 200 Area ETF, process knowledge and the risk to human health and the environment, the constituents of concern for closure will be determined through the data quality objective process. Based on constituents in wastewater received at LERF from 2000 to 2006 which are present at five percent of their delisting levels or higher, the constituents of concern are:

- Acetone.
- Ammonia.
- Barium.
- Chromium.
- Carbon tetrachloride.
- Fluoride.
- Lead.
- Mercury.
- Methyl ethyl ketone.
- n-Butyl alcohol.
- Total cresols.
- Tributyl phosphate.
- Vanadium.

Arsenic and beryllium are excluded because they are present in Hanford soils and may therefore give a false positive sample result. Constituents of concern vary in each basin. For example, ammonia may be present only in LERF Basin 42. The constituents of concern for each basin will be determined by process knowledge as part of the Data Quality Objectives process for the Sampling and Analysis Plan.

H.3.3 Removing Dangerous Waste

At the start of LERF closure, aqueous waste will be transferred sequentially from each basin to another LERF basin or to 200 Area ETF for treatment.

At a pump rate of about 75 gallons per minute, it will take approximately 60 days to empty a full basin. Basin covers will remain in place to prevent possible wind dispersion of waste until all basin waste has been removed.

All of the aqueous waste inventory at the 200 Area ETF will be processed before closure. Any residue remaining in piping, equipment, or the LERF liner will be removed to an appropriate disposal unit. All containerized waste will be dispositioned. All secondary waste in containers will be transferred to an appropriate TSD unit.

H.3.4 Decontaminating Structures, Equipment, and Soils

This section discusses the activities necessary to implement a clean closure strategy for the LERF and 200 Area ETF.

H.3.4.1 Covers and Primary Liner

The following steps will be performed to close each LERF basin cover and primary liner:

- Wastewater will be removed from the basins and transferred to another LERF basin or to 200 Area ETF. Additional pumps and piping may be installed to empty the basin as low as possible.
- The basin cover will be cut into pieces and disposed in containers.
- As much as practical of the remaining residue within the basins will be removed and transferred to containers, another LERF basin, or 200 Area ETF. Rinsing may be performed to facilitate removal.
- The pipe risers, transfer pump, HDPE primary liner and bentonite carpet liner will be cut into pieces and disposed in containers.

H.3.4.2 Drainage Layer and Secondary Liner

The following steps will be performed to close each LERF basin drainage layer and secondary liner:

- The drainage gravel, geotextile, and geonet will be cut into pieces, and disposed in containers.
- As much as practical of the remaining residue on the secondary liner will be removed and transferred to containers, another LERF basin or 200 Area ETF. Rinsing may be performed to facilitate removal of residue.
- The HDPE liner portion of the secondary liner will be visually inspected for physical damage. This will provide potential sampling locations to determine if the soil/bentonite below the HDPE liner may be clean closed.
- The leachate pump, pump riser, and HDPE liner portion of the secondary liner will be removed, cut into pieces, and disposed in containers.
- The soil/bentonite portion of the secondary liner will be visually inspected for signs of contamination. This will provide potential sampling locations to determine if the soil/bentonite may be clean closed.

Assessment of contamination beneath the LERF's secondary liner will be performed within each basin by sampling the top surface of the 36-inch-thick layer of soil/bentonite. Biased and random location selection will be used to increase the probability of detecting leachate contamination. Some sampling points will be chosen randomly, while others will be chosen where physical damage was noted during the inspection of the secondary HDPE liner and soil/bentonite layer, and in areas where the underlying material porosity and permeability and the hydraulic head would most likely drive any leachate. The leakage rate through the liner would increase toward the bottom of the liner as hydraulic head increases. Any leakage that did occur in the sloped sides could be expected to travel down slope through the geotextile between the primary and secondary liner until reaching the bottom of the liner.

Therefore, the most likely area of contamination would be the soil/bentonite in the leachate sump and at the bottom of the basin. Sampling and disposal objectives will be determined at the time prior to closure activities through the data quality objectives process. The sampling and analysis plan will be prepared following the completion of a data quality objectives process in accordance with EPA/600/R-96/055 (QA/G-4) *Data Quality Objectives Process*, as amended.

The data quality objectives process will be initiated prior to closure on a schedule to ensure timely closure of LERF. The sampling and analysis plan will be submitted to Ecology as part of a permit modification request meeting the requirements of WAC 173-303-830. The sampling and analysis plan will be prepared consistent with EPA/240/B-01/003 (EPA QA/R-5), *EPA Requirements for Quality Assurance Project Plans*, as amended.

Sampling of the soil/bentonite will be performed in accordance with the sampling methods allowed for in WAC 173-303-110(2). Special care will be needed in sampling for volatiles. To aid in ensuring sample integrity, the initial sampling of the soil/bentonite may proceed while the secondary HDPE liner is in the process of being removed.

If no constituents of concern are found above soil closure performance standards (Section H.2.3), no further analysis will be done. If the initial sample analysis indicates liner leakage, additional samples from different depths and locations will be taken to determine the spatial extent of contamination. The soil/bentonite will be removed in the area around the contamination and placed in containers. If contamination is found to extend through the entire depth of the soil/bentonite layer, soil beneath the basin that is contaminated above closure performance standards will also be removed and placed in containers.

H.3.4.3 Tank Systems

The following general steps will be performed to close, each 200 Area ETF tank and ancillary equipment:

- Wastewater and chemical additions to the tank will be isolated or rerouted to a downstream tank.
- Piping and ancillary equipment associated with the tank will be flushed with water and drained to the tank being closed, to another tank, or to containers.
- Wastewater will be removed from the tank and transferred to another tank. Additional pumps and piping may be installed to empty the tank as low as possible.
- All remaining residue at the bottom of the tank will be removed and transferred to another tank or containers. Rinsing may be performed to facilitate removal of residue.
- An initial visual inspection of the tank's interior and exterior surfaces will be performed to determine the type of flushing that will allow the tank to be clean closed, or whether the tank cannot be clean closed.
- For all tanks, except Load-In Station Tanks 59A-TK-109 and 59A-TK-117, the tank's surfaces, piping and ancillary equipment will be cleaned by chemical or physical extraction techniques described in 40 CFR 268.45. Flush solution will be transferred to another tank or containers. All flush solution at the bottom of the tank will be removed before visual inspection.

- Due to severe pitting and corrosion, attainment of a clean debris surface is not practical for Load-In Station Tanks 59A-TK-109 and 59A-TK-117. Consequently, these tanks will be removed and disposed of as dangerous waste. The tank, piping, and ancillary equipment will be inspected visually for compliance with the performance standard in Sections H.2.1 and H.2.2.

Closure will begin with the Load-In Station tank 59A-TK-1, surge tank, and other tanks of the main treatment train. The secondary treatment train will operate as long as possible to reduce the volume of flush water requiring disposal. Condensate from the secondary treatment train will be routed to the main treatment train or the verification tanks for storage or treatment.

After rinsing, the tanks will be inspected visually for compliance with the performance standard. Visual inspection might be made remotely using a camera or other device that allows verification of meeting the performance standard.

If any tank surface areas are found not to meet the clean debris surface performance standard, these areas will be decontaminated in-place, or the contaminated portions will be removed, designated, and disposed accordingly. Per 40 CFR 268.45, Table 1 incorporated by reference at WAC 173-303-140, only removal of contaminants from the surface layer is necessary for metal surfaces.

The outside of the tanks also will be inspected for compliance to the performance standard. Any areas found not to meet this performance standard will be decontaminated in-place, or the contaminated portions will be removed, designated, and disposed accordingly.

Before using decontamination solutions on the outside of the tanks, the floor will be inspected for cracks or other openings that could provide a pathway to soil. This inspection will be performed as described in Section H.2.3 in conjunction with mapping of potential through-thickness cracks. Any such cracks will be mapped. The cracks will be sealed before beginning treatment or other engineered containment devices (e.g., portable catch basins, liners) will be used to collect and contain solutions.

Decontamination residues will be collected, designated, and managed as appropriate. If it is not possible to meet the clean closure performance standard, contaminated portions of the tanks could be removed, designated, and disposed of accordingly. The inspections for a clean debris surface will be documented on an inspection record.

H.3.4.4 Internal and External Piping and Ancillary Equipment

The internal piping and ancillary equipment for both LERF and 200 Area ETF, which have contacted dangerous waste will be flushed and drained as part of closure. Any treatment media, such as filters, reverse osmosis membranes, ion exchange resins, will be removed from the ancillary equipment, and disposed of accordingly. Where the contaminated surfaces can be inspected, an inspection will be performed to see if the piping and ancillary equipment meet the clean debris surface standard in 40 CFR 268.45 and can be declared non-dangerous. If it is not possible to meet the clean debris surface standard or the piping or ancillary equipment cannot be inspected, those portions of the piping and ancillary equipment will be removed, designated, and disposed of accordingly.

External piping (transfer lines) associated with LERF and 200 Area ETF consist of below grade and above grade piping. Below grade, piping will be dispositioned at closure consistent with the practices for below grade piping in the 200 Areas at the time of closure consistent with the 200-IS-1 operable unit decisions. Above grade piping will be dispositioned consistent with the provisions for internal piping.

Rinsate from the LERF and 200 Area ETF external piping and LERF internal piping will be processed through 200 Area ETF. Dangerous and/or mixed-waste solutions and materials generated during closure activities, which cannot be treated at 200 Area ETF will be managed in accordance with WAC 173-303-610(5).

H.3.4.5 Concrete

At LERF, the concrete catch basins are located at the northeast corner of each retention basin, where inlet pipes, leachate risers, and transfer pipe risers emerge for the basin. The concrete catch basin is curbed, and coated with a chemical resistant epoxy sealant. The concrete catch basin is sloped so that any leaks or spills from the piping or connections will drain into the basin. At the 200 Area ETF, the coated concrete floor and berm provides secondary containment for all the tanks and process piping.

Closure of concrete at LERF and 200 Area ETF will be performed after the associated tanks, piping, ancillary equipment, and structures have been closed. All concrete will be inspected visually and surveyed before any decontamination. The purpose of the inspection will be twofold: to identify and map any cracks in the concrete that might have allowed contaminants a pathway to the soil below (Section H.2.3), and to identify areas that potentially are contaminated with dangerous waste or dangerous waste residues. The inspection standard will be a clean debris surface as defined in Section H.2.1. The inspection of the concrete for a clean debris surface will be documented on an inspection record. Those areas already meeting the standard can be clean closed as is.

Those potentially contaminated areas will undergo decontamination to meet the clean closure standard of a clean debris surface. The concrete will be washed down; the rinsate collected, designated, and disposed of accordingly. The concrete will be reinspected for a clean debris surface. Concrete surfaces indicated by visual examination, as still being potentially contaminated will have the surface layer removed to a depth of 0.25 inches by scabbing or other approved methods. This will not threaten the environment, even if potential through-thickness cracks had been found during the inspection, because concrete decontamination (scabbing) will not employ liquid solutions that could enter cracks and because scabbing residues will be vacuumed away from cracks as, any residue is generated.

Achievement of a clean debris surface will be documented on an inspection record. Decontamination residues will be collected, designated, and managed as appropriate.

H.3.4.6 Structures

If contaminated with either dangerous or mixed waste constituents, the 200 Area ETF structures will be decontaminated and/or disassembled, if necessary, packaged, and disposed of in accordance with existing land disposal restrictions (WAC 173-303-140).

Closure steps could include the following activities.

- Containerize (as necessary and practicable) and remove any remaining waste.
- Review operating records for spillage incidents and visually inspect storage area surfaces for evidence of contamination or for cracks that could harbor contamination or allow the escape of decontamination solutions. Inspect storage area surfaces for visible evidence of contamination (e.g., discoloration, material degradation, wetness, and odor). If contamination is evident, the affected area(s) will be decontaminated.
- Decontaminate 200 Area ETF walls and floors to minimize the potential for loose contamination and facilitate any required surveys and/or chemical field screening. The structures could be cleaned by water rinse or high-pressure, low-volume steam cleaning coupled with a detergent wash. After decontamination, the walls and floors will be compared to closure performance standards.
- Collect rinsate and manage as dangerous waste for appropriate disposal.
- Secure (lock) personnel entries into building and post doors with appropriate warning signs.

H.3.4.7 Underlying Soils

Clean closure of soil under LERF's secondary liner will be accomplished by demonstrating that the liners and leak detection system kept contaminants from reaching the soil. The secondary liner provided secondary containment for the LERF basins. Unless inspections identify potential leaks, punctures, cracks, or tears indicating containment failure and a subsequent potential for soil contamination from TSD unit operations, the soil will be considered clean closed. However, if inspections identify such leaks, punctures, etc., potential soil contamination will be investigated.

Clean closure of soil under 200 Area ETF will be accomplished by demonstrating that the coated concrete floor kept contaminants from reaching the soil. The coated concrete floor and bermed area provided secondary containment for all the tanks and process piping. Unless inspections identify potential through-thickness cracks indicating containment failure and a subsequent potential for soil contamination from TSD unit operations, the soil will be considered clean closed. However, if inspections identify such cracks and there have been documented spills in the vicinity, potential soil contamination will be investigated.

Where it is possible visually to inspect directly beneath the tanks, a visual inspection will be performed. Where it is not possible visually to inspect beneath the tanks, an evaluation of the tank integrity will be made. The condition of the tank will be evaluated to determine if there was any potential for leakage. If no cracks, severe corrosion, or evidence of leaks is observed, it will be reasoned that mixed or dangerous waste solutions could not have penetrated to the soil directly below the tank.

External piping (transfer lines) between the 242-A Evaporator and LERF and 200 Area ETF are double lined with a leak detection system. If records indicate that no leaks from the primary piping occurred, the soil will be considered clean with respect to Resource Conservation and Recovery Act (RCRA) closure.

Where there is evidence that contamination may have leaked into the soil below tanks, concrete, or the soil/bentonite layer at LERF, the contaminated tank, concrete, or soil/bentonite layer will be removed to allow the underlying soil to be sampled to determine the depth of the contamination. Soil that is contaminated above the closure performance standards in Section H.2.3 will be removed, placed in containers, and disposed accordingly.

H.4 Maximum Waste Inventory

The maximum waste inventory for LERF and 200 Area ETF is in Addendum A.

H.5 Closure of Containers, Tanks, and Surface Impoundments

The following sections cover closure of containers, closure of tanks, and closure of surface impoundments.

H.5.1 Closure of Containers

Containers at 200 Area ETF will be used to contain dangerous waste in the event of a spill, unexpected release, or equipment failure. Containers will be used to accumulate nonradioactive dangerous waste and/or mixed wastes. All containers will be emptied and treated prior to closure of 200 Area ETF. Any containers used to contain dangerous and/or mixed waste at the 200 Area ETF that is generated during the closure process and therefore cannot be treated at 200 Area ETF will be designated and shipped to an on-site TSD unit or off-site TSD facility. Containers of dangerous and/or mixed waste will not be left in the 200 Area ETF after closure.

H.5.2 Closure of Tanks

Clean closure of 200 Area ETF will consist of the removal and disposal of all dangerous waste and the decontamination and/or removal and disposal of equipment which does not meet the performance standards in Section H.2, including tanks listed in Addendum C, Table C-1 and associated ancillary equipment as identified in Addendum C, Table C-8. The 200 Area ETF was designed to incorporate

removable components. This design facilitates closure by allowing complete removal of equipment, which does not meet the performance standards.

H.5.2.1 Load-In Tanks 59A-TK-109 and 59A-TK-117

Tanks 59A-TK-109 and 59A-TK-117 have been isolated from sources of dangerous waste because of severe pitting and corrosion. As such, these tanks are not fit for use; and do not meet the criteria for clean closure. Therefore, Tanks 59A-TK-109 and 59A-TK-117 will be managed as dangerous wastes and will be closed in accordance with this plan. The change in waste streams managed at the 2025ED Load-In Station, capacity of Load-In Station Tank 59A-TK-1, and the ability to unload tankers directly to the LERF basins has negated the need to replace the capacity of Tanks 59A-TK-109 and 59A-TK-117.

Tank 59A-TK-109 is empty and isolated from service; with the inlet valve (59A-MV-109), and outlet valve (59A-MF-105) replaced with blank flanges to isolate the tanks physically from potential sources of dangerous waste.

Tank 59A-TK-117 is empty and isolated from service; with the inlet valve (59A-MV-117) and outlet valve (59A-MV-113) replaced with blank flanges to isolate the tanks physically from potential sources of dangerous waste.

The 2025ED Load-In Station pumps, piping, secondary containment pit, sump, and sump leak detection will remain in service to support the mission of 2025ED Load-In Station.

H.5.2.2 2025EG Backup Load-In Station Unloading Components

Clean closure of 2025EG Load-In Station unloading components (platform, filter housing, and hose and hose transfer line) will consist of the removal and disposal of all dangerous waste and the removal and disposal of the unloading components. The secondary containment pit is shared with 2025ED and will remain in service to support the mission of 2025ED Load-In Station.

H.5.3 Closure of Surface Impoundments

At closure, all of LERF that received regulated waste will be closed in accordance with the requirements of this approved closure plan, which are intended to ensure compliance with the requirements of WAC 173-303-650(6)(a)(i). All equipment, structures, and other material associated with closure of LERF will be decontaminated or removed in accordance with WAC 173-303-610(2). All basin waste and decontamination rinsate will be transferred to 200 Area ETF. Sampling and testing will be conducted as described in Section H.3.4.2.

H.6 Schedule for Closure

Closure of LERF and 200 Area ETF has been extended to 2052 to support tank waste processing. The actual year of closure will depend on the time required for current waste to be processed and what role the LERF and 200 Area ETF will play in processing additional waste generated during future activities in the 200 Areas. Other factors affecting the year of closure include changes in operational requirements, lifetime extension upgrades, and unforeseen factors. When a definite closure date is established, notification of closure will be provided in accordance with Permit Condition II.J.3.

The activities required to complete closure are planned to be accomplished within 180 days in accordance with WAC 173-303-610(4)(b). Should a modified schedule be necessary, a revised schedule will be proposed through the permit modification procedure in accordance with WAC 173-303-610(4)(b).

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LIQUID EFFLUENT RETENTION FACILITY & 200 AREA EFFLUENT TREATMENT FACILITY 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
03/10/2021	8C.2020.8F
05/19/2020	8C.2020.6F
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

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ADDENDUM I
INSPECTION REQUIREMENTS

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ADDENDUM I
INSPECTION REQUIREMENTS

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I. INSPECTION REQUIREMENTS

I.1 Inspection Plan

This addendum describes the method and schedule for inspections of the Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (ETF). The purpose of inspections is to help ensure that situations do not exist that might cause or lead to the release of dangerous and/or mixed waste that could pose a threat to human health and the environment. Abnormal conditions identified by an inspection will be corrected on a schedule that prevents hazards to workers, the public, and the environment.

I.1.1 General Inspection Requirements

The content and frequency of inspections are described in this section. Inspection records are retained in the Hanford Facility Operating Record, LERF and 200 Area ETF file, or other approved locations, in accordance with Permit Condition II.I.1.

In certain areas of the 200 Area ETF, many inspections are performed remotely to maintain as low as reasonably achievable (ALARA) exposure. Monitoring instruments are connected to audible alarms and visual indicators track alarm status. The monitoring system provides trending of selected monitoring data, graphics, and equipment summary displays.

A preventive maintenance recall system is employed to direct preventive maintenance activities at the LERF and 200 Area ETF. Equipment requiring maintenance is checked as indicated by the maintenance history, manufacturer's recommendations, or engineering recommendations. The preventive maintenance of certain equipment might not be possible if the LERF or the 200 Area ETF is in an operational mode. Thus, the preventive maintenance could be performed slightly earlier or later than planned to minimize impact on operations.

Instrumentation at 200 Area ETF is calibrated regularly to ensure accuracy and reliability. All process control instrumentation is calibrated on a schedule depending on previous calibration experience. An instrument calibration and recall system is employed to manage calibrations.

I.1.1.1 Types of Problems

Key components of the LERF inspection program include the following areas:

- Structural integrity of the basins.
- Catch basin secondary containment system integrity.
- Evidence of release from basins.
- Safety, communications, and emergency equipment.

Key components of the 200 Area ETF inspection program include the following areas:

- Condition of tanks and ancillary piping.
- Condition of containers.
- Condition of the process control equipment.
- Condition of emergency equipment.
- Condition of secondary containment.

Table I-1 and Table I-2 provide a description of LERF and 200 Area ETF items to be inspected.

I.1.1.2 Frequency of Inspections

The frequency of inspections is how often (at a minimum) an inspection must be performed. The frequency of inspections is based on the rate of possible deterioration of equipment, operational history, engineering judgement, or the probability of a threat to human health or the environment.

Unless otherwise noted, inspection frequencies are defined by the following periodicities:

- Daily means once per calendar day.
- Weekly means once per calendar week, spanning from Sunday to Saturday.
- Monthly means once each calendar month.
- Quarterly means once per calendar quarter.
- Annually means at least once per 12-month period ±30 days.
- Continuous monitoring means instrument monitoring performed remotely in the 200 Area ETF Control Room continuously during 200 Area ETF waste processing operations and/or waste transfers. If instrumentation is not functioning, daily visual inspections are performed as identified in Table I-2, and as discussed in Addendum C, "Process Information."

The LERF and 200 Area ETF inspections and instrument monitoring frequencies are indicated in Table I-1 and Table I-2. The LERF and 200 Area ETF is inspected as indicated in Table I-1 and Table I-2.

I.1.2 Specific Process Inspections

The following sections describe the specific process inspections performed at LERF and 200 Area ETF.

I.1.2.1 Container Inspections

Container inspections and frequencies are provided in Table I-1. Containers are used at the 200 Area ETF to store secondary waste, such as the powder waste from the thin film dryer, liquid from the brine loadout system, and maintenance and operations waste. When containers are being held in container storage areas, the inspection schedule identified in Table I-1 is maintained.

Following the inspections, an inspection datasheet is signed and dated by the inspector and supervisor.

I.1.2.2 Tank System Inspections

A description of the tank systems and ancillary equipment at the 200 Area ETF is given in Addendum C. Tank system inspections, instrument monitoring criteria, and frequencies are given in Table I-1 and Table I-2. Tank system inspections occur at least once each operating day. Each operating day is defined as every day the tank is in operations (i.e. storing or treating dangerous waste).

Integrity assessments for the 200 Area ETF tank systems is discussed in Addendum C, "Process Information." The integrity assessment program will continue over the life of the tank systems at a frequency of every 10 years. The schedule is based on design and age of the tank systems, characteristics and quantity of the waste processed, tank visual inspections, corrosion assessment program, facility upgrades, past integrity assessments, and recommendation of the IQRPE. A description of the tank systems and ancillary equipment at the 200 Area ETF is given in Addendum C, "Process Information."

I.1.2.2.1 Overfill Protection

Tanks that have the possibility of being overfilled have level instrumentation that alarms before the tanks reach overflow. Tank level alarms annunciate in the 200 Area ETF Control Room, allowing operating personnel to take immediate action to stop the vessels from overfilling. These alarms are monitored continuously in the 200 Area ETF Control Room during solution transfers. When tank level instrumentation is inoperable, the alternate controls discussed in Addendum C, Section C.4.4.2 are followed to prevent tank overfilling.

I.1.2.2.2 Visual Inspections

Visual inspections of tanks and secondary containments are performed to check for leaks, signs of corrosion or damage, and malfunctioning equipment. Inspections are performed on tanks, secondary containment within the 200 Area ETF, surge tank, and verification tank, and associated secondary containment.

I.1.2.2.3 Secondary Containment Leak Detectors

The surge tank and verification tank secondary containment systems have sloped floors that drain solutions to sumps equipped with leak detectors that alarm in the 200 Area ETF Control Room. These alarms are monitored continuously in the 200 Area ETF Control Room during 200 Area ETF processing operations or during waste transfer, and at least daily when processing operations or waste transfers are not occurring. If an alarm is activated, further investigation is performed to determine if the source is a tank leak or other solution (i.e., precipitation).

I.1.2.2.4 Integrity Assessments

The initial integrity assessment was issued in 1995 (Addendum C). Consistent with the recommendations of the integrity assessment, a periodic integrity assessment program was developed for the 200 Area ETF tanks and is discussed in detail in Addendum C, Section C.4.1.5.

I.1.2.2.5 Effluent Treatment Facility Piping

The 200 Area ETF employs an extensive piping system. During inspections at the 200 Area ETF, any aboveground piping is inspected visually for signs of leakage and for general structural integrity. During the visual inspection, particular attention is paid to valves and fittings for signs of cracking, deformation, and leakage.

I.1.2.3 Surface Impoundment Inspections

Inspection and monitoring criteria and frequencies for the LERF Basins 42, 43, and 44 are provided in Table I-1 and Table I-2. A description of the LERF basins; leachate detection, collection, and removal system; inter-basin transfer pipelines, and overtopping and flow controls are discussed in Addendum C.

The totalizer method or pump run hour method is used to calculate the action leakage rate for each basin, to determine whether the action leakage rate for each basin is less than the limit of 2,100 gallons per acre per day. A flow meter/totalizer measures the amount of leachate removed from the leachate collection sump. In addition, a timer on the leachate pump tracks the cumulative pump run time. The amount of liquid removed from each leachate detection system sump is recorded weekly, and average daily flow rate calculated to verify that the action leakage rate has not been exceeded. The flow meter or the pump hour meter may not always be in service; therefore, the leak rate through the primary liner can be determined using one of two methods:

- Measured as the leachate flow meter/totalizer readings (flow meters/totalizers are located on the outflow line from the collection sumps at the bottom of the LERF basins); or
- Calculated using the pump operating time readings multiplied by the pump flow rate (the pump runs at a constant flow rate).

Structural integrity of the LERF basin dikes is discussed in Addendum C, “Process Information.”

I.1.2.3.1 Overtopping Control

Under current operating conditions, 2 feet of freeboard is maintained at each LERF basin, which corresponds to an operating level of 22.2 feet, or operating capacity of 7.8 million gallons. Level indicators at each basin are monitored to confirm that this level is not exceeded.

Before an aqueous waste is transferred into a basin, administrative controls are implemented to ensure overtopping will not occur during the transfer. The volume of feed to be transferred is compared to the available volume in the receiving basin. The transfer is not initiated unless there is sufficient volume available in the receiving basin or a cut-off level is established. The transfer into the basin would be stopped when this cut-off level is reached.

The LERF basins also are provided with floating covers that are designed and constructed to prevent overtopping by the introduction of precipitation and dust into the basins. Overtopping and flow control also are discussed in Addendum C.

I.1.2.3.2 Impoundment Contents

The LERF basins are inspected weekly to assess whether the contents are escaping from a basin. Level indicators are inspected weekly to check for unaccountable change in the level of the basins.

I.1.2.3.3 Leak Detection

The leachate detection, collection, and removal system is described in Addendum C. The leachate collection sump pump is activated when the liquid level in the leachate sump reaches a preset level, or manually when needed. A flow meter/totalizer measures the amount of leachate removed. In addition, the timer on the leachate pump tracks the cumulative pump run time. The leak rate through the primary liner can be determined using one of two methods:

1. Measured as the leachate flow meter/totalizer readings (flow meters/totalizers are located on the outflow line from the collection sumps in the bottom of the LERF basins) or
2. Calculated using the pump operating time readings multiplied by the pump flow rate (the pump runs at a constant flow rate).

Calculations using either method are sufficient for compliance. If either the flow meter/totalizer or pump operating time system is not functioning, this is identified as an abnormal condition (see Section I.1).

The LERF employs a double-walled transfer piping between 242-A Evaporator/Waste Treatment and Immobilization Plant, Effluent Management Facility (WTP-EMF) and LERF and between LERF and 200 Area ETF. The WAC 173-303-650 regulations do not require a discussion of piping for surface impoundments. However, for the purposes of comprehensive coverage of the LERF, inspections and integrity assessments are performed on the piping system. Aqueous waste (e.g., process condensate) is transferred from the 242-A Evaporator and WTP-EMF to the LERF via a buried pipeline. Likewise, aqueous waste is transferred to the 200 Area ETF via buried pipelines. At the LERF dikes, aboveground piping serves to transfer waste from one basin to another.

I.1.2.3.4 Dike Erosion

The LERF basins and dikes are visually inspected weekly and after significant precipitation events for run-on, run-off, cover integrity, erosion problems, or other signs of deterioration in the dikes from precipitation, wind, burrowing mammals, or vegetation.

I.1.2.3.5 Structural Integrity

A written certification attesting to the structural integrity of the basin dikes, signed by a qualified, registered professional engineer, is provided in Addendum C.

I.1.2.3.6 Container Inspection

Normal operation of the LERF does not involve the storage of dangerous waste in containers. Therefore, the inspection requirements of this section normally are not applicable to the LERF. Any containerized dangerous waste generated at LERF will be brought to the 200 Area ETF and managed in accordance with WAC 173-303-630 and is discussed in Addendum C.

I.1.3 Inspection Log

Observations made and deficiencies noted during an inspection are recorded on an inspection log (round sheets, work packages, data sheets, electronic inspection logs, etc.). On completion, the inspection log includes the inspector's printed name, handwritten or electronic signature, date, and time of inspection; the inspection log is submitted for review and approval by LERF and 200 Area ETF management or their designee. Once approved, the inspection log is kept in the Hanford Facility Operating Record, LERF and 200 Area ETF files. Inspection records are retained in the Hanford Facility Operating Record, LERF and 200 Area ETF files, or other approved locations, in accordance with Permit Condition II.I.1. The inspection records are used to help determine any necessary corrective actions. Problems identified during the inspections are prioritized and addressed in a timely fashion to mitigate health risks to workers, maintain integrity of the TSD units, and prevent hazards to public health and the environment.

If an inspection log cannot be located in the LERF and 200 Area ETF Operating Record, substitute documentation/log will be added to the LERF and 200 Area ETF Operating Record that documents the missing log. If an inspection was scheduled or attempted, but could not be performed or fully completed due to a planned event (e.g. power outage), then a reasonable attempt will be made to reschedule and complete the inspection within the identified inspection frequency. If an inspection was scheduled or attempted but could not be performed or fully completed due to an unplanned event (e.g. Hanford Site or local area emergency or injury; unplanned power outage; unexpected or radiological conditions, work, training, or safety restrictions); the missed inspection or portions thereof that were not completed shall be documented on the relevant inspection log or facility logbook; and if applicable, reported in the Hanford Facility Annual Noncompliance Report.

If while performing an inspection, a leak or spill is discovered, facility operations responds per the emergency response procedures action is taken to stop the leak and determine the cause. The waste is removed from the secondary containment in a timely manner that prevents harm to human health and the environment.

I.1.4 Storage of Ignitable or Reactive Wastes

Inspection and frequency criteria for ignitable and reactive waste is provided in Table I-1. The LERF could receive an aqueous waste that is designated reactive or ignitable. Any aqueous waste exhibiting these characteristics is managed (e.g., through flow equalization in LERF) such that the waste no longer exhibits the reactive or ignitable characteristics, as described in Addendum C, Section C.5.10.

Though unlikely, the 200 Area ETF secondary wastes might have the characteristics of being reactive or ignitable. A qualified inspector performs annual fire inspections of the 200 Area ETF using a checklist developed specifically for facilities that handle dangerous and/or mixed waste.

Table I-1 Visual Inspection Schedule for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility

Item	Inspection	Frequency
Tank Systems		
Load-In Station tank system (2025ED)	Inspect area for leaks. Note any unusual noises or vibration from the system pumps during waste transfers. Inspect secondary containment system for signs of deterioration.	Daily
Backup Load-In Station (2025EG)	Inspect ancillary equipment (transfer piping/valves) for leaks during processing operation, waste storage, or during waste transfers.	Daily
Filter drain sump tanks 59A-TK-2/59A-TK-3 and 59A-TK-4	Inspect tanks and ancillary equipment for corrosion or releases of waste.	Daily
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_2O_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 waste receiving tanks	Inspect tanks 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 tanks	Inspect tanks and ancillary equipment for leaks. Note any unusual noises or vibration from the system pumps.	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

Table I-1 Visual Inspection Schedule for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility

Item	Inspection	Frequency
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
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/Equipment		
Eye wash stations	Check status; check for adequate pressure.	Monthly
Safety showers	Check status; check for adequate pressure.	Monthly
Signs for WTP-EMF to LERF Underground Piping (4”-WTP-001-M17)	Verify portions of WTP-EMF to LERF underground transfer pipeline (4”-WTP-001-M17) located outside the 200 East Area are marked with signs reading “Buried Dangerous Waste Pipe” in accordance with Permit Condition II.V. Note: Signs and anchoring devices are made of durable plastic or metal.	Annually
Emergency Systems/Equipment		
Fire extinguishers	Check for adequate charge.	Monthly
Emergency lighting	Test operability.	Monthly
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, runoff, cover integrity, erosion problems, and other signs of deterioration.	Weekly & After significant precipitation events
Vessel Off Gas (VOG)		
VOG ventilation system	Inspect filters (HEPA and pre-filters), check VOG pressures, system flow, and discharge temperatures.	Daily
Ignitable and Reactive Waste		
Ignitable and reactive waste	Storage in compliance with Hanford Site fire protection standards and WAC 173-303-630(8).	Annually[2]

Table I-1 Visual Inspection Schedule for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility

Item	Inspection	Frequency
Container Storage Areas		
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
Secondary Containment Areas		
Integrity of floors, berms, trenches, dikes, sumps/pits, ramps, curbs, walls, and special coatings	Visually inspect the protective coatings, sumps/pits, trenches, ramps, curbs, and walls for evidence of significant cracks, gaps, or other degradation that may compromise the integrity of the containment. Check that items are in good condition, and that no liquid is present on the floors.	Daily

[1]If the camera system is inoperable, daily visual inspections will be performed; or the Thin Film Dryer will be emptied and isolated (either physically or administratively), by closing the influent valves and/or ensuring the influent pumps remain off, to prevent waste additions that could result in undetected leaks or spills in the Thin Film Dryer Room.

[2]When waste management activities occur.

HEPA – High efficiency particulate air.

I.1.5 Instrumentation Monitoring

The Inspection schedule pertaining to instrumentation monitoring and frequencies is provided in Table I-2. Instrumentation is monitored in the 200 Area ETF Control Room or location specified in Table I-2. In cases where this instrumentation is out of service (e.g. calibration, power failures, or maintenance), daily visual inspections will be performed in accordance with WAC 173-303-640, using the methods identified in Table I-2, and discussed in Addendum C, “Process Information,” for leak detection, level inspection, and overfill prevention.

If an alarm is activated, further investigation is performed to determine the cause of the alarm.

Continuous monitoring applies to the electronic monitoring performed in the 200 Area ETF Control Room for this instrumentation during 200 Area ETF processing operations, Backup Load-In Station (2025EG), and/or 2025-E Load-In Station transfers. Data from alarms, leak detectors, and level transmitters are monitored daily in the 200 Area ETF Control Room when waste transfers are not occurring (see C.2.5.1). In cases where this instrumentation is out of service (e.g., calibration, power failures, or maintenance) daily visual inspections will be performed in accordance with WAC 173-303-640, using the alternate methods discussed in Addendum C, Section C.1 for leak detection, Section C.4.3.1.2 for level inspection, and Section C.4.4.2 for overfill prevention will be followed.

In the event the electronic leak detectors or level indicators for Sump Tank 1 or Sump Tank 2 are out of service, daily visual inspections will be performed each operating day (WAC-173-303-640).

Inspections pertaining to instrumentation monitoring is provided in Table I-2.

Table I-2 Inspection Plan for Tank Systems Instrumentation Monitoring

Item	Inspection	Frequency
2025-ED/2025EG Load-In Stations		
Level alarm LSH-59A-003	Monitor liquid level in Load-In Tanks TK-1 to prevent overflow.	Continuously
Leak alarm LDA-59A-125	Monitor for leakage in the Load-In Station tank pit sump. Monitor for leakage from pipeline between 2025ED and 2025EG.	Continuously
Main Treatment Train		
Leak detector LAH-20B009	Monitor for leakage in the surge tank drainage sump.	Continuously
Level alarm LAHX-60A012	Monitor surge tank level to prevent overflow.	Continuously
Level alarm LAH-60C-111	Monitor liquid levels in the pH adjustment tank to prevent overflow.	Continuously
Level alarm LAH-60F-101	Monitor liquid levels in the first RO feed tank to prevent overflow.	Continuously
Level alarm LAH-60F-201	Monitor liquid levels in the second RO feed tank to prevent overflow.	Continuously
Level alarms LAH-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-20B-010	Monitor for leakage in the verification tank drainage sump.	Continuously
Secondary Treatment Train		
Level alarm LAHH-60I-001A/B	Monitor liquid levels in secondary waste receiver tanks A and B to prevent overflow.	Continuously
Level alarm LAHH-60J-001A/B	Monitor liquid levels in concentrate tanks A and B to prevent overflow.	Continuously
Level alarm LAHH-60I-107	Monitor liquid levels in the evaporator tank to prevent overflow.	Continuously
Level alarm LSHH-60J-036	Monitor liquid levels in the spray condenser tank to prevent overflow.	Continuously
Level alarm LAHH-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

Table I-2 Inspection Plan for Tank Systems Instrumentation Monitoring

Item	Inspection	Frequency
Level alarm LAHH-20B001	Monitor liquid level in Sump Tank 1 to prevent overflow.	Continuously
Level alarm LAHH-20B002	Monitor liquid level in Sump Tank 2 to prevent overflow.	Continuously
Leak alarm LAH-20B-003	Monitor for leakage to Sump No. 1.	Continuously
Leak alarm LAH-20B-005	Monitor for leakage to Sump No. 2.	Continuously
Leak alarm LDA-59A-127	Monitor for leakage from pipeline between 200 Area ETF and 2025-ED Load-In Station. Note: Monitoring required only during waste transfers	Continuously
Leak alarm LDA-60A-040 3” line LDA-60M-01A/ -01B 4” line	Monitor for leakage from pipeline between 200 Area ETF and LERF. Note: Monitoring required only during waste transfers.	Continuously
Transfer Pipeline		
WTP-EMF to LERF Catch Basin 242AL-42 (4”-WTP-001-M17) Leak Alarm LDA-42-2	Verify no leak alarm for transfer pipeline (4”-WTP-001-M17); or perform daily visual inspection to check for liquid in the sight glass (FG-80W-001) at LERF Catch Basin 242AL-42. Note: Monitoring required only during WTP waste transfers.	Continuously

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Revision 1

FACILITY RESPONSE PLAN FOR EFFLUENT TREATMENT FACILITIES

Prepared by

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Washington River Protection Solutions, LLC

Date Published
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washington river protection solutions

Prepared for the U.S. Department of Energy
Office of River Protection

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Approved for Public Release;
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This plan covers the following buildings and structures:

Liquid Effluent Retention Facility (LERF), 200 Area Effluent Treatment Facility (ETF), and 200 Area Treated Effluent Disposal Facility (TEDF).

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This document will be reviewed at least annually and updated if necessary by Facility Management unless Hanford Facility RCRA Permit coordination requirements provide otherwise.

FACILITY RESPONSE PLAN

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1.0 GENERAL INFORMATION

The LERF, 200 Area ETF, and TEDF are located on the Hanford Site, a 560-square-mile (1,450-square kilometer) U.S. Department of Energy (DOE) Richland Operations Office (RL) site in southeastern Washington State. The LERF, and 200 Area ETF are located in the East portion of the 200 Area near the north end of the Hanford Site. Portions of TEDF are located in the 600 Area and both 200 East and West areas.

This plan contains a description of facility specific emergency planning and response and is used in conjunction with portions of the DOE/RL-94-02, *Hanford Emergency Management Plan*, to meet contingency plan requirements Washington Administrative Code (WAC) 173-303. Pursuant to WAC 173-303, *Dangerous Waste Regulations*, DOE-RL as the owner or operator of the Hanford Facility is required to have a "contingency plan" for use in emergencies or sudden or non-sudden releases that threaten human health and the environment. Additionally, WAC 173-303-201(9) (for dangerous waste generator locations) and WAC 173-303-350(2) (for TSD facilities) allows the owner or operator to use documentation, other than a "contingency plan," so long as the other documentation incorporates dangerous waste management provisions sufficient to comply with the requirements of WAC 173-303-201, WAC 173-303-350, and WAC 173-303-360. This approach is used at Hanford. There is no specific document titled "Contingency Plan" for the Hanford Facility. Rather, specific portions of this plan combined with portions of contractor facility/activity-specific documentation (e.g., emergency plans/procedures) are maintained to meet the contingency plan requirements of WAC 173-303.

1.1 Facility Name:

U.S. Department of Energy, Hanford Site
Liquid Effluent Retention Facility (LERF)
200 Area Effluent Treatment Facility (ETF)
200 Area Treated Effluent Disposal Facility (TEDF)

1.2 Facility Location:

Benton County, Washington within the 200 East and 200 West Areas. Buildings/facilities covered by this plan are LERF, 200 Area ETF, and TEDF (not a staffed facility).

<u>LERF buildings/facilities:</u>

- LERF Basins 42, 43, and 44
- MO-180, change trailer
- 217-1 LERF building
- 242AL-71, instrument building
- 242AL-11, LERF garage

<u>200 Area ETF buildings/facilities:</u>

- 2025E ETF building
- 2025EC-71 building
- 2025ED Load-In Station building
- 2025EG Backup Load-In Station building
- HS-0011

- MO-148 ETF tool crib building
- MO-251, operations support office building
- MO-269, material coordinator building

TEDF buildings/facilities:

- 225E TEDF pump station 2
- 225W TEDF pump station 1
- 6653 TEDF disposal sampling building
- 6653A TEDF pump station 3

Central Accumulation Areas (CAAs) and Satellite Accumulation Areas (SAAs)

1.3 Owner:

U.S. Department of Energy
Richland Operations Office
PO Box 550
Richland, WA 99352

Manager:

Washington River Protection Solutions (WRPS), LLC
P.O. Box 850
Richland, Washington 99352

1.4 Description of the Facility and Operations

1.4.1 Liquid Effluent Retention Facility

LERF consists of three-lined surface impoundments (Basins 42, 43, and 44) used to store and treat dangerous/mixed aqueous waste. LERF is operating under a permit to treat and store dangerous waste. Basins 42, 43, and 44 are constructed with primary and secondary composite liners; a leachate detection, collection, and removal system between liners; and a floating cover. Wastes are also accumulated within the LERF fence line in CAAs and SAAs.

1.4.2 200 Area Effluent Treatment Facility

Wastes are accumulated at the 200 Area ETF in permitted storage areas, CAAs, and SAAs (as appropriate). The 200 Area ETF is operating under a permit to treat and store dangerous waste. 200 Area ETF treats various aqueous wastes generated at the Hanford Site prior to discharging the treated effluent to the State-Approved Land Disposal Site (SALDS) north of the 200 West Area, under the authority of a Washington State Waste Discharge Permit. Both LERF and 200 Area ETF waste processing operations are controlled in a central control room located in the ETF building (2025E).

200 Area ETF operations structures are comprised of the following:

2025E ETF Building. Aqueous waste is treated and stored in 2025E Process Areas in a series of tank systems and process units. The 2025E Building includes adjacent tanks located outside that are used to store aqueous waste and chemicals used in the process. Within building 2025E, waste also is managed in containers through treatment and/or storage.

2025ED Load-In Station. The 2025ED Load-In Station provides the capability to unload, store, and transfer aqueous waste until the waste is transferred into the Load-In Station tank, surge tank, or directly to LERF. The Load-In Station consists of two truck bays equipped with Load-In Station tanks.

2025EG Backup Load-In Station. During expansion of the 2025ED Load-In Station, the Backup Load-In Station (2025EG) provides the capability to transfer of aqueous waste from tanker trucks and other containers from other Hanford Site sources until the waste is transferred to ETF or LERF; and for storage and treatment of miscellaneous waste. Once the 2025ED expansion project is complete, the Backup Load-In Station unloading components will be disconnected, removed, and dispositioned as appropriate; and the facility will be used for storage and treatment of miscellaneous waste. The Backup Load-In Station consists of a single truck bay.

2025E Verification Tanks. These tanks are located outside and are used to receive treated effluent, store treated effluent during laboratory analysis and verification, or discharge verified effluent.

2025E and 2025EA Offices Buildings. These areas provide office space.

1.4.3 200 Area Treated Effluent Disposal Facility

The 200 Area TEDF is located southeast of 200 Area ETF, and transports the 200 East and West Area facility effluents to a common disposal system. TEDF is not a staffed facility. TEDF is comprised of collection and transfer system piping, three pump stations, a sample building, and two 5-acre disposal ponds. The TEDF accepts liquid effluents from other Hanford facilities located in the 200 East and 200 West Areas that meet TEDF wastewater discharge permit requirements.

2.0 PURPOSE

This plan describes the actions, which will be taken in response to upset and/or emergency conditions within the LERF and 200 Area ETF facilities. These events may include spills or releases caused by processing, fires and explosions, transportation activities, movement of materials, packaging, storage of hazardous materials, and natural and security contingencies. Sections 1.0, 3.1, 4.0, 6.1, 6.1.1, 6.1.2, 6.2, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.5.1, 6.3 and subsections, 6.6, 7.2, 7.2.1, 7.2.1.1, 7.2.2, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 9.0, 10.0 of the FRP are enforceable sections meeting RCRA contingency planning requirements for LERF and 200 Area ETF. Enforceable sections cannot be changed without coordinating the change with the Permit modification process. Attachment B of this FRP provides a crosswalk listing applicable WAC 173-303 requirements and how/where, the requirement is met.

3.0 FACILITY/BUILDING EMERGENCY RESPONSE ORGANIZATION

The facility/building emergency response organization (ERO) includes the Building Warden (BW)/Building Emergency Director (BED), Staging Area Manager (SAM), Personnel Accountability Aides (PAA) who are responsible for implementing emergency response actions at LERF and 200 Area ETF. Other facility support personnel include facility subject-matter experts, and other operational personnel.

200 Area ETF Shift Operations Managers are designated as BW/BEDs. In accordance with roles and responsibilities of RLEP 1.1 Checklist, Section 3.3 Building Warden/Building Emergency Director for Low-Hazards Facilities – Checklisted Duties.

The 200 Area ETF ERO is responsible for implementing emergency response action at the LERF, 200 Area ETF facilities. The 200 Area ETF is staffed 24-hours a day, and is prepared to respond to emergencies through designated personnel with specific primary, on-call and alternate responsibilities. The BW/BED is responsible for managing emergency actions for the LERF and 200 Area ETF. The BW/BED will utilize the Hanford Incident Command System (ICS), supplemented by facility-specific emergency response procedures and DOE-0223 Emergency Plan Implementing Procedures. The BW/BED may assign other facility subject-matter experts to additional tasks.

3.1 Building Warden/Building Emergency Director

Emergency response will be directed by the BW/BED until the IC arrives. The BW/BED fulfills the role and meets the requirements of the "Emergency Coordinator" as defined in WAC 173-303-360(1). The senior Hanford Fire Department officer will be the IC. If the event is determined to be primarily a security event, the Hanford Fire Department and Hanford Patrol will operate under a unified command system with Hanford Patrol making decisions pertaining to security. These individuals have the authority to request and obtain any resources necessary for protecting people and the environment.

The BW/BED becomes a member of the Incident Command Organization and functions under the direction of the IC. In this role, the BW/BED continues to manage and direct LERF and 200 Area ETF operations.

A BW/BED is available, on either the premises or on-call, 24 hours a day. At the 200 Area ETF, the name, and telephone number of the BW/BEDs is kept in the 200 Area ETF emergency binders located in the 200 Area ETF Control Room.

Security and emergency services organization maintains a complete listing of qualified BW/BEDs. The list is maintained on the security and emergency services webpage, within the LERF and 200 Area ETF section, and is contained in Permit Attachment 4A.

3.2 Other Members

The following positions are not required; but are used as appropriate when available. Facility management appoints and ensures training is provided to individuals to perform as Personnel Accountability Aides (PAAs) and Staging Area Managers (SAMs).

- PAAs are responsible for facilitating the implementation of protective actions (evacuation or take cover) and for facilitating the accountability of personnel once the protective actions have been implemented.
- SAMs are responsible for coordinating and conducting activities at the staging area.

Additional support personnel (radiological control, maintenance, engineering, hazardous material coordinators, etc.) are available as needed to assist the facility ERO. The BW/BED will use the public address system (PAX) system, 200 Area ETF radio, cell phone, landline phones, or individuals to notify personnel that their support is needed in an event.

The complete Facility/Building Emergency Response Organization listing of positions, names, work locations, and telephone numbers for the LERF and 200 Area ETF is maintained in a separate location in a format determined appropriate by LERF and 200 Area ETF management. Copies are distributed to appropriate LERF and 200 Area ETF locations and maintained by the security and emergency services organization.

4.0 IMPLEMENTATION OF THE PLAN

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

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

The BW/BED shall use the following steps to determine if an event is subject to the contingency plan implementation and notification requirements of WAC 173-303-201 or WAC-173-303-360:

1. The event involved an unplanned spill, release, fire, or explosion

AND

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

OR

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

AND

3. The emergency circumstance poses a threat to human health or the environment.

Additional guidance to assist the BW/BED in determining the applicability of the requirements is maintained in DOE-RL emergency plan implementing procedures. This guidance is derived from Washington State Department of Ecology Dangerous Waste permit application guidelines for implementation of the contingency plan and notifications to Ecology. Contractor environmental single points-of-contact are also available to assist the BW/BED in determining the applicability of requirements.

If assessment of an event does not allow a definitive determination of the threat to human health and the environment, then the BW/BED shall continue to implement the emergency procedures for the event, and through that process continue the assessment of the event.

Immediately after an emergency, the BW/BED must provide for treating, storing or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at LERF and 200 Area ETF.

If the BW/BED determines that the event response requires contingency plan implementation, the BW/BED must notify production operations Central Shift Manager, who will ensure that the environmental organization makes environmental notifications in accordance with WAC 173-303-201(14)(d) or WAC 173-303-360(2)(d).

The following information must be included in the assessment report:

- The name and telephone number of reporter.
- The name and address of facility.
- The time and type of incident (e.g., release, fire, or explosion).
- The name and quantity of material(s) involved, to the extent known.
- The extent of injuries, if any.
- The possible hazards to human health or the environment outside the facility.

5.0 POTENTIAL EMERGENCY CONDITIONS

Potential emergency conditions, under both WAC 173-303 and DOE requirements fall into three basic categories: (1) operations (process upsets, fires, explosions, loss of utilities, spills, and releases), (2) natural phenomena (e.g., earthquakes), and (3) security contingencies (bomb threat, hostage situation, etc.). The following are conditions that have been evaluated to determine if they may lead to an emergency at the LERF and 200 Area ETF.

5.1 Facility Operations Emergencies

The following conditions could result in a potential emergency condition or require facility personnel to implement protective actions, and describes the condition and adverse effect to the facility. This information typically is derived from a safety analysis report, hazards evaluation, or risk assessment for the facility.

5.1.1 Loss of Utilities

Loss of utilities includes loss of electricity, water, ventilation, instrument air. The 200 Area ETF uses steam from two small electric-powered boilers for the Evaporator and Thin Film Dryer processes; however, none of these are a utility for the building. Loss of utilities at LERF and 200 Area ETF can affect dangerous waste operations and worker activities.

5.1.1.1 Loss of Electricity

A loss of electricity could produce loss of process equipment, loss of ventilation. The associated hazard in this case is exposure to radiation and/or toxic materials.

Loss of utilities at LERF and 200 Area ETF can affect dangerous waste operations and worker activities. Loss of electricity at LERF can also affect pumping, leak detection, level monitoring, and the leachate collection system. Loss of electricity at 200 Area ETF can also affect the treatment processes, leak detection, level monitoring, pumping and off-loading operations.

Loss of electricity at TEDF can affect pumping, and automatic sampling processes at TEDF.

5.1.1.2 Loss of Water

A loss of water would not result in an emergency.

5.1.1.3 Loss of Ventilation

A loss of ventilation at the 200 Area ETF could result in the loss of airborne contamination control, producing a radiological and/or toxic exposure hazard from inadequate air supply.

Loss of ventilation is not applicable to LERF; and a loss of ventilation does not cause an operational emergency at TEDF.

5.1.1.4 Loss of Compressed Air Systems

Loss of the compressed air at 200 Area ETF will result in loss of plant control, loss of ventilation, or a process disruption. A compressor(s) is located in the 2025E ETF building and supplies instrument air to the ventilation system and 2025E Process Area. Process disruption/loss of plant control would interrupt the treatment processes.

A loss of instrument air would shut down the ventilation system at 2025E Process Area; and interruption of process operations could cause potentially hazardous situations.

5.1.2 Major Process Disruption/Loss of Plant Control

Process upsets typically result from the failure of mechanical controlling or monitoring equipment, such as failure of a pump, liquid level control, leak detection, or chemical metering equipment.

Major process disruption/loss of plant control at LERF would interrupt the pumping, leak detection, level monitoring, and the leachate collection system.

A major process upset at 200 Area ETF could involve leakage of mixed waste from the 200 Area ETF storage tanks. Process disruption/loss of plant control would interrupt the treatment processes, leak detection, level monitoring, off-loading and pumping operations.

5.1.3 Pressure Release

The following section describes the results of pressure system failures at 200 Area ETF. There are no pressure hazards at LERF or TEDF.

200 Area ETF has low-pressure compressed air and steam systems. Loss of the compressed air or steam system(s) could result in loss of plant control, loss of ventilation, or a loss of steam, which will result in a process disruption. Process disruption/loss of plant control would interrupt the treatment processes. Compressed gas cylinders are used in various locations at the 200 Area ETF. These cylinders pose a possible projectile and inhalation hazard in the immediate area where stored and used. A process system pressure release is categorized as a condensate spray release. This is addressed as a radioactive/dangerous/mixed waste spill in Section 5.1.6.

5.1.4 Fire and/or Explosion

In addition to the usual fire and explosion hazards, a fire or explosion at LERF and 200 Area ETF could result in personnel injury, personnel exposure to hazardous materials, highly toxic vapors,

and/or corrosive fumes. There are no hazardous materials stored at TEDF that could cause a fire and/or explosion.

A fire/explosion at 200 Area ETF could generate highly toxic and/or corrosive fumes. Flying debris might result from explosions and compressed gas cylinder failure. Injury to personnel, process system disruption, loss of plant control, and breach of process system boundaries could result from the flying debris.

5.1.5 Hazardous Material Spill

Hazards associated with this type of spill include potential exposure to corrosive and/or toxic material. TEDF does not store hazardous material. Hazardous materials include:

Small quantities of hazardous material could be used in LERF maintenance and sampling activities. Process liquid releases are addressed in Section 5.1.6.

Hazards associated with 200 Area ETF process chemical spills include potential exposure to corrosive, oxidizing, or toxic materials, as well as potential environmental damage by the release of these materials to the air, water, or soil column. The hazards assessment required by DOE Orders identifies sodium hydroxide (per Hazards Assessment), hydrogen peroxide, and sulfuric acid spills as events that could pose significant risk or consequences.

5.1.6 Dangerous/Mixed Waste Spill

Hazards associated with this type of spill include potential exposure to radioactive, caustic, corrosive, and/or toxic material as well as potential environmental damage. Hazardous materials are not stored at TEDF. Hazardous materials are stored in LERF and 200 Area ETF.

Inventories at LERF include large quantities of aqueous waste. The hazards at LERF could pose significant risks or consequences. LERF has the potential for exposures to radioactive material, or toxic materials, as well as environmental damage by their release to air, water, or soil column. Responses for dangerous/mixed waste release are included in the scope of emergency response plans and abnormal operating procedures for the 200 Area ETF.

Inventories at 200 Area ETF include large quantities of process liquid, secondary powder and brine waste, indirect waste, and dry active waste. The hazards assessment has determined that there are no events that could pose significant risk or consequences. 200 Area ETF has the potential for minor exposures to radioactive material, corrosive, oxidizing, or toxic materials, as well as localized environmental damage by their release to air, water, or soil column. Therefore, responses for dangerous/mixed waste releases are included in the scope of emergency response plans and abnormal operating procedures for the 200 Area ETF.

5.1.7 Transportation and /or Packaging Incidents

LERF and 200 Area ETF transportation and/or packaging incident involving hazardous chemicals, radioactive/dangerous/mixed waste, or samples could result in exposure to hazardous materials (corrosive, oxidizer, toxic) and/or low levels of radioactivity, as well as potential environmental damage by their release to the air, water, or soil column.

Not applicable to TEDF.

5.1.8 Radioactive Material Release

Hazards associated with liquid releases from misrouting, process upsets, or spills could expose personnel and the environment to hazardous and liquid mixed waste. Significant contamination spread/releases from failure of secondary containment systems could result in the transport to and contamination of soil, water, or air. The hazards involve personnel and environmental exposure to radioactive and toxic materials.

Inventories at 200 Area ETF include large quantities of process liquid, secondary powder and brine waste, indirect waste, and dry active waste that have the potential for exposures to radioactive material. Responses for dangerous/mixed waste release are included in the scope of emergency response plans and abnormal operating procedures for the 200 Area ETF.

Refer to Section 5.1.6 for LERF. This section is not applicable to TEDF.

5.1.9 Criticality

Not applicable or cannot cause an emergency condition at 200 Area ETF, LERF, and/or TEDF.

5.2 Natural Phenomena

Natural phenomena type events are discussed in the following sections.

5.2.1 Seismic Event

Depending on the magnitude of the event, severe structural damage can occur resulting in serious injuries or fatalities and the release of hazardous materials to the environment. Damaged electrical circuits and wiring could result in the initiation of fires, interruption of process monitoring/control systems, and loss of ventilation systems. Seismic events could also impact water utilities and process/instrument air systems.

5.2.2 Volcanic Eruption/Ash Fall

Though not expected to cause structural damage, the ash resulting from a volcanic eruption could cause shorts in electrical equipment and plug ventilation system filters.

5.2.3 High Winds/Tornadoes

High winds or tornadoes may cause structural damage to systems containing hazardous materials resulting in a release of the materials to the environment.

5.2.4 Flood

Flooding can cause the release of hazardous materials depending on the type of storage containers. Floods can also cause short circuits in electrical wiring located at or below ground level. This may then result in an increased likelihood of fires.

5.2.5 Range Fire

The hazards associated with a range fire are the same as those associated with a building fire, plus potential site access restrictions and travel hazards such as poor visibility.

5.2.6 Aircraft Crash

In addition to the potential for serious injuries or fatalities, an aircraft crash could result in the direct release of hazardous materials to the environment or cause a fire that could lead to the release.

5.3 Security Contingencies

Security contingencies are discussed in the following sections.

5.3.1 Bomb Threat/Explosive Device

A bomb threat may be received by anyone who answers the telephone or receives mail. The major effect is that personnel will need to perform emergency shutdown of the facility before evacuation, if safe to do so. If an explosive device detonates, the effects are the same as those discussed under fire and explosion.

5.3.2 Hostage Situation/Armed Intruder

A hostage situation or the entry of an armed hostile intruder(s) can pose an emergency if either of these conditions has the potential to adversely affect facility operations.

5.3.3 Suspicious Object

If a suspicious object is discovered, personnel may need to perform an emergency shutdown of the facility before evacuation, if safe to do so.

6.0 INCIDENT RESPONSE

The initial response to any emergency is to immediately protect the health and safety of persons in the affected area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment are secondary responses.

The following sections describe the process for implementing basic protective actions as well as descriptions of response actions for the events that may affect LERF and 200 Area ETF as identified in Section 5.0 of this plan. In addition, actions to prevent secondary release, fires, or explosions are provided. Attachment A provides a list of applicable procedures.

6.1 Protective Action Responses

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

The BW/BED reviews the ETF emergency response procedure(s) for categorization of the event and if necessary, activates the Hanford Site Emergency Response Organization. Operational Emergency categorization is reported to the production operations Central Shift Manager, who makes notifications to the Hanford Emergency Operations Center (EOC) Shift Office.

A common set of initial response actions are performed by the event discoverer and the BW/BED during all events. Those actions are described below and are not repeated in each following subsection.

The discoverer notifies the BW/BED and initiates SWIM response as specified in the following sections.

- **S**tops work.
- **W**arns others in the vicinity.
- **I**solates the area.
- **M**inimizes exposure to the hazards.
  - The BW/BED determines if emergency conditions exist requiring response from the Hanford Fire Department and evaluates the need to perform additional protective actions.
  - If the Hanford Fire Department resources are not needed, the event is mitigated with resources identified in Section 9.0 of this plan and proper notifications are made.
  - If the Hanford Fire Department resources are needed, the BW/BED ensures notification to 911 (509-373-0911 if using a cell phone).
  - The BW/BED ensures a representative is sent to meet the Hanford Fire Department.
  - The BW/BED provides a formal turnover to the IC when the IC arrives at the ICP.
  - The BW/BED informs the Hanford Site ERO as to the extent of the emergency (including estimates of dangerous waste and mixed waste quantities released to the environment).
  - If operations are stopped in response to the event, the BW/BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
  - Hanford Fire Department stabilizes the event.

6.1.1 Evacuation Plan

The objective of a facility evacuation order is to limit personnel exposure to hazardous materials or dangerous/mixed waste by increasing the distance between personnel and the hazard. The scope of the evacuation includes evacuation of the facility because of an event at the facility or an evacuation of the facility in response to a Site evacuation order. Evacuation will be directed by the BW/BED when conditions warrant and will apply to all personnel not actively involved in the event response or emergency plan-related activities.

The BW/BED will initiate the evacuation by making/directing an announcement to evacuate, the evacuation location, and safe route of travel over a public address system and facility radios. The BW/BED or designee will call 911 (509-373-0911 if using a cell phone). Personnel will proceed to a predetermined staging area (see Figure 1), or other safe upwind location, as determined by the BW/BED. The BW/BED will determine the operating configuration of the facility and identify any additional protective actions to limit personnel exposure to the hazard.

The BW/BED will assign ERO members or operational personnel to check the buildings, ensuring evacuation actions are taken at ETF occupied buildings. Implementing actions executed by the BW/BED and ERO members are directed by the emergency response procedures. When evacuation actions are complete, a status report will be given to the BW/BED. The BW/BED will provide a status update to the IC.

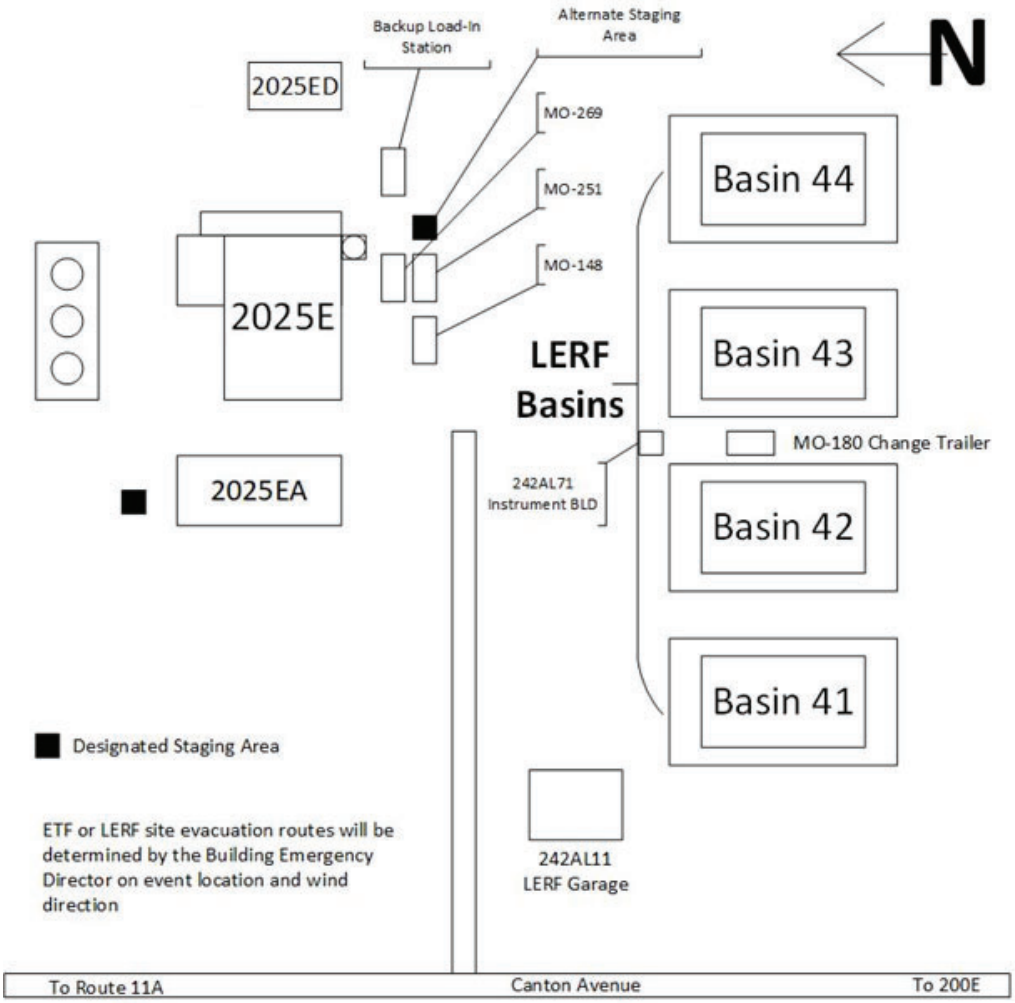

Figure 1. LERF and 200 Area ETF Staging Areas

6.1.2 Take Cover

The BW/BED initiates the take cover by directing that an announcement be made over the public address system, 2-way portable radios, and take cover siren (WAVERING SIREN) by calling the POC using 911 (509-373-0911 if using a cell phone). Actions to complete a take cover order are directed by *Take Cover* at ETF emergency response procedure. Protective actions associated with operations include configuring, or shutting down the ventilation systems. Determination of additional take cover actions is based on operating configuration, weather conditions, amount and duration of release, and other conditions, as applicable, to the event and associated hazard. At a minimum, personnel exposure to the hazard will be minimized. The BW/BED ensures take cover actions are taken at all occupied buildings identified in Section 1.2.

6.2 Response to Facility Operations Emergencies

The BW/BED reviews the ETF emergency response procedure and, as required, and categorizes the event. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events. Attachment A provides a list of procedures.

6.2.1 Loss of Utilities

A case-by-case evaluation is required for each event to determine loss of utility impacts. When a BW/BED determines a loss of utility impact, actions are taken to ensure dangerous and/or mixed waste is being properly managed, to the extent possible given event circumstances. As necessary, the BW/BED will stop operations and take appropriate actions until the utility is restored.

6.2.2 Major Process Disruption/Loss of Plant Control

The hazards assessment has determined that this occurrence does not pose significant risk to human health or the environment.

6.2.3 Pressure Release

The hazards assessment has determined that a pressure release does not pose significant risk to human health or the environment. Hazardous material release and dangerous/mixed waste releases are addressed in Section 6.2.5.

6.2.4 Fire and/or Explosion

In the event of a fire and/or explosion, the discoverer activates a fire alarm (pull box), calls 911 (509-373-0911 if using a cell phone). The BW/BED verifies that 911 has been called. Automatic initiation of a fire alarm (through the smoke detectors and sprinkler systems) is also possible.

The discoverer notifies the BW/BED and initiates SWIM response (see Section 6.1).

Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit and proceed to the designated staging area for accountability.

On actuation of the fire alarm, ONLY if time permits, personnel should shutdown equipment and secure waste; the alarm automatically signals the Hanford Fire Department.

The BW/BED establishes the initial command post, obtains all necessary information pertaining to the incident, and sends a representative to meet Hanford Fire Department.

The BW/BED provides a turnover briefing to the IC when the IC arrives at the initial command post.

If operations are stopped in response to the fire, the BW/BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.

Hanford Fire Department firefighters extinguish the fire as necessary.

NOTE: Following a fire and/or explosion, WAC 173-303-640(7) will be addressed for the 200 Area ETF tank systems regarding fitness for use.

6.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill

Spills can result from many sources including process leaks, tanker trucks, container spills or leaks, damaged packages or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra hazards posed by the presence of radioactive materials.

These controls include containment berms, dedicated spill control sumps, remote gauges, and level indicators as well as spray shields on chemical pipe flanges. Procedures provide alarm response and maintenance actions for leak detection equipment, surveillance of possible leak locations, and response actions for detected spills.

The discoverer notifies the BW/BED and initiates SWIM actions (see Section 6.1).

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

6.2.5.1 Damaged or Unacceptable Shipments

During the course of receiving an onsite transfer of dangerous and/or mixed waste at LERF and 200 Area ETF, an unanticipated event could be discovered resulting in a conformance issue concerning the waste. Damaged or unacceptable shipments resulting from onsite transfers are not subject to WAC 173-303-370; however, conformance issues must be resolved in order to maintain proper records.

The following actions are taken to resolve the conformance issue:

- Operations management is notified of the damaged or unacceptable waste to be received.
- If the conformance issue results in a spill or release, actions described in Section 6.2.5 are taken.
- The generating organization is notified of the conformance issue.
- An operations representative, in conjunction with the generating organization, determines the course of action to resolve the conformance issue.

6.2.6 Radioactive Material Release

Section 6.2.5 addresses the actions for a radiological material release.

6.2.7 Criticality

Not applicable.

6.3 Response to Natural Phenomena

The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events. Attachment A provides a list of procedures.

6.3.1 Seismic Event

The Hanford Site Emergency Response Organizations' primary role in a seismic event is coordinating the initial response to injuries, fires, fire hazards and acting to contain or control radioactive and/or hazardous material releases.

Individuals should remain calm and stay away from windows, steam lines, and hazardous material storage locations. Once the shaking has subsided, individuals should evacuate carefully and assist personnel needing help. The location of any trapped individuals should be reported to the BW/BED or immediately reported to 911 (509-373-0911 if using a cell phone), followed by notification to the BW/BED.

The BW/BED takes whatever actions are necessary to minimize damage and personnel injuries. Responsibilities include the following:

- Coordinating searches for personnel and potential hazardous conditions (fires, spills, etc.).
- Conducting accountability.
- Securing utilities and facility operations.
- Arranging rescue efforts and notifying 911 (509-373-0911 if using a cell phone) for assistance.
- Determining if hazardous materials were released.
- Determining current local meteorological conditions.
- Providing personnel and resource assistance to other facilities, if required and possible.

6.3.2 Volcanic Eruption/Ash Fall

When notified of an impending ash fall, the BW/BED will implement measures to minimize the impact of the ash fall. BW/BED actions include the following:

- Shutting down some or all operations and processes.
- Securing secondary use exterior doors.

If other emergency conditions arise as a result of the ash fall (e.g., fires due to electrical shorts), response is as described in other sections of this plan.

6.3.3 High Winds/Tornadoes

Upon notification of impending high winds, the BW/BED takes necessary steps to secure all outdoor waste and hazardous material containers and storage locations. All doors and windows are shut, and personnel are warned to use extreme caution when entering or exiting the building. Ventilation, utilities, and operations will be shut down as appropriate to lessen the severity of the impact.

6.3.4 Flood

Not applicable.

6.3.5 Range Fire

Responses to range fires are handled by preventive measures (e.g., keeping hazardous material and waste accumulation areas free of combustible materials, such as weeds and brush). If a range fire breaches the LERF and 200 Area ETF boundary, the response is as described in Section 6.2.4.

6.3.6 Aircraft Crash

The response to an aircraft crash is the same as for a fire and/or explosion (Section 6.2.4).

6.4 Security Contingencies

The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events. Attachment A provides a list of procedures.

6.4.1 Bomb Threat/Explosive Device

Response to a bomb threat/explosive device is discussed in the following sections.

6.4.1.1 Telephone Threat

Individuals receiving telephoned threats attempt to get as much information as possible from the caller (using the bomb threat checklist if available). Upon conclusion of the call, or during the call if possible, notify the BW/BED and Hanford Patrol by calling 911 (do not use wireless communications devices for reporting a bomb threat/explosive device unless beyond 100 feet from the suspected object).

When notified, the BW/BED ensures facility protective actions have been taken as appropriate, and questions personnel at the staging area regarding any suspicious objects. When Hanford Patrol personnel arrive, follow their instructions.

6.4.1.2 Written Threat

Receivers of written threats handle the letter as little as possible. Notify the BW/BED and Hanford Patrol by calling 911 (do not use wireless communications devices for reporting a bomb threat/explosive device unless beyond 100 feet from the suspected object). Depending on the content of the letter, the BW/BED might evacuate the affected locations. The letter is turned over to Hanford Patrol and their instructions are followed.

6.4.2 Hostage Situation/Armed Intruder

The discoverer of a hostage situation or armed intruder reports the incident to 911 (509-373-0911 if using a cell phone) and to the BW/BED if possible. Hanford Patrol will determine the remaining response actions.

6.4.3 Suspicious Object

The discoverer of a suspicious object reports this object to the BW/BED and to 911 (do not use wireless communications devices for reporting a bomb threat/explosive device unless beyond 100 feet from the suspected object), if possible, and ensures that the object is not disturbed. The BW/BED initiates SWIM as described in Section 6.1, and evacuation actions as described in Section 6.1.1.

6.5 Response to Unexpected/Unidentified Odors

Not applicable.

6.6 Prevention of Recurrence or Spread of Fires, Explosions, or Releases

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

7.0 TERMINATION OF EVENT, INCIDENT RECOVERY, AND RESTART OF OPERATIONS

DOE/RL-94-02, Section 9.0, describes actions for event termination, incident recovery, restart of operations, and incompatible waste.

7.1 Termination of Event

For events where the Hanford EOC is activated, the Site Emergency Director has the authority to declare event termination. This decision is based on input from the BW/BED, IC, and other emergency response organization members. For events where the Hanford EOC is not activated, the IC and BW/BED will declare event termination.

7.2 Incident Recovery and Restart of Operations

Immediately after an emergency, the BW/BED must provide for treating, storing, or disposing of recovered waste, contaminated soil, or surface water, or any other material that results from a release, fire, or explosion at LERF and 200 Area ETF. A recovery plan is developed when necessary in accordance with DOE/RL-94-02, Section 9.2.

If this plan was implemented according to Section 4.0 of this plan, Ecology is notified that the LERF and 200 Area ETF is in compliance with cleanup activities, as described in DOE/RL 94-02, Section 5.1.2.2, before operations can resume.

7.2.1 Incompatible Waste

After an event, the BW/BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Clean up actions are taken by LERF and 200 Area ETF personnel or other assigned personnel. DOE/RL-94-02, Section 9.2.3, describes actions to be taken.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility is performed before storage, as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in approved storage areas appropriate for their compatibility class.

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

7.2.2 Post Emergency Equipment Maintenance and Decontamination

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumable and disposed materials are restocked.

The BW/BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished; protective clothing is cleaned or disposed of and restocked, etc.

8.0 EMERGENCY EQUIPMENT

Emergency resources and equipment for the LERF and 200 Area are presented in this section in accordance with WAC 173-303-340(1) and WAC 173-303-201(3); and WAC 173-303-350(3)(e) and WAC 173-303-201(9)(b). Emergency equipment must be tested and maintained to assure its proper operation in time of emergency. No fire extinguishers are used because a sprinkler system is maintained throughout the facility for fire suppression prior to the arrival of the Hanford Fire Department.

Sufficient space is maintained at the LERF Basins and in ETF building 2025E to allow access of personnel and equipment responding to fires, spills, or other emergencies in accordance with WAC 173-303-340(3) and WAC 173-303-201(6). Unobstructed fire lanes run from main entrance to allow emergency vehicle access to the main entrance and the fire hydrants. The interior space is designed to allow access by emergency response personnel while maintaining barriers to contain releases of gaseous or liquid waste and hazardous substances as defined in WAC 173-303-040 and WAC 173-303-201. Exit (egress) paths at these locations containing dangerous waste are checked weekly to ensure the walkways have not been obstructed.

8.1 Fixed Emergency Equipment

The following table lists fixed emergency equipment.

Fixed Emergency Equipment		
Type	**Location**	**Capability**
Emergency lighting	2025E building 225E TEDF pump station 2 225W TEDF pump station 1 6653A TEDF pump station 3 6653 TEDF disposal sampling building	Provide temporary lighting
Preactive sprinkler	200 Area ETF Control Room Electrical equipment room	Support fire suppression
Safety shower/ eye wash stations	2025E Decon Station 2025E South Process Area 2025ED Load-In Station building 2025EG Backup Load-In Station building	Assist in decontamination/flushing of chemicals/materials from personnel
Water Supply	2025E building 2025EA building	At adequate volume and pressure to support fire suppression
Wet pipe sprinkler	2025E building; except areas protected by pre-active sprinklers 2025ED Load-In Station building	Support fire suppression

8.2 Portable Emergency Equipment

The following table lists portable emergency equipment.

Portable Emergency Equipment		
Type	**Location**	**Capability**
Fire Extinguishers	LERF buildings/facilities LERF basins general area 242AL-11 LERF garage 217-1 LERF building MO-180 change trailer	Support fire suppression
	ETF buildings/facilities 2025E ETF building 2025EC-71 building 2025ED Load-In Station building 2025EG Backup Load-In Station building HS-0011 outside MO-148 ETF tool crib MO-251 operations support office	
	TEDF buildings/facilities 225E TEDF pump station 2	

Portable Emergency Equipment		
Type	**Location**	**Capability**
	225W, TEDF pump station 1 6653 TEDF disposal sampling building 6653A TEDF pump station 3	
Portable Safety Shower and Eye Wash Station	Staged as needed for special evolutions and maintenance	Assist in decontamination/flushing of chemicals/ materials from the eyes, body, and face of personnel
Rad Con Emergency Kit*	2025EA building 2025E building	Assist in radiological control, decontamination/flushing of chemicals/materials, and response

8.3 Communications Equipment/Warning Systems

Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, or if there is ever just a single employee on the premises while the facility is operating, the employee or employees involved must have immediate access to a radio or telephone capable of summoning emergency assistance.

The following table lists communications equipment.

Communications Equipment		
Type	**Location**	**Capability**
Fire alarm/pull boxes	2025E high traffic office areas, truck bay, and process area	Detect and warn personnel of smoke or fire
2-Way portable radios	200 Area ETF Control Room	Communication to 200 Area ETF Control Room
PAX	Throughout 2025E building	Audible throughout 2025E building
Telephone	200 Area ETF Control Room 242AL71 LERF instrument building 6653 TEDF disposal sampling building	Internal and external communications

NOTE: Site-wide communications and warning systems are identified in DOE/RL-94-02, Section 5.2.5.

* This equipment is for radiological emergency response purposes only

8.4 Personal Protective Equipment

The following table lists personal protective equipment.

Personal Protective Equipment		
Type	**Location**	**Capability**
Acid suits	2025E building spill response cabinets	Chemical protection for personnel
Respirators	2025E building	Filtered air for recovery of known hazards
Anti-contamination*	2025E building	Radiological protection for personnel

8.5 Spill Control and Containment Supplies

The following lists spill kits and spill control equipment.

Spill Kits And Spill Control Equipment		
Type	**Location**	**Capability**
Spill Response Kits (PPE and/or absorbents)	MO-180 change trailer 2025E building 2025ED Load-In Station building 2025EG Backup Load-In Station building 6653 TEDF disposal sampling building	Support containment and cleanup of hazardous material spills

9.0 REQUIRED REPORTS

Post incident written reports are required for certain incidents on the Hanford Site. The reports are described in DOE/RL-94-02, Sections 5.1.2.4 and 5.1.2.2.

Facility management must note in the LERF and 200 Area ETF operating record or generator activity record, the time, date and details of any incident that requires implementation of the contingency plan (refer to Section 4.0 of this plan). Within 15 days after the incident, a written report must be submitted to Ecology. The report must include the elements specified in WAC 173-303-201(14)(k) or WAC 173-303-360(2)(k).

10.0 PLAN LOCATION AND AMENDMENTS

Copies of this plan are maintained at the following location:

- 200 Area ETF Control Room

This plan will be reviewed and immediately amended, as necessary, in accordance with DOE/RL-94-02, Section 14.3.1.1.

* Anti-contamination equipment is for radiological emergency response purposes only.

11.0 REFERENCES

DOE/RL-94-02, *Hanford Emergency Management Plan*, U.S. Department of Energy Richland Operations Office.

WAC 173-303, Washington Administrative Code, *Washington State Dangerous Waste Regulations,* Washington State Department of Ecology, Olympia, Washington.

Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Permit Number WA7890008967, Washington State Department of Ecology, Olympia, Washington.

ATTACHMENT A

LISTING OF PROCEDURES

DOE-0223, *Emergency Plan Implementing Procedures*, RLEP 1.1, *Hanford Incident Command System and Event Recognition and Classification*, U.S. Department of Energy Richland Operations Office.

DOE-0223, *Emergency Plan Implementing Procedures*, RLEP 3.24, *Notification, Reporting, and Processing of Operations Information*, U.S. Department of Energy Richland Operations Office

DOE-0223, *Emergency Plan Implementing Procedures*, RLEP 3.4, *Emergency Termination, Reentry, and Recovery*, U.S. Department of Energy Richland Operations Office.

DOE/RL-94-02, *Hanford Emergency Management Plan*, U.S. Department of Energy Richland Operations Office

ETF-OR-DR-OOR, *ETF Outside Operator Daily Rounds*

TFC-ENG-FACSUP-P-30, *LERF Basin Leachate Monitoring*

ETF-ERP-85B-003, *Emergency Spill or Release at ETF*

ETF-ERP-85B-005, *Fire/Explosion at ETF*

ETF-ERP-85B-007, *Take Cover at ETF*

ETF-ERP-85B-008, *Evacuation at ETF*

ETF-ERP-85B-009, *Security Events at ETF*

ATTACHMENT B

RCRA APPLICABILITY MATRIX FOR TSD ACTIVITIES

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-340	Preparedness and prevention. Facilities must be designed, constructed, maintained and operated to minimize the possibility of fire, explosion, or any unplanned sudden or nonsudden release of dangerous waste or dangerous waste constituents to air, soil, or surface or groundwater which could threaten the public health or the environment. This section describes preparations and preventive measures which help avoid or mitigate such situations.	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-340(1)	Required equipment. All facilities must be equipped with the following, unless it can be demonstrated to the department that none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-340(1)(a)	(a) An internal communications or alarm system capable of providing immediate emergency instruction to facility personnel;	DOE/RL-94-02, Section 5.2.5.	*FRP Section 8.3.* *BEP section 9.3.*
WAC 173-303-340(1)(b)	(b) A device, such as a telephone or a hand-held, two-way radio, capable of summoning emergency assistance from local police departments, fire departments, or state or local emergency response teams;	DOE/RL-94-02, Section 5.2.12.	*FRP Section 8.3.* *BEP section 9.3.* Units summons assistance by calling the Hanford Patrol emergency number. No offsite assistance is requested by the unit itself.
WAC 173-303-340(1)(c)	(c) Portable fire extinguishers, fire control equipment (including special extinguishing equipment, such as that using foam, inert gas, or dry chemicals), spill control equipment, and decontamination equipment; and	DOE/RL-94-02, Sections 11.2.2, 11.2.3, 11.2.4, 11.2.8 and Appendix C.	*FRP Section 8.1, 8.2, 8.5* *BEP section 9.1, 9.2, 9.5*
WAC 173-303-340(1)(d)	(d) Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems.	DOE/RL-94-02, Sections 11.2.2 and 11.2.8.	*FRP Section 8.1* *BEP section 9.1*
WAC 173-303-340(1)(end)	All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.	DOE/RL-94-02, Sections 11.2, 11.2.8, and 11.3.	*FRP Section 8.0* *BEP section 9.0*
WAC 173-303-340(2)	Access to communications or alarms. Personnel must have immediate access to the signalling devices described in the situations below:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-340(2)(a)	(a) Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required in subsection (1) of this section;	DOE/RL-94-02, Section 5.2.12	*FRP Section 8.3.* *BEP section 9.3.*
WAC 173-303-340(2)(b)	(b) If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone or a hand-held, two-way radio, capable of summoning external emergency assistance, unless such a device is not required in subsection (1) of this section.	DOE/RL-94-02, Section 5.2.12	*FRP Section 8.3.* *BEP section 9.3.*
WAC 173-303-340(3)	Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	Requirement is met at the unit level.	The process information chapters of Parts III, V, and VI of the Hanford Facility Dangerous Waste Permit (WA7890008967) describe how each unit meets this requirement. For CAAs, FRP Section 8.0. For CAAs, BEP section 9.0
WAC 173-303-340(4)	Arrangements with local authorities. The owner or operator must attempt to make the following arrangements, as appropriate for the type of waste handled at his facility and the potential need for the services of these organizations, unless the hazards posed by wastes handled at the facility would not require these arrangements:	Introductory statement of requirement – requirements are in sections below.	Requirement is met at the site level.
WAC 173-303-340(4)(a)	(a) Arrangements to familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of dangerous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes;	The arrangements agreed to by local police, fire departments emergency response teams to coordinate emergency services are located in DOE/RL-94-02, Sections 3.4, 3.4.1.1, 3.4.1.2, 3.7, and Table 3-1.	Requirement is met at the site level.
WAC 173-303-340(4)(b)	(b) Arrangements to familiarize local hospitals with the properties of dangerous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility;	The arrangements agreed to by local hospitals to coordinate emergency services are located in DOE/RL-94-02, Sections 3.4.1.3, 3.7, and Table 3-1.	Requirement is met at the site level.
WAC 173-303-340(4)(c)	(c) Agreements with state emergency response teams, emergency response contractors, and equipment suppliers; and	The arrangements agreed to by state emergency response teams to coordinate emergency services are located in DOE/RL-94-02, Sections 3.3.1, 3.3.2, 3.7, and Table 3-1.	Requirement is met at the site level.
WAC 173-303-340(4)(d)	(d) Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements with any others to provide support to the primary emergency authority.	Discussed in the Tri-County Mutual Aid Agreement MOU and Mutual Law Enforcement Assistance MOUs. DOE/RL-94-02, Section 3.7, and Table 3-1.	Requirement is met at the site level.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-340(5)	Where state or local authorities decline to enter into such arrangements, the owner or operator must document the refusal in the operating record.	If authorities decline, the documentation will be maintained in the Hanford Facility Operating Record.	Requirement is met at the site level.
WAC 173-303-350(1)	Purpose. The purpose of this section and WAC 173-303-360 is to lessen the potential impact on the public health and the environment in the event of any emergency event, including, but not limited to, a fire, natural disaster, explosion, or unplanned sudden or nonsudden release of dangerous waste, hazardous substance, or dangerous waste constituents to air, soil, surface water, or groundwater by a facility. A contingency plan must be developed to lessen the potential impacts of such emergency event, and the plan must be implemented immediately whenever such an emergency event occurs.	DOE/RL-94-02, Sections 1.1 and 1.2.	*FRP Section 1.0.* *BEP section 1.0.* Identified sections of the BEP/FRP are part of the contingency plan.
WAC 173-303-350(2)	(2) Contingency plan. Each owner or operator must have a contingency plan at their facility for use in emergencies or any sudden or nonsudden releases which threaten human health and the environment. If the owner or operator has already prepared a spill prevention control and countermeasures (SPCC) plan in accordance with Part 112 of Title 40 C.F.R., or some other emergency or contingency plan, they need only amend that plan to incorporate dangerous waste management provisions that are sufficient to comply with the requirements of this section and WAC 173-303-360. The owner or operator may develop one contingency plan that meets all regulatory requirements. Ecology recommends that the plan be based on the National Response Team's Integrated Contingency Plan Guidance ("One Plan"). When modifications are made to nondangerous waste (non-Hazardous Waste Management Act or nondangerous waste regulation) provisions in an integrated contingency plan, the changes do not trigger the need for a dangerous waste permit modification.	DOE/RL-94-02, Sections 1.1 and 1.2. Portions of the Hanford emergency response program are used to meet requirements of WAC 173-303-350 and -360 under the provision of -350(2).	*FRP Section 1.0.* *BEP section 1.0.* Identified sections of the BEP/FRP are part of the contingency plan.
WAC 173-303-350(3)(a)	The contingency plan must contain the following: (a) A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360;	DOE/RL-94-02, Section 1.3.4 provides an overview of how the Hanford Site responds to emergency events. More specific descriptions of actions to meet other requirements of this section and WAC 173-303-360 are identified in those sections of this matrix. The relationship of emergency procedures and description of actions is in footnote *.	*FRP Section 6.1 and subsections and Section 6.2, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.5.1* *BEP Section 7.1 and subsections and Sections 7.2, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, 7.2.5.1, 7.3 and subsections*

* Site-wide and facility/activity-specific emergency procedures are described and in some cases identified in this plan (DOE/RL 94-02) and in facility/activity-specific plans/procedures. The descriptions of actions in this plan and in facility/activity plans/procedures are required to accurately describe the emergency procedures. Unless specifically incorporated into the RCRA Permit, these emergency procedures are not subject to permit modification requirements of permit condition 1.C.3 simply because they are described or referenced in this plan or in a facility/activity-specific plan/procedure. If the emergency procedures change and the description is no longer accurate, the revision of the description is subject to permit modification requirements of permit condition 1.C.3.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-350(3)(b)	The contingency plan must contain the following: (b) A description of the actions which will 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;	Requirement is met at the unit level.	*FRP Section 6.2.5.1* *BEP Section 7.2.5.1*
WAC 173-303-350(3)(c)	The contingency plan must contain the following: (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);	The arrangements agreed to by state emergency response teams to coordinate emergency services are located in DOE/RL-94-02, 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.	Requirement is met at the site level.
WAC 173-303-350(3)(d)	The contingency plan must contain the following: (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;	DOE/RL-94-02, Sections 2.2 and 2.2.1.1 discuss personnel job titles, which will fill duties and responsibilities of the Emergency Coordinator, described in WAC 173-303-360.A list of current assigned or "on-call" BEDs/BWs is maintained at the Patrol Operations Center per II.A.4. A list of BEDs/BWs for each Hanford TSD unit required to have an emergency coordinator is maintained in Permit Attachment 4A. Changing BEDs/BWs is a Class 1 modification, self-implemented.	*FRP Sections 3.1* *BEP Sections 3.1* The BEP/FRP includes a list of qualified BEDs/BWs or clearly describes the location where the list is maintained at the unit. The BEP/FRP also includes the location where the current or "on-call" BED/BW list is maintained at the unit.
WAC 173-303-350(3)(e)	The contingency plan must contain the following: (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; and	DOE/RL-94-02, Sections 11.2 and 11.2.8, and Appendix C.	*FRP Sections 8.1, 8.2, 8.3, 8.4, 8.5* *BEP Sections 9.1, 9.2, 9.3, 9.4, and 9.5*
WAC 173-303-350(3)(f)	The contingency plan must contain the following: (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.	DOE/RL-94-02, Figure 7-3, and Table 5-1.	*FRP Section 6.1.1* *BEP Section 7.1.1*
WAC 173-303-350(4)	Copies of contingency plan. A copy of the contingency plan and all revisions to the plan must be:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-350(4)(a)	(a) Maintained at the facility; and	DOE/RL-94-02, Section 14.3.7.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-350(4)(b)	(b) Submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services.	DOE/RL-94-02, Section 14.3.7.	Requirement is met at the site level. DOE is responsible for offering documents to offsite entities.
WAC 173-303-350(5)	Amendments. The owner or operator must review and immediately amend the contingency plan, if necessary, whenever:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-350(5)(a)	(a) Applicable regulations or the facility permit are revised;	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-350(5)(b)	(b) The plan fails in an emergency;	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-350(5)(c)	(c) The facility changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency;	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-350(5)(d)	(d) The list of emergency coordinators changes; or	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-350(5)(e)	(e) The list of emergency equipment changes.	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-355(1)	Owners or operators must coordinate preparedness and prevention planning and contingency planning efforts, conducted under WAC 173-303-340 and 173-303-350, with local emergency planning committees established pursuant to Title III of the 1986 Superfund Amendments and Reauthorization Act.	DOE/RL-94-02, Sections 3.1, 3.1.1, and 3.4.	Requirement is met at the site level.
WAC 173-303-355(2)	Appropriate and generally accepted computer models should be utilized to determine the impacts of a potential catastrophic air release due to fire, explosion, or other accidental releases of hazardous constituents. Evacuation plans prepared pursuant to WAC 173-303-350 (3)(d) must include those effected persons and areas identified through these modelling efforts.	DOE/RL-94-02, Sections 2.2.2.1.4, and 1.3.3.2.	Requirement is met at the site level.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-360(1)	Emergency coordinator. At all times, there must be at least one employee either on the facility premises or on call (that is, available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, required by WAC 173-303-350(2), all operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout. In addition, this person must have the authority to commit the resources needed to carry out the contingency plan.	DOE/RL-94-02, Sections 2.2, 2.2.1, and 2.2.1.1.	*FRP Section 3.1* *BEP Section 3.1* Permit Attachment 4A lists the BED/BW for each unit.
WAC 173-303-360(2)	Emergency procedures. The following procedures must be implemented in any emergency event identified in WAC 173-303-350.	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-360(2)(a)	(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or their designee when the emergency coordinator is on call) must immediately:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-360(2)(a)(i)	(i) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and	DOE/RL-94-02, Sections 2.2.1.1.2(b), 2.2.1.1.3(b), and 5.2.5.	*FRP Section 6.1 and subsections, and 6.2 and subsections* *BEP Section 7.1 and subsections, and 7.2 and subsections*
WAC 173-303-360(2)(a)(ii)	(ii) Notify appropriate state or local agencies with designated response roles if their help is needed.	DOE/RL-94-02, Sections 1.3.4, and 5.2.1. Units summons assistance by calling the Hanford Patrol emergency number. No offsite assistance is requested by the unit itself.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-360(2)(b)	Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials.	DOE/RL-94-02, Sections 2.2.1.1.2(f), 2.2.1.1.3(g), and 4.2.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-360(2)(c)	Concurrently, the emergency coordinator must assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from the release, fire, or explosion.	DOE/RL-94-02, Sections 4.2 and 2.2.2.1.4.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-360(2)(d)	If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, they must report their findings as follows:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-360(2)(d)(i)	(i) If their assessment indicates that evacuation of local areas may be advisable, they must immediately notify appropriate local authorities. They must be available to help appropriate officials decide whether local areas should be evacuated; and	DOE/RL-94-02, Sections 2.2.1.1.2(a) & (d), 2.2.1.1.3 (a) & (e), 5.1.1, 5.1.1.2, and 5.1.2.1.	*FRP Section 6.1* *BEP Section 7.1*

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-360(2)(d)(ii)	(ii) They must immediately notify the department and either the government official designated as the on-scene coordinator, or the National Response Center (using their 24-hour toll free number (800) 424-8802).	DOE/RL-94-02, Sections 2.2.1.1.2(a) & (d), 2.2.1.1.3 (a) & (e), 5.1.1, 5.1.1.2, 5.1.2.1, and 5.1.2.2.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-360(2)(e)	(e) Their assessment report must include: (i) Name and telephone number of reporter; (ii) Name and address of facility; (iii) Time and type of incident (e.g., release, fire); (iv) Name and quantity of material(s) involved, to the extent known; (v) The extent of injuries, if any; and (vi) The possible hazards to human health or the environment outside the facility	DOE/RL-94-02, Sections 2.2.1.1.2(d), 2.2.1.1.3(e), 5.1.1, 5.1.1.2, 5.1.2.1, and 5.1.2.2.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-360(2)(f)	During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.	DOE/RL-94-02, Sections 2.2.1.1, 2.2.1.1.2(f) and 2.2.1.1.3(g).	*FRP Section 6.6* *BEP Section 7.6*
WAC 173-303-360(2)(g)	If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.	DOE/RL-94-02, Sections 2.2.1.1.2(f) and 2.2.1.1.3(g).	*FRP Sections 6.2.4 and 6.2.5* *BEP Sections 7.2.4 and 7.2.5*
WAC 173-303-360(2)(h)	Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.	DOE/RL-94-02, Section 9.2.3.	*FRP Section 7.2* *BEP Section 8.2*
WAC 173-303-360(2)(i)	The emergency coordinator must ensure that, in the affected area(s) of the facility:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-360(2)(i)(i)	(i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and	DOE/RL-94-02, Section 9.2.3.	*FRP Section 7.2.1* *BEP Section 8.2.1*
WAC 173-303-360(2)(i)(ii)	(ii) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.	DOE/RL-94-02, Section 11.2.	*FRP Section 7.2.2* *BEP Section 8.2.2*
WAC 173-303-360(2)(j)	The owner or operator must notify the department, and appropriate local authorities, that the facility is in compliance with (i) of this subsection before operations are resumed in the affected area(s) of the facility.	DOE/RL-94-02, Section 5.1.2.2.	*FRP Section 7.2* *BEP Section 8.2*

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-360(2)(k)	The owner or operator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within fifteen days after the incident, they must submit a written report on the incident to the department. The report must include: (i) Name, address, and telephone number of the owner or operator; (ii) Name, address, and telephone number of the facility; (iii) Date, time, and type of incident (e.g., fire, explosion); (iv) Name and quantity of material(s) involved; (v) The extent of injuries, if any; (vi) An assessment of actual or potential hazards to human health or the environment, where this is applicable; (vii) Estimated quantity and disposition of recovered material that resulted from the incident; (viii) Cause of incident; and (ix) Description of corrective action taken to prevent reoccurrence of the incident.	DOE/RL-94-02, Sections 5.1.2.1 and 5.1.2.2.	*FRP Section 9.0* *BEP Section 11.0*

ATTACHMENT C

RCRA APPLICABILITY MATRIX FOR GENERATOR ACTIVITIES

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201	Preparedness, prevention, emergency procedures and contingency plans for large quantity generators.	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(1)	Applicability. The regulations of this section apply to those areas of a large quantity generator's facility where dangerous waste is generated or accumulated on site.	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(2)	A large quantity generator facility must be designed, constructed, maintained and operated to minimize the possibility of fire, explosion, or any unplanned sudden or nonsudden release of dangerous waste, hazardous substance or dangerous waste constituents to air, soil, or surface or groundwater which could threaten the public health or the environment. This section describes preparations and preventive measures which help avoid or mitigate such situations.	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(3)	Required equipment. All areas deemed applicable by subsection (1) of this section must be equipped with the following, unless it can be demonstrated to the department that none of the hazards posed by waste or hazardous substance handled at the facility could require a particular kind of equipment specified below. A large quantity generator may determine the most appropriate locations within its facility to locate equipment necessary to prepare for and respond to emergencies:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(3)(a)	(a) An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel;	DOE/RL-94-02, Section 5.2.5.	*FRP Section 8.3* *BEP Section 9.3.*
WAC 173-303-201(3)(b)	(b) A device, such as a telephone (immediately available at the scene of operations) or a hand-held, two-way radio, capable of summoning emergency assistance from local police departments, fire departments, or state or local emergency response teams;	DOE/RL-94-02, Section 5.2.12.	*FRP Section 8.3* *BEP Section 9.3* Units summon assistance by calling the Hanford Patrol emergency number. No offsite assistance is requested by the unit itself.
WAC 173-303-201(3)(c)	(c) Portable fire extinguishers, fire control equipment (including special extinguishing equipment, such as those using foam, inert gas, or dry chemicals), spill control equipment, and decontamination equipment; and	DOE/RL-94-02, Sections 11.2.2, 11.2.3, 11.2.4, 11.2.8 and Appendix C.	*FRP Section 8.1, 8.2, 8.5* *BEP Section 9.1, 9.2, 9.5*
WAC 173-303-201(3)(d)	(d) Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems.	DOE/RL-94-02, Sections 11.2.2 and 11.2.8.	*FRP Section 8.1* *BEP Section 9.1*
WAC 173-303-201(4)	Testing and maintenance of equipment. All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.	DOE/RL-94-02, Sections 11.2, 11.2.8, and 11.3.	*FRP Section 8.0* *BEP Section 8.0*

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(5)	Access to communications or alarms. Personnel must have immediate access to the signaling devices described in the situations below:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(5)(a)	(a) Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access (e.g., direct or unimpeded access) to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required in subsection (3) of this section;	DOE/RL-94-02, Section 5.2.12	*FRP Section 8.3* *BEP Section9.3*
WAC 173-303-201(5)(b)	(b) If there is ever just one employee on the premises while the facility is operating, they must have immediate access (e.g., direct or unimpeded access) to a device, such as a telephone (immediately available at the scene of operation) or a hand-held, two-way radio, capable of summoning external emergency assistance, unless such a device is not required in subsection (3) of this section.	DOE/RL-94-02, Section 5.2.12	*FRP Section 8.3* *BEP Section9.3*
WAC 173-303-201(6)	Aisle space. The generator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	Requirement is met at the unit level.	The process information chapters of Parts III, V, and VI of the Hanford Facility Dangerous Waste Permit (WA7890008967) describe how each unit meets this requirement. For CAAs, FRP Section 8.0. For CAAs, BEP section 9.0
WAC 173-303-201(7)	Arrangements with local authorities. The large quantity generator must attempt to make the following arrangements, as appropriate for the type of waste handled at its facility and the potential need for the services of these organizations, unless the hazards posed by wastes handled at the facility would not require these arrangements:	Introductory statement of requirement – requirements are in sections below.	Requirement is met at the site level.
WAC 173-303-201(7)(a)	(a) Arrangements to familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of dangerous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes;	The arrangements agreed to by local police, fire departments emergency response teams to coordinate emergency services are located in DOE/RL-94-02, Sections 3.4, 3.4.1.1, 3.4.1.2, 3.7, and Table 3-1.	Requirement is met at the site level.
WAC 173-303-201(7)(b)	(b) Arrangements to familiarize local hospitals with the properties of dangerous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility;	The arrangements agreed to by local hospitals to coordinate emergency services are located in DOE/RL-94-02, Sections 3.4.1.3, 3.7, and Table 3-1.	Requirement is met at the site level.
WAC 173-303-201(7)(c)	(c) Agreements with state emergency response teams, emergency response contractors, and equipment suppliers;	The arrangements agreed to by state emergency response teams to coordinate emergency services are located in DOE/RL-94-02, Sections 3.3.1, 3.3.2, 3.7, and Table 3-1.	Requirement is met at the site level.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(7)(d)	(d) Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements with any others to provide support to the primary emergency authority;	Discussed in the Tri-County Mutual Aid Agreement MOU and Mutual Law Enforcement Assistance MOUs. DOE/RL-94-02, Section 3.7, and Table 3-1.	Requirement is met at the site level.
WAC 173-303-201(7)(e)	(e) Where state or local authorities decline to enter into such arrangements, the generator must document the refusal in the operating record; and	If authorities decline, the documentation will be maintained in the Hanford Facility Operating Record.	Requirement is met at the site level.
WAC 173-303-201(7)(f)	(f) A facility possessing twenty-four-hour response capabilities may seek a waiver from the authority having jurisdiction (AHJ) over the fire code with the facility's locality as far as needing to make arrangements with the local fire department as well as any other organization necessary to respond to an emergency, provided that the waiver is documented in the generator's operating record.	Since the Hanford Site has its own Fire Department and its own Fire Marshal this requirement does not apply. Also, Hanford has long standing, Mutual Aid Agreements, with the local fire departments. The Mutual Aid Agreements are provided in Appendix B to DOE/RL 94-02.	Since the Hanford Site has its own Fire Department and its own Fire Marshal this requirement does not apply. Also, Hanford has long standing, Mutual Aid Agreements, with the local fire departments. The Mutual Aid Agreements are provided in Appendix B to DOE/RL 94-02.
WAC 173-303-201(8)	Contingency plan purpose and implementation.	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(8)(a)	(a) The large quantity generator must have a contingency plan for the facility. The purpose of a contingency plan and emergency procedures is to lessen the potential impact on the public health and the environment due to any emergency event such as, but not limited to, a fire, natural disaster, explosion, or any unplanned sudden or nonsudden release of dangerous waste, hazardous substance or dangerous waste constituents to air, soil, surface water, or groundwater.	DOE/RL-94-02, Sections 1.1 and 1.2.	*FRP Section 1.0* *BEP Section 1.0* Identified sections of the BEP/FRP are part of the contingency plan.
WAC 173-303-201(8)(b)	(b) A contingency plan must be developed to lessen the potential impacts of such emergency events, and the plan must be implemented immediately when such emergency events occur.	DOE/RL-94-02, Sections 1.1 and 1.2.	*FRP Section 1.0* *BEP Section 1.0* Identified sections of the BEP/FRP are part of the contingency plan.
WAC 173-303-201(9)	Contents of a contingency plan.	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(9)(a)	(a) Each large quantity generator must have a contingency plan at their facility for use in emergencies or any sudden or nonsudden releases which threaten human health and the environment. If the generator has already prepared a spill prevention control and countermeasures (SPCC) plan in accordance with 40 C.F.R. Part 112, or some other emergency or contingency plan, they need only amend that plan to incorporate dangerous waste management provisions that are sufficient to comply with the requirements of this section. The large quantity generator may develop one contingency plan that meets all regulatory requirements. Ecology recommends that the plan be based on the National Response Team's Integrated Contingency Plan Guidance ("One Plan").	DOE/RL-94-02, Sections 1.1 and 1.2. Portions of the Hanford emergency response program are used to meet requirements of WAC 173-303-201(8) through 201(14) under the provision of -201(9).	*FRP Section 1.0* *BEP Section 1.0* Identified sections of the BEP/FRP are part of the contingency plan.
WAC 173-303-201(9)(b)	(b) The contingency plan must contain the following:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(9)(b)(i)	(i) A description of the actions which facility personnel must take to comply with subsections (8) and (14) of this section and WAC 173-303-145;	DOE/RL-94-02, Section 1.3.4 provides an overview of how the Hanford Site responds to emergency events. More specific descriptions of actions to meet other requirements of this section are identified in those sections of this matrix. Actions to comply with WAC 173-303-145 are addressed in DOE/RL-94-02, Section 5.1.2.	*FRP Section 6.1 and subsections and Section 6.2, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.5.1* *BEP Section 7.1 and subsections and Section 7.2, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, 7.2.5.1*
WAC 173-303-201(9)(b)(ii)	(ii) A description of the actions which will 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 large quantity generator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(6), manifest system, reasons for not accepting dangerous waste shipments;	Requirement is met at the unit level.	*FRP Section 6.2.5.1* *BEP Section 7.2.5.1*
WAC 173-303-201(9)(b)(iii)	(iii) 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 subsection (7) of this section;	The arrangements agreed to by state emergency response teams to coordinate emergency services are located in DOE/RL-94-02, 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.	Requirement is met at the site level.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(9)(b)(iv)	(iv) A current list of names and emergency telephone numbers of all persons qualified to act as the emergency coordinator required in this section and this list must be kept up to date. 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. In situations where the large quantity generator facility has an emergency coordinator continuously on duty because it operates twenty-four hours per day, every day of the year, the plan may list the staffed position (e.g., operations manager, shift coordinator, shift operations supervisor) as well as an emergency telephone number that can be guaranteed to be answered at all times;	DOE/RL-94-02, Sections 2.2 and 2.2.1.1 discusses personnel job titles, which will fill duties and responsibilities of the Emergency Coordinator, described in WAC173-303-201(13). A list of current assigned or "on-call" BEDs/BWs is maintained at the Patrol Operations Center per II.A.4. A list of BEDs/BWs for central accumulation areas and satellite accumulation areas is maintained in Permit Attachment 4A. Changing BEDs/BWs on this list is not subject to permit modification requirements. Updates to the list will be provided to Ecology per II.A.4.a.	*FRP Sections 3.1* *BEP Sections 3.1* The list of BEDs/BWs for CAAs and SAAs is maintained and collocated with the BEP/FRP
WAC 173-303-201(9)(b)(v)	(v) 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; and	DOE/RL-94-02, Sections 11.2 and 11.2.8, and Appendix C.	*FRP Sections 8.1, 8.2, 8.3, 8.4, 8.5* *BEP Sections 9.1, 9.2, 9.3, 9.4, 9.5*
WAC 173-303-201(9)(b)(vi)	(vi) 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 (in cases where the primary routes could be blocked by releases of materials or fires).	DOE/RL-94-02, Figure 7-3, and Table 5-1.	*FRP Section 6.1.1* *BEP Section 7.1.1*
WAC 173-303-201(10)	Copies of contingency plan. A copy of the contingency plan and all revisions to the plan must be:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(10)(a)	(a) Maintained at the large quantity generator's facility; and	DOE/RL-94-02, Section 14.3.7.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-201(10)(b)	(b) Submitted by the large quantity generator to all local emergency responders (i.e., police departments, fire departments, hospitals, and state and local emergency response teams) that may be called upon to provide emergency services.	DOE/RL-94-02, Section 14.3.7.	Requirement is met at the site level. DOE is responsible for offering documents to offsite entities.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(11)	Quick reference guide. (a) A large quantity generator who first becomes subject to these provisions and any current large quantity generator who is amending its contingency plan must at that time submit a quick reference guide of the contingency plan to the local emergency responders identified in subsection (10) of this section. (b) Contents of the quick reference guide. This quick reference guide must include the following elements: (i) The types and names of dangerous waste in layman's terms and the associated hazards associated with each dangerous waste present at any one time (e.g., toxic paint waste, spent ignitable solvent, corrosive acid); (ii) The estimated maximum amount of each dangerous waste that may be present at any one time; (iii) The identification of any dangerous waste where exposure would require unique or special treatment by medical or hospital staff; (iv) A map of the facility showing where dangerous wastes are generated, accumulated, recycled and treated and routes for accessing these wastes; (v) A street map of the facility in relation to surrounding businesses, schools and residential areas to understand how best to get to the facility and also evacuate citizens and workers; (vi) The locations of water supply (e.g., fire hydrant and its flow rate); (vii) The identification of on-site notification systems (e.g., a fire alarm that rings off site, smoke alarms); and (viii) The name of the emergency coordinator(s) and seven days/twenty-four-hours emergency telephone number(s) or, in the case of a facility where an emergency coordinator is continuously on duty, the emergency telephone number for the emergency coordinator. (c) Generators must update, if necessary, their quick reference guides, whenever the contingency plan is amended and submit these documents to the local emergency responders identified in this section.	Permit Condition II.A.7 and Permit Attachment 9	Requirement is met at the site level.
WAC 173-303-201(12)	Amendments of a contingency plan. The large quantity generator must review and immediately amend the contingency plan, if necessary, whenever:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(12)(a)	(a) Applicable regulations are revised;	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-201(12)(b)	(b) The plan fails in an emergency;	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-201(12)(c)	(c) The generator's facility changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency;	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-201(12)(d)	(d) The list of emergency coordinators changes; or	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(12)(e)	(e) The list of emergency equipment changes.	DOE/RL-94-02, Section 14.3.1.1.	*FRP Section 10.0* *BEP Section 12.0*
WAC 173-303-201(13)	Emergency coordinator. At all times, there must be at least one employee either on the facility premises or on call (that is, available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, required by subsection (9) of this section, all operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout. In addition, this person must have the authority to commit the resources needed to carry out the contingency plan and to implement the necessary emergency procedures outlined in subsection (14) of this section.	DOE/RL-94-02, Sections 2.2 and 2.2.1.1.	*FRP Section 3.1* *BEP Section 3.1* Permit Attachment 4A lists the BED/BW for each unit.
WAC 173-303-201(14)	Emergency procedures. The following procedures must be implemented in the event of an emergency:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(14)(a)	(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or designee when the emergency coordinator is on call) must immediately:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(14)(a)(i)	(i) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and	DOE/RL-94-02, Sections 2.2.1.1.2(b), 2.2.1.1.3(b), and 5.2.5.	*FRP Section 6.1 and subsections, and 6.2 and subsections* *BEP Section 7.1 and subsections, and 7.2 and subsections*
WAC 173-303-201(14)(a)(ii)	(ii) Notify appropriate state or local agencies with designated response roles if their help is needed.	DOE/RL-94-02, Sections 1.3.4, and 5.2.1. Units summon assistance by calling the Hanford Patrol emergency number. No offsite assistance is requested by the unit itself.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-201(14)(b)	(b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials.	DOE/RL-94-02, Sections 2.2.1.1.2(f), 2.2.1.1.3(g), and 4.2.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-201(14)(c)	(c) Concurrently, the emergency coordinator must assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from the release, fire, or explosion.	DOE/RL-94-02, Section 4.2, and 2.2.2.2.4.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-201(14)(d)	(d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, they must report their findings as follows:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(14)(d)(i)	(i) If their assessment indicates that evacuation of local areas may be advisable, they must immediately notify appropriate local authorities. They must be available to help appropriate officials decide whether local areas should be evacuated; and	DOE/RL-94-02, Sections 2.2.1.1.2(a) & (d), 2.2.1.1.3 (a) & (e), 5.1.1, 5.1.1.2, and 5.1.2.1.	*FRP Section 6.1* *BEP Section 7.1*
WAC 173-303-201(14)(d)(ii)	(ii) They must immediately notify the department and either the government official designated as the on-scene coordinator, or the National Response Center (using their twenty-four-hour toll free number 1-800-424-8802).	DOE/RL-94-02, Sections 2.2.1.1.2(a) & (d), 2.2.1.1.3 (a) & (e), 5.1.1, 5.1.1.2, 5.1.2.1, and 5.1.2.2.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-201(14)(e)	(e) Their assessment report must include: (i) Name and telephone number of reporter; (ii) Name and address of facility; (iii) Time and type of incident (e.g., release, fire); (iv) Name and quantity of material(s) involved, to the extent known; (v) The extent of injuries, if any; and (vi) The possible hazards to human health or the environment outside the facility.	DOE/RL-94-02, Sections 2.2.1.1.2(d), 2.2.1.1.3(e), 5.1.1, 5.1.1.2, 5.1.2.1, and 5.1.2.2.	*FRP Section 4.0* *BEP Section 4.0*
WAC 173-303-201(14)(f)	(f) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.	DOE/RL-94-02, Sections 2.2.1.1, 2.2.1.1.2(f) and 2.2.1.1.3(g).	*FRP Section 6.6* *BEP Section 7.6*
WAC 173-303-201(14)(g)	(g) If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.	DOE/RL-94-02, Sections 2.2.1.1.2(f) and 2.2.1.1.3(g).	*FRP Sections 6.2.4 and 6.2.5* *BEP Sections 7.2.4 and 7.2.5*
WAC 173-303-201(14)(h)	(h) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.	DOE/RL-94-02, Section 9.2.3.	*FRP Section 7.2* *BEP Section 8.2*
WAC 173-303-201(14)(i)	(i) The emergency coordinator must ensure that, in the affected area(s) of the facility:	Introductory statement of requirement – requirements are in sections below.	Introductory statement of requirement – requirements are in sections below.
WAC 173-303-201(14)(i)(i)	(i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and	DOE/RL-94-02, Section 9.2.3.	*FRP Section 7.2.1* *BEP Section 8.2.1*
WAC 173-303-201(14)(i)(ii)	(ii) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.	DOE/RL-94-02, Section 11.2.	*FRP Section 7.2.2* *BEP Section 8.2.2*
WAC 173-303-201(14)(j)	(j) The large quantity generator must notify the department, and appropriate local authorities, that the facility is in compliance with this subsection (14)(i) of this section before operations are resumed in the affected area(s) of the facility.	DOE/RL-94-02, Section 5.1.2.2.	*FRP Section 7.2* *BEP Section 8.2*

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	SITE LEVEL (How/Where Met)	UNIT LEVEL (How/Where Met)
WAC 173-303-201(14)(k)	(k) The large quantity generator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within fifteen days after the incident, they must submit a written report on the incident to the department. The report must include: (i) Name, address, and telephone number of the generator; (ii) Name, address, and telephone number of the facility; (iii) Date, time, and type of incident (e.g., fire, explosion); (iv) Name and quantity of material(s) involved; (v) The extent of injuries, if any; (vi) An assessment of actual or potential hazards to human health or the environment, where this is applicable; (vii) Estimated quantity and disposition of recovered material that resulted from the incident; (viii) Cause of incident; and (ix) Description of corrective action taken to prevent reoccurrence of the incident.	DOE/RL-94-02, Sections 5.1.2.1 and 5.1.2.2.	*FRP Section 9.0* *BEP Section 11.0*