



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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December 5, 2012

12-NWP-186

Mr. Scott L. Samuelson, Manager  
Office of River Protection  
United States Department of Energy  
P.O. Box 450, MSIN: H6-60  
Richland, Washington 99352

Re: Ecology Assessment Report for Field Monitoring Activities of the waste material near Riser 83 of the 241-AY-102 Double Shell Tank (DST)

Dear Mr. Samuelson:

On August 8, 2012, the Department of Ecology (Ecology) was notified that material was found in the Annulus Space of the 241- AY-102 DST. On October 23, 2012, the United States Department of Energy – Office of River Protection (USDOE-ORP) reported that the DST was leaking and more material was accumulating in the Annulus Space. To monitor the leak, the Tank Farm Contractor, Washington River Protection Solutions (WRPS), conducted weekly video inspections of the material through the 241-AY-102 Tank’s Riser #83.

Ecology staff visited the 241-AY Farm on October 25, 2012 to witness the weekly visual inspection of the waste material found near Riser 83 of the 241-AY-102 DST. Ecology staff noted the following:

- The extent of the area of the waste material did not appear to grow compared to the amount viewed during the visual inspection conducted 10/18/12.
- The quantity and potential cascade of waste through a ventilation slot had shrunk in size as compared to the amount present the prior week.
- The color of the waste appeared to be changing from a dark green to a lighter green in some locations, from a lighter green to lighter yellow, and a lighter yellow to a white color along the waste perimeter. This indicates that the waste material may be “drying”.
- The waste is in direct contact with tank components. Neither the 6-inch wide carbon steel refractory ring, annulus floor, primary tank liner, nor the refractory/concrete material showed staining, cracking, pitting, etc., at those specific locations, as a result of the direct contact.



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The USDOE-ORP/WRPS/Ecology Integrated Project Team will use this data to develop and evaluate options for the interim and longer term management of this tank and its contents.

Attached are Ecology's assessment report and photographs from the field visit. If you have any questions, please contact me at 509-372-7970 or [Michelle.Hendrickson@ecy.wa.gov](mailto:Michelle.Hendrickson@ecy.wa.gov).

Sincerely,



Michelle L. Hendrickson, CHMM, PE  
Tank System Operations and Closure Engineer  
Nuclear Waste Program

dbm  
Enclosures (2)

cc electronic:

Tom Fletcher, USDOE-ORP  
Lisa Domnoske-Rauch, USDOE-ORP  
Jeremy Johnson, USDOE-ORP  
Jeff Voogd, WRPS  
Steve Killoy, WRPS  
Jason Engeman, WRPS

Dennis Washenfelder, WRPS  
David Bernhard, NPT  
Dirk Dunning, ODOE  
Ken Niles, ODOE  
Randall Robinson, DNFSB

cc:

Stuart Harris, CTUIR  
  
Gabriel Bohnee, NPT  
Steve Hudson, HAB  
Russell Jim, YN

Administrative Record: DST/Tank Waste  
Storage/214-AY-102/S-2-3  
Environmental Portal, LMSI  
USDOE-ORP Correspondence Control  
WRPS Correspondence Control



## ASSESSMENT REPORT

### Field Monitoring Activities

#### A. GENERAL INFORMATION

Project: 241-AY-102 Field Monitoring, Riser 83 Video

Project Contact: Tom Fletcher (ORP) Phone: (509) 376-3434

Review Date: 10/25/2012

Reviewer: Michelle Hendrickson, CHMM, PE

USDOE Project: US Department of Energy-Office of River Protection (USDOE-ORP)

USDOE Contact: Tom Fletcher

Prime Contractor: Washington River Protection Solutions (WRPS)

Project Manager: Michael Hardesty Phone: (509) 373-4573

Location: 241-AY-102, 200 East Area, Hanford

Scheduled Start Date: 10/25/2012 Actual Start Date: 10/25/2012 Completion Date: 10/25/2012

Contract Amount: Currently estimated at \$75,000 for 4 Risers by WRPS.

Sub-Contractor: N/A

Location: 200 East Area, Hanford Nuclear Reservation, Richland, WA

#### PROJECT DESCRIPTION:

- On an 8/8/12 visual inspection, material was found in the Annulus Space at AY-102. On 10/23/2012, USDOE-ORP reported that the DST was leaking and more material was accumulating in the Annulus Space.
- To monitor the slow leak, WRPS is conducting weekly video inspections of the material through the AY-102 Tank's Riser #83.

The Pre-job meeting was conducted at 8:00 AM. Prior to the meeting, RCTs reviewed RWP TF-101 for oversight with an escort.

The job in the field consisted of:

1. We entered the farm at approximately 9:45 AM. A Flammable Gas sample was being collected because the annulus exhauster had not ran continuously in the past 24-hours and the camera is considered a potential spark source. The ventilation was down because a breaker on the chiller for the primary exhauster, 702-AZ, tripped. The annulus exhauster was then also shutdown. Upon investigation, a wire for one of the compressor heaters had grounded out and caused the trip. This compressor was disconnected and the 702-AZ primary ventilation was restarted. The annulus ventilation was also restarted at approximately 1:00 PM on 10/24/12.
2. When the flammable gas sample indicated that the annulus space was less than 25% lower flammability limit, the camera was cleared to be lowered into the annulus space.
3. The camera was in a plastic bag and wire attached in a sleeve. The sleeve was carefully inspected and then the camera was removed from the bag and lowered after the ventilation from the annulus was reduced from -14 inch to a -1 inch vacuum. The ventilation vacuum was lessened as the air currents generated by the vacuum create air currents which cause the camera to swing and makes its manipulation within the annular space very difficult.

4. A "top-hat" configuration had previously been installed at Riser 83 for visual inspection and sample collection through that riser. Also, vapor monitoring had previously been conducted.
5. The camera completed a 360-degree scan and was raised and tilted. Close-ups of the material along the entire area of waste deposition were viewed. The "landmarks" within the tank (black dot or rock, two white pebbles, and ventilation slots) were specifically viewed.
6. Once all of the views were captured, the camera was raised and re-bagged.
7. We surveyed out of the 241-AY Farm.

**B. RECORDS AND PROCEDURES**

1. Personnel Contacted During Assessment

|    | <u>Name</u>                | <u>Title or Duties/Organization</u>     | <u>Phone</u>        |
|----|----------------------------|---|---------------------|
| a. | <u>Tom Fletcher</u>        | <u>TF Assistant Manager - ORP</u>       | <u>509-376-3434</u> |
| b. | <u>Michael Hardesty</u>    | <u>Field Work Supervisor</u>            | <u>509-373-4573</u> |
| c. | <u>Lisa Domnoske-Rauch</u> | <u>Facility Representative - ORP</u>    | <u>509-376-9886</u> |
| d. | <u>Jason Engeman</u>       | <u>DST Integrity Engineering - WRPS</u> | <u>509-376-2113</u> |
| e. | <u>Roger Hammer</u>        | <u>Camera Operator - WRPS</u>           | <u>509-373-3355</u> |

2. Progress

- a. Scheduled Percentage                      100 %

|  | Yes                      | No                       | NA                       | See<br>Remarks           |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 3. Stockpiled equipment or materials                                     |                          |                          |                          |                          |
| a. Records adequate?   | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Protected?  | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Monitoring Procedures up to date?                                     | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Work Packages up to date?   | X                        | <input type="checkbox"/> | <input type="checkbox"/> | X                        |
| 6. Adequate involvement in changes?                                      | X                        | <input type="checkbox"/> | <input type="checkbox"/> | X                        |
| 7. Change of monitoring procedures appropriate and submitted to Ecology? | <input type="checkbox"/> | <input type="checkbox"/> | X                        | <input type="checkbox"/> |
| 8. Instrument(s) Calibrated adequately?                                  | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Permit No/TPA Requirement.: DST System Unit RCRA Permit               |                          |                          |                          |                          |

**C. FIELD MONITORING**

- The weather was reported at the Plan of the Day meeting as low fog, chilly with a high reaching 50-degrees Fahrenheit and low winds.
- The video taken of the waste material was near Riser 83 of the 241-AY-102 Annulus Space.
- The video was viewed and camera manipulated in the AY-801 Building.
- As the camera descended to the bottom of the annular space, a thermocouple became visible. These are used to monitor concrete at the base of the primary tank. Some thermocouples are actually embedded inside of the concrete. Others are routed through the refractory material. Ecology asked if these thermocouples were operable and temperature readings were taken. (It may be good to know if these specific thermocouples are operable and note if any change in temperature since 2006 has occurred in this location.)
- The camera zoomed in and the off-riser sampler/crawler's tracks were visible. The crawler's tread size ranges from approximately 9/8-inch wide at center, tapering to 5/8- inch wide at the edge This indicates that less than a few inches of waste material is present in this specific location.

- All witnessing the inspection noted that the color of the waste appeared to be changing. The dark green was changing to a lighter green in some locations. The lighter green was becoming a dark yellow. The darker yellow was changing to a lighter yellow. The lighter yellow was turning to a white color along the waste perimeter. This indicates that the waste material may be drying, most likely due to the ventilation.
- The camera viewed the waste in respect to the different in-annular space "landmarks" including the black dot or rock, two white pebbles and ventilation slots. It was noted by all witnessing the video that the size of the area of the waste material did not appear to have grown as compared to the amount of waste material viewed during the visual inspection conducted on 10/18/12.
- It was estimated that the area extent of the waste material in this riser location was approximately 6 inches by 22 inches when first discovered. It is approximated that the area extent of the waste material in this riser location is now approximately 8 inches by 36 inches in the rounded portion and approximately 48 inches in total length.
- All witnessing the video noted that the quantity and potential cascade of waste through a ventilation slot had either shrunk in size or receded. It looked more like the photos from visual inspections taken on 10/1/12 than those collected during the 10/18/12 effort.
- Ecology noted that there did not appear to be any visual damage indicators such as staining, cracking, pitting, etc. of the 6 inch wide carbon steel refractory ring, annulus floor, primary tank liner, or the refractory/concrete material where the waste was in direct contact with the tank structures. ORP noted that preliminary analytical results of the waste material indicated the presence of corrosion prohibiting constituents such as nitrite and hydroxides. ORP is actively seeking chemistry control/stabilization of the waste material present within the annulus.

|   | Yes                      | No                       | NA                       | See Remarks              |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Comply with Procedures and QA/QC Specifications?             | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Field Test Being Accomplished?                               | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Satisfactory Contractor Quality Control?                     | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Inspection Documentation Satisfactory?                       | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Site Condition   |                          |                          |                          |                          |
| a. Orderly?   | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Control room interface adequate?                             | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Equipment set-up adequate?                                   | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Monitoring bypassing satisfactory?                           | <input type="checkbox"/> | <input type="checkbox"/> | X                        | <input type="checkbox"/> |
| 7. Unsafe Conditions/Health Hazards Observed?                   | <input type="checkbox"/> | X                        | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Is Project on Schedule?                                      | X                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Is the Operations and Maintenance Documentation on Schedule? | <input type="checkbox"/> | <input type="checkbox"/> | X                        | <input type="checkbox"/> |
| 10. Is the Maintenance Management System on Schedule?           | <input type="checkbox"/> | <input type="checkbox"/> | X                        | <input type="checkbox"/> |
| 11. Traffic control and traffic safety?                         | <input type="checkbox"/> | <input type="checkbox"/> | X                        | <input type="checkbox"/> |

REMARKS:

B.5.) the work package was modified to collect a flam gas sample as the ventilation had not ran for the past 24-hrs continuously.

B.6.) USDOE-ORP Facility Representatives and TF AM were involved with the proposed and accepted modification.

Photographs from this field monitoring event are attached.

Assessment Completed:

Project Engineer's Signature

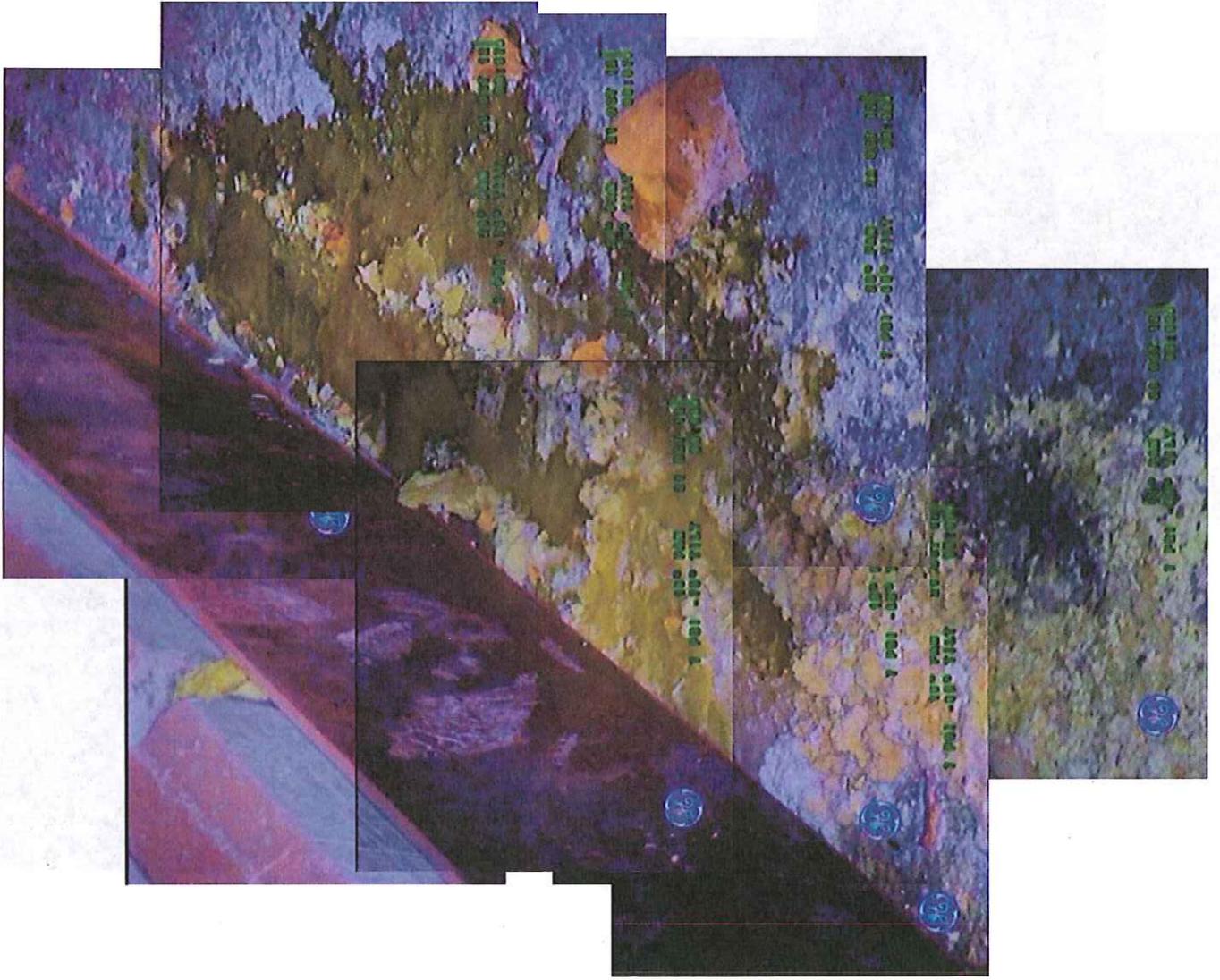
Date



10/1/2012



10/21/2012



10/25/2012



10/25/2012



