MEETING NOTES

Annual Meeting Between the U.S. Department of Energy, Office of River Protection (DOE-ORP) and the State of Washington, Department of Ecology (Ecology) to Discuss Interim Measures Completed in Fiscal Year 2017 and Planned for Fiscal Year 2018

MEETING DATE: July 11, 2017

LOCATION: 3100 Port of Benton Blvd, Room 3A

ATTENDEES:

Michael Gerle (WRPS)
John Doughty (WRPS)
Jessica Joyner (WRPS)
Mike Barnes (Ecology)
Jeff Lyon (Ecology)
Cindy Tabor (WRPS)
Dan Parker (WRPS)
Harold Sydnor (WRPS)
James Hamilton (WRPS)
Alex Pappas (WRPS)
Joe Caggiano (Ecology)
Jan Bovier (DOE-ORP)
Robin Varljen (WRPS)
Maria Skorska (Ecology)
Ryan Childress (WRPS)
Jeremy Johnson (DOE-ORP)

PURPOSE OF MEETING: Fulfill Hanford Federal Facility and Consent Order commitment M-045-56, "to meet yearly...for the establishment of additional Agreement interim measures."

The following topics were discussed at the meeting:

- Actions for FY 2017 - proposed in FY 2016 Meeting **(Item A)**
- Additional actions completed in FY 2017 **(Item B)**
- Discuss Objectives for Barriers **(Item C)**
- Discuss the Path Forward of Interim Surface Barrier at T Farm **(Item D)**
- Provide Status of Subsidence Detected at 241-TY-104 **(Item E)**
- Discuss SX Barrier - Potential Expansion **(Item F)**
- Provide Update on Interim Measures associated with 241-T-112 **(Item G)**
- Proposed actions for FY 2018 **(Item H)**
- Discuss the need for modification of M-045-56 language **(Item I)**

Details on these topics are provided below.

A. ACTIONS FOR FY 2017 (PROPOSED IN FY 2016 MEETING):

1. Determine Locations for Barriers 3 and 4

It was identified that Barriers 3 and 4 have not been selected to-date. A brief discussion occurred regarding potential locations before it was identified that a follow-up meeting should be set up to continue discussions (**Action 2017-07-11-03**). The potential location for barriers identified were TX Farm (Jan Bovier and Maria Skorska) and U Farm (Jeff Lyon). Cindy Tabor identified that the objectives of Interim Surface Barrier (ISB) was on the agenda to be discussed later in this meeting (**Item C**).

2. ***FY 2016 Barrier Monitoring Report (T/TY)***

Alex Pappas identified that the FY 2016 Barrier Monitoring Report (T/TY) was going through the clearance process and should be available by the end of July. When the report is cleared, it will be provided electronically to Maria Skorska (**Action 2017-07-11-01**).

Mr. Pappas provide a brief summary of the report and addressed questions:

- Very slight drying is occurring in the soil underneath the barrier
- It is possible another probe has stopped operating properly
- For every nest there are 4 heat dissipation units (HDU) and 5 capacitance probes
- The deepest HDU is 10 meters below ground surface (bgs) and the deepest capacitance probe is 8 feet bgs
- Moisture results are at the edge of the detection limits.

Harold Sydnor identified that the barriers aided in directing surface water runoff away from the farms. Joe Caggiano asked about the impact regarding the higher precipitation during FY 2017. Mr. Pappas identified that this information would be presented in next year's report.

3. ***Provide a report evaluating T-111 ventilation system at the end of system operation***

Cindy Tabor identified that the report is in the Administrative Record and previously emailed the following link to attendees:

http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0071509H

4. ***Provide an update on the T/TY Barrier Inspections and Maintenance***

Cindy Tabor indicated that a presentation was provided on March 1, 2017. She also noted that the presentation was originally supposed to be provided in January but was delayed due to weather related closure issues in the early part of the year. The meeting notes and presentation are in the Administrative Record and available at the following link:

http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0069792H

Several questions were identified during the March presentation and responses to these questions were provided in an email on April 17, 2017 (see Attachment A). Additionally, the email identified that the path forward on the T Farm ISB regarding being replaced or repair was being evaluated. It was identified that this was an item on the agenda to be discussed later in this meeting (**Item D**).

B. <u>ADDITIONAL ACTIONS COMPLETED IN FY 2017</u>

Michael Gerle provided information on the Interim Measures Monitoring Plan inspections (i.e. checking berms etc.). He indicated that several minor issues were found during the October 20, 2016 and April 17, 2017 inspections:

- Pump and treat water line cut through berm
- Engineering drawings did not reflect current information and needed to be updated
- Infiltration areas beginning to silt up, but were still effective.

It was identified that the subsidence near TY-104 was observed after these inspections. It was also identified that the Interim Measures Monitoring Plan does not address interim surface barriers, which are addressed under another inspection program.

It was also identified that these inspections were documented through the WRPS Management Observation Program (MOP). Maria Skorska requested a copy of the documentation from these inspections and Michael Gerle indicated that he would provide cleared information by the end of July 2017 (**Action 2017-07-11-02**).

C. DISCUSS OBJECTIVES FOR BARRIERS

There was a brief discussion on this item before it was identified that a follow-up meeting should be set up and that DOE-ORP should present the language for barrier objectives (**Action 2017-07-11-04**). It was also identified that objectives for ISBs should be discussed at the same meeting in which future barrier locations are to be discussed and that DOE-ORP should present the rationale for why TX Farm should be the location for ISB 3 and 4. Prior to this being held, Maria Skorska took the action to coordinate with Ecology to reach agreement on the next barrier locations and the objectives for barriers (**Action 2017-07-11-05**).

During the brief barrier objective discussion, Dan Parker and Maria Skorska indicated that the objectives of ISB's are changing from protecting groundwater from existing tank leaks and vadose zone contamination, to a more proactive objective of protecting against future leaks and also address tank intrusions. Maria Skorska also voiced Ecology's concerns on the depth of effectiveness for ISBs and that the concept moving forward should be to place ISBs over "non-leaker" tanks that have been identified as having high inventories of risk driving constituents like Tc-99. This would reduce the risks of large Tc-99 inventories reaching groundwater.

Jeff Lyon identified that DOE-ORP needs to consider current and new milestone requirements for barriers during these discussions and proposals.

D. DISCUSS THE PATH FORWARD OF INTERIM SURFACE BARRIER AT T FARM

It was identified that there is no decision on the path forward for T Farm barrier replacement or repair. Jan Bovier took an action to provide follow-up information to Ecology on the path forward (**Action 2017-07-11-06**).

E. PROVIDE STATUS OF SUBSIDENCE DETECTED AT 241-TY-104

James Hamilton stated that the subsidence likely occurred in May 2017 and was discovered by operations crew at the end of May. Ecology personnel (Jared Mathey) also viewed the subsidence during a field inspection in June. It was theorized that the cause of subsidence is associated with the prior design of wooden boxes installed around steam valves. These boxes are now decaying and in-turn might cause a subsidence. Precautions were taken to barricade the area of the TY-104 subsidence and to prevent foot traffic over other areas where a subsidence may occur. James Hamilton took the action to provide a copy of the information regarding TY Farm subsidence, provided to Jared Mathey, to Maria Skorska as well (**Action 2017-07-11-07**). It was also identified that longer term corrective actions are currently being developed to address the current subsidence and possible future ones.

F. PROVIDE UPDATE ON INTERIM MEASURES ASSOCIATED WITH 241-T-112

Jeremy Johnson indicated that this effort has been discontinued due to issues (e.g., unlikely to get Ecology approval, no movement on permit modifications). He identified that design work for duct/exhauster installation had been completed and development of a work plan (similar to T-111) had been initiated. He identified that currently there are no plans to exhaust T-112 amid ongoing conversations between DOE-ORP and Ecology.

Maria Skorska stated that exhausting T-112 would create condensate and in-turn create a precedent that it was allowable for tanks to pump condensate into the air. This activity would not be able to be permitted.

G. DISCUSS SX BARRIER DESIGN CHANGE

Dan Parker identified that DOE-ORP is looking at expanding the extent of the SX barrier from the current design. Mr. Parker noted that in order to enable potential future expansion, a design change to the water conveyance system beneath the currently approved SX Barrier North would be needed. Maria Skorska requested a drawing and elaboration of this design change. It was agreed that a meeting with Ecology to discuss and reach agreement on this design change was needed. Dan Parker took the action to schedule a meeting to discuss and reach agreement on the SX Barrier Design Change (Action 2017-07-11-08). He also indicated that – after this meeting was held, he planned to document approval of the design change in the monthly project manager meeting.

H. PROPOSED ACTIONS FOR FY 2018

Cindy Tabor identified the following proposed actions proposed for FY 2018:

- FY 2017 Barrier Monitoring Report – T/TY [July 2018]
- Design for Barrier 3 [June 2018]
- Status of SX Barrier Construction [July 2018])

Dan Parker noted that updates on SX ISB construction would be provided as it progressed, not just in July.

I. DISCUSS THE NEED FOR MODIFICATION OF M-045-56 LANGUAGE

Cindy Tabor identified that she provided information to attendees on change package M-45-98-03, which included information on the development of this M-045-56 milestone. She provided a handout (Attachment B), which was an excerpt from the change package. She also indicated that the language associated with this milestone was broad and allowed for various interim measures activities to be conducted.

Maria Skorska took the action to coordinate with Ecology to reach agreement on the need to modify M-045-56 language (**Action 2017-07-11-09**).

JAN B BOVIER	Jan B Bovier	8/7/2017
DOE Project Manager (print)	DOE Project Manager (signature)	Date
Jeffery J. Lyon		8/7/2017
Ecology Project Manager (print)	Ecology Project Manager (signature)	Date

The following actions were identified in this meeting:

ACTIONS			
Action Number	**Actionee**	**Description**	**Status**
2017-07-11-01	Pappas	Provide to Ecology (Skorska) - on CD - the FY 2016 Barrier Monitoring Report for T/TY.	
2017-07-11-02	Gerle	By the end of July 2017, provide to Ecology (Skorska) the Interim Measure Monitoring Plan October 20, 2017 and April 17, 2017 assessment information.	
2017-07-11-03	Bovier	Set up a meeting with Ecology to discuss locations of Barriers 3, 4 and subsequent Barriers.	
2017-07-11-04	Bovier	Present the language for Barrier objectives in the meeting associated with Action 2017-07-11-03.	
2017-07-11-05	Skorska	Coordinate with Ecology to reach agreement on the next Barrier locations and the objectives for Barriers.	
2017-07-11-06	Bovier	Provide follow-up information to Ecology on the path forward for T-Farm Barrier.	
2017-07-11-07	Hamilton	Provide a copy of the information regarding TY Farm subsidence - that are being provided to Jared Mathey (Ecology) - to Skorska (Ecology).	
2017-07-11-08	Parker	Set up a meeting with Ecology to discuss and reach agreement on SX Barrier North design change.	
2017-07-11-09	Skorska	Coordinate with Ecology to reach agreement on the need to modify M-045-56 language.	

Attachment A

Tabor, Cynthia L

From: Tabor, Cynthia L
Sent: Monday, April 17, 2017 8:18 AM
To: Skorska, Maria; 'miba461@ecy.wa.gov'; Caggiano, Joseph
Cc: Bovier, Jan B; Rutland, Paul L; Parker, Dan L (Danny); Lyon, Jeffery; Childress, Ryan D
Subject: T/TY Barrier Inspection and Maintenance Presentation and Follow-up Questions
Attachments: 2017-2_MeetingNotes_20170301.pdf; Ecology Final TFarm Focus sheet.pdf; 0902151_WRPS_-_0912070064.pdf

Hi All

The first attached file are draft meeting notes including the cleared presentation from the March 1st (#4: Provide an update on the T/TY Barrier Inspections and Maintenance). This was an action item (#4) from our annual interim measures meeting (Meeting Notes: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0074960H). There was issues with schedules and weather – thus the presentation was in March (rather than January – as identified above).

Additionally, there were questions generated during the meeting. The below are the questions and responses.

1) Joe C (Ecology): When were the pictures taken?
   Response: 2014

2) Joe C (Ecology): Slide 22 – how long did it take for the separation issue to reoccur?
   Response: It took ~ 2 years for the separation issue to reoccur.

3) Marysia S (Ecology): What are the plans for future repairs (issue cost effectiveness vs implementing alternative)
   Response: With respect to the T and TY interim surface barriers, it should be noted that these were both constructed as demonstration projects. T interim surface barrier was planned as a two year demonstration (See Ecology's T-Farm Interim Surface Barrier Demonstration Project Fact Sheet – second attached file), but had a projected design life of about 25 years. The T interim surface barrier has been repaired in the past. The TY interim surface barrier was also planned as a two year demonstration (See Ecology's TY-Farm Interim Surface Barrier Demonstration Project Fact Sheet – third attached file) and also had a projected design life of about 25 years. The TY interim surface barrier has not been repaired.

   Included

   Monitoring of the two interim surface barriers has continued to the present time and shows that the barriers have been effective in drying the vadose zone under the barriers. Therefore, the two barriers are still performing their intended function. The T interim surface barrier is being evaluated to determine if it should be replaced or repaired. A path forward has not been decided upon at this point.

4) Joe C (Ecology): How close were we to reaching dome load with asphalt barrier?
   Response: With respect to TY Farm, Tank TY-101 came the closest to the allowable load (385,000 lbs) with 116,693 lbs of combined loaded soil and barrier.

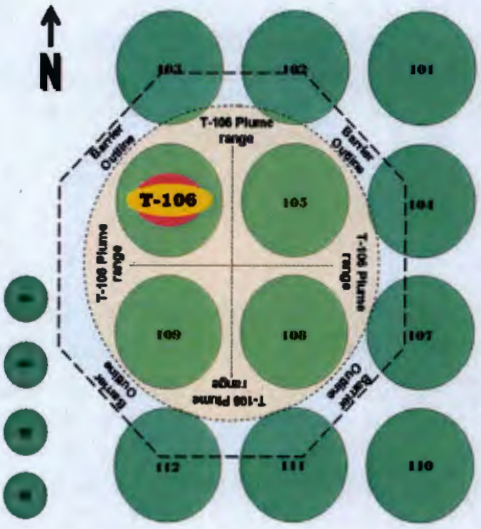
If there are any questions...please let us know.

Thank you
Cindy

CYNTHIA TABOR | SCIENTIST
CLOSURE & CORRECTIVE MEASURES

T-Farm Surface Barrier Demonstration Project

The Washington State Department of Ecology invites you to comment on the U. S. Department of Energy's plans to place a temporary barrier (similar to a truck bed liner) over part of the "T" Tank Farm. "Farm" is the term used for groups of underground waste storage tanks on Hanford's central plateau. This project will demonstrate the ability of an interim barrier to inhibit the infiltration of rain and melting snow into the soil and significantly reduce the downward migration of a plume of contamination in the soil in T Tank Farm.



Background

Hanford has huge amounts of radioactive waste left over from making plutonium for the nation's defense. Workers put much of the waste into underground storage tanks. The first 149 tanks had a single steel liner and a reinforced concrete shell, and 67 of these tanks are known or suspected to have leaked.

The largest leak was in June 1973, when 115,000 gallons of waste leaked from the T-106 tank. This tank is in the T Farm in the northern end of 200 West area. This leak released an estimated 21,000 curies of cesium-137 and an estimated 60 curies of Tc-99, which is mobile and essentially moves with about the same speed as the infiltrating water.

The plume of contaminants from this leak remains around and under the T-106 tank and continues to slowly migrate downward toward groundwater. The infiltration of rain and snow melt is the primary driver in moving the contaminant plume downward toward the water table. Also, the surface of the tank farms is gravel, which water can easily infiltrate. Groundwater is the pathway for contaminants that reach the water table to move to the Columbia River. That is why it is important to keep rain and snow from driving the plume deeper.

Regulatory Framework

Cleanup of the Hanford Site is well underway. The Hanford Federal Facility Agreement and Consent Order, or Tri-Party Agreement guides the cleanup. The commitment for cleanup of contaminated soil around the tanks is designated in Milestone M-45, "Complete Closure of all Single-Shell Tank Farms."

The single-shell tank farm cleanup has several parts. The main parts are to retrieve the waste from inside the tanks, to remediate contamination in the sand and gravel around these tanks and related equipment, and finally close the Tank Farms. Cleanup of groundwater in the 200 West Area will be after cleanup of all contaminant sources .
The legal deadline for final cleanup of the single-shell tank farms is 2024, only 17 years from now. In the meantime we want to prevent the spread of the contamination under the tanks. We especially want to keep contaminants from reaching groundwater to avoid making groundwater quality worse.

The Plan

In 2006, USDOE proposed installing an interim barrier over the contaminated soils in the tank farms. USDOE and Washington Department of Ecology are planning a surface barrier demonstration at the "T" tank farm on Hanford's central plateau. The barrier is to go above the T-106 tank. The barrier is intended to keep water from infiltrating into the soil by redirecting the water away from the contaminated area in the tank farm.

The method of applying the barrier on the soil is similar to the method used to spray-on plastic liners for truck beds, only thicker and more durable. The barrier material is polyurea/ polyurethane. The barrier will be sloped to drain collected rain and snow melt to an uncontaminated area outside of the T Farm where it will be allowed to infiltrate into uncontaminated soil.

The barrier would be a demonstration for use of similar barriers as interim measures in the Resource Conservation and Recovery Act Corrective Action Program. Tri-Party Agreement milestones 45-56C calls for USDOE to propose additional interim measures every year.

The proposed barrier is a test. This is an interim measure and does not rule out any final remedy.

The demonstration barrier will help USDOE answer a number of questions:

- How well will this technique work?
- What is the practicality of installing the barrier over a tank farm?
- What do barriers like this really cost?
- How effective will the barrier be?
- What are the long-term costs for operations and maintenance?
- Does the barrier reduce risk in localized areas, and how much?

The plan is to:

- Continue design through May 2007
- Plan how to install the barrier, and procure in stallation services and materials through June2007
- Construct/install the barrier from June through September 2007.
- Monitor and evaluate soil moisture contentunder and next to the barrier and overall barrier perfor mance
- Perform regular inspections of the barrier

About the Tanks

How many tanks are in the T Tank Farm?
The T Farm has 16 tanks; 12 are 530,000 gallon capacity and 4 are 55,000 gallon capacity.

How many T Farm tanks have leaked?
USDOE reports show 7 tanks have leaked: T-101, T-103, T-106, T-107, T-108, T-109, and T-111. But the T-106 leak is about ten times larger than all other T-Farm tank leaks combined.

Will the barrier go over other tanks that have leaked?
Yes, it will go over some of them. The purpose of this demonstration is to cover the T-106 tank leak plume, not all the known leaking tanks in T Farm.

Publication Number 07-05-023

About the plume

How deep is the contamination plume?
We know the plume is at least 125 ft. below ground surface; about 85 feet below the bottom of the tank.

How deep is the groundwater under T Farm?
Right now the groundwater is 242 ft. below ground surface, but the water table is slowly dropping about 1 foot per year.

What direction is groundwater flow under T Farm?
The present direction of groundwater flow beneath T Tank Farm is east-northeast. During Hanford operations, it varied from south to the present east-northeast. Over time, groundwater should flow eastward, as it did before Hanford operations began.

About the barrier

How big will the barrier be?
Although the design is not complete, the barrier will be about 60,000 square feet. (For comparison, a football field is 57,600 square feet.) The barrier will be large enough to cover the T-106 tank leak plume. The barrier technology is flexible and can be added to or removed as needed.

How thick will the barrier be?
Although the design is not complete, the polyurea/polyurethane liner will be about ½ inch thick or less. Engineered fill will be placed up to 2 to 3 feet thick before barrier installation to achieve the desired slope for drainage.

How will the barrier be secured to prevent damage or movement from the strong winds?
The final design will answer that question. The design will require that the barrier be adequately anchored to the ground to prevent high winds from lifting it.

What other tanks will be covered?
The barrier may cover part or all of the surrounding tanks; T-102, T-103, T-104, T-105, T-107, T-108, T-109, T-111, and T-112.

Will the barrier prevent the usual monitoring of the tanks?
No. Tank monitoring equipment will remain accessible. Boreholes surrounding the tanks will remain accessible for geophysical logging activities.

Will the barrier become radioactive waste?
No.

About future plans

When will you know how well the barrier performs?
The demonstration and related monitoring will last at least 2 years.

When will the barrier be removed?
We don't yet know. If the barrier works as we plan, we probably would leave it there until final T Farm remediation decisions are made.

If this barrier demonstration is successful, are more temporary barriers expected?
Yes. They would cover areas of large releases in other tank farms.

What do you think?

Design is under way, and the public may comment on the proposal through May 7, 2007.

For more information, or if you would like to comment, please write or email

Joe Caggiano
Washington Department of Ecology
Nuclear Waste Program
3100 Port of Benton Blvd
Richland, WA 99354
fax: 509-372-7971
jcag461@ecy.wa.gov

HANFORD PUBLIC INFORMATION REPOSITORIES

Richland
U.S. Department of Energy Reading Room
Consolidated Information Center, Room 101-L
2770 University Dr.
Attn: Janice Parthree 509-372-7443

Portland
Portland State University
Branford Price Millar Library
1875 SW Park Ave.
Attn: Don Frank 503-725-4132

Seattle
University of Washington
Suzzallo Library
Government Publications Division
Attn: Eleanor Chase 206-543-4664

Spokane
Gonzaga University
Foley Center
502 E. Boone Ave.
Attn: Linda Pierce 509-323-3834

If you need this publication in an alternate format, please call the Nuclear Waste Program at 509-372-7950. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

WASHINGTON STATE DEPARTMENT OF ECOLOGY
Nuclear Waste Program
3100 Port of Benton Blvd.
Richland, WA 99354

INCOMING CORRESPONDENCE COVERSHEET

Author	Addressee	Correspondence No.
J. J. Lyon/DOEC	S. J. Olinger/ORP	0902151

Subject: APPROVAL OF THE UPDATED 541-TY INTERIM BARRIER DESIGN REVIEW PACKAGE

DISTRIBUTION

Washington River Protection Solutions
WRPS Correspondence Control
JC Allen-Floyd
F Beranek
HS Berman
C Burrows
AB Dunning
JG Field
RE Gregory
JN Holloway
AM Hopkins
GJ Johnson
MA Lindholm
DL Parker
TR Reynolds
KJ Rueter
D J Sansotta
SM Sax
CG Spencer
BR Thomas

INFORMATION ONLY	
Priority:	**None**
Assignee:	**None**
Received:	December 7, 2009
Due Date:	**None**

WRPS Correspondence Control
For Questions call: 376-0271
Outlook Mail Address: ^WRPS Correspondence Control

Our approval gives USDOE-ORP the option to proceed on procurement of construction services for the 241-TY Interim Surface Barrier. However, we are still reviewing the *241-TY Tank Farm Interim Surface Barrier Monitoring Plan*, RPP-PLAN-36705, Revision 1.

If there are any questions, contact me at 509-372-7914.

Sincerely,

Jeffery J. Lyon
Tank Waste Storage Project Manager
Nuclear Waste Program

mm/aa
Enclosure

Reference: "241-TY Interim Barrier Design Review Package," submitted July 6, 2009, by Columbia Energy and Environmental Services

cc w/enc:
Bob Lober, USDOE
Colin Henderson, CEES
Jim Field, WRPS
Andrea Hopkins, WRPS
Dan Parker, WRPS
Stuart Harris, CTUIR
Gabriel Bohnee, NPT
Russell Jim, YN
Susan Leckband, HAB
Ken Niles, ODOE
Administrative Record: SST and 241-TY
Environmental Portal
Hanford Operating Record General File
USDOE-ORP Correspondence Control

The single-shell tank farm closure process has several parts. The main parts are to:
* Retrieve the waste from inside each tank.
* Remediate contamination in the sand and gravel around the tanks and related equipment.
* Investigate the contaminated soil in the tank farm, down to the groundwater.

Cleanup of groundwater in the 200 West Area has started and will continue after cleanup and closure of all contaminant sources.

The TPA addresses the legal deadline for final cleanup and closure of the single-shell tank farms. An amendment to the TPA has been proposed in the Settlement Agreement announced on August 11, 2009.

Our focus is to prevent the spread of the contamination below the tanks. We must keep contaminants from reaching the groundwater.

The Plan

In 2006, USDOE proposed installing interim barriers over some contaminated soil in the tank farms. The installation of other interim measures is referenced in the TPA. Milestones for additional barriers are proposed in the Settlement Agreement.

The first interim barrier demonstration is underway at the T Tank Farm.

The second interim barrier planned will cover the TY Tank Farm and a region to the south of the tank farm. This barrier is intended to keep water from penetrating the soil by redirecting the water away from the contaminated area in the tank farm.

The TY Farm was selected as a location for an interim surface barrier because:

TY Farm ranked in the top five for placement of a barrier due to the presence of mobile contaminants based on USDOE's comparison study RPP-ENV-41309.

Recent characterization data shows additional concentrations of Technetium-99 and nitrate at the south end of the TY Farm.

Construction would be easier and more cost effective, since TY Farm does not have above-ground equipment and obstructions.

The modified asphalt product proposed for the TY Tank Farm interim barrier would be constructed similar to an asphalt road or parking lot. The modified asphalt would be at least four inches thick and would contain a binder to make the material water-resistant. The barrier will be sloped to drain rain and snow melt to an area west of the tank farm where it will be discharged to a vegetated evaporation basin.

The proposed barrier is a test. It is an interim measure and does not rule out or restrict any final remedy. The demonstration barrier will help USDOE answer a number of questions:

- How well will this technique work?
- Is it practical to install a barrier over a tank farm?
- What do barriers like this really cost?
- How effective will the barrier be?
- What are the long-term costs for operations and maintenance?
- Does the barrier reduce risk to the groundwater in localized areas, and how much?

The plan is to:

- Complete the design in Fall 2009.
- Plan the installation and procure contractors and materials through Spring 2010.
- Construct and install the barrier in 2010.
- Monitor and evaluate soil moisture content under and next to the barrier.
- Monitor and evaluate overall barrier performance.
- Perform regular visual inspections of the barrier.

TY Tank Farm

The TY Farm has six tanks, each with a 758,000-gallon capacity.

USDOE believes five tanks have leaked: TY-101, TY-103, TY-104, TY-105, and TY-106. In addition, it is likely that piping to the 242-T Evaporator has also leaked in the area.

The Plume

Future Plans

DEPARTMENT OF ECOLOGY
State of Washington

When will you know how well the barrier performs?

The demonstration and related monitoring will last at least two years.

When will the barrier be removed?

We don't know yet. If the barrier works as planned, we may leave it until final TY-Farm remediation decisions are made.

If this barrier demonstration is successful, will more temporary barriers be constructed?

Yes. New barriers would cover areas of large releases in other tank farms, as proposed in the Settlement Agreement announced on August 11, 2009.

What do you think?

Design of the barrier is underway. You may comment on the proposal from December 7, 2009, to January 12, 2010.

View the documents online at ecy.wa.gov/programs/nwp or one of the below repositories.

HANFORD PUBLIC INFORMATION REPOSITORIES

Richland
U.S. Department of Energy Reading Room
Consolidated Information Center, Room 101-L
2770 University Dr.
Attn: Janice Parthree 509-372-7443

Portland
Portland State University
Branford Price Millar Library
1875 SW Park Ave.
Attn: Don Frank 503-725-4132

Seattle
University of Washington
Suzzallo Library
Government Publications Division
Attn: Eleanor Chase 206-543-4664

Spokane
Gonzaga University
Foley Center
502 E. Boone Ave.
Attn: Linda Pierce 509-323-3834

Attachment B

Change Number M-45-98-03	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date January 22, 2001

Originator Ecology 0054858 **Phone**

Class of Change
[ ] I – Signatories [X] II – Executive Manager [ ] III – Project Manager

Change Title
Agreement Commitments Regarding Initial Single-Shell Tank Waste Management Area (WMA) Corrective Actions, Vadose Zone and Groundwater Characterization, Assessment, and the Integration of Vadose Zone and Groundwater Activities at specified Associated Sites.

Description/Justification of Change

Introduction:

The U. S. Department of Energy's (DOE's) Tank Waste Remediation System (TWRS) program mission is to store, retrieve, treat, and immobilize high level radioactive waste presently contained in twenty eight (28) double-shell tanks and one hundred forty nine (149) single-shell tanks (SSTs). The 149 SSTs are hazardous waste management units regulated under Washington's Hazardous Waste Management Act (HWMA, Chapter 70.105 RCW) and its implementing requirements (Washington's Dangerous Waste Regulations at Chapter 173-303 WAC) and applicable portions of the Federal Resource Conservation and Recovery Act (RCRA). The SSTs are currently operating under interim status standards pending closure. They will be closed as a treatment, storage, and/or disposal (TSD) facility under the HWMA and Major Milestone series M-45-00 of the Hanford Federal Facility Agreement and Consent Order (Agreement). The twelve (12) SST farms are grouped into seven (7) Waste Management Areas (WMAs) for purposes of HWMA groundwater assessment and monitoring.

To date, tank leaks and associated releases of tank waste including dangerous wastes and dangerous waste constituents have resulted in groundwater contamination documented at four (4) SST WMAs (See Attachment One). These 4 WMAs are WMA S-SX (containing S and SX single-shell tank farms), WMA B-BX-BY (containing B, BX, and BY single-shell tank farms), WMA T (containing the T single-shell tank farm), and WMA TX-TY (containing TX and TY single-shell tank farms).

Impact of Change
Modification of Agreement requirements including major milestone series M-45-00 (Complete Closure of all Single-Shell Tank Farms) Appendix D interim milestones and target dates documenting: (1) integration of groundwater and vadose zone activities related to corrective actions at DOE's SST WMAs, (2) interim measures identified to-date as initial response actions to SST leaks, and (3) commitments between the parties regarding the utilization of HWMA and RCRA corrective action processes. Ecology and DOE agree that work under this M-45-98-03 change will be managed through one unified schedule incorporating Agreement milestones, DOE (internal agency) milestones, and DOE contractor baseline. On approval of this M-45-98-03 change, Hanford site internal planning, management, and budget documents will be modified accordingly.

Affected Documents

The Hanford Federal Facility Agreement and Consent Order, as amended, and Hanford site internal planning, management, and budget documents (e.g., Baseline Change Control documents, Multi Year Work Plans, Sitewide System Engineering Control documents, Project Management Plans, and DOE's Hanford Site Groundwater/Vadose Zone Integration Project Long Range Plan).

Approvals

DOE	Date 3-26-01	✓ Approved	____ Disapproved
EPA NA	Date	____ Approved	____ Disapproved
Ecology	Date 3/13/01	✓ Approved	____ Disapproved

Description/Justification of Change (continued)

Releases from tank farm areas have caused surface, underlying vadose zone and groundwater contamination which has led to a number of regulatory responses including: (1) Compliance and Assessment level groundwater monitoring pursuant to the HWMA and its implementing requirements (See interim status standards incorporated by reference at Chapter 173.303.400 WAC, i.e., 40 CFR Part 265 Subpart F); and 40 CFR Part 265, Subpart J [Tank Systems]; and (2) Corrective Action pursuant to Chapter 173.303.646 WAC, and Agreement processes.

On July 10, 1998, Ecology called on the DOE to develop and submit a corrective action plan outside of the Agreement for the S, SX, B, BX, BY, T, TX, and TY SST farms, and that this plan at a minimum: "(1) provide information equivalent to a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and will include provisions to characterize the vadose zone and aquifer beneath the tank farms, (2) define the sources, nature, and extent of contamination, and (3) identify actual or potential receptors".[1] In response, the DOE invoked the dispute resolution procedures of the Agreement, and asked that the parties work with one another in developing a resolution.[2] Subsequent correspondence between the agencies[3] elevated this dispute to the agencies' Inter Agency Management Integration Team (IAMIT), further described their respective concerns, and documented conditions under which the parties would attempt to resolve this dispute through Agreement negotiations. This dispute was subsequently suspended through December 11, 1998. This Agreement Change Control Form #M-45-98-03 has been developed as a resolution of this dispute. The parties agree that based on information developed as a result of this Agreement modification, or other information, it may be necessary to take additional (now unanticipated) steps to address contamination at the SST WMAs and/or it may be necessary to accelerate either the closure or corrective action process.

This Change Control Form identifies initial actions necessary for the DOE to comply with the corrective action requirements of Chapter 173-303-646 WAC. Actions include the collection of information regarding contaminant nature, extent and migration so as to allow Ecology and EPA to begin to evaluate risk and identify appropriate interim measures. The parties anticipate that investigation and characterization at the SST WMAs will be a phased effort, where information developed during initial investigation and characterization will be used to refine and identify additional investigation and characterization needs. Initial actions to respond to SST leaks at SST WMAs and past tank waste discharges will be followed by additional Agreement commitments as new information is acquired (e.g., additional interim measures, Corrective Measures Study (CMS) documentation, identification of additional WMAs, etc.). This Agreement modification has been coordinated with site-wide groundwater/vadose zone activities under the Groundwater/Vadose Zone (GW/VZ) Integration Project.

Many activities addressed by this Change Control Form are also incorporated into DOE's GW/VZ Integration Project. One of the purposes of the Integration Project is to allow a comprehensive evaluation of ongoing activities to provide for improved coordination among projects, better use of resources, and elimination of potential redundancies within the projects. The GW/VZ Integration Project published its "Project Baseline/Long Range Plan" in early calendar year 1999. The integration of TWRS and Environmental Restoration (ER) characterization and remediation efforts is a clear objective of the plan. On approval, these Change Number M-45-98-03 requirements contained herein will: 1) be incorporated within the "Project Baseline/ Long Range Plan" plan, and 2) will be subject to modification to the same extent as other Agreement requirements.

---

1 Letter: Mike Wilson, Program Manager, Washington Department of Ecology, Nuclear Waste Program to Jackson Kinzer, Program Manager, Tank Waste Remediation System, U. S. Department of Energy, Richland Operations Office, July 10, 1998.

2 Letter: 98-EAP-400, George Sanders, Tri Party Agreement Administrator, U.S. Department of Energy, Richland Operations Office to Mike Wilson, Program Manager, Washington Department of Ecology, Nuclear Waste Program, July 22, 1998.

3 Letters: (1) 98-EAP-464, George Sanders, Tri Party Agreement Administrator, U.S. Department of Energy, Richland Operations Office to Mike Wilson, Program Manager, Washington Department of Ecology, Nuclear Waste Program, August 21, 1998, (2) Mike Wilson, Program Manager, Washington Department of Ecology, Nuclear Waste Program to George Sanders, Tri-Party Agreement Administrator, U. S. Department of Energy, Richland Operations Office, September 4, 1998, and (3) 98-EAP-508, James E. Rasmussen, Director, Environmental Assurance, Permits and Policy, U. S. Department of Energy, Richland Operations Office to Mike Wilson, Program Manager, Washington Department of Ecology, Nuclear Waste Program, September 11, 1998.

Implementation of Initial Interim Measures

The development of corrective action documentation at SST WMAs will enable the parties to identify additional interim measures and interim corrective measures, as well as support the eventual closure of the SST TSDs. To date a wide range of near term interim measures and supporting activities have been identified and agreed to by the parties. Some of these interim measures are relatively straightforward and do not require vadose zone characterization to optimize engineering designs or supporting analyses (e.g., eliminating water sources and preferential pathways for surface water). Other potential interim measures require careful consideration of feasibility, benefits, the protection of human health and the environment, and impacts to tank farm operations including safety and worker risk, and therefore may require improved understanding of subsurface conditions and processes (e.g., placement of surface barriers to limit infiltration).

Initial interim measures or activities that directly support identification of interim measures, and that do not require vadose zone characterization include the following:

(1) Upgrading leak tight caps on monitoring drywells around SSTs.

(2) Conducting an engineering study of other potential near-term interim measures (e.g., identifying and isolating additional potentially leaking water lines in or near the SST WMAs, sealing additional abandoned wells in or near the SST WMAs, and controlling surface drainage and ponding). Completion of this study will aid scheduling additional interim measures that can be implemented in the near term prior to or concurrent with vadose zone characterization.

(3) Conducting a workshop as part of DOE's Innovative Treatment Remedial Demonstration Project to identify concepts for interim surface barriers that could be installed at the SST WMAs to limit migration of contaminants in the vadose zone prior to tank farm closure. Results and recommendations of this workshop, as well as results and conclusions from recommended test and evaluation activities, will be summarized following their completion and a copy submitted to Ecology.

Ecology regulatory decisions and DOE decisions on placing interim surface barriers, controlling retrieval leaks, readying tanks for closure by removing waste, and closing tank farms will be aided by improved understanding of subsurface conditions and processes. Information regarding TWRS vadose zone activities may be found at Table Four (4) of the DOE's Tank Waste Remediation System Vadose Zone Program Plan (DOE/RL-98-49, July 1998). Table 1 is a listing of those activities underway in FY 1999, those which will start or continue after FY 1999, and those that are included in the milestone section of this Change Control Form.

Table 1

Activity	Underway in FY 1999	Will Start or Continue After FY 1999	Included in Milestone Section of this Change Control Form
Initial activities for the management of existing vadose zone contamination:			
1) Water line testing.		X	X
2) Seal abandoned wells, cap boreholes.	X	X	X
3) Gather data on tank farm surface water runoff and ponding.	X		X
4) Define drainage control remedies, and implement minor changes.		X	X
5) Implement major surface drainage controls if required.		X	X
6) Conduct studies and field testing for interim surface barriers.	X	X	X
7) Provide interim surface barriers if required.			X
8) Prepare detailed characterization work plans.	X	X	X
9) Analyze historic gross gamma logging data.	X		
10) Conduct supporting analyses for initial characterization campaign.	X		
11) Characterize the four SST WMAs that are under RCRA assessment (includes characterization boreholes with fieldwork and initial borehole installation to begin in July 1999 pending Ecology approval).	X	X	X
12) Borehole 41-09-39 decommissioning and sampling.	X		
Vadose zone data and analyses needed for decisions regarding the mitigation of existing contamination:			
1) Compile and evaluate data/update work plan for corrective measures characterization.	X	X	X
2) Develop system model.	X		
3) Assess value/need for major corrective measures.		X	X
4) Continue required additional characterization for corrective measures.		X	X
5) Assess retrieval leak impacts and identify additional data needs.		X	X
6) Compile and evaluate data/update work plan for retrieval.		X	X
7) Continue required characterization for retrieval.		X	X
Vadose zone data and analyses needed for decisions on how to close SST tank farms:			
1) Assess readiness to proceed with closure.		X	X
2) Compile and evaluate data/update work plan for closure.		X	X
Surveillance and maintenance activities:			
1) Complete baseline logging and issue final tank farm reports.	X	X	X
2) Conduct surveillance for changes in baseline.	X	X	
3) TWRS expense for maintaining RCRA monitoring well network (e.g., characterization information obtained from replacement well installation)	X	X	
Process improvement activities identified to date:			
1) Develop and deploy improved technologies.		X	
2) Conduct external scientific peer review.	X	X	

M-45-55-T01	Submit to Ecology for review and comment as an Agreement secondary document a Field Investigation Report pursuant to the site-specific SST WMA Phase 1 RFI/CMS Work Plan addenda for WMA S-SX.	April 2001
M-45-55-T02	Submit to Ecology for review and comment as an Agreement secondary document a Field Investigation Report pursuant to the site-specific SST WMA Phase 1 RFI/CMS Work Plan addenda for WMA B-BX-BY.	May 2002
M-45-55-T03	Submit to Ecology for review and comment as an Agreement secondary document a Field Investigation Report pursuant to the site-specific SST WMA Phase 1 RFI/CMS Work Plan addenda for WMA T and WMA TX-TY.	June 2003
M-45-55	*Submit to Ecology for review and approval as an Agreement primary* document a Phase 1 RFI Report integrating results of data gathering activities and evaluations for WMAs S-SX, T, TX-TY, and B-BX-BY and related activities, including groundwater monitoring and impacts assessment using Hanford Site groundwater models, with conclusions and recommendations.	*February 2004*
M-45-56	Complete implementation of agreed-to interim measures. Specific interim measures will be implemented pursuant to Agreement commitments (e.g., see interim milestone M-45-57). Interim measures may also be required by Ecology, proposed by DOE in the SST WMA RFI Report (M-45-55) (or engineering studies including that addressed in target milestone M-45-56-T01), or established by agreement of the parties at any time during the Corrective Action process. Also see Table 1 of Agreement Change Control Form #M-45-98-03. Ecology and DOE agree, at a minimum, to meet yearly (by July or as needed to support annual budgeting) for the specific purpose of assessing the adequacy of information, and the need for the establishment of additional Agreement interim measures. Additional Agreement interim measures shall be documented through establishment of Interim Milestones and associated Target Dates as agreed necessary by the parties	TBD
M-45-56-T01	Summarize results of engineering studies and recommendations on isolating water lines in or near SST WMAs, sealing abandoned wells in or near SST WMAs, and controlling surface drainage at SST WMAs and submit these results to Ecology. This engineering study will include data regarding SST WMA surface water runoff and ponding as necessary to support a decision on whether drainage controls are needed to prevent or reduce surface water infiltration.	October 1999
M-45-57	Complete upgrading of leak-tight caps on monitoring drywells around SSTs.	June 1999
M-45-58	Submit to Ecology for review and approval as an Agreement primary *document a Corrective Measures Study for interim corrective measures* (pending results and conclusions in the Phase 1 RFI Report—Milestone M-45-55 or subsequent RFI reports).	TBD

M-45-59	Control surface water infiltration pathways as needed to control or significantly reduce the likelihood of migration of subsurface contamination to groundwater at the SST WMAs (pending the CMS Report, Milestone M-45-58, and implementation of other interim corrective measures. Decisions on controlling surface water infiltration pathways will be made by evaluating the role of surface water infiltration and the transport of subsurface contamination to groundwater. Based on the Corrective Measures Study (M-45-58) interim surface barriers and/or other infiltration controls may be required.	TBD
M-45-59-T01	Summarize results of Innovative Treatment Remedial Demonstration workshop, with conclusions and recommendations for test and evaluation of interim surface barrier concepts and submit these results to Ecology.	July 1999
M-45-60	Submit to Ecology for review and approval as an Agreement primary document DOE's RFI/CMS Work Plan for SST WMAs. This RFI/CMS Work Plan shall document the additional interim measures and further investigations needed for decisions on retrieval, closure, and corrective measures for the SST WMAs.	6 months following RFI Report approval.

1) Attachment One: Initial Single-Shell Tank Waste Management Areas and associated sites.

2) Attachment Two: Utilization of the HWMA and RCRA corrective action processes for SST WMA and associated site groundwater/vadose zone decision making in coordination with SST tank farm closure under Agreement milestone M-45.