

## U.S. Department of Energy

Hanford Field Office  
P.O. Box 550  
Richland, Washington 99352

April 10, 2025

25-TWO-0052

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

Dear Ms. Schlieff:

THE U.S. DEPARTMENT OF ENERGY, HANFORD FIELD OFFICE RESPONSE TO LETTER 25-NWP-028 FROM THE WASHINGTON STATE DEPARTMENT OF ECOLOGY AND TRANSMITTAL OF RPP-RPT-61684, "MAINTENANCE AND PERFORMANCE MONITORING PLAN FOR THE INTERIM SURFACE BARRIERS PROGRAM," REV. 5A

- References:
- (1) Ecology letter from J. J. Lyon to R. Bang, HFO, "Transmittal of the Department of Ecology's Review Comment Record (RCR) for the T Tank Farm Interim Surface Barrier Design and the 'Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program,' RPP-RPT-61684, Rev. 4A," 25-NWP-028, dated February 19, 2025.
  - (2) HFO letter from D. L. Noyes to S. N. Schlieff, Ecology, "The U.S. Department of Energy, Hanford Field Office Submittal of the T Tank Farm Interim Surface Barrier Design and RPP-RPT-61684, 'Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program,' Rev. 4A," 24-TWO-0167, dated December 12, 2024.

This letter transmits the updated RPP-RPT-61684, "Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program," Rev. 5A, and responses to comments provided in Washington State Department of Ecology (Ecology) letter 25-NWP-028.

In accordance with the requirements set forth in Agreed Order Docket No. 21304, Section V.D.2.i, a day-for-day slip in completing construction of the T Tank Farm interim surface barrier will be given for each day construction is not authorized following three months after submittal of the interim surface barrier design. The day-for-day slip in completing construction of the barrier began on March 12, 2025, three months after submittal of the interim surface barrier design with letter 24-TWO-0167. The U.S. Department of Energy, Hanford Field Office requests Ecology authorize construction by approving the previously submitted T Tank Farm interim surface barrier design and updated Maintenance and Performance Monitoring Plan, Rev. 5A, as soon as practicable to avoid further delays.

Ms. Stephanie Schlieff  
25-TWO-0052

-2-

April 10, 2025

If you have any questions, please contact me, or you may contact Ricky Bang, Deputy Assistant Manager, Tank Waste Operations, at (509) 376-4151.

Sincerely,

Delmar L.  
Noyes

Digitally signed by Delmar  
L. Noyes  
Date: 2025.04.10  
15:33:11 -07'00'

Delmar L. Noyes, Assistant Manager  
Tank Waste Operations

TWO:RIB

Attachments:

1. RPP-RPT-61684 Rev. 5A
2. Review Comment Record

cc w/attach:

S. P. Anderson, H2C  
S. L. Brasher, HMIS  
C. Buck, Wanapum  
L. C. Buelow, EPA  
C. E. Cameron, EPA  
L. Contreras, YN  
S. L. Dahl-Crumpler, Ecology  
S. A. Davis, BNI  
D. R. Einan, EPA  
E. Holbrook, Ecology  
M. E. Jones, BNI  
D. L. Klages, H2C  
M. T. Levitt, H2C  
K. McCallum, BNI  
K. R. McNeel, H2C  
A. G. Miskho, H2C

M. R. Mullin, EPA  
M. Murphy, CTUIR  
C. J. Nelson, H2C  
K. M. Roberts, H2C  
E. A. Rochette, Ecology  
G. D. Roosendaal, H2C  
T. E. Sackett, H2C  
A. Smith, NPT  
J. H. Temple, Ecology  
M. J. Turner, HMIS  
M. Woods, ODOE  
J. L. Wunneburger, H2C  
Administrative Record (TSD: H-0-8)  
Environmental Portal  
HF Operating Record (J. K. Perry, HMIS)  
H2C Correspondence

Attachment 1  
25-TWO-0052

RPP-RPT-61684 Rev. 5A

(35 pages including cover sheet)

<b>DOCUMENT RELEASE AND CHANGE FORM</b>				<b>Release Stamp</b>																									
Prepared For the U.S. Department of Energy, Assistant Secretary for Environmental Management By Hanford Tank Waste Operations & Closure LLC, (H2C) Contractor For U.S. Department of Energy, Hanford Field Office  TRADEMARK DISCLAIMER: Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof or its contractors or subcontractors. Printed in the United States of America.				<div style="border: 2px solid red; padding: 10px; display: inline-block;"> <p style="color: red; font-weight: bold; font-size: 1.2em;">DATE:</p> <p style="color: red; font-size: 1.5em; margin-top: 5px;">Apr 10, 2025</p> </div> <p style="color: black; font-weight: bold; margin-top: 20px;">Clearance Review Restriction Type:</p> <p style="text-align: center;">Approved for Public Release</p>																									
<b>1. Doc No:</b> RPP-RPT-61684 <b>Rev.</b> 05A																													
<b>2. Title:</b> Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program																													
<b>3. Project Number:</b> <input checked="" type="checkbox"/> N/A		<b>4. Design Verification Required:</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																											
<b>5. USQ Number:</b> <input checked="" type="checkbox"/> N/A RPP-27195		<b>6. PrHA Number</b> <b>Rev.</b> <input checked="" type="checkbox"/> N/A																											
<b>7. Approvals</b> <table border="1" style="width:100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th style="width: 30%;">Title</th> <th style="width: 30%;">Name</th> <th style="width: 30%;">Signature</th> <th style="width: 10%;">Date</th> </tr> </thead> <tbody> <tr> <td>Clearance Review</td> <td>Moyer, Heather L</td> <td><i>Moyer, Heather L</i></td> <td>04/10/2025</td> </tr> <tr> <td>Document Control Approval</td> <td>Sandoval, Sierra D</td> <td><i>Sandoval, Sierra D</i></td> <td>04/10/2025</td> </tr> <tr> <td>Originator</td> <td>Nelson, Carly J</td> <td><i>Nelson, Carly J</i></td> <td>04/09/2025</td> </tr> <tr> <td>Other Approver</td> <td>Roberts, Katie M</td> <td><i>Roberts, Katie M</i></td> <td>04/09/2025</td> </tr> <tr> <td>Responsible Manager</td> <td>Levitt, Marc T</td> <td><i>Levitt, Marc T</i></td> <td>04/09/2025</td> </tr> </tbody> </table>						Title	Name	Signature	Date	Clearance Review	Moyer, Heather L	<i>Moyer, Heather L</i>	04/10/2025	Document Control Approval	Sandoval, Sierra D	<i>Sandoval, Sierra D</i>	04/10/2025	Originator	Nelson, Carly J	<i>Nelson, Carly J</i>	04/09/2025	Other Approver	Roberts, Katie M	<i>Roberts, Katie M</i>	04/09/2025	Responsible Manager	Levitt, Marc T	<i>Levitt, Marc T</i>	04/09/2025
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<b>8. Description of Change and Justification</b> REV-0: Initial issue REV-1: Complete revision to include new outline and additional monitoring updates REV-2: Incorporates Dept. of Ecology comments from letter 20-NWP-159 Rev-3 Updated Plan to incorporate U Barrier monitoring as required for the TPA milestone M-045-92. Also in FY 21, RPP-9937 was revised and data collection intervals for leak monitoring changed, thus impacting this document. Rev-3A: Updated Rev. 3 to incorporate Ecology comments from letter 22-NWP-037 and the change from the problem evaluation request system to the condition reporting and resolution system. Rev 3B: Address Ecology comments from letter 23-NWP-038, regarding "version history," clarified the Scope of the report in Section 2.0, and modified references to "barriers" to be "interim surface barriers" or "ISBs." Rev 4: Incorporate new section for the completion of the U farm interim surface barrier and perform editorial updates. -Update instrument functionality. -Rearrange document to eliminate redundant sections. -Add language to remove subsurface monitoring from T Farm Barrier and remove T Farm subsurface monitoring sections. Rev. 4A: Add clarifying information to the inspection and maintenance sections. Add new section for roles and responsibilities. Rev. 5: Incorporate new section for B farm interim surface barrier. Rev. 5A: - Incorporated comments received from the Washington State Department of Ecology via letter 25-NWP-028 on Rev. 4A. Note: Description updates to Summary of Changes for 3A, 3B, 4, 4A, and 5 have been added in response to Ecology comments and to provide additional clarity. *Revision 4 was not submitted to Ecology*																													
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<b>14. Distribution</b>		
<b>Name</b>	<b>Organization</b>	
Blyther, Joshua D	OPS SUPPORT & STE	
Callison, Stacey W	ENV PROG REPRTG & TECH SUPPORT	
Decker, Jay S	CLOSURE REGULATORY	
Dobson, Jared R	A/AN/AX/AY/AZ TEAM	
Klages, Deanna L	CLOSURE REGULATORY	
Kubicki, Christopher W	CLOSURE RISK & PERF ASSESSMENT	
Levitt, Marc T	CLOSURE & INTERIM MEASURES	
Miskho, Anthony (Tony)	ENVIRONMENTAL REG ASSURANCE	
Nelson, Carly J	CLOSURE REGULATORY	
Purvis, Andrew H	WEST AREA OPERATIONS	
Roberts, Katie M	ENVIRONMENTAL REG ASSURANCE	
Schanke, Mark T	ENV PROG REPRTG & TECH SUPPORT	
Yokuda, Eileen	OPS SUPPORT & STE	

**RPP-RPT-61684  
Revision 5A**

# Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program

**Prepared by**

**C. J. Nelson**  
Hanford Tank Waste Operations & Closure, LLC (H2C)

Date Published  
April 2025



Prepared for the U.S. Department of Energy  
Hanford Field Office

Contract No. 89303324DEM000096

**Approved for Public Release;  
Further Dissemination Unlimited**

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**LIST OF TERMS****Abbreviations and Acronyms**

DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
HDU	heat dissipation unit
HFFACO	Hanford Federal Facility Agreement and Consent Order
HFO	DOE Hanford Field Office
ISB	interim surface barrier
SST	single-shell tank
WMA	Waste Management Area

**Units**

cm	centimeter
ft	foot
ft <sup>2</sup>	square feet
gal	gallon
in.	inch
L	liter
m	meter

## RPP-RPT-61684, Rev. 5A

**VERSION HISTORY**

<b>Rev.</b>	<b>Author</b>	<b>Date</b>	<b>Summary of Changes</b>
Rev. 00A	A. Pappas	Sept 2019	n/a
Rev. 1	M. LaMothe	July 2020	Incorporated comments received from the Washington State Department of Ecology via letter 20-NWP-106. Changes included: <ul style="list-style-type: none"> <li>- Complete revision included a new outline</li> <li>- Additional monitoring updates</li> </ul>
Rev. 2	M. LaMothe	Nov 2020	Incorporated comments received from the Washington State Department of Ecology via letter 20-NWP-159. Changes included: <ul style="list-style-type: none"> <li>- Editorial</li> <li>- Scope clarifications and changed present tense to future tense</li> <li>- Added photos/figures</li> <li>- Removed Appendix A and made a separate report titled “Annual Interim Surface Barriers Maintenance and Performance Monitoring Report”</li> <li>- Deleted “conclusion” section. Added “Research completed to evaluate new monitoring technologies” section.</li> </ul>
Rev. 3	M. LaMothe	June 2021	Updated and revised with submittal of the U Tank Farm interim surface barrier design. Changes included: <ul style="list-style-type: none"> <li>- TX Tank Farm interim surface barrier monitoring, surveillance and maintenance expectations were added.</li> <li>- U Tank Farm interim surface barrier summary and monitoring, surveillance and maintenance expectations were added.</li> <li>- Updated sections pertaining to monitoring requirements stated in RPP-9937 Rev. 4 <i>Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document</i>.</li> <li>- Updated instrument functionality.</li> <li>- Updated tank leak assessments performed in fiscal year 2020.</li> </ul>

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Rev.	Author	Date	Summary of Changes
Rev. 3A	M. LaMothe	May 2022	<p>Incorporated comments received from the Washington State Department of Ecology via letter 22-NWP-037. Changes included:</p> <ul style="list-style-type: none"> <li>- Updated Objectives and Scope to state reason for revision, the objectives of each interim surface barrier installed in the tank farms, clarified the scope of the plan,</li> <li>- Updated figures to show interim surface barriers located inside farm fence lines, what tanks each interim surface barrier covers, and the new interim surface barrier over TX Farm.</li> <li>- Updated problem evaluation request system references to the new condition reporting and resolution system</li> </ul>
Rev. 3B	M. LaMothe	April 2023	<p>Incorporated comments received from the Washington State Department of Ecology via letter 23-NWP-038. Changes included:</p> <ul style="list-style-type: none"> <li>- Added reference to this “Version History” table in Section 2 paragraph 2 to address comment 1 in the RCR.</li> <li>- To address comment 4, revised Section 2 paragraph 3 to state, “This plan provides an overview of each tank farm with an interim surface barrier and how the systematic inspections and maintenance walkdowns are carried out at each location. Additionally, the plan details performance monitoring used to evaluate interim surface barrier performance and meet expectations stated in HFFACO Milestone M-045-92. The list of activities discussed in this maintenance and performance monitoring plan include nest station moisture monitoring, leak detection, intrusion monitoring, drywell logging, tank leak assessments, and annual reporting on ISB data and findings.”</li> <li>- Changed interim barrier to interim surface barrier or ISB</li> <li>- Revised title to be “<i>Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program</i>”</li> </ul>

## RPP-RPT-61684, Rev. 5A

<b>Rev.</b>	<b>Author</b>	<b>Date</b>	<b>Summary of Changes</b>
Rev. 4*	C. Nelson	May 2024	<p>Updated and revised in anticipation of submittal of the T Tank Farm interim surface barrier design. Changes included:</p> <ul style="list-style-type: none"> <li>- Incorporate new section for the completion of the U farm interim surface barrier and perform editorial updates.</li> <li>- Update instrument functionality.</li> <li>- Rearrange document to eliminate redundant sections.</li> <li>- Added language to remove subsurface monitoring from the T Tank Farm interim surface barrier and remove T Tank Farm subsurface monitoring sections.</li> </ul> <p>*Rev. 4 was not submitted or approved by Department of Ecology, as it was determined additional changes needed to be made in a Rev. 4A prior to submittal.</p>
Rev. 4A	C. Nelson	October 2024	<p>Updated and revised with submittal of the T Tank Farm interim surface barrier design. Changes included:</p> <ul style="list-style-type: none"> <li>- Added clarifying information to the inspection and maintenance sections.</li> <li>- Added new section for roles and responsibilities.</li> </ul>
Rev. 5	C. Nelson	January 2025	<p>Updated and revised with submittal of the B Tank Farm interim surface barrier design. Changes included:</p> <ul style="list-style-type: none"> <li>- Incorporated new section for B Tank Farm interim surface barrier</li> </ul>
Rev. 5A	C. Nelson	April 2025	<p>Incorporated comments received from the Washington State Department of Ecology via letter 25-NWP-028 on Rev. 4A.</p> <p>Note: Description updates to Summary of Changes for 3A, 3B, 4, 4A, and 5 have been added in response to Ecology comments and to provide additional clarity.</p>

## RPP-RPT-61684, Rev. 5A

### **1.0 BACKGROUND AND OBJECTIVES OF INTERIM SURFACE BARRIERS PROGRAM**

#### **1.1 INTERIM SURFACE BARRIERS BACKGROUND**

The Hanford Site, located in southeastern Washington State, has 149 underground single-shell tanks (SST) that store chemical and radioactive waste. The 149 SSTs are separated into smaller groups of tanks referred to as tank farms.

The SST farms have varying levels of contamination due to tank leaks, surface spills, cascade line leaks, spare inlet leaks due to tank overflows, or other release mechanisms. The location and degree of contamination is dependent on the specific SST farm. Each tank farm was prioritized for interim surface barriers (ISB) using a list of criteria stated in RPP-ENV-41309, *Criteria for Prioritizing Hanford Site Tank Farm Interim Surface Barriers and for Evaluating Their Performance*, to minimize the impact of surface precipitation in driving contaminant movement toward groundwater.

In addition to the ISBs, the DOE Hanford Field Office (HFO) operates an extensive groundwater treatment and control process to mitigate and minimize the impact of tank farm leaks and waste disposal activities that occurred outside the tank farms to the groundwater. The ISBs are a groundwater contamination mitigation measure that supplements the robust groundwater pump and treat program that operates at the Hanford Site.

The ISB monitoring and modeling results published in RPP-RPT-47123, *Interim Surface Barrier Evaluation Report*, and RPP-33431, *Design Analysis for T-Farm Interim Surface Barrier (TISB)*, Section 8, “Performance Simulations of an Interim Surface Barrier over the 241-T-106 Tank Release,” showed that ISBs are effective at reducing the impacts of vadose zone contamination to the unconfined aquifer. The ISBs slow migration of mobile contaminants and extends the migration to groundwater over a longer period of time. A limitation of ISBs is that the impact of an ISB in mitigating contaminant migration downward through the vadose zone diminishes with depth. The further below ground the contamination is located, the longer it will take for an ISB to impact that contaminant’s migration. There exists a maximum depth at which ISBs are no longer effective at impacting the contaminant migration. The model results indicate that this depth is different in each tank farm, and that it is based on factors such as soil properties, depth of the waste, and contaminant properties (i.e., mobility).

#### **1.2 INTERIM SURFACE BARRIERS PURPOSE AND DESIGN FUNCTION**

The primary objective and intended purpose of the ISB program is to slow the mobility and rate of leaked tank waste from potentially migrating through the vadose zone soil and reaching groundwater. The ISB design function is to minimize the impact of infiltration (RPP-ENV-41309) by directing natural precipitation from the tank farm soil surface to designated capture and evapotranspiration basins. The ISB program’s strategic benefit is to provide an interim measure to afford additional time for developing and implementing retrieval

## RPP-RPT-61684, Rev. 5A

of SST waste, cleanup, and closure actions per the *Hanford Federal Facility Agreement and Consent Order* (HFFACO) (Ecology et. al 1989) milestones, and for constructing and operating groundwater pump and treat facilities. ISB systems can slow waste migration but cannot remove, treat, or eliminate the leaked waste or its associated hazards.

The ISBs range in size from approximately 80,000-ft<sup>2</sup> (1.8 acres) to 220,000-ft<sup>2</sup> (5.1 acres) with an average size of approximately 160,000-ft<sup>2</sup> (3.7 acres). ISBs are designed to minimize infiltration, but they do not completely eliminate infiltration within the limits of the ISB coverage over the tank structures. Very small areas within the ISB, typically less than ~2 percent, may remain uncovered as part of design to accommodate design, tank farm logistics, operations, and safety constraints. These uncovered areas range in size from approximately 1,000 to 4,500-ft<sup>2</sup>, depending on ISB location. Examples of uncovered areas, which may not comprise an all-inclusive list, include:

- Structures that are too large to cover (e.g., equipment over some 200-series tanks)
- Areas to allow for drainage off covered structures (e.g. foam-covered pits or vaults) that are below ISB grade
- Instrumentation that is routinely accessed and which cannot be covered due to height of instrumentation, size of access area, etc.
- Access areas in front of instrumentation/electrical/control buildings

In addition to the above open areas, portions of the ISBs may be temporarily uncovered to accommodate tank farm infrastructure enhancements and field work activities (e.g., installation of footers or piping infrastructure for retrieval or enhanced ventilation, vadose zone soil drilling and sampling, etc.). These areas are repaired with materials consistent with design specification after construction is completed; however, these areas may remain open during the ongoing activities.

The ISBs are not installed to prevent intrusion into the tanks and ISB systems are categorized solely as a groundwater mitigation measure that supplements the robust Hanford Site groundwater pump and treat program.

### **1.3 INTERIM SURFACE BARRIERS INSTALLATION AND OPERABILITY HISTORY**

The HFO has constructed ISBs at T Tank Farm, TY Tank Farm, SX Tank Farm, TX Tank Farm, and U Tank Farm. ISBs at TY Tank Farm, SX Tank Farm, TX Tank Farm, and U Tank Farm cover all SSTs within each farm while the ISB at T Tank Farm currently only cover Tanks 241-T-105 (T-105), 241-T-106 (T-106), 241-T-108 (T-108), and 241-T-109 (T-109).

The ISBs at T Tank Farm and TY Tank Farm were demonstration projects installed to determine if ISBs performed as expected to reduce surface water infiltration (PNNL-16538, *T Tank Farm Interim Surface Barrier Demonstration – Vadose Zone Monitoring Plan*, and PNNL-PNNL-19772, *T-TY Tank Farm Interim Surface Barrier Demonstration—Vadose Zone Monitoring Plan*). The ISB at T Tank Farm was completed in 2008, and the ISB at TY Tank Farm was completed in 2010. Following completion of the demonstration projects, ISBs were

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constructed as part of HFFACO Milestone M-045-92 at the SX Tank Farm, TX Tank Farm, and U Tank Farm. The three ISBs at SX Tank Farm were completed in 2019, the ISB at TX Tank Farm was completed in 2021, and the U Tank Farm ISB was completed in 2023.

The first ISB technology used in T Tank Farm was a spray on polyurea over a geotextile material above a layer of compacted soil. Based on lessons learned, the difficulty of construction during the T Tank Farm ISB demonstration project, and the results of the alternatives analysis presented in RPP-RPT-38323, *Tank Farm Interim Surface Barrier Materials and Runoff Alternatives Study*, the ISB technology used in TY, SX, TX, and U Tank Farms was changed to consist of a modified asphalt layer referred to as MatCon<sup>®</sup>,<sup>1</sup> over a layer of compacted soil.

The T Tank Farm ISB is still performing per design, but there have been some weather degradations to the surface; therefore, the ISB at T Tank Farm will be replaced as negotiated in the Agreed Order (Agreed Order Docket No. 21304, *In the Matter of an Administrative Order Concerning: U.S. Department of Energy*) dated August 25, 2022. The replacement ISB will replace the polyurea with MatCon<sup>®</sup> and cover all SSTs in T Tank Farm. Per the Agreed Order, the construction completion date is September 31[sic], 2028<sup>2</sup>.

As part of the Agreed Order No. 21304, B Tank Farm is the next farm to have an ISB installed after the T Tank Farm replacement ISB is installed. The B Tank Farm ISB will cover all the tanks and the material and design, including the evapotranspiration basin, and is consistent with the ISB technology used in TY, SX, TX, and U Tank Farms. Per the Agreed Order, the construction completion date is September 31[sic], 2028<sup>3</sup>.

## 2.0 SCOPE OF MAINTENANCE AND PERFORMANCE MONITORING PLAN

The maintenance and performance monitoring data, with continued Washington State Department of Ecology (Ecology) approvals to install additional ISBs, has shown that ISBs have achieved their intended purpose, design function, and strategic benefit of minimizing infiltration. These achievements have been reported under HFFACO Milestone M-045-92.

Prescriptive monitoring requirements for ISBs are not addressed in either the state dangerous waste regulations or in the design specifications for the ISBs (RPP-PLAN-48439, *241-SX Tank Farm South Interim Surface Barrier Monitoring Plan* and External letter 11-NWP-044, “Re: Completion of Two Hanford Federal Facility and Consent Order [HFFACO] M-045-92 Milestones”). Therefore, the present document describes a plan to be used at each ISB to meet the maintenance and performance monitoring requirements for ISBs stated in the HFFACO Milestone M-045-92 and to provide management direction in accordance with ISB systems intended purpose and design function. In support of the ISBs intended purpose and design function, this maintenance and performance monitoring plan addresses systematic inspections and maintenance of the ISBs to ensure their performance over their 25-year service life. It also

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<sup>1</sup> MatCon<sup>®</sup> is a registered trademark of MatCon, Inc., Maple Valley, Washington.

<sup>2</sup> A day-for-day slip in completing construction of the ISB will be given for each day construction is not authorized following three months after submittal.

<sup>3</sup> A day-for-day slip in completing construction of the ISB will be given for each day construction is not authorized following 3 months after submittal.

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addresses systematic performance monitoring of ISB systems at T Tank Farm (until removal of equipment during construction of the replacement ISB), TY Tank Farm, and SX Tank Farm.

### **2.1 ROLES AND RESPONSIBILITIES**

Multiple organizations contribute to the operation, inspection, maintenance, performance monitoring, and annual reporting of the ISB program. The roles and responsibilities for each organization is described in this section and include the Facility Owner; Technical Owner; Environmental Surveillance Owner; Performance Monitoring Owner; and the HFFACO Milestone Reporting Owner. Each organization performs tasks that encompass the ISB program.

#### **2.1.1 Facility Owner**

The Facility Owner is responsible for the overall operation and maintenance of the ISBs and the basins that collect runoff from the ISBs. The Facility Owner ensures that the inspections and maintenance work are scheduled, completed, and closed. They also provide review and support of the HFFACO Milestone M-045-92 Annual Report and the Annual M-045-56 Interim Measures meeting. The Facility Owner participates within the ISB maintenance and corrective action disposition team to evaluate ISB field inspection observations to determine maintenance needs in accordance with ISB intent and design function.

#### **2.1.2 Technical Owner**

The Technical Owner is responsible for the completion of the quarterly ISB inspections. Based on the outcome of those inspections, the Technical Owner, who is part of the ISB Maintenance and Corrective Action Disposition Team, determines if the observation is both anomalous and having potential to impact ISB intent and design function. Observations that have the potential to impact ISB intent and design will be documented and corrected through an approved database-driven corrective action reporting system. The system will track corrective action items from open to closure and resolution. The Technical Owner assists with the completion of the HFFACO Milestone M-045-92 Annual Report and the Annual M-045-56 Interim Measures meeting. The Technical Owner participates within the ISB maintenance and corrective action disposition team to evaluate ISB field inspection observations to determine maintenance needs in accordance with ISB intent and design function.

#### **2.1.3 Environmental Surveillance Owner**

The Environmental Surveillance Owner is responsible for the completion of the annual surveillance of the control measures used to minimize precipitation and snow melt from running onto the tank farms. This surveillance also includes the basins used to collect runoff from the ISBs. The environmental organization surveillances are completed on all the SSTs. Based on the outcome of those surveillances, Action Requests may be created for tracking and resolution of observations made. The Environmental Surveillance Owner participates within the ISB Maintenance and Corrective Action Disposition Team to evaluate ISB field inspection observations to determine maintenance needs in accordance with the ISBs intent and design



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function. The environmental organization will assist with the completion of the HFFACO Milestone M-045-92 Annual Report and the Annual M-045-56 Interim Measures meeting.

### **2.1.4 Performance Monitoring Owner**

The Performance Monitoring Owner is responsible for ensuring the completion of regular geophysical data collection, data analysis, and reporting in support of annual ISB performance monitoring. The Performance Monitoring Owner will support research and alternatives analysis of new or enhanced performance monitoring equipment or techniques to support future ISB design, draft any updates to the Maintenance and Performance Monitoring Plan in support of performance monitoring, and will document annual monitoring results within the HFFACO Milestone M-045-92 Annual Report.

### **2.1.5 HFFACO Milestone and Reporting Owner**

The HFFACO Milestone and Reporting Owner (HFFACO owner) is responsible for completion of HFFACO Milestones M-045-56 (Annual Interim Measures meeting) and M-045-92 (Annual Report). The HFFACO owner is responsible for producing and providing the reports and plans that satisfy the HFFACO milestones. The HFFACO owner reviews and supports the quarterly and annual inspections that are performed by the Technical Owner and the Environmental Surveillance Owner. The HFFACO owner participates within the ISB Maintenance and Corrective Action Disposition Team to evaluate ISB field inspection observations to determine maintenance needs in accordance with the ISBs intent and design function.

## **3.0 INTERIM SURFACE BARRIER SURVEILLANCE, INSPECTION, MAINTENANCE, AND PERFORMANCE MONITORING**

The purpose of the ISB inspection and surveillance is to note observations of potential deficiency that may compromise the ISBs' intended purpose and design function or to note opportunities for improvement. The ISB maintenance program is used to provide corrective actions (e.g., maintenance or repair) if and when field inspection observations are determined to have the potential to compromise the ISBs' intended purpose and design function during their 25-year service life. To ensure the ISB is performing as intended, visual inspection walkdowns, field surveillances, and maintenance of installed interim measure controls and components are performed at T, TY, SX, TX, and U Tank Farms. The visual inspections, walkdowns, field surveillance, and maintenance will also be included at B Tank Farm after the ISB is installed. To confirm ISBs are performing as expected, performance monitoring, which uses in-situ sensors and drywell holes or neutron logging tubes, is performed at T (until removal of equipment during construction of the replacement ISB), TY, and SX Tank Farms.

The monitoring systems have fulfilled their intended purpose and have provided sufficient data that show that the ISBs effectively minimize rainfall and snowmelt from entering the soil beneath the ISBs.

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### 3.1 ANNUAL PREVENTITIVE MAINTENANCE

Annual ISB preventative maintenance is conducted at all ISBs to ensure adequate performance for the 25-year life span to support the ISB function of minimizing infiltration. On an annual basis, the following preventative maintenance is performed, as needed:

- Removal of debris and cleaning of drain inlets
- Control of fugitive vegetation via herbicide application on the basin areas
- Reseeding of basin areas with design approved vegetation
- Sealing or patching of any deviations, dents, or cracks in the MatCon<sup>®</sup> surface with manufacturer approved sealant

### 3.2 QUARTERLY INSPECTIONS AND REPAIR

Quarterly inspections at all the tank farms with ISBs and evapotranspiration basins are performed using appropriate work packages and procedures. To perform these, the Technical Owner uses field walkdown sheets (known as preventative maintenance inspection data sheets) to note observations that may require maintenance. An ISB maintenance and corrective action disposition team, consisting of members from facility owner, technical owner, environmental, and HFFACO owner, is used to evaluate ISB field inspection observations to determine maintenance needs in accordance with the ISBs intent and design. Any field inspection observations that are determined by the ISB Maintenance and Corrective Action Disposition Team to be both anomalous and having potential to impact ISB intent and design function will be documented and corrected through an approved database-driven corrective action reporting system. Dispositions for corrective action may include continued monitoring in future inspections, low-priority corrective action for non-critical improvements or deficiencies, and high-priority corrective actions for critical deficiencies.

Examples of past observations have included surficial cracks in the ISB surface material, minor pooling of water, minor blockages within the water runoff ditch, and accumulating tumbleweeds in the evapotranspiration basin. Any observations made will be reviewed to determine:

- if the observation is a note for continued monitoring purposes
- if the observation may have an impact to the purpose and function of the ISB
- the timeframe for addressing the observations, if necessary
- the mechanism for tracking the observations through resolution and closure

Quarterly inspection observations showing an anomaly that may have the potential to impact the ISBs intended purpose and design function shall be included in the annual ISB monitoring report with a documented path-forward. ISB inspections are performed as routine preventative maintenance activities to maintain the ISBs during their 25-year lifespan.

### 3.3 ANNUAL SURVEILLANCE AND REPAIR

In addition to quarterly inspections performed by the Technical Owner, the Environmental Surveillance Owner conducts surveillance inspections and schedules maintenance on an annual

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basis. The annual surveillance performed is on control measures, such as berms, installed at all SSTs. The surveillance does not inspect the ISB itself but does include the basins used to collect runoff water from ISBs. Surveillance and maintenance of engineering controls help to maintain the purpose and function of the ISBs, and the ability to reduce infiltration of precipitation into contaminated soils and slow down the spread/transfer of contamination. Surveillance and scheduled maintenance activities are captured in the HFFACO Milestone M-045-56 Annual Interim Measures meeting and the HFFACO Milestone M-045-92 Annual Report. Items that are part of the surveillance include:

- Verify the ability of the berms, storm water inlets, and storm water drains to divert water runoff.
- Verify that there is no obvious subsidence, voids, animal burrows, or low spots.
- Confirm adequate rock/gravel (e.g., Rip Rap) surface around berms, storm water drains, and storm water inlets.
- Verify storm water drains are adequate and functioning.
- Confirm that discharge areas are adequately performing their function.
- Identify changes to locations/conditions of installed interim measures controls.

Minor issues (e.g. tumbleweed removal) noted during surveillances are addressed by processing a work request and assigning it to the appropriate resources for repair. For more significant items, an action request will be completed through an approved database-driven corrective action reporting system.

### 3.4 PERFORMANCE MONITORING

Performance monitoring is conducted in T (until removal of equipment during construction of the replacement ISB), TY, and SX Tank Farms. Performance monitoring instruments collect data to determine if the ISBs are performing as expected. At T (until removal of equipment during construction of replacement ISB) and TY Tank Farms, the instruments are grouped into monitoring nest stations that include a neutron probe access tube and a group of heat dissipation units (HDU). At SX Tank Farm, the neutron probe instrumentation utilizes previously established drywells while the HDU instruments are located within monitoring nest stations. The monitoring nest station data loggers' control and store the measurement data of moisture content from soil-water pressure, soil temperature from HDUs, and air temperature from the thermistor.

Table 1 shows the monitoring frequency of each type of instrumentation at T (until removal of equipment during construction of replacement ISB), TY, and SX Tank Farms. There are no plans to replace any of the failed underground monitoring equipment. It is not easily retrievable or accessible for maintenance and refurbishment, and the equipment was known to have a relatively short lifespan when it was installed. Suspect or erroneous data are not reported in the HFFACO Milestone M-045-92 Annual Report.

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**Table 1. Data Collection Methods and Approximate Frequency Under Normal Working Conditions.**

Monitoring Variable	Monitoring Method <sup>a</sup>	Monitoring Frequency	Data Logger Download Frequency
Soil-Water Content	Neutron Moisture Probe	Twice Annually	Not applicable
Soil-Water Pressure and Soil Temperature	Heat Dissipation Unit	Daily	Quarterly
Air Temperature	Thermistor	Daily	

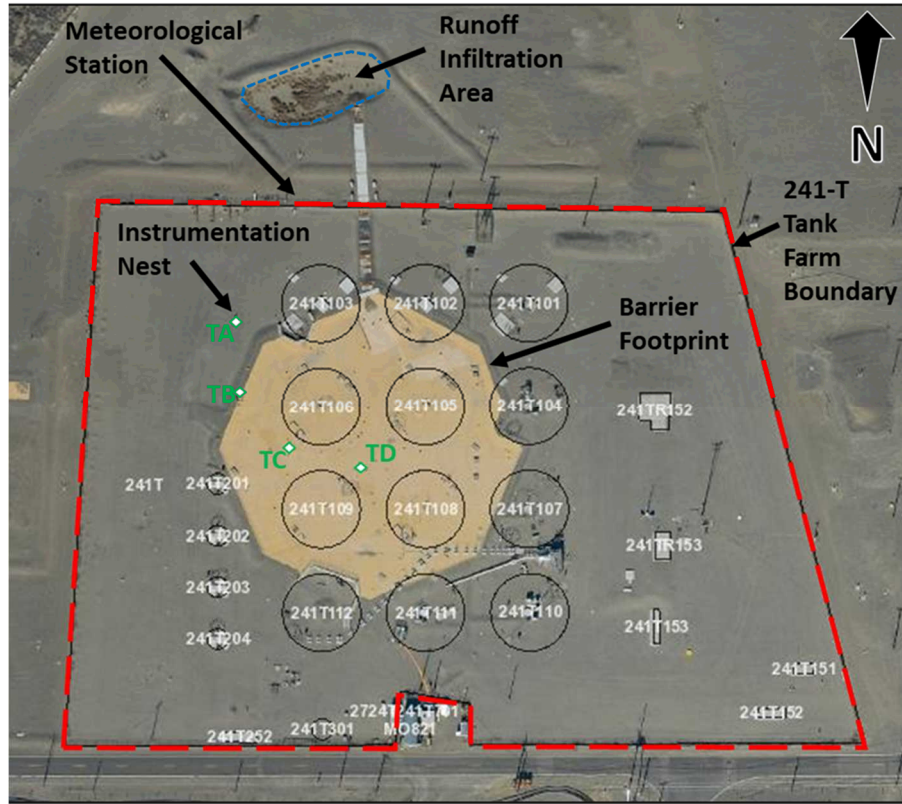
<sup>a</sup> All measurements except the neutron probe are controlled by data loggers and taken automatically.

#### 4.0 T TANK FARM INTERIM SURFACE BARRIER

The T Tank Farm was constructed from 1943 to 1944 (RPP-23752, *Field Investigation Report for Waste Management Areas T and TX-TY*) and is part of Waste Management Area (WMA) T. It is comprised of 12 SSTs with a diameter of 23-m (75-ft) and a capacity of 2,006,050-L (530,000-gal); four SSTs with a diameter of 6.1 m (20.0-ft) and a capacity of 208,175-L (55,000-gal); waste-transfer lines; leak detection systems; and tank ancillary equipment.

The largest known tank leak in the SST system occurred in 1973 at Tank T-106 in T Tank Farm (see Figure 4-1). At the time the existing T Tank Farm ISB was being designed in 2007, the available characterization data indicated that most of the mobile contaminants associated with the T-106 leak remained in the vadose zone. Therefore, the area above the contamination plume was selected for the installation of the first ISB demonstration project (PNNL-16538).

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**Figure 4-1. T Tank Farm Interim Surface Barrier and Monitoring Nest Station Locations.**

The areal extent of the T Tank Farm ISB is shown in Figure 4-1, and the demonstration ISB covers Tanks T-105, T-106, T-108, and T-109. It was designed to cover ~90 percent of the contaminants released into the soil from the T-106 leak (RPP-33431). T Tank Farm is the only tank farm where an ISB was constructed without covering all the SSTs within the tank farm. Construction and design specifications of the T Tank Farm ISB are described in RPP-33431. Construction on the ISB began in October 2007 and was completed in April 2008. Approximately 0.3-m (1 ft) of thick compacted soil was added to the original ground surface before the ISB was placed. Above the compacted soil, a 0.6-cm (0.25-in.) thick layered polyurea material was sprayed over a geotextile felt which formed the impermeable ISB. The ISB dips slightly to the north to enable precipitation to drain along a lined runoff ditch to a runoff infiltration area.

Although the T Tank Farm ISB polyurea material is effective in minimizing rainfall infiltration, the material has presented several operational challenges:

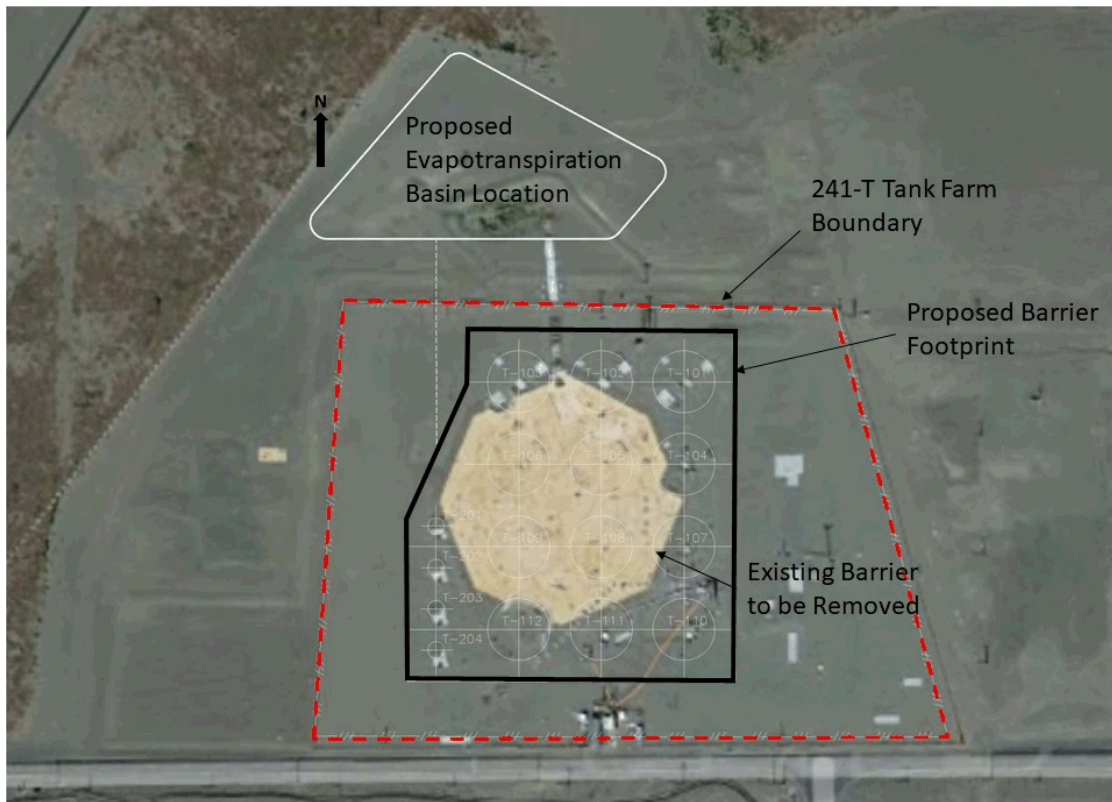
- The polyurea material attracted radon during the application process.
- The polyurea ISB surface becomes slippery during inclement weather.
- The polyurea liner does not hold up to the weather as well as the MatCon<sup>®</sup> surface.

Therefore, the polyurea material at T Tank Farm will be replaced with a MatCon<sup>®</sup> surface, and the ISB will be expanded to cover the tank farm fully, as negotiated in the Agreed Order

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No. 21304. Construction of the replacement ISB includes the installation of an evapotranspiration basin to replace the infiltration area. Figure 4-2 shows the proposed new ISB and evapotranspiration basin locations. The proposed size of the ISB will be 158,470-ft<sup>2</sup>. The material and design are similar to the TY, TX, SX, and U Tank Farm ISBs.

**Figure 4-2. T Tank Farm New Interim Surface Barrier & Evapotranspiration Basin.**



#### 4.1 PERFORMANCE MONITORING AT T TANK FARM

The performance monitoring equipment that is currently at T Tank Farm are grouped into monitoring nest stations that include a neutron probe access tube and four HDUs. These technologies started monitoring soil moisture content under and around the T Tank Farm ISB in 2007. Data from these monitoring stations are published in the HFFACO Milestone M-045-92 Annual Report. Figure 4-1 shows the instrument nest stations labeled as TA, TB, TC, and TD to identify their individual positions in relation to the ISB.

During the removal of the T Tank Farm polyurea ISB and installation of the modified asphalt replacement ISB, all the historic above ground monitoring equipment will be removed, and in-ground equipment will be preserved. During demolition of the demonstration ISB, construction of the replacement ISB and once the replacement ISB is in place, subsurface monitoring will no longer be performed at T Tank Farm. This is consistent with previously approved ISB designs for TX Tank Farm and U Tank Farm, and previously approved revisions of the *Maintenance and Performance Monitoring Plans* (this plan). No new subsurface monitoring equipment will be

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installed at the replacement ISB for T Tank Farm, and subsurface monitoring there will not be resumed.

## **5.0 TY TANK FARM INTERIM SURFACE BARRIER**

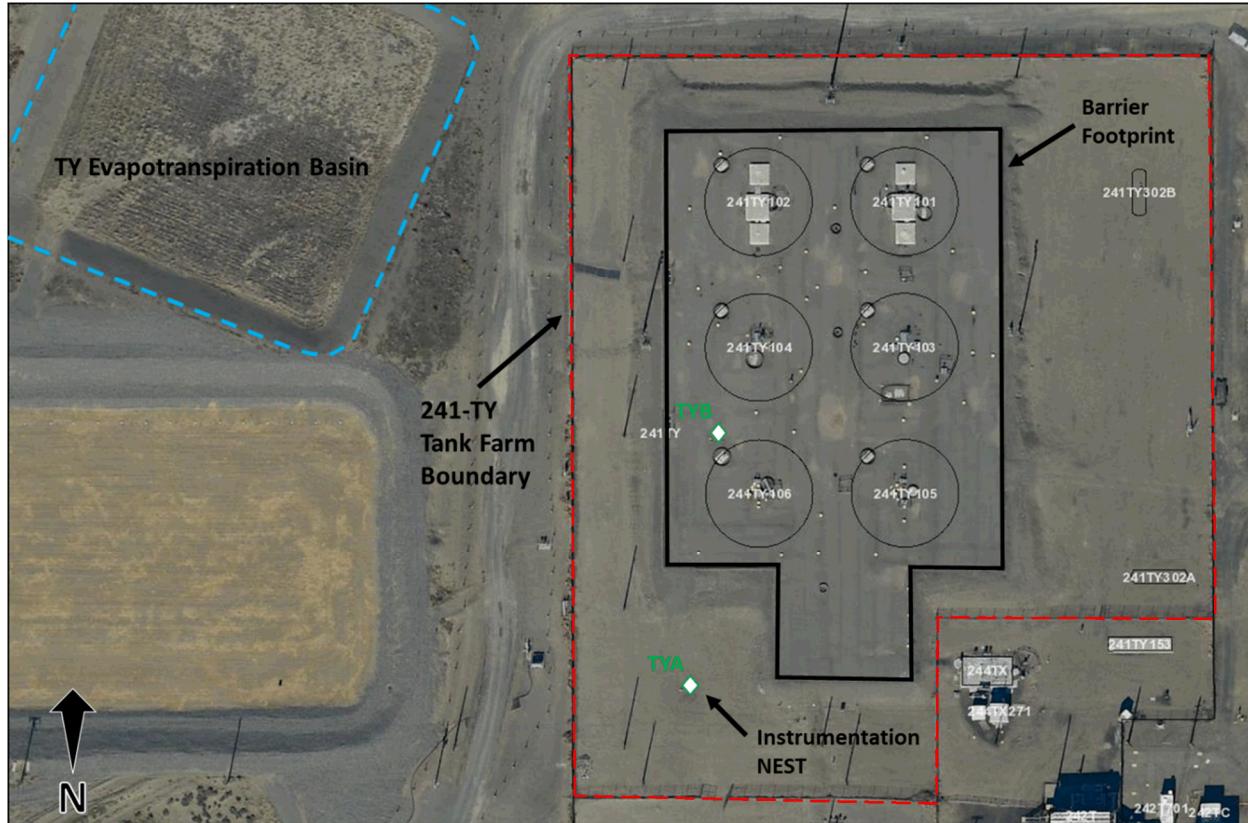
The TY Tank Farm was built from 1951 through 1952 and is comprised of six SSTs with a diameter of 23-m (75-ft) and a capacity of 2,870,000-L (758,000-gal), waste-transfer lines, leak detection systems, and tank ancillary equipment (RPP-23752). TY Tank Farm is part of WMA TX-TY.

The ISB at TY Tank Farm was the second ISB constructed as part of the ISB demonstration project detailed in PNNL-PNNL-19772. TY Tank Farm was prioritized for an ISB based on criteria listed in RPP-ENV-41309, and the discovery of Technetium-99 and nitrate contamination near the southern end of the farm, about 95- to 100-ft below ground surface. Initial measurements of the Technetium-99 indicated that the pore water concentration was one of the highest found at that time at Hanford. At TY Tank Farm, five out of the six tanks were designated as assumed leakers at the time RPP-ENV-41309 was prepared, and many of the contaminants from waste releases still resided within the vadose zone beneath the tank farm. With only six tanks, TY Tank Farm was ideal for a demonstration ISB because the footprint was small with minimal above-ground infrastructure; thus, the surface was readily accessible for ISB placement.

Construction of the TY Tank Farm demonstration ISB began in February 2010 and was completed in September 2010. Figure 5-1 shows the ISB in place at TY Tank Farm. The ISB consists of a 10-cm (4-in.) thick layer of MatCon<sup>®</sup> over a base layer. Collected water flows by gravity to two collection points at the west side of the ISB and from there to an evapotranspiration basin. Runoff water evaporates from the basin or is transpired by local vegetation.



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**Figure 5-1. TY Tank Farm Interim Surface Barrier & Monitoring Nest Station Locations.****5.1 PERFORMANCE MONITORING AT TY TANK FARM**

The TY Tank Farm has two nests (TYA and TYB) that can be seen in Figure 5-1. Each nest includes a neutron probe access tube and four HDUs. Nests TYA and TYB were installed in Fiscal Year 2010, and monitoring was initiated in March 2010. The results are published in the HFFACO Milestone M-045-92 Annual Report.

Nest TYA was placed outside of the ISB to serve as a control for the demonstration project. The control nest was installed at least 5-m (16-ft) away from the closest edge of the surface cover to prevent measurable impacts from the cover from influencing the data (PNNL-16538). The other nest site at TY Tank Farm is TYB, which is located within the ISB footprint. The location of nest TYB was determined to be at least 5-m (16-ft) from the closest edge of the ISB and between two or more tanks where the largest decrease of soil-water content was expected after the emplacement of the ISB.

Vertically, the monitoring depths of the HDU nests at TY Tank Farm are 1-m (3-ft), 2-m (7-ft), 5-m (16-ft), and 10-m (33-ft) below ground surface. Changes in soil moisture were expected to be more significant in shallower depths after the emplacement of an ISB; therefore, more frequent measurements are taken at shallow depths (PNNL-19772). To date, the quarterly monitoring nest station data indicate that ISBs are reducing recharge of water to the vadose zone and reducing the impact of meteoric water on soil-moisture conditions under the ISBs.



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Additional ISB performance monitoring deeper than the backfill is performed using neutron access tubes that extend 50-ft or more below ground surface and into the undisturbed Hanford formation below the tanks. Neutron access tubes are accessible at TY Tank Farm. Semi-annual neutron moisture probe measurements are performed manually at 0.3-m (1-ft) intervals to depths of 50-ft below ground surface. Monitoring nest station data and neutron moisture measurements collected during the year are included in the HFFACO Milestone M-045-92 Annual Report.

Due to the age of the monitoring system, some of the instrumentation is only partially functional. The causes for functional problems with the instruments are: interruptions to the system, other Tank Farm operations (e.g., field work within the tank farms), poor wire connections (e.g., due to corrosion occurrence), instrument failure, and/or data logger overload. Table 2 shows the status of instrument functionality at TY Tank Farm.

**Table 2. TY Tank Farm Instrument Functionality.**

Tank Farm	Nest	Heat Dissipation Units	Thermistor
TY	TYA	Full Functionality	Full Functionality
	TYB	Partial Functionality	Partial Functionality

## 6.0 SX TANK FARM INTERIM SURFACE BARRIERS

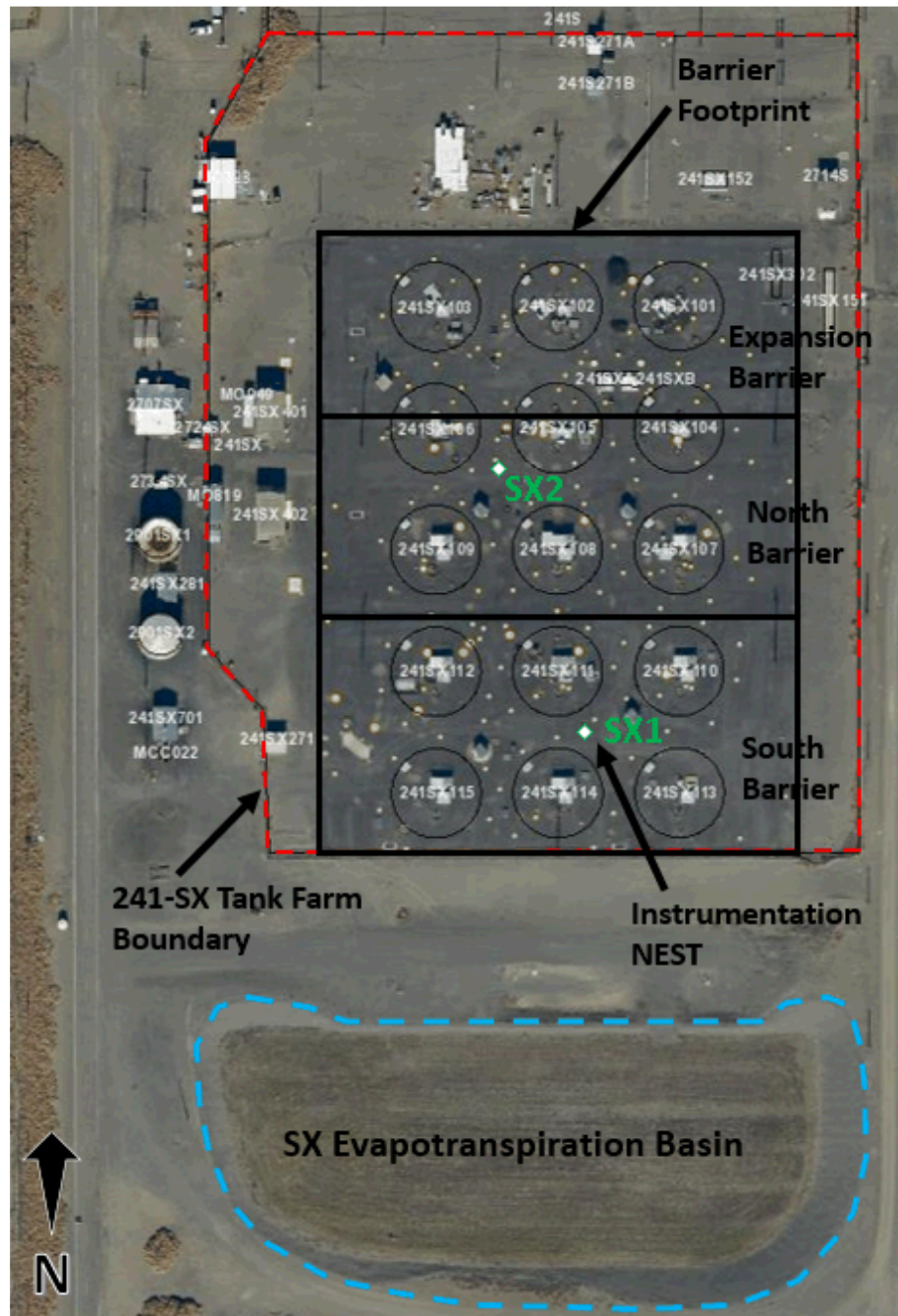
The SX Tank Farm is comprised of 15 100-series carbon steel SSTs encased in a reinforced concrete shell built during 1953 to 1954. The SX Tank Farm is part of WMA S-SX. Each of the tanks has a diameter of 23-m (75-ft) and a capacity of 3,785,000-L (1 million-gal). Included in the farm are also waste-transfer lines, leak detection systems, and tank ancillary equipment.

The SX Tank Farm was prioritized to receive an ISB after TY Tank Farm because 8 of the 15 tanks in SX Tank Farm were designated as assumed leakers at the time. RPP-ENV-41309 was prepared, and many of the contaminants from waste releases still resided within the vadose zone beneath the tank farm. The SX south and SX north ISBs were the first and second ISBs required under HFFACO Milestone M-045-92. During construction, SX Tank Farm also received an additional ISB north of the north ISB, referred to as the SX expansion ISB. The expansion allowed all 15 tanks in SX Tank Farm to be covered under one contiguous ISB.

Figure 6-1 shows the completed ISBs at SX Tank Farm. Construction consisted of building three MatCon® ISBs to cover all the SSTs within the SX Tank Farm, and the three ISBs were completed in 2019. The first ISB is SX south, which entirely covers Tanks SX-110 through SX-115. The second ISB is SX north, which covers all of Tanks SX-107 through SX-109, and the southern portions of Tanks SX-104 through SX-106. The SX expansion ISB covers Tanks SX-101 through SX-103 and the northern portions of Tanks SX-104 through SX-106. Collected water from the ISBs flows by gravity to collection points at the south side of the tank farm and from there to an evapotranspiration basin. Runoff water evaporates from the basin or is transpired by local vegetation.

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Figure 6-1. SX Tank Farm Interim Surface Barriers &amp; Monitoring Nest Station Locations.



## 6.1 PERFORMANCE MONITORING AT SX TANK FARM

The south and north ISBs at SX Tank Farm have monitoring nests which started collecting data in August of 2019. The nest sites can be seen in Figure 6-1. The south ISB nest, SX1, consists of two HDU monitoring probe arrays and three drywell logging holes that are used to collect data. The SX2 nest station on the north ISB consists of one HDU probe array and three drywell

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logging holes that are used to collect data. Data collected from these nests are reported in the HFFACO Milestone M-045-92 Annual Report.

Vertically, the monitoring depths of SX1 are monitored by two separate HDU monitoring probe arrays. One HDU monitoring array collects data at 1-m (3-ft), 2-m (7-ft), 3-m (10-ft), 5-m (16-ft), and 10-m (33-ft). The other HDU monitoring array collects data at depths of 10-m (33-ft), 15-m (49-ft), and 20-m (66-ft). SX2 has one HDU monitoring array located at depths of approximately 1-m (3-ft), 3-m (10-ft), 5-m (16-ft), and 10-m (33-ft). Changes of soil moisture were expected to be more significant in shallower depths after emplacement of the ISB. The two SX Tank Farm monitoring nest station locations lie within backfill material. The nests extend into the naturally formed Hanford sediment layers to track soil moisture changes below the tank farm backfill.

The monitoring approach at SX Tank Farm is the same as at TY Tank Farm in that it uses the monitoring nest station data from quarterly data downloads and the Hanford Meteorological Station records to evaluate the effectiveness of the SX Tank Farm ISB (PNNL-PNNL-29136, *SX Tank Farm Interim Surface Barrier Vadose Zone Monitoring Plan*). A Watermark<sup>TM,4</sup> 200 soil moisture sensor was installed at the SX Tank Farm ISB as a replacement for the previously used capacitance probes. Unfortunately, the Watermark<sup>TM</sup> sensor has not worked since installation and data using this sensor have never been reported.

Additional monitoring at SX Tank Farm includes using six previously established drywells that are neutron logged for moisture on a semi-annual basis: 41-05-07, 41-05-08, and 41-06-05 on the north panel; and 41-11-05, 41-11-06, and 41-14-02 on the south panel. Monitoring system plans for the south and north ISBs can be found in RPP-PLAN-48439 and RPP-PLAN-49187, *241-SX Tank Farm North Interim Surface Barrier Monitoring Plan*.

Neutron moisture probe measurements at SX Tank Farm are performed manually at 0.3-m (1-ft) intervals to depths of 50-ft. The monitoring nest station data logger controls and stores the measurements of soil-water pressure and soil temperature from HDUs, and air temperature from the thermistor.

Table 3 shows the status of instrument functionality. Because the monitoring systems are newer, all probes are functioning as expected.

**Table 3. SX Tank Farm Instrument Functionality.**

Tank Farm	Nest	Heat Dissipation Units	Thermistor
SX	SX1	Partial Functionality	Partial Functionality
	SX2	Full Functionality	Full Functionality

<sup>4</sup>Watermark<sup>TM</sup> is a registered trademark of the Irrometer Company, Riverside, California.

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## 7.0 TX TANK FARM INTERIM SURFACE BARRIER

The TX Tank Farm is an SST farm within WMA TX-TY. Constructed between 1947 and 1948, there are a total of 18 SSTs within TX Tank Farm, making it the largest tank farm according to number of tanks at the Hanford Site. Each of the 18 second-generation SSTs has a capacity of 758,000-gal and a diameter of 75-ft (RPP-RPT-60506, *241-TX Interim Surface Barrier Design Considerations Report*).

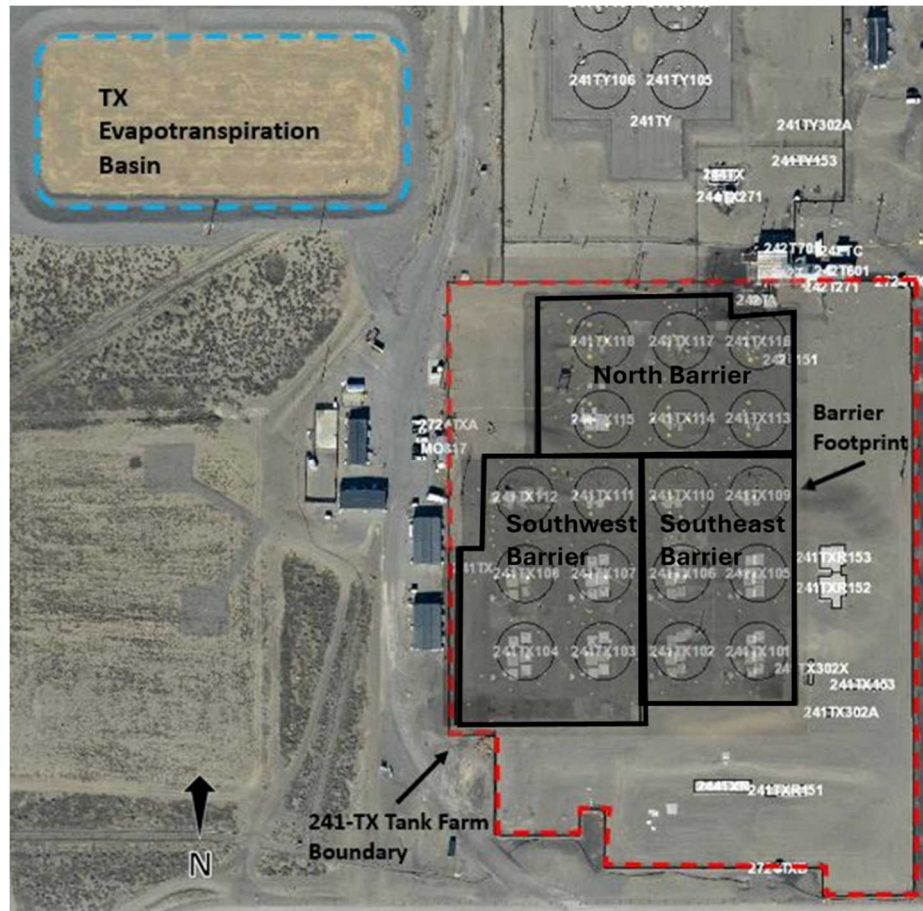
Based on criteria listed in RPP-ENV-41309, TX Tank Farm was prioritized to receive an ISB after SX Tank Farm because 7 of the 18 tanks in TX Tank Farm were designated as assumed leakers at the time RPP-ENV-41309 was prepared, and many of the contaminants from waste releases still resided within the vadose zone beneath the tank farm.

Figure 7-1 shows the completed ISB at TX Tank Farm. Construction was completed September 2021 and consisted of a MatCon<sup>®</sup> ISB over all SSTs in TX Tank Farm. The TX Tank Farm image shows the outline of the ISB, evapotranspiration basin, and TX Tank Farm fence line. The ISB includes three combined panels (north, southeast, and southwest panels) with a total combined area of approximately 221,000-ft<sup>2</sup>. Construction material and design resembles the SX Tank Farm ISB and basin installation (RPP-RPT-60506).

### 7.1 PERFORMANCE MONITORING AT TX TANK FARM

The T, TY, and SX Tank Farm ISB monitoring instruments have provided sufficient data to conclude that the ISBs are effective at redirecting precipitation and runoff water away from the tank farms and contaminated soil within tank farm backfill. Therefore, the TX Tank Farm ISB design and RPP-RPT-61684, *Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program*, Rev. 2 (of this plan), that were approved by Ecology, did not include subsurface performance monitoring at TX Tank Farm.

## RPP-RPT-61684, Rev. 5A

**Figure 7-1. TX Tank Farm Interim Surface Barrier & Evapotranspiration Basin Location.**

## 8.0 U TANK FARM INTERIM SURFACE BARRIER

The U Tank Farm is an SST farm within WMA U. It is comprised of 12 SSTs with a diameter of 23-m (75-ft) and a capacity of 2,006,050-L (530,000-gal), four SSTs with a diameter of 6.1-m (20.0-ft) and a capacity of 208,175-L (55,000-gal), diversion boxes, waste-transfer lines, leak detection systems, and tank ancillary equipment.

By the 1960s, leaks were detected from Tanks U-101 and U-104. The volume of hazardous waste calculated to have leaked to the vadose zone was approximately 378,500-L (100,000-gal) (RPP-ENV-41309). At the time RPP-ENV-41309 was prepared, many of the contaminants from waste releases still resided within the vadose zone beneath the tank farm. U Tank Farm was prioritized for an ISB based on criteria listed in RPP-ENV-41309.

Per HFFACO Milestone M-045-92, the U Tank Farm ISB was completed October 2023. The ISB is one cohesive panel with a total area of approximately 144,000-ft<sup>2</sup> and covers all 16 tanks within the farm. The material and design are similar to TY, TX, and SX Tank Farm ISBs and basin installation (RPP-RPT-60506). Figure 8-1 shows the locations of the U Tank Farm ISB and evapotranspiration basin.



## RPP-RPT-61684, Rev. 5A

**Figure 8-1. U Tank Farm Interim Surface Barrier & Evapotranspiration Basin Location.****8.1 PERFORMANCE MONITORING AT U TANK FARM**

The T, TY, and SX Tank Farm ISB monitoring technologies have provided sufficient data to conclude that the ISBs are effective at redirecting precipitation and runoff water away from the tank farms and contaminated soil within tank farm backfill. Therefore, the U Tank Farm ISB design and RPP-RPT-61684, *Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program*, Rev. 3B (of this plan), that were approved by Ecology, did not include subsurface performance monitoring at U Tank Farm.

**9.0 B TANK FARM INTERIM SURFACE BARRIER**

The B Tank Farm is an SST farm within WMA B-BX-BY. It was constructed from 1943 to 1944. It is comprised of 12 SSTs with a diameter of 23-m (75-ft) and a capacity of 2,006,050-L (530,000-gal), four SSTs with a diameter of 6.1-m (20.0-ft) and a capacity of 208,175-L (55,000-gal), diversion boxes, waste-transfer lines, leak detection systems, and tank ancillary equipment.

As part of the Agreed Order No. 21304, B Tank Farm is the next farm to have an ISB installed after the T Tank Farm replacement ISB is installed. The ISB is expected to be one cohesive panel with a total area of approximately 155,609-ft<sup>2</sup> and cover all 16 tanks within the farm. The material and design are similar to TY, TX, and SX Tank Farm ISBs and basin installation (RPP-RPT-60506). Figure 9-1 shows the proposed location of the B Tank Farm ISB and evapotranspiration basin.

## RPP-RPT-61684, Rev. 5A

**Figure 9-1. B Tank Farm Proposed Interim Surface Barrier & Evapotranspiration Basin.****9.1 PERFORMANCE MONITORING AT B TANK FARM**

The T, TY, and SX Tank Farm ISB monitoring technologies have provided sufficient data to conclude that the ISBs are effective at redirecting precipitation and runoff water away from the tank farms and contaminated soil within tank farm backfill. The B Tank Farm ISB design does not include subsurface performance monitoring. This is consistent with previously approved ISB designs for TX Tank Farm and U Tank Farm, and previously approved revisions of RPP-RPT-61684 (this plan).

**10.0 CONCLUSION REQUIREMENTS FOR THE HFFACO MILESTONE M-045-92 ANNUAL REPORT**

To continue to assess the ISBs, quarterly visual inspection walkdowns, annual environmental surveillance, and maintenance activities will be completed and reported on within an annual ISB report to meet HFFACO Milestone M-045-92 requirements. The performance monitoring data collected at TY and SX Tank Farms will track the performance of those ISBs. Trends in the performance monitoring data will be displayed in visual formats.

The HFFACO Milestone M-045-92 Annual Report will include the following results pertaining to that fiscal year:

## RPP-RPT-61684, Rev. 5A

- Results of quarterly visual inspections
- Results of annual environmental surveillance
- Results of maintenance performed/scheduled (if applicable)
- Performance monitoring results (if applicable)
- Research on new ISB technology (if applicable)



## RPP-RPT-61684, Rev. 5A

**11.0 REFERENCES**

- 11-NWP-044, 2011, "Re: Completion of Two Hanford Federal Facility and Consent Order (HFFACO) M-045-92 Milestones" (external letter from J. J. Lyon to S. L. Samuelson, Office of River Protection, U.S. Department of Energy, May 19), State of Washington Department of Ecology, Richland, Washington.
- Agreed Order No. 21304, 2022, *In the Matter of an Administrative Order Concerning: U.S. Department of Energy, State of Washington Department of Ecology/ U.S. Department of Energy Office of River Protection, Richland, Washington.*
- Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order – Tri-Party Agreement, 2 vols.*, as amended, State of Washington Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.
- PNNL-16538, 2007, *T Tank Farm Interim Surface Barrier Demonstration – Vadose Zone Monitoring Plan*, Pacific Northwest National Laboratory, Richland, Washington.
- PNNL-19772, 2010, *T-TY Tank Farm Interim Surface Barrier Demonstration—Vadose Zone Monitoring Plan*, Pacific Northwest National Laboratory/Washington River Protection Solutions, Inc., Richland, Washington.
- PNNL-PNNL-29136, 2019, *SX Tank Farm Interim Surface Barrier Vadose Zone Monitoring, RPT-DVZ-SX-0002*, Pacific Northwest National Laboratory, Richland, Washington.
- RPP-23752, 2005, *Field Investigation Report for Waste Management Areas T and TX-TY, Rev. 0-A*, CH2M HILL Hanford Group, Inc., Richland, Washington.
- RPP-33431, 2007, *Design Analysis for T-Farm Interim Surface Barrier (TISB), Rev. 0A*, CH2M HILL Hanford Group, Inc., Richland, Washington.
- RPP-ENV-41309, 2009, *Criteria for Prioritizing Hanford Site Tank Farm Interim Surface Barriers and for Evaluating Their Performance, Rev. 0*, Washington River Protection Solutions, LLC, Richland, Washington.
- RPP-PLAN-48439, 2011, *241-SX Tank Farm South Interim Surface Barrier Monitoring Plan, Rev. 0*, Columbia Energy and Environmental Services, Inc. for Washington River Protection Solutions, LLC, Richland, Washington.
- RPP-PLAN-49187, 2011, *241-SX Tank Farm North Interim Surface Barrier Monitoring Plan, Rev. 0*, Columbia Energy and Environmental Services, Inc. for Washington River Protection Solutions, LLC, Richland, Washington.

## RPP-RPT-61684, Rev. 5A

RPP-RPT-38323, 2009, *Tank Farm Interim Surface Barrier Materials and Runoff Alternatives Study*, Rev. 0, prepared by Columbia Energy & Environmental Services, Inc. for Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-47123, 2010, *Interim Surface Barrier Evaluation Report*, Rev. 0B, Washington River Protection Solutions, LLC/Pacific Northwest National Laboratory, Richland, Washington.

RPP-RPT-60506, 2018, *241-TX Interim Surface Barrier Design Considerations Report*, Rev. 0, Columbia Energy and Environmental Services, Inc. for Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-61684, 2020, *Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program*, Rev. 2, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-61684, 2023, *Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program*, Rev. 3B, Washington River Protection Solutions, LLC, Richland, Washington.

## INFORMATION CLEARANCE REVIEW AND RELEASE APPROVAL

### Part I: Background Information

Title: Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program	Information Category: <input type="checkbox"/> Abstract <input type="checkbox"/> Journal Article <input type="checkbox"/> Summary <input type="checkbox"/> Internet <input type="checkbox"/> Visual Aid <input type="checkbox"/> Software <input type="checkbox"/> Full Paper <input type="checkbox"/> Report <input checked="" type="checkbox"/> Other <u>Plan</u>
Publish to OSTI? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Trademark/Copyright "Right to Use" Information or Permission Documentation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> NA
Document Number: RPP-RPT-61684 Revision 5A	Date: April 2025
Author: Nelson, Carly J	

### Part II: External/Public Presentation Information

Conference Name:	
Sponsoring Organization(s): Department of Energy	
Date of Conference: 04/09/2025	Conference Location:
Will Material be Handed Out? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Will Information be Published? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>(If Yes, attach copy of Conference format instructions/guidance.)</i>

### Part III: H2C Document Originator Checklist

Description	Yes	N/A	Print/Sign/Date
Information Product meets requirements in TFC-BSM-AD-C-01?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Document Release Criteria in TFC-ENG-DESIGN-C-25 completed? (Attach checklist)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If product contains pictures, safety review completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Roberts, Sheryl K    Approved - IDMS data file att. 04/09/2025

### Part IV: H2C Internal Review

Function	Organization	Date	Print Name/Signature/Date
Subject Matter Expert	H2C	04/09/2025	Nelson, Carly J    Approved - IDMS data file att.
Responsible Manager	H2C	04/09/2025	Klages, Deanna L    Approved - IDMS data file att.
Other:			

### Part V: IRM Clearance Services Review

Description	Yes	No	Print Name/Signature
Document Contains Classified Information?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If Answer is "Yes," ADC Approval Required  _____ Print Name/Signature/Date
Document Contains Information Restricted by DOE Operational Security Guidelines?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reviewer Signature:  _____ Print Name/Signature/Date
Document is Subject to Release Restrictions? <i>If the answer is "Yes," please mark category at right and describe limitation or responsible organization below:</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Document contains: <input type="checkbox"/> Applied Technology <input type="checkbox"/> Protected CRADA <input type="checkbox"/> Personal/Private <input type="checkbox"/> Export Controlled <input type="checkbox"/> Proprietary <input type="checkbox"/> Procurement – Sensitive <input type="checkbox"/> Patentable Info. <input type="checkbox"/> OUO <input type="checkbox"/> Predecisional Info. <input type="checkbox"/> UCNi <input type="checkbox"/> Restricted by Operational Security Guidelines <input type="checkbox"/> Other (Specify) _____
Additional Comments from Information Clearance Specialist Review?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Information Clearance Specialist Approval  <div style="border: 1px solid green; padding: 5px; display: inline-block; color: green; font-weight: bold;">             APPROVED              By Sarah Harrison at 6:45 am, Apr 10, 2025           </div> _____ Print Name/Signature/Date

When IRM Clearance Review is Complete – Return to H2C Originator for Final Signature Routing (Part VI)

## INFORMATION CLEARANCE REVIEW AND RELEASE APPROVAL

### Part VI: Final Review and Approvals

Description	Approved for Release		Print Name/Signature	
	Yes	N/A		
H2C External Affairs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Kraemer, Kristin M	Approved - IDMS data file att.
H2C Office of Chief Counsel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Kneese, Kyle C	Approved - IDMS data file att.
DOE – ORP Public Affairs/Communications	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dawson, Edward M	Approved - IDMS data file att.
Other: DOE SME	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Blackwell, Becky	Approved - IDMS data file att.
Other:	<input type="checkbox"/>	<input type="checkbox"/>		

Comments Required for H2C-Indicate Purpose of Document:

This is a rush item for review to deliver to Ecology by 4/18/2025 with a comment response to the T-Farm Barrier Design package. Would like it to be completed this week if possible.

Please put clearance pages at the end of the document if possible.



#### Information Release Station

Was/Is Information Product Approved for Release?  Yes  No

If Yes, what is the Level of Release?  Public/Unrestricted  Other (Specify) \_\_\_\_\_

Date Information Product Stamped/Marked for Release: 04/10/2025

Was/Is Information Product Transferred to OSTI?  Yes  No

**Forward Copies of Completed Form to H2C Originator**

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    Monitoring Plan for the Interim Surface Barriers Program, Revision 5A, submitted by Carly Nelson
    for public release to Ecology with a comment response to the TFarm Barrier Design package.
    </comments>
  </task>
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Attachment 2  
25-TWO-0052

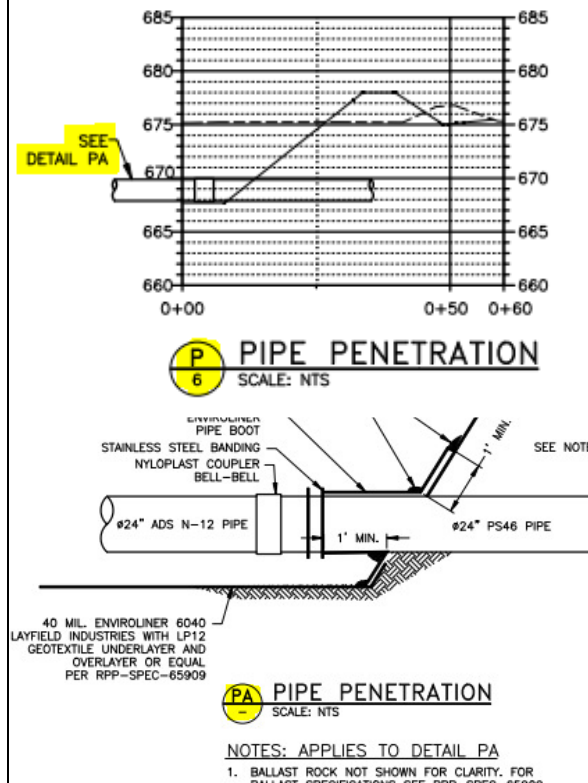
Review Comment Record

(27 pages including cover sheet)

Review Comment Record		Washington State Department of Ecology Nuclear Waste Program				Date: 2/19/25: ECY comments (25-NWP-029) April 2025: DOE-HFO Response																	
Document Title(s)/Number(s): 24-TWO-0167 - T Tank Farm Interim Surface Barrier Design Package and RPP-RPT-61684 Rev. 4A "Maintenance and Performance Monitoring Plan for the Interim Surface Barrier Program"																							
Document Manager			Telephone Number	Project Manager		Telephone Number	Facility Site ID	Cleanup Site ID															
Cathrene Glick				Luissa Johnston																			
Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/Close	Reviewer Initials															
1.	24-TWO-0167 Attachment_1 Plan Sheet 1 and Sheet 29	Callout for New Vehicle Crossing Ramp references "Detail 27" without identifying which sheet Detail 27 is depicted.	Include reference sheet for detail.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Acknowledged. No change to design documents necessary, since there is one Detail 27 and comprehension of the plan set is not compromised.			CG															
2.	24-TWO-0167 Attachment_1 Plan Sheet 1 and Sheet 7	Callout for Existing Rip Rap Abandonment references "Section S" without identifying which sheet Section S is depicted.	Include reference sheet for section.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Acknowledged. No change to design documents is necessary, since there is one Section S and comprehension of the plan set is not compromised.			CG															
3.	24-TWO-0167 Attachment_1 Plan Sheet 1 and Sheet 7	Callout for Existing Rip Rap Abandonment to be covered with soil and references "Section S" however there are no notes or explanation as to how the new soil is to be placed and compacted around/over the rip rap and there are no specifications in the Earthwork Specifications to address how new fill soil is to be "keyed into" the existing rip rap slope for compaction and stability.	Include clear details and earthwork specifications to address how new fill soil is to be "keyed into" the existing rip rap slope compaction and stability.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. Specification RPP-SPEC-65909 Section 3.2 adequately address backfill placement.			CG															
4.	24-TWO-0167 Attachment_1 Plan Sheet 1 and Sheet 7	Callout for East Side Surface Water Control Berm references "Section S" without identifying which sheet Section S is depicted and there are no notes or explanation as to how the new soil is to be placed and compacted around/over the rip rap and there are no specifications in the Earthwork Specifications to address how new fill soil is to be "keyed into" the existing rip rap slope for compaction and stability.	Include clear details and earthwork specifications to address how new fill soil is to be "keyed into" the existing earth berm soils for compaction and stability.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. Specification RPP-SPEC-65909 Section 3.2 adequately address backfill placement.			CG															
5.	24-TWO-0167 Attachment_1 Plan Sheet 6	Plan Sheet for Evapotranspiration Basin identifies four (4) existing groundwater monitoring wells within the footprint of the basin without clear indication/evidence that these wells have been properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990 or how contractor is to assure that the wells are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990 following earthwork excavation.	Address and include details and specifications on how contractor is to assure that the existing groundwater monitoring wells within the footprint of the basin are properly decommissioned/ destroyed in accordance with WAC 173-160-381 or 173-160-990 following earthwork excavation and grading work.	Construction documents must clearly identify entity responsible to assure well decommissioning in accordance with WAC and the means/methods to achieve this verification or means/methods to accomplish decommissioning of wells.	Not Accept. The subject well and boreholes have been decommissioned. According to the decommissioning well reports the casing for well 299-W10-175 was filled with bentonite crumbles to 41-feet bgs, and the other wells were boreholes that were decommissioned by being filled with bentonite crumbles when back-pulling the tubing. <table border="1"> <thead> <tr> <th>WELL NAME</th> <th>WELL ID</th> <th>STATUS</th> </tr> </thead> <tbody> <tr> <td>299-W10-175</td> <td>C5651</td> <td>DECOMMISSIONED-V</td> </tr> <tr> <td>C5689</td> <td>C5689</td> <td>DECOMMISSIONED-V</td> </tr> <tr> <td>C5690</td> <td>C5690</td> <td>DECOMMISSIONED-V</td> </tr> <tr> <td>C5691</td> <td>C5691</td> <td>DECOMMISSIONED-V</td> </tr> </tbody> </table>	WELL NAME	WELL ID	STATUS	299-W10-175	C5651	DECOMMISSIONED-V	C5689	C5689	DECOMMISSIONED-V	C5690	C5690	DECOMMISSIONED-V	C5691	C5691	DECOMMISSIONED-V			CG
WELL NAME	WELL ID	STATUS																					
299-W10-175	C5651	DECOMMISSIONED-V																					
C5689	C5689	DECOMMISSIONED-V																					
C5690	C5690	DECOMMISSIONED-V																					
C5691	C5691	DECOMMISSIONED-V																					

Review Comment Record		Washington State Department of Ecology Nuclear Waste Program					Date: 2/19/25: ECY comments (25-NWP-029) April 2025: DOE-HFO Response														
Document Title(s)/Number(s): 24-TWO-0167 - T Tank Farm Interim Surface Barrier Design Package and RPP-RPT-61684 Rev. 4A "Maintenance and Performance Monitoring Plan for the Interim Surface Barrier Program"																					
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					C5692 C5693 C5694	C5692 C5693 C5694	DECOMMISSIONED-V DECOMMISSIONED-V DECOMMISSIONED-V														
6.	24-TWO-0167 Attachment_1 Plan Sheet 6	Plan Sheet for Evapotranspiration Basin identifies three (3) existing groundwater monitoring wells (299-W10-10, 299-W10-15, and 299-W10-23) adjacent to the perimeter of the basin excavation without clear indication as to what is to happen to these wells or what protection is to be provided for these wells.	Include note to address how these three (3) groundwater monitoring wells are to be protected in-place during earthwork activities.	Construction documents must clearly identify requirements and/or means/methods to protect groundwater monitoring wells which could be impacted during construction.	Not accepted. Well 299-W10-10 was decommissioned, and the other two wells are features that will be protected per Sections 311000 and 312000 of RPP-SPEC-65909. <table border="1"> <thead> <tr> <th>WELL NAME</th> <th>WELL ID</th> <th>STATUS</th> </tr> </thead> <tbody> <tr> <td>299-W10-10</td> <td>A4887</td> <td>DECOMMISSIONED-V</td> </tr> <tr> <td>299-W10-15</td> <td>A4892</td> <td>CANDIDATE FOR DECOMMISSIONING</td> </tr> <tr> <td>299-W10-23</td> <td>B8545</td> <td>IN-USE</td> </tr> </tbody> </table>		WELL NAME	WELL ID	STATUS	299-W10-10	A4887	DECOMMISSIONED-V	299-W10-15	A4892	CANDIDATE FOR DECOMMISSIONING	299-W10-23	B8545	IN-USE			CG
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299-W10-15	A4892	CANDIDATE FOR DECOMMISSIONING																			
299-W10-23	B8545	IN-USE																			
7.	24-TWO-0167 Attachment_1 Plan Sheet 6	Plan Sheet for Evapotranspiration Basin identifies three (3) existing groundwater monitoring wells (299-W10-9, 299-W10-12, and 299-W10-11) within the general area of earthwork for the evapotranspiration basin and earthwork/paving for the ISB without clear indication as to what is to happen to these wells or what protection is to be provided for these wells.	Include note to address how these three (3) groundwater monitoring wells are to be protected in-place during earthwork and paving activities.	Construction documents must clearly identify requirements and/or means/methods to protect groundwater monitoring wells which could be impacted during construction.	Not accepted. All three wells have been decommissioned. <table border="1"> <thead> <tr> <th>WELL NAME</th> <th>WELL ID</th> <th>STATUS</th> </tr> </thead> <tbody> <tr> <td>299-W10-9</td> <td>A4900</td> <td>DECOMMISSIONED-V</td> </tr> <tr> <td>299-W10-11</td> <td>A4888</td> <td>DECOMMISSIONED-V</td> </tr> <tr> <td>299-W10-12</td> <td>A4889</td> <td>DECOMMISSIONED-V</td> </tr> </tbody> </table>		WELL NAME	WELL ID	STATUS	299-W10-9	A4900	DECOMMISSIONED-V	299-W10-11	A4888	DECOMMISSIONED-V	299-W10-12	A4889	DECOMMISSIONED-V			CG
WELL NAME	WELL ID	STATUS																			
299-W10-9	A4900	DECOMMISSIONED-V																			
299-W10-11	A4888	DECOMMISSIONED-V																			
299-W10-12	A4889	DECOMMISSIONED-V																			
8.	24-TWO-0167 Attachment_1 Plan Sheet 6	Plan Sheet for Evapotranspiration Basin identifies "hatched area for unknown buried anomalies" without clarification if such anomaly/debris will be encountered and/or exposed during excavation for the basin or how this is anomaly/debris is to be addressed if exposed/encountered during basin excavation. Note 6 states "Do Not Excavate In This Area..." without clarification if the anomaly/debris is located beneath the proposed earthwork grades or if such anomaly/debris will be unexpectedly encountered during excavation.	Provide clarification if the anomaly/debris is located beneath the proposed earthwork grades or if such anomaly/debris will be unexpectedly encountered during excavation.	Construction documents must clearly identify any impediments to accomplishing the intended construction including clearly identifying the plans/details to address the consequences of encountering buried anomalies/debris and provide direction to contractor to mitigate or implement changes to the design because of encountering these anomalies/debris.	Not accepted. Note 6 precludes excavation in this area. The hatched area simply highlights the area of concern. No change to design required.				CG												
9.	24-TWO-0167 Attachment_1 Plan Sheet 7	Sections "K" and "Q" identify fill soil to be placed at top of cut slope to create Evapotranspiration Basin however there are no specifications in the Earthwork Specifications to address how new fill soil (often referred to as a "sliver fill") is to be "benched/keyed into" the existing ground surface and cut slope for compaction and slope stability.	Include clear details and earthwork specifications to address how new "sliver fill" soil is to be "benched/keyed into" the existing ground surface and cut slope for compaction and slope stability.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. Specification RPP-SPEC-65909 allows the vendor to submit their Backfill, Compaction, and Inspection Procedure. The project will review and approve this document prior to commencement of installation.				CG												



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Cathrene Glick			Luissa Johnston					
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10.	24-TWO-0167 Attachment_1 Plan Sheet 7	Detail "M" identifies locking trench detail and identifies backfill of the trench following embedment of the 40-mil liner material however there are no specifications in the Earthwork Specifications to address how trench backfill soil is to be placed and compacted.	Include clear details and earthwork specifications to address how trench backfill soil is to be placed and compacted.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. Anchor trench backfill is addressed in Section 312300, Subsection 3.2.E of RPP-SPEC-65909.			CG
11.	24-TWO-0167 Attachment_1 Plan Sheet 6 and Sheet 7	Section "P" identified on Sheet 6 to be depicted on Sheet 7; however Detail on Sheet 7 is identified as "PA".	Correct Section/Detail Identification.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not Accepted. Detail P is identified on Sheet 7 (top right of sheet), and Detail PA is identified on Detail P of Sheet 7 and then Detail PA is shown on Sheet 7.  Pictures from Sheet 7:  			CG
12.	24-TWO-0167 Attachment_1 Plan Sheet 7	Section/Detail "PA" indicates that there is to be an "extrusion weld" for the Enviroliner overlap at the Pipe Boot; however, there are no specifications or details to clarify this weld to assure there is no leakage at boot/liner connection.	Clarify detail and add specifications for extrusion weld.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. Seam qualification and test are addressed in Section 334713.13, Subsection 3.3 and 3.4 of RPP-SPEC-65909.			CG

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13.	24-TWO-0167 Attachment_1 Plan Sheet 10	Plan Sheet depicts "oval-shaped" lay back for Tanks T-201 thru T-204 rather than "rectangular shaped" lay back with 3:1 sloping access ramp as depicted in TOC-PRES-24-6406-VA-00 presented to Ecology on December 11, 2004. Provide clarification as to how the "rectangular shaped" lay back area for Tanks T-201 thru T-204 changed from the December 11th presentation (plans were submitted to Ecology on the next day) and more specifically how contractor is to grade an oval, non-dimensioned aspect of the ISB.	Clarify design.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. The rectangular shaped lay back area depicted on slide 35 of TOC-PRES-24-6406-VA-00 was generated to show in 3-D, an approximate representation of the pits for Tanks T-201 through T-204. The oval shaped representations shown on sheets 23-26 provide an approximate pit lay back perimeter, with Detail 39 on sheet 30 providing the balance of direction for pit construction. As the four pits will all vary to some degree, and as gravel is not amenable to having sharp edges once graded, the construction notes for Detail 39 are intended to provide the construction contractor with sufficient guidance to meet the intent of the 3:1 and 1:1 slopes without detailing specific dimensions. Note 2 clarifies that the individual tank plan views on sheets 23-26 provide "recommended" shapes of pit lay back areas. Note 3 further acknowledges the need for some latitude during installation by stating "The intent is that personnel access be on the low side of the pit, therefore the 3:1 slope location may be adjusted as needed." It is well within the skill of construction subcontractors to use scale drawings to plan and place construction staking, including make field adjustments to catch the edges of excavation slopes, and, for skilled equipment operators to perform earthwork to that construction staking.			CG
14.	24-TWO-0167 Attachment_1 Plan Sheet 13	Plan Sheet identifies Nest Station Boreholes/Nest Data Station to be removed by ECN-718181 which incorporates "RPP-RPT-61684, "Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program," Rev. 4A" however, the Rev 4 version of RPP-RPT-61684 was not submitted to Ecology and was not accepted/approved by Ecology and Rev 4A version of RPP-RPT-61684 has not been accepted/approved by Ecology at this time and revisions to the document may be revised during review/approval process.	Remove reference to ECN-718181 authorizing or approving removal of any ISB monitoring devices.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. The ECN is necessary to document and gain approval for modification of the facility by removal of the above grade monitoring equipment in order to remove the polyurea barrier and install the new MatCon barrier. The boreholes will not be abandoned, removed, or decommissioned at this time. The underground equipment will remain in place and is not associated with the ECN. The boreholes are a feature that will be protected per Sections 311000, 312000, and 321216 of RPP-SPEC-65908. The above grade monitoring equipment will not be reinstalled nor connected to the underground equipment. This is consistent with the performance monitoring approach adopted for the two most recent approved ISB designs for TX			CG

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					<p>Tank Farm and U Tank Farm, where no subsurface monitoring equipment was included. Therefore, no surface monitoring equipment will be reinstalled at the replacement ISB for the T Tank Farm, and subsurface monitoring at T Tank Farm will not be resumed.</p> <p>Regarding Revision 4 of RPP-RPT-61684, Ecology is correct that Revision 4 was not submitted to Ecology and Revision 3B is the current approved revision of the document. Revision 4 of RPP-RPT-61684 was generated, reviewed internally, and "issued" within the WRPS/H2C document management software system; however, the revision was not submitted to Ecology. Unfortunately, it is not possible to revise and reissue a document revision within the document management software system. We apologize for any confusion/frustration this might have caused.</p> <p>Will update next revision available of the plan to include in the change table a statement to address the different revisions and which have been submitted/approved/reviewed by ECY.</p>			
15.	24-TWO-0167 Attachment_1 Plan Sheet 13	Plan Sheet identifies Nest Station Boreholes/Nest Data Station to be removed by ECN-718181 "RPP-RPT-61684, "Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program," Rev. 4A" however, the Rev 4A version of RPP-RPT-61684 has not been accepted/approved by Ecology at this time and revisions to the document may be revised during review/approval process. There are no specifications for how the boreholes are to be abandoned in accordance with WAC 173-160-381 or 173-160-990 or how contractor is to assure that the wells are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990 following earthwork excavation.	Clarify if removal of the Nest Station Boreholes/Nest Data Station is part of the contractor's responsibility or if this is action to be performed "by others" should Rev 4A version of RPP-RPT-61684 be approved to agree to such equipment removal/borehole abandonment. Address and include details and specifications on how contractor is to assure that the boreholes are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. See the response for comment #14.			CG
16.	24-TWO-0167 Attachment_1 Plan Sheet 16	Plan Sheet identifies Nest Station Boreholes/Nest Data Station to be removed by ECN-718181 which incorporates "RPP-RPT-61684, "Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program," Rev. 4A" however, the Rev 4	Remove reference to ECN-718181 authorizing or approving removal of any ISB monitoring devices.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface	Not accepted. See the response for comment #14.			CG

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		version of RPP-RPT-61684 was not submitted to Ecology and was not accepted/approved by Ecology and Rev 4A version of RPP-RPT-61684 has not been accepted/approved by Ecology at this time and revisions to the document may be revised during review/approval process. RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.		monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.				
17.	24-TWO-0167 Attachment_1 Plan Sheet 16	Plan Sheet identifies 24" CMP w/Lid for Nest Station Boreholes and Nest Data Station to be removed by ECN-718181 "RPP-RPT-61684, "Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program," Rev. 4A" however, the Rev 4A version of RPP-RPT-61684 has not been accepted/approved by Ecology at this time and revisions to the document may be revised during review/approval process. There are no specifications for how the boreholes are to be abandoned in accordance with WAC 173-160-381 or 173-160-990 or how contractor is to assure that the wells are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990 following earthwork excavation.	Clarify if removal of the Nest Station Boreholes/Nest Data Station is part of the contractor's responsibility or if this is action to be performed "by others" should Rev 4A version of RPP-RPT-61684 be approved to agree to such equipment removal/borehole abandonment.  Address and include details and specifications on how contractor is to assure that the boreholes are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. See the response for comment #14.			CG
18.	24-TWO-0167 Attachment_1 Plan Sheet 19	Plan Sheet identifies Nest Station Boreholes/Nest Data Station to be removed by ECN-718181 which incorporates "RPP-RPT-61684, "Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program," Rev. 4A" however, the Rev 4 version of RPP-RPT-61684 was not submitted to Ecology and was not accepted/approved by Ecology and Rev 4A version of RPP-RPT-61684 has not been accepted/approved by Ecology at this time and revisions to the document may be revised during review/approval process.	Remove reference to ECN-718181 authorizing or approving removal of any ISB monitoring devices.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. See the response for comment #14.			CG
19.	24-TWO-0167 Attachment_1 Plan Sheet 19	Plan Sheet identifies 24" CMP w/Lid for Nest Station Boreholes and Nest Data Station to be removed by ECN-718181 "RPP-RPT-61684, "Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program," Rev. 4A" however, the Rev 4A version of RPP-RPT-61684 has not been accepted/approved by Ecology at this time and	Clarify if removal of the Nest Station Boreholes/Nest Data Station is part of the contractor's responsibility or if this is action to be performed "by others" should Rev 4A version of RPP-RPT-61684 be approved to agree to such equipment removal/borehole abandonment.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal	Not accepted. See the response for comment #14.			CG



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		revisions to the document may be revised during review/approval process. There are no specifications for how the boreholes are to be abandoned in accordance with WAC 173-160-381 or 173-160-990 or how contractor is to assure that the wells are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990 following earthwork excavation.	Address and include details and specifications on how contractor is to assure that the boreholes are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990.	of any ISB monitoring devices.					
20.	24-TWO-0167 Attachment_1 Plan Sheet 23	Plan Sheet depicts "oval-shaped" lay back for Tank T-201 rather than "rectangular shaped" lay back with 3:1 sloping access ramp as depicted in TOC-PRES-24-6406-VA-00 presented to Ecology on December 11, 2004. There are no specifics on how or where contractor is to grade a non-dimensioned oval aspect of the ISB. Also, the note on plan sheet indicates "Approx. Pit Lay Back Perimeter Per Detail 39, 3:1 Slope for Personnel Access (This Side), all other sides 1:1 Slope". Provide clarification for the note that indicates "3:1 Slope for Personnel Access (This Side)" when an oval shape does not necessarily have "sides" and what the specific width of the 3:1 slope area is since there are no specific dimensions or details for transition from 1:1 to 3:1 slope condition.	Clarify design and provide dimensions.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. See the response for comment #13.				CG
21.	24-TWO-0167 Attachment_1 Plan Sheet 24	Plan Sheet depicts "oval-shaped" lay back for Tank T-202 rather than "rectangular shaped" lay back with 3:1 sloping access ramp as depicted in TOC-PRES-24-6406-VA-00 presented to Ecology on December 11, 2004. There are no specifics on how or where contractor is to grade a non-dimensioned oval aspect of the ISB.  Also, the note on plan sheet indicates "Approx. Pit Lay Back Perimeter Per Detail 39, 3:1 Slope for Personnel Access (This Side), all other sides 1:1 Slope". Provide clarification for the note that indicates "3:1 Slope for Personnel Access (This Side)" when an oval shape does not necessarily have "sides" and what the specific width of the 3:1 slope area is since there are no specific dimensions or details for transition from 1:1 to 3:1 slope condition.	Clarify design and provide dimensions.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. See the response for comment #13.				CG
22.	24-TWO-0167 Attachment_1 Plan Sheet 25	Plan Sheet depicts "oval-shaped" lay back for Tank T-203 rather than "rectangular shaped" lay back with 3:1 sloping access ramp as depicted in TOC-PRES-24-6406-VA-00 presented to Ecology on December 11,	Clarify design and provide dimensions.	Construction documents are to include complete and precise construction requirements and clear detail references for	Not accepted. See the response for comment #13.				CG

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		2004. There are no specifics on how or where contractor is to grade a non-dimensioned oval aspect of the ISB. Also, the note on plan sheet indicates "Approx. Pit Lay Back Perimeter Per Detail 39, 3:1 Slope for Personnel Access (This Side), all other sides 1:1 Slope". Provide clarification for the note that indicates "3:1 Slope for Personnel Access (This Side)" when an oval shape does not necessarily have "sides" and what the specific width of the 3:1 slope area is since there are no specific dimensions or details for transition from 1:1 to 3:1 slope condition.		contractor to accomplish the work.				
23.	24-TWO-0167 Attachment_1 Plan Sheet 26	Plan Sheet depicts "oval-shaped" lay back for Tank T-204 rather than "rectangular shaped" lay back with 3:1 sloping access ramp as depicted in TOC-PRES-24-6406-VA-00 presented to Ecology on December 11, 2004. There are no specifics on how or where contractor is to grade a non-dimensioned oval aspect of the ISB.  Also, the note on plan sheet indicates "Approx. Pit Lay Back Perimeter Per Detail 39, 3:1 Slope for Personnel Access (This Side), all other sides 1:1 Slope". Provide clarification for the note that indicates "3:1 Slope for Personnel Access (This Side)" when an oval shape does not necessarily have "sides" and what the specific width of the 3:1 slope area is since there are no specific dimensions or details for transition from 1:1 to 3:1 slope condition.	Clarify design and provide dimensions.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. See the response for comment #13.			CG
24.	24-TWO-0167 Attachment_1 Plan Sheet 30	Section/Detail #37and #38 depict an unspecified vertical edge of MatCon Asphalt supporting a MatCon Curb without any lateral support/confinement to sustain the vertical edge of asphalt. Asphalt does not typically hold vertical edges over any period of time, particularly with a vertical load (curb) place immediately along edge. Provide engineering analysis supporting conclusion that a vertical edge of MatCon Asphalt with an overlying vertical load can be sustainable over time of ISB design life (25 years).	Clarify design and provide dimensions.	Construction documents are to include complete and precise construction requirements and clear detail references for contractor to accomplish the work.	Not accepted. See Section 321216 subsection 3.6 of RPP-SPEC-65908.			CG
25.	24-TWO-0167 Attachment_2 RPP-CALC-65907, Rev.0 Attachment C2	Attachment C2 provides data from prior MatCon Material projects Ferndale, WA (1989) and Dover AFB, Dover, DE (Constructed 1999) without specific application/ construction differences between those sites and the UST sites at Hanford – specific	Clarify design and provide design criteria for T-Farm ISB.	Construction documents need to provide clear methods to achieve the compactive effort necessary to meet and/or exceed the performance	Not accepted. Specification RPP-SPEC-65908 states that the barrier vendor may utilize the methods described in RPP-SPEC-60023 (Previously approved WRPS Construction Specification for A and AX-Farm Waste			CG

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		compactive effort to achieve permeability criteria and equipment used. Attachment C2 also provides void content data for prior ISBs at Hanford but does not provide/include any specific information/criteria for the T-Farm ISB design and specified void content for construction purposes.		achieved at other MatCon application sites. Current documents do not provide contractor necessary information to achieve and verify the compaction necessary to achieve the required very low permeable conditions.	Retrieval Projects), Division 31, Attachment 2 or 3 or may submit for approval their Backfill, Compaction, and Inspection Procedure. The specification Part 1, Section 1.1, Items 13-16 further requires submittal of information regarding voids for approval.				
26.	24-TWO-0167 Attachment_2 RPP-CALC-65907, Rev.0 Attachment C	Appendix C contains the analysis of the increase in soil cover height associated with construction of the barrier. But there is no equipment specific bearing pressure calculations to determine if heavy equipment can be safely used.	Clarify why bearing pressure calculations and supporting data similar to those in appendices of HNF-17862 are not needed for safety and to achieve adequate compaction with heavy equipment?	Request for clarification	Not accepted. Dome loading calculations were provided in RPP-CALC-65907. Work restrictions associated with heavy equipment are addressed in RPP-SPEC-65908 Section 1.2 and will be further detailed in Work Order instructions.			JD	
27.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	There are no specifications for how the boreholes and/or monitoring wells are to be abandoned in accordance with WAC 173-160-381 or 173-160-990 or how contractor is to assure that the wells are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990 following earthwork excavation.	Address and include specifications on how contractor is to assure that the boreholes and monitoring wells are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990.	Construction documents must clearly identify requirements and/or means/methods to protect groundwater monitoring wells which could be impacted during construction.	Not accepted. See the response for comments #5, 6, and 7.			CG	
28.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	SECTION 312000 - EXCAVATION AND FILL does not include any information on compaction requirements (90% or 95% of maximum dry density) for fill materials or trench backfill soils.	Include specifications.	Construction documents are to include complete and precise construction requirements and verification process to achieve the required compaction.	Not Accepted. RPP-SPEC-65908 Section 1.3 requires subcontractor to submit their quality control plan for approval at commencement of the project. This plan shall address compaction field density measurements.			CG	
29.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	SECTION 312000 - EXCAVATION AND FILL does not include requirement for frequency of soil compaction testing (eg. one test per X sq ft or per X sq. yd) of fill placement.	Include specifications.	Construction documents are to include complete and precise construction requirements and verification process to achieve the required compaction.	Not accepted. RPP-SPEC-65908 Section 1.3 requires subcontractor to submit their quality control plan for approval at commencement of the project. This plan shall address independent laboratory testing, sampling and testing, and compaction field density measurements.			CG	
30.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	SECTION 312000 - EXCAVATION AND FILL does not include any information on proof rolling/compaction of fill slope soils for slope stability.	Include specifications.	Construction documents are to include complete and precise construction and earthwork compaction requirements and verification process to achieve the required compaction.	Not accepted. Section 321216, subsection 3.1, A adequately address requirements for proof rolling.			CG	
31.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	SECTION 312000 - EXCAVATION AND FILL 3.2.F.2 states "Within 3 ft of risers, vaults, and other existing vertical features, compact using hand-held equipment using controlled method similar to that outlined in RPP-SPEC-60023". Where is RPP-SPEC-	Include/Clarify specifications.	Construction documents to include complete specifications for contractor to accomplish work without reference to unknown or	Not Accepted. This specification is complete without the subject reference, which is offered for information to the subcontractor that the subcontractor may or may not use. The construction subcontractor backfill, compaction,			CG	

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		60023 found within the construction documents?		unavailable specifications cited to avoid conflict of interpretations of requirements.	and inspection means and methods are addressed through the submittal process identified in RPP-SPEC-65908 Section 312000 1.1.B. The references to specification RPP-SPEC-60023 identify information to the subcontractor that may or may not use in preparation of that submittal.			
32.	24-TWO-0167 Attachment_3 RPP-SPEC- 65908, Rev. 0	SECTION 312000 - EXCAVATION AND FILL 3.2.G states "Bring subgrade to proper grade and cross-section and uniformly compact surface. Place backfill and fill in layers not more than 8 in. in loose depth at optimum moisture content. Compact each layer per approved backfill, compaction, and inspection procedure." Obtaining "optimum moisture content" during grading operations is generally unachievable and specifications should provide lower and upper limit relative to optimum moisture content (such as $\pm 2\%$ ) to allow for atmospheric conditions and soil variances during grading. Achieving "optimum moisture content" does not assure compaction is accomplished to the degree required for stability and support without including the specific compaction requirements (90% or 95% of maximum dry density).	Include/Clarify specifications.	Construction documents are to include complete and precise construction and earthwork compaction requirements and verification process to achieve the required compaction.	Not accepted. Section 31200, 1.1.4 states that moisture content requirements as well as inspection and surveillance requirements are to be included as a submittal for review and approval.			CG
33.	24-TWO-0167 Attachment_3 RPP-SPEC- 65908, Rev. 0 Section 312000, "Excavation and Fill"	Subsections 3.2, G and 3.2, I, reference optimum moisture content for the fill material and backfill material.	Specify the planned requirements for compaction of fill/backfill material.  Additionally, how is the optimum moisture content going to be performed? What range of moisture content is defined for compaction and stability during grading?	Construction documents are to include complete and precise construction and earthwork compaction requirements and verification process to achieve the required compaction.	Not Accepted See the response for comment #32.			JR
34.	24-TWO-0167 Attachment_3 RPP-SPEC- 65908, Rev. 0	SECTION 312000 - EXCAVATION AND FILL 3.2.I states "Under pavements place base course material on prepared subgrades and compact at optimum moisture content to required grades, lines, cross sections, and thicknesses." Obtaining "optimum moisture content" in base course material during grading operations is generally unachievable and specifications should provide lower and upper limit relative to optimum moisture content(such as + 2%) to allow for atmospheric conditions and soil/aggregate base variances during grading. Achieving "optimum moisture content" does not assure	Include/Clarify specifications.	Construction documents are to include complete and precise construction and earthwork compaction requirements and verification process to achieve the required compaction.	Not Accepted. See the response for comment #32.			CG



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		compaction is accomplished to the degree required for stability and support without including the specific compaction requirements (90% or 95% of maximum dry density).							
35.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	SECTION 312000 - EXCAVATION AND FILL 3.5.C states the requirement to use "non-nuclear density gauge" for compaction testing of MatCon Asphalt but this criteria is not addressed to other soil and aggregate base testing.	Clarify if nuclear gage testing apparatus is allowed for soil and aggregate base compaction testing or if all compaction testing must be with non-nuclear gage apparatus.	Construction documents are to include complete and clear information regarding compaction testing equipment necessary to achieve the required very low permeable conditions for each aspect of the project specifically when equipment is prohibited for use.	Not Accepted. There is no subsection 3.5.C in Section 31200 of RPP-SPEC-65908.  Note: Construction subcontractor test methods are addressed through the means and methods provided for review and approval in the submittal process identified in RPP-SPEC-65908 Section 312000 1.1.B.			CG	
36.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	SECTION 321216 - ASPHALT PAVING 2.1.B indicates a Hydraulic conductivity (maximum) $k < 1 \times 10^{-7}$ cm/sec but does not include stating the necessary compaction effort (97% of maximum dry density as specified on Manufacturer's Website and Section 3.7.E) and there is no validation that restricted compaction equipment (vibrating plates) can achieve this level of compaction where asphalt material is hand placed.	Include/Clarify specifications.	Construction documents are to include complete and precise construction and MatCon Asphalt product compaction requirements and verification process to achieve the required compaction necessary to achieve the required very low permeable conditions.	Not Accepted. As stated in the sentence prior to the first bullet point citing the hydraulic conductivity value, the values are provided for information only. The compaction requirements are identified in subsection 3.5 of this section.			CG	
37.	24-TWO-0167 Attachment_3 RPP-SPEC-65908, Rev. 0	SECTION 321216 - ASPHALT PAVING 3.7.E addresses required 97% of maximum dry density compaction for the "test section" but there is no indication of the type and range of equipment used to place/compact the test strip. If roller compactor equipment is used for the test section then there is no correspondence to the level of compaction that is achievable with vibrating plates or plate whackers to achieve the necessary density to achieve the necessary hydraulic conductivity.	Include/Clarify specifications to assure that 97% compaction efforts can be achievable in the test section and verify with field testing in areas where this is applied within the ISB.	Construction documents are to include complete and precise construction and MatCon Asphalt product compaction requirements and verification process to achieve the required compaction necessary to achieve the required very low permeable conditions achieved with the test strip.	Not Accepted. 97% criteria in subsection 3.7.E is a MatCon HMA mix acceptance criteria not a field placement criteria.			CG	
38.	RPP-SPEC- 65908 Rev.00, Pg. 29, Sec. 2.2.D.3, 2 <sup>nd</sup> Para.	The text reads: "Acceptance of the aggregate gradation shall be based on samples taken from the final mix." I recommend taking a sample from each batch. I've seen mistakes happen and testing is relatively cheap.	Consider increasing test frequency of asphalt gradation.	To catch gradation errors sooner.	Not Accepted. The referenced sentence pertaining to HMA aggregate gradation acceptance testing and not the HMA quality control plan sampling and testing submittal requirements in subsection 1.3 of section 321216.			MM	
39.	RPP-SPEC-65908 Rev.00 P 321216-18 Section 3.8	The specification allows tapered cold joint panels of 1 to 9 feet, which differs from the EPA-recommended 3 meters.	Either update drawings and specifications to require 3 meter wedge shaped panels at cold joints or provide studies demonstrating that 1 to 9 foot tapered panels will prevent cracking.	Requested edit per Item #75.	Not accepted. The project will follow the MatCon manufacturer's recommendations. MatCon asphalt material is significantly different from asphalt material the EPA recommendations are based upon.			JD	

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40.	RPP-SPEC-65908 P 312000-7 Section 3.2(D)(1)	RPP-SPEC-65908 states that backfill tolerance for "Final lines and grades" will be "within a tolerance of +/-0.1 ft unless dimensions or grades are shown or specified otherwise." But elsewhere a tolerance of +/- 1/2 inch is specified.	Clarify whether final subgrade lines/grades will meet a tolerance of ±0.5 inches and how compliance will be measured.	Request for clarification	Not accepted. The tolerance is written as intended, i.e., 0.1-foot tolerance is the default tolerance unless otherwise specified, such as the specific incidences where the 1/2 inch tolerance is specified.			JD
41.	RPP-SPEC-65908 P 312000-2 and P 011000-3	Some reference documents are missing from Hanford AR.	Ensure all documents referenced in RPP-SPEC-65908, Revision 0 have been shared with Ecology and are available for public review in the Hanford AR, including TFC- ENG-FACSUP-C-10.	Document Request	Not accepted. TFC-ENG-FACSUP-C-10 is an internal procedure.			JD
42.	RPP-SPEC-65908 P 011000-2 Section 1.1(D)(2)	MatCon has slope limitations on subgrade. H-14-112217 specifies elevations of control points, but I do not see where these maximum and minimum subgrade slopes are implemented to prevent cracking.	Please update subgrade preparation requirements to ensure that prior to the installation of MatCon subgrade has slopes of less than 3:1 (height:volume) to ensure the safe use of compacting and paving equipment during installation, and a slope greater than 1.5 percent to facilitate drainage and minimize surface water ponding.	Requested edit	Not accepted. The final grading is depicted on sheet H-14-112217-2, additionally, East – West and North – South Grade profiles are depicted on sheets H-14-112217-4 and H-14-112217-5, respectively. The slopes are readily determined from these scale drawings.			JD
43.	RPP-SPEC-65908 321216-5 Section 1.3 And 321216-19 Section 3.11	The specification requires development of a Quality Assurance plan, and there are a there are a number of sample events described (e.g. gradation, binder and compaction) with minimum or total number of samples and sample methods already specified, but no systematic planning or data quality objectives are mentioned.	Clarify how sampling was or is being planned for: <ul style="list-style-type: none"> <li>• Gradation of final mix</li> <li>• Binder</li> <li>• Compaction</li> </ul> Will each sampling activity achieve adequate confidence in results? Provide Quality Control Plan to Ecology before project begins, and Quality Assurance report after project is complete.	Request for clarification and document.	Not accepted. The requested information is provided by the paving construction subcontractor as a submittal after subcontract award. The submittal will be reviewed for conformance with the specification and referenced standards. The submittal is dependent upon the paving subcontractors means and methods and is approved by WRPS, now H2C, construction manager.			JD
44.	24-TWO-0167 Attachment_4 RPP-SPEC-65909, Rev. 0	There are no specifications for how the monitoring wells and/or boreholes are to be abandoned in accordance with WAC 173-160-381 or 173-160-990 or how contractor is to assure that the wells are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990 following earthwork excavation.	Address and include details and specifications on how contractor is to assure that the monitoring wells and/or boreholes are properly decommissioned/destroyed in accordance with WAC 173-160-381 or 173-160-990.	Construction documents must clearly identify requirements and/or means/methods to protect groundwater monitoring wells which could be impacted during construction.	Not accepted. See comment #4, 5, and 6.			CG
45.	24-TWO-0167 Attachment_4 RPP-SPEC-65909, Rev. 0	Section 1.1.A.2 and 1.1.A.5 address "optional Backfill, Compaction, and Inspection Procedure" which is not defined/clarified as to how this is to meet and/or exceed the compaction and testing requirements specified elsewhere in the construction documents.	Provide minimum compaction effort requirements for all subgrade, fill soil, trench backfill, and aggregate base materials (per Section 3.2.E) for any "optional Backfill, Compaction, and Inspection Procedure".	Construction documents are to include complete and precise construction and earthwork compaction requirements and verification process to achieve the required compaction.	Not accepted. Specification RPP-SPEC-65909 allows the vendor to submit their Backfill, Compaction, and Inspection Procedure. The project will review and approve this document prior to commencement of installation.			CG

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46.	24-TWO-0167 Attachment_3 RPP-SPEC-65909, Rev. 0	SECTION 321216 - EXCAVATION AND FILL does not include requirement for frequency of MatCon asphalt compaction testing (eg. one test per X sq. ft. or per X sq. yd.) of asphalt placement.	Include specifications.	Construction documents are to include complete and precise construction and MatCon Asphalt product compaction requirements and verification/testing process to achieve the required compaction necessary to achieve the required very low permeable conditions achieved with the test strip.	Not accepted. The scope of specification RPP-SPEC- 65909 is Evapotranspiration Basin and Storm Utility Drainage. The MatCon HMA specifications are in Specification RPP-SPEC-65908.				CG	
47.	24-TWO-0167 Attachment_4 RPP-SPEC-65909, Rev. 0	RPP-SPEC-65908 Interim Surface Barrier Construction Specification designates the requirement to use "non-nuclear density gauge" for compaction testing of MatCon Asphalt but is non-specific on use of conventional nuclear density gage for subgrade preparation and compaction of fill soils/base course material. RPP-SPEC-65909 Rev.00 does not address if the criteria for use of "non-nuclear density gauge" for compaction testing is required or use of conventional nuclear density gage is acceptable for the evapotranspiration basin soil compaction testing.	Clarify if nuclear gage testing apparatus is allowed for soil and aggregate base compaction testing or if all compaction testing must be with non-nuclear gage apparatus.	Construction documents are to include complete and clear information regarding compaction testing equipment necessary to achieve the required very low permeable conditions for each aspect of the project specifically when equipment is prohibited for use.	Not Accepted. See the response for comment #35.				CG	
48.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Document title "RPP-RPT-61684, Rev. 4A" is inaccurate since there has not been a published "RPP-RPT-61684, Rev. 4" submitted to Ecology and Ecology has not agreed to or accepted any versions of "RPP-RPT-61684" since Rev. 3B dated 4/25/2023.	Revise document title since there is no approved and published RPP-RPT-61684, Rev. 4.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision.	Accept in principle.  Regarding Revision 4 of RPP-RPT-61684, Ecology is correct that Revision 4 was not submitted to Ecology and Revision 3B is the current approved revision of the document. Revision 4 of RPP-RPT-61684 was generated, reviewed internally, and "issued" within the WRPS/H2C document management software system; however, the revision was not submitted to Ecology. Unfortunately, it is not possible to revise and reissue a document revision within the document management software system. We apologize for any confusion/frustration this might have caused.  Will update next revision available of the plan to include in the change table a statement to address the different revisions and which have been submitted/approved/reviewed by ECY.				CG	

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49.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Document Release and Change Form Section 1 cites RPP-RPT-61684, Rev. 4A. Rev. 4 was not submitted to Ecology for review and approval and therefore any reference to changes identified as having been made in Rev.4 and incorporated into Rev. 4A are not valid.	Revise document to remove reference to RPP-RPT-61684, Rev. 4 since no such document has been published and agreed to or accepted by Ecology.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision.	Accept in principle. See the response for comment #48.			CG	
50.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Document contains print out of an email from Kyle C Kneese to Carly J Nelson sent October 14, 2024, citing changes from RPP-RPT-61684 Rev. 4 and Rev. 4A which incorrectly acknowledges/validates that RPP-RPT-61684 Rev. 4 is a valid approved document for subsequent changes to be made. Email indicates an attached pdf copy of RPP-RPT-61684 Rev. 4. RPP-RPT-61684 Rev. 4 was not submitted to Ecology for review and approval and therefore any reference to changes identified as having been made in Rev. 4 and incorporated into Rev. 4A are not valid.	Revise/Correct.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision.	Accept in principle. See the response for comment #48 regarding the revision number.  Accepted correction: Will delete the 10/14/24 email from Kyle Kneese to Carly Nelson.			CG	
51.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Information Clearance Review and Release Approval Form cites RPP-RPT-61684, Rev. 4A. Rev. 4 was not submitted to Ecology for review and approval and therefore any reference to changes identified as having been made in Rev.4 and incorporated into Rev. 4A are not valid.	Revise document to remove reference to RPP-RPT-61684, Rev. 4 since no such document has been published and agreed to or accepted by Ecology.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision.	Accept in principle. See the response to comment #48.			CG	
52.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Document Release and Change Form Section 8 cites: Rev 4: Incorporate new section for the completion of the U farm interim surface barrier and perform editorial updates. -Update instrument functionality. -Rearrange document to eliminate redundant sections. -Add language to remove subsurface monitoring from T Farm Barrier and remove T Farm subsurface monitoring sections. Rev. 4A: Add clarifying information to the inspection and maintenance sections. Add new section for roles and responsibilities. Rev. 4 was not submitted to Ecology for review and approval and therefore any reference to changes identified as having been made in Rev.4 and incorporated into Rev. 4A are not valid.	Revise document to remove reference to RPP-RPT-61684, Rev. 4 since no such document has been published and agreed to or accepted by Ecology. Rev. 3B dated 4/25/2023 is the current valid revision.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision.	Accept in principle. See the response to comment #48.			CG	
53.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Document title "RPP-RPT-61684, Rev. 4A" is inaccurate since there has not been a published "RPP-RPT-61684, Rev. 4" submitted to Ecology and Ecology has not agreed to or accepted any versions of "RPP-RPT-61684" since Rev. 3B dated 4/25/2023.	Revise document title since there is no approved and published RPP-RPT-61684, Rev. 4.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision.	Accept in principle. See the response to comment #48.			CG	



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54.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Version History identifies Rev. 4 issued in May 2024 removed subsurface monitoring from T-Farm Barrier; however, Rev. 4 was not submitted to Ecology for review and approval and therefore changes identified as having been made in Rev.4 and incorporated into Rev. 4A are not valid. Subsurface monitoring for T-Farm Barrier remains a requirement for current polyurea barrier and proposed new MatCon ISB per the current RPP-RPT-61684, Rev. 3B dated 4/25/2023. RPP-RPT-61684, Rev. 3B dated 4/25/2023 retains subsurface monitoring for T-Farm ISB and this requirement has not been rescinded and that changes alluded to in Rev. 4 removing subsurface monitoring from T-Farm Barrier are not valid.	Revise document to remove reference to RPP-RPT-61684, Rev. 4 since no such document has been published and agreed to or accepted by Ecology. Revise Version History table to reflect that RPP-RPT-61684, Rev. 3B dated 4/25/2023 is the current valid revision (which retains subsurface monitoring for T-Farm ISB and this requirement has not been rescinded) and that changes alluded to in Rev. 4 are not valid.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Accept in principle. See the response to comment #48.				CG	
55.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 1.1	Section 1.1 text states “A limitation of ISBs is that the impact of an ISB in mitigating contaminant migration downward through the vadose zone diminishes with depth. The further below ground the contamination is located, the longer it will take for an ISB to impact that contaminant’s migration. There exists a maximum depth at which ISBs are no longer effective at impacting the contaminant migration.” This statement supports the necessity to incorporate and continue subsurface monitoring via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	Incorporate and continue subsurface monitoring via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	Address limitations of project design as performance criteria to accomplish the goal of the ISB to reduce infiltration into the subsurface soils/vadose zone and reduce migration of contaminants.	Not Accepted. Performance monitoring in the context of ISBs is the evaluation for maintenance of the physical surface barrier integrity as necessary for the surface barrier to continue to perform its intended propose, reducing surface infiltration of precipitation. While reducing surface infiltration is expected to slow migration of existing releases of mobile constituents directly under the barrier to great depths, the ISBs are not intended to function as final barriers. Consequently, ongoing comprehensive performance monitoring that might be applicable to final barriers is not appropriate for ISBs.				CG	
56.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 1.1 “Interim Surface Barriers Background”	The text states “The ISBs slow migration of mobile contaminants and extends the migration to groundwater over a longer period of time. A limitation of ISBs is that the impact of an ISB in mitigating contaminant migration downward through the vadose zone diminishes with depth.” This seems to suggest that it is important to monitor the full thickness of the vadose zone beneath the area (footprint) of the ISB using neutron probe + drywell logging and soil moisture data collection.	Recommend monitoring the vadose zone beneath the replacement ISB with neutron probe, drywell logging, and soil moisture data collection during the 25-year service life.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. Ecology’s request for deep monitoring of the vadose zone is beyond the scope of ISB performance monitoring. Performance monitoring in the context of ISBs is the evaluation for maintenance of the physical surface barrier integrity as necessary for the surface barrier to continue to perform its intended propose, reducing surface infiltration of precipitation. While reducing surface infiltration is expected to slow migration of existing releases of mobile constituents directly under the barrier to great depths, the ISBs are not intended to function as final barriers nor as a treatment for contaminated soils.				JR	

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57.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 2.0	Section 2.0 text states "To meet expectations stated within the HFFACO Milestone M-045-92, the list of activities discussed in this maintenance and performance monitoring plan includes guidance on performance of: <ul style="list-style-type: none"><li>• ISB quarterly and annual field inspection and maintenance;</li><li>• ISB performance monitoring through collection and analysis of geophysical data (e.g. soil moisture, drywell logging, etc.); and</li><li>• Annual reporting on ISB inspection, maintenance, and performance monitoring data."</li></ul> This statement supports the necessity to incorporate and continue subsurface monitoring via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	Incorporate and continue subsurface monitoring via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Accept. Will modify language to be consistent with milestone language. The Maintenance and Performance Monitoring Plan will address: • Systematic inspections and maintenance of the interim barriers to ensure their performance over their 25-year service life.			CG
58.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 3.0	Section 3.0 text states "To confirm ISBs are performing as expected, performance monitoring, which uses in-situ sensors and drywell holes or neutron logging tubes, is performed at T, TY, and SX Tank Farms."  Under the current approved RPP-RPT-61684, Rev. 3B dated 4/25/2023 subsurface monitoring for T-Farm ISB retains a requirement. RPP-RPT-61684, Rev. 4 was not submitted to Ecology for review and approval and therefore changes identified as having been made in Rev.4 and incorporated into Rev. 4A are not valid. Subsurface monitoring for T-Farm Barrier remains a requirement for current polyurea barrier and proposed new MatCon ISB per the current RPP-RPT-61684, Rev. 3B dated 4/25/2023.	Incorporate and continue subsurface monitoring to extend during the 25-year service life via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Accept. Will modify language to identify that T Farm subsurface monitoring will continue until above ground equipment removal is completed for the new barrier construction, throughout Section 3.0.			CG
59.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 3.0	Section 3.0 text states "The monitoring systems have fulfilled their intended purpose and have provided substantial data that show that the ISBs effectively minimize rainfall and snowmelt from entering the soil beneath the ISBs." However, Section 2.0 states "The maintenance and performance monitoring plan addresses the following requirements: <ul style="list-style-type: none"><li>• Systematic inspections and maintenance of the ISBs to ensure their performance over their 25-year service life."</li></ul> The monitoring is to extend during the 25-year service life and not terminate early and should be incorporated	Incorporate and continue subsurface monitoring to extend during the 25-year service life via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. Systematic inspection and maintenance is accomplished through the continued quarterly inspection and maintenance program that occurs at all of the ISBs. Inspections and maintenance are performed to maintain the ISBs integrity and will continue.			CG

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		into each site with an ISB.								
60.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 5 Sec. 3.0 Para. 1/Last sentence	Text states that "the monitoring systems <u>have fulfilled</u> their intended purpose and have provided <u>substantial</u> data that show that the ISBs effectively minimize rainfall and snowmelt from entering the soil beneath the ISBs."  The past tense of "have fulfilled" insinuates that monitoring would no longer be needed.  The word "substantial" feels like an overstatement.	Monitoring should be on-going to support the statement and the phrase should be changed to "the monitoring systems will be used to continue to provide data that show that the ISBs effectively minimize rainfall and snowmelt from entering the soil beneath the ISBs."	Reference could not be found where it is documented that that monitoring of the system was to only be needed for the purpose of showing the ISB was effective and would then be terminated.  It is also not reasonable to assume that because one barrier that was monitored showed the ISB was effective that future monitoring at other barriers would not be needed.	Accept. Will update the language to remove the word substantial and insert sufficient.				LJ	
61.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 5 Section 3.1 Section Title	Section title has a spelling error. It currently reads "Quarterly Insepctions and Maintenance."	Correct title to "Quarterly Inspections and Maintenance."	Spelling/Grammatical error.	Accepted. Will correct the word Inspections				EP	
62.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 5 Sec. 3.1 Para. 2	Calling the pooling of water a "nuisance" feels inadequate.	The plan should address pooling in a more active way rather than just referring to it as a "nuisance".	Pooling of water or snow has the potential to infiltrate imperfections or tears in the barrier, potentially leading to intrusion. DOE needs to address what they will do when they observe pooling on the barrier.	Accepted. Will delete the word nuisance and replace with "minor pooling of water" in accordance with barrier design and function.  Clarification: Design of the barrier surface involves several trade-offs and compromises involving the elevation difference between the basin and ISB surface vs. the need to cut/fill over the tank farm vs. the weight that the tanks can support. In some cases, it is not possible to ensure a slope that fully drains 100% of the rainfall, e.g. in small locations where slope is less than 2%. Therefore, all of the previously approved designs allow for short term pooling of rainfall on the barrier surface in areas with less than 2% slope. The very low permeability ISB surface barrier prevents infiltration and promotes evaporation no				LJ	

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					differently than the evapotranspiration barrier. Standing water does not impact the permeability of the MatCon material which is 4" thick.					
63.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 5 Sec. 3.1 Para. 2 Sentence 1	As indicated in the Section 1.2, "Interim Surface Barriers Purpose and Design Function," a core principle of the ISB's function is to direct natural precipitation away from tank farms. Further below in Section 3.1, the noted paragraph includes "pooling of water" as an observed nuisance in past inspections.	Explain how the nuisance of "pooling water": A) Fulfills the purpose of redirecting natural precipitation and; B) Will be rectified in future cases, if they should arise.	A primary design function of ISBs is directing natural precipitation from tank farms. Leaving "pool[ed] water" on the surface should be considered inconsistent with the design function.	Clarification: Nuisance is an operational description and does not affect the design function of the barrier. The MatCon material allows for an operational amount of pooling water. See response to Item 62.				EP	
64.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 5 Sec. 3.1 Last Para./Sent. 1	"Quarterly inspection observations showing an anomaly that may have the potential to impact the ISBs intended purpose and design function shall be included in the annual ISB monitoring report with a documented path-forward"  The FY2023 Annual ISB report noted pooling and cracks in the barrier that should have been identified as "anomalies that may have the potential to impact the ISBs intended purpose", but this was not the case. There was no documented "Path-forward" for dealing with pooling or cracks. Observation is not a "path-forward".	DOE needs to identify a "path-forward" for addressing issues like pooling and cracks that appear to be a constant issue and could impact the ISBs intended purpose.	Other barriers have had issues with pooling and cracks within their lifetime. It is an issue that should be addressed as it is likely to continue to be an issue as barriers age and settle.	Not accepted. In the FY2023 Annual Report, pooling water was not considered a potential anomaly that would impact the ISB integrity and therefore did not have a path-forward or corrective action.  Cracks that were identified to have the potential to impact the ISB were noted as monitor/repair. Engineering judgement is utilized to determine urgency of those repairs based on information that is gathered during the quarterly inspections.  Clarifying criteria was added for use with internal procedures to identify when actions are necessary for observations made during the quarterly inspections.				LJ	
65.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 3.3	Section 3.3 text states "Performance monitoring is conducted in T, TY, and SX Tank Farms... At T and TY Tank Farms, the instruments are grouped into monitoring nest stations that include a neutron probe access tube, a group of capacitance probe (CP) sensors, and a group of heat dissipation units (HDUs)."  Under the current approved RPP-RPT-61684, Rev. 3B dated 4/25/2023 subsurface monitoring for T-Farm ISB retains a requirement. RPP-RPT-61684, Rev. 4 was not submitted to Ecology for review and approval and therefore changes identified as having been made in Rev.4 and incorporated into Rev. 4A are not valid. Subsurface monitoring for T-Farm Barrier remains a	Incorporate and continue subsurface monitoring to extend during the 25-year service life via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. Subsurface monitoring at T Farm Demonstration barrier will continue until the polyurea barrier is removed. Revision 3B of the Plan does not include the new T Tank Farm MatCon Barrier.  Regarding Revision 4 of RPP-RPT-61684: Ecology is correct that Revision 4 was not submitted to Ecology and Revision 3B is the current approved revision of the document. Revision 4 of RPP-RPT-61684 was generated, reviewed internally, and "issued" within the WRPS/H2C document management software system; however, the revision was not submitted				CG	



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		requirement per the current RPP-RPT-61684, Rev. 3B.			<p>to Ecology. Unfortunately, it is not possible to revise and reissue a document revision within the document management software system. We apologize for any confusion/frustration this might have caused.</p> <p>Will update next revision available of the plan to include in the change table a statement to address the different revisions and which have been submitted/approved/reviewed by ECY.</p> <p>Regarding continuation of subsurface monitoring: It is necessary to remove the above grade monitoring equipment in order to remove the polyurea barrier and install the new MatCon barrier. The boreholes will not be abandoned, removed, or decommissioned at this time. The underground equipment will remain in place. The boreholes are a feature that will be protected per Sections 311000, 312000, and 321216 of RPP-SPEC-65908. The above grade monitoring equipment will not be reinstalled nor connected to the underground equipment. This is consistent with the performance monitoring approach adopted for the two most recent approved ISB designs for TX Tank Farm and U Tank Farm, where no subsurface monitoring equipment was included. Therefore, no surface monitoring equipment will be reinstalled at the replacement ISB for the T Tank Farm, and subsurface monitoring at T Tank Farm will not be resumed.</p>			
66.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 3.3 "Performance Monitoring" and Table 1	The text describes performance monitoring instruments and mentions that capacitance probes will not be utilized. The text also states that when performance monitoring equipment fails, it will not be replaced. What is the purpose of reducing or eliminating performance monitoring equipment over the 25-year service life of the ISB? Is this section of the document meant to imply that performance monitoring will become less important over the 25-year service life?	Recommend that performance monitoring equipment that is installed to monitor the performance of the ISB be replaced or repaired if it is found to have failed or been broken during the 25-year service life.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. Current approved RPP-RPT-61684, REV 3B states, "Because the monitoring systems have fulfilled their intended purpose and show that the ISBs effectively control moisture beneath the barriers, there is no need, nor are there plans to replace failed monitoring equipment." – Page 7, and page 12.			JR

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67.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A	Figure 4-1 is from another document but does not include the figure description (e.g. explanation of the different monitoring instrumentation nests, footprint, edge effect, control point etc.) from the other document.	The figure should include a legend or description of the TA, TB, TC, and TD instrumentation nest equipment that is installed.	Clarification.	Not accepted. The purpose of the figure, which includes nest labels, is to identify locations not the type of equipment.				JR	
68.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 9 Sec. 4.1 Para. 2/Sent.1	"During the removal of the T Tank Farm polyurea ISB and installation of the modified asphalt replacement ISB, all the historic monitoring equipment will be removed, and subsurface monitoring will be terminated." Does Ecology approve of this?	If Ecology approved this, please provide a reference to this.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Accept. Will add clarifying language to state that above ground equipment will be removed, and in-ground equipment will remain, but in keeping with past approved designs, will not perform subsurface monitoring once construction is complete. Ecology approval is pending based on design and Revision 4A of RPP-RPT-61684 Revision 4A.				LJ	
69.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 4.1 "Performance Monitoring at T Tank Farm"	The text states "During the removal of the T Farm polyurea ISB and installation of the modified asphalt replacement ISB, all historic monitoring equipment will be removed, and subsurface monitoring will be terminated."	Recommend subsurface monitoring of the vadose zone beneath the replacement ISB should be performed during the 25-year service life period, in order to continue monitoring performance/assessment of performance.	Continue to provide subsurface monitoring of the vadose zone beneath the replacement ISB per RPP-RPT-61684 Rev. 3B dated 4/25/202.	See response to comment #68.				JR	
70.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 4.1	Section 4.1 text states "During the removal of the T Tank Farm polyurea ISB and installation of the modified asphalt replacement ISB, all the historic monitoring equipment will be removed, and subsurface monitoring will be terminated. Consistent with Ecology approved ISB designs for TX Tank Farm and U Tank Farm, no subsurface monitoring equipment will be installed at the replacement ISB for T Tank Farm, and subsurface monitoring there will not be resumed."  Under the current approved RPP-RPT-61684, Rev. 3B dated 4/25/2023 subsurface monitoring for T-Farm ISB retains a requirement. RPP-RPT-61684, Rev. 4 was not submitted to Ecology for review and approval and therefore changes identified as having been made in Rev.4 and incorporated into Rev. 4A are not valid. Subsurface monitoring for T-Farm Barrier remains a requirement per the current RPP-RPT-61684, Rev. 3B. Any agreement/understanding which led to elimination of subsurface monitoring for TX-Tank Farm and U-Tank Farm is not unilaterally extended to the ISB for T-Tank Farm.	Remove text indicating removal of subsurface monitoring equipment and termination of subsurface monitoring. Incorporate and continue subsurface monitoring to extend during the 25-year service life via neutron probe dry well logging, soil moisture logging, surface geophysical methods, or other applied vadose zone techniques.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted.  Regarding Revision 4 of RPP-RPT-61684: Ecology is correct that Revision 4 was not submitted to Ecology and Revision 3B is the current approved revision of the document. Revision 4 of RPP-RPT-61684 was generated, reviewed internally, and "issued" within the WRPS/H2C document management software system; however, the revision was not submitted to Ecology. Unfortunately, it is not possible to revise and reissue a document revision within the document management software system. We apologize for any confusion/frustration this might have caused.  Will update next revision available of the plan to include in the change table a statement to address the different revisions and which have been submitted/approved/reviewed by ECY.  Regarding continuation of subsurface monitoring:				CG	

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					It is necessary to remove the above grade monitoring equipment in order to remove the polyurea barrier and install the new MatCon barrier. The boreholes will not be abandoned, removed, or decommissioned at this time. The underground equipment will remain in place. The boreholes are a feature that will be protected per Sections 311000, 312000, and 321216 of RPP-SPEC-65908. The above grade monitoring equipment will not be reinstalled nor connected to the underground equipment. This is consistent with the performance monitoring approach adopted for the two most recent approved ISB designs for TX Tank Farm and U Tank Farm, where no subsurface monitoring equipment was included. Therefore, no surface monitoring equipment will be reinstalled at the replacement ISB for the T Tank Farm, and subsurface monitoring at T Tank Farm will not be resumed.			
71.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 10, Sec. 5.0, 1st Para	I'd like to see a more robust monitoring plan given the deterioration of the tanks. For example, looking at the TY Tank Farm, the text reads: "The ISB at TY Tank Farm was the second ISB constructed as part of the ISB demonstration project detailed in PNNL-19772. TY Tank Farm was prioritized for an ISB based on criteria listed in RPP-ENV-41309, and the discovery of Technetium-99 (Tc-99) and nitrate contamination near the southern end of the farm, about 95- to 100-ft below ground surface. Initial measurements of the Tc-99 indicated that the pore water concentration was one of the highest found at that time at Hanford. At TY Tank Farm, five out of the six tanks were designated as assumed leakers at the time RPP-ENV-41309 was prepared, and many of the contaminants from waste releases still resided within the vadose zone beneath the tank farm." As stated, there are 5 out of 6 assumed leakers, there are contaminant plumes at the southern end of the farm, and the documents PNNL-19772 and RPP-ENV-41309 are dated 2010 and 2009, respectively. Given the dates of PNNL-19772 and RPP- ENV-41309, there doesn't appear to be a current analysis of vadose zone contaminants or groundwater plume characterization.	Increase monitoring and data collection at the tank farms.	It will provide a more complete data set in order to determine effectiveness of the barrier as time goes on.	Not accepted. Comment and Ecology request is beyond the scope of the Interim Surface Barriers program. Vadose zone sampling and groundwater plumes characterization is not part of the Interim Surface Barriers program.			MM

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72.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Pg. 16 Sec. 7.1 Para. 1/Sent. 1  And  Pg. 17 Sec. 8.1 Para. 1/Sent. 1	"The T, TY and SX Tank Farm ISB monitoring instruments have provided substantial data to conclude that the ISBs are effective at redirecting precipitation and runoff water away from the tank farms and contaminated soil within tank farm backfill." The term "substantial" is inaccurate.	DOE needs to rectify that their data does not support the conclusion that the ISBs are as effective as they claim to be considering the instances of pooling, especially over tank pits. There is already no monitoring being conducted at TX and U farm based off of this conclusion. At the very least new ISBs going forward should reconsider implementing some sort of monitoring ex-tank monitoring..	Pooling on the ISBs and intrusion at TX-101 is basis enough to conclude the ISBs are not quite as effective as they claim, in which case continued monitoring and an appropriate "path-forward" needs to be included in order to take this into account. Few instances of monitoring data is not enough to approve a comment that states there is "substantial data" for their conclusion.	Accept. Will modify language to remove the word "substantial" and change to "sufficient".			LJ
73.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A P. 17, Section 9	Documents evaluating barrier materials are not in administrative record or Ecology Library.	Ensure all documents referenced in RPP-RPT-61684, Rev. 4a have been shared with Ecology and are available for public review in the Hanford AR, including RPP-RPT-47488, 241-SX Tank Farm Interim Surface Barrier Material Alternatives Study and in RPP-RPT-38323, Tank Farm Interim Surface Barrier Materials and Runoff Alternatives Study.	Records Request.	Accept. The reports have been added to the AR: RPP-RPT-47488, <a href="#">AR-34006</a> and RPP-RPT-38323, <a href="#">AR-34005</a> .			JD
74.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A P. 17, Section 9	MatCon Barrier:  Document states MatCon was chosen as the barrier construction material. This material has several strengths and weaknesses according to EPA's innovative technology evaluation report, EPA/540/R-03/505, <i>Evaluation of Wilder Construction Company's MatCon Cover Technology</i> :  Mat con out performed conventional asphalt in UV degradation and permeability in accelerated aging tests, but permeability did increase by several orders of magnitude to 2.2 x 10 <sup>-6</sup> cm/sec, which exceeds the RCRA Subtitle C limit of 1x10 <sup>-7</sup> cm/s.	More information should be provided in this section about how the materials evaluated in the two different documents were compared to one another. This explanation should state whether any materials out performed Matcon for permeability, and whether they evaluated for accelerated aging with water spraying, how the test compared and what the performance was after that test. In that context, explain how it was determined that MatCon was the best material in the long term and whether any materials outperformed MatCon in accelerated aging tests for permeability.	Requested edit	Accepted. Per milestone requirement, information not required to be in RPP-RPT-61648, will modify plan to remove this Section.			JD
75.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A P. 17, Section 9	MatCon Barrier: Document states MatCon was chosen as the barrier construction material. This material has several weaknesses according to EPA/540/R-03/505: At the TCL site, a crack at a cold joint appeared after a prolonged period of cold weather in January 2000. The edge of the asphalt application is	More information should be provided in this section about how the materials evaluated in the two different documents were compared to one another. This explanation should state whether any materials are better suited than MatCon for cracking along cold joints. In the context of that information, explain how it was	Requested edit and clarifying question.	Accepted. This is beyond the scope of the maintenance and performance monitoring plan and pertains to a component of the approved ISB design. Will modify plan to remove this Section.			JD



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		<p>typically more difficult to compact because there is no lateral support for the roller. When the asphalt is hot, the edges weld together properly. However, an edge that is allowed to cool overnight is then very difficult to bond to the next day's first application of asphalt. In addition, it is especially difficult to increase density in the cold joint area. The result is a zone along the cold joint that may be poorly compacted. Raveling, or separation of aggregate particle fines from the surface or edges of the compacted asphalt, can occur in these zones. Although WCC has determined that poor quality workmanship was the cause, a better design has since been developed to overcome the raveling and reduce dependency on workmanship. A wedge-shaped cold joint panel (3-meters wide) proved to be a good design in terms of bonding and providing a good impermeable mat. The new design includes removal of some material and a heavy tack coating.</p> <p>The crack that appeared at the cold joint at the TCL site was routed and sealed. The zone along the cold joint, about 3 feet wide (0.91 meter), was sealed with mastic to decrease the permeability by filling the surface voids.</p> <p>Ecology has expressed concern about segmentation which DOE has tried to address, but the cold joints introduced by the number of temporary segments is concerning given MatCon's known issues with cold joint fractures.</p>	<p>determined that MatCon was the best material in the long term. DOE should explain what construction technique they intend to use, such as a 3-meter wedge shaped cold joint panel at section borders to improve bonding (note, this is discussed in the construction specification, but there is still concern because the tapered edge construction described is considerably shorter than 3 meters, as little as 1 foot, see #39).</p> <p>Also, has there been any cracking along cold joints in either of the past two MatCon projects?</p>					
76.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A P. 17, Section 9	<p>MatCon Barrier:</p> <p>Document states MatCon was chosen as the barrier construction material. This material has several limitations according to EPA/540/R-03/505:</p> <ul style="list-style-type: none"> <li>The subgrade to receive the MatCon cover must be firm and unyielding to support compaction of the MatCon asphalt during construction.</li> <li>The subgrade to receive the MatCon cover must have slopes of less than 3:1 (height:volume) to ensure the safe use of compacting and paving equipment during</li> </ul>	<p>More information should be provided in this section about how MatCon was chosen, and whether the site characteristics are suitable to the use of Matcon, in particular:</p> <ul style="list-style-type: none"> <li>Is the subgrade, with the underground tanks, adequate support for the equipment and pressure needed for compaction of MatCon?</li> <li>What is the pressure needed for compaction of MatCon hot and cold joints and what are the loading limits for the subgrade and tank domes?</li> <li>Will subgrade have slope in the envelope needed for MatCon?</li> </ul>	Requested edit	Accepted. This is beyond the scope of the maintenance and performance monitoring plan and pertains to a component of the approved ISB design. Will modify plan to remove this Section.			JD

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		installation. <ul style="list-style-type: none"> <li>The subgrade to receive MatCon must have a slope greater than 1.5 percent to facilitate drainage and minimize surface water ponding.</li> </ul> The subgrade must be constructed to a grading tolerance of ±0.5 inch (1.3 cm).	<ul style="list-style-type: none"> <li>Will there grading tolerance be adequate?</li> <li>What subgrade tolerance will be achieved and how will it be measured?</li> </ul> Supporting document should also be provided (see comment #40)					
77.	24-TWO-0167 Attachment_5 RPP-RPT-61684, Rev. 4A Section 10	Section 10 omits T-Tank Farm from inclusion of future Milestone M-045-92 Annual ISB Report under the current approved RPP-RPT-61684, Rev. 3B dated 4/25/2023 which specifically includes subsurface monitoring for T-Farm ISB as a requirement.	Revise text to reinstate subsurface monitoring for T-Farm ISB.	RPP-RPT-61684 Rev. 3B dated 4/25/2023 is the current valid revision and there are no provisions in this document for cessation of subsurface monitoring for T-Farm or supporting/approving removal of any ISB monitoring devices.	Not accepted. There are no plans to perform subsurface monitoring at the new MatCon T Farm barrier. Revision 3B does not include the MatCon surface, but the demonstration polyurea barrier, which will be removed.  See response to Item 70.			CG
78.	Unresolved Comments to RPP-RPT-64363 Rev. 0 241-T Tank Farm Interim Surface Barrier Design Considerations Report Page 6 Section 3.1 Last Paragraph	Text reads: "Last, the entire tank farm fenced boundary has historically not been within the scope of barrier coverage due to less risk associated with future events." It is unclear what the "future events" include and why this sentence is included.	Clarify, add additional information, or delete sentence.	Unresolved Comment requires clarification for continued limitations of the extent of the ISB since there are stated depth limitations to the influence of reduction of infiltration into the subsurface soils with the current 20-ft distance from the SSTs.	Not accepted. Document provided to Ecology based on their request to provide as information only.			CG
79.	Unresolved Comments to RPP-RPT-64363 Rev. 0 241-T Tank Farm Interim Surface Barrier Design Considerations Report Page 20 Section 3.4.5 6th Bullet	Text addresses intended removal of ISB vadose zone monitoring equipment and NEST stations and states that "All ISB monitoring data is being evaluated by Closure and Interim Measures staff. Recommendations on a path forward for future monitoring of all ISBs will be included in this evaluation. Further assessment will be required to determine whether the boreholes need protection in the new 241-T Tank Farm ISB, or whether they can be abandoned in place." Ecology recommends inclusion/ implementation of an ISB monitoring program for 241-T Tank Farm to include dry-well neutron probe monitoring and to incorporated into the Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program (RPP-RPT- 61884 Rev 3B or current revision).	Ecology recommends securing and utilization of existing dry-well monitoring system for ISB vadose zone monitoring and include dry-well neutron probe monitoring and to incorporated into the Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program (RPP-RPT-61884 Rev 3B or current revision).	Unresolved Comment since there has not been acceptance and/or approval by Ecology to terminate or eliminate subsurface moisture monitoring for T-Farm.	See comment #78			CG

Review Comment Record		Washington State Department of Ecology Nuclear Waste Program					Date: 2/19/25: ECY comments (25-NWP-029) April 2025: DOE-HFO Response	
<b>Document Title(s)/Number(s):</b> 24-TWO-0167 - T Tank Farm Interim Surface Barrier Design Package and RPP-RPT-61684 Rev. 4A "Maintenance and Performance Monitoring Plan for the Interim Surface Barrier Program"								
Document Manager			Telephone Number	Project Manager		Telephone Number	Facility Site ID	Cleanup Site ID
Cathrene Glick				Luissa Johnston				
Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	Permittee Response	Ecology Response	Open/Close	Reviewer Initials
80.	Unresolved Comments to RPP-RPT-64363 Rev. 0 241-T Tank Farm Interim Surface Barrier Design Considerations Report Page 48 Table 4-2 Item #11	Text addresses existing NEST stations within and adjacent to T-Farm.	Ecology recommends securing and utilization of existing dry-well monitoring system for ISB vadose zone monitoring and include dry-well neutron probe monitoring and to incorporated into the Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program (RPP-RPT-61884 Rev 3B or current revision).	Unresolved Comment since there has not been acceptance and/or approval by Ecology to terminate or eliminate subsurface moisture monitoring for T-Farm.	See comment #78			CG
81.	Unresolved Comments to RPP-RPT-64363 Rev. 0 241-T Tank Farm Interim Surface Barrier Design Considerations Report General Comment	Ecology currently recommends inclusion/implementation of an ISB monitoring program for 241-T Tank Farm to include dry-well neutron probe monitoring and to incorporated into the Maintenance and Performance Monitoring Plan for the Interim Surface Barriers Program (RPP-RPT-61884 Rev 3B or current revision).	Changes/Revision to prior agreements for future ISB monitoring for 241-T Tank Farm.	Unresolved Comment since there has not been acceptance and/or approval by Ecology to terminate or eliminate subsurface moisture monitoring for T-Farm.	See comment #78			CG
82.	Unresolved Comments to RPP-RPT-64363 Rev. 0 241-T Tank Farm Interim Surface Barrier Design Considerations Report Section 3.1, Page 4, Second Paragraph	RPP-RPT-55084, <i>Hanford 241-T Farm Leak Inventory Assessment Report</i> , was published in 2013.	Are you able to provide a more recent report?	Unresolved Comment. If current data is available, it would be great if reference it. If not, discuss why the data is still relevant?	See comment #78			MM
83.	Unresolved Comments to RPP-RPT-64363 Rev. 0 241-T Tank Farm Interim Surface Barrier Design Considerations Report	PNL-6297, <i>Model Assessment of Protective Barrier Designs: Part II</i> was published in 1987.	State why this document is still relevant given that it was published in 1987.	Unresolved Comment. If current data is available, it would be great if reference it. If not, discuss why the data is still relevant?	See comment #78			MM

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	Section 3.1, Page 6, Paragraph 3								
84.	Unresolved Comments to RPP-RPT-64363 Rev. 0 241-T Tank Farm Interim Surface Barrier Design Considerations Report Section 4.1, Page 25, Paragraph 4.	The test reads: "A literature survey was performed in 2023 (for this report) to identify new materials or similar projects that might affect the material selection process. Most asphalt development since 2010 has been to decrease traffic impacts to roadways, to aid longevity and reduce repair costs ("perpetual pavement" designed to last 50 years without major structural rework other than periodic resurfacing), or to produce permeable asphalt in an effort to limit stormwater runoff."	Provide a reference for the literature survey.	Unresolved Comment.	See comment #78				MM