U.S. Department of Energy
Hanford Site

20-ECD-0019

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

Dear Ms. Smith:

SUBMITTAL OF RESPONSES TO TECHNICAL REVIEW COMMENTS ON THE CLASS 3 MODIFICATION FOR THE HANFORD FACILITY DANGEROUS WASTE PART B PERMIT APPLICATION FOR THE LOW-ACTIVITY WASTE PRETREATMENT SYSTEM (TS-2-8)

This letter responds to your February 14, 2020, letter 20-NWP-034. The U.S. Department of Energy, Office of River Protection (ORP) is submitting the responses to technical review comments (Attachment 1) and Low-Activity Waste Pretreatment System permit application addenda updated to incorporate changes to certain technical review comments (Attachment 2).

Representatives from ORP and Washington River Protection Solutions LLC met with Washington State Department of Ecology staff throughout the months of March and April 2020 and reached mutual agreement on how each of the comments documented in 20-NWP-034 was resolved.

Attachment 3 provides ORP and Washington River Protection Solutions LLC certifications for the updated permit application to Washington State Department of Ecology.

The U.S. Department of Energy believes this submittal meets two Tri-Party Agreement milestones, M-062-54A Submit Permit Application for AP Tank Farm Mods and Operations Necessary to Support Tank-Side Cesium Removal due July 15, 2020, and M-090-14 Submit CD-1 for Facility to Store Spent Ion Exchange Columns Prior to Direct Feed Low-Activity Waste due March 31, 2021 and will submit the necessary milestone forms.

If you have any questions, please contact me, or your staff may contact Mary Burandt, Environmental Compliance Division, Office of River Protection, on (509) 372-8828.

Sincerely,

Digitally signed by Brian T. Vance
DN: cn=Brian T. Vance, o=Office of River Protection, ou=Department of Energy, email=brian.t.vance@orp.doe.gov, c=US
Date: 2020.04.16 17:14:45 -07'00'

Brian T. Vance
Manager

ECD:MEB

Attachments: (3)

cc w/attachs:
J. Cantu, Ecology
Administrative Record
Environmental Portal
WRPS Correspondence

cc w/o attachs:
T. G. Beam, WRPS
J. Bell NPT
G. P. Bohnee, NPT
R. Buck, Wanapum
L. Contreras, YN
M. Jones, Ecology
K. Niles, Oregon Energy
C. P. Strand, WRPS

Attachment 1
20-ECD-0019

LAWPS Dangerous Waste Permit Application
Change Control Table

(58 Pages Including Cover Sheet)

Review Comment Record	Washington State Department of Ecology Nuclear Waste Program	Date: 4/7/2020 Page 1 of 33

Document Title(s)/Number(s):

Formal Review of LAWPS

Document Manager	Telephone Number	Project Manager	Telephone Number	Facility Site ID	Cleanup Site ID

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
Addendum A, Part A								
1	Pg. A.3 Section XI	Are the transfer lines associated with the LAWPS/TSCR facilities going to be part of this application?	Provide information about the relationship and ownership of the transfer lines and the LAWPS Project.		Assuming this question pertains to the hard-piped transfer lines between AP Farm and WTP, they are going to be included in this application, but only for design and installation. Per past discussions with Ecology, operational responsibility will be addressed in future permit modifications. These transfer lines are discussed in detail in the Addendum C, Process Information. No change made to the text in response to this comment. Ecology response: The transfer lines need to be included as ancillary equipment to a DWMU in the LAWPS OUG. Once a decision has been made in which permit they will reside, they can be removed from the LAWPS OUG permit. Ecology believes we have all the necessary design information however they are not detailed as ancillary equipment to a DWMU in this permit. A simple sentence in the Part A will address this concern. If DOE has made a decision on who the responsible operator will be for these transfer lines, please let us know, so we can incorporate them into the correct permit. Permittee response: Transfer lines, both hose-in-hose transfer lines and hard walled pipe-in-pipe, have been added to the Part A Form, Section XI, Nature of Business, second paragraph.	Accept	Close	JR
2	Pg. A.3, Section XI, Nature of Business	The scope of the system should make it clear that it includes ancillary equipment such as HIHTLs and pipelines.	Provide a high level description of the scope of the system being permitted, to be expanded upon in Addendum C Process Information.		This level of information is not required in a Part A Form, which is also consistent with the Revision 9, Part A Conceptual Agreement Package. Complete details of the permitted system are included in Addendum C, Process Information. No change was made in response to this comment. Ecology response: The transfer lines need to be included as ancillary equipment to a DWMU in the LAWPS OUG. Once a decision has been made in which permit they will reside, they can be removed from the LAWPS OUG permit. Ecology believes we have all the necessary design information however they are not detailed as ancillary	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					equipment to a DWMU in this permit. A simple sentence in the Part A will address this concern. If DOE has made a decision on who the responsible operator will be for these transfer lines, please let us know, so we can incorporate them into the correct permit. Permittee response: Transfer lines, both hose-in-hose transfer lines and hard walled pipe-in-pipe, have been added to the Part A Form, Section XI, Nature of Business, second paragraph.			
3	Pg. A.14 and A.15	Please update the Figure numbers. It appears Figure A.3 and A.5 are missing. If agreement is reached that DST 241-AP-106 will be included as S02, Tank Storage in the LAWPS Part A, please include it on one of the Figures. The below grade hard wall transfer lines should also be included in one of the figures.			Figures representing transfer pipe routing are not included in any of the final status Part II OUG (reference Part A Forms for 242-A, LERF/ETF, and WTP). This level of detail depicting tank system ancillary components is not required in a Part A Form, but is provided in Addendum C, Process Information. No change was made in response to this comment. Ecology response: The first two parts of the comment have been closed. The transfer lines need to be included as ancillary equipment to a DWMU in the LAWPS OUG. Figure A.4 depicts where the hard walled lines will reside within the OUG, but there is not mention of them in the Nature of Business section. Once a decision has been made in which permit they will reside, they can be removed from the LAWPS OUG permit. Ecology believes we have all the necessary design information however they are not detailed as ancillary equipment to a DWMU in this permit. A simple sentence in the Part A will address this concern. If DOE has made a decision on who the responsible operator will be for these transfer lines, please let us know, so we can incorporate them into the correct permit. Permittee response: Figure numbers have been corrected. During Notice of Deficiency disucssions between the permittees and Ecology it was agreed that a new figure depicting the hard walled transfer lines was not required in the Part A Form. Figures of the transfer lines are included in Addendum C, Process Information. Figure A.3 is being deleted as an artifact of 30% design. IXC mounting arrangement is shown on Figure A.2. Figure A.2 has been updated to add a call-out for the BOF Pad.	Accept	Close	MJ
4	General	For TSCR Phase One design, Ecology agrees with the design of these HIHTLs specific to the leak detection issues as it applies to the hose rise into the sump where it is exaggerated and creates a low point in the pipeline. Ecology shared concerns multiple times but			Permittee response: Comment noted.	Accept	Close	SD

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		the layout was not changed. In the future, we will not approve of this type of layout for HIHTLs that significantly impacts timely leak detection.						
Addendum B, Waste Analysis Plan								
5	Page B.2, Section B.5, 1st Paragraph	Says contents of the "feed qualification tank" are sampled to demonstrate waste is acceptable to process at TSCR. Will this sampling occurrence also determine acceptability for treatment at WTP LAW facility?	If so, please add language to clarify since waste treated at TSCR must also meet LAW WAC.		Permittee response: The same sampling event will be used to determine acceptability for treatment at both TSCR and WTP LAW, with the exception of cesium. However, Waste Acceptance Criteria (WAC) compliance demonstration for WTP LAW is managed in accordance with that Operating Unit Group's Waste Analysis Plan (WAP), not the TSCR WAP. In addition, WAC parameters differ between WTP LAW and TSCR. Therefore, it is not appropriate for the TSCR WAP to speak to the WTP waste acceptance. During Notice of Deficiency discussions between the permittees and Ecology it was agreed that no change was required to be made in response to this comment.	Accept	Close	NC
6	Page B.6, Table B.2	4th column title "Action Level" implies that an action must be initiated if level is exceeded. If so, should the parameter be labeled with a "greater than or equal to" (≥) symbol rather than a "less than or equal to" (≤) symbol? Or is the intent to communicate parameter concentrations (less than DQO action limit) at which waste will be accepted at TSCR?	Change equality symbol or suggest column be titled "Acceptance Level" or something similar for clarity.	Title as it is listed leaves room for ambiguity.	Permittee response: The intent is to communicate parameter concentration "less than or equal to" are acceptable for processing. The 4th column title "Action Level" is correct. If the action level is exceeded, the results will be assessed in accordance with Section B.7.3. Refer to the second sentence of Section B.9.2. During Notice of Deficiency discussions between the permittees and Ecology it was agreed that no change was required to be made in response to this comment.	Accept	Close	NC
7	Page B.9, Section B.10.5	The text says things like "A SAP will be developed to provide clear directions…" and "The SAP may include…" as if sampling will not occur until sometime in the future. Ecology was told in the 11/14 LAWPS meeting that the TSCR feed in AP-107 has already been characterized. This section must be rewritten completely to describe the sampling requirements and how sampling is being performed. A copy of the SAP and QAPjP must be included with the WAP.			The contents of AP-107 were sampled and analyzed to the superseded revision of the DQO. This was done to gain advance knowledge of the feed preparation for that tank for planning purposes. It is expected that additional sampling will be performed at a future date. A SAP will not be developed until that qualification feed sampling activity is to be performed and will not be included in the WAP. No changes have been made to the text. **Ecology Action**: Ecology will add a permit condition to require the submittal of the SAP to the Operating Record as detailed in Section B.7.2 of the WAP	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Permittee response: Ecology action noted.			
Addendum C, Process Information								
8	Pg. C.1, Sec. C.	Please add discussion regarding the expected duration of the TSCR project elements.	1. Describe the possible life span range for the TSCR facility, e.g., the plan is 5-years, but it might terminated within 3-years, and it could possibly be extended indefinitely. 2. HIHTLs between TSCR and the AP Tanks are temporary and will only be used for 3-years. Expected IXC storage duration, e.g., up to 50 years on the IXC storage pad and please indicate a duration on IXC staging pad. Revise the text to clarify that the HIHTLs have a maximum 3 year service life from the date of first use.	Clarity and transparency/19-NWP-041 dated 3/12/2019	1. Any discussion regarding the TSCR life span range would be speculative at best. It has been communicated to Ecology that TSCR, as represented in this permit application, represents the first of two phases, with an out-year decision to be made regarding the second phase of a cesium removal system. 2. Comment noted. 3. Life-cycle disposition is addressed in Addendum H Closure. No changes were made in response to this comment. Ecology response: Please add the following sentence or Ecology will add in the draft permit: HIHTL have a 3 year service life, after three years the lines will need to be replaced with another set of HIHTL. Anything beyond the 5 year duration of Phase One must have hard walled piping. Permittee response: The following sentences will be added to Addendum C, Section C.3.1 *"HIHTLs have a 3 year service life, after three years the lines will be replaced with another set of HIHTL. Anything beyond the approximately 5 year duration of LAWPS Phase One will utilize hard walled piping."* Five years is an approximation because Phase One of LAWPS is not strictly defined being limited to 5 years.	Accept	Close	JSD/SL
9	Pg. C.1, Sec. C.	This introduction refers to Figure C.1, which is a good figure; however, the figure does not encompass the entire scope of the TSCR unit group. Please consider either: a) adding another figure that covers the whole TSCR unit group scope, or b) list the major component parts, e.g., the TSCR unit, HIHTLs, IXC storage pad, and waste transfer line extensions, with references to the respective figures later in the document.		Clarity and transparency	Additional figures identifying those elements addressed in the comment are provided throughout Addendum C. The TSCR unit group boundary is provided in Addendum A, Part A. No changes were made in response to this comment. Ecology response: The sentence that reads, "The layout of TSCR facilities are shown on a simplified site plan in Figure C.1." Is not true, please revise this statement or refer to additional drawings that show all of the TSCR (LAWPS OUG) DWMU. Permittee response:	Accept	Close	JSD

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Both the introduction to Figure C.1 and the figure title will be changed to reflect what is shown.			
10	Pg. C.1, Sec C.1	No information is provided on tank shell thicknesses, connection details, anchorage details, pressure controls, or level controls.	Revise the addendum.	-640(2)(c)(i) -806(4)(c)(i-v)	The Rev. 9 Process CAP has not been issued; therefore, the permittees are unable to address this comment and the balance of CAP related comments in this RCR. Furthermore, once the CAP is issued, the permittees will review and provide feedback to Ecology. This results in months to year's long process of Major Theme discussions and deficiency identification and solution workshops. This process will not conclude until well after the initial LAWPS permit application and the supplemental information package has been submitted to Ecology. No changes were made in response to this comment. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #10.	Accept	Close	SL
11	Page C.2	Does the TSCR perimeter fence include the Ancillary Enclosure? Neither Figure C.1 nor C.5 depict a fence around this area.			Permittee response: No fence is provided for the Ancillary or Control Enclosures (reference H-14-111604).	Accept	Close	YL
12	Pg. C.2, Figure C.1 TSCR Site Plan	Please identify the second container storage area (IXC Storage Pad) on this Figure.			The scale of this figure does not allow the IXC storage pad to be shown. The intent of this figure is to show the TSCR process area layout. The IXC storage pad is shown on Figure C.5. No change was made in response to this comment. Ecology response: The transfer lines should also be included in this figure. Page C.1, Lines 6-7 state the layout of TSCR facilities are shown on a Figure C.1 which is incorrect since the IXC Storage Pad is missing. Permittee response: Both the introduction to Figure C.1 and the figure title will be changed to reflect what is shown (reference response to comment #9 above). The IXC storage pad is shown on Figure C.5.	Accept	Close	MJ
13	Pg. C.7, Sec. C.2.1, line 20	Can you clarify what is meant by the following phrase, "…Process Enclosure followed making inlet and outlet connections."? Should it say "after" instead of "followed"?			Permittee response: The sentence will be corrected as follows "*A new filter is then installed into the Process Enclosure followed by making inlet and outlet connections.*"	Accept	Close	MJ

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
14	Pg. C.8, Sec. C.2.2, line 3	What is this "pre-determined limit" and where will it be documented?			Permittee response: The setpoint is determined by an input value based on the waste feed sodium concentration. Therefore, the value will show some variability between feed tank campaigns. During Notice of Deficiency discussions between the permittees and Ecology it was agreed to modify Section C.2.3 to add a sentence stating setpoints for each campaign will be recorded and entered into the LAWPS OUG operating record.	Accept	Close	MJ
15	Pg. C.8, Sec. C.2.2, line 12	What is this "treated waste set-point" and where will it be documented?			Permittee response: The setpoint is determined by an input value based on the waste feed sodium concentration. Therefore the value will show some variability between feed tank campaigns. During Notice of Deficiency discussions between the permittees and Ecology it was agreed to modify Section C.2.3 to add a sentence stating setpoints for each campaign will be recorded and entered into the LAWPS OUG operating record.	Accept	Close	MJ
16	Pg. C.9, Sec. C.2.4, Ln. 6	There is a reference to "demineralized water" and Figure C.2 references "softened water", please clarify.	Clarify	Clarity and transparency	Figure C.2 callout changed to demineralized water for consistency. Ecology response: Action was not completed. Should the text be changed to read "softened water" to be in agreement with all of the supporting technical documentation? Permittee response: All references, including Figure C.2 use the term "softened" water.	Accept	Close	JSD
17	Pg. C.9, Sec. C.2.4	How long will an IXC remain in the staging area and storage pad?	Specify the how long waste can be kept in each area		Establishing durations is speculative. The addendum notes in several sections the IXC staging area is used as a temporary area in the event a column requires corrective action (e.g., decontamination). Columns will remain on the IXC storage pad until they are ready to have the CST media fed through HLW. The exact time is not known. No change was made in response to this comment. Ecology response: Please provide a definition of what the project considers temporary (e.g. 30 days, 60 days). The design life of the IXC areas is 50 years, therefore duration of the column storage is not speculative. Permittee response:	Accept	Close	YL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Text in Section C.5 Container Storage, third paragraph was modified to establish IXCs may remain in the staging area for up to 1 year, and will remain on the storage pad for up to 50 years. In addition, Figure C.5 has been updated to add a call-out for the BOF Pad.			
18	Pg. C.11, Sec. C.2.8, Ln. 10	Please expand the discussion with information regarding a) if a TSCR operating event can result in an automated action, e.g., shutdown, of the AP Tank equipment, and b) if an AP Tank farm event can result in an automated action, e.g., shutdown, of TSCR equipment.	Expand and clarify.	Clarity and transparency	Section C.2.8 acknowledges automated shutdown upon indication of leaks. Control logic received at 60% design, and subsequent to Ecology review of this addendum, provides additional detail that will be included in the Process Information addendum. Changes will be made in response to this comment. Ecology response: Please identify what changes were made to address this comment. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #18.	Accept	Close	JSD
19	Pg. C.12, Sec. C.3.1	Please add discussion of the following: a) the HIHTLs are temporary and have maximum service life of 3 years, b) if TSCR operation extends beyond 3 years, the lines will be replaced with permanent lines prior to operation beyond 3-years.	Expand and clarify	Clarity and transparency	It is acknowledged HIHTLs have a three-year service life. However, the permittees have not agreed to replacing them with permanent lines after three years. The commitment from the permittees was to utilize permanent transfer lines for Phase 2 of LAWPS, which is a cesium removal system to be chosen after Phase 1 (TSCR). This is consistent with numerous discussions and the November 2018 version of the LAWPS Permitting Plan. No changes were made in response to this comment. **Ecology Action:** Please add the following sentence or Ecology will add in the draft permit: HIHTL have a 3 year service life, after three years the lines will need to be replaced with another set of HIHTL. Permittee response: The following sentences will be added to Addendum C, Section C.3.1 *"HIHTLs have a 3 year service life, after three years the lines will be replaced with another set of HIHTL. Anything beyond the approximately 5 year duration of LAWPS Phase One will utilize hard walled piping."* Five years is an approximation because Phase One of LAWPS is not strictly defined being limited to 5 years.	Accept	Close	JSD

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
20	Pg. C.14, Sec. C.4	Please indicate whether fire water, e.g., a hydrant, will be supplied to a) the TSCR process area, and b) the IXC storage pad.	Expand and clarify	Clarity and transparency	Subsequent to development of the draft addendum and Ecology review, it has been determined TSCR will be equipped with a skid-mounted fire suppression system. This section will be rewritten accordingly. The IXC storage pad will be serviced by a hydrant. Changes will be made in response to this comment and design changes. Ecology response: Please identify what changes were made to address this comment. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #20.	Accept	Close	JSD
21	Pg. C.16, Sec. C.5	Please add discussion of the following: a) the design life of the IXC columns, b) the design life of the IXC storage pad, c) the anticipated IXC storage period, and d) information pertaining to the IXC vent configuration, anticipated total duration vent filters will have to be maintained, and anticipated filter replacement period.	Expand and clarify	Clarity and transparency	a) Design attributes for the concrete storage areas are established in the respective specifications cited in Section C.5. b) IXC design attributes are established in RPP-SPEC-61910. c) Identifying an IXC storage period is speculative. d) IXC vent configuration and maintenance requirements remain under development and will be established in a radioactive air emissions Notice of Construction. No changes were made in response to these comments. Ecology response: Please provide a definition of what the project considers temporary (e.g. 30 days, 60 days). The design life of the IXC areas is 50 years, therefore duration of the columns is not speculative. Permittee response: Text in Section C.5 Container Storage, third paragraph was modified to establish IXCs may remain in the staging area for up to 1 year, and will remain on the storage pad for up to 50 years. Vent functionality and maintenance are regulated under the Clean Air Act and will be licensed in accordance with WAC 246-247.	Accept	Close	JSD
22	Pg. C.17, § C.6 General Comment Regarding Design Requirements	Ecology intends for the TSCR unit group to be permitted according to DWP Rev. 9 requirements, specifically including Addendum C Process Information section (Process CAP). It is		Clarity and transparency	The Rev. 9 Process CAP has not been issued; therefore, the permittees are unable to address this comment and the balance of CAP related comments in this RCR.	Accept	Close	JSD

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
		recommended that the permittee consider the following and include as appropriate: a) Following the appendix organization section 9 of Process CAP for this addendum b) Include a table in this addendum that lists the documents included in the appendices for this process addendum. c) Verify that the documents listed in the table and included in the appendices provide the information required in section 5.4 of the Process CAP. d) If the permittees wish to facilitate Ecology review, the permittees could provide a cross walk of the requirements in section 5.4 of the Process CAP with the documents in the appendices containing the information. While Ecology understands that this is a preliminary and incomplete submittal, Ecology emphasizes that under the Process CAP that the basis for design must be provided. Examples of items where is unclear that the permittees intend to provide basis documents include the following: i) design basis, ii) code and standards, iii) construction QA and inspection plan, iv) material selection, v) future integrity assessments, vi) independent installation inspector plan, and vii) above grade pipeline signage.			Furthermore, once the CAP is issued, the permittees will review and provide feedback to Ecology. This results in months to year's long process of Major Theme discussions and deficiency identification and solution workshops. This process will not conclude until well after the initial LAWPS permit application and the supplemental information package has been submitted to Ecology. **Ecology Action:** Ecology will evaluate the Process Information Addenda against the final CAP and major theme agreement prior to the Rev 9 reissuance. Permittee response: Ecology action noted.			
23	Pg. C.17, Sec. C.6, Table C.2	Is there a reason why the volumes of filters, IXCs, and media trap are not included?	Add volume data if appropriate	Clarity and transparency	There are no static volumes associated with these, as they are continuous once-through components. Ecology response: Nonresponsive, Please include the empty vessel volumes. Permittee response: Volumes for the filters, IXCs, and media trap will be added to Table C.2. • IXCs = 162.6 gal • Filters = 49.5 gal • Media Trap = .25 gal	Accept	Close	JSD
24	General	There is a complete lack of detail on the engineering design and operation of TSCR. Ex – Text says TSCR is equipped with alarms that annunciate on any indication of malfunction and the system shuts down. That is not sufficient.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	Multiple EPA and HWTR Conceptual Agreements	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Ecology response: Please identify if any text has been added to the addenda to address this comment. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #24.			
25	Page C.22 Sec C.6.5	Are there any entry points to the underground pipelines that require marking as detailed in WAC 173-303-640(5)(d)? Update text as necessary.	Revise the addendum.	WAC 173-303-640(5)(d)	Labels are not required on underground portions of tank systems. No change was made in response to this comment. Permittee response: There are no entry points to the underground pipelines. During Notice of Deficiency disucssions between the permittees and Ecology it was agreed that no changes were necessary in response to this comment.	Accept	Close	SL
26	Page C.17 Sec C.5 Page C.20 Sec C.6.1.3	Assessment of the structural integrity of the base for container storage area(s) is required.	Revise the addendum.	WAC 173-303-806(4)(b)(i) WTP Permit Condition III.10.D.3.b ECY Pub 95-402 Sec D2.4.3	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #26.	Accept	Close	SL
27	General	Structures used to contain, store, and process dangerous wastes are not fully described.	Revise the addendum.	WAC-173-303-283; -395; -630;-640; -806(4)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #27.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
28	General	Processes used to transfer, consolidate, and treat dangerous waste are not fully described.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC-173-303-283; -395; -630;-640; -806(4)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #28.	Accept	Close	SL
29	Page C.11 Sec C.2.8	Limits and controls on the waste management activities are not sufficiently described to evaluate regulatory compliance and protection of HHE. Ex – How is a fine spray leak detected?	Revise the addendum.	WAC-173-303-283; -630;-640; -806(4)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #29.	Accept	Close	SL
30	Various figures	All areas where waste is being managed are not shown on the drawings in detail. Only sketches are provided. There is no mention even as to what are the DWMU(s?) or their boundaries.	Revise the addendum.	WAC 173-303-806(4)(a)(xviii)(J) and (L)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #30.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
31	General	The equipment and facilities used to monitor and control waste management activities are not described in detail. Ex – Little or no information is provided on the TSCR components.	Revise the addendum.	WAC-173-303-283; -630; -640; -806(4)(a)(viii)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #31.	Accept	Close	SL
32	Page C.15 Sec C.4	Safety equipment is not adequately described. All the text says is call the Fire Department. Ex – Are there fire extinguishers or safety showers? How do SCBA requirements from Tank Farms affect TSCR?	Revise the addendum.	WAC-173-303-283; -630; -640; -806(4)(a)(viii)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #32.	Accept	Close	SL
33	Page C.17 Sec C.5	No information is provided on how the location of waste is tracked, the quantity of waste, and the compatibility class of waste.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC 173-303-300(6); -380(1)(b); -806(4)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #33. During Notice of Deficiency disucssions between the permittees and Ecology, the Ecology reviewer indicated a portion of this comment applied to operational considerations associated with	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Hose-in-Hose Transfer Lines (HIHTLs). That portion of the comment will be dispositioned with comment #89.			
34	Page C.23 Sec C.6.6	Addendum C needs to refer to specific processes and procedures in the Add. B WAP on how the ignitable and reactive waste codes are removed.	Revise the addendum.	WAC 173-303-283; -630; -640; -806(4)(a)(ii) and (iii)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #34.	Accept	Close	SL
35	Page C.11 Sec C.2.8	Operating limits and controls are not defined for the waste management activities.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC 173-303-283; -630; -640; -806(4)(a)(ii) and (iii)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #35.	Accept	Close	SL
36	Page C.18 Sec C.6.1	Information is not provided in Addendum C to support the waste acceptance requirements in Addendum B.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC 173-303-283; -630; -640; -806(4)(a)(ii) and (iii)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #36.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					In addition, Addendum B, Waste Analysis Plan, Section B.4 references back to Addendum C, Process Information.			
37	Page C.20 Sec C.6.1.2	Insufficient information is provided on materials and floor coatings. Just saying stainless steel is not sufficient.	Revise the addendum.	WAC 173-303-283; -630; -640; -806(4)(a)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #37.	Accept	Close	SL
38	Page C.20 Sec C.6.1.3, C.6.3.1	No mention is made of how the facility will ensure liners and floor coatings are maintained in good condition, regularly inspected, and repairs are managed.	Revise the addendum.	WAC 173-303-283; -630; -640; -806(4)(a)(v)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #38.	Accept	Close	SL
39	Page C.21 Sec C.6.3.1	The text does not describe how liquid which collects in secondary containment areas and sumps will be managed. All it says is leaked waste is removed.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC 173-303-283; -630; -640; -806(4)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #39 for TSCR secondary containment.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Removal of waste from a HIHTL secondary hose will be added to the end of Addendum C, Section C.6.3.2, Secondary Containment Transfer Lines.			
40	Page C.23 Sec C.6.7	Waste compatibility only addresses transfers to TSCR and is not sufficient. A waste compatibility evaluation will be performed by Tank Farms per RPP-11192, *Tank Farms Chemical Compatibility Program*, to address all the transfers in operating TSCR.	Revise the addendum.	WAC 173-303-283; -630; -640; -806(4)(a)(ii) and (iii)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #40. In addition, a sentence has been added to Section C.6.7 acknowledging returns from TSCR back to AP Farm will comply with the DST System waste acceptance criteria.	Accept	Close	SL
41	Page C.17 Sec C.5	Design and profile drawings are not provided for container storage areas.	Revise the addendum.	WAC 173-303-395, -630, -806(4)(b)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology Response: Based on the last Internal process CAP meeting (2/4/2020). The expectation is that the Permittees will provide drawings for every unit. If during unit group workshops, the Permittees are not able to provide drawings, it will be discussed at the unit group with the unit group. Is there a reason that profile drawings cannot be provided for the LAWPS container storage areas? Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #41.	Accept	Close	SL
42	Page C.17 Sec C.5	Waste container spacing is not addressed for the spent IX packages.	Revise the addendum.	WAC 173-303-340(3)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #42.			
43	Page C.17 Sec C.5	More detail is needed on the control of flammable gases and the fire code requirements applicable to the spent IX packages. Ex – Details on the vent and filter arrangement.	Revise the addendum.	WAC 173-303-283; -691(1); -630; -806(4)(b)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Fire protection for the IXC Storage Pad is addressed in Section C.4.	Accept	Close	SL
44	Page C.17 Sec C.5	Addendum C needs to reference specific test procedures in Addendum B for demonstrating waste containers do not contain free liquids.	Revise the addendum.	WAC 173-303-806(4)(b)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: IXC drying is discussed in Section C.2.2 of Addendum C.	Accept	Close	SL
45	Page C.17 Sec C.5	Waste container labelling requirements are not discussed.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC 173-303-160(2); -395(6); -630(3), -806(4)(b)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #45.			
46	Page C.17 Sec C.5	A description is needed of practices for safely managing waste containers (including procedures, equipment, and structures) to ensure they are not opened, handled, or stored in a manner which may cause them to rupture or leak.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC 173-303-630(5)(a); -806(4)(b)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #46.	Accept	Close	SL
47	Page C.17 Sec C.5	Waste tracking for containers is not addressed.	Revise the addendum.	WAC 173-303-300(6); -380(1)(b); -806(4)(b)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #47.	Accept	Close	SL
48	Page C.23 Sec C.6.4.1	Text incorrectly states tank overfill prevention is not a concern. TSCR is sending separate streams to DSTs AP-106 and AP-108 which have liquid level limits. Same for AP-102 if this permit includes waste returns from EMF. The text needs to describe the controls and practices to prevent spills and overflows.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	WAC 173-303-640(5)(b)(ii)	With respect to overfill protection, DST operational controls are not within the scope of this application. With respect to the CAP, see previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Ecology believes the overfill	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					protection for DST Operations does belong in this permit, until the DST have a permit of their own. Permittee response: 241-AP Farm tank liquid levels signals are shared with the TSCR montoring and control system, but are controlled by the AP Farm Central Control Room, which is a function of the DST OUG.			
49	Page C.19 Sec C.6.1.1	The text only says a seismic analysis will be performed. A description is required of how tank system design/construction accounts for earthquake stresses.	Revise the addendum.	WAC 173-303-640(3)(a); -806(4)(c)(i-v)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #49.	Accept	Close	SL
50	Page C.19 Sec C.6.1.1	The draft lists the "primary" codes and standards. This is incomplete. References must be provided to all applicable design standards and building codes to which the tank system was constructed.	Revise the addendum.	WAC 173-303-640(3)(a); -806(4)(c)(i-v)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology Response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: The word "Primary" was removed from the introductory sentence for Table C.3.	Accept	Close	SL
51	Page C.20 Sec C.6.1.3	A schedule for future integrity assessments is required. The addendum must state that if TSCR operates longer than 5 years, the end of its design life, an integrity assessment will be conducted.	Revise the addendum.	WAC 173-303-640(3)(b)	With regards to integrity assessments, they can only be established following design and installation. With respect to the CAP, see previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology Response:	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #51.			
52	Page C.21 Sec C.6.2	The addendum needs to describe how TSCR will be installed, including proper procedures to prevent damage to the tank system during installation.	Revise the addendum.	WAC 173-303-640(3)(c); -806(4)(c)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology Response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #52.	Accept	Close	SL
53	Page C.20 Sec C.6.1.3	Under integrity assessments the text states there will be corrosion inspection program but provides no details. Input from an independent corrosion expert is required.	Revise the addendum.	WAC 173-303-640(3)(g)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology Response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation. Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #53.	Accept	Close	SL
54	Page C.21 Sec C.6.3	No details are provided for the leak detection systems. Ex – Types of sensors, amount that may leak without being detected.	Revise the addendum.	WAC 173-303-640(4)	See previous comment response regarding the Process Information CAP. The permittees are unable to adequately respond to CAP related comments. No changes were made in response to this comment. Ecology Response: Please update the response and identify how you plan to meet the regulatory requirement or where text has been added to the addenda to address the regulation.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
					Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #54. Ecology Response: Was there any language added to describe the lines and why we couldn't slope the way we would have wanted i.e. soil coverage, crane crossing couldn't go over them without crushing? Leak rate definition of 2 gallons in 24 hours? Permittee response: Language describing the lines and why some could not be continually sloped exists in Section C.6.3.2. Preliminary calculations establish a 2-gallon per hour leak from within any of the five hoses can be detected within 1 hour. No additional changes were made in response to Ecology's most recent response.			
55	Pg. C.18, Lines 25-26	Secondary containment is not provided for the IXC staging area; however, decontamination may be necessary of the IXCs. If a wash down of the columns occurs, how will the runoff be collected, tested and disposed of?			Permittee response: Any decontamination would involve use of a containment for contamination control. Decontamination techniques typically do not include a "wash down" and use a "wipe down" method. Exact procedures to be used would depend on nature and extent of contamination.	Accept	Close	YL
56	Page C.18 Sec C.5 Lines 43-44	Regulations for SAAs are described in WAC 173-303-174	Correct WAC citation	WAC 173-303-200 addresses exemption for a large quantity generator	Permittee response: The WAC citation will be corrected.	Accept	Close	YL
57	Table C.4	Add detail for the sump and pump in the Process Enclosure			Permittee response: The Process Enclosure sump is integral to the Process Enclosure secondary containment. Reference Table C.4, row 8. Details are found in the Appendix and Volume reference in the last column. The column entry for row 8 will include (sump and pump) for clarity.	Accept	Close	YL
58	Page C.25 Sec C.6.4 Lines 24-27	This paragraph (describing the response to leaks or spills and disposition of leaking or unfit-for-use tank systems) makes a broad reference to the requirements of -640(7) which is okay. But then it goes on to list some of the requirements in -640(7)(a-f) but not all. The ones left out are remove the tank system from	Revise the paragraph to agree with the regulations, and be consistent with the 95-402 application guidance Sec F2.4.2.3 as follows:	-640(7)(a-f) Pub 95-402 Sec F2.4.2.3	Permittee response: Section C.6.4 will be revised as requested.	Accept	Close	SL

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
		service, contain releases, remove waste from the tank system or secondary containment, repair or close the tank system, and notify Ecology.	A tank system or secondary containment system from which there has been a leak or a spill, will be removed from service immediately. Following isolation, the corrective actions of WAC 173-303-640(7), incorporated by reference, are followed. The Permittee shall ensure that: – Flow or addition of waste into the tank system will be stopped immediately. – Waste will be removed from the tank system or secondary containment. – Visible releases will be contained. – Non-exempt leaks or spills will be reported. – The tank system will be repaired or closed. – Major repairs will be certified.					
59	Page C.25 Sec C.6.4 Lines 20-23	The text needs to be clearer about how corrosion is not a problem. First it says the waste has a low solids content, and erosion and corrosion is not a problem. (Erosion yes, but corrosion is unrelated to solids content.) Then it says the materials of construction make it unlikely that an aqueous waste would corrode a tank, hose, or piping materials. (Unlikely? And the statement is not supported. Elsewhere it mentions that stainless steel is mostly used.)	The text needs to take credit for the Tank Farms Waste Transfer Compatibility Program, HNF-SD-WM-OCD-015. The program provides a formal process for evaluating waste transfers and chemical additions, and addresses waste chemistry and corrosion mitigation. Then say that nothing TSCR does will affect the waste compatibility.	-640(3)(a) and (5)(a)	Permittee response: Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #59.	Accept	Close	SL
Addendum E, Security Requirements								
60	Pg. E.1, Lines 7-8	Lists active portions of LAWPS OUG as "TSCR Process Enclosure, the TSCR spent IX column staging area and storage pad, and waste transfer lines." Why is the Ancillary Enclosure area not included as an active portion since it contains the ancillary enclosure (with reagent totes, and service water and air) and control enclosure?	Clarification, and/or revise as appropriate		Permittee response: The Reagent Enclosure does not manage mixed waste and is therefore not a dangerous waste management unit.	Accept	Close	NC

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/ Close	Reviewer Initials
61	Pg. E.1, Line 15	Detail which building visitors check-in to.			Visitor check in location is unknown at this time. No change made at this time. Ecology Response: Please update when known. Permittee response: Update information will be provided when known.	Accept	Close	MJ
Addendum F, Preparedness and Prevention								
62	Page F.2, Line 30	Can we discuss this sentence, "Because the TSCR spent IX column storage area does not store waste with free liquids…?" I understand the intent of the sentence, but need to understand which elements of WAC 173-303-630(7) the project intents to comply with for the IX column storage area.	We need to clarify the intent of the sentence and add some details to this section about the applicability of WAC 173-303-630(7).		Containment provisions of WAC 173-303-630(7), including prevention of run-on into containment systems as stipulated by WAC 173-303-630(7)(b), are not required provided **either** WAC 173-303-630(7)(c)(i) **or** WAC 173-303-630(7)(c)(ii) followed. The immediately following sentence states "*The spent IX column storage pad is sloped to remove accumulation of precipitation in accordance with WAC 173-303-630(7)(c)(i).*" The permittees believe the text is sufficiently clear as to which container requirements will be applicable to the spent IXC column staging area and storage area. Additional detail is provided in Addendum C, Process Information. No change made in response to this comment. NOTE: The spent IXC staging area is a design feature developed subsequent to drafting this addendum. Reference to this new feature has been added throughout. Ecology Response: Accept the response, please confirm that the information for the IXC Staging Area has been added to F.2.2. Permittee response: F.2.2 does address "IXC storage areas", plural for both the staging area and storage pad. However, the last sentence addressing sloping to remove precipitation only speaks to the storage pad. The staging area is sloped for the same purpose; therefore, Section F.2.2 will be revised for more clarity to address both areas.	Accept	Close	MJ
Addendum G, Personnel Training								

63	General Comment	Throughout this Addenda it should reference the LAWPS OUG instead of TSCR so that it is clear that these requirements apply to all portions of the OUG (TSCR, transfer lines and IX column storage pad).			The final application will include language to ensure an understanding by the reader as to which particular elements of the LAWPS OUG any specific section is applicable to. Ecology Response: It does not appear that this cleaning up of the language has occurred. The Part A is for the LAWPS operating unit group (OUG-1). The TSCR Process Enclosure, IXC staging area and IXC storage pad are DWMUs within OUG-1 as detailed in page H.1 of Closure Plan. Please update as appropriate throughout all Addenda. Permittee response: It was agreed that Ecology will adjust references to the TSCR and LAWPS OUG during permit development, as necessary.	Accept	Close	MJ
64	Page G.5, Line 22, Section G.4	Rad surveys are conducted along the path of the HIHTLs for the purpose of detecting leaks since the HIHTLs do not freely drain. The HPTs receive specific training in performing these radiological monitoring plan-directed surveys. The scope of the training includes classroom training, a written knowledge check, and a field walkdown of the system to demonstrate familiarity with the survey locations which coincide with likely leak sites, survey methods, and abnormal event response. This training needs to be described in the addendum.			Radiological training is not required to be included in DWTPs per the Training CAP. No change made in response to this comment. Permittee response: Radiological Control Technician training is not included in Dangerous Waste Training Plans as agreed to during the Revision 9 CAP workshops on personnel training.	Accept	Close	SL
65	Page G.1, Line 2	Personnel requirements are based on WAC 173-303-330	Change to WAC 173-303-330		Permittee response: Change made as requested.	Accept	Close	YL
66	Page G.3, Sec. G.3, Line 40	Clarify that the Training Plan is not just outside of the Permit but also in the operating record.	The Training Plan must be maintained in the operating record		Permittee response: Change made as requested. Ecology Response: The Training Plan must be maintained in the LAWPS OUG Operating Record. The sentence added states the administrative record. Permittee response: Text was changed to make reference to the LAWPS OUG Operating record.	Accept	Close	YL
Addendum H, Closure Plan								

67	Pg. H.1, Sec H.1.1, Lines 29-30 Pg. H.7, Sec H.2.5, Lines 9-12	The closure plan needs to address disposition of the lead shielding in the spent IX columns. Coordinate with the SWOC Trench 94 closure plan and the regulatory language used for the lead shielding in the reactor compartments.	Address disposition of lead shielding for completeness.		LDRs for the lead in the spent IXCs will be addressed through the appropriate treatment standard at time of closure. SWOC Trench 94 closure plan addresses landfill closure requirements that are not applicable to clean closure of TSCR DWMUs. No change made in response to this comment. Permittee response: Land Disposal Restrictions associated with treatment standards for the disposition of materials generated during closure are addressed in Section H.2.2.	Accept	Close	SL
68	Section H.2, Closure Performance Standards	Discussion of "clear debris" presents the use of the hazardous debris rule in a very backwards approach. The discussion should state that any materials that can be inspected will be subject to hazardous debris treatment, and then evaluated according to the standard applicable to that treatment. See EPA Comment DST #8: This sentence seems to supersede the definition of "hazardous debris" at WAC 173-303-040. To avoid this, this sentence should be revised to read something like "Contaminated equipment, tanks, and piping removed from the DST System pursuant to this closure plan meeting the definition of "hazardous debris" will be treated and disposed of as such."	Correctly explain the application of hazardous debris standards.		Addendum H, Closure Plan has undergone a complete rewrite based on Rev. 9 Closure workshops. Ecology Response: Please add the suggested sentence or Ecology will add in the draft permit. Permittee response: Land Disposal Restrictions associated with treatment standards for the disposition of materials generated during closure are addressed in Section H.2.2.	Accept	Close	CW
69	Pg. H.5, lines 4-8 Pg. H.6, lines 5-6	What "risk-based limits" or standards?			Addendum H, Closure Plan has undergone a complete rewrite based on Rev. 9 Closure workshops. **Ecology Action:** Addition of Table H.2 addresses the original comment. When Ecology drafts the permit we will compare Table H.2 to the table currently being discussed to support Rev. 9 Permittee response: Ecology action noted. Closure Performance Standards remain under discussion between Ecology and the Permittees as part of the ongoing Closure CAP.	Accept	Close	CW

70	Pg. H.15, Table H.3	The table of waste constituents is not limited to just the components which have DW waste codes. The list of waste constituents are those regulated by MTCA. WAC 173-303-610(2)(b)(i) requires that numeric clean closure levels for soils, groundwater, surface water, and air must be determined using unrestricted site use exposure assumptions according to MTCA. Several regulated compounds are not listed (e.g., 1-butanol, toluene).	Revise the list of waste constituents to reflect the composition of tank waste and be consistent with MTCA, similar to the SWOC closure plan example.	WAC 173-303-610(2)(b)(i)	Addendum H, Closure Plan has undergone a complete rewrite based on Rev. 9 Closure workshops. **Ecology Action:** Addition of Table H.2 addresses the original comment. When Ecology drafts the permit we will compare Table H.2 to the table currently being discussed to support Rev. 9 Permittee response: Ecology action noted. Closure Performance Standards remain under discussion between Ecology and the Permittees as part of the ongoing Closure CAP.	Accept	Close	SL
71	Page H.9 Table H.2	Many of the "Values" and "Basis" for the closure performance standards in Table H.2 are different from the CPS negotiated with DOE/WRPS over the last year.	Revise Table H.2 so as to be consistent with the agreed upon CPS.	-610(2)(b)(i)	**Ecology Action:** Addition of Table H.2 addresses the original comment. When Ecology drafts the permit we will compare Table H.2 to the table currently being discussed to support Rev. 9 Permittee response: Ecology action noted. Closure Performance Standards remain under discussion between Ecology and the Permittees as part of the ongoing Closure CAP.	Accept	Close	SL
72	Page H.7 Sec H.4 Page H.9 Table H.2	The list of waste constituents to be analyzed for closure is not complete. Numerous other dangerous waste constituents have been detected in the tank waste and will be present in the feed to TSCR (e.g., butanol F003, toluene F005, chlorobenzene F002/D021, tetrachloroethylene* D039/F001/F002). The list of waste constituents is also much different than the list of TAPs which have been detected in the tank vapor space and are being used for air permitting. The -610 closure regs specifically say to consider waste decomposition products. *Note – Tetrachloroethylene is listed in the Part A but appears to have gotten left off of Table H.2.	Revise Table H.2 to include all the dangerous waste constituents and decomposition products which will be present in the feed to TSCR over the operating life of the facility.	-610(2)(a)(ii) 173-303-9905	**Ecology Action:** Addition of Table H.2 addresses the original comment. When Ecology drafts the permit we will compare Table H.2 to the table currently being discussed to support Rev. 9 Permittee response: Ecology action noted. Closure Performance Standards remain under discussion between Ecology and the Permittees as part of the ongoing Closure CAP.	Accept	Close	SL
73	Page H.7, Section H.4, Lines 9-14	It appears that the first and second sentences of the paragraph seem to say the same thing as the third and fourth sentences.	Clarify or revise as appropriate		Permittee response: The subtle differences between those sentences address differences in the basis for the numerical performance standards, such as direct exposure versus a risk-based value.	Accept	Close	NC
Addendum I, Inspection Plan								
74	Page I.2, Line 2	General comment; Throughout these addenda it references TSCR, but I think the language would be clearer if it stated LAWPS OUG. That language change would clarify that the language is applicable			Comment accepted. The final application will include language to ensure an understanding by the reader as to which particular elements of the LAWPS OUG any specific section is applicable to.	Accept	Close	MJ

		to TSCR, transfer lines, and IX storage column storage pad.			Ecology Response: The Part A is for the LAWPS operating unit group (OUG-1). The TSCR Process Enclosure, IXC staging area and IXC storage pad are DWMUs within OUG-1 as detailed in page H.1 of Closure Plan. Please update as appropriate throughout all Addenda. Permittee response: It was agreed that Ecology will adjust references to the TSCR and LAWPS OUG during permit development, as necessary.			
75	Page I.3, Line 13 – 14	"Visual inspection performed remotely via cameras installed in high dose rate areas are performed on all tanks and ancillary equipment at least annually."	Can you detail the anticipated camera placement?		Not at this time. This level of detail will not be available until design is finalized. It is intended to test the CCTV system during Factory Acceptance Testing to optimize the location(s), field of view, and functionality. Exact number of cameras and locations are TBD. No change made at this time due to design maturity. Ecology Response: Can this information be updated now since design has progressed? Permittee response: Information is still premature for inclusion in the Addendum as final configuration will be determined through factory acceptance testing. Current status of camera deployment is as follows; three cameras in the process area of the process enclosure and one camera in the Process Enclosure airlock. It is anticipated two additional cameras will be recommended for the process area, making a total of five in that area and six overall.	Accept	Close	MJ
76	Page I.3, Lines 31 - 34	Add the line and location identifiers within this paragraph. For example, "Waste transfer lines (line #) to and from…" Can you clarify do each of the locations mentioned in this paragraph have continuous monitoring?			Agree, HIHTL layouts, connection sequencing, and ID#s are provided in Addendum C, Process Information. HIHTLs are included in the inspection plan Table I.2. Ecology Response: We see that this information has been added to Table I.1. Confirm if you will have continuous monitoring on the HIHTLs Permittee response: Continuous leak detection is provided for each HIHTL at the AP Farm tank connection.	Accept	Close	MJ

77	Page I.5, Table I.1	Will visual inspections on the Inlet Filter, Media Trap and Treated Waste Delay Tank occur within the enclosure during column change out? While the enclosure is processing waste will the monitors in the control room be continuously monitored?			Yes, Visual inspections will be performed during column change out. The addendum has been updated to capture this requirement. Regarding the second question; CCTV monitoring will be continuous during process operations and recorded daily as an inspection. The addendum has been updated to capture this requirement. Ecology Response: Please identify where this information has been added Permittee response: Use of CCTV to perform daily inspections is addressed in Sections I.1.5, I.2, and Table I.1. CCTV will monitor during process operations, but the inspection is recorded once daily. In addition, Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #77. Ecology Response: Permittees were to add general inspection for media trap in Table I.1. Permittee response: Added media trap to Table I.1. Because the component is very small and located behind valves and instrumentation, viewing with CCTV is very limited. Added to the IXC change-out frequency.	Accept	Close	MJ
78	Page I.3, Line 12, Section I.1.2.2	Text says that "daily inspections required by WAC 173-303-640 are performed by a daily inspection of leak detection monitoring data." That is confusing two separate regulatory requirements. -640(6)(b)(i) requires daily inspection of aboveground portions of tank systems to check for corrosion or leaks (visual inspection). -640(6)(b)(ii) requires daily inspection of leak detection monitoring data (review the electronic monitoring data). Line 13 says a visual inspection is performed annually using cameras; that is not sufficient. A daily visual inspection must be performed to satisfy the -640(6)(b)(i) requirement.		-640(6)(b)(i,ii)	It is accepted by all parties that not all above ground portions of tank systems can be visually inspected daily because of radiological restrictions (e.g., personnel will be restricted from entering the Process Enclosure during waste processing). A daily review of leak detection data is an accepted alternative to -640(6)(b)(i) and also satisfies -640(6)(b)(ii). No text change was made because the response above appears to address the item. Permittee response: The Inspection Addendum was entirely rewritten prior to certification and submittal. Section I.1.2.2 no longer exists. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #78.	Accept	Close	SL

79	Page I.3, Line 24, Section I.1.2.3	During the 30% design review it was stated that the sole purpose of the enclosure around the TSCR unit was to contain spray leaks. A spray leak may not produce sufficient volume to activate the leak detector in the sump for some time. No mention is made of airborne monitoring within the enclosure or in the ventilation system for leak detection purposes. Some sort of monitoring must be provided for detecting spray leaks. The monitoring system will require periodic inspection and functional testing.		-640(4)(b)(ii)	Spray leaks within this context are a nuclear safety consideration, the dangerous waste regulations do not differentiate between types of leaks. Liquid from process leaks, whether from spray leaks or other, will collect in compliant sumps with active leak detection capabilities. No airborne monitoring within the enclosure will be performed during processing. Leak detection will be supplemented with remote camera viewing capabilities. No change made in response to this comment. Permittee response: The Inspection Addendum was entirely rewritten prior to certification and submittal. Section I.1.2.3 no longer exists. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #79.	Accept	Close	SL
80	Page I.5, Table I.1	The list of Safety and Security Systems equipment needs to include Emergency Lighting (verify operability, monthly), PPE (verify availability, weekly), and Respirators (verify availability and shelf life, monthly).			The list of safety and security equipment is consistent with the Inspection CAP agreements and modifications made to other OUG inspection plans. The Inspection Addendum has been updated accordingly. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #80.	Accept	Close	SL
81	Page I.3, Line 35, Section I.1.2.4	The section on Integrity Assessments needs to include the structural integrity assessments for (1) the TSCR tank system and (2) the IXC Storage Pad which is a container storage area. These are to be submitted with the Part B permit application.		-640(3)(a) -806(4)(c)(i)	An Integrity Assessment program has yet to be developed for the TSCR tank system, but will be prior to first receipt of waste. However, this requirement does not exist in -630, does not apply to container storage and will not be performed. No change made in response to this comment. Permittee response: The Inspection Addendum was entirely rewritten prior to certification and submittal. Section I.1.2.4 no longer exists. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #81.	Accept	Close	SL
82	Page I.5, Table I.1	The text in Section F.2.4 says "If power at TSCR is lost, the valves assume a fail-safe position to allow the process to remain in a safe shutdown mode until restoration of power." There needs to be functional testing of these valves before startup and periodically thereafter. Include this testing in the addendum as required inspections. See the similar Evaporator procedure TF-FT-680-022 for functional testing of safety interlock systems.		-283 -340	We agree that valve functionality will be performed at Factory Acceptance Testing and during readiness and start up. They will be routinely operated during waste processing, confirming their functionality. No change to the text was made though as a result of confirmation of value functionality. Permittee response:	Accept	Close	SL

					The extent of functional testing used as inspections remains under debate between Ecology and the Permittees. This issue will be tracked and dispositioned prior to TSCR operations.			
83	Page I.6, Table I.2	Functional testing of all the leak detection systems listed in Table I.2 is needed before startup and periodically thereafter. Include this testing in the addendum as required inspections. See the similar Tank Farms Leak Detector Devices Maintenance Procedures.	Ecology expects this comment to be addressed prior to the submittal of the permit modification to support Operations of the LAWPS OUG.	-283 -340	Startup protocols have yet to be developed. But leak detectors are addressed in Table I.1 of the Inspection Plan. Permittee response: The extent of functional testing used as inspections remains under debate between Ecology and the Permittees. This issue will be tracked and dispositioned prior to TSCR operations.	Accept	Close	SL
84	Page I.3, Line 31, Section I.1.2.3	Rad surveys are conducted along the path of the HIHTLs for the purpose of detecting leaks. Baseline surveys are first performed and re-established every 24 hours, then walkdowns are performed every 8 hrs during operation. See the Radiological Monitoring Plan for TSCR operation.		-640(4)	Comment noted, however no change was made to the text. Permittee response: The Inspection Addendum was entirely rewritten prior to certification and submittal. Section I.1.2.3 no longer exists. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #84.	Accept	Close	SL
85	Page I.6, Table I.2	Pressure indicators and recorders measure DST primary tank vacuum. AP primary tank vacuum shall be maximum -8.7 in. w.g. and minimum 0 in. w.g. Readings are recorded on daily round sheets. AP primary tank vacuum must be verified when venting TSCR and when drying spent IX columns.		OSD-T-151-00007, Section 1.3 Procedure TF-OR-DR-AN	The cited requirement is a condition of a Clean Air Act permit and not subject to regulation under the dangerous waste regulations. AP Farm monitoring routines are performed as part of that OUG. No change made in response to this comment Permittee response: The Inspection Addendum was entirely rewritten prior to certification and submittal. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #85.	Accept	Close	SL
86	Page I.6, Table I.2	DST liquid levels may be recorded by either an automatic liquid level measuring device (Enraf) or by manual liquid level tape/zip cord. AP primary tank waste level normal operating limit shall be 454 in. and maximum authorized limit shall be 458 in. An AP DST waste level above 422 inches must comply with in-service leak check requirements of RPP-19438, *Report of Expert Panel Workshop for Hanford Site Double-Shell Tank Waste Level Increase*, including operating leak detection. Tank levels are recorded on data sheets and checked against maximum liquid levels. AP primary tank waste levels must be verified when TSCR transfers treated LAW to AP-106, and when receiving waste returns from EMF to AP-102.		OSD-T-151-00007, Section 1.1 Procedure TF-OR-DR-AN	Operations protocols have yet to be developed. No change made in response to this comment. Permittee response: The Inspection Addendum was entirely rewritten prior to certification and submittal. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #86.	Accept	Close	SL

87	Page I.6, Table I.2	There is an environmental requirement that the AP tank farm primary ventilation system must be operating during waste disturbing activities. Operation must be verified prior to initiating waste transfers. Operation of the AP tank ventilation system must be verified when transferring feed to TSCR from AP-107, and when TSCR transfers treated LAW to AP-106.		RPP-16922, Section 3.5	The cited specification has been cancelled. Ecology response: Has a new specification been developed to address this requirement? Does the requirement to have AP Tank Farm primary ventilation operating when transferring feed to TSCR still apply? Permittee response: The Inspection Addendum was entirely rewritten prior to certification and submittal. Reference the attached *Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk*, comment #87.	Accept	Close	SL
88	Addendum I	This LAWPS OUG permit application is for design and installation only. However, some of the inspections listed in the Inspection Schedule Table I.1 seem to apply only to operations. Ecology will need to review the Inspection Schedule when the application for the operating permit is submitted.		-320 -640(6)	Permittee response: Comment noted.	Accept	Close	SL
Addendum J, Contingency Plan								
		No comments						

89 (New)	AddendumC	**Requirement,, for Managing HIHTLs** [Previous comments #B, 39, 52, 54, 64, and 84 apply to HIHTI..s (e.g., 1/52 is about leak testing).] There are numerous requirements in the HIHTL Mgmt Plan RPP-12711 that are not captured in the permit. Need to address: · • Description of how each HIHTL is installed (ok), maintained, and operated. • Description of initial leak testing of assembled HIHTL system (no vendor testing of subassemblies) and when replacing HIHTLs; see the construction spec RPP-SPEC-62633 Section 40 05 22. • IQRPE certification of new HIHTL installation (not just design), and when ever a connection is unmade and re-made. • Process and criteria for life extension requests for HIHTLs and need for IQRPE certification. • Tracking system to ensure HIHTLs are not used beyond their initial design service life or extended service life. • Evaluation of limitations, and sensitivity of leak detection system for each HIHTL: - Time for detection of leaks using in-pit leak detection and material balance discrepancy methods for 2 gpm leak. - Minimum leak rate that can be detected in 24 hrs using in-pit leak detection and material balance discrepancy methods. • Use of radiological monitoring and visual inspection as supplemental leak detection methods for HIHTLs. • Process for flushing, draining, and air blowing HIHTLs. • Annual HIHTL status report.	(Per Compliance) Either this information must be brought into the permit, or the permit must say the HIHTL Mgmt Plan RPP-1271 is "incorporated by reference" and include the revision number and effective date.	-640(3), (4), (5), (6), (7)	Permittee response: Bullets one and two are addressed in the construction specification, RPP-SPEC-62663. **Ecology Response:** Please verify that this reference is the correct specification. Ecology will include this specification in the permit. Permittee Response: Installation and pre-operational testing is included in the Construction Specification. Section C.3.1 was modified in response to bullet three to acknowledge IQII or IQRPE certification for HIHTL installations. **Ecology Response:** Ecology will add a permit condition to document any actions that need to be taken if a connection in the HIHTL is broken and remade. Permittee Response: Ecology comment note. Permittee Response: Regarding the fourth bullet, the permittees agreed to not pursue life extensions for HIHTLs. Section C.3.1 establishes hoses will be replaced after 3 years of service. **Ecology Response:** We are working on a draft condition to document the agreed to lifespan of the HIHTL. Please add text in section C.3.1 that states that when HIHTLs are removed from service they will be correctly managed under the generator regulations in the WAC 173-303-200. Permittee Response: Text modified as requested. Permittee Response: Regarding the fifth bullet, a tracking system within the context of RPP-12711 is not necessary for the five TSCR hoses that will all be placed into service at the same time. **Ecology Response:** Comment closed. We believe that the added condition and the requested additional language about disposal of the HIHTLs documented in the previous bullet will address our concern. Ecology considers this a one time exemption, and any furture HIHTL used will need to follow the tracking system as required in RPP-12711. Permittee Response: Regarding the sixth bullet, HIHTLs supporting TSCR rely on in pit, or in-drop leg leak detection, which is an engineered method that is preferred. The short distances of TSCR HIHTLs make the use of material balance discrepancy methods uncessary. A leak rate of 2 gpm can be detected in less than 24 hours for each hose. **Ecology Response:** At our last meeting to walk through the technical deficiencies Ecology agreed that you would not	Accept	Close	SL

					need to provide the formal calculations if a table with this information was added to the Process Addenda. Please add this information. In addition, add text to the Inspection Addenda that states that radiological monitoring and visual inspection of HIHTL routes will be performed when the HIHTLs are flushed during IXC replacement. If not added, Ecology will add language to the text or add as a permit condition. Permittee Response: A statement was added to Section C.6.3.2 that a 2-gallon per minute leak could be detected in less than one hour in all five hoses. Addendum I, Table I.1 was modified to include a once per IXC change-out radiological and visual inspection for each HIHTL. Permittee Response: Regarding the seventh bullet, use of radiological surveys as supplemental leak detection is uncessary because of the short hose lengths being deployed. In-pit and in-drop leg leak detection is the preferred engineered method. **Ecology Response:** Please see response to the sixth bullet. Permittee Response: Addendum I, Table I.1 was modified to include a once per IXC change-out radiological and visual inspection for each HIHTL. Permittee Response: Regarding the eighth bullet, flush, drain, and air blowing of HIHTLs has been added to Section C.6.3.2. **Ecology Response:** Ecology will add a permit condition that documents what specific information from the Annual HIHTL status report will be kept in the Operating Record for the LAWPS OUG. Permittee Response: Ecology comment noted.			

90 (New)	Addendum I Table I.I	**Inspections of Monitoring Equipment** -640(6)(b)(ii) requires daily inspection of data gathered from monitoring and leak detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system **is** being operated according to its design. This includes things like inspection for liquid levels and leak alarms. -320(2) requires inspection of monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment This would include inspecting for whether the leak detectors themselves are functioning properly. (Tank Farms does this annually.} The Inspection Schedule addresses inspections of operating data, but misses altogether inspections of the monitoring equipment itself.	Include inspections of monitoring equipment in Table I.1 Inspection Schedule.	-320(2)	Permittee response: The nature and extent of inspection and functional testing of monitoring equipment remains under dispute in the Addendum I, Inspection Plan CAP workshops. The permittee continue to monitor progress and may have to address Inspection Plan developments prior to TSCR commissioning. **Ecology Response:** Comment closed for now. Ecology does have concerns that will need to be addressed in the LAWPS operating permit.	Accept	Close	SL
91	Addendum C Addendum I	All leaks from HIHTLs to date have occurred at fittings. There is no provision for detecting leaks in the shielded enclosure where TSCR connects to the five HIHTLs.	Describe provisions for detecting leaks in the shielded enclosure. The inspection schedule must include (1) a daily check of data from leak detection instruments, and (2) an annual check of the leak detector to verify it is functioning properly.	-320(2) -640(4) -640(6)(b)(ii) -806(4)(c)(vii)	Permittee response: The only HIHTL leak (in 2002) came from the hose-to-fitting interface. This was a barbed connection that is no longer used. All hose to fitting unions are now swaged and have never leaked. No fitting to fitting connection has ever leaked. Daily checks of data from leak detection (including both HIHTL tank terminations and TSCR Process Enclosure) already are included in Addendum I, Table I.1. The nature and extent of inspection and functional testing of monitoring equipment remains under dispute in the Addendum I, Inspection Plan CAP workshops. The permittee continue to monitor progress and may have to address Inspection Plan developments prior to TSCR commissioning.	Accept	Close	SL

Formal Review of LAWPS Notice of Deficiency Comment Resolution Crosswalk

<table>
<tr><th>Comment Number/Comment</th><th>Addenda Location</th><th>Design Media</th></tr>
<tr>
<td>#10

“No information is provided on tank shell thicknesses, connection details, anchorage details, pressure controls, or level controls.”</td>
<td>Addendum C, Sections C.6, C.6.1.2, and C.8, Table C.4</td>
<td>
Appendix 2, Volume 1, Table A.1
<table>
<tr><td>DS-1813-00, Rev. 1</td><td>IXC-150 Data sheet</td></tr>
<tr><td>DS-1813-01, Rev. 1</td><td>Filter Data Sheet</td></tr>
<tr><td>DS-1813-02, Rev. 1</td><td>Delay Tank Data Sheet</td></tr>
<tr><td>DS-1813-03, Rev. 1</td><td>Media Trap Data Sheet</td></tr>
<tr><td>RPP-CALC-62458, Rev. 2</td><td>TSCR Anchoring Base for Storage Pad-Seismic Calculation</td></tr>
<tr><td>RPP-RPT-61220, Rev. 2</td><td>Tank Side Cesium Removal (TSCR) Control Logic Narrative</td></tr>
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Appendix 2, Volume 2 Table A.5
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<tr><td>H-14-111251-1, Rev. 3</td><td>General Arrangement Filter</td></tr>
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<tr><td>H-14-111252, Rev. 3</td><td>General Arrangement Delay Tank</td></tr>
<tr><td>H-14-111253, Rev. 3</td><td>General Arrangement Media Trap</td></tr>
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<tr><td>H-14-111244-1, Rev. 3</td><td>General Arrangement Process Enclosure Equipment Layout</td></tr>
<tr><td>H-14-111244-2, Rev. 3</td><td>General Arrangement Process Enclosure Equipment Layout</td></tr>
<tr><td>H-14-111244-3, Rev. 3</td><td>General Arrangement Process Enclosure Equipment Layout</td></tr>
<tr><td>H-14-111244-4, Rev. 3</td><td>General Arrangement Process Enclosure Equipment Layout</td></tr>
<tr><td>H-14-111244-5, Rev. 3</td><td>General Arrangement Process Enclosure Equipment Layout</td></tr>
<tr><td>H-14-111244-6, Rev. 3</td><td>General Arrangement Process Enclosure Equipment Layout</td></tr>
<tr><td>H-14-111244-7, Rev. 3</td><td>General Arrangement Process Enclosure Equipment Layout</td></tr>
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</table>

#18. *"Please expand the discussion with information regarding a) if a TSCR operating event can result in an automated action, e.g., shutdown, of the AP Tank equipment, and b) if an AP Tank farm event can result in an automated action, e.g., shutdown, of TSCR equipment."*	**Addendum C, Section C.2.8.**	**Appendix 2, Volume 1, Table A.1** RPP-RPT-61220, Rev. 2 | Tank Side Cesium Removal (TSCR) Control Logic Narrative
#20. *"Please indicate whether fire water, e.g., a hydrant, will be supplied to a) the TSCR process area, and b) the IXC storage pad."*	**Addendum C, Section C.4.**	N/A
#24. *"There is a complete lack of detail on the engineering design and operation of TSCR. Ex – Text says TSCR is equipped with alarms that annunciate on any indication of malfunction and the system shuts*	**Addendum C, Section C.2.8.**	**Appendix 2, Volume 1, Table A.1** RPP-RPT-61220, Rev. 2 | Tank Side Cesium Removal (TSCR) Control Logic Narrative

<table>
<tr>
<td>down. That is not sufficient.”

NOTE: Addenda location and design media addresses the text citing alarm and shutdown. The remaining portion of the comment is too broad to provide a meaningful response.</td>
<td></td>
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</tr>
<tr>
<td>#26

“Assessment of the structural integrity of the base for container storage area(s) is required.”</td>
<td>Addendum C, Sections C.2.6 and C.5, Figures C.1 and C.5.</td>
<td>
Appendix 2, Volume 1, Table A.1
<table>
<tr><td>RPP-SPEC-62054, Rev. 2</td><td>TSCR IXC Concrete Storage Pad System: Tank Farm System Infrastructure Upgrades Specification</td></tr>
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Appendix 2, Volume 2, Table A.7
<table>
<tr><td>H-14-111603, Rev. 0</td><td>TSCR IXC Storage Area Civil General Notes & Legend</td></tr>
<tr><td>H-14-111604, Rev. 0</td><td>TSCR IXC Storage Area Civil Overall Site Plan</td></tr>
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<tr><td>H-14-111605-2, Rev. 0</td><td>TSCR IXC Storage Area Civil Grading Plan</td></tr>
<tr><td>H-14-111606, Rev. 0</td><td>TSCR IXC Storage Area Civil Enlarged Plan</td></tr>
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<tr><td>H-14-111608-1, Rev. 0</td><td>TSCR IXC Storage Area Civil Security Fence & Pad DETS</td></tr>
<tr><td>H-14-111608-2, Rev. 0</td><td>TSCR IXC Storage Area Civil Security Fence & Pad DETS</td></tr>
<tr><td>H-14-111608-3, Rev. 0</td><td>TSCR IXC Storage Area Civil Security Fence & Pad DETS</td></tr>
<tr><td>H-14-111609-1, Rev. 0</td><td>TSCR IXC Storage Area Civil Sections & Details</td></tr>
</table>
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</table>

#27.

"Structures used to contain, store, and process dangerous wastes are not fully described."

NOTE: This comment is so broad, the reviewer must consider all information provide in the entire application, including supplemental materials.

"contain" - **Sections C.2.4, C.2.6 C.5, C.6.1, C.6.3 and C.6.4.**

"store" - **Sections C.1, C.2.4, C.5, C.6.3.**

"process" - **Sections C.1, C.2, C.2.1, C.2.3, C.2.5, C.2.6 and C.2.8.**

"contain" - **Appendix 2, Volume 1, Table A.1 and Appendix 2, Volume 2, Table A.5**

DS-1813-79, Rev. 0	Leak Detector Data Sheet
DS-1813-80, Rev. 0	Leak Detector Data Sheet
RPP-CALC-62500, Rev. 2	Process Enclosure Secondary Containment Sizing Calculation
RPP-CALC-62504, Rev. 2	TSCR Sump Pump Sizing
No. DA-314470-01, Rev. 0	Independent Qualified Registered Professional Engineer Design Assessment R for Tank Side Cesium Removal (TSCR) Design
H-14-111241, Rev. 0	TSCR Block Flow Diagram
H-14-111242, Rev. 2	TSCR Process Flow Diagram
H-14-111244-9, Rev. 3	General Arrangement Process Enclosure Sump and Drain Details

"store" - **Appendix 2, Volume 1, Tables A.1 and A.3. Appendix 2, Volume 2, Tables A.5 and A.7**

DS-1813-00, Rev. 1	IXC-150 Data sheet
DS-1813-02, Rev. 1	Delay Tank Data Sheet
RPP-CALC-62465, Rev 2	TSCR IXC-150 (POR655-WP-IX-400A/B/C) ASME Section VIII Division 1, Edition Code Calculation
RPP-CALC-62497, Rev. 2	Tank Side Cesium Removal (TSCR) IXC-150 Sizing
RPP-CALC-62498, Rev. 2	TSCR Delay Tank Sizing
RPP-CALC-62499, Rev. 2	TSCR Media Trap Sizing
RPP-CALC-62500, Rev. 2	Process Enclosure Secondary Containment Sizing Calculation
RPP-CALC-62504, Rev. 2	TSCR Sump Pump Sizing
RPP-SPEC-62054, Rev. 2	TSCR IXC Concrete Storage Pad System: Tank Farm System Infrastructure Upgrades Specification
RPP-CALC-62547, Rev. 0	Structural Analysis of TSCR IXC Storage Pad
RPP-CALC-63060, Rev. 0	Structural Analysis of TSCR Balance of Facilities (BOF) Pad
H-14-111250, Rev. 3	General Arrangement IXC-150
H-14-111252, Rev. 3	General Arrangement Delay Tank
H-14-111603, Rev. 0	TSCR IXC Storage Area Civil General Notes & Legend
H-14-111604, Rev. 0	TSCR IXC Storage Area Civil Overall Site Plan
H-14-111605-1, Rev. 0	TSCR IXC Storage Area Civil Grading Plan
H-14-111605-2, Rev. 0	TSCR IXC Storage Area Civil Grading Plan
H-14-111606, Rev. 0	TSCR IXC Storage Area Civil Enlarged Plan
H-14-111607, Rev. 0	TSCR IXC Storage Area Civil BOF Pad Enlarged Plan
H-14-111608-1, Rev. 0	TSCR IXC Storage Area Civil Security Fence & Pad DETS

		H-14-111608-2, Rev. 0	TSCR IXC Storage Area Civil Security Fence & Pad DETS
		H-14-111608-3, Rev. 0	TSCR IXC Storage Area Civil Security Fence & Pad DETS
		H-14-111609-1, Rev. 0	TSCR IXC Storage Area Civil Sections & Details
		H-14-111293-1, Rev. 0	TSCR Anchoring Base for Storage Pad
		H-14-111293-2, Rev. 0	TSCR Anchoring Base for Storage Pad
		H-14-111293-3, Rev. 0	TSCR Anchoring Base for Storage Pad
		H-14-111293-4, Rev. 0	TSCR Anchoring Base for Storage Pad
		"process" - **Appendix 2, Volume 1, Tables A.1 and A.3. Appendix 2, Volume 2, Table A.5**	
		DS-1813-00, Rev. 1	IXC-150 Data sheet
		DS-1813-01, Rev. 1	Filter Data Sheet
		DS-1813-02, Rev. 1	Delay Tank Data Sheet
		DS-1813-03, Rev. 1	Media Trap Data Sheet
		DS-1813-04. Rev. 0	Dead End Filter – Filter Media
		DS-1813-06, Rev. 0	CST Media Data Sheet
		RPP-CALC-62465, Rev 2	TSCR IXC-150 (POR655-WP-IX-400A/B/C) ASME Section VIII Division 1, 2 Edition Code Calculation
		RPP-CALC-62472, Rev. 2	TSCR Filter (POR655-WP-FLT-325A/B) Pressure Vessel Code, Nozzle Load, Seismic Calculation
		RPP-CALC-62484, Rev. 2	TSCR Delay Tank (POR655-WP-TK-550) Pressure Vessel Code, Nozzle Load Seismic Calculation
		RPP-CALC-62495, Rev 0	Pressure Relief Device Calculation
		RPP-CALC-62496, Rev. 2	TSCR Filter Sizing
		RPP-CALC-62497, Rev. 2	Tank Side Cesium Removal (TSCR) IXC-150 Sizing
		RPP-CALC-62498, Rev. 2	TSCR Delay Tank Sizing
		RPP-CALC-62499, Rev. 2	TSCR Media Trap Sizing
		RPP-RPT-61030, Rev. 1	Process Operations Description
		RPP-RPT-61220, Rev. 2	Tank Side Cesium Removal (TSCR) Control Logic Narrative
		H-14-024857-6, Rev. 3	TSCR P&ID Feed
		H-14-024857-7, Rev. 3	TSCR P&ID Filtration
		H-14-024857-8, Rev. 3	TSCR P&ID IXC Positions A & B
		H-14-024857-9, Rev. 3	TSCR P&ID IXC Position C
		H-14-024857-10, Rev. 3	TSCR P&ID Effluent Components
		H-14-024857-13, Rev. 3	TSCR P&ID Interlock Table
		H-14-111241, Rev. 0	TSCR Block Flow Diagram
		H-14-111242, Rev. 2	TSCR Process Flow Diagram

		H-14-111244-1, Rev. 3 — General Arrangement Process Enclosure Equipment Layout H-14-111244-2, Rev. 3 — General Arrangement Process Enclosure Equipment Layout H-14-111244-3, Rev. 3 — General Arrangement Process Enclosure Equipment Layout H-14-111244-4, Rev. 3 — General Arrangement Process Enclosure Equipment Layout H-14-111244-5, Rev. 3 — General Arrangement Process Enclosure Equipment Layout H-14-111244-6, Rev. 3 — General Arrangement Process Enclosure Equipment Layout H-14-111244-7, Rev. 3 — General Arrangement Process Enclosure Equipment Layout H-14-111244-8, Rev. 3 — General Arrangement Process Enclosure Center of Gravity
#28. *"Processes used to transfer, consolidate, and treat dangerous waste are not fully described."* **NOTE:** This comment is so broad, the reviewer must consider all information provide in the entire application, including supplemental materials.	"transfer" - **Sections C.2, C.3, and C.3.1** No "consolidation" will be performed. "treat" – assume this is synonymous with "process". See "process" sections and design media immediately above for comment #27.	"transfer" - **Appendix 2, Volume 1, Tables A.2 and A.4. Appendix 2, Volume 2, Tables A.6 and A.8** **NOTE:** For utilized portions of the Project W-211 transfer lines, reference **19-ECD-0028** Attachment 5 (1,285 pages) No. DA-316542-01, Rev. 0 — Independent Qualified Registered Professional Engineer Design Assessment Re for TSCR Tank Farms Infrastructure Upgrades. RPP-CALC-62532, Rev. 0 — Tank Side Cesium Removal System AP Farm Hydraulic Transient Analysis RPP-CALC-62640, Rev. 0 — Tank Side Cesium Removal Process Pump Flow Analysis RPP-RPT-61171, Rev. 0 — Tank Farm System Infrastructure Upgrades Control Strategy No. DA-317076-01, Rev. 0 — Independent Qualified Registered Professional Engineer Design Assessment Re for Waste Feed Delivery – LAW Feed RPP-SPEC-62666, Rev. 0 — Procurement Specification for Fabrication of a Double Containment Piping Syst for Tank Farm Upgrades/Waste Feed Delivery RPP-CALC-62528, Rev. 0 — B31.3 Evaluation of Tie-In Transfer Lines RPP-CALC-62607, Rev. 0 — AP-106 to WTP LAW Facility Flow Analysis RPP-CALC-62660, Rev. 0 — Low Activity Waste (LAW) Feed Buried Structural Supports RPP-CALC-62950, Rev. 0 — 1996 to 2016 B31.3 Gap Analysis for Buried Waste Transfer Piping ECN-714471, Rev 0 — Cut and Cap Lines 3"SN-637 and 3"SN-700 at Locations Identified for W-211 Transfer Line Upgrade ECN-714908, Rev 0 — W211 Transfer Lines 3"SN-637 and 3"SN-700 Tie-In to DFLAW & Effluent Re ECN-714910, Rev 0 — Connect New Line From Pump Pit 241-AP-06A To 3"SN-637 Piping

		H-14-020803-14, Rev. 0	AP Farm TSCR Upgrades System (WT) P&ID	
		H-14-042603-53, Rev. 0	INSTM Loop Diagram AP TSCR Feed Pump Discharge Pressure	
		H-14-042603-54, Rev. 0	INSTM Loop Diagram AP Waste Feed Delivery Discharge Pressure	
		H-14-042603-55, Rev. 0	INSTM Loop Diagram AP TSCR Feed Pump Discharge Flow	
		H-14-042603-56, Rev. 0	INSTM Loop Diagram AP Waste Feed Delivery Discharge Flow	
		H-14-042603-57, Rev. 0	INSTM Loop Diagram Pit AP-07F Leak Detection	
		H-14-042603-58, Rev. 0	INSTM Loop Diagram AP-106 Riser #2 Leak Detection	
		H-14-042603-59, Rev. 0	INSTM Loop Diagram AP-108 Riser #15 Leak Detection	
		H-14-111331-1, Rev. 0	AP Farm TSCR Upgrades HIHTL Layout General Arrangement	
		H-14-111331-2, Rev. 0	AP Farm TSCR Upgrades HIHTL Layout Sections	
		H-14-111331-3, Rev. 0	AP Farm TSCR Upgrades HIHTL Layout Sections	
		H-14-111331-4, Rev. 0	AP Farm TSCR Upgrades HIHTL Layout Hose Chart	
		H-14-111340-1, Rev. 0	AP Farm TSCR Upgrades 241-AP-07F HIHTL STRBK Notes and Parts List	
		H-14-111340-2, Rev. 0	AP Farm TSCR Upgrades 241-AP-07F HIHTL STRBK Assembly	
		H-14-111340-3, Rev. 0	AP Farm TSCR Upgrades 241-AP-07F HIHTL STRBK Weldment	
		H-14-111340-4, Rev. 0	AP Farm TSCR Upgrades 241-AP-07F HIHTL STRBK Weldment	
		H-14-111340-5, Rev. 0	AP Farm TSCR Upgrades 241-AP-07F HIHTL STRBK Details	
		H-14-111357-1, Rev. 0	AP Farm TSCR Upgrades Piping Hydraulic Diagram	
		H-14-111357-2, Rev. 0	AP Farm TSCR Upgrades Piping Hydraulic Diagram	
		H-14-111360-1, Rev. 0	AP Farm TSCR Upgrades 241-AP TSCR HIHTL STRBK Notes And Parts List	
		H-14-111360-2, Rev. 0	AP Farm TSCR Upgrades 241-AP TSCR HIHTL STRBK Assembly	
		H-14-111360-3, Rev. 0	AP Farm TSCR Upgrades 241-AP TSCR HIHTL STRBK Weldment	
		H-14-111360-4, Rev. 0	AP Farm TSCR Upgrades 241-AP TSCR HIHTL STRBK Details	
		H-14-020803-15, Rev. 0	Waste Transfer System (WT) P&ID	
		H-14-111301, Rev. 0	AP Farm Waste Transfer Waste Feed Layout General Arrangement	
		H-14-111321, Rev. 0	LAW Feed Upgrades Civil Plan and Profile	
		H-14-111322-1, Rev. 0	Piping Waste Feed Line Mod Pipe Support Key Plan	
		H-14-111322-2, Rev. 0	Piping Waste Feed Line Mod Pipe Support Plan	
		H-14-111322-3, Rev. 0	Piping Waste Feed Line Mod Pipe Support Plan	
		H-14-111322-4, Rev. 0	Piping Waste Feed Line Mod Pipe Support Plan	
		H-14-111371-1, Rev. 0	LAW Interface Piping – Civil Plan and Profile	
		H-14-111371-2, Rev. 0	LAW Interface Piping – Civil Plan and Profile	
		H-14-111372-1, Rev. 0	Piping LAW Interface Piping Pipe Support Key Plan	
		H-14-111372-2, Rev. 0	Piping LAW Interface Piping Pipe Support Plan	
		H-14-111372-3, Rev. 0	Piping LAW Interface Piping Pipe Support Plan	

		H-14-111372-4, Rev. 0	Piping LAW Interface Piping Pipe Support Plan
		H-14-111372-5, Rev. 0	Piping LAW Interface Piping Pipe Support Plan
		H-14-111372-6, Rev. 0	Piping LAW Interface Piping Pipe Support Plan
		H-14-111373-1, Rev. 0	Piping Details – AP Farm Yard Piping
		H-14-111373-2, Rev. 0	Piping Details – AP Farm Yard Piping
		H-14-111373-3, Rev. 0	Piping Details – AP Farm Yard Piping
		H-14-111373-4, Rev. 0	Piping Details – AP Farm Yard Piping
		H-14-111375-1, Rev. 0	Piping – AP Farm Waste Feed Hydraulic Diagram
		H-14-111375-2, Rev. 0	Piping – AP Farm Waste Feed Hydraulic Diagram
#29 *"Limits and controls on the waste management activities are not sufficiently described to evaluate regulatory compliance and protection of HHE. Ex – How is a fine spray leak detected?"*	**Addendum C, Section C.2.8.**	**Appendix 2, Volume 1, Table A.1** RPP-RPT-61220, Rev. 2	Tank Side Cesium Removal (TSCR) Control Logic Narrative
#30 *"All areas where waste is being managed are not shown on the drawings in detail. Only sketches are provided. There is no mention even as to what are the DWMU(s?) or their boundaries."*	**Addendum A, Part A Form, Figures A.1, A.2, A.3 and A.4.** The LAWPS Operating Unit Group boundary is show on Figure A.4.	**Appendix 2, Volume 2, Tables A.5 and A.7**	
		H-14-024857-6, Rev. 3	TSCR P&ID Feed
		H-14-024857-7, Rev. 3	TSCR P&ID Filtration
		H-14-024857-8, Rev. 3	TSCR P&ID IXC Positions A & B
		H-14-024857-9, Rev. 3	TSCR P&ID IXC Position C
		H-14-024857-10, Rev. 3	TSCR P&ID Effluent Components
		H-14-024857-13, Rev. 3	TSCR P&ID Interlock Table
		H-14-111241, Rev. 0	TSCR Block Flow Diagram
		H-14-111242, Rev. 2	TSCR Process Flow Diagram
		H-14-111250, Rev. 3	General Arrangement IXC-150
		H-14-111251-1, Rev. 3	General Arrangement Filter
		H-14-111251-2, Rev. 3	General Arrangement Filter

	Addendum C. Figures C.1., C.2, C.5, C.6, C.8, and C.9.	H-14-111252, Rev. 3	General Arrangement Delay Tank
		H-14-111253, Rev. 3	General Arrangement Media Trap
		H-14-111244-1, Rev. 3	General Arrangement Process Enclosure Equipment Layout
		H-14-111244-2, Rev. 3	General Arrangement Process Enclosure Equipment Layout
		H-14-111244-3, Rev. 3	General Arrangement Process Enclosure Equipment Layout
		H-14-111244-4, Rev. 3	General Arrangement Process Enclosure Equipment Layout
		H-14-111244-5, Rev. 3	General Arrangement Process Enclosure Equipment Layout
		H-14-111244-6, Rev. 3	General Arrangement Process Enclosure Equipment Layout
		H-14-111244-7, Rev. 3	General Arrangement Process Enclosure Equipment Layout
		H-14-111244-8, Rev. 3	General Arrangement Process Enclosure Center of Gravity
		H-14-111603, Rev. 0	TSCR IXC Storage Area Civil General Notes & Legend
		H-14-111604, Rev. 0	TSCR IXC Storage Area Civil Overall Site Plan
		H-14-111605-1, Rev. 0	TSCR IXC Storage Area Civil Grading Plan
		H-14-111605-2, Rev. 0	TSCR IXC Storage Area Civil Grading Plan
		H-14-111606, Rev. 0	TSCR IXC Storage Area Civil Enlarged Plan
		H-14-111607, Rev. 0	TSCR IXC Storage Area Civil BOF Pad Enlarged Plan
		H-14-111608-1, Rev. 0	TSCR IXC Storage Area Civil Security Fence & Pad DETS
		H-14-111608-2, Rev. 0	TSCR IXC Storage Area Civil Security Fence & Pad DETS
		H-14-111608-3, Rev. 0	TSCR IXC Storage Area Civil Security Fence & Pad DETS
		H-14-111609-1, Rev. 0	TSCR IXC Storage Area Civil Sections & Details
		H-14-111613-1, Rev. 0	TSCR IXC Storage Area Mechanical Piping Plan
		H-14-111613-2, Rev. 0	TSCR IXC Storage Area Mechanical Piping Sections & Details
		H-14-111613-3, Rev. 0	TSCR IXC Storage Area Mechanical Sections & Details
		H-14-111613-4, Rev. 0	TSCR IXC Storage Area Mechanical Sections & Details
		H-14-111613-5, Rev. 0	TSCR IXC Storage Area Mechanical Details
#31 *"The equipment and facilities used to monitor and control waste management activities are not described in detail. Ex – Little or no information is provided on the TSCR components."*	**Addendum C, Section C.1, C.2.3, C.2.8, C.6.3, C.6.3.2, and C.6.4.**	**Appendix 2, Volume 1, Table A.1 and Appendix 2, Volume 2 Tables A.5, and A.6**	
		DS-1813-79, Rev. 0	Leak Detector Data Sheet
		DS-1813-80, Rev. 0	Leak Detector Data Sheet
		DS-1813-81, Rev. 0	Level Transmitter Data Sheet
		RPP-CALC-62495, Rev 0	Pressure Relief Device Calculation
		RPP-RPT-61030, Rev. 1	Process Operations Description
		RPP-RPT-61220, Rev. 2	Tank Side Cesium Removal (TSCR) Control Logic Narrative
		H-14-024857-13, Rev. 3	TSCR P&ID Interlock Table
		H-14-111241, Rev. 0	TSCR Block Flow Diagram
		H-14-111242, Rev. 2	TSCR Process Flow Diagram

		H-14-042603-57, Rev. 0 — INSTM Loop Diagram Pit AP-07F Leak Detection H-14-042603-58, Rev. 0 — INSTM Loop Diagram AP-106 Riser #2 Leak Detection H-14-042603-59, Rev. 0 — INSTM Loop Diagram AP-108 Riser #15 Leak Detection
#32 *"Safety equipment is not adequately described. All the text says is call the Fire Department. Ex – Are there fire extinguishers or safety showers? How do SCBA requirements from Tank Farms affect TSCR?"*	**Addendum J, Section J.4, Table J.2.** **Addendum I, Section I.1.7 and Table I.1**	N/A
#33 "No information is provided on how the location of waste is tracked, the quantity of waste, and the compatibility class of waste."	**Addendum C, Sections C.1, C.2.8, and Section C.6.7.** **Addendum B, Sections B.5, B.5.2, B.7, and B.8.**	**Appendix 2, Volume 1, Table A.1** RPP-RPT-61030, Rev. 1 — Process Operations Description RPP-RPT-61220, Rev. 2 — Tank Side Cesium Removal (TSCR) Control Logic Narrative
#34 *"Addendum C needs to refer to specific processes and procedures in the Add. B WAP on how the ignitable and reactive*	**Addendum C, Section C.6.6.** **LAWPS Permitting Plan, Section 6.0.**	N/A

<table>
<tr><td>waste codes are removed.”</td><td>19-ECD-028, Attachment 8,
Evaluation of the Ignitability and Reactivity Dangerous Waste Characteristics of Hanford Site Tank Waste to be Processed by the Low Activity Waste Pretreatment System</td><td></td></tr>
<tr><td># 35

“Operating limits and controls are not defined for the waste management activities.”</td><td>Addendum C, Sections C.1, C.2.8, and C.6.4.</td><td>Appendix 2, Volume 1, Table A.1 and Appendix 2, Volume 2, Table A.5
<table><tr><td>RPP-RPT-61030, Rev. 1</td><td>Process Operations Description</td></tr><tr><td>RPP-RPT-61220, Rev. 2</td><td>Tank Side Cesium Removal (TSCR) Control Logic Narrative</td></tr></table></td></tr>
<tr><td>#36

“Information is not provided in Addendum C to support the waste acceptance requirements in Addendum B.”</td><td>Addendum C, Sections C.2. and C.6.6.</td><td>N/A</td></tr>
<tr><td>#37</td><td>Addendum C, Section</td><td>Appendix 2, Volume 1, Table A.1</td></tr>
</table>

<table>
<tr>
<td>“Insufficient information is provided on materials and floor coatings. Just saying stainless steel is not sufficient.”</td>
<td>C.6.1.2, Table C.4.

NOTE: No floor coatings are used.</td>
<td>
<table>
<tr><td>No. DA-314470-01, Rev. 0</td><td>Independent Qualified Registered Professional Engineer Design Assessment R for Tank Side Cesium Removal (TSCR) Design</td></tr>
<tr><td>RPP-RPT-61282, Rev. 2</td><td>Materials of Construction Evaluation</td></tr>
</table>
</td>
</tr>
<tr>
<td>#38

“No mention is made of how the facility will ensure liners and floor coatings are maintained in good condition, regularly inspected, and repairs are managed.”</td>
<td>Addendum I. Sections I, I.1.2, I.1.5, I.2 and Table I.1</td>
<td>N/A</td>
</tr>
<tr>
<td>#39

“The text does not describe how liquid which collects in secondary containment areas and sumps will be managed. All it says is leaked waste is removed.”</td>
<td>Addendum C. Section C.6.3.1</td>
<td>Appendix 2, Volume 1, Table A.1
<table>
<tr><td>RPP-RPT-61030, Rev. 1</td><td>Process Operations Description</td></tr>
<tr><td>RPP-RPT-61220, Rev. 2</td><td>Tank Side Cesium Removal (TSCR) Control Logic Narrative</td></tr>
<tr><td>H-14-024857-10, Rev. 3</td><td>TSCR P&ID Effluent Components</td></tr>
<tr><td>H-14-111242, Rev. 2</td><td>TSCR Process Flow Diagram</td></tr>
<tr><td>H-14-111244-9, Rev. 3</td><td>General Arrangement Process Enclosure Sump and Drain Details</td></tr>
</table>
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</tr>
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<td>#40

“Waste compatibility only addresses transfers to TSCR and is not sufficient. A waste compatibility evaluation</td>
<td>Addendum B, Sections B.5, B.5.2, B.7, and B.8.</td>
<td>N/A</td>
</tr>
</table>

<table>
<tr><td>will be performed by Tank Farms per RPP-11192, Tank Farms Chemical Compatibility Program, to address all the transfers in operating TSCR.”</td><td></td><td></td></tr>
<tr><td>#41

“Design and profile drawings are not provided for container storage areas.”</td><td>Addendum C. Section C.5 and Figure C.5.</td><td>Appendix 2, Volume 2, Table A.7
<table>
<tr><td>H-14-111603, Rev. 0</td><td>TSCR IXC Storage Area Civil General Notes & Legend</td></tr>
<tr><td>H-14-111604, Rev. 0</td><td>TSCR IXC Storage Area Civil Overall Site Plan</td></tr>
<tr><td>H-14-111605-1, Rev. 0</td><td>TSCR IXC Storage Area Civil Grading Plan</td></tr>
<tr><td>H-14-111605-2, Rev. 0</td><td>TSCR IXC Storage Area Civil Grading Plan</td></tr>
<tr><td>H-14-111606, Rev. 0</td><td>TSCR IXC Storage Area Civil Enlarged Plan</td></tr>
<tr><td>H-14-111607, Rev. 0</td><td>TSCR IXC Storage Area Civil BOF Pad Enlarged Plan</td></tr>
<tr><td>H-14-111608-1, Rev. 0</td><td>TSCR IXC Storage Area Civil Security Fence & Pad DETS</td></tr>
<tr><td>H-14-111608-2, Rev. 0</td><td>TSCR IXC Storage Area Civil Security Fence & Pad DETS</td></tr>
<tr><td>H-14-111608-3, Rev. 0</td><td>TSCR IXC Storage Area Civil Security Fence & Pad DETS</td></tr>
<tr><td>H-14-111609-1, Rev. 0</td><td>TSCR IXC Storage Area Civil Sections & Details</td></tr>
<tr><td>H-14-111613-1, Rev. 0</td><td>TSCR IXC Storage Area Mechanical Piping Plan</td></tr>
<tr><td>H-14-111613-2, Rev. 0</td><td>TSCR IXC Storage Area Mechanical Piping Sections & Details</td></tr>
<tr><td>H-14-111613-3, Rev. 0</td><td>TSCR IXC Storage Area Mechanical Sections & Details</td></tr>
<tr><td>H-14-111613-4, Rev. 0</td><td>TSCR IXC Storage Area Mechanical Sections & Details</td></tr>
<tr><td>H-14-111613-5, Rev. 0</td><td>TSCR IXC Storage Area Mechanical Details</td></tr>
</table></td></tr>
<tr><td>#42

“Waste container spacing is not addressed for the spent IX packages.”</td><td>Addendum C. Section C.5 and Figure C.5.</td><td>Appendix 2, Volume 2, Table A.7
<table>
<tr><td>H-14-111606, Rev. 0</td><td>TSCR IXC Storage Area Civil Enlarged Plan</td></tr>
</table></td></tr>
<tr><td>#45</td><td>Addendum C. Section C.6.5</td><td>N/A</td></tr>
</table>

"Waste container labelling requirements are not discussed."		
#46 *"A description is needed of practices for safely managing waste containers (including procedures, equipment, and structures) to ensure they are not opened, handled, or stored in a manner which may cause them to rupture or leak."*	**Addendum C. Sections C.2.4. C.2.6, and C.5.**	N/A
#47 *"Waste tracking for containers is not addressed."*	**Addendum C. Sections C.2.4. C.2.6, and C.5.**	N/A
#49 *"The text only says a seismic analysis will be performed. A description is required of how tank system design/construction accounts for earthquake stresses."*	**Addendum C. Sections C.6.1 and C.6.1.1.**	**Appendix 2, Volume 1, Table A.1** No. DA-314470-01, Rev. 0 — Independent Qualified Registered Professional Engineer Design Assessment R for Tank Side Cesium Removal (TSCR) Design RPP-CALC-62464, Rev. 1 — TSCR Process Enclosure Structural/Lifting Calculation RPP-CALC-62472, Rev. 2 — TSCR Filter (POR655-WP-FLT-325A/B) Pressure Vessel Code, Nozzle Load, Seismic Calculation RPP-CALC-62484, Rev. 2 — TSCR Delay Tank (POR655-WP-TK-550) Pressure Vessel Code, Nozzle Load Seismic Calculation No. DA-316542-01, Rev. 0 — Independent Qualified Registered Professional Engineer Design Assessment R for TSCR Tank Farms Infrastructure Upgrades. RPP-CALC-63060, Rev. 0 — Structural Analysis of TSCR Balance of Facilities (BOF) Pad

#51 *"A schedule for future integrity assessments is required. The addendum must state that if TSCR operates longer than 5 years, the end of its design life, an integrity assessment will be conducted."*	**Addendum C. Section C.6.1.3.**	**Appendix 2, Volume 1, Table A.1** No. DA-314470-01, Rev. 0 — Independent Qualified Registered Professional Engineer Design Assessment R for Tank Side Cesium Removal (TSCR) Design
#52 *"The addendum needs to describe how TSCR will be installed, including proper procedures to prevent damage to the tank system during installation."*	**Addendum C. Sections C.6.1.1., C.6.2., and C.6.3.1.**	**Appendix 2, Volume 1, Table A.3** RPP-SPEC-62663, Rev. 0 — Construction Specification for TSCR Upgrades, Waste Feed Delivery & TSCR I Storage Pad
#53 *"Under integrity assessments the text states there will be corrosion inspection program but provides no details. Input from an independent corrosion expert is required."*	**Addendum C. Sections C.6.1., C.6.1.3., and C.6.4.**	**Appendix 2, Volume 1, Table A.1** No. DA-314470-01, Rev. 0 — Independent Qualified Registered Professional Engineer Design Assessment R for Tank Side Cesium Removal (TSCR) Design
#54	**Addendum C. Sections C.1., C.2.8.,**	**Appendix 2, Volume 1, Tables A.1 and A.5** RPP-CALC-62500, Rev. 2 — Process Enclosure Secondary Containment Sizing Calculation

"No details are provided for the leak detection systems. Ex – Types of sensors, amount that may leak without being detected."	**C.3.1, C.6.3., C.6.3.1., and C.6.3.2**	RPP-CALC-62504, Rev. 2	TSCR Sump Pump Sizing
		DS-1813-79, Rev. 0	Leak Detector Data Sheet
		DS-1813-80, Rev. 0	Leak Detector Data Sheet
		H-14-111241, Rev. 0	TSCR Block Flow Diagram
		H-14-111242, Rev. 2	TSCR Process Flow Diagram
		H-14-111244-9, Rev. 3	General Arrangement Process Enclosure Sump and Drain Details
		H-14-042603-57, Rev. 0	INSTM Loop Diagram Pit AP-07F Leak Detection
		H-14-042603-58, Rev. 0	INSTM Loop Diagram AP-106 Riser #2 Leak Detection
		H-14-042603-59, Rev. 0	INSTM Loop Diagram AP-108 Riser #15 Leak Detection
#59 *"The text needs to be clearer about how corrosion is not a problem.* *First it says the waste has a low solids content, and erosion and corrosion is not a problem. (Erosion yes, but corrosion is unrelated to solids content.)* *Then it says the materials of construction make it unlikely that an aqueous waste would corrode a tank, hose, or piping materials. (Unlikely? And the statement is not supported. Elsewhere it mentions that stainless steel is mostly used.)"*	**Addendum C. Sections C.6.1., C.6.1.3., and C.6.4.**	**Appendix 2, Volume 1, Table A.1**	
		No. DA-314470-01, Rev. 0	Independent Qualified Registered Professional Engineer Design Assessment R for Tank Side Cesium Removal (TSCR) Design

#77 *"Will visual inspections on the Inlet Filter, Media Trap and Treated Waste Delay Tank occur within the enclosure during column change out? While the enclosure is processing waste will the monitors in the control room be continuously monitored?"*	**Addendum I, Sections I.1.5. and I.2. Table I.1.**	**Appendix 2, Volume 2, Table A.5** H-14-111242, Rev. 2 — TSCR Process Flow Diagram
#78 *"Text says that "daily inspections required by WAC 173-303-640 are performed by a daily inspection of leak detection monitoring data." That is confusing two separate regulatory requirements. -640(6)(b)(i) requires daily inspection of aboveground portions of tank systems to check for corrosion or leaks (visual inspection). -640(6)(b)(ii) requires daily inspection of leak detection monitoring data (review the*	**Addendum I**	N/A

electronic monitoring data). Line 13 says a visual inspection is performed annually using cameras; that is not sufficient. A daily visual inspection must be performed to satisfy the -640(6)(b)(i) requirement." **NOTE:** This comment was written against a draft of Addendum I, Section 1.3. Section 1.3 no longer exists in the addendum.		
#79 *"During the 30% design review it was stated that the sole purpose of the enclosure around the TSCR unit was to contain spray leaks. A spray leak may not produce sufficient volume to activate the leak detector in the sump for some time. No mention is made of airborne monitoring within the enclosure or in the ventilation system for leak detection purposes. Some sort of*	**Addendum I.**	N/A

monitoring must be provided for detecting spray leaks. The monitoring system will require periodic inspection and functional testing.” **NOTE:** This comment was written against a draft of Addendum I, Section 1.3. Section 1.3 no longer exists in the addendum.		
#80 *“The list of Safety and Security Systems equipment needs to include Emergency Lighting (verify operability, monthly), PPE (verify availability, weekly), and Respirators (verify availability and shelf life, monthly).”*	**Addendum I, Section I.1.7, Table I.1.**	N/A
#81 *“The section on Integrity Assessments needs to include the structural integrity assessments for (1) the TSCR tank system and (2) the IXC Storage Pad which is a container*	**Addendum I, Section I.1.5.**	**Appendix 2, Volume 1, Table A.1** No. DA-314470-01, Rev. 0 — Independent Qualified Registered Professional Engineer Design Assessment R for Tank Side Cesium Removal (TSCR) Design

storage area. These are to be submitted with the Part B permit application." **NOTE:** This comment was written against a draft of Addendum I, Section 1.3. Section 1.3 no longer exists in the addendum.		
#83 "Functional testing of all the leak detection systems listed in Table I.2 is needed before startup and periodically thereafter. Include this testing in the addendum as required inspections. See the similar Tank Farms Leak Detector Devices Maintenance Procedures." **NOTE:** This comment was written against a draft of Addendum I. Table I.2 no longer exists in the addendum.	**Addendum I.**	N/A
#84	**Addendum I.**	N/A

"Rad surveys are conducted along the path of the HIHTLs for the purpose of detecting leaks. Baseline surveys are first performed and re-established every 24 hours, then walkdowns are performed every 8 hrs during operation. See the Radiological Monitoring Plan for TSCR operation." **NOTE:** This comment was written against a draft of Addendum I. Section I.1.2.3 no longer exists in the addendum.		
#85 *"Pressure indicators and recorders measure DST primary tank vacuum. AP primary tank vacuum shall be maximum -8.7 in. w.g. and minimum 0 in. w.g. Readings are recorded on daily round sheets.*	**Addendum I.**	N/A

AP primary tank vacuum must be verified when venting TSCR and when drying spent IX columns." **NOTE:** This comment was written against a draft of Addendum I. Table I.2 no longer exists in the addendum.		
#86 *"DST liquid levels may be recorded by either an automatic liquid level measuring device (Enraf) or by manual liquid level tape/zip cord. AP primary tank waste level normal operating limit shall be 454 in. and maximum authorized limit shall be 458 in. An AP DST waste level above 422 inches must comply with in-service leak check requirements of RPP-19438, Report of Expert Panel Workshop for Hanford Site Double-Shell Tank Waste Level Increase, including operating leak detection. Tank levels*	**Addendum I.**	N/A

are recorded on data sheets and checked against maximum liquid levels. *AP primary tank waste levels must be verified when TSCR transfers treated LAW to AP-106, and when receiving waste returns from EMF to AP-102.”* **NOTE:** This comment was written against a draft of Addendum I. Table I.2 no longer exists in the addendum.		
#87 There is an environmental requirement that the AP tank farm primary ventilation system must be operating during waste disturbing activities. Operation must be verified prior to initiating waste transfers. Operation of the AP tank ventilation system must be verified when transferring feed to TSCR from AP-107, and	**Addendum I.**	N/A

when TSCR transfers treated LAW to AP-106. **NOTE:** This comment was written against a draft of Addendum I. Table I.2 no longer exists in the addendum.		

Attachment 2
20-ECD-0019

Hanford Facility Dangerous Waste Part B Permit Application
Low-Activity Waste Pretreatment System

(116 Pages Including Cover Sheet)

DOE/ORP-2018-02
Revision 1

Hanford Facility Dangerous Waste Part B Permit Application, Low Activity Waste Pretreatment System

Date Published
April 2020

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Office of River Protection

P.O. Box 450
Richland, Washington 99352

APPROVED
By Janis D. Aardal at 6:42 am, Apr 16, 2020

Release Approval | Date

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APPENDIX 1

ADDENDA

ADDENDUM A, PART A FORM

ADDENDUM C, PROCESS INFORMATION

ADDENDUM F, PREPAREDNESS AND PREVENTION

ADDENDUM G, PERSONNEL TRAINING

ADDENDUM H, CLOSURE PLAN

ADDENDUM I, INSPECTION PLAN

ADDENDUM J, CONTINGENCY PLAN

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ADDENDUM A

PART A FORM

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WASHINGTON STATE DEPARTMENT OF ECOLOGY

Addendum A
Part A Form

Date Received	Reviewed by:	Date:
Month Day Year	Approved by:	Date:

I. This form is submitted to: (place an "X" in the appropriate box)

☒	**Request modification to a final status permit (commonly called a "Part B" permit)**
☐	**Request a change under interim status**
☐	**Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).**
☐	**Establish interim status because of the wastes newly regulated on:** (Date)
	List waste codes:

II. EPA/State ID Number

W	A	7	8	9	0	0	0	8	9	6	7

III. Name of Facility

U.S. Department of Energy – Hanford Facility

IV. Facility Location (Physical address not P.O. Box or Route Number)
A. Street

Refer to Permit Attachment 2, Hanford Facility Permit Legal Description

City or Town	State	ZIP Code
Near Richland	WA	

County Code	County Name
005	Benton

B. Land Type	C. Geographic Location Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	D. Facility Existence Date Month Day Year
F	Refer to TOPO Map (Section XV)		11 19 1980

V. Facility Mailing Address

Street or P.O. Box
P.O. Box 450

City or Town	State	ZIP Code
Richland	WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)		
Name (last)	**(first)**	
Vance	Brian	
Job Title	**Phone Number (area code and number)**	
Manager	(509) 372-2315	
Contact Address		
Street or P.O. Box		
P.O. Box 450		
City or Town	**State**	**ZIP Code**
Richland	WA	99352

VII. Facility Operator Information	
A. Name	**Phone Number**
U.S. Department of Energy Owner/Operator Washington River Protection Solutions, LLC Co-Operator for the Low-Activity Waste Pretreatment System.	(509) 372-2315 (509) 376-2574
Street or P.O. Box	
P.O. Box 450 P.O. Box 850	

City or Town	**State**	**ZIP Code**
Richland	WA	99352

B. Operator Type	F	
C. Does the name in VII.A reflect a proposed change in operator?	☐ Yes ☒ No	
If yes, provide the scheduled date for the change:	**Month**	**Day** / **Year**
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.	☐ Yes ☒ No	

VIII. Facility Owner Information		
A. Name	**Phone Number (area code and number)**	
U.S. Department of Energy Owner/Operator	(509) 372-2315	
Street or P.O. Box		
P.O. Box 450		
City or Town	**State**	**ZIP Code**
Richland	WA	99352

B. Operator Type	F	
C. Does the name in VII.A reflect a proposed change in operator?	☐ Yes ☒ No	
If yes, provide the scheduled date for the change:	**Month**	**Day** / **Year**

IX. NAICS Codes (5/6 digit codes)													
A. First							**B. Second**						
5	6	2	2	1	1	Waste Treatment & Disposal	5	6	2	9	1	0	Remediation Services
C. Third							**D. Fourth**						
5	4	1	7	1	5	Research & Development in the Physical, Engineering and Life Sciences	9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs

X. Other Environmental Permits (see instructions)

A. Permit Type	B. Permit Number	C. Description
E	AOP00-05-006	Title V Air Operating Permit. Incorporation of current non-radiological Notice of Construction permits and FF-01 radiological licenses into the AOP may be delayed up to 2 years.
E	ST00045 11	WAC 173-216, State Waste Discharge Permit Program, Sitewide Permit for Miscellaneous Streams

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)

The Tank-Side Cesium Removal [TSCR] unit represents Phase One of the Low-Activity Waste Pretreatment System (LAWPS) project. Phase One TSCR operations will account for approximately one half of the required 10-gallon per minute treatment capacity throughput necessary for full two-melter Waste Treatment and Immobilization Plant (WTP) Low Activity Waste (LAW) facility operations. The following information represents operational parameters for LAWPS Phase One (TSCR) alone.

TSCR is a mixed waste treatment and storage unit that treats Double-Shell Tank (DST) supernatant waste. The DST supernatant waste contains undissolved solids and radionuclides; to remove the undissolved solids and radionuclide content, the DST waste will be processed through the TSCR system. The TSCR system is housed in a Process Enclosure and is designed to remove undissolved solids and cesium-137, and discharge the pretreated low activity waste (LAW) stream to DST 241-AP-106. The pretreated LAW will be stored in DST 241-AP-106 until transferred to the WTP LAW facility for vitrification. The TSCR Process Enclosure is connected to the 241-AP Farm tanks 241-AP-107 (feed), 241-AP-106 (pretreated LAW), and 241-AP-108 (vent and drain) with hose-in-hose transfer lines. Hard walled pipe-in-pipe transfer lines are used to transfer pretreated LAW from the 241-AP Farm (241-AP-106) to WTP.

The TSCR Process Enclosure contains dead-end filters that separate undissolved solids from the supernatant waste prior to entering a series of three ion exchange (IX) columns. The three ion exchange (IX) columns remove cesium-137 from the supernatant waste. The IX columns will be replaced once the columns become loaded with cesium-137. Prior to replacement, waste remaining in the spent IX columns will be displaced with a caustic solution followed by a water flush followed by air drying to remove any free liquids. Once dry, the spent columns are removed from the TSCR Process Enclosure and transferred to the IXC storage pad. If the columns require additional work (e.g., decontamination) prior to being placed on the storage pad, they may be placed on the IXC staging area as an interim measure.

TSCR dangerous waste management units include:

<u>T01, Tank Treatment</u>: The TSCR tank treatment removes undissolved solids and radionuclides from DST supernatant waste. The filters remove undissolved solids, and IX columns remove cesium-137 to levels required by the WTP LAW facility acceptance criteria.

The process design capacity is 7,200 gallons per day (5 gallons per minute). The estimated annual quantity of waste is 14,725 tons per year, based on estimated liquid waste throughput operating at 100 percent capacity, converted to a mass using the density of water, multiplied by the maximum acceptable specific gravity (SpG) of 1.35.

<u>S02, Tank Storage:</u> The LAW waste stream from the IX columns discharges to a Delay Tank before being pumped to DST 241-AP-106.

The process design capacity of the Delay Tank is 300 gallons. The estimated annual quantity of waste for tank storage is 3,365 pounds per year based on design capacity of the Delay Tank (300 gallons), converted to a mass using the density of water, multiplied by the maximum acceptable SpG of 1.35 SpG.

<u>S01, Container Storage:</u> The container storage area consists of two outdoor concrete pads for the storage of the spent IX columns generated from TSCR operations. These include the IX column staging area and the IX column storage pad. The IX column staging area is only used on a temporary basis for decontamination or other corrective measures prior to placement of an IX column on the IX column storage pad. The IX column staging area is limited to three columns and the process design capacity is included within that for the IX column storage pad. Container storage also includes IX media traps, should that waste form be generated during waste processing. The IX media trap is a contingency feature located just downstream of the polish IX column and is designed to capture IX media in the unlikely event of a screen failure within an IX column that could result in IX media being released into the process stream. A media trap is a small component approximately 17 inches by 3 inches that resembles a small cartridge filter. Given the low probability of an IX column screen failure and the small nature of the component, storage of

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)

this item is credibly bounded by the process design capacity for the IX columns.

The process design capacity of the outdoor concrete pad is 120 cubic yards, based on generating 30 IX columns per year (24 cubic yards per year) with a nominal internal volume of 0.8 cubic yards per column, multiplied by projected 5-year processing duration. The estimated annual quantity of waste for container storage is 450 tons per year based on 30 columns at a nominal mass of 30,000 pounds each.

NAICS Codes

NAICS codes listed in Section IX.B – IX.D apply to the Hanford Facility and not to this unit.

EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below): A facility has two storage tanks that hold 1200 gallons and 400 gallons respectively. There is also treatment in tanks at 20 gallons/hr. Finally, a one-quarter acre area that is two meters deep will undergo in situ *vitrification*.

Section XII. Process Codes and Design Capacities								Section XIII. Other Process Codes								
Line Number		A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number		A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
					1. Amount	2. Unit of Measure (enter code)							1. Amount	2. Unit of Measure (enter code)		
X	1	S	0	2	1,600	G	002	X	1	T	0	4	700	C	001	In situ vitrification
X	2	T	0	3	20	E	001									
X	3	T	0	4	700	C	001									
	1	T	0	1	7,200	U	001		1							
	2	S	0	2	300	G	001		2							
	3	S	0	1	120	Y	002		3							
	4								4							
	5								5							
	6								6							
	7								7							
	8								8							
	9								9							
1	0							1	0							
1	1							1	1							
1	2							1	2							
1	3							1	3							
1	4							1	4							
1	5							1	5							
1	6							1	6							
1	7							1	7							
1	8							1	8							
1	9							1	9							
2	0							2	0							
2	1							2	1							
2	2							2	2							
2	3							2	3							
2	4							2	4							
2	5							2	5							

XIV. Description of Dangerous Wastes

Example for completing this section: A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Processes												
				(1) Process Codes (enter)												(2) Process Description [If a code is not entered in D (1)]
X 1	D 0 0 2	400	P	S	0	1	T	0	1							
X 2	D 0 0 1	100	P	S	0	2	T	0	1							
X 3	D 0 0 2															Included with above
1	D 0 0 2	14,725	T	T	0	1										
2	D 0 0 4															Included with above
3	D 0 0 5															Included with above
4	D 0 0 6															Included with above
5	D 0 0 7															Included with above
6	D 0 0 8															Included with above
7	D 0 0 9															Included with above
8	D 0 1 0															Included with above
9	D 0 1 1															Included with above
10	D 0 1 8															Included with above
11	D 0 1 9															Included with above
12	D 0 2 2															Included with above
13	D 0 2 8															Included with above
14	D 0 2 9															Included with above
15	D 0 3 0															Included with above
16	D 0 3 3															Included with above
17	D 0 3 4															Included with above
18	D 0 3 5															Included with above
19	D 0 3 6															Included with above
20	D 0 3 8															Included with above
21	D 0 3 9															Included with above
22	D 0 4 0															Included with above
23	D 0 4 1															Included with above
24	D 0 4 3															Included with above
25	F 0 0 1															Included with above

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
26	F	0	0	2												Included with above
27	F	0	0	3												Included with above
28	F	0	0	4												Included with above
29	F	0	0	5												Included with above
30	W	P	0	1												Included with above
31	W	P	0	2												Included with above
32	W	T	0	1												Included with above
33	W	T	0	2												Included with above
34	D	0	0	2	3,365	P	S	0	2							
35	D	0	0	4												Included with above
36	D	0	0	5												Included with above
37	D	0	0	6												Included with above
38	D	0	0	7												Included with above
39	D	0	0	8												Included with above
40	D	0	0	9												Included with above
41	D	0	1	0												Included with above
42	D	0	1	1												Included with above
43	D	0	1	8												Included with above
44	D	0	1	9												Included with above
45	D	0	2	2												Included with above
46	D	0	2	8												Included with above
47	D	0	2	9												Included with above
48	D	0	3	0												Included with above
49	D	0	3	3												Included with above
50	D	0	3	4												Included with above
51	D	0	3	5												Included with above
52	D	0	3	6												Included with above
53	D	0	3	8												Included with above
54	D	0	3	9												Included with above
55	D	0	4	0												Included with above
56	D	0	4	1												Included with above

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
57	D	0	4	3												Included with above
58	F	0	0	1												Included with above
59	F	0	0	2												Included with above
60	F	0	0	3												Included with above
61	F	0	0	4												Included with above
62	F	0	0	5												Included with above
63	W	P	0	1												Included with above
64	W	P	0	2												Included with above
65	W	T	0	1												Included with above
66	W	T	0	2												Included with above
67	D	0	0	2	450	T	S	0	1							
68	D	0	0	4												Included with above
69	D	0	0	5												Included with above
70	D	0	0	6												Included with above
71	D	0	0	7												Included with above
72	D	0	0	8												Included with above
73	D	0	0	9												Included with above
74	D	0	1	0												Included with above
75	D	0	1	1												Included with above
76	D	0	1	8												Included with above
77	D	0	1	9												Included with above
78	D	0	2	2												Included with above
79	D	0	2	8												Included with above
80	D	0	2	9												Included with above
81	D	0	3	0												Included with above
82	D	0	3	3												Included with above
83	D	0	3	4												Included with above
84	D	0	3	5												Included with above
85	D	0	3	6												Included with above
86	D	0	3	8												Included with above

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
87	D	0	3	9												Included with above
88	D	0	4	0												Included with above
89	D	0	4	1												Included with above
90	D	0	4	3												Included with above
91	F	0	0	1												Included with above
92	F	0	0	2												Included with above
93	F	0	0	3												Included with above
94	F	0	0	4												Included with above
95	F	0	0	5												Included with above
96	W	P	0	1												Included with above
97	W	P	0	2												Included with above
98	W	T	0	1												Included with above
99	W	T	0	2												Included with above
100																
101																
102																
103																
104																
105																
106																
107																
108																
109																

XV. Map

Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. The instructions provide additional information on meeting these requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (refer to Instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, recycling, and disposal areas; and sites of future storage, treatment, recycling, or disposal areas (refer to Instructions for more detail).

XVIII. Certifications

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Operator Name and Official Title (type or print) Brian T. Vance, Manager U.S. Department of Energy Office of River Protection	**Signature**	**Date Signed**
Co-Operator* Name and Official Title (type or print) John R. Eschenberg President and Project Manager Washington River Protection Solutions, LLC	**Signature** J R Eschenberg	**Date Signed** 4/9/20
Co-Operator – Address and Telephone Number* P.O. Box 850 Richland, WA 99352 (509) 376-3492		
Facility-Property Owner Name and Official Title (type or print) Brian T. Vance, Manager U.S. Department of Energy Office of River Protection	**Signature**	**Date Signed**

XIX. Comments

Figure A.1. TSCR Site Plan

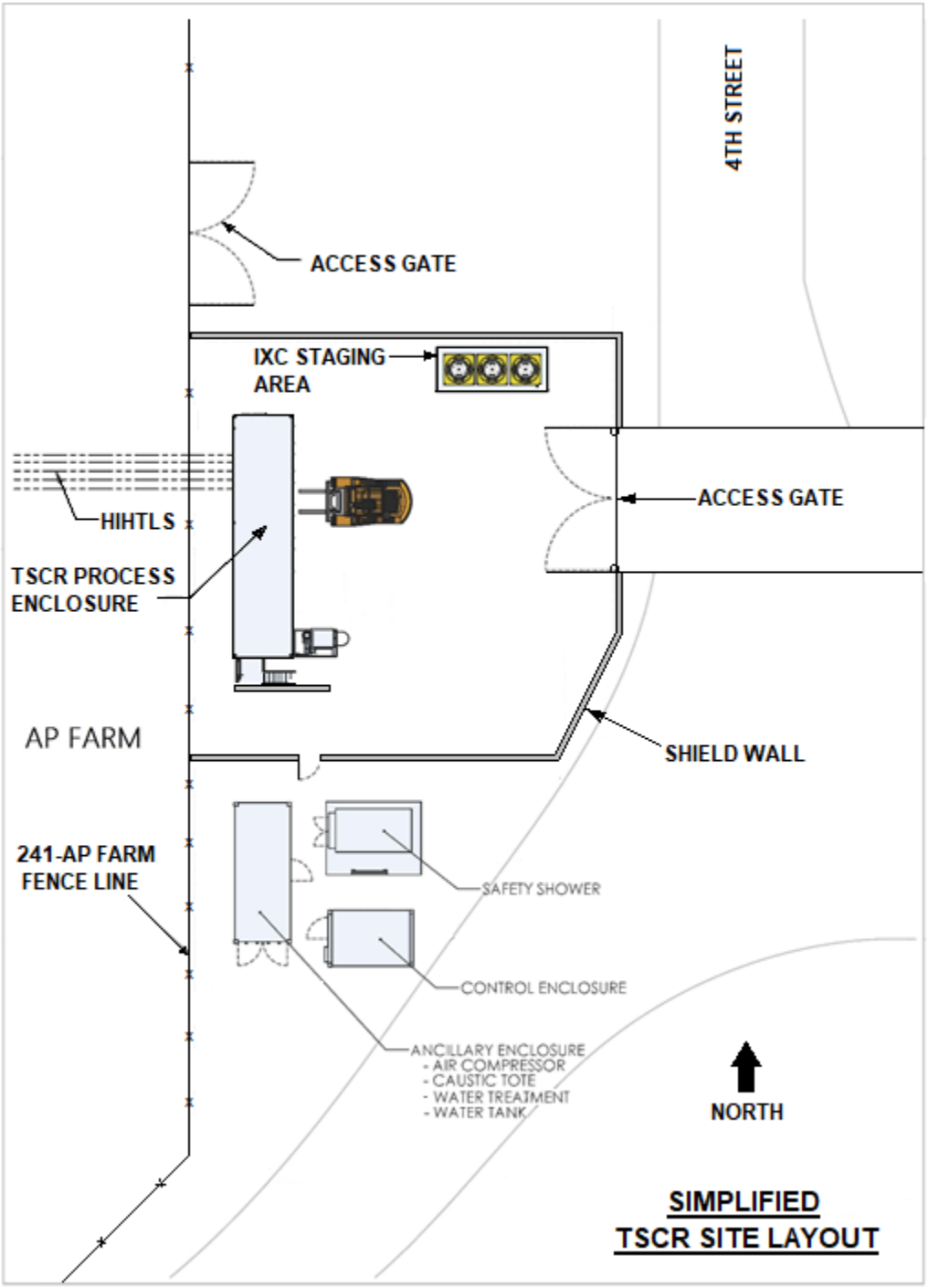


Figure A.2. TSCR and IX Storage Pad General Arrangement, Plan View

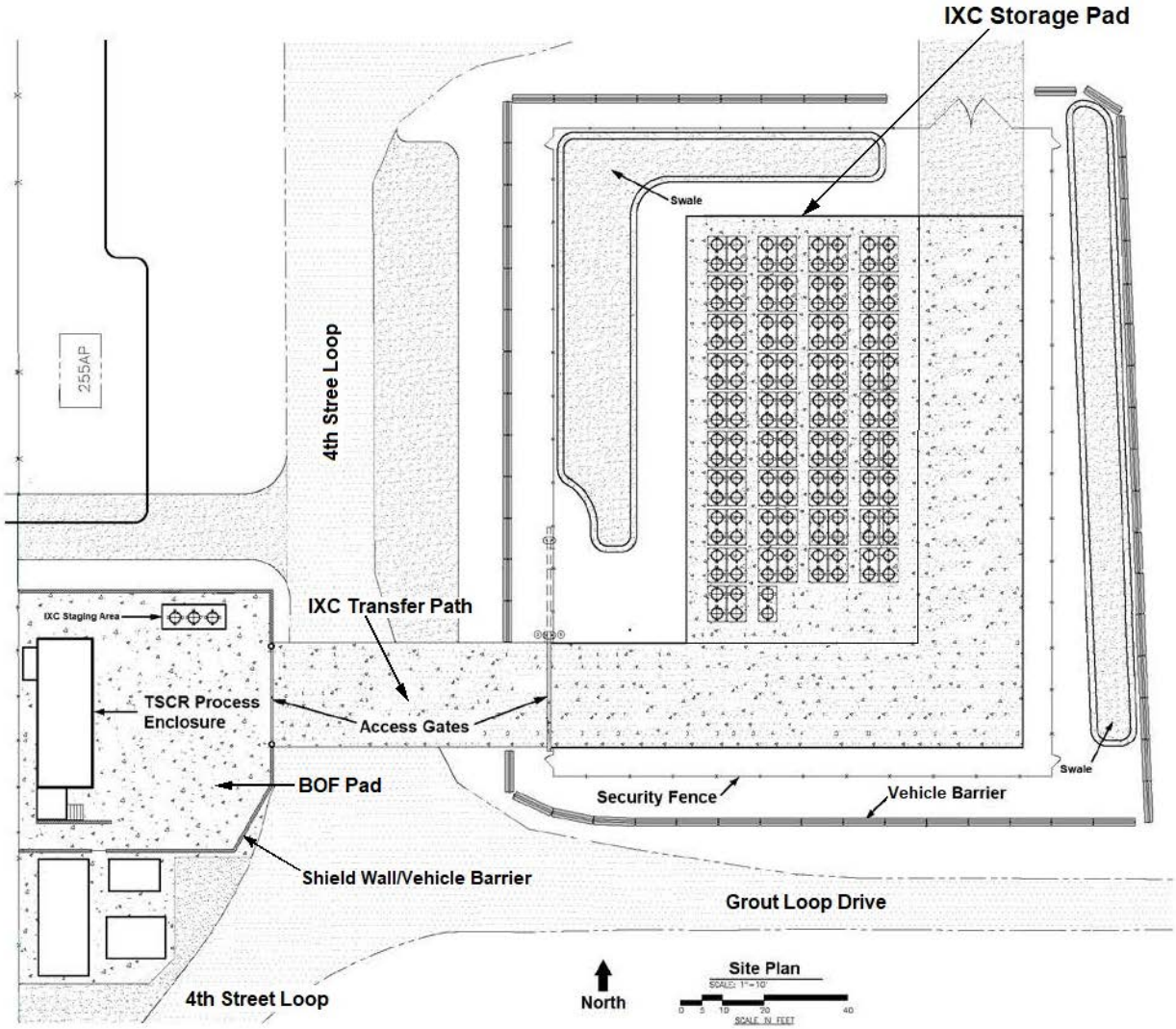
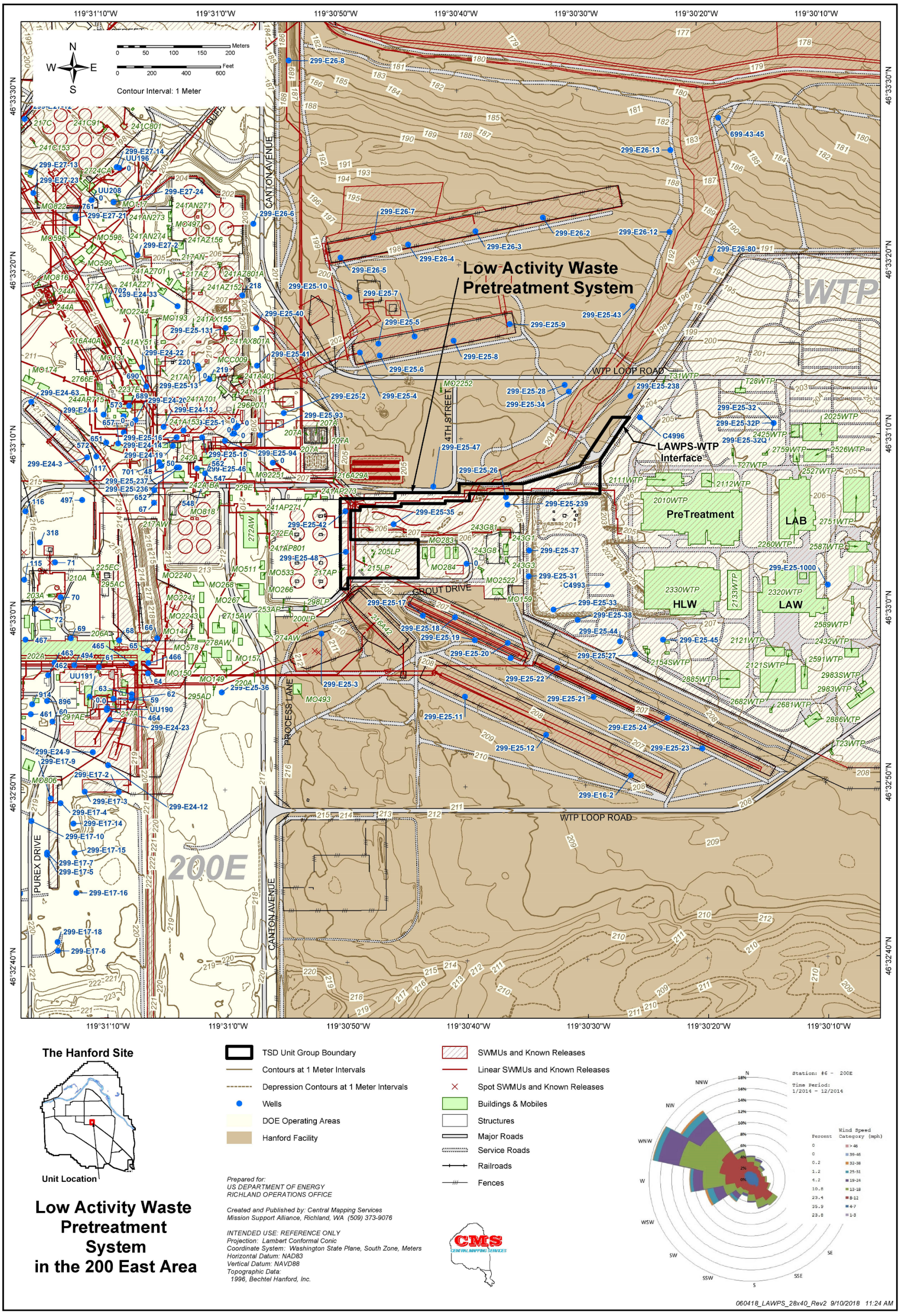


Figure A.3. LAWPS Operating Unit Group Topographic Map



ADDENDUM C
PROCESS INFORMATION

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ADDENDUM C
PROCESS INFORMATION

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C. PROCESS INFORMATION

The Low-Activity Waste Pretreatment System (LAWPS) project encompasses two phases to provide the necessary throughput to support full operation of the Waste Treatment and Immobilization Plant (WTP) Low Activity Waste (LAW) facility. Phase One of the project will employ use of a single Tank Side Cesium Removal (TSCR) unit that will operate for approximately 5 years. Phase Two will follow at a later date and either use a permanent cesium removal capability or additional TSCR unit(s) to support sustained, long term WTP LAW operations.

This addendum provides a detailed discussion of the Tank Side Cesium Removal (TSCR) system processes and equipment. The TSCR comprises a low activity liquid mixed-waste tank storage and treatment system located in the 200 East Area of the Hanford site. The facility also includes two storage areas for spent ion exchange columns (IXCs) that are generated during the treatment process. All TSCR facilities are located immediately adjacent to the southeast corner of the 241-AP Tank Farm. The layout of the TSCR process area is shown on a simplified site plan in Figure C.1.

The supernatant waste treated in TSCR consists of aqueous phase liquids transferred from the 241-AP Tank Farm for treatment prior to transfer to the Waste Treatment and Immobilization Plant (WTP) Low Activity Waste (LAW) facility for vitrification. The TSCR waste processing is controlled in a Control Enclosure located immediately south of the TSCR Process Enclosure, which is staffed continuously during processing operations. Section C.2.8 describes the monitoring and control system (MCS) that is located within the Control Enclosure. The MCS controls and monitors the performance of TSCR process operations. When TSCR processing operations are not occurring, the Control Enclosure is not required to be staffed continuously.

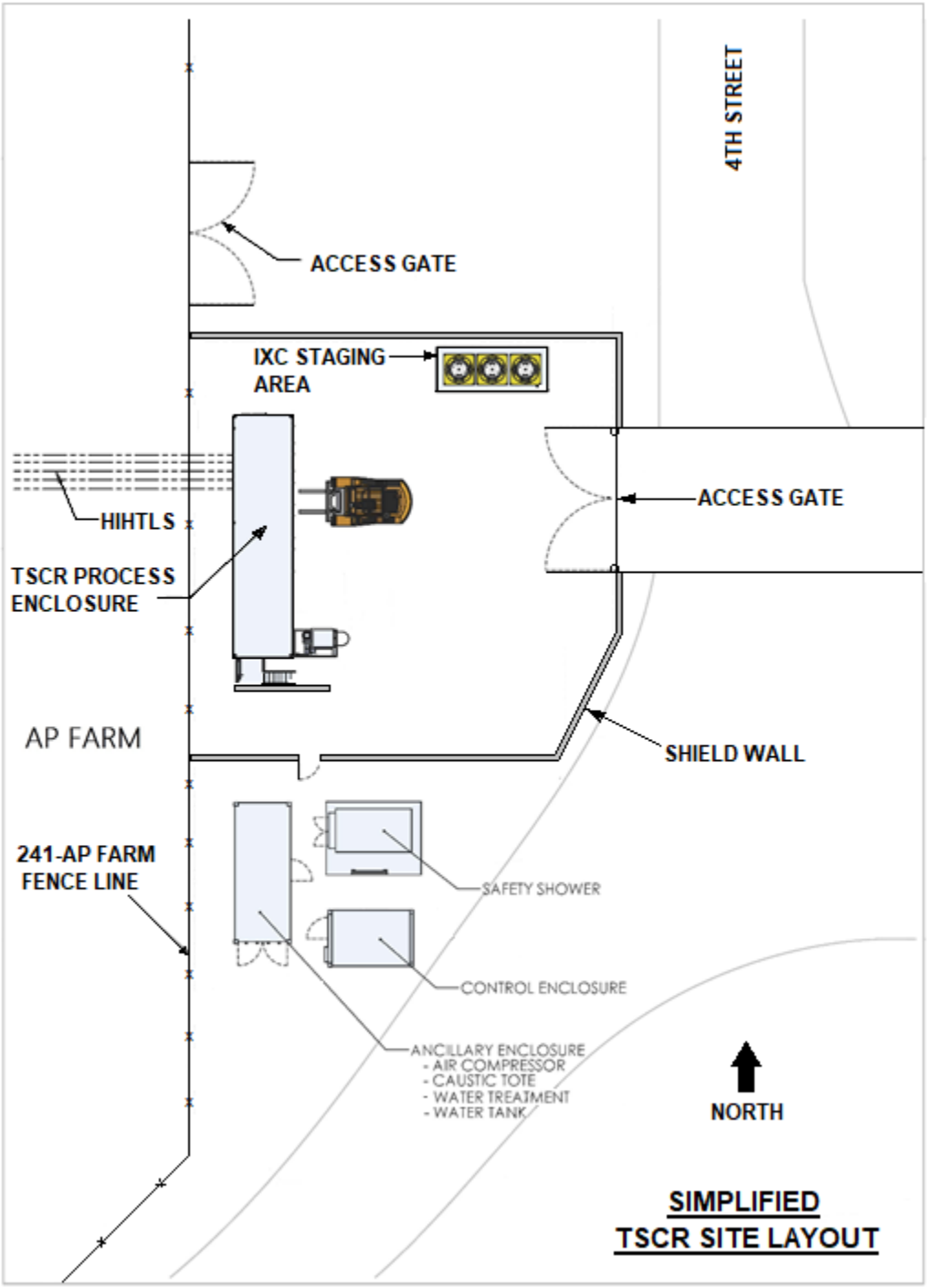
C.1 Tank Side Cesium Removal Process Description

The TSCR process flow diagram is provided in Figure C.2. Tank waste supernatant is transferred from Double Shell Tank (DST) 241-AP-107 to the Process Enclosure where an approximately 5-gallon per minute feed portion is diverted through the TSCR process system via a flow control valve. The feed stream is then filtered through a dead-end filter before passing though Ion Exchange Columns (IXCs) for cesium removal. Following cesium removal, the stream passes through a media trap designed to capture IX media in the unlikely event of an upstream screen failure in one of the IXCs. The treated waste then proceeds through a delay tank, which is sized to provide adequate holdup allowing the metastable barium (^{137}Ba-m) to decay so that gamma measurements can be made to ensure processing goals for cesium removal have been reached. After exiting the delay tank, the treated waste is then passed through two in-line gamma monitors to verify cesium removal before being routed to DST 241-AP-106 for storage and subsequent transfer to the WTP LAW facility for vitrification. Should the gamma monitors detect elevated cesium levels, the stream is diverted to DST 241-AP-108 as off-specification and processing is discontinued. The balance of the feed stream not processed through TSCR is continuously recycled back to DST 241-AP-107

The following is a summary of the TSCR component operations contained in this section.

- **241-AP-107 Waste Feed and Recirculation Return (Section C.2):** Feed is transferred from DST 241-AP-107 through a Hose-in-Hose Transfer Line (HIHTL) to the TSCR Process Enclosure. A separate HIHTL from the Process Enclosure returns the unused portion of the feed stream back to DST 241-AP-107.
- **Filtration (Section C.2.1):** Initial treatment of the feed stream occurs by dead end filtration. Filtration removes solids as a means to protect the downstream IXC media bed from becoming fouled. Two filters are used, with one being off-line. The on-line filter is taken out of service for back-pulsing with air as determined by differential pressure. The back-pulsed process waste stream is sent to DST 241-AP-108 via HIHTL. During back-pulsing, the offline filter assumes the online function. When back-pulsing and/or caustic washing are no longer effective, each filter can be replaced.

Figure C.1. TSCR Process Area Site Plan



- **Ion Exchange (Section C.2.2):** The filtered feed is passed through three IXCs (lead, lag, and polish positions). The lead and lag columns remove the bulk of the cesium by adsorbing it onto crystalline silicotitanate (CST) IX media designed to selectively remove cesium from high pH and sodium solutions. High pH of the waste is the result of carbon steel corrosion protection requirements in the DST system. Cesium removal continues until it is determined that the IX media becomes saturated to a point that cesium removal efficiency declines and cesium

concentration passing through the columns rises above a pre-determined limit. The process will then be shut down, and the lead and lag IXCs will be removed from service and replaced with fresh columns. The polish column then becomes lead for the next loading cycle.

- **Gamma Monitoring and Treated LAW Transfer (Section C.2.3):** After exiting the lag/polish columns, the waste is routed through a media trap. This feature prevents escape of IX media from the columns in the unlikely event of IXC screen failure. Loss of media downstream would potentially render treated waste off specification for cesium. After passing through the media trap, the waste is then routed through a Delay Tank. The Delay Tank includes a baffled chamber and is sized to provide sufficient retention time to allowing the metastable barium (^{137}Ba-m) to decay so that accurate gamma measurements can be made to ensure processing goals for cesium removal have been reached. Gamma monitoring is performed just downstream of the delay tank outlet. The treated supernatant is then transferred via HIHTL to DST 241-AP-106 for accumulation and subsequent transfer to the WTP LAW facility for vitrification.
- **IXC Change-Out (Section C.2.4.):** Following system shutdown, IXC change out is initiated by displacing remaining LAW in all process components with dilute sodium hydroxide (NaOH), which is followed by a water flush. This serves to de-inventory the TSCR Process Enclosure establishing conditions necessary for personnel entry. Caustic and water flush solutions are returned to DST 241-AP-108 via a HIHTL. After waste displacement and flushing; the columns are bulk dewatered using compressed air. This effluent is also returned to DST 241-AP-108. The columns are then dried for between 1 and 4 days using compressed air, which is vented to DST 241-AP-108.
- **Reagent, Water, and Service Air (Section C.2.5):** The reagents necessary to support TSCR operations are dilute NaOH and process water. NaOH is supplied by a tote and process water is made up in the Ancillary Enclosure from potable water delivered by truck. Both are introduced into the TSCR Process Enclosure via pumps. A compressor is used to supply service air for remote valve actuation, filter back-pulse, sweep air, bulk water displacement from the columns, and column drying. All three systems are located south of the Process Enclosure in the Ancillary Enclosure. The NaOH and process water systems are protected with a misroute prevention system that ensures neither system can become cross contaminated by process waste systems.
- **Spent IXC Transfer and Storage (Section C.2.6):** Once air dried, the columns are disconnected and removed from the Process Enclosure with a forklift. During normal operations, the columns are transported directly to the IXC storage pad where they are affixed to a mounting plate on the pad. The mounting plate ensures the columns remain upright in a seismic event. Should a column become externally radiologically contaminated during process operations and require decontamination, or other corrective actions, it can be temporarily placed in the IXC staging area. The IXC staging area can hold three columns that are placed directly on the balance of facility pad. Because this is a temporary location, no mounting bracket is used. Once decontaminated, or other corrective actions completed, a column or columns are removed from the IXC staging area and transferred to the IXC storage pad via a dedicated concrete travel path.
- **Process and Enclosure Ventilation (Section C.2.7):** The TSCR Process Enclosure includes a process ventilation system and a process drain system. Both discharge to DST 241-AP-108 via separate dedicated HIHTLs. The process ventilation system remains closed during operations and is only opened during column change-out after LAW displacement and flushing are completed. The TSCR Process Enclosure also is equipped with a separate ventilation system that only provides ventilation within the process area during manned entries into the enclosure. This ventilation system is not operated during waste processing. Heating and cooling is provided for process temperature control, and for manned entries into the enclosure.
- **Process Control and Monitoring (Section C.2.8):** The Control Enclosure provides process controls through a monitoring and control system (MCS) for TSCR and is manned at all times during waste processing. The Control Enclosure is located immediately south of the Process

Enclosure and is connected to the tank farms Central Control room. This allows the Control Enclosure to receive leak detection signals from the 241-AP Farm allowing process shutdown upon indication of a leak within the farm connections to the TSCR Process Enclosure.

C.2 241-AP-107 Waste Feed and Recirculation Return

The TSCR Process Enclosure receives qualified feed from DST 241-AP-107. Feed qualification and waste acceptance are discussed in detail in Addendum B, Waste Analysis Plan. Supernatant will be transferred to the Process Enclosure through a dedicated HIHTL at a flow rate of approximately 70 gallons per minute. Of the 70 gallon per minute feed stream, approximately 5-gallons per minute portion is diverted into the TSCR process system via a flow control valve with the remainder returned to DST 241-AP-107 via a dedicated return HIHTL. The feed stream is then filtered through a dead-end filter before passing though the IXCs for cesium removal.

The HIHTL feed and return lines represent one of the three process interfaces between the TSCR Process Enclosure and the 241-AP Tank Farm. The other two being the vent and drain HIHTLs between the Process Enclosure and DST 241-AP-108, and the treated LAW transfer HIHTL between the Process Enclosure and DST 241-AP-106. HIHTL layouts between TSCR and the 241-AP Tank Farm are shown on Figure C.6.

C.2.1 Filtration

Two filters are used, with one being in service and the other off-line. The on-line filter is taken out of service for back-pulsing with air approximately once per day, or if it reaches a high differential pressure beforehand. During back-pulsing, the off-line filter assumes the online function. When filter recovery is diminished as indicated by a more frequent high differential pressure readings over repeated backwash cycles, each filter can undergo a caustic wash or be replaced. The filters operate in up-flow with feed entering at the bottom and flowing up through the filter elements where solids are retained. Filtrate continues up through the filter element core into the top head where it exits out the filtrate nozzle and proceeds to the lead IXC.

The MCS automatically and remotely aligns valves to bring the second filter online. Two filters are now operating in parallel for a short period while valves are then aligned to remove the first filter from service. The drain outlet valve is opened on the filter to be back-pulsed, which allows a small amount of liquid to drain from the filter. Most of the liquid is retained, particularly within the filter element interior core up through the top head because retained solids create a thin cake on the outside of the filters that inhibits liquid drainage. Then the air receiver outlet isolation valve is opened, discharging 20 gallons of air at 60-80 pounds per square inch gauge (psig) into the filter top head.

Expansion of air from the receiver forces liquid out of the top head, down through the filter elements and out the bottom head of the Filter. Air, filtrate, and solids dislodged from the outside of the filter elements exit through the backwash outlet. Air, liquid, and backwash solids will continue into the drain manifold and are discharged through the HIHTL to DST 241-AP-108. The air receiver air capacity is sufficient to empty the contents of the filter and the HIHTL routed to DST 241- AP-108. After a backwash, the filter is virtually emptied of liquid.

NOTE: If desired, a second backwash can be performed by filling the Filter with 0.1 M NaOH and repeating the actions from above. Figure C.3 depicts a filter assembly.

Figure C.2. TSCR Process Flow Diagram

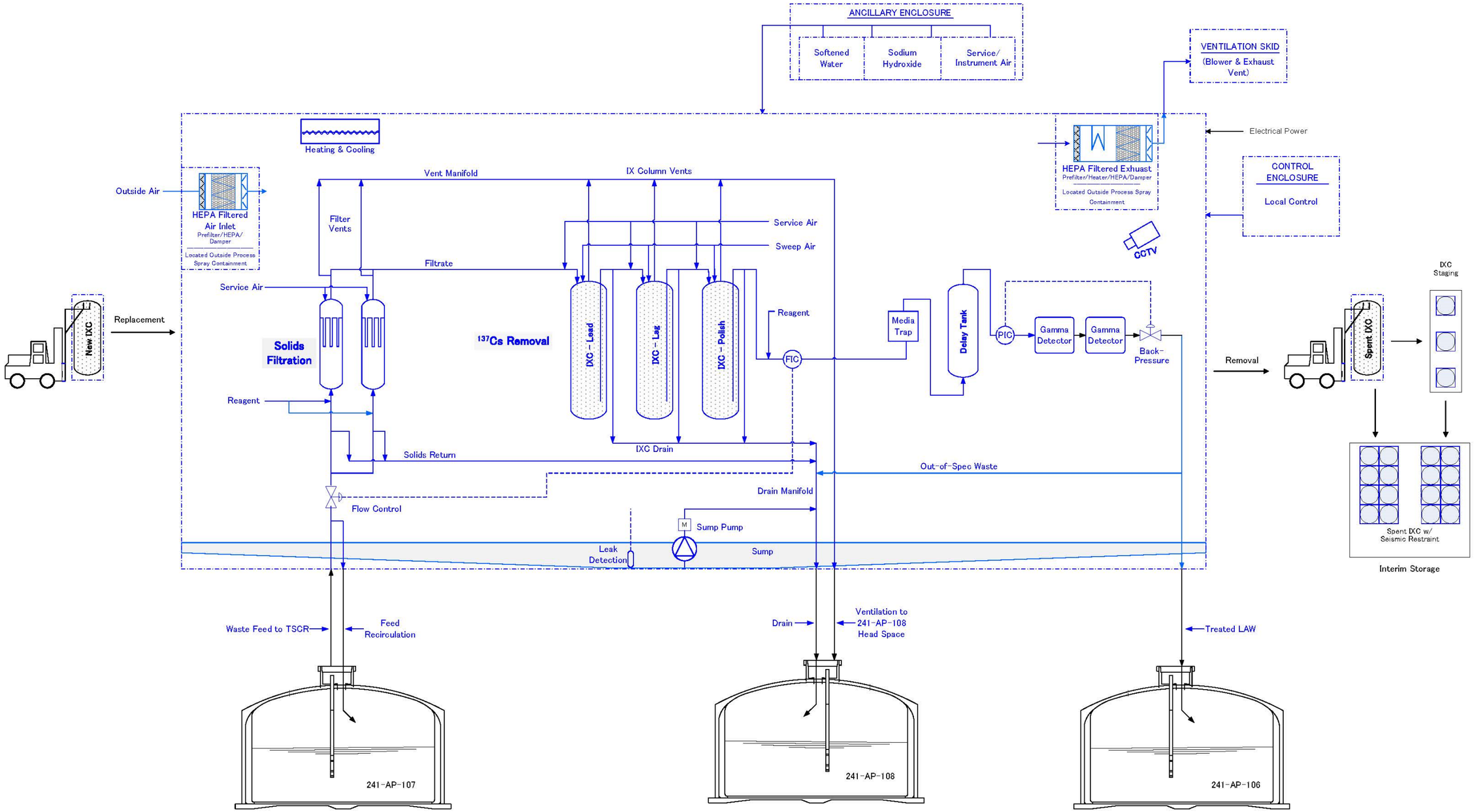


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Figure C.3. Filter Assembly

It is estimated a filter will require replacement after approximately 400 backwash cycles or about 19 months of continuous operation. Each filter includes a shield assembly to facilitate filter replacement with minimal dose to workers. An outline of the replacement sequence is as follows:

Backwash – Backwash the filter (as previously described) and leave it completely empty of liquids.

Vent – The filter vent is opened eliminating pressure on the housing.

Filter Disconnect – Disconnect the CHEMJOINT on the Filtrate nozzle of the selected filter. Install a "dust plug" into the filtrate hose to seal it and prevent leakage. Install a "dust cap" on the filtrate nozzle to seal it in preparation for disposal. Disconnect CHEMJOINT on the inlet/drain nozzle of the selected filter. Install a "dust plug" into the inlet/drain hose to seal it and prevent leakage. Install a "dust cap" on the Inlet/drain nozzle to seal it in preparation for removal.

Close the filter vent valve. Disconnect CHEMJOINT on the vent nozzle of the selected filter and install a "dust plug" into the vent hose to seal it and prevent leakage. Install a "dust cap" on the vent nozzle to seal it in preparation for removal.

Filter Removal and Installation – The bay containing the filter to be removed is located on the inside of the enclosure, which requires the outer enclosure access panel to be removed. The filter is then removed using a provided lifting yoke attached to a forklift. A new filter is then installed into the Process Enclosure followed by making inlet and outlet connections. After being filled, vented, and leak tested, the new filter will be ready for use.

C.2.2 Ion Exchange

The IXCs remove ^{137}Cs from filtered waste using non-elutable CST IX media housed within three columns. The filtered feed is passed through three IXCs (lead, lag, and polish positions). The lead and lag columns remove the bulk of the cesium by adsorbing it onto the CST IX media designed to selectively

remove cesium from high pH and sodium waste. Cesium removal continues until it is determined that the IXCs becomes saturated to a point that cesium removal efficiency declines and cesium concentration rises above a pre-determined limit. The process will then be shut down, and the lead and lag IXCs will be removed from service and replaced with fresh columns. The polish column then becomes lead for the next loading cycle.

The IXC lead/lag/polish cesium loading cycle is expected to take approximately 30 days depending on the LAW feed characteristics and degree of media exhaustion in the lead (formerly polish position) IXC when the loading cycle commences. IXC change-out will require approximately one week of downtime; of which, four days will be used for drying the spent IXCs. However, should an increase in operational efficiency be required to meet processing goals, drying can be completed in one day reducing the downtime associated with column change-out.

When the treated effluent approaches the treated waste set-point, the lead and lag IXC's are deemed exhausted/ loaded and are removed from service. Primary steps associated with IXC replacement are:

- Displacement of LAW with 0.1 M NaOH
- Water rinsing of lead and lag columns to remove NaOH
- Bulk dewatering with compressed air
- Drying of lead and lag columns
- Removal of lead and lag columns from system.

Between the above steps and during shut-down periods, sweep-air will continuously flow into the headspace of each IXC and out through the vent line to remove hydrogen gas.

C.2.3 Gamma Monitoring and Treated LAW Transfer

After exiting the polish column, the waste is routed through a media trap. This feature prevents escape of IX media from the columns in the unlikely event of IXC retention screen failure. Loss of media downstream would potentially render treated waste off specification for cesium. After passing through the media trap, the waste is then routed through a Delay Tank. The Delay Tank includes a baffled chamber and is sized to provide adequate holdup time allowing the metastable barium (^{137}Ba-m) to decay so that gamma measurements can be made to ensure processing goals for cesium removal have been reached.

TSCR is equipped with gamma monitoring instrumentation to ensure treated waste being transferred to the downstream DST 241-AP-106 meets the WTP LAW acceptance criteria for cesium. There are two gamma monitors in series designed and shielded to enable detection down to less than 1.8E- 05 Ci/L, which is approximately ten times below the WTP LAW acceptance criteria for cesium. The gamma monitors are capable of measuring over a 6-decade range and the in-series configuration improves measurement reliability.

Treated LAW leaving the polish column will have the lowest cesium concentration at the beginning of a loading cycle and then trend up as loading continues. When the treated LAW approaches the gamma high set-point, operators will initiate a system shutdown. The set-point is variable based on the feed tank sodium concentration. Set-points for each campaign will be recorded and entered into the LAWPS OUG operating record. If the gamma high-high set-point is reached, the TSCR system will automatically shut down and divert the waste to DST 241-AP-108. Using knowledge of CST performance data, operations personnel will be able to forecast the approximate time of lead/lag IXC exhaustion and have fresh IXCs ready to install in the lag and polish positions (previous polish position becomes the lead position). All treated supernatant with acceptable gamma levels is automatically transferred to DST 241-AP-106 via the system pressure provided by the 241-AP-107 feed pump.

C.2.4 IXC Change-Out

The following steps are performed to remove waste inventory, place Process Enclosure in a safe standby, and remove spent columns.

Waste Displacement – After operations are stopped, 0.1 M NaOH is pumped through the same path that waste had previously been flowing to displace waste in the filter and IXCs. The displacement solution (waste and 0.1 M NaOH) will exit from the delay tank into the drain manifold and discharge to DST 241-AP-108.

Lead/Lag Column Rinse – Sweep airflow is isolated from the lead and lag IXC's. The two columns are rinsed with softened water that is discharged to DST 241-AP-108 via the drain manifold and drain HIHTL.

Column Blowdown/ Sweep-Air – The lead and lag columns are bulk dewatered with service air to the drain manifold. Sweep-Air flow is then initiated through the lag IXC vent.

Air Drying of Lead/Lag IXCs – Sweep Air flow is isolated from the lead and lag IXC's and drying Air (service air) is started at > 30 standard cubic feet per minute (SCFM) per IXC, or > 60 SCFM total. Drying air will continuously flow through each ion exchange column for approximately four days. As noted previously, drying can be accomplished in one day should operational needs require.

After drying, drying air is secured, IXC vents are opened, sweep-air flow is established, and IXC drain outlets are closed (the path drying air flowed to drain manifold is closed). The above steps are completed immediately after drying to establish sweep-air. During this process, the polish IXC remains in standby with sweep-air continuously flowing through the headspace and into the vent line.

Disconnect IXC and Establish Ventilation-Flow – The following steps are completed to disconnect the IXC from the piping rack and establish confinement ventilation flow.

A radiological survey is completed to identify any changes in dose rates that may have taken place during IXC drying. After verifying the vent manifold pressure is below atmospheric, the IXC selected for removal is isolated from sweep-air. The CHEMJOINT on the outlet nozzle of the IXC is disconnected and a "dust plug" is installed into the outlet hose to prevent leakage. Then a "dust plug" is installed on the IXC outlet nozzle in preparation for removal and storage. This same process is repeated on the IXC inlet hose and nozzle.

The next step involves installing a vent intake assembly on the selected column that includes a filter on the inlet nozzle of the selected IXC. Then the CHEMJOINT on the vent nozzle is disconnected with a "dust plug" inserted into the hose to prevent contamination spread. A vent exhaust assembly that includes a filter is then installed on the vent nozzle. The difference in vent height, air moisture content, and temperature between the intake and outlet filters will cause sufficient convective air flow through the IXC headspace to maintain the H_2 concentration below the lower flammability limit (LFL). The last step is to disconnect the CHEMJOINT on the sweep-air nozzle, install a "dust plug" into the sweep-air hose, and install a cap on the IXC sweep-air nozzle to seal it. The IXC is now ready to be removed from the Process Enclosure.

Move IXC from Process Enclosure to Storage Pad or Staging Area – The following steps are completed to remove an IXC from the Process Enclosure for relocation to either the IXC Staging Area or IXC Storage Pad.

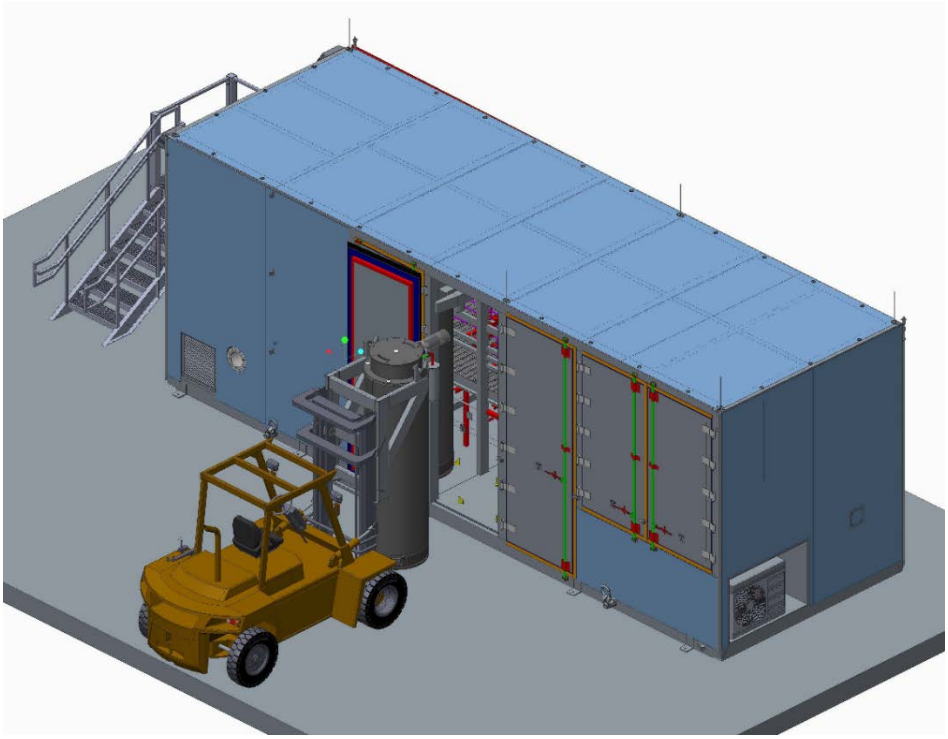
Radiological surveys are completed to ensure surfaces are sufficiently clean to allow outdoor IXC storage. If contamination above radiological limits is identified, then decontaminate the IXC and/or wrap it in an approved material to allow movement of the column to the IXC staging area for decontamination.

Next, the Process Enclosure exterior panel and seismic brace are removed and stowed in preparation for IXC removal. If contamination above radiological limits is identified, then decontaminate the IXC and/or

wrap it in an approved material to allow movement to the IXC Staging Area where additional decontamination can be performed.

Using a forklift fitted with the IXC lifting yoke, the IXC is removed from the Process Enclosure as depicted in Figure C.4, and transferred directly to the nearby IXC storage pad where it is secured to a mounting plate.

Figure C.4. IXC Removal



Following IXC removal, the forklift installs a fresh column in the empty position. Then the seismic brace and exterior panels are installed and the drain valve is opened. Hose connections for the inlet, outlet, vent and sweep-air from the valve rack to the IXC are then completed. Then the new IXC is filled with either dilute NaOH or process water, vented, and leak tested. If the leak test is passed, the new IXC is ready for use.

This process is the same for lead, lag, or polish column replacement. New IXCs are installed in reverse order of the connection sequence discussed above. Once the new columns are in place and all connections are made, they are charged with process water and leak tested prior to resumption of waste processing.

C.2.5 Reagent, Water, and Service Air

The reagents necessary to support TSCR operations are dilute NaOH and process water. NaOH is supplied by a tote or drum and will be replenished by delivery. Process water is made up in the Ancillary Enclosure from potable water delivered by truck. Both are introduced into the TSCR Process Enclosure via pumps. Prior to use, potable water is treated by a softener system. A compressor is used to supply service air for remote valve actuation, filter back-pulse, bulk water displacement from the columns, and IX media drying as part of change-out. All three systems are located south of the Process Enclosure in the Ancillary Enclosure. The NaOH, service air, and process water systems are protected with a misroute prevention system that ensures neither system can become cross contaminated by process waste systems.

C.2.6 Spent IXC Transfer and Storage

Under normal conditions, the forklift fitted with the IXC lifting yoke transfers a spent IXC from the Process Enclosure via a concrete travel path directly to the adjacent IXC storage pad where it is secured to a mounting plate. The IXC storage pad is sized to store 150 columns, which accommodates the expected generation rate of two columns per month for the projected five-year duration of TSCR (LAWPS Phase 1) operations with some added contingency space. Upon arrival on the storage pad, the IXCs are affixed in place to a mounting plate that is secured to concrete slab embed plates. The IX storage pad is fenced and locked except when transporting a column into place for storage. Refer to Figure C.5 for the IXC storage pad layout.

If contamination above radiological limits is identified during preparations for removal of a spent IXC from the Process Enclosure, the IXC can be wrapped and transferred to the IXC staging area where additional decontamination can be performed. The IXC staging area provides temporary storage and any spent IXC placed in this location will be moved to the IXC storage pad once any necessary corrective measures have been completed. The IXC staging area can accommodate three columns and is located within the Process Enclosure fenced area. Reference Figures C.1 and C.5 for the storage area layouts. Additional information regarding both container storage areas is provided in Section C.5.

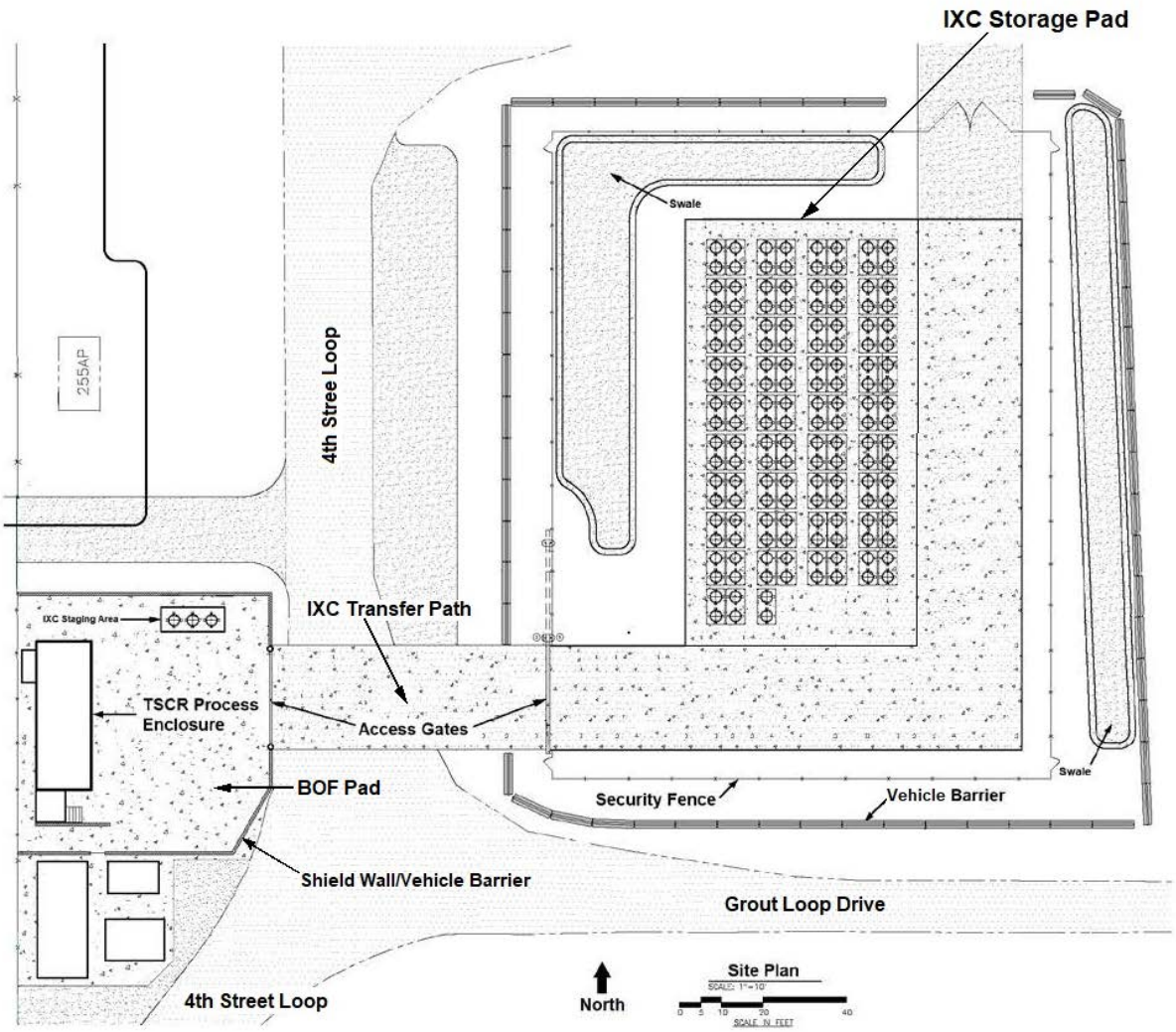
C.2.7 Process and Enclosure Ventilation

There are two independent ventilation systems supporting TSCR operations; the Process Ventilation system, and the Process Enclosure ventilation system. Both are discussed separately in the following.

The Process Ventilation system consists of a vent collection header that connects the filters, IXCs, and delay tank. The vent header is routed through valves out of the Process Enclosure to the headspace of DST 241-AP-108 via a dedicated HIHTL. The Process Ventilation system remains closed at all times while waste processing occurs and only opens upon process shutdown to support column or filter change-out (bulk dewatering and IX media drying) and equipment maintenance. Sweep-Air is used to maintain a flow from the process components to the DST headspace. In addition, the slight negative pressure is maintained by an eductor located upstream of the hose-in-hose transfer line (HIHTL) connection. The eductor uses compressed air controlled by a manual flow control valve as the motive force and the vent line as the suction. The discharge is routed back to the vent line and DST 241-AP-108.

The TSCR Process Enclosure ventilation unit is only used to provide fresh air prior to personnel entry for column and filter change-out or maintenance activities. The ventilation system will only be operated immediately before and during personnel entries into the enclosure to provide fresh air to workers at a rate of a minimum of two air changes per hour. During routine process operations the vent will not be operated. Heating and cooling for the enclosure will be provided by the internal recirculating HVAC units to support process temperature requirements , and personnel comfort as necessary during manned entries. HEPA filters on the fresh air intake and exhaust vent are only provided for equipment cleanliness within the enclosure. These filters are not credited for providing confinement ventilation.

Figure C.5. IXC Storage Pad Layout



C.2.8 Process Control and Monitoring

The Control Enclosure is a climate controlled, prefabricated office structure that serves as the operator workstation and TSCR control room. Primary process operations control, automated/remote maintenance evolutions (e.g., filter backwash, system flush, IXC blow-down, etc.), and ventilation system functions are controlled from the Control Enclosure. Capabilities include alarm monitoring and video monitoring of the process equipment that is facilitated via Human Machine Interface (HMI) and Programmable Logic Controller that controls all TSCR operations. The Control Enclosure also is interfaced with the Tank Farm Operations central control room and receives leak detection signals from the 241-AP Farm, which allows shutdown on indication of a HIHTL leak detected by 241-AP Farm instrumentation.

Startup commences with start of 241-AP-107 feed pump AP07F-WT-P-001. Flow continues through a short recirculation-piping loop within the Process Enclosure then back to 241-AP-107. This recirculation loop contains flow control valve WP-FCV-306 that opens to a set point of 5 gallons per minute allowing waste to enter the process system components initiating waste treatment.

Leak detection indication, whether from the Process Enclosure secondary containment or from AP Farm, activates an interlock causing shutdown of process operations. The shutdown sequence, whether in response to leak detection within the TSCR Process Enclosure or 241-AP Farm connections to the Process Enclosure, is as follows:

1. Pumps Stop.
   - 241-AP-107 Feed Pump
   - Caustic Pump (RA-P-130)
   - Potable Water Pump (RA-P-139)
2. Flow control inlet valve WP-FCV-306 closes.
3. Valve WP-AOV-556 (effluent to 241-AP-108) opens.
4. Valve WP-AOV-560 (effluent to 241-AP-106) closes.
5. Valve RA-AOC-157 (bladder tank pressure release) opens.

The monitoring and control system (MCS) provides for process monitoring, modulating control, and process interlocks, and sequencing. TSCR controls are integrated into the Tank Farm Local Area Network (TFLAN), and the primary operator interface is located at the TSCR Control Enclosure. A high level of automation is utilized to minimize direct operator interaction with TSCR and 241-AP Farm process operations. A detailed description of all warnings, alarms, set-points, and interlocks are provided in RPP-RPT-61220, *Control Logic Narrative* (as amended) included in Appendix 2, Volume 1.

The Control Enclosure is located south of, and outside, the TSCR Process Enclosure fenced area. Reference Figure C.1.

C.3 Waste Transfer Lines

Waste transfer lines supporting the projected five year duration of TSCR operations (LAWPS Phase 1) are of HIHTL type. Waste transfer lines conveying pretreated feed from the 241-AP Farm to the WTP interface point and WTP effluent returns back to the 241-AP Farm are of hard line pipe-in-pipe type. The following sections describe both waste transfer line types. For the purposes of this permit application, the two pipe-in-pipe transfer lines (241-AP-106 pretreated feed to WTP LAW and WTP Effluent Management Facility (EMF) condensate returns to DST 241-AP-102) are included to allow for design and installation of tie-in segments. Relevant design documents for the new portions of these two transfer lines are included in the design media Appendix 2, Volumes 1 and 2. Relevant design documents for the existing portions of these two lines have been provided as supplemental information to this application. Once the operating portions of the permit are written, responsibility for operations of the WTP transfer lines could be transferred to another operating unit group such as the DST Operating Unit Group (OUG) or the WTP OUG via future permit modification requests to reflect operational responsibility for waste going through those transfer lines.

C.3.1 Hose-in-Hose Transfer Lines

Five HIHTLs support TSCR operations and include the following:

#1. TSCR Process Enclosure to 241-AP-106 pretreated LAW transfer line.

#2. TSCR Process Enclosure to 241-AP-107 feed recirculation line.

#3. 241-AP-107 to TSCR Process Enclosure feed line.

#4. TSCR Process Enclosure to 241-AP-108 drain line.

#5. TSCR Process Enclosure to 241-AP-108 vent line.

Refer to Figure C.6 for a simplified HIHTL layout. HIHTL primary hoses have a nominal inside diameter of 2” with the secondary hoses having a nominal inside diameter of 4”. Hoses accommodate the end fittings for primary and secondary hoses on both the DST 241-AP Farm attachment points and TSCR

Process Enclosure attachment points. HIHTLs have a 3 year service life, after three years the lines will be replaced with another set of HIHTL. Anything beyond the approximately 5 year duration of LAWPS Phase One will utilize hard walled piping. Installation HIHTL assemblies will be certified by an independent, qualified installation inspector or an IQRPR prior to first receipt of waste and following subsequent hose change-outs. HIHTLs removed from service will be correctly managed under the generator regulations in WAC 173-303-200.

Both primary and secondary hose tube material are constructed of ethylene propylene diene monomer (EPDM) which meets the chemical compatibility requirements for use with Hanford tank waste. Braiding reinforcement is provided to meet the pressure and tensile strength requirements identified for the hoses with reinforcement material being fully encapsulated. Primary hose ends are fitted with a ChemJoint™[1] coupling. Refer to Figure C.7 for a typical HIHTL configuration. The TSCR enclosure represents the high point for the HIHTL and therefore, leak detection for all five HIHTLs occurs at the 241-AP Farm, which is the low point of the lines. All efforts have been made to minimize low points which could hold up waste between the TSCR enclosure and the AP tank farm. The leak detection has been designed to detect a leak within 24 hours. The HIHTL will be tightness tested in accordance with the required standards in Table C.3. Refer to Section C.6.3.2 for additional detail regarding HIHTL secondary containment and leak detection. The following table provides additional HIHTL attributes.

Table C.1. HIHTL Attributes

HIHTL #	Line Number	Origination/ Connection	Destination/Connection	Length (ft.)*
1	HIHTL-AP106-SN-101	TSCR	AP-10P-106 Drop Leg, Riser 002	211
2	HIHTL-AP107-SN-102	TSCR	AP-07F Pump Pit, Drop Leg	335
3	HIHTL-AP107-SN-103	AP-07F Pump Pit	TSCR	329
4	HIHTL-AP108-SN-104	TSCR	241-AP-108 Drop Leg, Riser 015	138
5	HIHTL-AP108-SN-105	TSCR	241-AP-108 Drop Leg, Riser 015	142

*Nominal length, subject to change.

[1] ChemJoint is a trademark of Campbell Fittings, Inc., Boyertown, Pennsylvania.

Figure C.6. Simplified HIHTL Layout

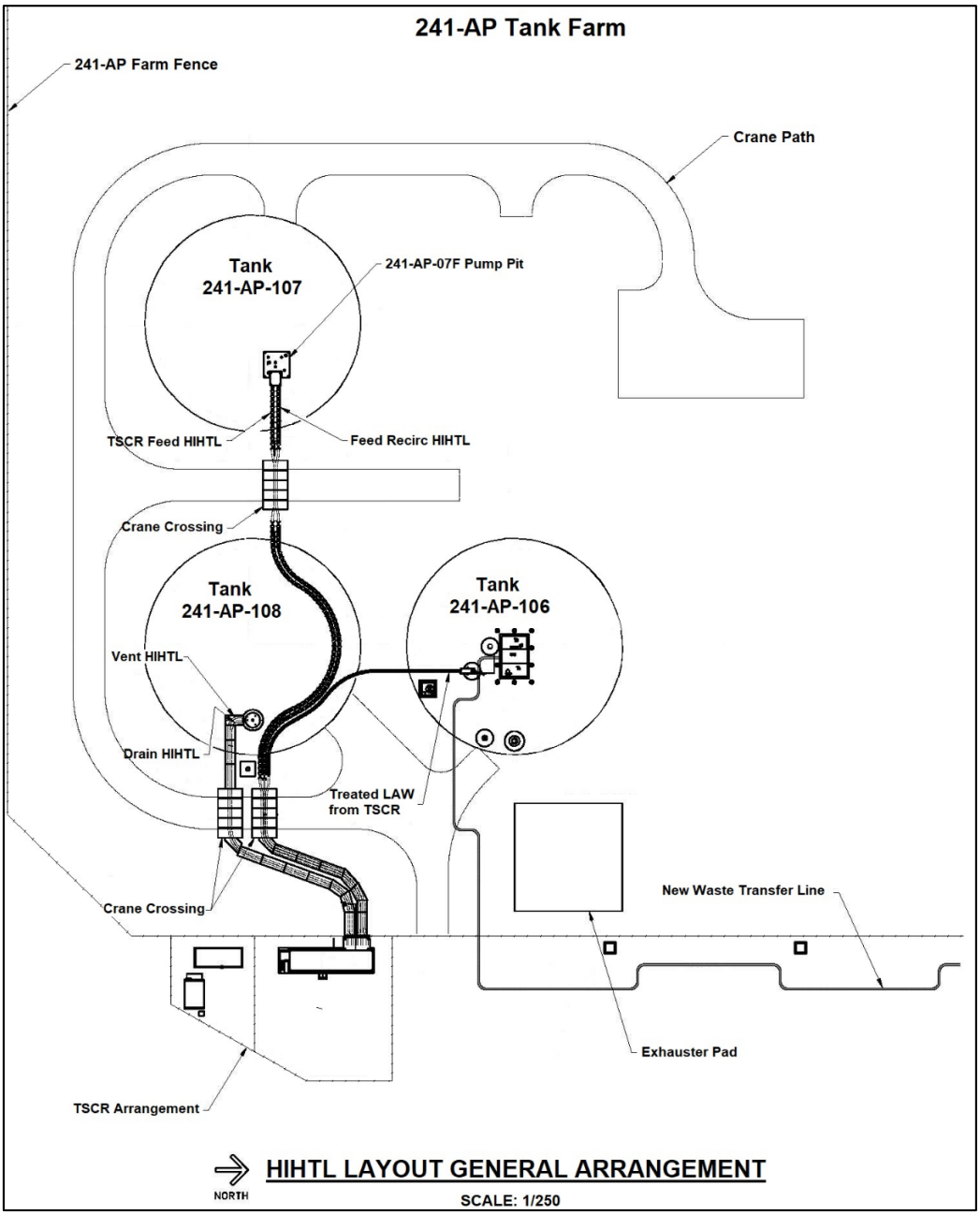
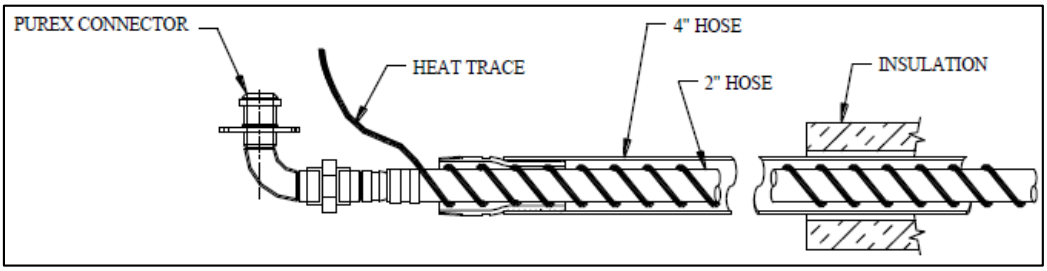


Figure C.7. Typical HIHTL Configuration



C.3.2 241-AP Farm to WTP Interface Point Transfer Lines

As part of Project W-211, *Initial Tank Retrieval Systems*, three pipe-in-pipe waste transfer lines were previously installed between Tank Farms and WTP. These transfer lines were designed and originally intended to transfer full feed to the WTP Pretreatment Facility. A portion of two of the three transfer lines have been selected for use in the DFLAW program. One waste transfer line will convey pretreated waste feed from DST 241-AP-106 to the WTP LAW facility for vitrification. The second waste transfer line will convey secondary process effluent from the WTP EMF facility back to DST 241-AP-102. For the purposes of this permit application, the Tank Farms portion of both transfer lines ends at the WTP interface point (reference Figure C.8).

Both transfer lines utilize a significant portion of the existing WTP "full-feed" lines installed from the 241-AP Farm to the WTP Pretreatment Facility as part of Project W-211. Figure C.8 provides a graphic representation of the approximate length of the utilized portion of the W-211 transfer lines.

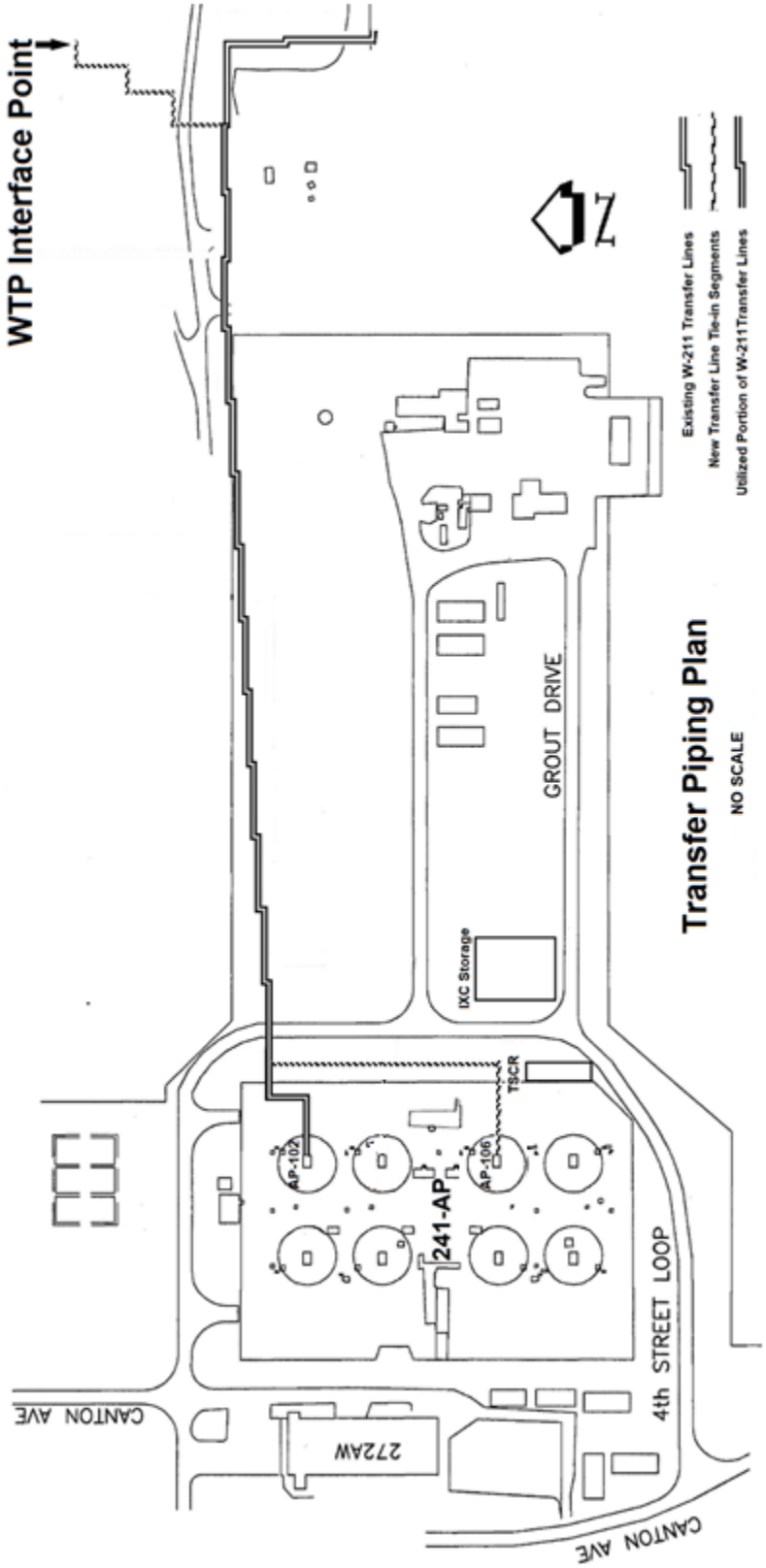
The three Project W-211 installed lines include; SN-637, SN-700, and SN-701, with SN-637 selected for waste feed delivery to WTP and SN-700 selected for EMF returns. A new segment from DST 241-AP-106 is to be installed to the tie-in point at SN-637. This also required installation of a new segment from the SN-637 take-off point to the WTP Interface Point. The reverse will be performed for EMF returns to DST 241-AP-102. A new segment is to be installed from the WTP Interface Point to the SN-700 tie-in point with the remainder of SN-700 being used to the AP-02D valve pit. Transfer line SN-701 will remain unused in the DFLAW configuration. The routing of the two modified two transfer lines is shown on Figure C.8.

C.4 Fire Suppression and Fire Alarm

TSCR is not connected to the 200 East Area fire water supply system. However, the Process Enclosure is equipped with a fire suppression system supplied by a nitrogen driven water mist skid located within the Ancillary Enclosure. Nearby hydrants supplement fire suppression and also serve the IXC staging and storage areas. The Hanford Fire Department is equipped with fire engines for control of fires requiring high water volume and pressure.

TSCR facilities, including the spent IX column storage pad, rely primarily on the Hanford Fire Department to respond to fires and other emergencies as described in Hanford Facility Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02). The Hanford Fire Department provides all the necessary equipment and personnel to respond to emergencies. Operators will respond to emergencies in accordance with the TSCR Contingency Plan (Addendum J) and are trained in the use of emergency systems, response to fires, and use of communications equipment.

Figure C.8. 241-AP Farm to WTP Transfer Piping Plan



C.5 Container Storage

TSCR includes two container storage areas used to manage spent IXCs. The first is the IXC Storage Pad located immediately east of the TSCR facilities. The IXC storage pad is sized to store 150 columns, which accommodates the expected generation rate of two columns per month for the approximate five-year duration of TSCR (LAWPS Phase 1) operations with some added contingency space. The storage pad could also accommodate media traps, should that waste form be generated during waste processing. The media trap is a contingency feature located just upstream of the delay tank and is designed to capture IX media in the unlikely event of a screen failure within an IX column that could result in IX media being released into the process stream. A media trap is a small component approximately 17 inches by 3 inches that resembles a small cartridge filter.

Storage pad dimensions account for row and aisle spacing requirements in accordance with WAC 173-303-630(5)(c). The IXC storage pad is approximately 110 feet long by 75 feet wide, orientated in a north-south configuration. The reinforced slab is 28 inches thick with 54-inch turndowns to provide adequate load carrying capacity to meet seismic and loading requirements. The storage pad is connected to the Balance of Facilities (BOF) concrete pad (where the TSCR Process Enclosure resides), by a concrete travel path (reference Figure C.5).

The IXC Staging Area is located immediately adjacent to the TSCR Process Enclosure. This container storage area can accommodate three columns and is intended as a contingency location for columns that may require decontamination, or other corrective actions, prior to placement onto the IXC Storage Pad. The IXC Staging Area concrete slab is integral to the BOF slab and will be demarcated with striping and stanchions as appropriate. Refer to Section C.2.6 and Figures C.1 and C.5 for additional information on both container storage areas. Columns will remain in the IXC Staging area for no longer than one year and may remain on the IXC Storage Pad for up to fifty years.

Both container storage areas are located within fenced and gated boundaries with access controls. Because the IXCs will not contain free liquids and do not hold waste types listed in WAC 173-303-630(7)(c), secondary containment is not provided for either storage area. Both areas are sloped to remove liquids resulting from precipitation in accordance with WAC 173-303-630(7)(c)(i). The specifications and requirements for the design of both storage areas are found in RPP-SPEC-62054, *TSCR IXC Concrete Storage Pad System: Tank Farm System Infrastructure Upgrades Specification* and RPP-CALC-62547, *Structural Analysis of TSCR IXC Storage Pad* (both as amended).

Other secondary solid waste that results from the balance of process operations is considered newly generated waste that requires packaging for shipment, treatment if necessary, and disposal. Some waste may require treatment to address Land Disposal Restrictions prior to disposal.

Secondary waste will be managed in accordance with the applicable sections WAC 173-303-200, accumulation standards and WAC 173-303-630, use and management of containers. Secondary solid waste generated from TSCR operations will not result in any unique waste forms requiring specialized packaging, transportation, treatment, and disposal considerations. Waste stream types generated from TSCR operations may include, but are not limited to the following examples:

- Personal protective equipment/step-off pad waste
- Decontamination materials.
- Spill cleanup materials.
- Maintenance debris waste (e.g., tank waste contacted filters, valves and instruments).

In addition, satellite accumulation areas may be used as necessary for routinely generated dangerous waste in accordance with WAC 173-303-174.

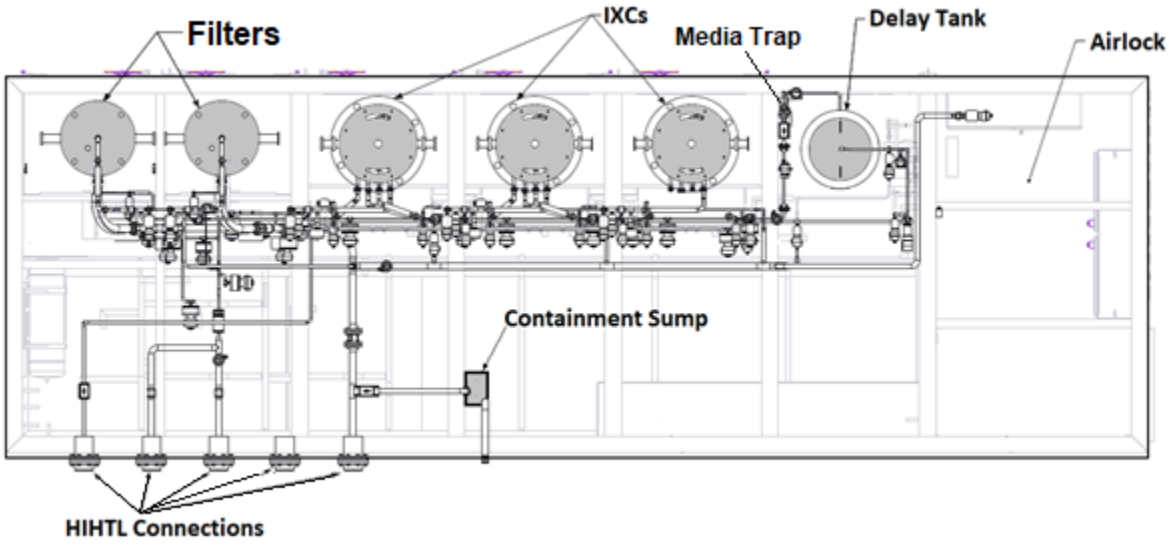
C.6 Tank Systems

This section provides specific information on the TSCR tank system and includes discussion on the type of waste to be managed in the system, tank system design information, integrity assessments, and

additional information on the TSCR tank system components that treat and store mixed waste. Modifications to the 241-AP Tank Farm beyond those described in this addendum are not associated with the LAWPS Operating Unit Group and are not included in this application. The TSCR Process Enclosure tank system components are discussed in Sections C.1 and C.2 and the locations of the tank system process components are presented in Figure C.9.

Figure C.9. TSCR Process Enclosure Layout

(Simplified Plan View)



The primary TSCR tank system components are shown in Table C.2.

Table C.2. Primary TSCR Tank System Components

Component	ID Number	Function	Volume
Feed Filters (2)	WP-FLT-325A WP-FLT-325B	Solids Filtration	49.5 gal
IXCs (3)	WP-IX-400A WP-IX-400B WP-IX-400C	Cesium Removal	162.6 gal
Media Trap	WP-RT-500	IX Media Confinement	.25 gal
Delay Tank	WP-TK-550	Barium Decay	300 gal

C.6.1 Design Requirements

The following sections provide an overview of the design specifications for the TSCR tank system components. 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 compatibility of materials with the waste being processed
- Materials of construction of foundations and structural supports
- Review of design codes and standards used in fabrication and construction
- Review of structural design calculations, including seismic design basis
- Waste characteristics and the effects of waste on corrosion.

A design assessment to establish compliance with WAC 173-303-640(3) has been performed and certified by an Independent Qualified Registered Professional Engineer (IQRPE). The design assessment reports found the tank system design in compliance with WAC 173-303-640(3).

The specifications and requirements for the design and fabrication of the TSCR tank system and ancillary equipment are documented in the following:

- TSCR specifications for design and fabrication are documented in RPP-SPEC-61910, *Specification for the Tank Side Cesium Removal Demonstration Project* (as amended).
- DST Project specifications for supporting infrastructure are documented in RPP-SPEC-60547, *Low Activity Waste Pretreatment System: Tank Farm System Infrastructure Upgrades Specification* (as amended).
- HIHTL specifications for design and fabrication are documented in RPP-14859, *Specification for Hose-in-Hose Transfer Line and Hose Jumpers* (as amended).
- Project W-211 transfer line specifications for the design and fabrication of the pipe-in-pipe transfer line components are documented in HNF-SD-W211-FDC-001, *Functional Design Criteria, Project W-211, Initial Tank Retrieval Systems* (as amended) and W-211-TP-P1, *Procurement Specification Double Containment Piping TFC/WTP Waste Transfer Piping* (as amended).
- DST Project specifications for the design and fabrication of the transfer line tie-in segments to the W-211 transfer lines are documented in RPP-SPEC-62029, *Waste Feed Delivery: Tank Farm System Infrastructure Upgrades Specification* (as amended).

All of the primary dangerous waste tank system treatment components in the TSCR Process Enclosure are constructed of stainless steel. According to the design basis, it was determined stainless steel provides adequate corrosion protection for these process components.

C.6.1.1 Codes and Standards for Tank System Design and Construction

Specific standards for the manufacture of TSCR process systems are briefly discussed in the following sections. In addition to these codes and industrial standards, a seismic analysis for each process system is required [WAC 173-303-806(4)(a)(xi)]. The seismic analysis was performed in accordance with DOE Order 420.1C.

Codes and standards applicable to the design, construction, and testing of the tanks, ancillary piping systems, and hose systems are established in Table C.3.

Table C.3. Codes and Standards for Tanks and Ancillary Systems

Code/Standard	Title
ASME – B31.1 (latest edition)	*Power Piping*
ASME – B31.3 (latest edition)	*Process Piping*
ASME – Boiler and Pressure Vessel Code	*Rules for Construction of Pressure Vessels*

(latest edition)	
ASME – NQA-1A (Addendum A, latest edition)	*Quality Assurance Requirements for Nuclear Facility Applications*
AWS – D1.1/D1.1M (latest edition)	*Structural Welding Code – Steel*
AWS – D1.6/D1.6M (latest edition)	*Structural Welding Code – Stainless Steel*
NAHAD 500 (latest edition)	*Industrial Hose Assembly Specification Guidelines.*
NAHAD 600 (latest edition)	*Composite Hose Assembly Specification Guidelines*
RMA IP-2 (latest edition)	*Hose Handbook*

The application of these standards to the fabrication and installation of the TSCR tank system, transfer piping, and hoses, combined with independent verification of completed systems ensures that the tank and tank supports have sufficient structural strength and that seams and connections are adequate to ensure tank integrity. In addition, each tank system component will meet strict quality assurance requirements. Any tank system component constructed offsite will be tested for integrity and leak tightness before shipment to the Hanford Facility. Following installation, the systems will be inspected for damage to ensure against leakage and to verify proper operation. If a tank system component was damaged during shipment or installation, repairs will be made and leak tightness testing will be repeated onsite.

C.6.1.2 Design Information for TSCR and Transfer Lines

The TSCR Process Enclosure and transfer lines (both hard pipe and HIHTL) will be constructed to meet a series of design standards, as discussed in the following sections. Table C.3 above presents the applicable design standards and codes for tank systems, and Tables C.4 and C.5 provide additional information on key ancillary equipment and materials of construction associated with the TSCR and waste transfer systems. All piping systems are designed to withstand the effects of internal pressure, weight, thermal expansion and contraction, and any dynamic flow. The design of these units been evaluated in an engineering design assessment certified by an IQRPE. The certified design assessments are documented in three reports included in Appendix 2, Volume 2, Tables A.1, A.2, and A.4. Follow-on integrity assessments, including frequency, will be established following completion of the design assessment.

Table C.4. Materials of Construction and Design

System	Number	Material	Design
Filters (2)	WP-FLT-325A WP-FLT-325B	316/316L Stainless Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
IX Column 1	WP-IX-400A	316/316L Stainless Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
IX Column 1	WP-IX-400B	316/316L Stainless Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
IX Column 1	WP-IX-400C	316/316L Stainless Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5

Media Trap	WP-RT-500	316/316L Stainless Steel Hastelloy® C-276 (screen)	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
Delay Tank	WP-TK-550	316/316L Stainless Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
TSCR Piping & Valves	Various	304/304L and 316/316L Stainless Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
TSCR Process Enclosure Secondary Containment (includes sump and pump)	N/A	Epoxy Coated Carbon Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
Misroute Prevention Secondary Containment	N/A	304/304L Stainless Steel	Appendix2, Volume 1, Table A.1 Appendix2, Volume 2, Table A.5
HIHTLs (5)	HIHTL-AP106-SN-101 HIHTL-AP107-SN-102 HIHTL-AP107-SN-103 HIHTL-AP108-SN-104 HIHTL-AP108-SN-105	EPDM	Appendix2, Volume 1 Table A.2 Appendix2, Volume 2 Table A.6
Pipe-in-Pipe Transfer Lines (primary)[1]	SN-637 SN-700	316/316L Stainless Steel	Appendix2, Volume 1 Table A.4 Appendix2, Volume 2 Table A.8

[1] Includes utilized portions of existing W-211 transfer lines and new tie-in segments.

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C.6.1.3 Integrity Assessments

The initial design assessment for TSCR attests to the adequacy of design and integrity of the tank system to ensure that the tanks and ancillary equipment will not collapse, rupture, or fail over the intended life considering intended uses. Specifically, the assessment documents the following considerations:

- Standards used during design of the tank system
- Characteristics of the waste feed
- Adequacy of the materials of construction to provide corrosion protection from the solution in waste feed.

The results of the assessment demonstrate that the tank system and ancillary equipment have sufficient structural integrity and are acceptable for storing and treating dangerous and/or mixed waste. The assessment concludes that the tank system and ancillary components are designed to withstand a design-basis earthquake.

If TSCR were to be operated longer than 5 years, a tank integrity assessment program and schedule, to include a corrosion inspection program, if necessary, will be developed and will include periodic follow-on integrity assessments. The frequency of follow-on integrity assessments will be determined by the initial assessment and include considerations for age of the tank system, materials of construction, characteristics of the waste, operating experience, and recommendations of the initial design assessment. It is common for each of these tank types to be assessed on a frequency adequate to determine if corrosion or other indications of deterioration is occurring. The tank integrity assessment program and schedule will be developed and entered into the LAWPS OUG operating record prior to the first receipt of waste.

C.6.2 Additional Requirements for New Tanks

Procedures for proper installation of tanks, tank supports, piping, concrete, etc., are included in construction specifications. During and following installation, an independent qualified installation inspector or an independent, qualified, registered professional engineer will inspect the tanks and secondary containment in accordance with WAC 173-303-640(3)(c). Deficiencies identified are to be documented and a determination will be made as to repair/rework or use-as-is. All deficiencies requiring corrective action will be repaired to the satisfaction of the engineer. The tanks and ancillary equipment will be leak tested as part of acceptance of the system from the fabrication contractor. Information on the inspections and leak tests are to be included in the construction/installation certification, which will be entered into the LAWPS OUG operating record.

C.6.3 Secondary Containment and Leak Detection

This section describes the design and operation of secondary containment and leak detection systems for the TSCR Process Enclosure and transfer lines (HIHTL and pipe-in-pipe).

C.6.3.1 Secondary Containment for the TSCR Process Enclosure

The TSCR Process Enclosure utilizes two secondary containment features; one that provides containment for all process area tank system components, and second system providing containment for the misroute prevention interface within the Process Enclosure airlock. The basis for sizing the secondary containment system in the TSCR Process Enclosure process area is documented in calculation RPP-CALC-62500, *Process Enclosure Secondary Containment Sizing* (as amended). Supporting design and construction specifications ensures the foundation is capable of supporting the tank and secondary containment systems and that uneven settling and failures from pressure gradients should not occur.

The TSCR Process Enclosure secondary containment system is integral to the process unit and underlies all tank system components within the structure. The system is designed to contain a leak from any process component within the Process Enclosure and is constructed of epoxy coated carbon steel. The underlying concrete foundation is designed with reinforcing steel. The concrete slab and footing dimensions preclude failure caused by load pressures and climatic conditions (e.g., frost heave). Established principles and techniques for structural analysis, soil mechanics, and concrete and structural steel design were used in the design calculations for the foundation and Process Enclosure structure. In each of the analyses, the major design criteria are established from the documents listed in Table C.5.

The second containment system is comprised of a National Electrical Manufacturers Association (NEMA) 4X rated liquid tight cabinet. The cabinet is constructed of stainless steel and houses reagent feeds (e.g.,, water, caustic, and service air) into the Process Enclosure process area. The cabinet provides containment in the unlikely event of waste misroute into any of the reagent feed lines. The cabinet is equipped with a drain line with a leak detector installed within the drain line above a closed valve. If the leak detector is activated, the valve automatically opens and drains any leaked liquids into the Process Enclosure drain manifold, which routes the leaked material directly to 241-AP-108. Reference Figure 10 for the NEMA cabinet location.

Figure C.10. NEMA Containment Cabinet

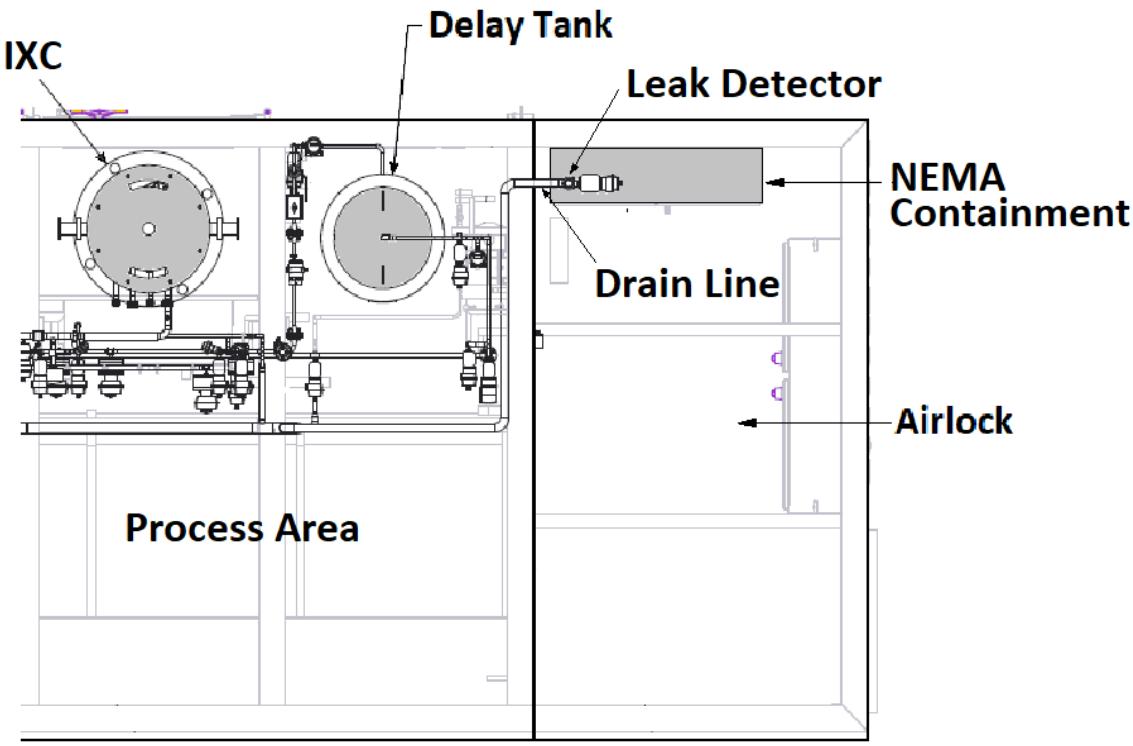

Table C.5. Codes and Standards for Structural Systems

Document	Title
DOE Order 420.1C (latest edition)	Facility Safety
IBC 2015	International Building Code
ACI 301 (latest edition)	Standard Specification for Structural Concrete
ACI 318(latest edition)	Building Code Requirements for Structural Concrete.
ACI 349 (latest edition)	Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary.

The TSCR Process Enclosure secondary containment system is designed to contain 100 percent of the volume of the largest tank within its boundary in accordance with WAC 173-303-640 (4)(e)(i)(A). The 300-gallon Delay Tank bound the necessary volume. RPP-CALC-62500, Process Enclosure Secondary Containment Sizing Calculation documents the basis for this secondary containment sizing.

The total volume of the Process Enclosure secondary containment system is 432 gallons. The containment system is sloped to a single low-point sump equipped with a leak detector and pump allowing for detection and removal of any leaked waste. Leaked waste would be pumped from the secondary containment sump through the drain manifold to 241-AP-108. Leak detection alarms are monitored in accordance with Addendum I, Inspections.

TSCR has no outside dangerous waste storage or treatment tanks that require consideration of the additional volume from a 25-year, 24-hour storm event [WAC 173-303-640(4)(e)(i)(B)].

C.6.3.2 Secondary Containment Transfer Lines

All five HIHTLs are provided secondary containment by the outer encasement hose. The TSCR Process Enclosure HIHTL connection represent the high point for all five lines, therefore, leak detection is provided by low point instruments located at the 241-AP Farm connections. All the lines have been designed to minimize low points between the TSCR enclosure and the AP Tank farm. However, due to structures, required equipment travel routes in the farms or the need to shield the lines, there can be some localized points. The following table identifies the location of low-point leak detection for each HIHTL. A 2-gallon per minute leak can be detected in any of the five hoses within one hour.

Table C.6. Secondary Containment for HIHTLs

HIHTL #	Line Number	Destination/Connection	Leak Detector Location
1	HIHTL-AP106-SN-101	AP-10P-106, Riser 002	Within Drop Leg
2	HIHTL-AP107-SN-102	AP-07F Pump Pit	Within Drop Leg
3	HIHTL-AP107-SN-103	AP-07F Pump Pit	Within Pump Pit
4	HIHTL-AP108-SN-104	241-AP-108, Riser 015	Within Drop Leg
5	HIHTL-AP108-SN-105	241-AP-108, Riser 015	Within Drop Leg

241-AP Farm leak detection signals are shared with the TSCR Control Enclosure allowing for shutdown of process operations upon indication of a leak with any of the five HIHTLs (reference Section C.2.8). The HIHTL primary hose can be flushed and air blown from the TSCR Process Enclosure back to the tank the HIHTL is connected to. In the event any leaked waste from a primary hose to the secondary, that material will be removed by compressed air and./or water flushing from the TSCR Process Enclosure end back to the tank the HIHTL is connected to. Any compromised HIHTL would be removed from service and replaced with a new one.

Secondary containment for hard-piped transfer lines are provided by the outer encasement pipe. Both the 241-AP Farm to WTP feed line and WTP EMF return line are sloped from the 241-AP Farm to the WTP EMF facility, which is equipped with a low-point leak detector that provides indication of a leak. WTP EMF leak detection signals will be provided to the DST Central Control room allowing for shutdown of waste transfers upon indication of a leak within either transfer line.

C.6.4 Tank Management Practices

Tank management practices addressing rupture, leakage, and corrosion prevention are discussed as follows.

Because TSCR treats DST System aqueous supernatant with a low solids content, this feed waste stream can be managed such that erosion and corrosion is not a significant concern. Additionally, the materials of construction used in the TSCR Process Enclosure, HIHTLs, and hard-piped transfer lines make it unlikely that an aqueous waste would corrode a tank, hose, or piping materials.

Should a leak in any tank system component be discovered, the leak is immediately stopped by isolating the leaking component and removing the tank system component from service. Following isolation, 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 preceded by removal of any waste. Any major repairs require certification. If repairs are not practical or successful, the tank system would undergo closure in accordance with Addendum H, Closure Plan.

External corrosion protection (i.e., cathodic protection) is not required for the TSCR Process Enclosure tank system components as they are contained within an above ground structure and are not in contact with soil or moisture. HIHTLs are protected from contact with soil or moisture with an exterior insulating system. Hard-piped transfer lines are protected from external corrosion by a protective coating system.

C.6.4.1 Overfilling Prevention

Because TSCR Process Enclosure tanks system components are designed and operated as a once-through, closed pressure vessel system, tank overfill controls and features are not applicable. The TSCR Control Enclosure MCS monitors all processing parameters and is equipped with alarms that annunciate on any indication of system malfunction that includes interlocks to shut the system down.

C.6.5 Labels or Signs

Each tank or primary process unit component (i.e., filters, IXCs, etc.) in the TSCR Process Enclosure are identified by an attached nameplate that includes the equipment number. Additionally, the Process Enclosure will bear a legend that identifies the systems and waste in a manner that 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.

Access to the fenced and gated TSCR Process Enclosure area, including the IXC staging area, is posted with black and white signs bearing the words *DANGER – UNAUTHORIZED PERSONNEL KEEP OUT*. Signs are posted at each entrance gate to the facility. The same posting is affixed to the IXC storage pad gate and entrances. Individual IXCs will bear labels in accordance with WAC 173-303-630(3). Refer to Addendum E, Security Requirements, for additional information on signs and postings.

C.6.6 Management of Ignitable or Reactive Wastes in Tanks Systems

TSCR treats aqueous waste that does not meet the definition of an ignitable or reactive waste in accordance with WAC 173-303-090(5). Therefore, design requirements, controls, and inspections associated with the management of ignitable or reactive waste are not applicable to TSCR. Additional information regarding qualification of TSCR feed waste acceptance criteria is found in Addendum B, Waste Analysis Plan.

C.6.7 Management of Incompatible Wastes in Tanks Systems

TSCR treats dilute solutions of aqueous waste that is mixed and sampled prior to receipt that pose no compatibility issues. TSCR Process Enclosure returns to the 241-AP Farm tanks will meet the DST System Waste Acceptance Criteria.

C.7 Organic Air Emissions Control

This section addresses organic air emission standards per 40 CFR 264, Subpart AA (WAC 173-303-690) and Subpart BB (WAC 173-303-691). The requirements of WAC 173-303-690 (Subpart AA) are not applicable because TSCR does not perform distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations [WAC 173-303-690(1)(b)]. The requirements of WAC 173-303-691 (Subpart BB) are not applicable because aqueous waste with 10 percent or greater organic concentration is not accepted for treatment at TSCR.

C.7.1 Applicability of Subpart CC Standards

The air emission standards of WAC 173-303-692 (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 parts per million (0.05%) by weight, based on the hazardous waste composition at the point of origination. However, waste management units that are used solely for management of radioactive mixed waste are exempt [WAC 173-303-692(1)(b)(vi)]. Since only radioactive mixed waste is managed at the TSCR, these requirements are not applicable to TSCR operations.

C.8 Engineering Design Media

Tabular listings and copies of PE-stamped TSCR Process Enclosure, HIHTL, hard-piped transfer lines, and IXC storage areas design drawings, calculations and other documentation reflecting the design submitted with this application package are provided in Appendix 2, Volumes 1 and 2.

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 LAWPS Operating Unit Group, which includes the TSCR Process Enclosure, waste transfer lines, Ion Exchange Column (IXC) staging area, and IXC storage pad.

F.1.1 Equipment Requirements

The following sections describe the internal and external communications systems and the emergency equipment that could be activated by the Tank Farm Operations Building Emergency Director(s) (BEDs) or other responsible personnel as necessary. Personnel have immediate access to communications systems and emergency equipment during waste processing operations.

F.1.1.1 Internal Communications

Communication systems are used to provide immediate emergency instruction to personnel involved with waste treatment operations at the TSCR and IXC staging and storage areas. Communication systems include both personal equipment, such as two-way radios and cell phones, and facility alarms.

When operators are present at TSCR or either IXC storage area, they carry two-way radios to maintain contact with personnel. The operators 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 mobile two-way radios and telephones.

TSCR alarms provide immediate notice of emergency conditions to facility personnel and include alarms for fire, leak detection, and process abnormal conditions (e.g. automatic shutdown). Fire alarms are located on the TSCR Process Enclosure and Control Enclosure. Alarms associated with process operations annunciate in the TSCR Control Enclosure. Certain alarm activation results in notification to the Building Emergency Director. Additional detail regarding emergency response can be found in Addendum J, Contingency Plan.

F.1.1.2 External Communications

Operations personnel 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 cellular telephones or two-way radios. The Process Enclosure and Control Enclosure are equipped with fire alarm pull boxes and personnel utilize cellular telephones for external communication, which would be necessary for an emergency at either IXC storage area.

F.1.1.3 Emergency Equipment

TSCR facilities, including the IXC storage areas, rely primarily on the Hanford Fire Department to respond to fires and other emergencies as described in Hanford Facility Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02). The Hanford Fire Department provides all the necessary equipment and personnel to respond to emergencies. Operators are familiar with the TSCR contingency plan (Addendum J) and are trained in the use of emergency systems, response to fires, and use of communications equipment.

Spill control equipment, and decontamination equipment are available at locations identified in the TSCR contingency plan. Addendum J provides additional detail on specific emergency equipment types and capabilities. The type of dangerous waste managed in the TSCR Process Enclosure and IXC storage areas do not require use of specialized extinguishing equipment.

Hazardous material protective gear and special work procedure clothing for operations personnel are kept in change rooms. A safety shower is located near the TSCR Process Enclosure, and emergency

eyewashes are available for use. Water for these devices are replenished from the delivery of sanitary water.

F.1.1.4 Water for Fire Control

TSCR is not connected to the 200 East Area fire water supply system, but will be equipped with a skid mounted fire suppression system that will provide a nitrogen driven water mist to the Process Enclosure in the event of a fire. In addition, the Hanford Fire Department is equipped with fire engines for control of fires requiring high water volume and pressure.

F.1.2 Aisle Space Requirement

The IXC storage pad is subject to aisle spacing requirements of WAC 173-303-630(5)(c). It is designed to be readily accessible to emergency response personnel and vehicles [WAC 173-303-340(3)]. This allows access by emergency responders by several means of approach. The IXC staging area is limited to three columns; therefore, isle spacing is not applicable. This location is readily accessible to emergency response personnel as well.

Layout of TSCR facilities also establishes equipment spacing that is sufficient to allow the movement of personnel and fire protection equipment in and around all portions of the facility. The facility general arrangement and layout also meets the requirements of the National Fire Protection Association for the protection of personnel.

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

Below-grade and above-grade portions of Hose-In-Hose Transfer Lines (HIHTLs) that convey tank waste to and from the TSCR Process Enclosure include secondary containment. If a leak is detected in a HIHTL, process operations will be stopped and the cause of the leak investigated and remediated. A more complete discussion of secondary containment is found in Addendum C, Process Information.

The TSCR systems are monitored continuously during processing operations and filling and/or processing is stopped immediately if leaks or other upset occurs.

Care is taken to ensure that even minor leaks are cleaned up immediately and disposed of in accordance with approved procedures. Any release of a material that is determined to be a dangerous waste will be managed according to the requirements of WAC 173-303.

Traffic and personnel access controls are employed during IXC change-out and transfer to the storage pad. The travel path is secured during transfers to ensure unimpeded and safe transfer of the spent columns from the Process Enclosure to placement on the storage pad. The IXC staging area is located within the fenced TSCR Process Enclosure area and does not require traffic control to place columns in this location.

F.2.2 Run-on

As a tank storage and treatment system equipped with secondary containment and leak detection systems, the TSCR Process Enclosure is designed and operated to prevent run-on from infiltration of precipitation into the secondary containment systems in accordance with [WAC 173-303-640(4)(e)(ii)]. Because the TSCR IXC storage areas (both staging and storage areas) do not store waste with free liquids, prevention of run-on in accordance with WAC 173-303-630(7)(b) is not required. The spent IX column staging area and storage pad are sloped to remove accumulation of precipitation in accordance with WAC 173-303-630(7)(c)(i).

F.2.3 Water Supplies

The TSCR design, operating practices, structures, and equipment prevent the contamination of natural water supplies (i.e., groundwater and surface water). The TSCR Process Enclosure is monitored

continuously during liquid waste transfers and processing to detect abnormal conditions (e.g., leaks). In addition, inspections are performed according to Addendum I, Inspection Plan, to detect equipment and structural deteriorations that could allow possible water supply contamination. Addendum J, Contingency Plan, provides information on procedures that are implemented if a release is detected.

There are no drinking water wells near the TSCR Process Enclosure and IXC storage areas, and waste transfer lines. Therefore, a release would not immediately contaminate drinking water supplies. The TSCR uses operating practices, structures, and equipment to prevent the contamination of natural water supplies (i.e., groundwater and surface water).

F.2.4 Equipment and Power Failure

The storage function of the TSCR tank system and IX columns are not affected by the loss of power and a loss of power would not pose a threat to the environment. Loss of electrical power would not cause the storage of the waste in either the Process Enclosure or IXC storage areas to be compromised. During loss of power, the affected pumps and subsystems will be shut down, including TSCR process operations.

If power at TSCR is lost, the Process Enclosure valves assume a fail-safe open position allowing waste to drain back to the 241-AP Tank Farm. This ensures the Process Enclosure remains in a safe shutdown mode until restoration of power. This action allows the operators to investigate and confirm that there are no safety related issues as a result of shut down.

A combination of reliability, redundancy, maintenance, and repair features are used in the TSCR equipment and systems to minimize random failure of equipment. Spare parts are maintained for essential production operations and safety equipment.

F.2.5 Personnel Exposure

Operating practices, structures, and equipment are used to prevent undue exposure of operations personnel to dangerous and/or mixed waste. All operations are conducted so that exposure to dangerous and/or mixed waste and hazardous materials are maintained As-Low-As-Reasonably-Achievable.

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, postings, and work instructions.

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

TSCR does not accept or manage ignitable, reactive, or incompatible waste. Therefore, the requirements of WAC 173-303-806(4)(c)(x), WAC 173-303-640(9) and (10), and WAC 173-303-395(1) do not apply.

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ADDENDUM G
PERSONNEL TRAINING

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ADDENDUM G
PERSONNEL TRAINING

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G. PERSONNEL TRAINING

This Addendum discusses personnel training requirements based on WAC 173-303-330 "Dangerous Waste Regulations" and the Hanford Facility RCRA Permit, WA7890008967 (Permit).

This Addendum provides the information necessary to comply with training requirements associated with permitted dangerous waste management activities at TSCR.

G.1 INTRODUCTORY AND CONTINUING TRAINING PROGRAM

The dangerous waste training program consists of introductory and continuing training programs that are designed to prepare personnel to operate and/or maintain TSCR in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSCR under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Addendum J, Contingency Plan.

Prior to first receipt of waste, a TSCR Dangerous Waste Training Plan (DWTP) will be developed that identifies each job title/position and requisite skills, education requirements, and other qualifications for TSCR personnel.

The introductory and continuing training programs contain the following objectives:

- Train Hanford Facility personnel to perform their duties in a way that ensures compliance with WAC 173-303
- Train Hanford Facility personnel on dangerous waste management activities (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed
- Ensure Hanford Facility personnel can respond effectively to emergencies.

The introductory and continuing training programs meet the requirements of WAC 173-303-330, *Personnel Training*, through general Hanford Facility training and Task Specific/Operations training as outlined below.

G.1.1 Introductory Training

Introductory training includes general Hanford Facility training and LAWPS unit-group specific training. General Hanford Facility training is described below. Unit-group specific training is provided to TSCR personnel allowing those personnel to work unescorted, and in some cases is required for escorted access. Personnel will be supervised until training is complete and cannot perform a task for which they are not trained, except to gain required experience while under the direct supervision of a trained employee, or a professional trainer as described in Section G.2.1.

Hanford General Employee Training (HGET): Hanford Facility personnel will receive Hanford Facility training described in Permit Attachment 5, "Hanford Facility Personnel Training Program." This training provides an orientation on dangerous waste management activities conducted at the Hanford Facility and includes the following:

- Description of emergency signals and appropriate personnel response
- Identification of contacts for information regarding dangerous waste management activities;
- Introduction to waste minimization concepts
- Identification of contact(s) for emergencies involving dangerous waste; and

- Familiarization with the applicable portions of the Permit Attachment 4, "*Hanford Emergency Management Plan*" (DOE/RL-94-02).

Contingency Plan training: TSCR personnel receive training on applicable portions of DOE/RL-94-02 in the general TSCR training. To ensure effective emergency response, personnel receive training on the content of the actions described in Addendum J as well.

Emergency Coordinator training: TSCR personnel facilitating emergency coordinator duties, WAC 173-303-360, "Emergencies," such as the Building Warden (BW) within the Hanford Incident Command System (ICS); receive training on implementing Addendum J and ICS BW responsibilities.

Non-TSCR Personnel or Visitors: As appropriate for the locations and activities, the Permittees will ensure training to non-TSCR personnel or visitors is undertaken. Non-TSCR personnel or visitors include individuals not permanently assigned exclusively to the TSCR and who do not have dangerous waste management responsibilities or supervision of such activities. These individuals include but are not limited to administrative personnel, regulatory oversight, transient sampling personnel, temporary personnel and other personnel not permanently assigned to TSCR.

G.1.2 Continuing Training

Refresher training occurs on many frequencies (i.e., annual, biennial, and triennial) for operations training. When justified, some training will not contain a refresher course and will be identified as a one-time only training course. Frequency of training will be established in the DWTP.

G.2 DESCRIPTION OF TRAINING PROGRAM

The Training Director is responsible for directing the training program for TSCR. The job description, duties, requisite skills, minimum education and other qualifications of the Training Director and TSCR personnel will be described in the TSCR DWTP.

Training elements of WAC 173-303-330(1)(e) applicable to TSCR operations include the following:

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Communications or alarm systems
- Response to fires or explosions
- Shutdown of operations
- Key parameters for automatic waste feed cut-off systems.

Proper design of the training program ensures TSCR personnel will be trained to perform their duties compliant with the Permit and with WAC 173-303 requirements. Actual job tasks, referred to as duties, include the above-referenced elements and are used to determine training requirements. As such, TSCR personnel will receive training appropriate to the duties they perform. This enables employees to know how to respond to emergencies, handle mixed/dangerous waste properly, and perform their work/duties in a safe manner.

G.2.1 Qualification of Personnel

Qualification of facility personnel relies on a combination of required education and experience, training courses (classroom and computer based), required reading, and on-the-job training. Training is determined and assigned based on job duties described in this addendum. Documentation for completion of training (e.g., course roster, qualification card, on-the-job training card, qualification checklist, required reading, etc.) is retained in the Operating Record.

Various evaluation techniques are used to measure a trainee's satisfactory completion of training. Examples of evaluation techniques are performance in written and oral exams and careful observation of

on-the-job performance. Periodically, employees critique formal training sessions using a training evaluation form. The evaluator determines whether the trainee has mastered the skills at the competency level necessary to perform the tasks described in the job description.

On-the-job training is hands-on training for the job duty provided under instruction of a trained employee or a professional trainer who serves as the course instructor. On-the-job training is assigned a course number with course completion being proof of training.

Training to meet the dangerous waste training program requirements is required to be completed within 6 months of assignment to dangerous waste duties at the Hanford Facility, or to a new job/title position at the Hanford Facility, whichever is later. While training courses (classroom and computer based) can be completed within 6 months, on-the-job training may take longer than 6 months to complete due to facility inactivity, complexity of requirements, complexity of tasks being performed, and pursuant to collective bargaining agreements. In no case will untrained personnel be allowed to complete job duties described in this addendum unless overseen by trained personnel.

G.2.2 Review of the Training Program

All employees are required to complete Hanford General Employee Training (HGET) on an annual basis. This training is subject to biennial evaluation by HGET Approval Authorities who review, and revise HGET lessons when deemed necessary.

The permittee's dangerous waste training program is reviewed through an iterative process of continuous improvement.

The following information is evaluated as part of this review:

- Changes to the dangerous waste regulations
- Changes to the RCRA permit
- Procedural changes
- Issues and opportunities for improvement identified by internal assessments
- Issues or areas of noncompliance identified as a result of events or regulatory inspections
- Deficiencies in staff performance of job tasks
- Feedback on training content

Changes, problems or opportunities for improvement may be addressed by revising course content, retrain frequency or delivery method. Periodically, employees critique formal training sessions using a training evaluation form. Each dangerous waste training course undergoes a full review at least every three years even if none of the conditions above indicate the need to revise the training program.

Training matrices included in the DTWP will indicate regularly scheduled (required) refresher training frequencies of individual courses for the express purpose of ensuring a regimented review of course material at a topical level on a specified interval.

Included in the review of training is an annual review of training matrices identifying minor changes (e.g. course numbers). Minor changes will be submitted as permit modification following the requirements in WAC 173-303-830(4)(a)(i), consistent with identifying changes in the dangerous waste training plan which are not a decrease in the type or amount of training given to employees.

G.3 DESCRIPTION OF TRAINING PLAN

The training plan documentation is maintained outside of the Permit, but documentation is included in the LAWPS Operating Unit Group operating record. Therefore, changes made to the training plan documentation are not subject to the Permit modification process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

Documentation prepared to meet the training plan will consist of hard copy and/or electronic media. The training plan documentation will consist of one or more documents and/or a training database with all the components identified in the core document.

The WAC 173-303-330 requirements for training are satisfied by this addendum. A description of how training plan documentation will meet the three items in WAC 173-303-330(2) is as follows:

WAC 173-303-330(2)(a): *The job title, job description, and name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position.*

Description: The specific TSCR personnel job title/position is correlated to the waste management duties. Waste management duties relating to WAC 173-303 are correlated to training courses to verify that training is properly assigned.

Only names of TSCR personnel who carry out job duties relating to TSD unit waste management operations at the TSCR will be maintained. A list of personnel assigned to the TSCR will be made available upon request.

Detailed information concerning job title, requisite skills, education, and other qualifications for personnel will be found in the DWTP documentation and will be made available upon request.

WAC 173-303-330(2)(b): *A written description of the type and amount of both introductory and continuing training required for each position.*

Description: In addition to the outline provided in Section G.1, the type, amount, and description of both introductory and continuing training relevant to positions and job duties for TSCR personnel required in the Permit will be included in the TSCR DWTP. Certain positions may have some variability of task assignment/responsibility. Personnel assigned specific waste management duties within a position are only required to take the necessary training specific to that duty.

WAC 173-303-330(2)(c): *Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received.*

Description: The Permittees will maintain documentation for completion of training (e.g., course roster, qualification card, on-the-job training card, qualification checklist, required reading, etc.) in the LAWPS Operating Unit Group Record in accordance with Permit Condition II.C.5.

Note that training records are maintained in accordance with the requirements of the *Privacy Act of 1974*. Training records for personnel are available for inspection purposes through 59 FR 17091, which gives federal, state, and local government officers 'routine use' access to training records where a regulatory program being implemented is applicable to a DOE or contractor program.

ADDENDUM H
CLOSURE PLAN

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ADDENDUM H
CLOSURE PLAN

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H. CLOSURE PLAN

H.1 Introduction

This addendum describes the planned activities and performance standards for closing the Tank Side Cesium Removal (TSCR) dangerous waste management units (DWMUs).

Addendum A, Part A Form provides contact information, unit description, history, location, layout, and identifies the process codes, design capacities pertaining to the waste inventory for the TSCR DWMUs. Dimensions, construction details (e.g., materials, as-built drawings, etc.), and associated ancillary equipment and secondary containment are found in Addendum C, Process Information. The waste types managed in each DWMU (by standard chemical name and waste code) can be found in Addendum A, Part A, and Addendum B, Waste Analysis Plan. Training requirements are provided in Addendum G, Training; inspection requirements are provided in Addendum I; Inspection, and Security requirements are provided in Addendum E, Security.

Closure of the TSCR DWMUs includes the tank systems and associated ancillary equipment, secondary containment system, spent IX column staging area, spent IX column storage pad, and underlying soil. Only areas that have treated, stored, or handled mixed waste will undergo closure activities. The TSCR Process Enclosure piping and hose-in-hose transfer lines (HIHTLs) will be flushed, drained and disposed of.

Table H.1. Dangerous Waste Management Units

T01– Tank Treatment S02 – Tank Storage, S01 – Container Storage
TSCR Dangerous Waste Management Units
DWMU #1 encompasses the TSCR process enclosure tank storage and treatment system. This includes the inlet feed filters, IX columns, media trap, delay tank, and all ancillary components (e.g., internal piping, valves, containment system, and HIHTLs). DWMU #2 encompasses the spent IX column staging area. DWMU #3 encompasses the spent IX column storage pad. Note: Pipe-in-Pipe transfer lines are included in the LAWPS OUG permit application for design and installation only because there is not final status permit for the DST OUG. It is anticipated for operations that these transfer lines will be transferred to a different final status OUG. Closure of these lines will be performed by the OUG they are assigned to for operation in a future permit modification.

Clean closure of the TSCR DWMUs will provide for decontamination or removal and disposal of all dangerous waste, waste residues, contaminated equipment, soil, or other material established in accordance with the clean closure performance standards of WAC 173-303-610(2). This and future closure plan revisions will provide for compliance with these performance standards. All work will be performed as low as reasonably achievable (ALARA) with respect to worker exposure to dangerous and/or any other workplace hazards. Activities that are planned to achieve clean closure are presented in the following sections.

H.1.1 Maximum Extent of Operations

The maximum extent of operations during the active life of TSCR corresponds to the maximum mixed waste inventory with full tanks and ancillary equipment operating at maximum design capacity and the total number of spent IX columns generated during operation.

An estimated 14,725 tons of waste feed will be processed through TSCR annually. The total combined tank storage capacity at any given time is a nominal 300 gallons. In addition, the TSCR IX column staging area and storage pad will accommodate an estimated 450 tons of spent IX columns annually. Refer to Addendum A, Part A for additional details.

Addendum C, Process Information provides dimensions and drawings showing the locations of the DWMUs, including the tank systems and ancillary equipment, and structures and equipment.

H.1.2 Health and Safety Requirements during Closure

Closure will be performed in a manner to ensure the safety of personnel and the surrounding environment. Qualified personnel will perform closure activities in compliance with established safety and environmental procedures. All work will be performed as low as reasonably achievable (ALARA) with respect to worker exposure to dangerous waste and/or any other workplace hazards. Personnel will be equipped with appropriate personal protective equipment. Qualified personnel will be trained in applicable safety and environmental procedures and have appropriate training in decontamination activities. Field operations will be performed in accordance with applicable health and safety requirements. If an emergency occurs, the on-call Building Emergency Director will be notified, and the requirements associated with Addendum J, Contingency Plan will be implemented.

H.2 Closure Performance Standards

The TSCR DWMUs will be closed in accordance with the general closure performance standard in WAC 173-303-610(2)(a), by decontamination or removal as provided for in this plan to achieve clean closure. The TSCR system will be closed in a manner that: minimizes the need for further maintenance; controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere; and returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

For the purposes of TSCR closure, the items listed in Table H.1 will meet the clean debris surface standard in 40 CFR 268.45, incorporated by reference in WAC 173-303-071(3)(qq), or be removed. Attainment of a clean debris surface can be verified visually in accordance with the standard [40 CFR 268.45] that states:

"*A clean debris surface means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except 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*".

H.2.1 Closure Standards for Concrete

The performance standard for concrete is a clean debris surface. The clean closure decontamination standards for concrete are those specified for hazardous debris in 40 CFR 268.45, Table 1. The concrete that does not have a clean debris surface will be treated using *Water Washing and Spraying* treatment technology of 40 CFR 268.45, Table 1; and if necessary, additional more aggressive decontamination methods until a clean debris surface is obtained. To minimize waste volume and the possibility of releases, decontamination will utilize low pressure application of the decontamination solution followed by manual scrubbing and rinsing. Any surfaces that do not meet the clean debris surface standard following the initial decontamination will be re-cleaned using one or more of the following methods: scarification, grinding, and plaining using rotating grinding wheels or other mechanical means of physically removing surface layers; or vibratory finishing.

In the unlikely event that structures cannot be cleaned using the methods described, these structures will be demolished, removed, and managed as dangerous waste. If it is determined that soil contamination is possible, the soil will be decontaminated (see Section H.2.4), and the investigation and cleanup of the soils will be managed in accordance with WAC 173-303-610(2)(b).

H.2.2 Closure Standards for Tank Systems

The closure standard for tank systems and associated ancillary equipment is a clean debris surface standard using 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).

The tank systems and ancillary equipment will be decontaminated in accordance with Section H.3.3. If it is not possible to meet the clean debris surface standard, for the tank systems and associated ancillary equipment, the components of concern will be removed, treated as necessary to comply with land disposal restrictions (LDRs) [40 CFR 268, incorporated by reference by WAC 173-303-140], to achieve clean closure.

For tank systems and associated ancillary equipment where the contaminated surfaces can be visually inspected, an inspection will be performed to see if the ancillary equipment meets the clean debris surface standard. If safe physical access is not available to perform visual inspection to determine whether the clean debris surface standard is met, other technologies such as remote operated cameras may be used.

H.2.3 Closure Standards for Container Storage

Closure of the TSCR IXC storage areas will entail complete removal and disposition of the spent IX columns. Following column removal, the IXC staging area and IXC storage pad will be inspected to ensure no dangerous waste residues remain (refer to Section H.2.1). Because the spent IX columns contained no free liquids and given the highly radioactive properties of the IX media contained within, radiological surveys combined with a visual inspection are determined to be sufficient following removal of the containers.

Any 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).

In support of determining a final disposition pathway for cesium, which currently exists in the DSTs, DOE will continue to evaluate potential options available. To ensure waste streams have a disposal pathway, DOE and Ecology will conduct workshops to identify what is known about column and CST media treatment and disposal. From this effort, it is anticipated that a project plan Tri-Party Agreement milestone would be developed for the disposition the spent IXCs. The evaluation will consider (1) current laws and regulations that affect disposal pathways, (2) potential changes to laws and regulations, (3) existing and reasonably possible options for the disposal of the IXCs and CST, (4) comparison of the baseline disposal scenario (i.e. vitrification at WTP) and alternative disposal pathways, (6) capability to vitrify the CST at WTP, and (7) comparison of the baseline interim storage scenario with alternative storage options, including shipment to a permitted treatment and storage facility off the Hanford Site.

H.2.4 Closure Standard for Focused Soil Sampling

The closure standard for the TSCR soil sampling uses WAC 173-340-740(3), “Model Toxics Control Act-Cleanup” (MTCA) “Unrestricted Land Use Soil Cleanup Standards” Method B that considers human health based on direct soil contact. The closure performance standards are provided in Section H.2.

H.3 Closure Activities

Prior to notification of closure [WAC 173-303-610(3)(c)], the closure plan will be modified as necessary to reflect current regulations and information. If the Permittee determines that clean closure is not possible, the closure plan will be modified.

Closure of the TSCR system will include removal of accumulated liquid waste (i.e., liquid remaining from treatment campaigns) by transferring the waste to the DST System, LERF, and/or another authorized dangerous waste facility. After the waste has been removed, and DWMUs in Table H.1 have been inspected, decontaminated, clean closure will be accomplished by demonstrating that the closure

performance standards are met in accordance with WAC 173-303-610. Clean closure of the soil will be accomplished by conducting a review of the operating record spill history, and demonstrating that the secondary containment (concrete and liner) prevented contaminants from reaching the soil.

If it is determined that soil contamination is possible, investigation and cleanup of the soils will also be managed in accordance with WAC 173-303-610(2)(b).

Ancillary equipment between the TSCR system and the 241-AP Tank Farm consists of HIHTLs. HIHTLs will be dispositioned at closure by removal, designation, and disposal in accordance with WAC 173-303-610(5). Closure of both IXC storage areas will be performed in accordance with Section H.2.3.

H.3.1 Removing of Waste and Waste Residues

All of the dangerous waste inventory within the TSCR Process Enclosure will be processed before closure following normal operating procedures. In addition, the tank systems components will be flushed as part of final processing to remove the waste and waste residues. Waste residues remaining after processing will be consistent with the wastes previously processed; as such, the residues will have the same dangerous waste codes. Residues will be removed by flushing and transferring the waste back to the DST System.

Closure of the TSCR IXC storage pads will entail complete removal and disposition of the spent IX columns.

H.3.2 Operating Record Review and Visual Inspection

After wastes and waste residues are removed, each DWMU will be evaluated for historical spills or other releases of dangerous or mixed wastes by review of the LAWPS operating record and by visual inspection. The review will include the following operating record documents: facility operating logbooks (including spill reports), integrity assessment reports, and waste management inspection and surveillance records.

Concrete beneath the TSCR Process Enclosure and both IXC storage areas will be inspected visually and surveyed radiologically before any decontamination will be performed. The purpose of the inspection is twofold: identify and document any cracks in the concrete that might have allowed contaminants a pathway to the underlying soil, and identify areas that potentially are contaminated with dangerous waste or dangerous waste residues.

H.3.3 Decontamination

Decontamination of the concrete and metal surfaces will be performed using the decontamination standards specified for hazardous debris in 40 CFR 268.45, Table 1. The surfaces will be inspected visually and radiologically surveyed before any decontamination. The concrete and metal surfaces that do not have a clean debris surface will be treated using *Water Washing and Spraying* treatment technology of 40 CFR 268.45, Table 1; and if necessary, additional more aggressive decontamination methods until a clean debris surface is obtained. Decontamination will initially utilize detergent and surfactant solutions (product will be identified based on the nature of the staining, and utilized in accordance with manufacturer's instruction). The product, concentration used, and residence time of application will be documented in the clean closure certification. To minimize waste volume and the possibility of releases, decontamination will utilize low pressure application of the decontamination solution followed by manual scrubbing and rinsing. Any surfaces that do not meet the clean debris surface standard following the initial decontamination will be re-cleaned using one or more of the physical extraction techniques until the standard is met; or the contaminated portions will be removed, designated, and disposed of at an authorized dangerous waste facility.

The inspections for a clean debris surface will be documented on an inspection record. Decontamination residues will be collected, designated, and transferred to the LERF or another authorized dangerous waste facility.

H.3.3.1 Tanks and Ancillary Equipment

In accordance with WAC 173-303-640(8), all waste from tank system components will be removed. Prior to decontamination, where it is possible to inspect visually, a visual inspection will be performed; where it is not possible to inspect visually beneath the tank system components, an evaluation of the tank system integrity will be made. The evaluation will determine the condition of the tank system, and determine whether there was any potential for leakage. If no cracks, severe corrosion, repairs, 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 TSCR Process Enclosure.

The tank system ancillary equipment will be flushed as part of closure. The tank system equipment will be decontaminated to meet the clean debris surface standard using the decontamination methods described in Section H.3.3. If decontamination by the proposed methods or visual inspection to confirm the clean debris surface performance standards are not possible, the particular component will be removed, designated, treated if necessary, and disposed of at an authorized dangerous waste facility, in accordance with 40 CFR 268, incorporated by reference by WAC 173-303-140, to achieve clean closure. Following decontamination of the tank system ancillary equipment will be inspected to determine if the surfaces meet 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).

HIHTLs will be removed and disposed of. Waste disposed of during closure activities will meet the waste acceptance criteria for the accepting authorized dangerous waste facility. Removal of any dangerous wastes or dangerous constituents generated during partial or final closure will be handled in accordance with applicable requirements of WAC 173-303-610(5).

H.3.3.2 Contaminated Environmental Media

The design of the TSCR DWMUs is intended to prevent the release of dangerous waste to the soil. Clean closure of the soil under the TSCR DWMUs will be accomplished by demonstrating that the TSCR Process Enclosure secondary containment has not lost integrity; and has therefore prevented contaminants from reaching the soil.

Clean closure of soil under IXC storage areas will be accomplished by demonstrating that concrete pads kept contaminants from reaching the soil. Unless inspections identify potential through-thickness cracks indicating 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. It is acknowledged the TSCR Process Enclosure, the IXC Staging Area, and IXC storage pad will be constructed over, and in proximity to several 200-IS-1 Operable Unit waste sites. As a result of installation of the IXC storage pad, a portion of Waste Information Data System (WIDS) pipeline sites 200-E-232-PL and 200-E-127-PL-B will be removed as an interference. Modifications to both waste sites as a result of the storage pad construction will be documented and the WIDS records for each waste site and updated accordingly. In addition, an approximate 100 foot length of waste site pipe lines 200-E-127-PL-B and 200-E-187-PL will lie beneath the concrete TSCR IXC travel path, which represents an interim interference to their remediation.

Focused sampling will be performed in the vicinity of any identified secondary containment defects, or in the known or suspected release location. If the soil analytical results determine that the constituents in Table H.2 are at or below the risk-based concentration limits for soil [WAC 173-303-610(2)(b)(i)], the soil will be considered clean closed. If the constituents exceed the numeric cleanup levels, the soil will be removed based on the areal and vertical extent of contamination, followed by additional confirmatory sampling. If the soil concentrations are less than or equal to risk-based soil standards for the constituents, the soil is clean closed. If not, and the contamination is limited and removable, the contaminated soil will be removed to meet risk-based concentration limits for soil, followed by additional confirmatory sampling at the limits of the excavation to confirm adequate removal WAC 173-303-610(2)(b). If the risk-based

concentration limits for soil cannot be met, then the Permittees will meet with Ecology to determine a path forward for closure.

H.3.4 Waste Generated During Closure

Rinsate generated during decontamination will be returned to the DST System or disposed of through LERF and 200 Area ETF. Soil and debris generated during closure will be containerized, labeled, and characterized in accordance with WAC 173-303-610(5).

Management and disposal of waste generated during closure will be documented and included as part of the clean closure certification documentation.

H.4 Sampling and Analysis Plan and Constituents to be Analyzed

Sampling and analysis will be performed in accordance with the sampling and quality standards established in this closure sampling and analysis plan (SAP).

If the review and/or inspections identify a loss of secondary containment integrity, where there is evidence that contamination may have leaked into the soil below the TSCR Process Enclosure or concrete storage areas, the concrete will be drilled or removed to allow the underlying soil to be sampled to determine the depth of the contamination. Focused sampling will be performed in the vicinity of identified contamination, secondary containment defects, or in the known or suspected release location.

If the soil analytical results determine that the constituents in Table H.2 are at or below the risk-based concentration limits for soil [WAC 173-303-610(2)(b)(i)], the soil will be considered clean closed. If the constituents in Table H.2 exceed the numeric cleanup levels, the soil will be removed based on the areal and vertical extent of contamination, followed by additional confirmatory sampling. If the soil concentrations are less than or equal to risk-based soil standards for the constituents in Table H.2 the soil is clean closed. If not, and the contamination is limited and removable, the contaminated soil will be removed to meet risk-based concentration limits for soil, followed by additional confirmatory sampling at the limits of the excavation to confirm adequate removal WAC 173-303-610(2)(b). If the risk-based concentration limits for soil cannot be met, then the Permittees will meet with Ecology to determine a path forward for closure [WAC 173-303-640(8)(b)].

H.4.1 Sampling and Analysis Plan Requirements

The objective of the sampling described in this document is to determine if the closure performance standards for soil (Section H.2.4) established in this closure plan pursuant to WAC 173-303-610(2)(b)(i) have been satisfied, demonstrating clean closure of the soil in the vicinity of the transfer piping wall penetrations.

The closure SAP details sampling and analysis procedures in accordance with SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update V*; and the American Society for Testing and Materials (ASTM) *Annual Book of ASTM Standards*. Sampling and analysis activities will meet applicable requirements of SW-846, ASTM standards, and EPA-approved methods at the time of closure.

H.4.1.1 Sampling and Analysis Schedule

Closure sampling and analysis will be performed in accordance with the closure schedule located in Table H.4.

H.4.1.2 Field Sampler Training/Certification

Training records of field samplers are maintained by the sampling organization, retained in the electronic training record database, or archived with operating records. Field samplers will be collecting focused samples of the soil beneath the concrete for analysis to determine if closure performance standards have been achieved.

H.4.1.3 Sampling Documents and Records

Logbooks (electronic or hardcopy) are required for field activities. A logbook must be identified with a unique project name and number, and the logbooks can be retained on electronic media. The individual(s) responsible for logbooks will be identified in the logbook, and the responsible individual will sign the logbook. Only authorized persons may make entries in logbooks. Corrections will be made by marking through the erroneous data with a single line, entering the correct data, and initialing and dating the changes.

The project file will contain the following records or references to their storage locations:

- Field logbooks or operational records

- Global positioning system data
- Sample authorization forms
- Chain of custody (COC) forms
- Sample receipt records
- Inspection or assessment reports and corrective action reports
- Interim progress reports
- Final reports
- Laboratory data packages
- Data verification and validation reports

The contract analytical laboratory is responsible for maintaining, and having available on request, the following:

- Analytical logbooks
- Raw data and quality control (QC) sample records
- Standard reference material or proficiency test sample data
- Instrument calibration information

H.4.1.4 Sampling Design and Analysis

The primary purpose of sampling the soil, if necessary, at focused sample locations is to determine if analytical results exceed closure performance standards (refer to Table H.2).

Focused sampling is selective sampling of areas where contamination is expected or releases have been documented. Selection of focused sampling units (i.e., the number and location of samples) is generally based on knowledge of the feature or condition under investigation and on professional judgment. Focused sampling is distinguished from probability-based sampling in that inferences are based on professional judgment, not statistical scientific theory. Therefore, conclusions about the target population are limited and depend entirely on the validity and accuracy of professional judgment. The use of statistical evaluation for focused data is not possible. Any focused data must be reviewed directly against the closure performance standards as to whether they are above or below the standards.

The presumed exposure pathways that were considered for TSCR DWMU closure are:

- WAC 173-340-740(3), "Model Toxics Control Act—Cleanup" (MTCA) "Unrestricted Land Use Soil Cleanup Standards" Method B (cancer and noncancer) that considers human health based on direct soil contact

- WAC 173-340-740, Table 740-1, "Method A Soil Cleanup Levels for Unrestricted Land Uses," which includes soil closure performance standards for human health based on unrestricted land use. MTCA Method A is only used if MTCA Method B is not available in the Cleanup Levels and Risk Calculation tables

- WAC 173-340-740, "Deriving Soil Concentrations for Groundwater Protection," that notes soil concentrations protective of groundwater

Of the exposure pathways listed above, MTCA Method B direct soil contact, or Method A as applicable, is always considered a complete and viable exposure pathway for all soil samples. The exposure pathway for soil levels protective of groundwater assumes that water or rainwater on a surface has an avenue to percolate through the surface and underlying soil to groundwater. Of the viable exposure pathways, the most conservative closure performance standard is selected. Per WAC 173-340-740(5)(c), the closure performance standard value cannot be below the laboratory practical quantitation limit (PQL).

Soil sampling and analysis will be conducted in accordance with the approved closure plan SAP (Section H.4). Analytical results of the focused sample will be individually compared to closure performance standards in a manner consistent with closure requirements [WAC 173-303-610(2)(b)(i)].

The target analytes considered for evaluation during closure sampling and analysis will be determined by reviewing the waste management records associated with TSCR operations and sample data from DST feed tanks. Table H.2 provides the closure performance standards for soil for each individual target analyte. If target analytes are found above closure performance standards, then the Permittees will meet with Ecology to determine a path forward for closure [WAC 173-303-640].

The constituents of concern identified in Table H.2 are based on waste codes TSCR is permitted to accept, Toxic Substances Control Act (TSCA) Risk-Based Disposal Approvals, and recent sampling.

Table H.2. Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code	Analyte	Closure Performance Standards	
			Value[a]	Basis
SW-846, Method 6010 Metals			**Accuracy Requirement ±20% Recovery[b] Precision Requirement ≤35 RPD[c]**	
7440-38-2	D004	Arsenic	2.00+01	Background level
7440-39-3	D005	Barium	1.65E+03	Groundwater Protection Calculated using WAC 173-340-747(4)
7440-43-9	D006	Cadmium	6.90E-01	Groundwater Protection
7439-92-1	D008	Lead	250	Method A Soil Level
7782-49-2	D010	Selenium	5.2	Groundwater Protection Calculated using WAC 173-340-747(4)
7440-22-4	D011	Silver	1.36E+01	Groundwater Protection Calculated using WAC 173-340-747(4)
SW-846, Method 7196 Chromium, Hexavalent			**Accuracy Requirement ±20% Recovery[b] Precision Requirement ≤35 RPD[c]**	
18540-29-9	D007	Chromium (Hexavalent)	18.4	Groundwater Protection
Sw-846, Method 7471 Mercury			**Accuracy Requirement ±20% Recovery[b] Precision Requirement ≤35 RPD[c]**	
7439-97-6	D009	Mercury	2.0	Human Health – Direct Contact (noncancer)
SW-846, Method 8082 Polychlorinated Biphenyls			**Accuracy Requirement ±20% Recovery[b] Precision Requirement ≤35 RPD[c]**	
1336-36-3	N/A	PCBs (total)	0.271	Groundwater Protection Calculated using WAC 173-340-747(4)
12674-11-2		Aroclor-1016	2.4	
11097-69-1		Aroclor-1254	0.114	
79-01-6		Aroclor-1260	0.5	
SW-846, Method 8260 Volatile Organics			**Accuracy Requirement ±30% Recovery[b] Precision Requirement ≤20 RPD[c]**	
67-64-1	F003 D001	Acetone	2.89E+01	Groundwater Protection
71-43-2	D018	Benzene	2.82E-02	Groundwater Protection
56-23-5	F001 F002	Carbon tetrachloride	4.60E-02	Groundwater Protection

Table H.2. Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code	Analyte	Closure Performance Standards	
			Value[a]	Basis
	D019			
67-66-3	D022	Chloroform	7.5E-02	Groundwater Protection
107-06-2	D028	1,2-Dichloroethane	2.32E-02	Groundwater Protection
75-35-4	D029	1,1-Dichloroethylene	5.01E-02	Groundwater Protection
121-14-2	D030	2,4-Dinitrotoluene	1.67E-03	Groundwater Protection
87-68-3	D033	Hexachlorobutadiene	6.05E-01	Groundwater Protection
78-93-3	F005 D035	Methyl ethyl ketone	1.97E+01	Groundwater Protection Calculated using WAC 173-340-747(4)
108-10-1	F003	Methyl isobutyl ketone	2.73	Groundwater Protection Calculated using WAC 173-340-747(4)
75-09-22	F001 F002	Methylene chloride	2.18E-02	Groundwater Protection
79-01-6	F001 F002 D040	Trichloroethylene	2.64E-02	Groundwater Protection
71-55-6	F001 F002	1,1,1-Trichloroethane	1.58	Groundwater Protection
75-01-4	D043	Vinyl chloride	1.83E-03	Groundwater Protection
67-72-1	D034	Hexachloroethane	4.36E-02	Groundwater Protection
SW-846, Method 8270 Semi-Volatile Organics			**Accuracy Requirement ±30% Recovery[b] Precision Requirement ≤30 RPD[c]**	
51-28-5	N/A	2,4-Dinitrophenol	1.28E-01	Groundwater Protection
108-39-4	F004	m-Cresol	4.0	Groundwater Protection Calculated using WAC 173-340-747(4)
95-48-7	F004	o-Cresol	2.33	
106-44-5	F004	p-Cresol	8.0	
98-95-3	D036	Nitrobenzene	1.02E-01	Groundwater Protection
62-75-9	N/A	N-Nitrosodimethylamine	3.8E-06	Groundwater Protection Calculated using WAC 173-340-747(4)
110-86-1	D038	Pyridine	4.36E-02	Groundwater Protection Calculated using WAC 173-340-747(4)
95-95-4	D041	2,4,5-Trichlorophenol	2.88E+01	Groundwater Protection

[a] Screening levels considered when developing closure performance standards were drawn from MTCA (WAC 173-340-740, "Model Toxics Control Act—Cleanup," "Unrestricted Land Use Soil Cleanup Standards") (Ecology, 2015, Cleanup Levels and Risk Calculation (CLARC) Tables, July 2015 data tables are most recent), and as noted calculated using WAC 173-340-747(4), Fixed Parameter Three-Phase Partitioning Model. MTCA Method B values represent both cancer and noncancer human health risk values from direct soil contact. The most conservative value is listed. Method A values are substituted when MTCA Method B values are not provided in the CLARC tables.

[b] Accuracy criteria for associated batch matrix spike percent recoveries. Evaluation based on statistical control of laboratory control samples is also performed. Precision criteria for batch laboratory replicate matrix spike analyses or replicate sample analysis.

[c] Determined by the laboratory based on historical data or statistically derived control limits. Limits are reported with the data. Where specific acceptance criteria are listed, those acceptance criteria may be used in place of statistically derived acceptance criteria.

Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update V.

Table H.2. Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code	Analyte	Closure Performance Standards	
			Value[a]	Basis

CAS = chemical abstracts service
PQL = practical quantitation limit
RPD = relative percent difference

H.4.1.5 Sampling Methods and Handling

The sample matrix will consist of soil collected in clean sample containers. Soil will be collected at a depth of no more than 6 inches below ground surface, unless staining or discoloration indicates contamination is below that depth. Once the soil is collected, it will be screened to remove material larger than approximately 0.08 inches in diameter, which allows for a larger surface area to volume ratio. This ratio increases the likelihood of identifying any potential contamination in the sample.

To ensure sample and data usability, sampling will be performed in accordance with established sampling practices, procedures, and requirements pertaining to sample collection, collection equipment, and sample handling. Sampling generally includes the following activities:

- Preparation and review of sampling paperwork such as COC or labels
- Sample container and equipment preparation
- Field walkdown of sample area (includes marking sample location)
- Sample collection
- Sample packaging and shipping

These requirements are in accordance with the analytical method specified. The final container type and volumes will be identified on the sample authorization form and the COC form.

A sampling and data-tracking database is used to track the samples from the point of collection through the laboratory analysis process. Sampling and data-tracking database sample numbers will be issued to the sampling organization for the project. Each sample is identified and labeled with a unique sampling and data-tracking database sample number.

To prevent potential contamination of the samples, clean equipment will be used for each sampling activity. Level I EPA pre-cleaned sample containers will be used for samples collected for chemical analysis. Container sizes may vary, depending on laboratory-specific volumes/requirements for meeting the PQL.

The date and time of sample collection, and the sample location, depth, and corresponding sampling and data-tracking database numbers will be documented in the sampler's field logbook. A custody seal (e.g., evidence tape) will be affixed to each sample container (except for volatile organic analysis [VOA] sample containers) or the sample collection package in such a way as to indicate potential tampering. The custody seal will be inscribed with the sampler's initials and date. Custody tape is not applied directly to VOA sample containers based on the potential for affecting analyte results or fouling of laboratory equipment. Alternatively, VOA vials are placed in a sealable plastic bag affixed with custody seals and any other required labels/documentation.

Data verification and validation will also note any issues with sample collection and analysis. Each sample container will be labeled with the following information on firmly affixed, water-resistant labels:

- Sample authorization form number
- Sampling and data-tracking database number
- Sample collection date and time

- Sampler identification (e.g., initials)
- Analysis required
- Preservation method (if applicable)
- COC identification number

In addition to the container label information, sample records must include the following information:

- Sample location
- Matrix (soil)

Sample custody will be maintained in accordance with existing Hanford Site protocols to ensure maintenance of sample integrity throughout the analytical process. COC protocols will be followed throughout sample collection, transfer, analysis, and disposal to ensure sample integrity is maintained. A COC record is initiated in the field at the time of sampling and will accompany each set of samples shipped to any laboratory. At a minimum, the following information must be identified on a completed COC record:

- Collector(s) names
- Project designation
- Unique sample numbers
- Date, time, and location (or traceable reference thereto) of sample collection
- Chain of possession information (i.e., signatures/printed names of all individuals involved in the transfer of sample custody and storage locations, dates of receipt and relinquishment)

Additional information regarding the sample and specific analytical instructions may also be documented.

Discrepancies with the sample material (unusual color, texture, or odor), collection techniques, containers, or transfer packages are noted in the field logbook, communicated with the project manager, and corrective actions are initiated. For instance, where a custody seal is damaged or missing, each case is individually reviewed for usability of the sample. The damaged or missing seal and action taken will be documented in the final data package. Data verification and validation will also note any issues with sample collection and analysis.

Newly generated waste resulting from sampling activities will be handled in accordance with all applicable requirements of WAC 173-303-170 through WAC 173-303-230.

H.4.1.6 Sampling and Analysis Requirements to Address Removal of Contaminated Soil

If sampling and analysis of the soil indicates contamination above the soil closure performance standards, then Permittees will meet with Ecology to determine a path forward for closure [WAC 173-303-640].

H.4.1.7 Analytical Methods

All analyses and testing will be performed consistent with this closure plan, laboratory contracts, and laboratory analytical procedures at the time of closure. The contracted analytical laboratory must achieve the lowest PQLs consistent with the selected analytical method in order to confirm that the closure performance standards are achieved.

H.4.2 Quality Control

QC procedures must be followed in the field and laboratory to ensure that reliable data are obtained. Field QC samples will be collected to evaluate the potential for cross-contamination and provide information pertinent to field sampling variability. Field QC samples include the following:

- Field trip blanks
- Field transfer blanks

- Equipment rinsate blanks
- Field duplicates

Laboratory QC samples estimate the precision and bias of the analytical data. Laboratory QC samples include the following samples:

- Method blanks
- Laboratory duplicates
- Matrix spikes
- Matrix spike duplicates
- Surrogates
- Laboratory control samples

Field and laboratory QC samples are summarized in Table H.3.

Table H.3. Project Quality Control Sampling Summary

QC Sample Type	Frequency	Characteristics Evaluated
Field QC		
Field Trip Blanks	One per 20 samples and minimum of one per decision unit	Field trip blanks are used to assess contamination from sample containers or during transportation and storage procedures
Field Transfer Blanks	One per day that volatile organic compounds are sampled	Field transfer blanks are used to assess contamination from surrounding sources during sample collection
Equipment Rinsate Blanks	One per 20 samples per analytical method	Equipment rinsate blanks are used to measure the cleanliness of sampling equipment and effectiveness of equipment decontamination procedures Equipment rinsate blanks are not required if only disposable equipment is used, or if rinsing between samples is not practical (e.g., core drilling equipment)
Field Duplicates	One per 20 samples with a minimum of one per decision unit	Field duplicates are used to assess the precision of the entire data collection activity, including sampling, analysis, and the site heterogeneity
Laboratory QC*		
Method Blanks	One per batch	Method blanks measure contamination associated with laboratory sample preparation and analysis
Laboratory Duplicates	One per laboratory analytical batch	Laboratory duplicates measure laboratory reproducibility and precision
Matrix Spikes	One per laboratory analytical batch	The matrix spike recovery measures the effects of interferences in the sample and reflects the accuracy of the determination
Matrix Spike Duplicates	One per laboratory analytical batch	The relative percent difference between matrix spike and matrix spike duplicate measures the precision of a given analysis
Surrogates	Added to each sample and QC (laboratory and field) sample	Surrogate standards are added prior to extraction of the sample to evaluate accuracy, method performance, and extraction efficiency

Table H.3. Project Quality Control Sampling Summary

QC Sample Type	Frequency	Characteristics Evaluated
Laboratory Control Samples	One per laboratory analytical batch	The laboratory control sample measures the accuracy of the analytical methods

*Batching across projects is allowed for similar matrices.
QC = quality control

H.4.2.1 Data Review, Verification, Validation, and Usability Requirements

Analytical results will be received from the contract analytical laboratory, loaded into a sampling and data-tracking database, and verified in accordance with Section H.4.2.2. A total of 5 percent of the data will be validated as described in Section H.4.2.3.

H.4.2.2 Data Verification

Verification activities ensure analytical data in the database were properly uploaded and reflect the contract laboratory program equivalent data packages. The steps outlined below will consider both the primary and QC samples. Activities may include, but are not limited to, the following:

- Amount of data requested matches the amount of data received (number of samples for requested methods of analytes)
- Correct procedures/methods are used
- Issues with sample collection and analysis are noted
- Documentation/deliverables are complete
- Hard copy and electronic versions of the data are identical
- Data seem reasonable based on analytical methodologies.

H.4.2.3 Data Validation

The contract analytical laboratory supplies the equivalent of contract laboratory program analytical data packages intended to support data validation by the third party. These data packages are supported by QC test results and raw data. Data validation considers both primary and QC samples, and considers issues with sample collection and analysis.

Controls are in place to preserve the data sent to the validators, such as allowing only additions to be made, not changes to the raw data. The format and requirements for data validation activities are based on the most current version of EPA-540-R-08-01, *National Functional Guidelines for Superfund Organic Methods Data Review* (OSWER 9240.1-48), and EPA-540-R-10-011, *National Functional Guidelines for Inorganic Superfund Data Review* (OSWER 9240.1-51). As defined by the validation guidelines, 5 percent of the analytical results will undergo Level C validation.

H.4.2.4 Revisions to the SAP and Constituents to be Analyzed

Changes to the SAP may be necessary due to unanticipated events during closure. An unanticipated event would be an event outside the scope of the SAP or a condition that inhibits implementation of the sampling as written. Any revision to the SAP will be submitted no later than 30 days after an unanticipated event as a permit modification as required in WAC 173-303-610(3)(b)(iii) and WAC 173-303-830(4).

H.5 Confirmation and Certification of Closure Activities

- Closure certification is performed by an independent qualified registered professional engineer (IQRPE) per Section H.5.2. Certification will be submitted to Ecology in a manner consistent with Section H.5.3. Conditions of the DWMU after closure are described in Section H.5.4

H.5.1 Confirmation of Clean Closure

The TSCR system completion of clean closure will be confirmed by inspection and collection of supporting documentation, including field notes, photographs, and results from sample analysis.

- Removal of dangerous waste and decontamination waste
- Decontamination of metal, tanks, and concrete surfaces will be verified by visual inspection of the surfaces. Visual inspection will confirm that the decontamination activities have achieved the clean debris surface treatment standard, as stated in 40 CFR 268.45, Table 1.

Analysis results from focused soil sampling performed will be used to confirm that dangerous waste constituents from operation of the TSCR system are below the closure performance standards (Section H.2).

H.5.2 Role of Independent Qualified Registered Professional Engineer

An IQRPE will be retained to provide certification of the closure as required by WAC 173-303-610(6). The IQRPE will be responsible for observing field activities and reviewing documents associated with clean closure of the TSCR system. At a minimum, the following field activities would be completed:

- Review TSCR visual inspection documentation.
- Observe or review decontamination of concrete surfaces.
- Verify that the concrete surfaces meet the clean debris surface standards.
- Observe or review sampling activities.
- Verify that locations of samples are as specified in the SAP.
- Review sampling procedures and results.
- Observe or review contaminated environmental debris removal (as applicable).
- Observe or review newly generated waste management and disposition records.
- Verify that closure activities were performed in accordance with this closure plan.

The IQRPE will record observations and reviews in the closure certification, which will then be provided to Ecology.

H.5.3 Certification of Closure

Within sixty days of completion of closure of each dangerous waste management unit, the owner or operator will submit to Ecology, by registered mail or other means that establish proof of receipt (including applicable electronic means), a certification that the dangerous waste management unit, has been closed in accordance with the specifications in the approved closure plan. The certification will be signed by the owner or operator and by an independent qualified registered professional engineer. Documentation supporting the independent qualified registered professional engineer's certification will be furnished to Ecology upon request.

H.5.4 Conditions that will be Achieved when Closure is Complete

When closure is complete, TSCR DWMUs will not have dangerous waste left onsite at levels above the clean closure performance standard for decontamination and removal.

The closure plan may also be revised before the start of closure work, based on relevant information from the operational history of the TSCR system and the DWMUs, advances in decontamination technology, newly designated dangerous waste, deviation from the SAP provided in this Closure Plan

H.6 Schedule for Closure

Closure of TSCR has not been determined. The actual year of closure will depend on the time required for current waste to be processed through WTP LAW in the DFLAW mission configuration. 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, a revised closure plan will be submitted to Ecology. At least 45-days prior to the date on which closure of one or more DWMUs is expected to begin; a notification for closure will be submitted to Ecology in writing. [WAC 173-303-610(3)(c)(i)]

Table H.4. Closure Schedule

Activity	Duration (Days)
• Develop operations protocol for closure activities	180
• Receipt of final volume of mixed waste	125
• Processing of last batch of waste feed	60
• Notify Ecology of intent to begin closure	30
• Records review and visual inspection of structural surfaces, equipment, and tank systems to identify areas of contamination and to determine levels and methods of decontamination required	90
• Flush and decontaminate structural surfaces, equipment, and tank systems	100
• Remove equipment/structures that could not be successfully decontaminated	180
• Visual inspection and/or sample and analyze as required	180
• Removal of decontamination residue	100
• Dispose of waste resulting from decontamination based on results of waste analyses	125
• Submit certification of closure to Ecology (within 60 days of completion of final closure activities)	90
Total Duration	1260

Note: Some activities can be perform in parallel

H.6.1 Extension of Closure Time

An extension of the closure time is requested for the TSCR DWMUs. The extended closure period exceeding the 180 days given in WAC 173-303-610(4)(b), is needed to accomplish complex work, while performing the work safely within radiological exposure issues. Decontamination is slow and labor-intensive operation, even after radiological exposure issues have been reduced enough to allow personnel entry, work is hampered by the extensive personal protective equipment staff are required to wear, and the strict procedures that are enforced to protect both workers and the environment from contamination.

H.7 Closure Plan Revisions

Clean closure is the goal for the TSCR DWMUs. The closure plan will be revised and submitted for approval in accordance with the modification procedures of WAC 173-303-830, if efforts to achieve the clean closure standards cannot be achieved. If an unexpected event has occurred, which has affected the closure plan, a Permit modification including a copy of the amended closure plan will be submitted no later than 60-days after the unexpected event.

Previous spills and subsequent cleanup will be identified and documented in the LAWPS portion of the facility operating record and addressed at the time of closure. A permit modification is required within 60 days when a release occurs that requires modification of the closure plan.

ADDENDUM I
INSPECTION PLAN

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ADDENDUM I
INSPECTION PLAN

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I. INSPECTION REQUIREMENTS

This addendum describes the requirements and schedule for inspections of TSCR tank systems and components and the spent IX column storage areas (IXC staging area and IXC storage pad) in accordance with WAC 173-303-806(4)(a)(v), WAC 173-303-320, and WAC 173-303-340. This inspection plan is designed to prevent malfunctions, deterioration, operator errors, and discharges that may cause or lead to the release of dangerous waste that could pose a threat to human health and the environment. This inspection plan is designed to provide early warning of the potential for such events in order to make timely corrections and/or take preventative actions. The plan contains a written inspection schedule that is maintained electronically in the LAWPS Operating Unit Group Operating Record. General Inspection Requirements

Inspections within the schedule are performed by qualified personnel according to a frequency that has been developed through both regulatory requirements and operating experience. Inspection requirements will continue until certification of completion of closure. For frequencies that are not defined by specific regulatory requirements a justification for the frequency will be documented and maintained in the LAWPS Operating Unit Group (OUG) Operating Record. During an inspection, inspectors evaluate each inspection item against its associated acceptance criteria, defined in the schedule (Table I.1). The results of the inspections are documented in inspection logs that are dated and signed (handwritten or electronic signature) by the inspector.

This inspection plan addresses the following unit group specific items:

- Tank systems and secondary containment
- Container storage
- Monitoring instrumentation
- Security equipment
- Safety and communication equipment
- Emergency equipment
- Ignitable or reactive waste

Management-level staff responsible for implementation of the Inspection Plan and for ensuring corrective actions are taken are the Shift Operations Manager, Shift Manager, or Operations Manager as described in Addendum G, Personnel Training; and the facility dangerous waste training plan (DWTP). Corrective action is discussed in Remedy Schedule section. Inspections are performed by either facility operations personnel, or Hanford Fire Department personnel. All inspectors are trained in accordance with Addendum G, Personnel Training; DWTP; and/or Permit Attachment 5, Hanford Facility Training.

A preventive maintenance recall system is employed to direct preventive maintenance activities at TSCR. Equipment requiring maintenance is checked as indicated by the maintenance history, the manufacturer's recommendations, or engineering recommendations.

Instrumentation at TSCR is calibrated regularly to ensure accuracy and reliability. All process control instrumentation is calibrated on a schedule depending on previous calibration experience, manufacturers recommendation, or engineering recommendations. An instrument calibration and recall system is employed to manage calibrations.

I.1 Frequency of Inspections

The frequency of inspection 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 is performed remotely in the TSCR Control Enclosure continuously during waste processing operations, and at least daily when TSCR is not processing waste. If instrumentation is not functioning, daily visual inspections are performed as identified in Table I.1.

The TSCR inspections, instrument monitoring, and functional testing frequencies are indicated in Table I.1.

I.1.1 Inspection Log

Notations of observations made and deficiencies noted during an inspection are recorded on an inspection log (data sheets, round sheets, work packages, electronic inspection logs, logbooks, etc.). The inspection log will also include an account of spills or discharges in accordance with WAC 173-303-145, and the date and nature of any repairs or remedial actions taken. On completion, the inspection log includes the inspector's printed name, handwritten or electronic signature, and date and time of the inspection. The inspection log is submitted for review and approval by management or their designee. Once approved, the inspection log is retained for at least 5 years in the LAWPS OUG Operating Record, or other approved locations, in accordance with Permit Condition II.I.1.

If an inspection log cannot be located in the LAWPS OUG Operating Record, substitute documentation/log will be added 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., planned power outage), then a reasonable attempt will be made to re-schedule and complete the inspection within the identified inspection frequency. If the cause was due to an unplanned event (e.g., weather, 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 to secondary containment is discovered, facility operations responds per the emergency response procedures. Action is taken to stop the leak, determine the cause, and the waste is removed from the secondary containment as soon as possible, preventing harm to human health and the environment. The inspection records are used to help determine any necessary corrective actions.

I.1.2 Remedy Schedule

Problems and unanticipated substandard conditions identified by the inspector are documented on the inspection log and reported to facility management for prioritization, and scheduling of remedial actions to minimize environmental or human health incidents. Problems identified during inspections are categorized into three general areas and addressed accordingly. The areas include imminent hazards to human health and/or the environment, problems that can be easily remedied with little or no planning, and maintenance items that require planning and coordination to correct:

- When an identified problem poses an imminent risk to human health or the environment actions are taken immediately to mitigate the hazard and may include activation of the Addendum J, Building Emergency Plan and Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), when contingency plan action levels are exceeded. Examples of problems that warrant immediate action include active releases of dangerous waste to the environment (e.g., container or tank system releases), failure of systems that mitigate potential releases (e.g., secondary containment systems), lack of emergency response equipment, and a security breach.

- Problems identified during inspection that are easily corrected (e.g., no maintenance planning required), such as label replacement, will be corrected within 24-hours of inspection or tracked until completion.

- Other problems, which cannot be easily corrected, are addressed on a prioritized schedule. These problems and the prioritized schedule are tracked using the Rounds Action Tracking List (RATL); for problems identified during Hanford Fire Department inspections, the Job Control System (JCS) is used.

  - An overall schedule for remedying problems would include time to develop a maintenance instruction in conjunction with any schedule constraints such as parts availability, fabrication, environmental and facility access limitations. The time to develop a maintenance instruction is dependent upon a number of factors including, nuclear, radiological, and industrial safety hazards associated with the task, complexity of the task, human factors and performance considerations, skill of worker(s), risk to the worker, public, or the environment.

  - The inspection problem resolution process may include an inspection data sheet, which identifies the criteria for the inspection; relaying identified problems onto an action-tracking list; and development of maintenance instructions for problems based on the actions tracking list. The remedies for problems identified are developed using maintenance instructions and prioritized on a schedule as described. Problems pending resolution, and their associated tracking number/designation, will be noted in subsequent inspection logs until the remedy is complete.

  - Information from the inspection problem resolution process will be maintained in the LAWPS OUG Operating Record.

I.1.3 Specific Process Inspection Requirements

The following sections describe the specific process inspections to be performed at the LAWPS OUG.

I.1.4 Container Inspections

Container inspections and frequencies are provided in Table I.1 and apply to spent Ion Exchange Columns (IXCs) located at either the IXC Staging Area or the IXC Storage Pad.

I.1.5 Tank System Inspections

Tank system inspections and instrument monitoring criteria and frequencies are provided in Table I.1. Tank system inspections occur at least once each operating day. Each operating day is defined as every day the TSCR system is in operation (i.e. processing dangerous waste). Tank system inspections are performed at least once each operating day to ensure the tank system is being operated according to its design.

Integrity assessments for TSCR tank systems are discussed in Addendum C. The integrity assessment program will continue over the life of the tank system at a frequency to be determined by an initial integrity assessment. The schedule will be based initially on the materials of construction, characteristics of the waste, and recommendation by an Independent Qualified Registered Professional Engineer. Follow-on integrity assessments would also take into consideration the age of the tank system. A detailed

description of the TSCR tank system, including ancillary equipment, is provided in Addendum C, Process Information.

The TSCR tank system process components are located within the Process Enclosure and is not accessible during process operations because of As Low As Reasonable Achievable restrictions (ALARA). The tank system has secondary containment and leak detection; any leakage from the process components and piping drains to the secondary containment sump and will alarm upon detection of liquid. The alarm annunciates in the TSCR Control Enclosure. Liquid collected in the sump can be pumped out to effluent receipt tank 241-AP-108. A second leak detector is located within a drain line from a National Electrical Manufacturers Associated (NEMA) rated box that houses misroute prevention components. The NEMA box is located in the airlock and provides secondary containment for the misroute prevention interface between reagents and waste process components. Activation of this leak detector will alarm upon detection of fluid and will automatically open a valve that drains any fluid to the drain header within the Process Enclosure. The alarm annunciates in the TSCR Control Enclosure.

TSCR is a once-through closed system, therefore overfill protection is not applicable. Refer to see Addendum C, Process Information for additional detail regarding leak detection and process component details.

Because of high radiation dose and entry restriction during process operations, daily visual inspections are performed remotely via closed circuit television (CCTV).

I.1.6 Security Equipment Inspections

Security equipment inspection criteria and frequencies are provided in Table I.1. The inspections pertain to posting warning signs, and doors as described in Addendum E, Security.

I.1.7 Safety and Communication Equipment

Safety equipment visual inspection criteria and frequencies are provided in Table I.1, and pertain to the spill response kits, eye wash stations, and safety showers. Safety and communication equipment functional testing criteria and frequencies are provided in Table I.1. The functional testing pertains to the telephone, 2-way portable radios, eyewash stations, safety showers, and fire alarms/pull boxes. The Hanford Fire Department performs the functional testing for the fire alarm/pull boxes. The inspection criteria and frequency for the spill response kits is provided in Table I.1. The safety and communication equipment locations will be specified in the TSCR Building Emergency Plan (BEP).

I.1.8 Emergency Equipment Functional Testing

Emergency equipment functional testing criteria and frequencies is provided in Table I.1. Emergency equipment locations are specified in Addendum J, Contingency Plan. The Hanford Fire Department performs the functional testing on the fire suppression system.

I.1.9 Ignitable and Reactive Waste Inspection

TSCR does not store or treat ignitable or reactive waste in tanks or containers; therefore, the requirements of WAC 173-303-395(1)(d) are not applicable.

I.2 Visual Inspection

The visual inspection schedule for the TSCR is provided in Table I.1, for tanks and secondary containment systems. Permit Condition II.O.3, allows alternate inspections when visual inspections cannot be performed due to ALARA concerns with high radiation dose. The inspection schedule for TSCR monitoring instrumentation and for spent IXC container storage is provided in Table I.1.

TSCR is designed for remote operation of equipment containing radioactive tank waste. The TSCR process components are located within the Process Enclosure and are not accessible during waste processing operations because of ALARA concerns with high radiation dose. Daily visual daily

inspection of the TSCR tank system components will be performed remotely by CCTV and is augmented by use of instrumentation monitoring for process operations and leak detection.

Table I.1. Inspection Schedule

Description	Instrumentation	Frequency[1]	Type of Problem/Evaluation Criteria
Secondary Containment Areas			
Process Enclosure process area secondary containment, including sump and coating	N/A	Once during IXC change-out.	Problem: Cracks, gaps, or other degradation of secondary containment, including the sumps that threaten the integrity of secondary containment Visually inspect the secondary containment, including sump for evidence of significant cracks, gaps, or other degradation that may compromise the integrity of the containment. Check that the structure is in good condition, and that no liquid is present.
Air lock, NEMA 4X Cabinet secondary containment WP-ENCL-004	N/A	Once during IXC change-out.	Problem: Cracks, gaps, or other degradation of secondary containment, including the sumps that threaten the integrity of secondary containment Visually inspect the secondary containment, for evidence of degradation that may compromise the integrity of the containment. Check that the item is in good condition and no liquid is present.
Media Trap	N/A	Once during IXC change-out	Problem: Degradation of component or fittings. Visually inspect the media trap for evidence of degradation. Check that the component is in good condition.
Container Storage			
Containers/container storage areas	N/A	Weekly	Problem: Damaged or degraded IXCs. Note: IXCs are fixed in place, ensuring 30-inch aisle spacing between rows.
Container labels	N/A	Weekly	Problem: Labels not present, difficult to read, falling off. Verify labels are present and visible. Assess legibility of labels; note any impediments to visibility and off-normal condition of labels.

Table I.1. Inspection Schedule

Description	Instrumentation	Frequency[1]	Type of Problem/Evaluation Criteria
Tank Systems			
Visual tank system inspection	N/A	Daily	Problem: Damage to tank/ancillary equipment or weld break threatening integrity of the tank system. Inspect viewable portions of the tank system for signs of corrosion or releases of waste; construction materials and the area immediately surrounding the externally accessible portion of the tank system, to detect erosion, or signs of releases of dangerous waste. NOTE: All areas within the Process Enclosure process area are viewed through cameras. If the camera system is inoperable, daily inspection of leak detection data will be performed
Tank labeling	N/A	Annual	Problem: Label/sign not present, falling off, or unreadable. Check for tank sign/major risk labels
Waste Feed	Pressure Indicating Transmitter POR655-WP-PIT-310	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.

Table I.1. Inspection Schedule

Description	Instrumentation	Frequency[1]	Type of Problem/Evaluation Criteria
Filter POR655-WP-FLT-325A	Pressure Indicator POR655-WP-PI-334A	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.
Filter POR655-WP-FLT-325B	Pressure Indicator POR655-WP-PI-334B	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.
IXC POR655-WP-IX-400A	Pressure Indicator POR655-WP-PIT-426A	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.
IXC POR655-WP-IX-400B	Pressure Indicator POR655-WP-PIT-426B	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.
IXC POR655-WP-IX-400C	Pressure Indicator POR655-WP-PIT-426C	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.
Delay Tank POR655-WP-TK-550	Pressure Indicator POR655-WP-PIT-558	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.
LAW Flow	Flow Indicator POR655-WP-FIT-309	Daily	Problem: Operating pressure out of acceptable range. Verify pressure is within acceptable range.
TSCR Waste Processing	Leak Alarm LDA-618	Daily	Problem: Process Area leak alarm received at TSCR Control Enclosure Verify no leak alarm for waste processing; or daily visually check during waste processing by camera inspection.
TSCR Waste Processing	Leak Alarm LAHH-610	Daily	Problem: Leak alarm received at TSCR Control Enclosure. Verify no leak alarm for waste processing.
HIHTL from 241-AP-107 to TSCR HIHTL-AP107-SN-103	Leak alarm LDAH-001	Daily	Problem: Leak alarm received at the TSCR Control Enclosure. Verify no leak alarm for HIHTL; or daily visually check during waste transfers by visual check for no liquid in AP-07F Pump Pit.
HIHTL from 241-AP-107 to TSCR HIHTL-AP107-SN-103	Radiological detector and visual.	Once during IXC change-out.	Problem: Radiological or visual indication of a leak. Verify no indication of a leak along HIHTL.
HIHTL from TSCR to 241-AP-107 HIHTL-AP107-SN-102	Leak alarm LDAH-001	Daily	Problem: Leak alarm received at the TSCR Control Enclosure. Verify no leak alarm for HIHTL; or daily visually check during waste transfers by visual check for no liquid in AP-07F Pump Pit.
HIHTL from TSCR to 241-AP-107 HIHTL-AP107-SN-102	Radiological detector and visual.	Once during IXC change-out.	Problem: Radiological or visual indication of a leak. Verify no indication of a leak along HIHTL.

Table I.1. Inspection Schedule

Description	Instrumentation	Frequency[1]	Type of Problem/Evaluation Criteria
HIHTL from TSCR to 241-AP-106 HIHTL-AP106-SN-101	Leak alarm LDAH-001	Daily	Problem: Leak alarm received at the TSCR Control Enclosure. Verify no leak alarm for HIHTL
HIHTL from TSCR to 241-AP-106 HIHTL-AP106-SN-101	Radiological detector and visual.	Once during IXC change-out.	Problem: Radiological or visual indication of a leak. Verify no indication of a leak along HIHTL.
HIHTL from TSCR to 241-AP-108 HIHTL-AP108-SN-104	Leak alarm LDAH-001	Daily	Problem: Leak alarm received at the TSCR Control Enclosure. Verify no leak alarm for HIHTL
HIHTL from TSCR to 241-AP-108 HIHTL-AP108-SN-104	Radiological detector and visual.	Once during IXC change-out.	Problem: Radiological or visual indication of a leak. Verify no indication of a leak along HIHTL.
HIHTL from TSCR to 241-AP-108 HIHTL-AP108-SN-105	Leak alarm LDAH-001	Daily	Problem: Leak alarm received at the TSCR Control Enclosure. Verify no leak alarm for HIHTL
HIHTL from TSCR to 241-AP-108 HIHTL-AP108-SN-105	Radiological detector and visual.	Once during IXC change-out.	Problem: Radiological or visual indication of a leak. Verify no indication of a leak along HIHTL.
Security Equipment			
Posted warning signs	N/A	Annual	Problem: Damaged, faded, or missing hazardous waste warning signs. Verify warning signs are posted in locations identified in Addendum E, Security, and that signs are readable, and not damaged.
Doors/gates	N/A	Daily	Problem: Open when facility is unattended Verify TSCR Process Enclosure exterior doors, and access gates are locked when not staffed. Verify the IXC storage area access gates are locked when not staffed. Lock doors/gates as appropriate.
Fencing	N/A	Monthly	Problem: Damaged security fence Verify fence is intact with no unexpected openings (see Addendum E, Security), and check for accumulated debris (e.g., tumbleweeds).
Safety and Communication Equipment			
Spill response kits	N/A	Monthly	Problem: Tamper seal is broken Verify tamper seal is not broken. If the seal is broken, inventory the spill response kit contents, and affix new seal after inventory check/restocking
2-way portable radios	N/A	Quarterly	Problem: Portable radios are not operational Verify that portable radios are operational by performing radio check

Table I.1. Inspection Schedule

Description	Instrumentation	Frequency[1]	Type of Problem/Evaluation Criteria
Eye wash stations	N/A	Monthly	Problem: Inadequate pressure, obstructions around and in front of eyewash station Check for adequate pressure, and no obstructions
Safety showers	N/A	Monthly	Problem: Inadequate pressure, obstructions around and in front of safety shower Check for adequate pressure, and no obstructions
Emergency Equipment			
Fire suppression systems	N/A	Annual	Problem: Pressures below operable range, gauges not calibrated Hanford Fire Department verify annual inspection is performed by qualified inspector [WAC 173-303-395(1)(d)], annual service completed, and pressures within tolerance.
Fire Extinguishers	N/A	Monthly	Problem: Missing fire extinguisher, or inadequate pressure. Verify fire extinguishers are in proper location, and that the fire extinguishers at adequate pressure for use.

Note1: Equipment locations are provided within the facility operating/inspection logs.

Note 2: Note 2: Pipe-in-Pipe transfer lines are included in the LAWPS OUG permit application for design and installation only because there is not final status permit for the DST OUG. It is anticipated for operations that these transfer lines will be transferred to a different final status OUG. Inspection of these lines will be performed by the OUG they are assigned to for operation in a future permit modification.

[1] Unless otherwise noted, inspection frequencies are defined in Section I.1.

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ADDENDUM J
CONTINGENCY PLAN

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ADDENDUM J
CONTINGENCY PLAN

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J. CONTINGENCY PLAN

The requirements for a contingency plan at the Tank Side Cesium Removal (TSCR) system are satisfied in the following documents: portions of Hanford Facility Permit (Permit) Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), the TSCR Building Emergency Plan, and this Addendum.

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

Table J.1 identifies the sections of the unit specific building emergency plan written to meet WAC 173-303-350(3) contingency plan requirements. In addition, Section 12.0 of the unit specific building emergency plan is written to meet WAC 173-303 requirements identifying where copies of Hanford Facility Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and the building emergency plan are located and maintained on the Hanford Facility. Therefore, revisions to Addendum J, Table J.1 require a modification subject to WAC 173-303-830 and/or Hanford Facility Permit Condition I.C.3.

A TSCR Building Emergency Plan will be provided prior to receipt of waste to demonstrate compliance with WAC 173-303-340, Preparedness and Prevention; WAC 173-303-350, Contingency Plan and Emergency Procedures; and WAC 173-303-360, Emergencies.

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3)

Requirement	Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02)	Building Emergency Plan[1]	Part III, OU-1, LAWPS, Addendum J
-350(3)(a) – A description of the actions, which facility personnel must take to comply with this section and WAC 173-303-360.	X[2] Section 1.3.4	X[2]	X[2] Sections J.3.1, J.3.2, through J.3.2.5, and J.3.3[3] Sections J.3, J.3.4, J.3.5, J.3.6, and J.5
-350(3)(b) – A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370(5), Manifest system, reasons for not accepting dangerous waste shipments.	X[2,4] Section 1.3.4		
-350(3)(c) – A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4).	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1		

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3)

Requirement	Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02)	Building Emergency Plan[1]	Part III, OU-1, LAWPS, Addendum J
-350(3)(d) – A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810(14)(a)(I)), rather than as part of the permit application.		X[5]	X[5] Sections J.2 and J.7
-350(3)(e) – A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.		X	X Section J.4
-350(3)(f) – An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	X[6] Figure 7-3 and Table 5-1	X[7]	X[7] Section J.1

An "X" indicates requirement applies.

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

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

[3] Sections J.1, J.2 through J.2.5, and J.3 of the building emergency plan are those sections subject to the Class 2 "Changes in emergency procedures (i.e., spill or release response procedures)" described in WAC 173-303-830, Appendix I, Section B.6.a.

[4] This requirement only applies to TSD units, which receive shipment of dangerous or mixed waste defined as off-site shipments in accordance with WAC 173-303.

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

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

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

J.1 Building Evacuation Routing

A Building Emergency Plan will be developed and will include identification of the primary and secondary staging areas and a general layout of TSCR facilities. Alternate evacuation routes will be used on a case-by-case basis based on meteorological conditions at the time of the event.

J.2 Building Emergency Director

Emergency response will be directed by the Building Emergency Director (BED) until the Incident Commander (IC) arrives. The Incident Command System and staff with supporting on-call personnel fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360.

During events, personnel perform response duties under the direction of the BED. The Incident Command Post (ICP) is managed by the senior Hanford Fire Department official, unless the event is determined to be a security event, in which case the Hanford Fire Department and Hanford Patrol will operate under a unified command system with Hanford Patrol making all decisions pertaining to security. These individuals are designated as the IC and as such, have the authority to request and obtain resources necessary for protecting people and the environment. The BED becomes a member of the ICP and functions under the direction of the IC. In this role, the BED continues to manage and direct TSCR operations.

The BED and alternate BED by work location, and work telephone numbers is contained in Section J.7 Facility/Building Emergency Response Organization (ERO). The BED is available through an "on-call" list 24 hours a day. Names and home telephone numbers of the BEDs are available from the Patrol Operations Center (POC) in accordance with Hanford Facility Permit Condition II.A.4.

J.3 Implementation of the Plan

In accordance with WAC 173-303-360(2)(b) the BED ensures that trained personnel identify the character, source, amount, and areal extent of a 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 tank systems and containers, sampling activities in the field, reference to inventory records, or by consulting with facility personnel. Sampling will be accomplished by qualified personnel and analyzed appropriately. These activities will be performed as soon as practical and shall include all available information.

The BED shall use the following guidelines to determine if an event has met the requirements of WAC 173-303-360(2)(d):

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 TSCR or transportation activity subject to RCRA contingency planning requirements,

AND

3. Time urgent response from an emergency services organization was required to mitigate the event or a threat to human health or the environment exists.

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

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

The BED must assess each incident to determine the response necessary to protect the personnel, facility, and the environment. If assistance from Hanford Patrol, Hanford Fire Department, or ambulance units is required, staff are trained to use the Hanford Emergency Response Number (911 from site office phones/373-0911 from cellular phones) to contact the POC and request the desired assistance.

J.3.1 Protective Actions 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 nature of incident events.

J.3.1.1 Evacuation

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 as well as evacuation of the facility in response to a site evacuation order. Evacuation will be directed by the BED when conditions warrant and will apply to all personnel not actively involved in the event response or emergency plan related activities.

The BED will initiate the evacuation by directing an announcement be made to evacuate along with the evacuation location over a public address system, facility radios, and, as conditions warrant, by activating the 200 Area site evacuation alarms by calling the POC using 911 from site office phones/373-0911 from cellular phones. Personnel proceed to a predetermined staging area, or other safe upwind location, as determined by the BED. The BED will determine the operating configuration of the facility and identify any additional protective actions to limit personnel exposure to the hazard.

Emergency organization personnel or assigned operations personnel will conduct a sweep of occupied buildings to ensure that all non-essential personnel and visitors have evacuated. For an immediate evacuation, accountability will be performed at the staging area. The BED will assign personnel as accountability aides and staging managers with the responsibility to ensure that evacuation actions are taken at all TSCR buildings. All implementing actions executed by the aides/managers are directed by the emergency response procedures. When evacuation actions are complete, the aides/managers will provide a status report to the BED. The BED will provide status to the IC.

J.3.1.2 Take Cover

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

The BED will initiate the take cover by directing an announcement be made over the public address system, facility radios, and, as conditions warrant, by activating the 200 Area site take cover alarms by calling the POC using 911 from site office phones/373-0911 from cellular phones). Actions to complete a facility take-cover will be directed by the emergency response procedure. Protective actions associated with operations include configuring, or shutting down, ventilation systems serving occupied portions of the facility. Determination of additional take cover response is based on plant operating configuration, weather conditions, amount and duration of release, and other conditions, as applicable to the event and associated hazard. The BED will assign personnel as accountability aides with responsibility to ensure that take-cover actions are taken at the single occupied building at the TSCR, which is the Control Enclosure. All implementing actions executed by the aides/managers are directed by the emergency response procedure. When take cover actions are complete, the aides/manager will provide the BED with a status report.

J.3.2 Response to Facility Operations Emergencies

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

J.3.2.1 Loss of Utilities

An evaluation of each event is required to determine the impacts due to loss of utility services. When a 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 BED will stop operations as appropriate and take appropriate actions until the utility is restored.

J.3.2.2 Major Process Disruption/Loss of Plant Control

A hazards assessment will confirm that design features prevent this occurrence from posing significant risk to human health or the environment.

J.3.2.3 Pressure Release

A hazards assessment will confirm that design features prevent a pressure release from posing a significant risk to human health or the environment. Hazardous material release and dangerous/mixed waste releases are addressed in Section J.3.2.5.

J.3.2.4 Fire and/or Explosion

The individual discovering a fire will activate the fire alarm (pull box); call 911 from site office phones/373-0911 from cellular phones or verifies that the Hanford Emergency Response Number has been called. Automatic initiation of a fire alarm (through the smoke detectors, suppression systems, or pull boxes) is also possible.

- Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit and proceed to the designated staging area for accountability.
- On activation of the fire alarm, ONLY if time permits, personnel should shut down equipment, and secure waste. The alarm automatically signals the Hanford Fire Department.
- The BED proceeds directly to the ICP, obtains all necessary information pertaining to the incident, and sends a representative to meet Hanford Fire Department.
- The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- The 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 fire, the 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 TSCR regarding fitness for use.

J.3.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill

Spills can result from many sources including process leaks, equipment malfunction, container spills or leaks, damaged packages or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the additional hazards posed by the presence of Atomic Energy Act radioactive materials. Spill controls include secondary containment systems, dedicated spill control sumps, remote gauges, and level indicators. Contractor procedures provide alarm response and maintenance requirements for leak detection equipment, surveillance of possible leak locations, and response actions for detected spills.

In the event of a spill:

- The discoverer notifies BED and initiates SWIM response:
  Stops work
  Warns others in the vicinity
  Isolates the area
  Minimizes the exposure to the hazards
- If Operations are stopped, the BED ensures that the plant is put in a safe shutdown configuration.
- The BED determines if emergency conditions exist requiring response from the Hanford Fire Department based on classification of the spill and injured personnel, and evaluates need to perform additional protective actions.
- If the Hanford Fire Department resources are not needed, the spill is mitigated with resources identified in Section J.4 of this plan and proper notifications are made.
- If the Hanford Fire Department resources are needed, the BED calls 911 from site office phones/373-0911 from cellular phones.
- The BED sends a representative to meet the Hanford Fire Department.
- The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- The 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 spill, the BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
- Hanford Fire Department stabilizes the spill.

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

J.3.2.5.1 Damaged, or Unacceptable Shipments

The TSCR does not receive dangerous or mixed waste shipments that require manifesting.

J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The BED, as part of the Incident Command System, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The BED will take measures, where applicable, to stop processes and operations, collect and contain released waste, and remove or isolate containers. The BED, with the assistance of Hazard Communication Assessors also monitors for leaks, pressure buildups, gas generation, or ruptures in valves, pipes, or other equipment, whenever this is appropriate.

J.3.4 Incident Recovery and Restart of Operations

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

If the incident recovery plan was implemented according to Section J.3 of this plan, Ecology is notified before operations can resume. The Hanford Facility Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 5.1 discusses different reports to outside agencies. This notification is in addition to those required reports and includes the following statements:

- There are no incompatibility issues with the waste and released materials from the incident.
- All the equipment has been cleaned (if necessary), determined to be fit for its intended use, and placed back into service.

The notification required by WAC 173-303-360(2)(j) and WAC 173-303-640(7)(d)(i) may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions will be included in the required 15-day report identified in Section J.5 of this plan.

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

J.3.5 Incompatible Waste

After an event, the 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. Cleanup actions are taken by TSCR personnel or other assigned personnel. Hanford Facility Permit Attachment 4, *Hanford Emergency Management Plan*, (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 before storage is performed as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in storage areas appropriate for their compatibility class.

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

J.3.6 Post Emergency Equipment Maintenance and Decontamination

All equipment used during an incident is decontaminated (if practicable) or disposed of as cleanup debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumable and disposed materials are restocked. Fire extinguishers are replaced as necessary.

The BED ensures that all equipment is cleaned and fit for its intended use, or replaced before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished.

J.4 Emergency Equipment

Emergency resources and equipment for the TSCR are presented in the following tables.

Table J.2. Fixed and Portable Emergency Equipment

Type	Location	Capability
Safety shower/ eyewash stations	Adjacent to the Ancillary Enclosure.	Assist in flushing chemicals/ materials from the body and/ or eyes and face of personnel.
Fire alarm pull boxes	Within Process, Ancillary, and Control Enclosures.	Activate the local fire alarm and notifies the HFD.
Emergency lights	Within the Process Enclosure.	1-hour temporary lighting.
Fire suppression skid	Within the Ancillary Enclosure	Fire suppression.
Fire extinguishers	Within cabinets outside the Process Enclosure, Control Enclosure, and Ancillary Enclosure exit doors.	Assist in fire suppression.

Table J.3. Communications Equipment/Warning Systems

Type	Location	Capability
Fire alarms	Annunciators located fixed external 241-AP Farm locations.	Audible throughout TSCR facilities.
Take cover/evacuation	Annunciators located fixed external 241-AP Farm locations.	Audible throughout TSCR facilities.
Public address system	Annunciators located fixed external 241-AP Farm locations.	Audible throughout TSCR facilities.
Portable radios	Operations and maintenance personnel	Communication between work teams and the TSCR Control Enclosure.
Telephone	Control Enclosure and change trailer.	Internal and external communications. Allows notification of outside resources (POC, HFD, Hanford Patrol, etc.

Note: Sitewide communications and warning systems are identified in Hanford Facility Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Table 5.1.

Table J.4. Spill Control and Containment Supplies

Spill Kits And Spill Control Equipment		
Type	**Location**	**Capability**
Spill response supplies	Ancillary Enclosure area.	Support containment and cleanup of hazardous material spills
Spill response cabinet	Ancillary Enclosure area.	Support equipment for spill response

J.4.1 Incident Command Post

If the ICP is activated, the BED will notify appropriate personnel of its location by either the public address system, radios, or telephones. Emergency resource materials are stored at that location or can be brought to an alternative location. The IC could activate the Hanford Fire Department Mobile Command Unit if necessary.

J.5 Required Reports

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

Facility management must note in the Treatment, Storage, and Disposal Unit operating record, the time, date and details of any incident that requires implementation of the contingency plan (refer to Section J.3). Within fifteen (15) days after the incident, a written report must be submitted to Ecology. The report must include the elements specified in WAC 173-303-360(2)(k) and WAC 173-303-640(7)(d)(ii).

J.6 Plan Location and Amendments

Copies of this plan are maintained at the Central Shift Office and TSCR Control Enclosure, both located in 200 East Area. This plan will be periodically reviewed and immediately amended as necessary, in accordance with Hanford Facility Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 14.3.1.1.

J.7 Facility/Building Emergency Response Organization

TSCR Building Emergency Directors		
Title	**Work Location**	**Work Phone**
Primary/Alternate	Central Shift Manager	200 Areas, Central Shift Office 373-2689

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

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Attachment 3
20-ECD-0019

U.S. Department of Energy, Office of River Protection, and
Washington River Protection Solutions LLC Certification Statements

(3 Pages Including Cover Sheet)

Office of River Protection Certification

The following certification statement is provided for the submittal of additional technical and design details supporting updated information for Hanford Facility Dangerous Waste Part B Permit Application, Low Activity Waste Pretreatment System, DOE/ORP-2018-02, Revision 1.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

Brian Vance, Manager Date

Office of River Protection

Washington River Protection Solutions LLC Certification

The following certification statement is provided for the submittal of additional technical and design details supporting updated information for Hanford Facility Dangerous Waste Part B Permit Application, Low Activity Waste Pretreatment System, DOE/ORP-2018-02, Revision 1.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

April 9, 2020

John R. Eschenberg
President and Project Manager
Washington River Protection Solutions LLC

Date