

100 & 300 AREA UNIT MANAGER MEETING MINUTES

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[0074816H]

Groundwater and Source Operable Units; Facility Deactivation, Decontamination, Decommission, and Demolition (D4); Interim Safe Storage (ISS); Field Remediation (FR); Mission Completion; and 100-K Sludge Treatment Project and 100-K Facility Demolition and Soil Remediation Projects

August 11, 2016

ADMINISTRATIVE

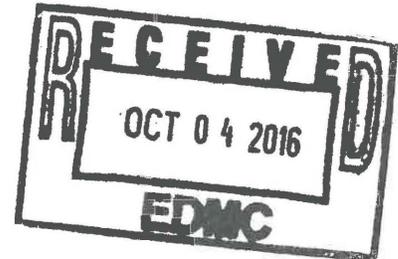
- **Next Unit Manager Meeting (UMM)** – The next meeting will be held September 8, 2016, at Ecology’s Office Building, 3100 Port of Benton Blvd, *and Conference Room TBA.*
- **Attendees/Delegations** – Attachment A is the list of attendees. Representatives from each agency were present to conduct the business of the UMM.
- **Approval of Minutes** – The July 14, 2016, meeting minutes were approved by the U.S. Environmental Protection Agency (EPA), and Washington State Department of Ecology (Ecology), The U.S. Department of Energy, Richland Operations Office (RL) delegate was not present to sign for DOE-RL.
- **Action Item Status** – The status of action items was reviewed and no updates were provided (see Attachment B).
- **Agenda** – Attachment C is the Regular Session meeting agenda and such was used for the August meeting.

EXECUTIVE SESSION (Tri-Parties Only)

An Executive Session was not held by RL, EPA, and Ecology prior to the August 11, 2016, UMM.

SPECIAL PRESENTATION

None



100-K AREA (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 2 provides a status of the 100-K Sludge Treatment Project and the 100-K Facility Demolition and Soil Remediation projects. No issues were identified and no agreements or actions were documented.

100-B/C AREA (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. No issues were identified and no agreements or action items were documented.

100-N AREA (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 3 provides status and information for Washington Closure Hanford (WCH) Closure Operations activities at the 100 Areas, 618-10, and the 300 Area.

100-D & 100-H AREAS (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 3 provides status and information for WCH Closure Operations activities at the 100 Areas, 618-10, and the 300 Area. No issues were identified and no agreements or action items were documented.

100-F & 100-IU-2/100-IU-6 AREAS (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 3 provides status and information for WCH Closure Operations activities at the 100 Areas, 618-10, and the 300 Area. No issues were identified and no agreements or action items were documented.

300 AREA – 618-10/11 (GROUNDWATER, SOILS)

Attachment 3 provides status and information for WCH Closure Operations activities at the 100 Areas, 618-10, and the 300 Area. No issues were identified and no agreements or action items were documented.

300 AREA - GENERAL (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. No issues were identified and no agreements or action items were documented.

ORCHARD LANDS

Field sample commenced in July 2016. The RI report is being prepared by PNNL. Ecology is now formally the lead agency for 100-OL-1. This change is being made in the TPA.

CERCLA FIVE YEAR REVIEW

MSA reported that Robin Varljen is the lead for Ecology and Dennis Faulk is the lead for EPA. The draft report is scheduled to be released after the final 2015 Annual GW report is released by CHPRC. That is estimated to be in August and the 5-year review will be issued in September for review and final in May 2017.

OTHER

CHPRC took over facilitating the UMM meeting as Karl Hadley reported last month. Bill Faught took the role vacated by Karl Hadley. Nina Menard again agreed to host next month's meeting at Ecology's facility.

A discussion was initiated on the schedule for the UMM meetings. After some open input and deliberation, a decision was made to conduct the September meeting, as scheduled, and then transition to bi-monthly. Therefore, the next meeting following September will be November.

The September meeting will include a Special Topic on Institutional Controls.

Attachment A

Attendees/Delegations

100/300 AREA UMM
 Aug. 11, 2016

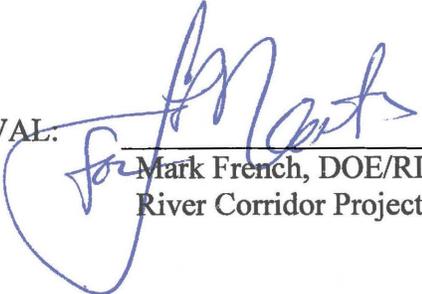
NAME/PRINT
 Dwayne Crumpler
 Dib Goswami
 Benjamin Vannah
 Kate Amrhein
 Kathy Higgins
 John Sands
 Laura Buelow
 AUCIA BOYD
 Greg Sinton
 KARL HADLEY
 Rich Mosen
 Dabi Gonwich
 Keelan Abenth
 Dan Beers
 Nina Menard
 Bill Fausst
 Clay McCuskey

NAME/SIGN
 Dwayne Crumpler
 Dib Goswami
 Ben W. Vannah
 Kate Amrhein
 Kathy Higgins
 John Sands
 Laura Buelow
 Alicia Boyd
 Greg Sinton
 Karl Hadley
 Rich Mosen
 Dabi Gonwich
 Keelan Abenth
 Dan Beers
 Nina M. Menard
 Bill Fausst
 Clay McCuskey

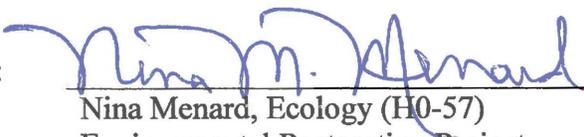
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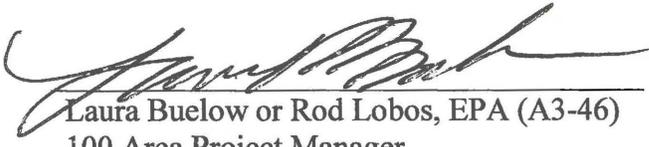
100/300 AREA UNIT MANAGERS MEETING
APPROVAL OF MEETING MINUTES

August 14, 2016

APPROVAL:  Date 9/8/16
Mark French, DOE/RL (A3-04)
River Corridor Project Manager

APPROVAL:  Date 9/8/2016
Mike Cline, DOE/RL (A5-11)
Groundwater Project Manager

APPROVAL:  Date 9/8/16
Nina Menard, Ecology (H0-57)
Environmental Restoration Project
Manager

APPROVAL:  Date 9/8/16
Laura Buelow or Rod Lobos, EPA (A3-46)
100 Area Project Manager

Attachment B

Action Item Status

100/300 Area UMM
Action List
August 11, 2016

Open (O)/ Closed (X)	Action No.	Co.	Actionee	Project	Action Description	Status
O	100-203	RL	Greg Sinton	S&GW	Provide a status on SGW-59118, "Technical Basis for field-Filtering Groundwater Samples for Hexavalent Chromium Analysis," at the June 2016 Unit Managers Meeting	Open: 5/12/16; Action: Closed 7/14/16
O	300-010	RL	John Sands	S&GW	Provide a presentation on sequestration at the July Unit Managers Meeting	Open: 5/12/16; Action: Closed 7/14/16

Attachment C

Agenda

100/300 Area Unit Manager Meeting
August 11, 2016
Ecology's Office Building
3100 Port of Benton Blvd
Room 31
2:00 p.m.

Administrative:

- Approval and signing of previous meeting minutes
- Update to Action Items List
- Next UMM (9/8/2016, Ecology's Office Building, Rooms 3A and 3B)

Open Session: Project Area Updates - Groundwater, Field Remediation, D4/ISS:

- Scheduling for Future UMMs (All)
- 100-K Area (Ellwood Glossbrenner, Roger Quintero)
- 100-B/C Area (Greg Sinton)
- 100-N Area (Greg Sinton, John Neath)
- 100-D & 100-H Areas (Ellen Dagan, John Neath)
- 100-F & 100-IU-2/6 Areas (Greg Sinton, John Neath)
- 300 Area - 618-10/11 exclusively (Jamie Zeisloft)
- 300 Area (John Sands/Rudy Guercia)
- Orchard Lands (John Sands)

Special Topics/Other

- CERCLA Five Year Review

Adjourn

Attachment 1

Groundwater Presentation

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

Summary Hanford Sampling Program

Hanford's overall Site groundwater monitoring program managed by CHPRC (River Corridor and Central Plateau) coordinates collection of groundwater samples from wells and aquifer tubes, as well as surface water samples from springs. Sample trips are scheduled by target month and prioritized based on project needs. Target sample dates (months) are chosen to minimize the number of sample trips by temporally aligning requests from multiple activities for a single location into a single trip, where practical.

Sample Trip Status by Month Scheduled

For Fiscal Year 2016, Hanford's overall Site groundwater monitoring program has 2,864 sample trips scheduled for collection. DOE has successfully completed 2,375 of 2,442 sample trips scheduled for FY-2016 (October 2015 through July 2016). In July 2016 (FY 2016, month ten), the program successfully completed 188 of the 233 sampling trips scheduled.

The specific wells, aquifer tubes, and springs sampled in the river corridor areas during July 2016 are listed in Table 1.

Awaiting Sample Trips

At the end of July there are 74 sample trips that are awaiting collection. Of these, 1 will be decommissioned, 12 require maintenance, 7 have access restrictions, 2 are not on the Well Access List, 2 pump-and-treat wells are not running, 1 is being reviewed for cancelation, 2 were unsuccessful, 21 are associated with a special study and have an adjusted schedule, and 26 are awaiting collection at the month end.

Table 2 presents the sample trips for only the river corridor that were not successfully completed in July. Sample trips in Table 2 are grouped by fiscal month scheduled and groundwater interest area. This table clearly shows that the number of awaiting well trips decreases with time from the schedule date. Reasons for sample trips to be awaiting include; well maintenance, weather conditions, access restrictions, and resource limitations.

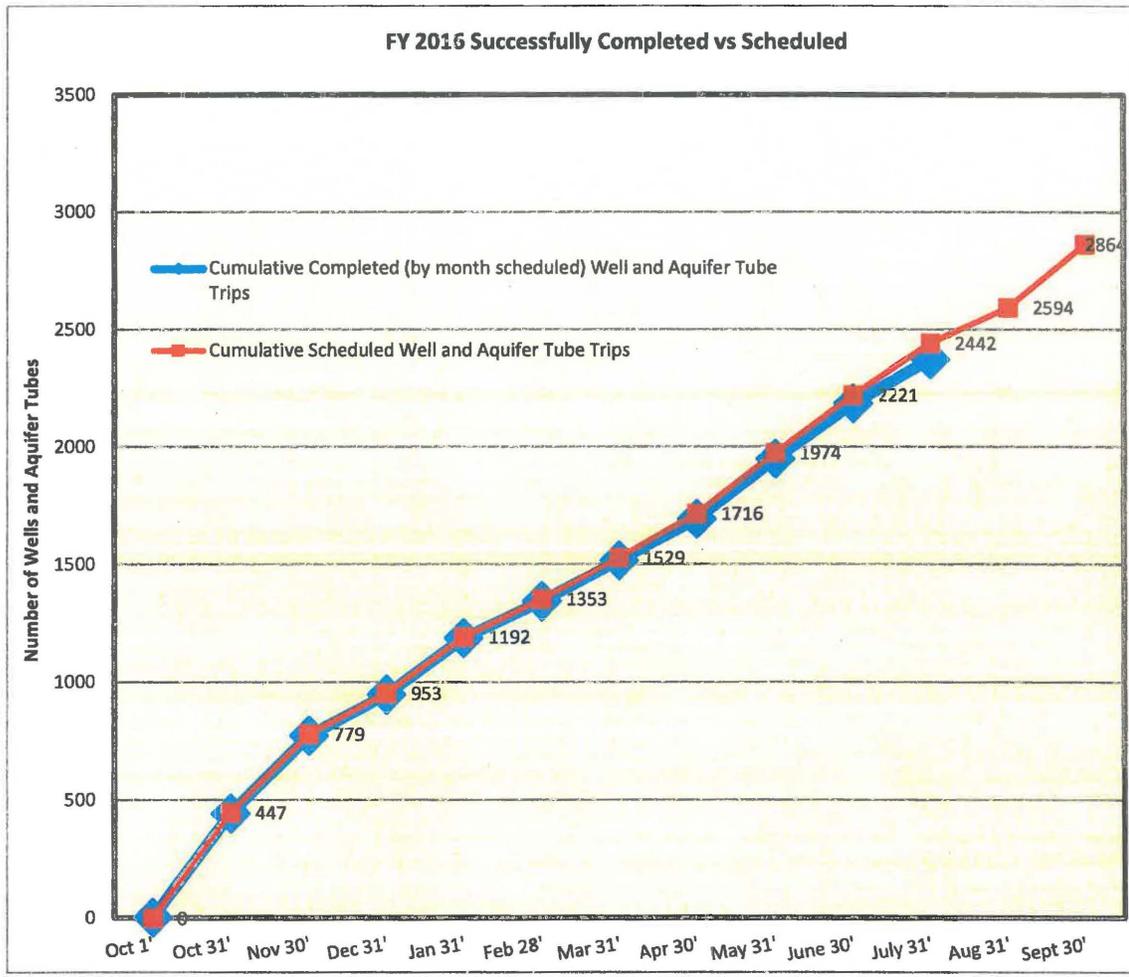
Upcoming Sample Trips

Sample trips for the river corridor only, scheduled for collection in August 2016 (and not collected before the target sample month) are listed in Table 3.

Data Access

The sampling results are available in HEIS and can be accessed from the Environmental Dashboard Application which can be accessed from the HLAN at <https://ehs.chprc.rl.gov/eda/> or from the internet at <https://ehs.hanford.gov/eda/>.

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)



100/300 Areas Unit Managers Meeting

August 11, 2016 (July data)

Operable Unit Specifics

100-KR-4 Groundwater Operable Unit (Mike Drewett/Chuck Miller/Jason Hulstrom)

- CERCLA Process Implementation:
 - ✓ The RI/FS and PP documents are on hold pending submittal of the 100-K East Reactor waste site characterization and modeling report. This report is based on the data from new wells 199-K-221 and 199-K-222 and the draft report is currently being prepared. The draft report scheduled to be submitted to RL in early September.
 - ✓ Monitoring Plans: The Draft B Interim Groundwater Monitoring Plan, Draft C Interim O&M Plan and Draft B Interim RD/RAWP were submitted by DOE-RL to EPA on July 21, 2016 for a 30-day review.
 - ✓ The KW pump and treat system was shut down on May 16, 2016 to start the rebound study. Extraction, injection, and monitoring wells were reconfigured to support this work. Sample collection from wells in the central plume area (down gradient of 183-KW Head House) began the first week of June and will continue through September. Initial low river results downgradient of the Head house indicate rebound is occurring in the 20 ug/L range.
- Remedial Actions & System Modifications:
 - ✓ The volume of groundwater treated and mass of Cr(VI) removed for the 100-K P&T systems (KX, KR-4, and KW) during July 2016 are:
 - Treated 51.0 million gallons (46.7 in June)
 - Removed 2.6 kg of hexavalent chromium (2.2 kg in June)
 - ✓ The influent and effluent Cr(VI) concentrations (measured weekly) for the three 100-K P&T systems during July are presented in Table K-1.

Table K-1. Monthly Summary of Influent and Effluent Concentrations at the 100-KR-4 P&T Systems

System	Weekly Influent Concentrations ^a (µg/L)	Average Monthly Influent Concentration (µg/L)	Weekly Effluent Concentrations ^{ab} (µg/L)	Average Monthly Effluent Concentration ^b (µg/L)
100-KR4	8, 5, 4	6	3, -1, 0	1
100-KW ^c	--	--	--	--
100-KX	16, 17, 18, 17	17	0, -1, 3, 2	1

a. Concentrations provided represent samples taken during the current month and loaded into HEIS as of the publication of the UMM.

b. Concentrations reported are below detection and represent the actual instrument reading on the sample(s). The detection limit is approximately 2 µg/L hexavalent chromium. The readings indicate that the measured concentration is indistinguishable from the blank.

c. The 100-KW P&T System was shutdown May 16, 2016 to initiate the rebound study.

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

- ✓ FY 2016 (Oct. 2015 through July 2016) P&T performance to date:

P&T System	Treated (mgal)	Removed (kg)
KR-4	132	2.9
KW	107	5.5
KX	363	21.8
100-KR-4 OU TOTAL	602	30.2

- ✓ In July 2016, the 30-day average pumping rates were 284 gpm, 0 gpm, and 864 gpm for the KR-4, KW, and KX systems, respectively. A summary of the number of extraction and injection wells in the three systems is shown in Table K-2. Figure K-1 illustrates the monthly average pumping rates for operating extraction wells across the 100-KR-4 system.
 - At KR-4, the system remains in service to provide hydraulic capture of inland groundwater. As part of the FY2016 P&T Optimization scope, well 199-K-144 was realigned to the KX system and is currently in operation. Due to this change, the flow rates at KR-4 decreased for much of July.
 - At KW, the system has been out of service since May 16, 2016 for the hexavalent chromium rebound study.
 - At KX, the system operated at near-full capacity for the month of July. At the end of July, 4 of 20 extraction wells exhibited hexavalent chromium concentrations that exceed 20 µg/L. These were wells 199-K-144, 199-K-152, 199-K-154, and 199-K-182. Well realignments performed as part of 2016 RPO actions were completed; these include realignment of extraction well 199-K-144 from KR4 system to KX system and realignment of injection well 199-K-179 from KR4 system to KX system.

Table K-2. Summary of Number of System Extraction and Injection Wells

Wells	KR4		KX		KW		TOTAL	
	2015	2016	2015	2016	2015	2016	2016	Current
Number of extraction wells	12	11	19	20	11	11 (off)	42	42
Number of injection wells	5	5	9	10	4	4 (off)	18	19

Note: KW system off for entire month of June

- ✓ Figures K-2 through K-4 present the June groundwater treatment rates and hexavalent chromium removal information. As indicated in the figures, Cr(VI) monthly mass removal at KR-4 and KX have decreased in recent months due to continued optimization efforts.
- ✓ Assessment of soil and groundwater characterization data from boreholes in the vicinity of 105-KE Reactor continues. Internal review of the draft characterization report has been completed. A review draft of the report is expected to be sent to RL in September.

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August 11, 2016 (July data)

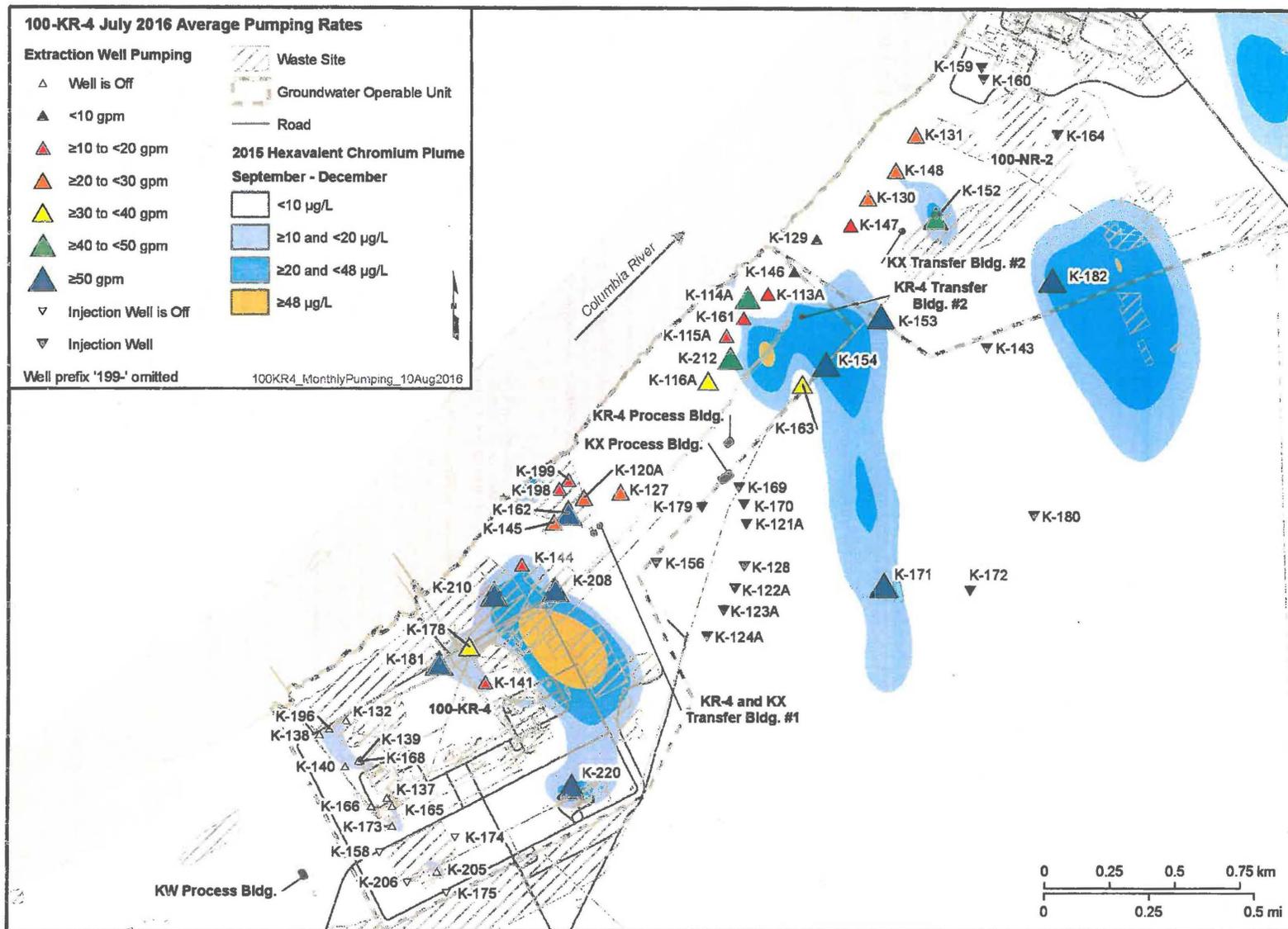


Figure K-1. July 2016 Average Pumping Rates for the 100-KR-4 P&T System

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

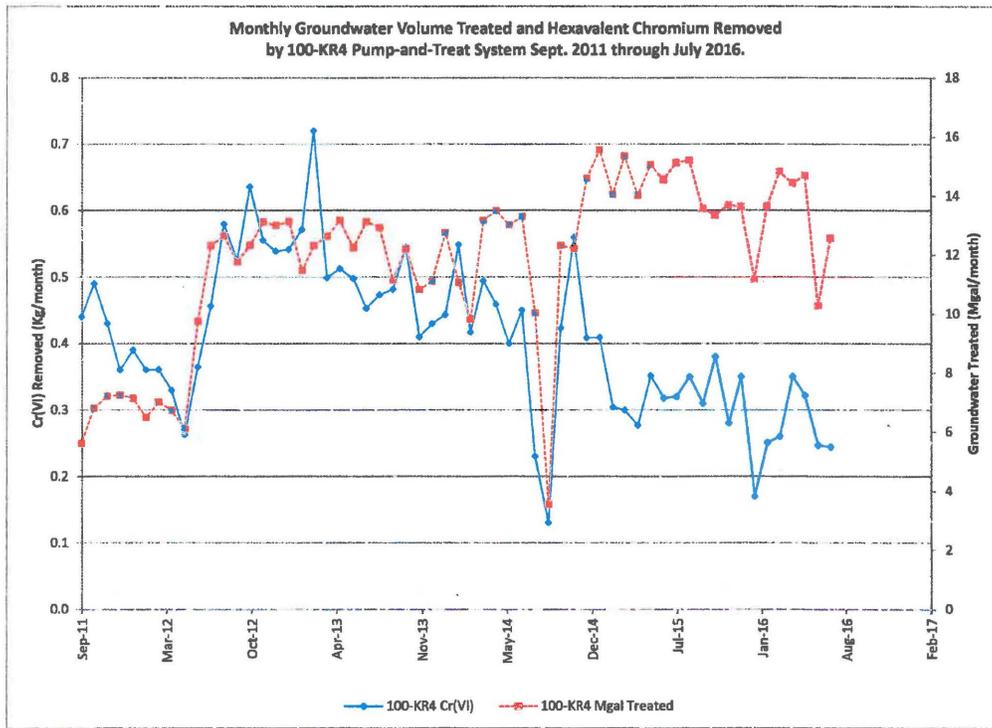


Figure K-2. Monthly Cr(VI) Removed and Groundwater Volume Treated by 100-KR-4 Pump-and-Treat, September 2011 through July 2016.

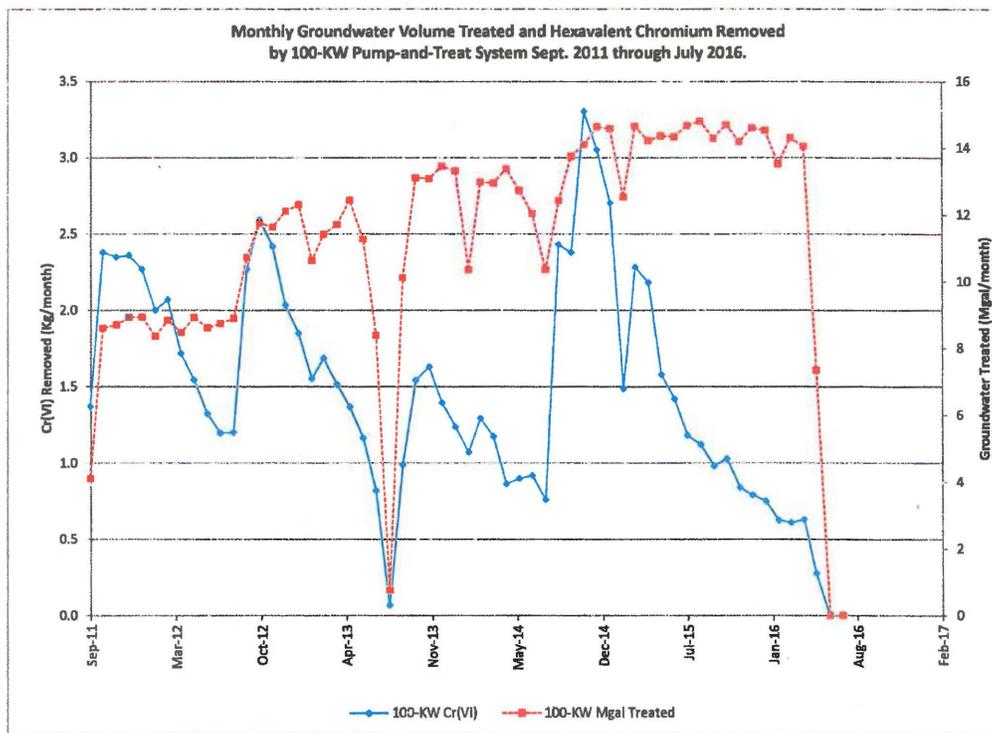


Figure K-3. Monthly Cr(VI) Removed and Groundwater Volume Treated by 100-KW Pump-and-Treat, September 2011 through July 2016.

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

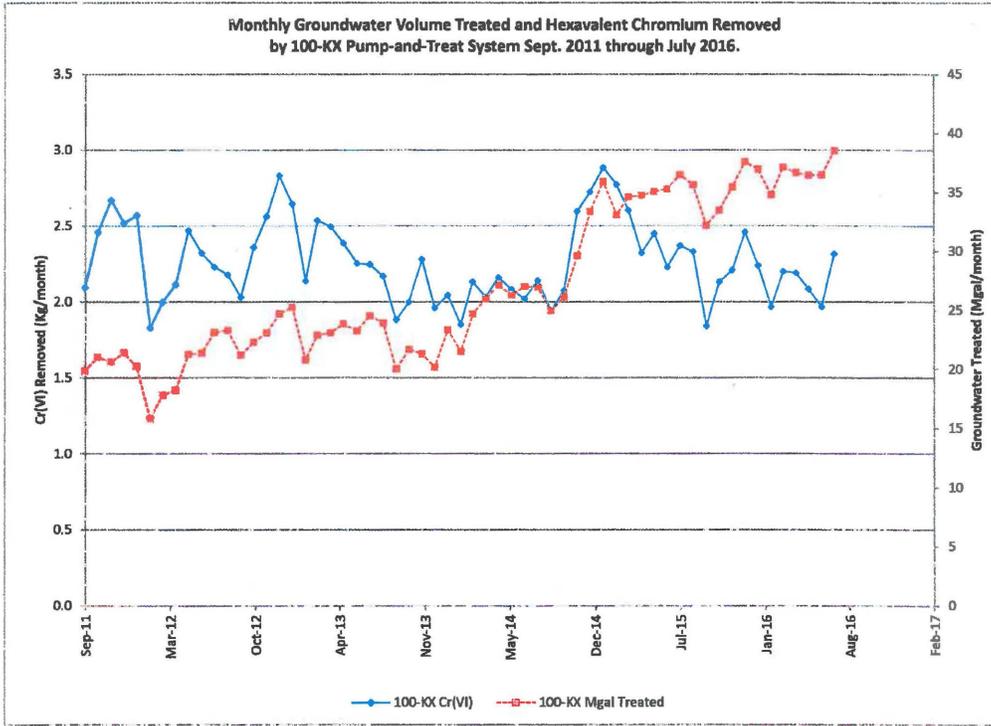


Figure K-4. Monthly Cr(VI) removed and groundwater volume treated by 100-KX pump-and-treat, September 2011 through July 2016.

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

100-BC-5 Groundwater Operable Unit – Robert Evans/Mary Hartman

- *Milestone M-015-79*: Due 12/15/2016 for the CERCLA RI/FS Report and Proposed Plan for the 100-BC-1, 100-BC-2 and 100-BC-5 Operable Units
- CERCLA Process Implementation:
 - ✓ Received RL's comments from review of the Decisional Draft RI/FS Report on July 20, 2016. Efforts are underway to address these comments.
 - ✓ Submitted the Decisional Draft Proposed Plan to RL for review on July 11, 2016.
- Monitoring & Reporting:
 - ✓ TPA-CN-0734, which revises the groundwater SAP (DOE/RL-2003-38, Rev. 2), was sent to EPA for review July 19, 2016. The change notice adds chloroform and trichloroethene for wells screened in the lower part of the unconfined aquifer, and tritium in one well downgradient of the 116-B-1 Burial Ground. This sampling will begin with the fall 2016 event.
 - ✓ Six monitoring wells were sampled in June, as planned.
 - Figure BC-1 presents hexavalent chromium in northeastern 100-BC. Concentrations in three of the wells continued to decline from their 2014 peaks, while the well with the highest concentration (199-B3-47) had a concentration consistent with the trend over the past 10 years (55 µg/L). Wells 199-B4-14 and 199-B5-6 in southern 100-BC also were sampled in June. Concentrations continued with previous trends of 7 µg/L in shallow well 199-B4-14 and 34 µg/L in deep well 199-B5-6.
 - Figure BC-2 shows strontium-90 in wells 199-B3-46 and 199-B3-52, and water level in 199-B3-46. Until this year, strontium-90 was not typically analyzed in samples collected during high river stage. The strontium-90 concentration in 199-B3-46 did not increase with the higher water table in June 2016, suggesting a lack of a significant PRZ source near the well. The concentration in 199-B3-52, which was drilled as a vadose characterization borehole at the 116-C-5 retention basin waste site was higher in June 2016 than in October 2015. This well was not routinely sampled until fiscal year 2016.
 - Strontium-90 and tritium data from wells 199-B3-1, 199-B3-47, and 199-B5-2 have not yet been received from the laboratory.
 - ✓ Twenty three aquifer tubes and HSPs will be sampled in September and 29 monitoring wells will be sampled in October.

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August 11, 2016 (July data)

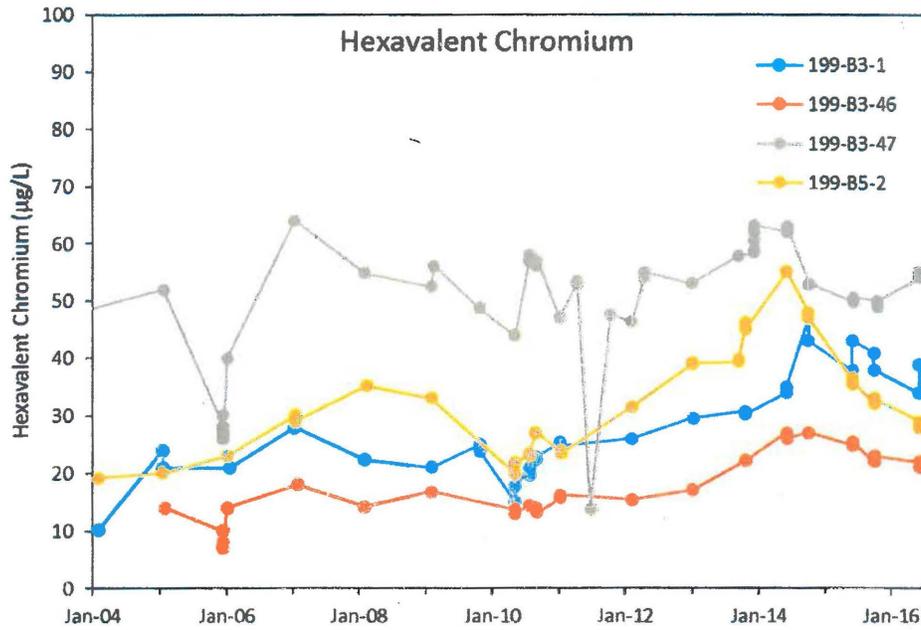


Figure BC-1. Hexavalent Chromium in 100-BC Wells

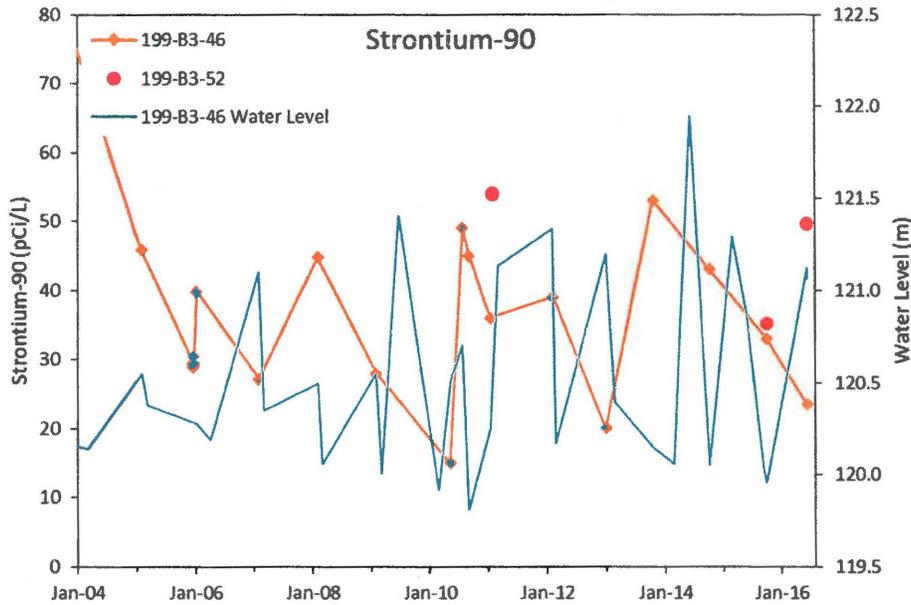


Figure BC-2. Strontium-90 in 100-BC Wells

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

100-NR-1/100-NR-2 Operable Unit – Bill Faught/Virginia Rohay/Art Lee

- CERCLA Process Implementation

- ✓ Drilling continued on the 6 new wells (Figure NR-1). Drilling and well construction have been completed for wells 199-N-371, 199-N-372, 199-N-373, 199-N-374, and 199-N-376. Drilling was initiated for well 199-N-377 on August 3, 2016. Soil and groundwater analyses are being performed on collected samples. To date, results from samples collected from wells 199-N-371, 199-N-372, and 199-N-374 (behind the reactor) are not at levels indicating a continuing source of high tritium and strontium that would be attributable to the high aquifer tube results in AT's C7934, C7935, and C7936.
- ✓ Authorization to start work on D&D activities for the P&T system was received July 12, 2016 and the field work started on August 8, 2016. A TPA CN is being prepared to relocate the NR-2 OU waste storage area, currently located at the NR-2 P&T to avoid interference and impacts from the NR-2 P&T D&D activities. Figure NR-2 shows the new proposed location for waste storage area.
- ✓ Revision 2 of DOE/RL-2001-27, *Remedial Design/Remedial Action Work Plan for the 100-NR-2 Operable Unit*, and the sampling and analysis plan (Appendix A) was transmitted to Ecology August 3, 2016.

- Remedial Actions:

100-NR-1 Bioventing –

- ✓ Figure NR-3 presents bioventing well gas sample results for monitoring wells 199-N-171 and 199-N-169. No monthly vapor sample measurements were collected in July because of the semi-annual respirometry test being conducted. The respirometry test concluded on August 1, 2016 and the bioventing system was restarted on August 2, 2016. The respirometry test field data is being reviewed to calculate biodegradation rates from observed gas measurements. Groundwater samples were collected from the bioremediation monitoring wells in July to correlate groundwater sample results for TPH with calculated biodegradation rates.
- ✓ The draft of the annual bioventing performance report covering the time period from March 2015 through February 2016 is being reviewed by DOE-RL. The draft report includes results from the semi-annual respirometry tests conducted during this period.

Product Recovery –

- ✓ The sponge assembly was removed from well 199-N-18 on July 21. The sponge was removed early and was in place only 5 weeks since the last sponge change out on June 15, compared to normal 2 month sponge change out period, to support collection of a groundwater sample from the well during the respirometry test. A total of 200 g of TPH was removed from groundwater. Assuming that the TPH is diesel, with a density of 0.85 g/mL, 0.24 L of diesel was removed which is slightly higher than previous measurements where 150 g of TPH was removed between sponge change-outs. Increased river levels in June/July may have contributed to the slight increase in the amount of TPH removed by the sponge, but typical mass removed by the sponges have ranged between 150 g to 200 g since 2011.

Aquifer Tubes –

- ✓ Tubes C7934, C7935, and C7936 are located adjacent to one another (Figure NR-4), with screens at depths of 14.41 ft. (C7934), 18.75 ft. (C7935), and 29.19 ft. (C7936). All three aquifer tubes were sampled on May 23, 2016, June 24, 2016, and July 29, 2016. Tritium and strontium-90 concentration trends for all three aquifer tubes through June 24, 2016 are shown in Figures NR-5 and NR-6, respectively. As of August 9, 2016, completion of the laboratory analysis for the July samples for all three aquifer tubes is still pending.

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

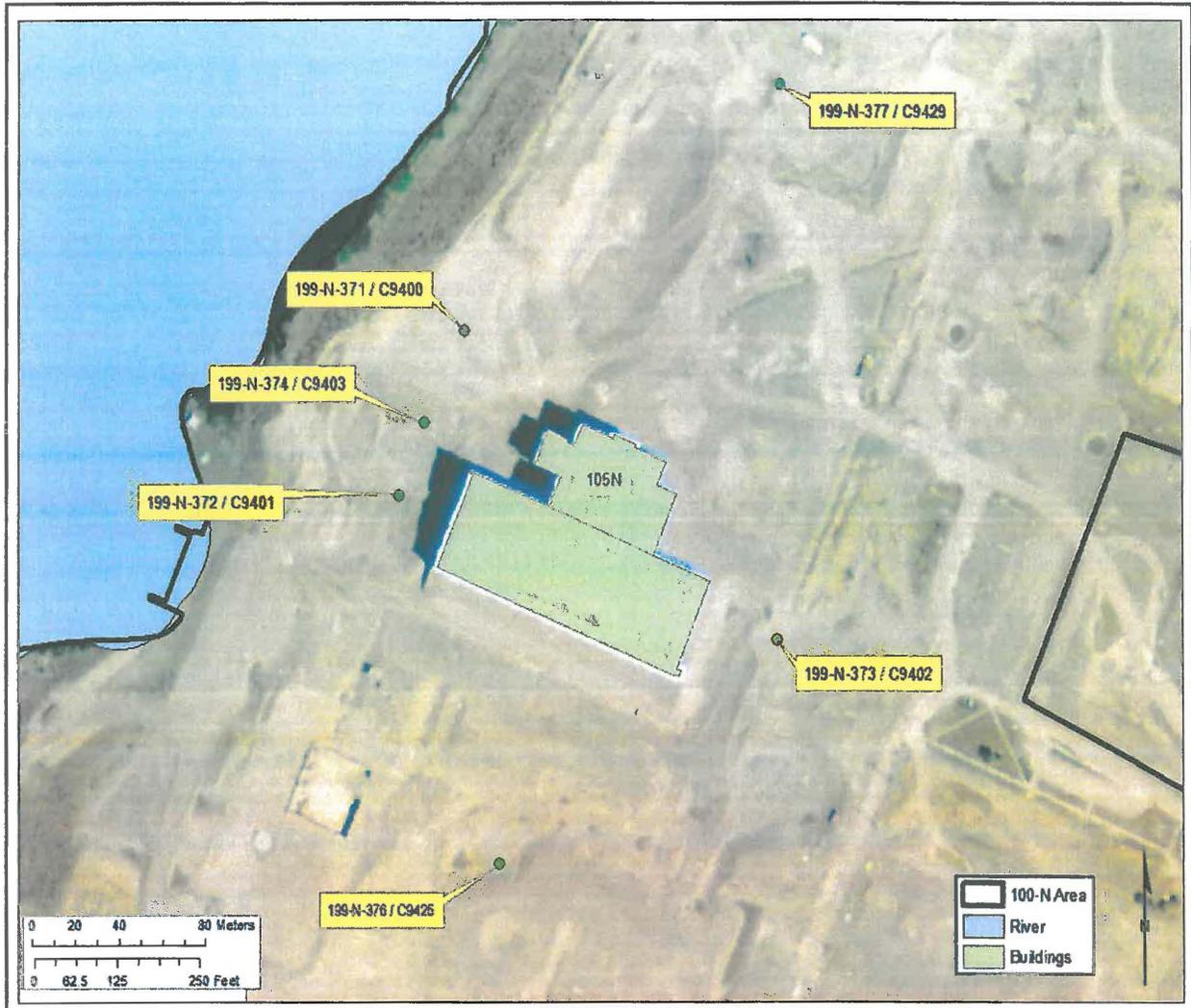


Figure NR-1. Location of Six New Wells in the 100-N Area

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

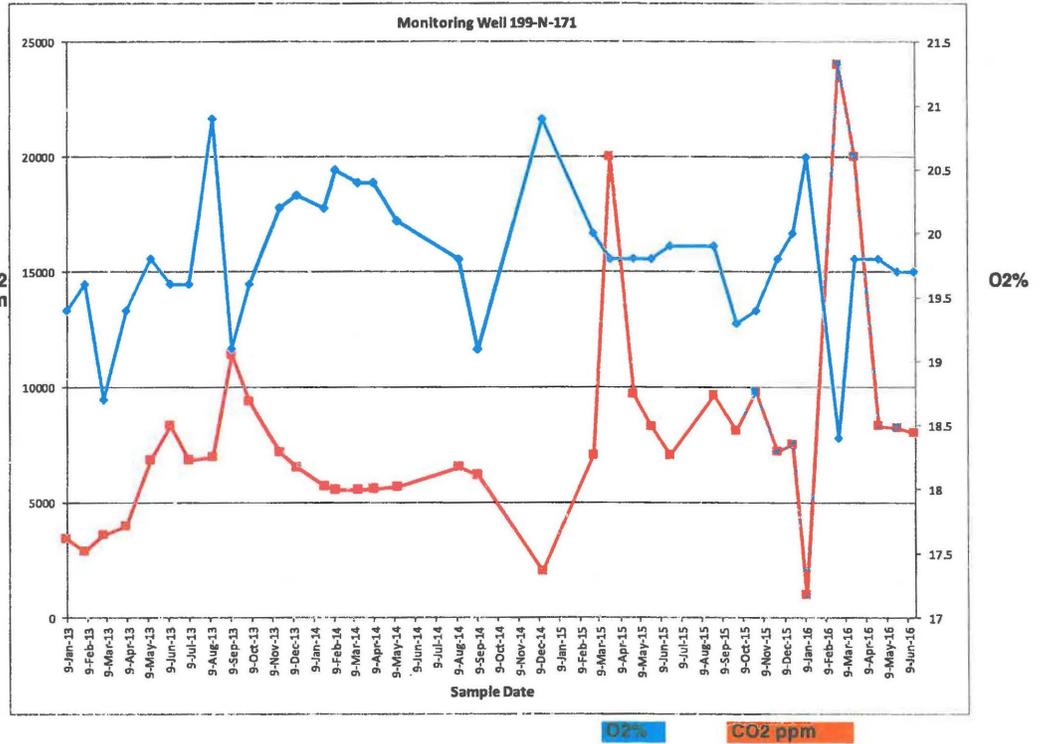


Figure NR-2. Proposed New Location for NR-2 Waste Storage Area

100/300 Areas Unit Managers Meeting August 11, 2016 (July data)

Well 199-N-171

Well #	Date	O2%	CO2 ppm
199-N-171	9-Jan-13	19.4	3400
	5-Feb-13	19.6	2840
	6-Mar-13	18.7	3570
	8-Apr-13	19.4	3960
	15-May-13	19.8	6820
	12-Jun-13	19.6	8290
	10-Jul-13	19.6	6800
	14-Aug-13	20.9	6940
	11-Sep-13	19.1	11400
	8-Oct-13	19.6	9380
	21-Nov-13	20.2	7160
	16-Dec-13	20.3	6520
	27-Jan-14	20.2	5720
	11-Feb-14	20.5	5520
	17-Mar-14	20.4	5520
	9-Apr-14	20.4	5560
	14-May-14	20.1	5670
	13-Aug-14	19.8	6520
	10-Sep-14	19.1	6180
	15-Dec-14	20.9	2000
	1-Mar-15	20	7020
	25-Mar-15	19.8	20000
	29-Apr-15	19.8	9650
	26-May-15	19.8	8260
	22-Jun-15	19.9	7000
	27-Aug-15	19.9	9620
	30-Sep-15	19.3	8070
	29-Oct-15	19.4	9770
	30-Nov-15	19.8	7200
	22-Dec-15	20	7510
	11-Jan-16	20.6	1000
	29-Feb-16	18.4	24000
	25-Mar-16	19.8	20000
	28-Apr-16	19.8	8290
	26-May-16	19.7	8220
	20-Jun-16	19.7	8000



Well 199-N-169

Well #	Date	O2%	CO2 ppm
199-N-169	9-Jan-13	20.9	0
	5-Feb-13	20.9	0
	6-Mar-13	20.9	0
	8-Apr-13	20.9	0
	15-May-13	20.9	800
	12-Jun-13	20.9	780
	#1 10-Jul 13	20.5	1020
	#2 10-Jul 13	20.9	920
	14-Aug-13	20.9	530
	11-Sep-13	20.9	1250
	8-Oct-13	20.9	550
	21-Nov-13	21.3	600
	16-Dec-13	20.9	530
	27-Jan-14	20.9	500
	11-Feb-14	20.9	550
	17-Mar-14	20.9	470
	9-Apr-14	20.9	660
	14-May-14	20.9	840
	13-Aug-14	20.9	520
	10-Sep-14	20.9	410
	15-Dec-14	21	100
	1-Mar-15	20.9	360
	25-Mar-15	20.9	325
	29-Apr-15	20.9	410
	26-May-15	20.9	460
	22-Jun-15	21	0
	27-Aug-15	21.4	330
	30-Sep-15	20.9	530
	29-Oct-15	20.9	360
	30-Nov-15	20.9	460
	22-Dec-15	20.9	490
	11-Jan-16	20.9	0
	29-Feb-16	20.9	520
	25-Mar-16	20.9	15.6
	28-Apr-16	20.9	520
	26-May-16	20.9	550
	20-Jun-16	21	0

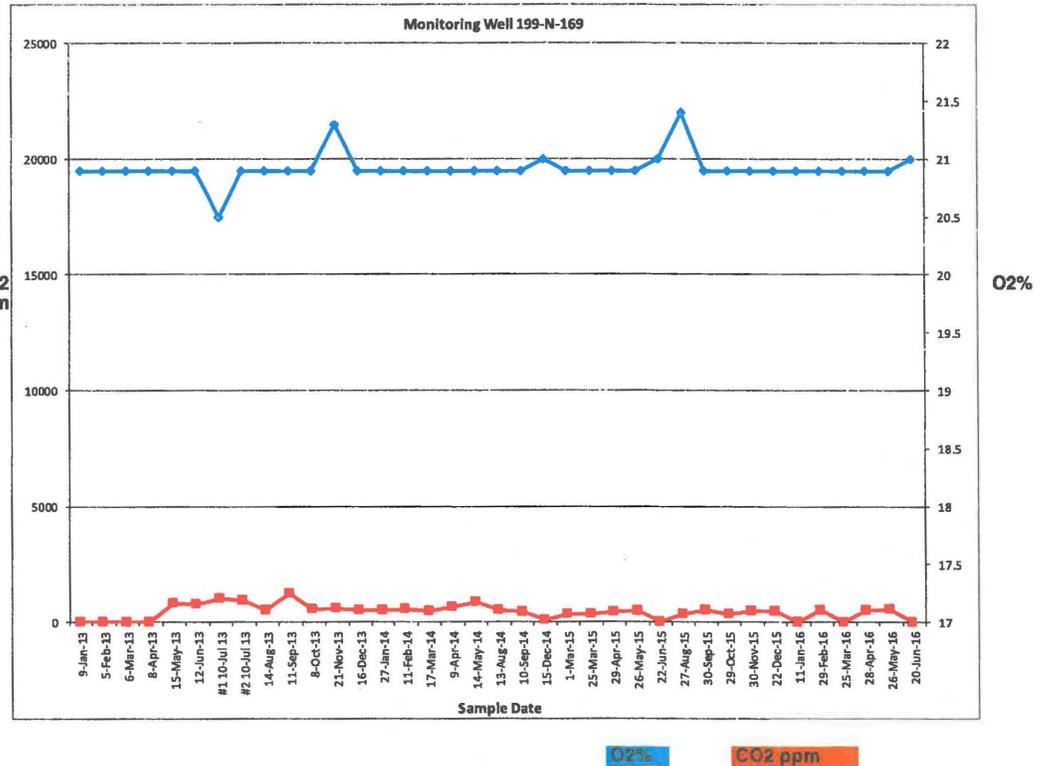


Figure NR-3. Bioventing Wells 199-N-169 and 199-N-171 Monthly Sampling Results.

100/300 Areas Unit Managers Meeting
August 11, 2016 (July data)

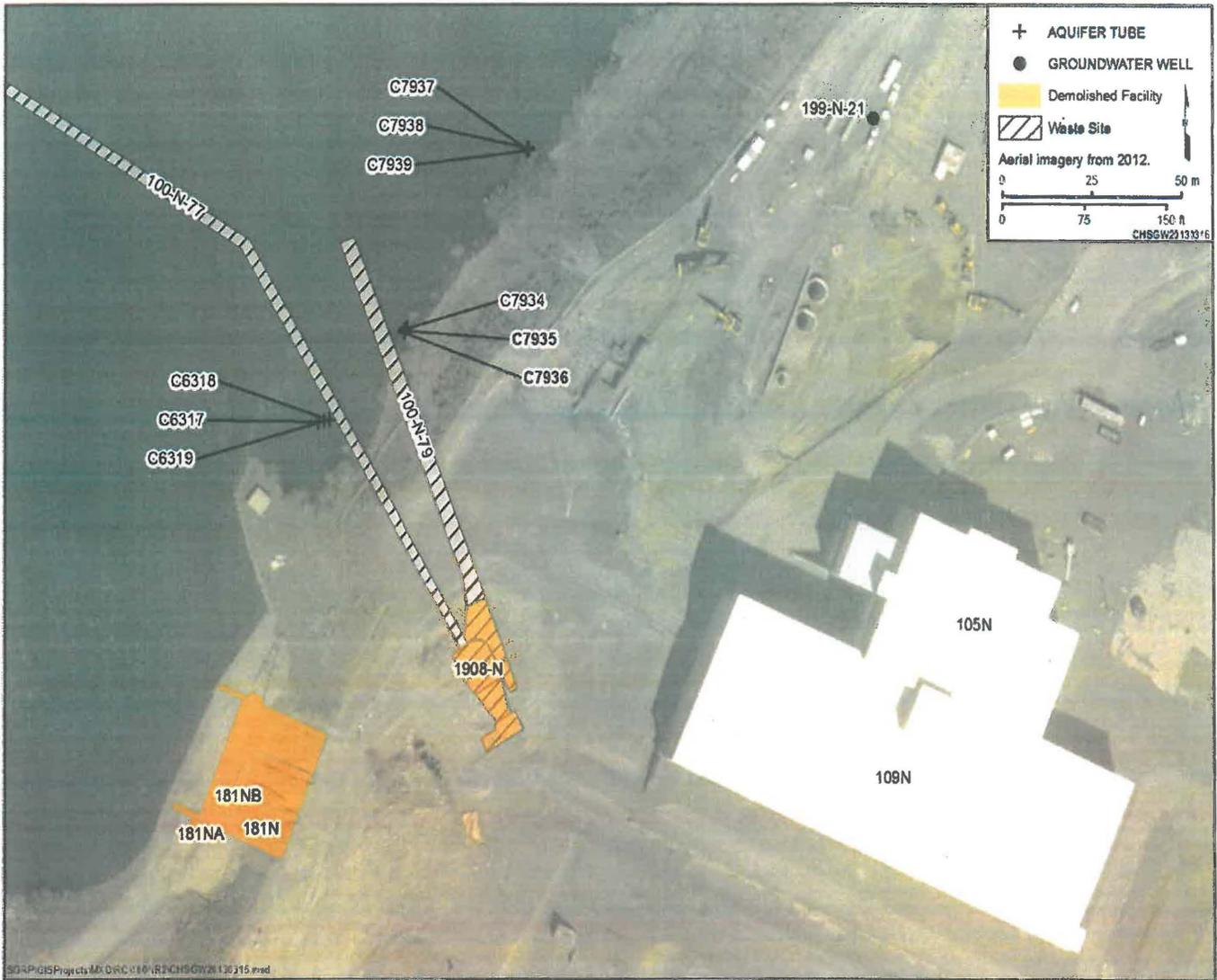


Figure NR-4. Locations of Aquifer Tubes C7934, C7935, and C7936.

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August 11, 2016 (July data)

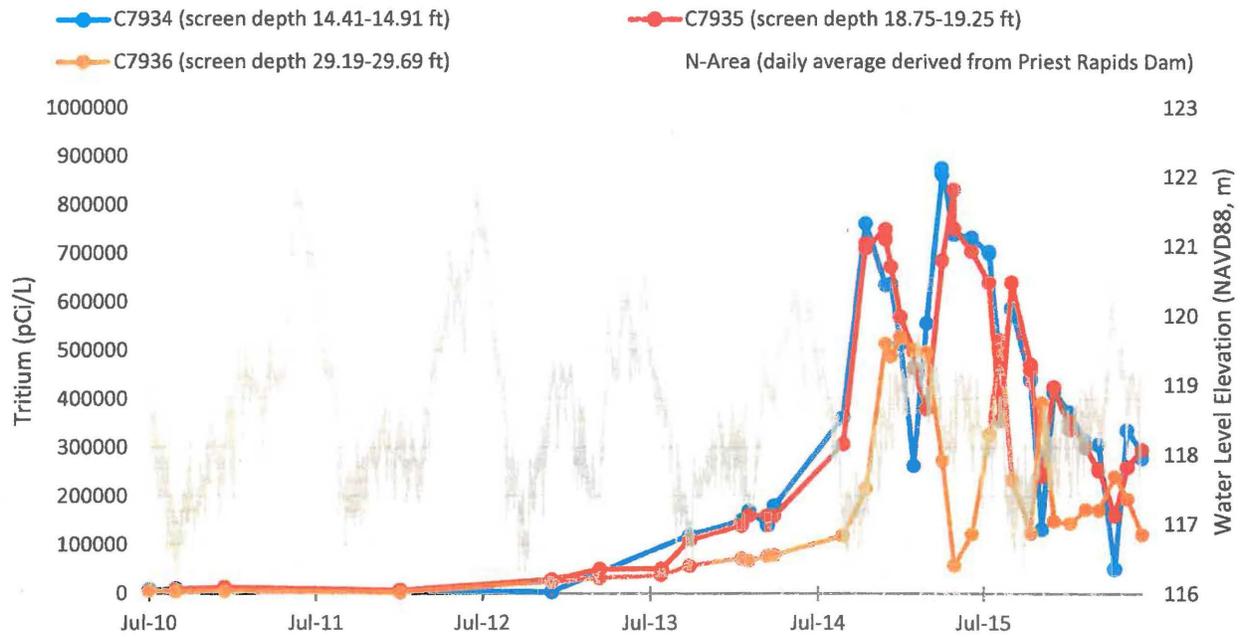


Figure NR-5. Tritium Trends through June 2016 at Aquifer Tubes C7934, C7935, and C7936.

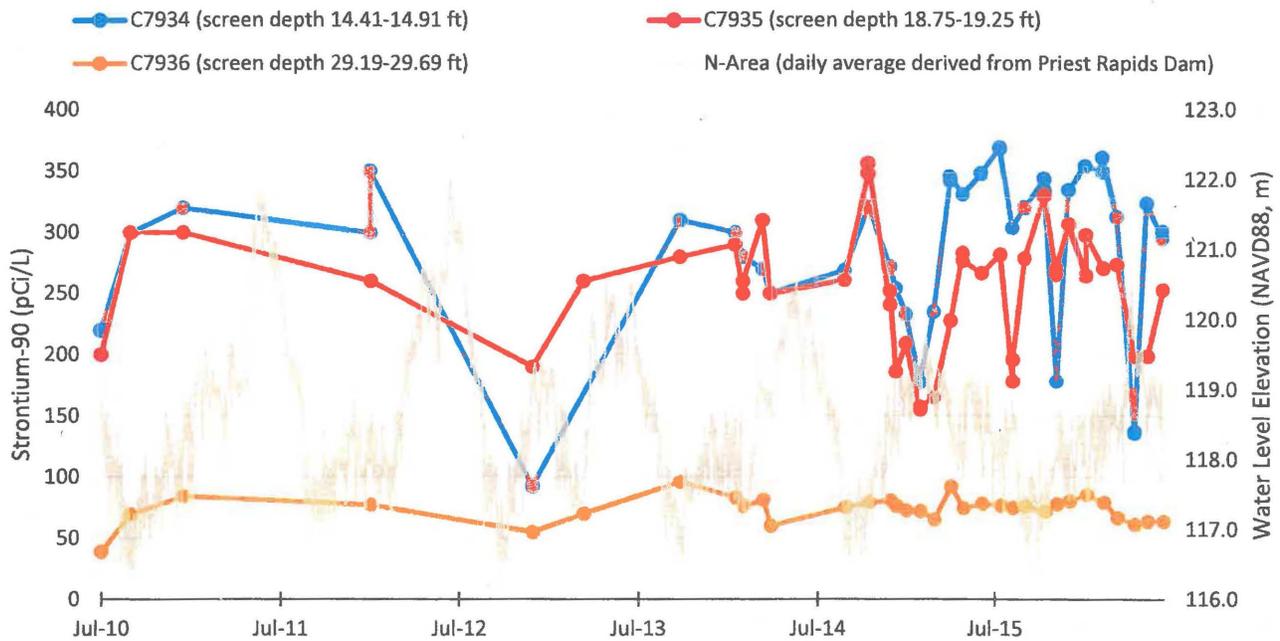


Figure NR-6. Strontium-90 Trends through June 2016 at Aquifer Tubes C7934, C7935, and C7936.

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100-HR-3 Groundwater Operable Unit – Mike Drewett/Rob Mackley

- CERCLA Process Implementation:
 - ✓ The Proposed Plan was submitted for public comment on July 26, 2016. The 30 day review period ends on August 25, 2016.
- FY16 Drilling Progress
 - ✓ Completed drilling on all 8 wells planned in 100-HR-3. Well development on the last two wells was completed on August 8, 2016.
- Ringold Upper Mud (RUM) Aquifer Pump Test
 - ✓ Step and constant rate tests have been completed, and data is being analyzed. A status summary report is being prepared for submittal to DOE-RL in September.
- Remedial Actions & System Modifications
 - ✓ The volume of groundwater treated and mass of Cr(VI) removed from the 100-HR-3 P&T systems during July 2016 are:
 - Treated: 64.4 million gallons (62.5 in June)
 - Removed: 7.7 kg of Cr(VI) (6.9 in June)

The influent and effluent Cr(VI) concentrations (measured weekly) for the 100-HR-3 systems during July are presented in Table H-1.

Table H-1. Monthly Summary of Influent and Effluent Concentrations at the 100-HR-3 P&T Systems

System	Weekly Influent Concentrations ^a (µg/L)	Average Monthly Influent Concentration (µg/L)	Weekly Effluent Concentrations ^{ab} (µg/L)	Average Monthly Effluent Concentration (µg/L)
100-DX	37, 34, 31, 33	34	-2, 1, -1, 0	-0.5
100-HX	17, 24, 20, 21	21	1, 4, 0, 0	1

- a. Concentrations provided represent samples taken during the current month and loaded into HEIS as of the publication of the UMM.
- b. Concentrations reported are below detection and represent the actual instrument reading on the sample(s). The detection limit is approximately 2 µg/L hexavalent chromium. The readings indicate that the measured concentration is indistinguishable from the blank.

- ✓ FY 2016 (Oct. through July) P&T performance to date:

P&T System	Treated (mgal)	Removed (kg)
DX	327	59.1
HX	236	21.3
Total 100-HR-3	563	80.4

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- ✓ A summary of the number of extraction and injection wells in the DX and HX P&T systems is shown in Table H-2. Figure H-1 illustrates the monthly average pumping rates for operating extraction wells across the DX and HX P&T systems. River levels are increasing, and therefore pumping rates have also increased.

Table H-2. Summary of the Number of Extraction and Injection Wells in the 100-HR-3 Systems

Wells	DX		HX		Total
	2014	2015	2014	2015	Current
Number of extraction wells	44	46	31	34	80
Number of injection wells	14	11	14	16	27

Note:

The FY16 well realignments are in progress. The number of operational wells for 2016 will be updated following completion of the planned realignments.

- ✓ Summaries of the volume of groundwater treated and Cr(VI) removed for the 100-DX and 100-HX pump and treat systems are shown in figures H-2 and H-3, respectively.
- ✓ A general reduction in Cr(VI) mass removal over time, a function of progress of remediation with associated reduction in groundwater contaminant concentration, is exhibited at both DX and HX. The drop in concentrations is more pronounced at DX, where concentrations were previously at very high levels. Influent concentrations at DX continue to decline as remediation progresses.

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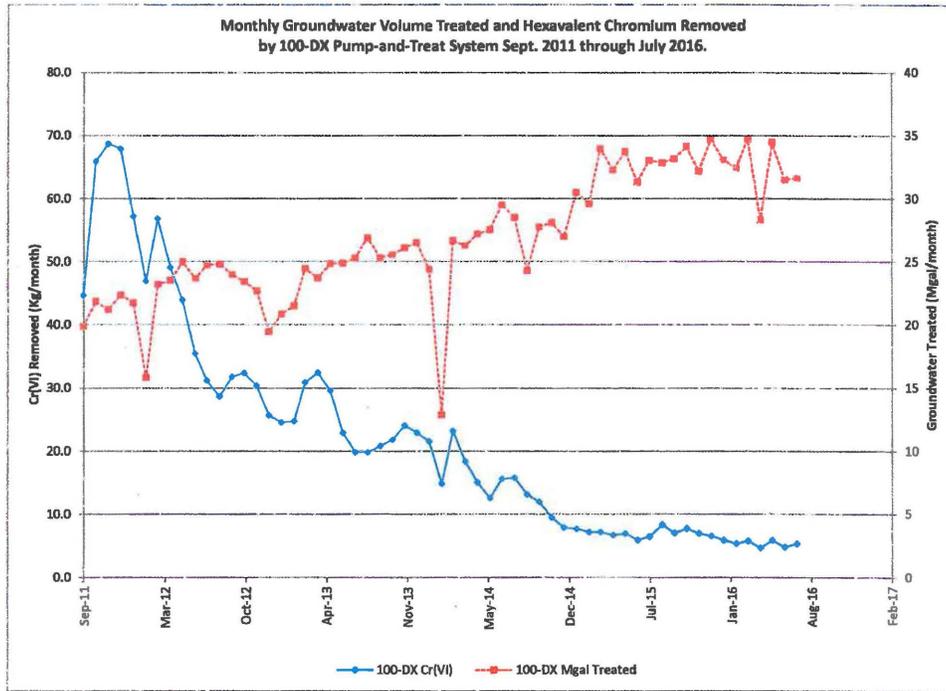


Figure H-2. Monthly Cr(VI) Removed and Groundwater Volume Treated by 100-DX Pump-and-Treat, September 2011 through July 2016.

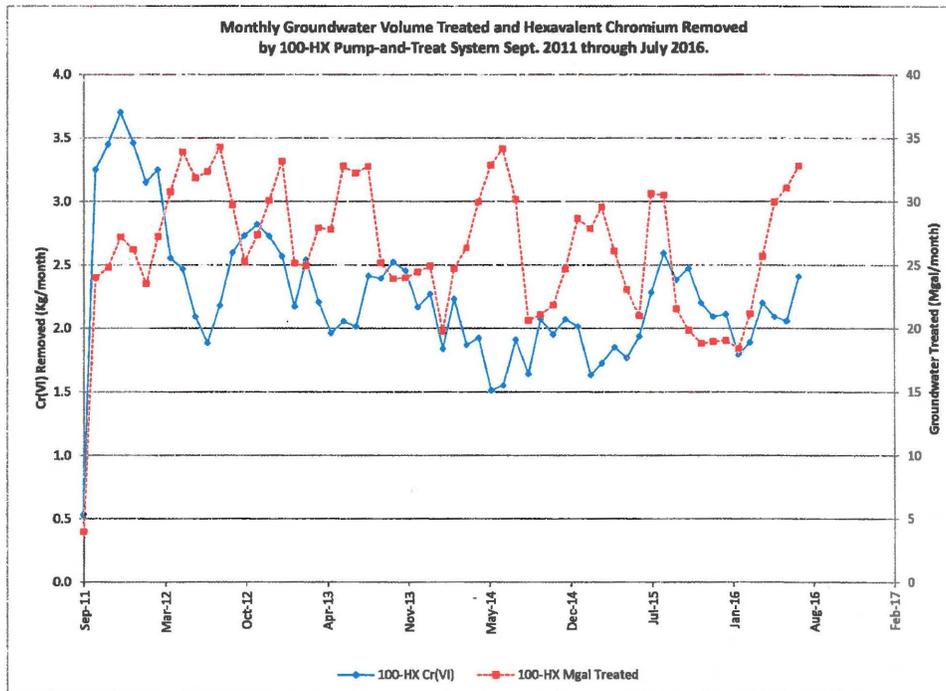


Figure H-3. Monthly Cr(VI) Removed and Groundwater Volume Treated by 100-HX Pump-and-Treat, September 2011 through July 2016.

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100-FR-3 Groundwater Operable Unit – Robert Evans/Mary Hartman

- CERCLA Process Implementation:
 - ✓ Complete
- Monitoring & Reporting:
 - ✓ Data was received for the five wells sampled in June. Results continued previously established trends. Figure F-1 shows strontium-90 and water level in 199-F5-55, which was installed as a vadose characterization borehole during the RI. Strontium-90 declined in June despite an increase in water level.
 - ✓ The six new monitoring wells are scheduled for sampling in August. They will be sampled quarterly for the first year.
- Spectral gamma geophysical logging will be performed in several of the old wells in the monitoring network to determine whether the Hanford/RUM contact is within the perforated intervals. The need for additional maintenance will be evaluated and some may be reconfigured to seal off the RUM. AWLN stations were installed in the new wells and in old well 699-63-25A (substitute for one of the new wells that could not be installed).
- The AWLN station installation for 100-FR-3 is now complete with new 20 stations.

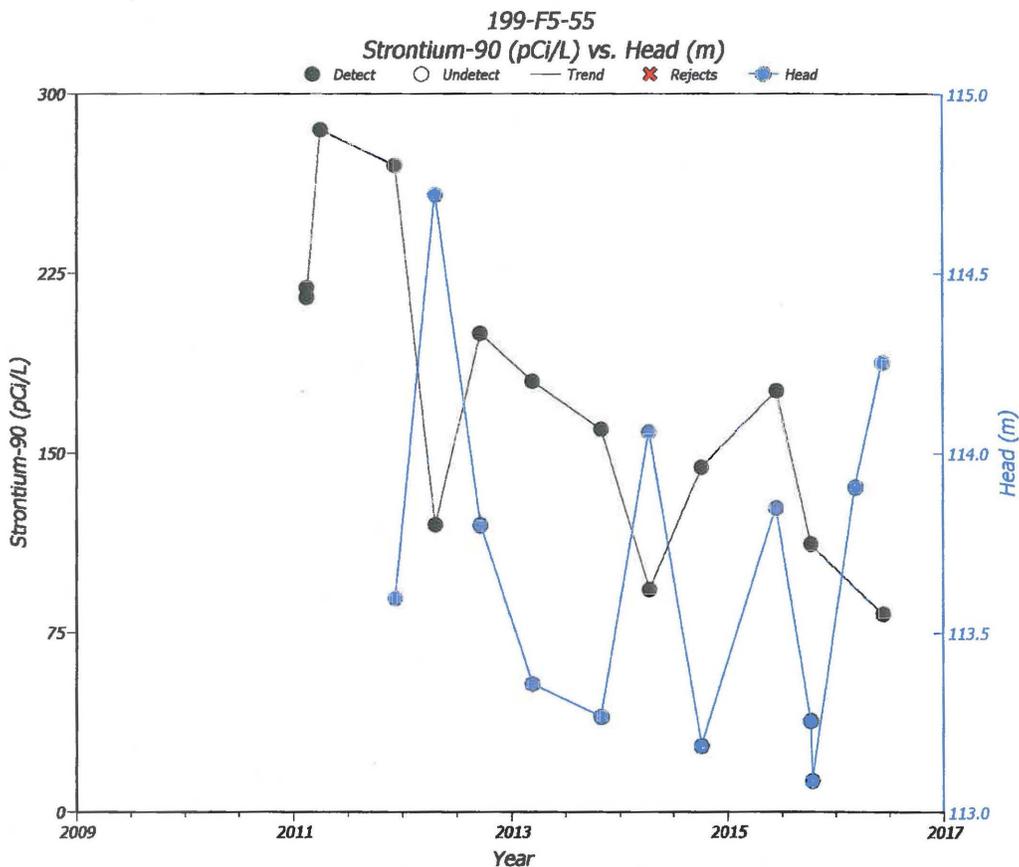


Figure F-1. Strontium-90 and Water Levels in 199-F5-55

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300-FF-5 Groundwater Operable Unit – Patrick Baynes/Virginia Rohay/Farah Elloy

- CERCLA Process Implementation:
 - ✓ Nothing new to report
- Remedial Actions:
 - ✓ Summary of preliminary, short-term observations for Stage A uranium sequestration (Figures FF-1 and FF-2):
 1. Injected directly into aquifer before, during, and immediately after infiltration
 - a. Goal: Sequester any uranium mobilized to groundwater as a result of infiltration
 - b. Observation(s):
 - i. Increase in phosphate concentrations observed in the monitoring wells located within Stage A
 - ii. No increase in uranium concentrations detected in downgradient wells
 - c. Conclusion:
 - i. Direct injection to wells screened only in the aquifer was effective at delivering high sustained concentrations of phosphate to the aquifer
 2. Infiltrated into vadose zone at a nominal depth of 6 feet below surface
 - a. Goal: Deliver phosphate to vadose zone and periodically re-wetted zone (PRZ) to sequester uranium
 - b. Observation(s):
 - i. Wetting front was well distributed laterally and vertically (based on Electrical Resistivity Tomography [ERT] data)
 - ii. Wetting front rate of downward movement varied from 0.5 to 2 m/d (based on ERT data)
 - iii. Local temporary increase in uranium concentration observed in monitoring wells
 - iv. Phosphate not uniformly distributed vertically in vadose zone (based on phosphate concentrations in soil samples).
 - c. Conclusion(s):
 - i. Increase in uranium concentration not discernible in the aquifer
 - ii. High phosphate concentrations in upper vadose zone indicated phosphate precipitation in upper vadose zone
 - iii. Lower permeability lithofacies led to lateral spreading
 3. Injected directly into PRZ after infiltration
 - a. Goal: Deliver phosphate to PRZ to sequester uranium in PRZ
 - b. Observation(s):
 - i. Phosphate was detected in PRZ monitoring wells at varying concentrations
 - ii. A temporary spike in uranium in PRZ within the treatment area during treatment
 - c. Conclusion(s):
 - i. Injection into PRZ was successful in delivering phosphate at high concentrations to PRZ
 - ii. Radius of influence of PRZ injections determined to be ~ 40 feet (based on phosphate concentrations in PRZ water samples and post-treatment borehole soil samples)
- Monitoring & Reporting:

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- ✓ 300 Area Industrial Complex: The next sampling event is scheduled for September 2016.
- ✓ 618-10 Burial Ground/316-4 Crib: The next sampling event is scheduled for December 2016.
- ✓ 618-11 Burial Ground: The next sampling event is scheduled for October 2017.
- ✓ 300 Area Process Trenches (316-5) RCRA Monitoring: All 8 wells scheduled for sampling in July 2016 were sampled on July 6, or July 7, 2016. The next sampling event is scheduled for August 2016. *Note, the 8 wells are sampled semiannually with 4 independent samples collected per semiannual period; the 4 independent samples are collected on a monthly sampling interval. As a result, the 8 wells are sampled 8 months per year.*



Figure FF-1. Location of the Stage A Enhanced Attenuation Area

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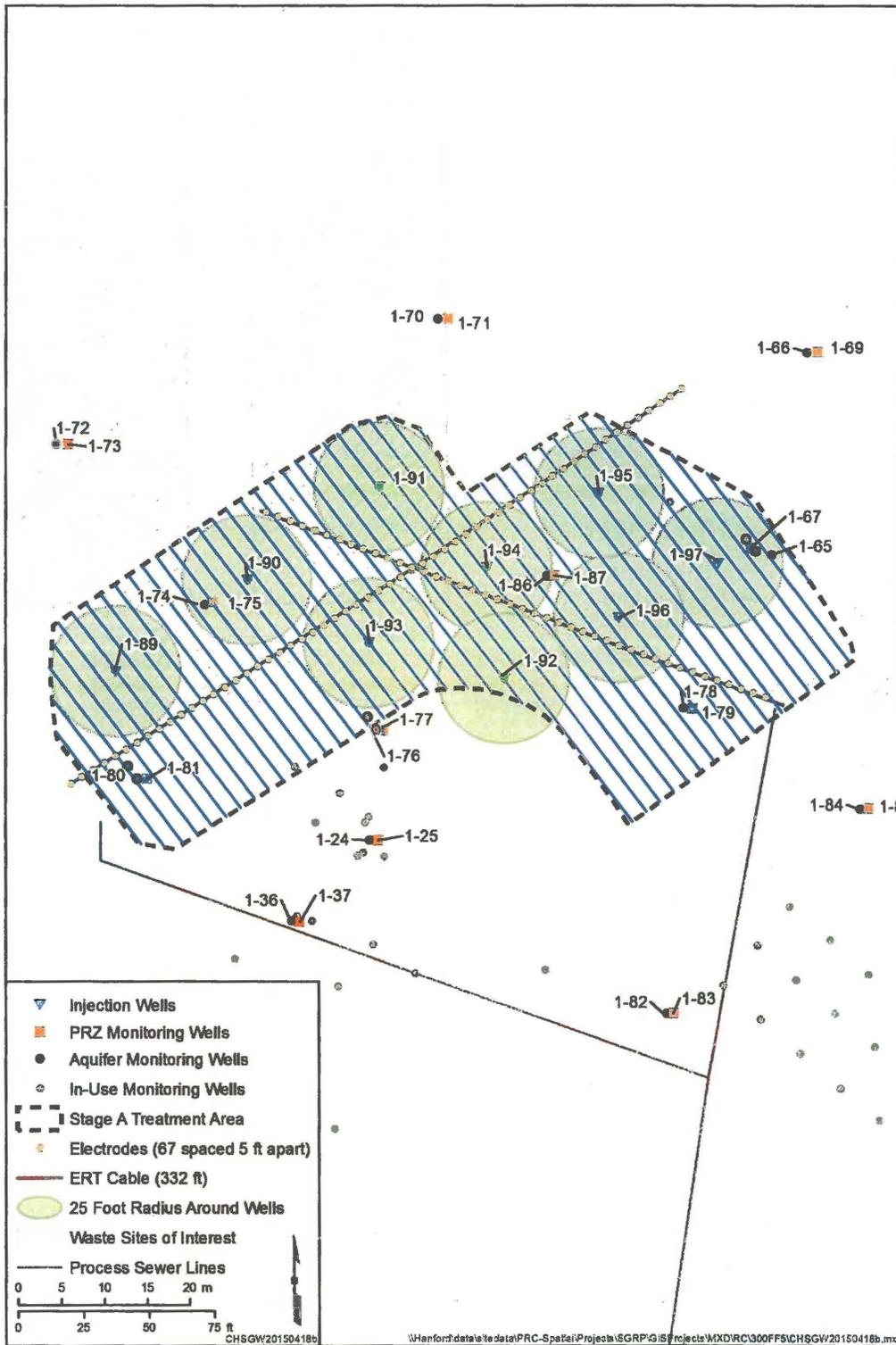


Figure FF-2. Stage A Enhanced Attenuation Injection and Monitoring Wells and Infiltration Lines.

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Hanford Sampling Program Information

Table 1 Wells, Aquifer Tubes, and springs in the River Corridor Successfully Sampled In July 2016

100-BC	100-FR	100-HR-D	100-HR-H	100-KR	100-NR	1100-EM	300-FF
	699-87-42A	199-D4-19	199-H3-2C	199-K-106A	199-N-167		399-1-10A
		199-D4-26	199-H3-9	199-K-106A	199-N-169		399-1-10B
		199-D4-55	199-H4-12C	199-K-107A	199-N-171		399-1-16A
		199-D4-65	199-H4-15CQ	199-K-107A	199-N-172		399-1-16B
		199-D4-77	199-H4-88	199-K-117A	199-N-173		399-1-17A
		199-D4-86	199-H4-92	199-K-132	199-N-173		399-1-17B
		199-D4-92	199-H4-93	199-K-132	199-N-18		399-1-18A
		199-D4-93	199-H5-16	199-K-137	199-N-183		399-1-18B
		199-D4-95	699-100-43B	199-K-137	199-N-19		
		199-D4-96	699-101-45	199-K-137	199-N-3		
		199-D4-97	699-88-41	199-K-141	199-N-350		
		199-D4-98	699-89-35	199-K-165	199-N-351		
		199-D4-99	699-90-37B	199-K-165	199-N-352		
		199-D5-101	699-97-47B	199-K-165	199-N-353		
		199-D5-103	699-97-60	199-K-166	199-N-354		
		199-D5-13		199-K-173	199-N-355		
		199-D5-130		199-K-173	199-N-356		
		199-D5-131		199-K-173	199-N-357		
		199-D5-14		199-K-18	199-N-358		
		199-D5-145		199-K-198	199-N-359		
		199-D5-151		199-K-199	199-N-360		
		199-D5-152		199-K-20	199-N-46		
		199-D5-159		199-K-202	199-N-56		
		199-D5-32		199-K-203	C6132		
		199-D5-33		199-K-204	C6135		
		199-D5-36		199-K-204	C7934		
		199-D5-37		199-K-205	C7935		
		199-D7-3		199-K-205	C7936		
		199-D7-6		199-K-205	C9587		
		199-D8-101		199-K-207	C9588		
		199-D8-102		199-K-208	C9589		
		199-D8-4		199-K-210	C9590		
		199-D8-89		199-K-212			
		199-D8-90		199-K-220			
		199-D8-91		199-K-221			
		199-D8-95		199-K-222			
		199-D8-96		199-K-32A			
		199-D8-97		199-K-32B			

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100-BC	100-FR	100-HR-D	100-HR-H	100-KR	100-NR	1100-EM	300-FF
		199-D8-98		199-K-34			
				199-K-34			
				C7641			
				C7642			
				C7643			

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Table 2 Fiscal Year 2015 and 2016 Sample Trips in the River Corridor Areas awaiting at the end of July 2016

Quarter Scheduled	GWIA	Sample Type	Site Name	Schedule Date	Frequency	Months Remain	Status	Comment
FY 2015 Q4	100-NR	AQUIFER TUBE	C6331	9/1/2015	Annual	1		
FY 2016 Q1	100-HR-D	AQUIFER TUBE	36-M	11/1/2015	Annual	3		Unsuccessful 12-8-2015
	100-KR	SPRING	100-K SPRING 68-1	10/1/2015	Annual	2		
		AQUIFER TUBE	AT-K-4-M	10/1/2015	Annual	2		
	100-NR	SPRING	River water adjacent to C6317/18/19	10/1/2015	Annual	2		
		SPRING	River water adjacent to C7934/35/36	10/1/2015	Annual	2		
		SPRING	River water adjacent to C7937/38/39	10/1/2015	Annual	2		
FY 2016 Q3	100-HR-H	WELL	199-H4-83	6/1/2016	3 Times Annually	2		
	100-KR	WELL	199-K-185	6/27/2016	Monthly	1		Special Study, Schedule adjusted
		WELL	199-K-188	5/1/2016	Quarterly	0	Late	Access Restricted, Review for cancellation
		WELL	199-K-36	5/1/2016	Biannual	3		Access Restricted
FY 2016 Q4	100-HR-D	WELL	199-D5-127	7/1/2016	Quarterly	2		
		WELL	199-D5-20	7/1/2016	Quarterly	2		
		WELL	699-97-61	7/1/2016	Quarterly	2		
	100-HR-H	WELL	199-H4-6	7/1/2016	Quarterly	2		Maintenance Required, Unsuccessful 7-27-2016
	100-KR	WELL	199-K-106A	7/25/2016	Monthly	1		Special Study, Schedule adjusted
		WELL	199-K-107A	7/25/2016	Monthly	1		Special Study, Schedule adjusted
		WELL	199-K-108A	7/25/2016	Monthly	1		Special Study, Schedule adjusted
		WELL	199-K-132	7/25/2016	Monthly	1		Special Study, Schedule adjusted
		WELL	199-K-138	7/25/2016	Every Other Month	1		Special Study, Schedule adjusted
		WELL	199-K-139	7/25/2016	Every Other Month	1		Special Study, Schedule adjusted
		WELL	199-K-140	7/25/2016	Monthly	1		Special Study, Schedule adjusted
		WELL	199-K-158	7/25/2016	Every Other Month	1		Special Study, Schedule adjusted
		WELL	199-K-168	7/25/2016	Monthly	1		Special Study, Schedule adjusted
		WELL	199-K-174	7/25/2016	Every Other Month	1		Special Study, Schedule adjusted
		WELL	199-K-175	7/25/2016	Every Other Month	1		Special Study, Schedule adjusted
		WELL	199-K-184	7/25/2016	Monthly	1		Special Study, Schedule adjusted
WELL		199-K-185	7/25/2016	Monthly	1		Special Study, Schedule adjusted	
WELL	199-K-196	7/25/2016	Monthly	1		Special Study, Schedule adjusted		
WELL	199-K-204	7/25/2016	Monthly	1		Special Study, Schedule adjusted		

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Quarter Scheduled	GWIA	Sample Type	Site Name	Schedule Date	Frequency	Months Remain	Status	Comment
		WELL	199-K-206	7/25/2016	Every Other Month	1		Special Study, Schedule adjusted
		WELL	199-K-223	7/25/2016	Monthly	1		Not on Well Access List, Special Study, Schedule adjusted
		WELL	199-K-224	7/25/2016	Monthly	1		Not on Well Access List, Special Study, Schedule adjusted
		WELL	199-K-34	7/25/2016	Monthly	1		Special Study, Schedule adjusted
	100-NR	WELL	199-N-96A	7/25/2016	Every Other Month	1		Special Study, Schedule adjusted

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Table 3 Groundwater Sampling Locations in the River Corridor Scheduled for August 2016

100-BC	100-FR	100-HR-D	100-HR-H	100-KR	100-NR	1100-EM	300-FF
		199-D4-101	199-H1-32	199-K-106A	C7934		399-1-10A
		199-D4-14	199-H1-33	199-K-106A	C7935		399-1-10B
		199-D4-34	199-H1-35	199-K-106A	C7936		399-1-16A
		199-D4-38	199-H1-37	199-K-107A			399-1-16B
		199-D4-39	199-H1-38	199-K-107A			399-1-17A
		199-D4-83	199-H1-40	199-K-107A			399-1-17B
		199-D4-84	199-H3-4	199-K-108A			399-1-18A
		199-D4-85	199-H3-9	199-K-111A			399-1-18B
		199-D5-104	199-H4-12A	199-K-132			
		199-D5-146	199-H4-12C	199-K-132			
		199-D5-34	199-H4-15A	199-K-137			
		199-D5-39	199-H4-4	199-K-137			
		199-D5-92	199-H4-84	199-K-140			
		199-D8-53	199-H4-86	199-K-157			
		199-D8-55	199-H6-2	199-K-165			
		199-D8-68		199-K-165			
		199-D8-69		199-K-168			
				199-K-173			
				199-K-173			
				199-K-184			
				199-K-185			
				199-K-185			
				199-K-186			
				199-K-187			
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				199-K-192			
				199-K-193			
				199-K-194			
				199-K-196			
				199-K-197			
				199-K-200			
				199-K-201			
				199-K-204			
				199-K-204			
				199-K-205			
				199-K-205			

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100-BC	100-FR	100-HR-D	100-HR-H	100-KR	100-NR	1100-EM	300-FF
				199-K-209			
				199-K-223			
				199-K-223			
				199-K-224			
				199-K-224			
				199-K-34			
				199-K-34			
				199-K-34			
				699-78-62			

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Documents for AR Submission

Number	Title	Referencing Doc/Driver
FH-0502966, 2005	PHMC Section C.4.2 – Submittal of Solid Waste Landfill Annual Monitoring Report	DOE/RL-2015-33 R0 SWL SAP
ECF-Hanford-16-0013, R0, 2016	Hydraulic Gradients and Velocity Calculations for RCRA Sites in 2015	cleared July 2016
DOE/RL-2009-75, R1	Interim Status GW Monitoring Plan for the LLBG WMA-1	cleared August 2016
ECF-Hanford-16-0061, R0	Calculation and Depiction of Groundwater Contamination for the Calendar Year 2015 Hanford Site Groundwater Monitoring Report	GW Annual Report
05-AMRC-0130	Hanford Site Solid Waste Landfill Annual Monitoring Report” Third Quarter Calendar Year 2003 through Second Quarter Calendar Year 2004 (July 2003 through June 2004) (letter to J. Price, Washington State Department of Ecology from L. Erickson)	DOE/RL-2015-33 R0 SWL SAP
DOE/RL-2016-19, R0	Calendar Year 2015 Annual Summary Report for the 100-HR-3 and 100-KR-4 Pump and Treat Operations, and 100-NR-2 Groundwater Remediation	cleared August 2016

Attachment 2

**100-K Sludge Treatment Project and 100-K Facility Demolition and Soil
Remediation Presentation**

100K Area Report
100/300 Area Unit Manager Meeting
August 11, 2016

RL-0012 Sludge Treatment Project

TPA Milestone **M-016-177**, *Complete 105-KW sludge transfer equipment installation.*
(9/30/17) – On Schedule

- **Equipment Procurement/Fabrication**
 - Completed Receipt Inspection on Sludge Transport and Storage Container vessels numbers 4066 through 409 and delivered them to HiLine Engineering and Fabrication Services to add the STSC Appurtenances. Completed installation of instrumentation and appurtenances on STSC 402 & 403. Completed insitu testing of 105KW Annex stack and verified location of sample port and flow profile are consistent with design assumptions. Fabrication of hardware continued and is expected to complete in September.
- **MASF Preoperational Acceptance Testing (MPAT)**
 - Test is ~98% complete with final completion forecast in mid-August
 - Completed MPAT base test procedure steps including ventilation balancing and sand simulant testing.
 - Completed resolution, retest, & closure of 136 of 160 Testing Disposition Reports (TDRs).
- **Construction**
 - **Annex**
 - Continued performing periodic PMs and CM in the Annex Facility
 - Completed Nitrogen System Pad
 - Completed site grading and backfill activities around new concrete pads and asphalt.
 - Completed HLAN and telecommunications installation.
 - **In-Basin Construction**
 - Completed installation of equipment in northeast corner of 105KW Basin
 - Completed installation of Booster Pump installation rail system
 - Completed structural and grating modifications in support of process equipment installation
 - Continued reviewing submittals and material procurement activities in support of future equipment installation
 - Worked on development of work packages for installation of ECRTS hardware

TPA Milestone **M-016-175**, *Begin sludge removal from 105-KW Fuel Storage Basin*
(9/30/18) – On Schedule

- Continued reviews of the draft KW Basin Documented Safety Analysis and Technical Safety Requirement documents with DOE RL. These documents combine the ECRTS PDSA R2 and

the current KW Basin safety basis documents into an integrated safety basis set. Formal submittal to DOE-RL is forecast for early September of 2016.

- Continued development of the One Time Request for Shipment (OTRS) that will be used for shipping the sludge from 100K Area to T Plant.
- Continued development of Training Lesson Guides and Exam Banks
- Continued to develop ECRTS operations and maintenance procedures
- Advanced 100K Area Readiness Activities
 - Completed comment incorporation on ARP and RSAs. Formal approval will not occur until 2017.
 - Completed development of the Plan of Action (POA) and provided to management for review/comment.
-
- Completed removal of North Loadout Pit equipment at T Plant.
- Continued installation of Electrical, Water Addition, and sludge storage hardware at T Plant
- Continued development of Work Package to install Nitrogen Purge System
- Advanced T Plant Readiness Activities
 - Completed development of ARP and the majority of RSAs development work for T-Plant RA-2

TPA Milestone M-016-176, *Complete sludge removal from 105-KW Fuel Storage Basin (12/31/19)* – On Schedule

- Initiation of this milestone follows completion of Milestone M-016-175

TPA Milestone M-016-178, *Initiate deactivation of 105-KW Fuel Storage Basin. (12/31/19)* – On Schedule

- The following pre-deactivation actions are underway:
 - Integrated Water Treatment System garnet filter media removal design work continues. The preliminary design is expected to be completed by the end of fiscal year 2016.
 - Skimmer system sand filter media removal system design work is on hold awaiting funding.
 - Dose to curie modeling of below-water debris in the center and West bays of K West Basin continues. A formal below-water debris activity calculation for the East bay of K West Basin is undergoing peer review.

TPA Milestone M-016-173, *Select K Basin sludge treatment and packaging technology and propose new interim sludge treatment and packaging milestones.*

(9/30/22) – On Schedule

- DOE/RL-2011-15, *Remedial Design/ Remedial Action Work Plan for the K Basins Interim Remedial Action: Treatment and Packaging of K Basins Sludge* is being revised to include specific provisions for the safe storage of sludge at T-Plant. The document will be issued after the ESD public comment period.

TPA Milestone M-016-181, *Complete deactivation, demolition and removal of 105-KW Fuel Storage Basin*

(9/30/23) – On Schedule

- Preparation of a relative order of magnitude cost estimate and schedule to complete the deactivation and demolition of 105-KW Fuel Storage basin is in-progress.

TPA Milestone **M-016-186**, *Initiate soil remediation under the 105-KW Fuel Storage Basin.*
(12/31/23) – On Schedule

RL-0041 K Facility Demolition and Soil Remediation

TPA Milestone **M-016-143**, *Complete the interim response actions for 100 K Area within the perimeter boundary and to the Columbia River for Phase 2 actions. Phase 2 is defined in the 100 K Area RD/RA Work Plans.*

(9/30/24) – On Schedule

AB Waste Sites. A Verification Sampling Instruction (VSI) is in development to perform confirmation sampling for closure of four of the waste sites in the AB area (1607-K-2, 126-KE-2, 100-K-14, 100-K-50). Waste sites 120-KE-1, 120-KE-2, 120-KE-4, 120-KE-5, have been excavated to 20 feet and in-process samples were taken with analytical results pending. An equipment failure on a parked fuel tanker truck supporting the AB waste sites work resulted in a spill of about 400 gallons of diesel fuel. The soil impacted by the spill has been removed and disposed. Samples to confirm that cleanup levels for petroleum were met were collected and results are being evaluated.

165-KE Asbestos Project. 165KE Asbestos abatement is going into a Min Safe mode. Insulators are being reassigned to PFP. Based on current schedule provided by Senior management, we will not start 165KE Asbestos abatement again until 2018..

TPA Milestone **M-093-28**, *Submit a change package for proposed interim milestones for 105-KE and 105-KW Reactor Interim Safe Storage*
(12/31/19) - On Schedule

TPA Milestone **M-093-27**, *Complete 105-KE and 105-KW Reactor Interim Safe Storage in Accordance with the Removal Action Work Plan.*
(9/30/2024) - On Schedule

TPA Milestone **M-016-00C**, *Complete all response actions for the 100 K Area*
(9/30/24) - On Schedule

Attachment 3

Closure Operations Status

August 11, 2016 Unit Manager's Meeting Closure Operations Status

100 Area

- 100-N-83 – Working with RL and Ecology to finalize draft closure document.

618-10

Trench Remediation

- Burial ground crews resumed excavation and drum characterization in south trench adjacent to VPU field.

VPU Remediation

- VPU augering was complete week before last. Drill is currently being downposted and will be moved to the 618-10 mock-up area for storage when complete.
- Waste from 27 VPUs has been successfully retrieved and grouted.

300 Area

- 300-288:2 - CVP has been drafted and shared with RL and EPA. Currently awaiting EPA approval.
- WCH has demobilized from 300 Area.