

**Final**

Office of River Protection  
Consent Decree 08-5085-FVS

Monthly Summary Report

March 2016

**Office of River Protection****Consent Decree 08-5085-FVS  
Monthly Summary Report****March 2016 (Monthly Summary Report/Project Earned Value Management System  
reflects January 2016 information)**

<b>Page</b>	<b>Topic</b>	<b>Leads</b>
3	CD Milestone Statistics/Status	Bryan Trimberger/Dan McDonald/Jeff Lyon
3	Consent Decree Reports/Reviews	
4	Single-Shell Tank Retrieval Program • D-00B-01, D-00B-02, D-00B-03, D-00B-04	Jeremy Johnson/Jeff Lyon
6	Tank Waste Retrieval Work Plan Status • Consent Decree Appendix C	Jeremy Johnson/Jeff Lyon
9	Waste Treatment and Immobilization Plant Project • D-00A-06, D-00A-17, D-00A-01	Joni Grindstaff/Dan McDonald
12	Pretreatment Facility • D-00A-18, D-00A-19, D-00A-13, D-00A-14, D-00A-15, D-00A-16	Dan Knight/Dan McDonald
15	High-Level Waste Facility • D-00A-20, D-00A-21, D-00A-02, D-00A-03	Wahed Abdul/Dan McDonald
18	Low-Activity Waste Facility • D-00A-07, D-00A-08, D-00A-09	Jeff Bruggeman/Dan McDonald
20	Balance of Facilities • D-00A-12	Jason Young/Dan McDonald
22	Analytical Laboratory • D-00A-005	
24	Waste Treatment Plant Project Percent Complete Status (Table)	

**CD Milestone Statistics/Status**

<b>Milestone</b>	<b>Title</b>	<b>Due Date</b>	<b>Completion Date</b>	<b>Status</b>
<b>Fiscal Year 2014</b>				
D-00B-01	Complete Retrieval of Tank Waste from 10 SSTs in WMA-C	09/30/2014		Past Due
D-00B-02	Advise Ecology of the Nine SSTs Waste will be Retrieved by 2022	09/30/2014	08/24/2011	Completed
<b>Fiscal Year 2015</b>				
D-00A-07	LAW Facility Construction Substantially Complete	12/31/2014		Past Due
D-00A-19	Complete elevation 98 feet Concrete Floor Slab Placements in PT Facility	12/31/2014		Past Due
<b>Fiscal Year 2016</b>				
D-00A-13	Complete Installation of Pretreatment Feed Separation Vessels	12/31/2015		Past Due
<b>Fiscal Year 2017</b>				
D-00A-02	HLW Facility Construction Substantially Complete	12/31/2016		Ongoing

CD = Consent Decree.

Ecology = Washington State Department of Ecology.

HLW = high-level waste.

LAW = low-activity waste.

PT = pretreatment.

SST = single-shell tank.

WMA-C = C Farm waste management area.

**Consent Decree Reports/Reviews**

**D-00C-01 series, Submit to State of Washington and State of Oregon Semi-Annual Report,** Due: Semiannually – January 31 and July 31 of each year, Status: Ongoing. The January 2016 Semiannual Report was issued on January 29, 2016, via U.S. Department of Energy (DOE), Office of River Protection (ORP) letter 16-ECD-0006, “January 2016 Semi-Annual Report for State of Washington vs. U.S. Department of Energy, Case No. 08-5085-FVS, for Waste Treatment and Immobilization Plant Construction and Startup Activities and Tank Retrieval Activities – May 1, 2015, thorough October 31, 2015.”

**D-00C-02 series, Submit to State of Washington and State of Oregon Monthly Summary Reports,** Due: End of each month, Status: Ongoing.

**D-006-00-B1, Provide State of Oregon notice of meetings in D-006-00-B, etc. no less than 30 days before they are scheduled,** Due: September 25, 2016, Status: On Schedule.

**D-006-00-B, Meet Approximately Every Three Years after Entry of Decree to review requirements of the Consent Decree, Due: October 25, 2016, Status: On Schedule.**

### Single-Shell Tank Retrieval Program

Milestone	Title	Due Date	Status
D-00B-01	Complete Retrieval of Tank Wastes from 10 Remaining SSTs in WMA-C	September 30, 2014	Past Due
D-00B-01A through D-00B-01J	Submit Tank Retrieval Complete Certification	One year following each retrieved tank retrieval completion report <sup>a</sup>	Ongoing
D-00B-02	Advise Ecology of the Nine SSTs from which Waste Will Be Retrieved by 2022	September 30, 2014	Completed
D-00B-03	Initiate Startup of Retrieval in At Least 5 of 9 SSTs in D-00B-02	December 31, 2017	Ongoing*
D-00B-04	Complete Retrieval of Tank Wastes from the nine SSTs in D-00B-02	September 30, 2022	Ongoing*
D-00B-04A through D-00B-04I	Submit Tank Retrieval Complete Certification	TBD	TBD

- a. Pursuant to Section IV-B-5 of the Consent Decree, the U.S. Department of Energy (DOE) must submit to the Washington State Department of Ecology (Ecology) a written certification that DOE has completed retrieval of a tank in accordance with the requirements of Appendix C, Part 1, of the Consent Decree. Completed for Single-Shell Tank (SST) C-104 on March 21, 2013, via DOE Office of River Protection (ORP) letter 13-TF-0018. Completed for SST C-108 on May 1, 2013, via ORP letter 13-TF-0025. Completed for SST C-109 on June 4, 2013, via ORP letter 13-TF-0037. Completed for SST C-110 on January 29, 2014, via ORP letter 14-TF-0007. Completed for SST C-107 on September 30, 2014, via ORP letter 14-TF-0114. Completed for SST C-112 on September 30, 2014, via ORP letter 14-TF-0115.

SST = single shell tank  
 TBD = to be determined.  
 WMA-C = C Farm waste management area.

#### Significant Past Accomplishments:

- Washington State Department of Ecology (Ecology) approved practicability evaluation request to forego a third retrieval technology in Tank 241-C-102.
- Completed Tank 241-C-102 Retrieval Completion Certification.
- Completed first post retrieval sample of C-102. Staging equipment for second sample.
- Retrieved approximately 45 percent of waste from Tank 241-C-105 utilizing the Mobile Arm Retrieval System – Vacuum (MARS-V) and high-pressure water.

- Obtained Tank 241-C-105 in-process sample.
- Initiate equipment removal of the Tank C-105 MARS-V, to ready tank for modification to modified sluicing system.
- Retrieved approximately 72 percent of the waste from Tank 241-C-111 thru March 1<sup>st</sup>, an estimated 9,800 gallons of waste remain in the tank.
- Completed isolation of legacy duct ventilation lines at Tanks 241-AX-101, Tank 241-AX-102, Tank 241-AX-103 and Tank 241-AX-104.
- Completed Tank 241-AX-102 cover block removal.

**Significant Planned Activities in the Next Six Months:**

- Complete Tank 241-C-102 post retrieval sampling.
- Complete Tank 241-C-111 extended reach sluicing system (ERSS) retrieval operations using high-pressure water, with caustic/water dissolution (second and third technologies).
- Complete A/AX infrastructure (water and utilities) design – fiscal year (FY) 2015 Phase 4A and Phase 5.
- Complete AX Farm field work for tower, stack extension, and platform installation.
- Complete equipment removal/disposal at AX-101 pit and riser.
- Complete AX-2707 fencing and gate upgrades
- Complete AX ventilation installation, testing and startup at portable exhauster (POR) 126.
- Complete building AX-2707 and building AX-80 removal and disposal

**Issues:**

\*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone.

**Tank Waste Retrieval Work Plan Status**

<b>Tank</b>	<b>TWRWP</b>	<b>Expected Revisions</b>	<b>First Retrieval Technology</b>	<b>Second Technology</b>	<b>Third Technology</b>
C-101	RPP-22520, Rev. 8	Complete	Modified Sluicing with ERSS	High-Pressure Water deployed with the ERSS	-
C-102	RPP-22393, Rev. 7	Complete	Modified Sluicing with ERSS	High-Pressure Water deployed with the ERSS	-
C-104	RPP-22393, Rev. 7	Complete	Modified Sluicing	Chemical Retrieval Process complete per 13-TF-0018	-
C-105	RPP-22520, Rev. 8	Third Technology	MARS-V	MARS-V-High Pressure Water Spray	TBD
C-107	RPP-22393, Rev. 7	Complete	MARS-S	MARS-S-High Pressure Water Spray	Water Dissolution
C-108	RPP-22393, Rev. 7	Complete	Modified Sluicing	Chemical Retrieval Process complete per 13-TF-0025	-
C-109	RPP-21895, Rev. 5	Complete	Modified Sluicing	Chemical Retrieval Process complete per 13-TF-0037	-
C-110	RPP-33116, Rev. 3	Complete	Modified Sluicing	Mechanical Waste Conditioning with an In-Tank Vehicle	High Pressure Water
C-111	RPP-37739, Rev. 2	Complete	Modified Sluicing	High pressure water using the ERSS	Chemical Dissolution Process with ERSS
C-112	RPP-22393, Rev. 7	Complete	Modified Sluicing	Chemical Retrieval Process	-

ERSS = extended reach sluicing system.

MARS = Mobile Arm Retrieval System.

S = sluicing.

TBD = to be determined.

TWRWP = Tank Waste Retrieval Work Plan.

V = vacuum.

**Significant Accomplishments:** None**Significant Planned Activities in the Next Six Months:**

- Finalize AX Farm tank waste retrieval work plans.
- Modify RPP-22520 241-C-101 and 241-C-105 Tanks Waste Retrieval Work Plan (C-105 TWRWP) to include a third technology for C-105 retrieval

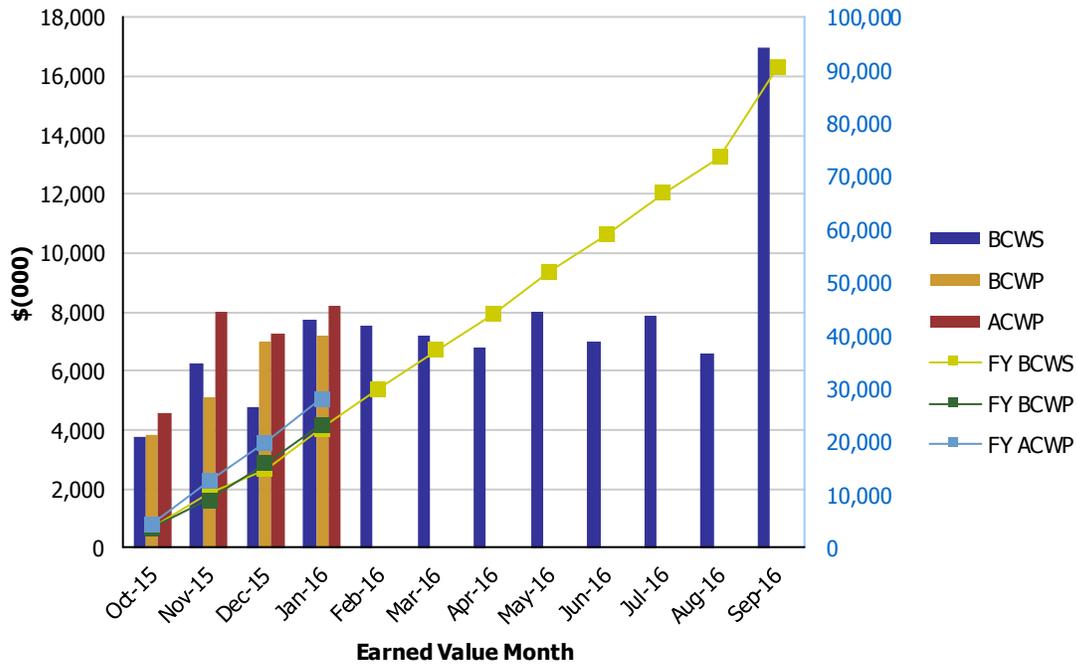
**Issues:** None

Earned Value Data: Fiscal Year 2016

January-16

**Tank Farms ORP-0014**  
**Retrieve and Close SST's 5.02**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2015	\$3,770	\$3,814	\$4,560	1.01	0.84	\$3,770	\$3,814	\$4,560	1.01	0.84
Nov 2015	\$6,282	\$5,131	\$8,006	0.82	0.64	\$10,052	\$8,946	\$12,566	0.89	0.71
Dec 2015	\$4,769	\$6,970	\$7,255	1.46	0.96	\$14,821	\$15,915	\$19,821	1.07	0.80
Jan 2016	\$7,702	\$7,214	\$8,233	0.94	0.88	\$22,522	\$23,130	\$28,053	1.03	0.82
Feb 2016	\$7,512					\$30,034				
Mar 2016	\$7,210					\$37,244				
Apr 2016	\$6,775					\$44,019				
May 2016	\$8,014					\$52,033				
Jun 2016	\$6,979					\$59,012				
Jul 2016	\$7,853					\$66,865				
Aug 2016	\$6,619					\$73,484				
Sep 2016	\$16,954					\$90,437				

CTD	\$615,000	\$608,356	\$638,026	0.99	0.95
-----	-----------	-----------	-----------	------	------

- |      |   |                                  |      |   |                                 |
|------|---|----------------------------------|------|---|---------------------------------|
| ACWP | = | actual cost of work performed.   | CTD  | = | contract to date.               |
| BCWP | = | budgeted cost of work performed. | EVMS | = | earned value management system. |
| BCWS | = | budgeted cost of work scheduled. | FY   | = | fiscal year.                    |
| CPI  | = | cost performance index.          | SPI  | = | schedule performance index.     |

***Retrieve and Close Single-Shell Tanks***

The current month unfavorable schedule variance (SV) of (\$487K) is due to:

- Crews were unable to complete AX-104 cover block removal due to lack of resources and crane availability (AY-102 and C-105 higher priority).

The current month unfavorable cost variance (CV) of (\$1,018K) is due to:

- AX-Farm ventilation installation activities progressed slower during January due to continued self-contained breathing apparatus (SCBA) requirements and flammable gas at Riser 7C and 9D (requiring additional health physicist technicians [HPT]/industrial hygienist technicians [IHT]). In addition, more time/duration has been required for replanning/sequencing field activities due to lack of resources and engineering revising work packages due to field conditions.

## Waste Treatment and Immobilization Plant Project

Number	Title	Due Date	Status*
D-00A-06	Complete Methods Validations	12/31/2017	Ongoing*
D-00A-17	Hot Start of Waste Treatment Plant	12/31/2019	Ongoing*
D-00A-01	Achieve Initial Plant Operations for WTP	12/31/2022	Ongoing*

WTP = waste treatment and immobilization plant

The Waste Treatment and Immobilization Plant (WTP) Project currently employs approximately 2,419 full-time equivalent contractor (Bechtel National, Inc. [BNI]) and subcontractor personnel. This includes 639 craft, 413 non-manual, and 144 subcontractor full-time equivalent personnel working at the WTP construction site (all facilities).

In October 2012, the percent-complete values for the Pretreatment (PT) and High-Level Waste (HLW) facilities were frozen at the September 2012 rate. Construction, procurement, and production engineering activities were placed on hold for the PT Facility and significantly slowed down for the HLW Facility. In August 2014, the U.S. Department of Energy (DOE) approved continuation of production engineering activities for HLW. Subsequently, DOE has approved the fiscal year (FY) 2015 and FY 2016 2-Year Interim Work Plan. In April 2015, a 3-Year Interim Work Plan for the PT Facility was implemented emphasizing prioritization of technical issue resolution activities. The WTP Project is focused on resolving the PT Facility technical issues and finalizing the HLW Facility design.

The WTP Project continues to focus on completion of the Low-Activity Waste (LAW) Facility, Analytical Laboratory (LAB), and Balance of Facilities (BOF) (collectively known as LBL, including LBL facility services). As of January 2016, LBL facilities were 48 percent complete, design and engineering was 73 percent complete, procurement was 69 percent complete, construction was 73 percent complete, and startup and commissioning was 9 percent complete.

In January 2016, the cumulative to-date WTP Project schedule variance was a negative \$21.5 million, and the cumulative to-date WTP Project cost variance was a positive \$64.6 million. The cumulative to-date cost and schedule variance is based on the progress of the LBL internal forecast.

The following is the project status through the end of January 2016.

### Significant Past Accomplishments:

- Completed installation of Wet Electrostatic Precipitator (WESP) electrode assemblies in one vessel - (LAW)
- Completed thermal catalytic oxidizer (TCO) and ammonia dilution skid functional test - (LAW)
- Continued to receive positive results from testing of the first high-efficiency particulate air (HEPA) filter design - (HLW)
- Approved Mississippi State University's NQA-1 quality assurance program for the HEPA filter testing - (HLW)

- Completed installation of the mud mat for the Effluent Management Facility - (EMF) processing, electrical and utility buildings - (BOF)
- Completed fire service water system turnover - (LAB)
- Issued WTP Criticality Safety Evaluation Report (CSER) to Design Review Notice (DRN) for ORP review and comment - (PT)
- Draft Hydrogen in Piping and Ancillary Vessels (HPAV) Preliminary Documented Safety Analysis (PDSA) change package to ORP for comment and review - (PT)

**Significant Planned Actions in the Next Six Months:**

- Assemble and install WESP internals in second vessel - (LAW)
- Transmit Final HPAV PDSA change package to ORP for approval pending comment resolution - (PT)
- Submit Basis of Design Change Notice (BODCN) and safety requirements document to ORP for approval - (PT)
- DOE approval of the radioactive liquid waste disposal (RLD) safety basis change package - (HLW)
- Continue full-scale HEPA filter testing to select filter(s) that will support the WTP ventilation and off-gas needs - (HLW)
- DOE approve the initial EMF Preliminary Documented Safety Analysis (PDSA) - (BOF)
- Begin excavation of the EMF drain pit - (BOF)
- Complete synergy and sliding bed evaluation reports and brief ORP - (PT)
- Complete site energization from permanent power supply - (BOF)
- Receive the thermal catalytic oxidizer (TCO) and ammonia dilution skid - (LAW)

**Issues:**

\*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone. Technical issues related to WTP include, among others, PJMs, corrosion/erosion in piping and vessels, hydrogen accumulation, criticality, and ventilation.

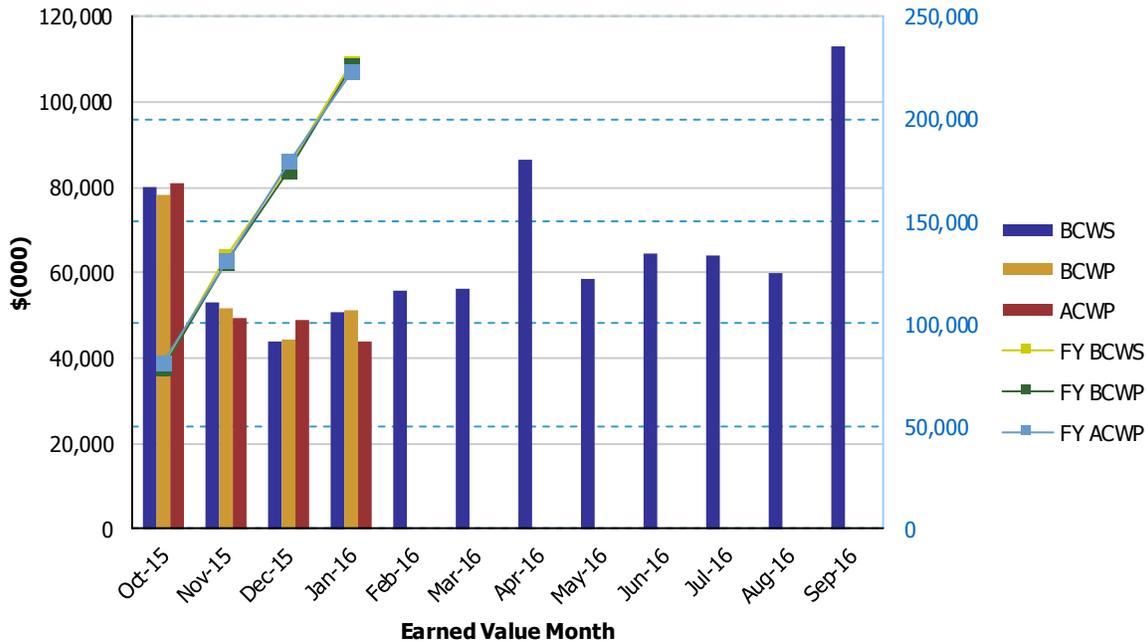
### EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: January 2016

**River Protection Project  
Waste Treatment Plant (WTP) Project**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2015	\$79,800	\$78,230	\$81,000	0.98	0.97	\$79,800	\$78,230	\$81,000	0.98	0.97
Nov 2015	\$52,815	\$51,614	\$49,184	0.98	1.05	\$132,615	\$129,844	\$130,184	0.98	1.00
Dec 2015	\$43,659	\$44,505	\$48,853	1.02	0.91	\$176,275	\$174,348	\$179,037	0.99	0.97
Jan 2016	\$50,515	\$51,167	\$43,662	1.01	1.17	\$226,790	\$225,515	\$222,699	0.99	1.01
Feb 2016	\$55,935									
Mar 2016	\$56,300									
Apr 2016	\$86,618									
May 2016	\$58,394									
Jun 2016	\$64,335									
Jul 2016	\$63,919									
Aug 2016	\$59,870									
Sep 2016	\$112,986									

PTD	\$9,326,553	\$9,305,062	\$9,240,501	1.00	1.01
-----	-------------	-------------	-------------	------	------

- |      |   |                                  |      |   |                                 |
|------|---|----------------------------------|------|---|---------------------------------|
| ACWP | = | actual cost of work performed.   | CTD  | = | contract to date.               |
| BCWP | = | budgeted cost of work performed. | EVMS | = | earned value management system. |
| BCWS | = | budgeted cost of work scheduled. | FY   | = | fiscal year.                    |
| CPI  | = | cost performance index.          | SPI  | = | schedule performance index.     |

### Pretreatment Facility

Number	Title	Due Date	Status*
D-00A-19	Complete Elevation 98' Concrete Floor Slab in PT Facility	12/31/2014	Past Due
D-00A-13	Complete Installation of Pretreatment Feed Separation Vessels	12/31/2015	Past Due
D-00A-14	PT Facility Construction Substantially Complete	12/31/2017	Ongoing*
D-00A-15	Start PT Facility Cold Commissioning	12/31/2018	Ongoing*
D-00A-16	PT Facility Hot Commissioning Complete	12/31/2019	Ongoing*

PT = pretreatment

The Pretreatment (PT) Facility will separate radioactive tank waste into high-level waste (HLW) and low-activity waste (LAW) fractions, and transfer each waste type to the respective vitrification facility for immobilization. As of September 2012, the PT Facility was 56 percent complete overall, with engineering design 85 percent complete, procurement 56 percent complete, construction 43 percent complete, and startup and commissioning 3 percent complete. Construction, procurement, and production engineering activities remain on hold, resulting in no change to the percent-complete status since September 2012. Bechtel National, Inc. (BNI) and U.S. Department of Energy (DOE) continue to focus on resolving technical issues, performing hazards analyses, and completing safety evaluations for process systems in accordance with the revised PT Facility 3-year Interim Work Plan

BNI has submitted resolution plans for eight technical issues: T1, Hydrogen in Vessels; T2, Criticality; T3, Hydrogen in Piping and Ancillary Vessels (HPAV); T4, Mixing; T5, Erosion Corrosion; T6, PT Facility Optimization; T7, Vessel Analysis; and T8, Ventilation. Phase 1 of the full-scale vessel testing is continuing for the pulse jet mixers (PJM) controls utilizing the radioactive liquid waste disposal (RLD) 8T vessel. Technical review teams continue to evaluate open PT Facility technical issues. An evaluation is ongoing relative to a standardized design for high-solids vessels within the PT Facility. With primary emphasis on design and fabrication of hold point releases supporting procurement, fabrication, and delivery of the standardized high solids vessel design (SHSVD)-T16ft vessel.

#### Significant Past Accomplishments:

- Issued Waste Treatment and Immobilization Plant (WTP) Criticality Safety Evaluation Report (CSER) to Design Review Notice (DRN) for DOE Office of River Protection (ORP) review and comment.

- Draft HPAV PDSA Change Package to ORP for comment and review
- Complete fabrication pulse jet mixers (PJMs) 1 and 2
- Issued 30 percent test mixing plan

**Significant Planned Actions in the Next Six Months:**

- Transmit final HPAV Preliminary Documented Safety Analysis (PDSA) change package to ORP for approval pending comment resolution
- Complete fabrication sparger piping
- Finalize erosion / corrosion simulant for one-quarter scale jet impingement and pipe loop testing
- Issue C5V System Study
- Transmit Engineering Study – Engineering Design Review (EDR) and comment resolution
- Submit Basis of Design Change Notice (BODCN) and safety requirements document to ORP for approval
- Start Phase 3 controls testing in SHSVD test

**Issues:**

\*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone. Technical issues related to WTP include, among others, PJMs, corrosion/erosion in piping and vessels, hydrogen accumulation, criticality, and ventilation.

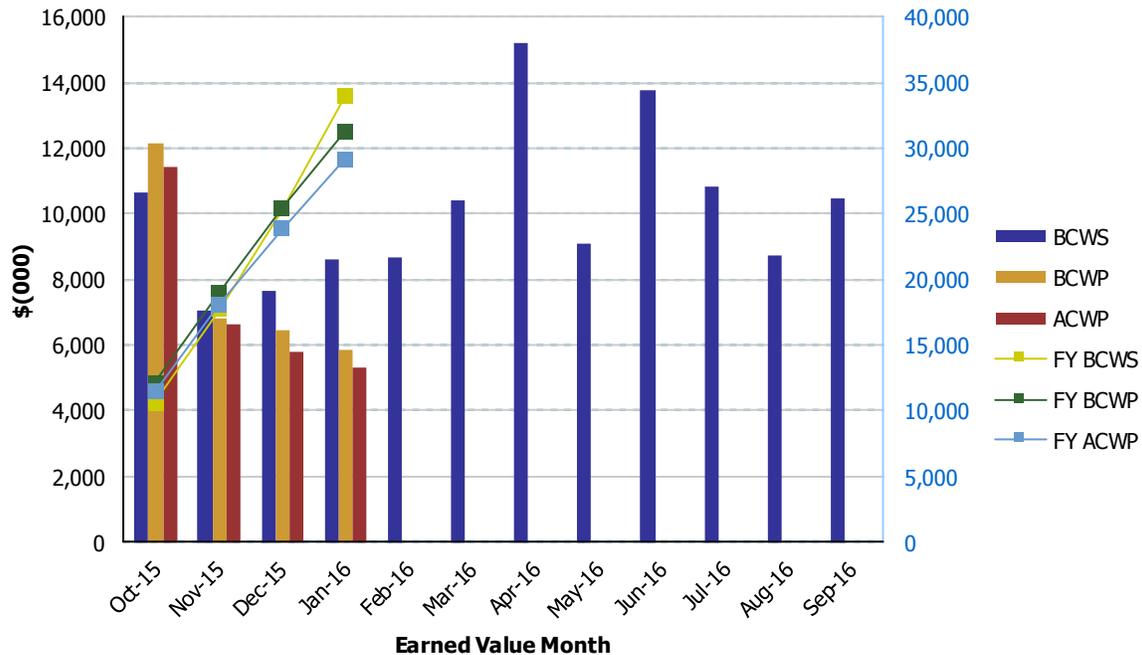
### EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: January 2016

**River Protection Project  
Pretreatment Facility (WBS 1.01)**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2015	\$10,667	\$12,155	\$11,441	1.14	1.06	\$10,667	\$12,155	\$11,441	1.14	1.06
Nov 2015	\$7,074	\$6,836	\$6,648	0.97	1.03	\$17,741	\$18,991	\$18,089	1.07	1.05
Dec 2015	\$7,678	\$6,441	\$5,777	0.84	1.11	\$25,419	\$25,432	\$23,867	1.00	1.07
Jan 2016	\$8,595	\$5,853	\$5,332	0.68	1.10	\$34,014	\$31,285	\$29,199	0.92	1.07
Feb 2016	\$8,692									
Mar 2016	\$10,431									
Apr 2016	\$15,213									
May 2016	\$9,089									
Jun 2016	\$13,767									
Jul 2016	\$10,827									
Aug 2016	\$8,732									
Sep 2016	\$10,439									

PTD	\$1,766,414	\$1,763,117	\$1,741,758	1.00	1.01
-----	-------------	-------------	-------------	------	------

- ACWP = actual cost of work performed.
- BCWP = budgeted cost of work performed.
- BCWS = budgeted cost of work scheduled.
- CPI = cost performance index.
- CTD = contract to date.
- EVMS = earned value management system.
- FY = fiscal year.
- SPI = schedule performance index.

### High-Level Waste Facility

Number	Title	Due Date	Status
D-00A-21	Complete Construction of Structural Steel to 37' in HLW Facility	12/31/2012	Complete
D-00A-02	HLW Facility Construction Substantially Complete	12/31/2016	Ongoing*
D-00A-03	Start HLW Facility Cold Commissioning	6/30/2018	Ongoing*
D-00A-04	HLW Facility Hot Commissioning Complete	12/31/2019	Ongoing*

HLW = high-level waste

The High-Level Waste (HLW) Facility will receive the separated HLW concentrate from the Pretreatment (PT) Facility. This concentrate will be blended with glass formers, converted into molten glass in one of the two HLW melter, and then poured into cylindrical stainless steel canisters. After cooling, the canisters will be sealed and decontaminated before shipping to interim storage.

As of September 2012, the HLW Facility was 62 percent complete overall, with engineering design 89 percent complete, procurement 81 percent complete, construction 43 percent complete, and startup and commissioning 4 percent complete. Construction, procurement, and production engineering activities have been significantly slowed down, resulting in minimal change to the percent completion status since September 2012.

Currently, all activities are being performed in accordance with the fiscal year (FY) 2015/FY 2016 2-Year Work Plan. Efforts are focused on completing activities required to obtain full-production authorization by the U.S. Department of Energy (DOE), including developing longer-term work plans. Limited construction is continuing with the concrete placements, installation of support steel, and crane rails in the melter caves.

Engineering is focused on activities to support implementation of technical core team recommendations, performance of engineering studies and analysis to disposition design and operability review comments. One on-going effort is Phase 1 of the high-level waste melter off-gas treatment process/process vessel vent engineering study, which is evaluating options for system changes to improve the design and operability. Hazard and accident analyses are ongoing to support the Preliminary Documented Safety Analysis (PDSA) update to align design and the safety basis.

Systems engineering continues to develop system design descriptions (SDD), and incorporate SDD requirements into a requirements management system to ensure that all requirements are verified at the completion of design.

Multiple high-efficiency particulate air (HEPA) filter media designs are planned to be tested to ensure the qualified filters support the needs for HLW, along with the Low-Activity Waste (LAW) Facility, Analytical Laboratory (LAB), and the Balance of Facilities (BOF) (collectively known as LBL, including LBL facility services). Testing of the full-scale filter designs at Mississippi State University is ongoing, showing positive and successful test results. Fabrication of the additional filters and testing continues.

The PDSA change package for radioactive liquid waste disposal (RLD) vessels 7 and 8 has been approved by DOE, allowing initiation of procurement of these vessels.

**Significant Past Accomplishments:**

- Continued to receive positive results from testing of the first HEPA filter design
- PDSA change package for RLD vessels 7 and 8 has been approved by DOE
- Installed 8 tons of structural steel
- Approved Mississippi State University's NQA-1 quality assurance program for the HEPA filter testing

**Significant Planned Actions in the Next Six Months:**

- Continue full-scale HEPA filter testing to select filter(s) that will support the WTP ventilation and off-gas needs
- Issue emergency turbine generator (ETX) system design description
- Issue Phase 1 of the high-level waste melter off-gas treatment process/process vessel vent engineering study
- Issue the radioactive waste handling system and melter cave support handling system engineering studies
- Complete facility hazards analysis to support PDSA update
- Continue civil build-out of the HLW Facility

**Issues:**

\*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone. Technical issues related to the WTP include, among others, pulse jet mixers (PJM), corrosion/erosion in piping and vessels, hydrogen accumulation, criticality, and ventilation.

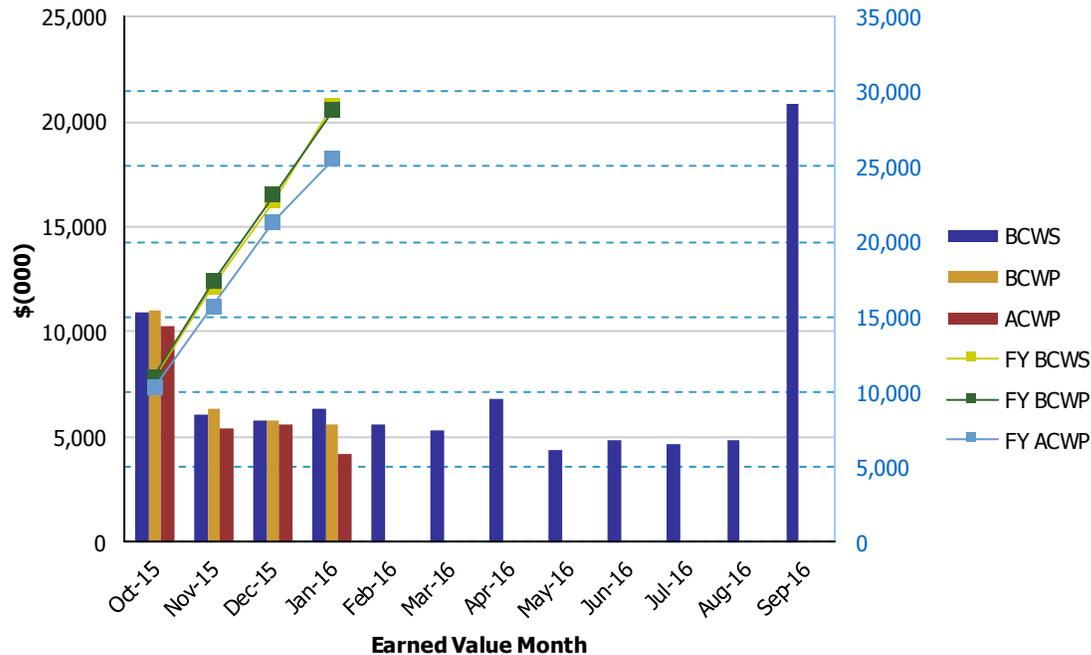
### EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: January 2016

**River Protection Project  
High-Level Waste Facility (WBS 1.03)**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2015	\$10,905	\$11,028	\$10,257	1.01	1.08	\$10,905	\$11,028	\$10,257	1.01	1.08
Nov 2015	\$6,103	\$6,326	\$5,452	1.04	1.16	\$17,008	\$17,355	\$15,708	1.02	1.10
Dec 2015	\$5,737	\$5,795	\$5,634	1.01	1.03	\$22,745	\$23,150	\$21,343	1.02	1.08
Jan 2016	\$6,368	\$5,591	\$4,174	0.88	1.34	\$29,113	\$28,741	\$25,517	0.99	1.13
Feb 2016	\$5,551									
Mar 2016	\$5,358									
Apr 2016	\$6,840									
May 2016	\$4,348									
Jun 2016	\$4,831									
Jul 2016	\$4,662									
Aug 2016	\$4,883									
Sep 2016	\$20,831									

PTD	\$1,230,401	\$1,229,007	\$1,211,647	1.00	1.01
-----	-------------	-------------	-------------	------	------

- |   |  |
|---|--|
| ACWP = actual cost of work performed.   | CTD = contract to date.                |
| BCWP = budgeted cost of work performed. | EVMS = earned value management system. |
| BCWS = budgeted cost of work scheduled. | FY = fiscal year.                      |
| CPI = cost performance index.           | SPI = schedule performance index.      |

### Low-Activity Waste Facility

Number	Title	Due Date	Status*
D-00A-07	LAW Facility Construction Substantially Complete	12/31/2014	Past Due
D-00A-08	Start LAW Facility Cold Commissioning	12/31/2018	Ongoing*
D-00A-09	LAW Facility Hot Commissioning Complete	12/31/2019	Ongoing*

LAW = low-activity waste

The Low-Activity Waste (LAW) Facility will process concentrated low-activity waste which will be mixed with silica and other glass-forming materials. The mixture will be fed into the LAW's two melters, at a design capacity of 30 metric tons per day, and heated to 2,100 degrees Fahrenheit and vitrified into glass. The 300-ton melters are approximately 20 feet by 30 feet and 16 feet high. The glass mixture will then be poured into stainless steel containers, which are 4 feet in diameter, 7 feet tall and weigh more than 7 tons. These containers are anticipated to be disposed of on the Hanford Site in the Integrated Disposal Facility. As of January 2016, the LAW Facility was 52 percent complete overall, with engineering design 72 percent complete, procurement 70 percent complete, construction 76 percent complete, and startup and commissioning 5 percent complete.

#### Significant Past Accomplishments:

- Installed 180 linear feet of process piping
- Installed 1,410 linear feet of conduit and pulled 18,510 linear feet of cable
- Installed 101 process area penetration seals
- Completed installation of Wet Electrostatic Precipitator (WESP) electrode assemblies in one vessel
- Completed thermal catalytic oxidizer (TCO) and ammonia dilution skid functional test
- Preparatory work commenced for melter lid 1 flipping frame installation
- Complete subcontractor work scope in the annex

#### Significant Planned Actions in the Next Six Months:

- Assemble and install WESP internals in second vessel
- Place second melter lid castable refractor
- Receive the TCO and ammonia dilution skid
- Documented Safety Analysis (DSA) Chapter 3.3, "Hazards Analysis" complete
- Receive caustic scrubber

#### Issues:

\*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone.

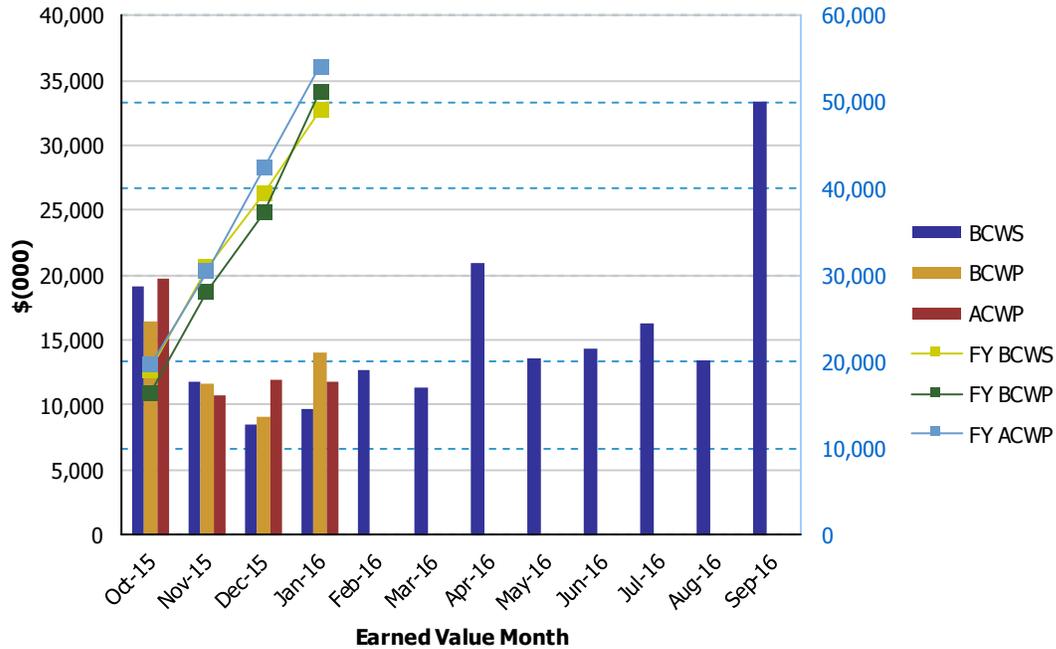
### EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: January 2016

**River Protection Project  
Low-Activity Waste Facility (WBS 1.02)**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2015	\$19,131	\$16,406	\$19,702	0.86	0.83	\$19,131	\$16,406	\$19,702	0.86	0.83
Nov 2015	\$11,764	\$11,637	\$10,735	0.99	1.08	\$30,896	\$28,043	\$30,436	0.91	0.92
Dec 2015	\$8,520	\$9,132	\$11,880	1.07	0.77	\$39,416	\$37,175	\$42,316	0.94	0.88
Jan 2016	\$9,694	\$14,071	\$11,790	1.45	1.19	\$49,110	\$51,245	\$54,105	1.04	0.95
Feb 2016	\$12,760									
Mar 2016	\$11,350									
Apr 2016	\$20,995									
May 2016	\$13,579									
Jun 2016	\$14,295									
Jul 2016	\$16,304									
Aug 2016	\$13,377									
Sep 2016	\$33,350									

PTD	\$1,267,309	\$1,259,501	\$1,255,595	0.99	1.00
-----	-------------	-------------	-------------	------	------

- |   |  |
|---|--|
| ACWP = actual cost of work performed.   | CTD = contract to date.                |
| BCWP = budgeted cost of work performed. | EVMS = earned value management system. |
| BCWS = budgeted cost of work scheduled. | FY = fiscal year.                      |
| CPI = cost performance index.           | SPI = schedule performance index.      |

## Balance of Facilities

Number	Title	Due Date	Status
D-00A-12	Steam Plant Construction Complete	12/31/2012	Complete

BOF = balance of facilities

The Balance of Facilities (BOF) will provide services and utilities to support operation of the main production facilities: Pretreatment (PT), High-Level Waste (HLW), Low-Activity Waste (LAW), and Analytical Laboratory (LAB). As of January 2016, BOF was 55 percent complete overall, with engineering design 75 percent complete, procurement 76 percent complete, construction 81 percent complete, and startup and commissioning 15 percent complete.

Engineering activities are in progress to develop the design for BOF systems in support of direct feed, low-activity-waste (DFLAW). Current efforts are focused on progressing the design of the Effluent Management Facility (EMF), identifying and supporting BOF system isolations, supporting procurement activities, and finalizing the initial preliminary design safety analysis (PDSA) for the EMF. Construction efforts are focused on initial excavation of the EMF, installation of BOF system isolations, and completion of the remaining items required for energization of the Waste Treatment and Immobilization Plant (WTP) switchgear building from the permanent power supply.

### Significant Past Accomplishments:

- Completed installation of the mud mat for the EMF processing, electrical and utility buildings
- Continued installing communications in the switchgear buildings and nonradioactive liquid waste disposal (NLD)
- Continued installing the battery monitoring system in the switchgear buildings
- Started commercial and technical evaluation for the rotary screw compressor
- Continued excavation and drilling activities to install cathodic protection system upgrades and started anode installation and backfill

### Significant Planned Actions in the Next Six Months:

- DOE approve the initial EMF PDSA
- Begin excavation of the EMF drain pit
- Complete site energization from permanent power supply

### Issues:

No major issues at this time.

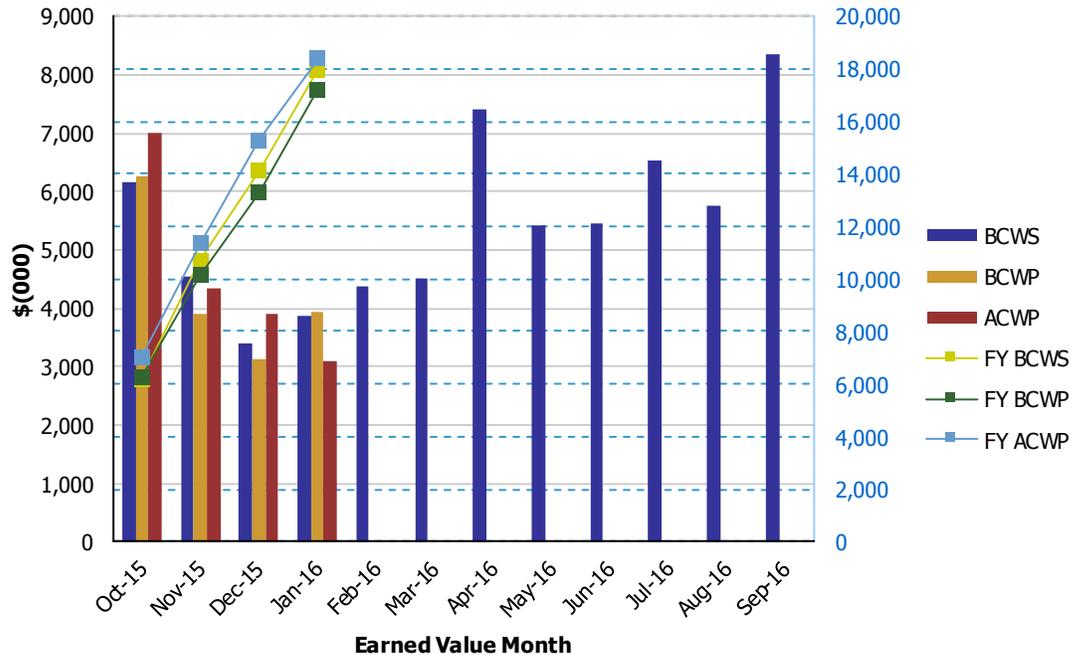
### EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: January 2016

**River Protection Project  
Balance of Facilities (WBS 1.05)**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2015	\$6,160	\$6,249	\$7,006	1.01	0.89	\$6,160	\$6,249	\$7,006	1.01	0.89
Nov 2015	\$4,555	\$3,913	\$4,344	0.86	0.90	\$10,715	\$10,162	\$11,350	0.95	0.90
Dec 2015	\$3,400	\$3,134	\$3,917	0.92	0.80	\$14,115	\$13,296	\$15,267	0.94	0.87
Jan 2016	\$3,874	\$3,917	\$3,108	1.01	1.26	\$17,989	\$17,214	\$18,375	0.96	0.94
Feb 2016	\$4,367									
Mar 2016	\$4,492									
Apr 2016	\$7,400									
May 2016	\$5,420									
Jun 2016	\$5,459									
Jul 2016	\$6,538									
Aug 2016	\$5,738									
Sep 2016	\$8,346									

PTD	\$447,483	\$442,415	\$441,998	0.99	1.00
-----	-----------	-----------	-----------	------	------

- |   |  |        |
|---|--|--------|
| ACWP = actual cost of work performed.   | CTD = contract to date.                | ACWP = |
| BCWP = budgeted cost of work performed. | EVMS = earned value management system. | BCWP = |
| BCWS = budgeted cost of work scheduled. | FY = fiscal year.                      | BCWS = |
| CPI = cost performance index.           | SPI = schedule performance index.      | CPI =  |

## Analytical Laboratory

Number	Title	Due Date	Status
D-00A-05	LAB Construction Substantially Complete	12/31/2012	Complete

LAB = analytical laboratory

The Analytical Laboratory (LAB) will support Waste Treatment and Immobilization Plant (WTP) operations by analyzing feed, vitrified waste, and effluent streams. As of January 2016, the LAB was 58 percent complete overall, with engineering design 76 percent complete, procurement 88 percent complete, construction 94 percent complete, and startup and commissioning 11 percent complete.

During this reporting period engineering efforts were focused on LAB system reviews to evaluate potential modifications or isolations in support of the direct feed of low-activity waste (DFLAW). Closure of nonconformance reports and construction deficiency reports continued. Construction efforts within the LAB focused on installation of the test engineers work station to support Balance of Facilities (BOF) startup efforts. The remaining construction work scope will be completed in parallel with system modifications and construction activities required to support the direct feed of LAW.

### Significant Past Accomplishments:

- Completed fire service water system turnover
- Continued installation of the test engineers workstation – installed and tested fiber
- Continued development of procedures for the WTP analytical methods development process

### Significant Planned Actions in the Next Six Months:

- Complete test engineers work station
- Initiate component level testing of select LAB systems
- Complete LAB system walk downs in support of DFLAW modifications

### Issues:

No major issues at this time.

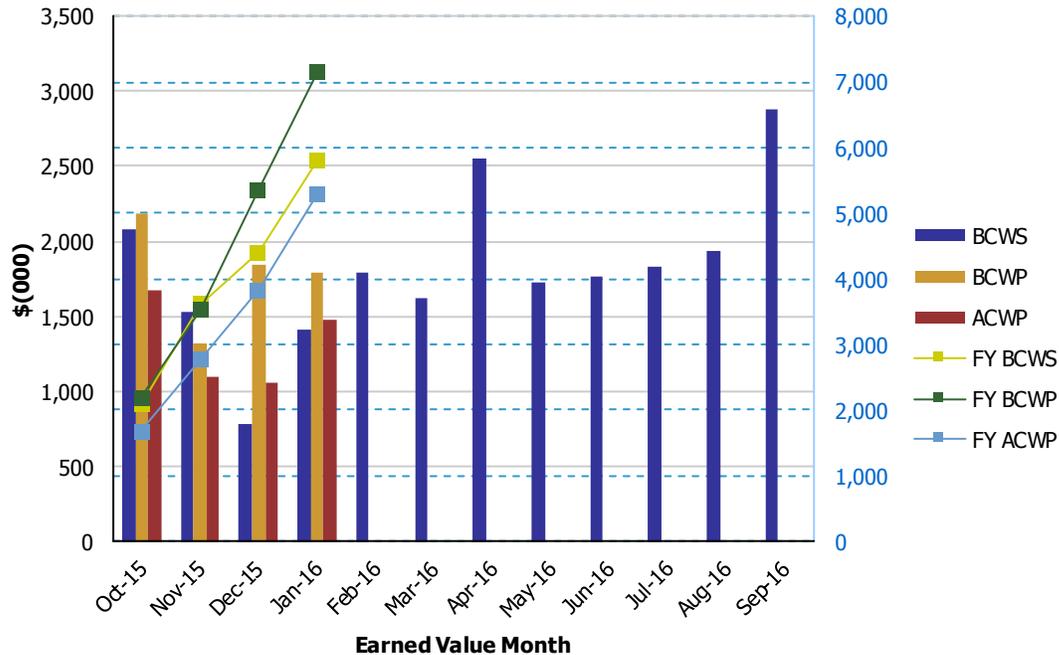
### EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: January 2016

**River Protection Project  
Analytical Laboratory (WBS 1.06)**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2015	\$2,083	\$2,188	\$1,674	1.05	1.31	\$2,083	\$2,188	\$1,674	1.05	1.31
Nov 2015	\$1,528	\$1,324	\$1,093	0.87	1.21	\$3,611	\$3,513	\$2,768	0.97	1.27
Dec 2015	\$789	\$1,844	\$1,060	2.34	1.74	\$4,399	\$5,356	\$3,827	1.22	1.40
Jan 2016	\$1,415	\$1,797	\$1,472	1.27	1.22	\$5,815	\$7,153	\$5,299	1.23	1.35
Feb 2016	\$1,786									
Mar 2016	\$1,628									
Apr 2016	\$2,555									
May 2016	\$1,732									
Jun 2016	\$1,765									
Jul 2016	\$1,826									
Aug 2016	\$1,933									
Sep 2016	\$2,880									

PTD	\$318,380	\$318,072	\$313,648	1.00	1.01
-----	-----------	-----------	-----------	------	------

- ACWP = actual cost of work performed.
- BCWP = budgeted cost of work performed.
- BCWS = budgeted cost of work scheduled.
- CPI = cost performance index.
- CTD = contract to date.
- EVMS = earned value management system.
- FY = fiscal year.
- SPI = schedule performance index.

## Waste Treatment Plant Project Percent Complete Status (Table)

Waste Treatment Plant Project - (LBL/Project Services) Percent Complete Status																		
Through January 2016																		
(Dollars - Millions)	Overall Facility Percent Complete Unallocated Dollars			Design/Engineering Unallocated Dollars			Procurement Unallocated Dollars			Construction Unallocated Dollars			Startup & Plant Operations Unallocated Dollars			Project Management & Shared Services Unallocated Dollars		
	Performance Measurement Baseline (PMB)	Budgeted Cost of Work Performed (BCWP)	% Complete	Performance Measurement Baseline (PMB)	Budgeted Cost of Work Performed (BCWP)	% Complete	Performance Measurement Baseline (PMB)	Budgeted Cost of Work Performed (BCWP)	% Complete	Performance Measurement Baseline (PMB)	Budgeted Cost of Work Performed (BCWP)	% Complete	Performance Measurement Baseline (PMB)	Budgeted Cost of Work Performed (BCWP)	% Complete	Performance Measurement Baseline (PMB)	Budgeted Cost of Work Performed (BCWP)	% Complete
<b>Facilities</b>																		
Low-Activity Waste	2,271.1	1,194.5	52%	531.7	382.7	72%	370.3	260.3	70%	658.0	502.4	76%	707.0	35.0	5%	4.0	4.0	100%
Balance of Facilities	755.6	414.7	55%	149.7	111.6	75%	71.6	54.3	76%	253.7	206.7	81%	280.1	41.7	15%	0.5	0.5	100%
Analytical Lab	530.5	310.1	58%	106.1	80.4	76%	65.4	57.3	88%	160.7	150.8	94%	197.9	21.1	11%	0.5	0.5	100%
LBL Facility Services	603.5	84.6	14%	0.0	0.0	0%	53.4	13.4	25%	128.7	14.4	11%	264.5	27.5	10%	156.8	29.31	19%
<b>Total LBL</b>	<b>4,160.7</b>	<b>1,993.9</b>	<b>48%</b>	<b>787.6</b>	<b>574.7</b>	<b>73%</b>	<b>560.7</b>	<b>385.3</b>	<b>69%</b>	<b>1,201.1</b>	<b>874.2</b>	<b>73%</b>	<b>1,449.6</b>	<b>125.4</b>	<b>9%</b>	<b>161.8</b>	<b>34.3</b>	<b>21%</b>
Direct Feed LAW	372.5	29.0	8%	78.9	23.9	30%	58.07	0.46	1%	226.5	2.8	1%	0.0	0.0	0%	9.0	1.77	20%
Project Services	369.2	258.7	70%	53.3	35.6	67%	34.9	23.6	68%	71.4	59.3	83%	1.7	1.7	100%	207.9	138.5	67%
<b>Total DFLAW &amp; PS</b>	<b>741.7</b>	<b>287.7</b>	<b>39%</b>	<b>132.2</b>	<b>59.5</b>	<b>45%</b>	<b>93.0</b>	<b>24.1</b>	<b>26%</b>	<b>297.9</b>	<b>62.1</b>	<b>21%</b>	<b>1.7</b>	<b>1.7</b>	<b>100%</b>	<b>216.9</b>	<b>140.3</b>	<b>65%</b>
<b>Total LBL, DFLAW &amp; Project Services</b>	<b>4,902.4</b>	<b>2,281.6</b>	<b>47%</b>	<b>919.8</b>	<b>634.2</b>	<b>69%</b>	<b>653.7</b>	<b>409.4</b>	<b>63%</b>	<b>1,499.0</b>	<b>936.4</b>	<b>62%</b>	<b>1,451.3</b>	<b>127.1</b>	<b>9%</b>	<b>378.7</b>	<b>174.5</b>	<b>46%</b>
<b>PT/HLW/SS Percent Complete Status Frozen as of September 2012 (due to project rebaselining efforts)</b>																		
High-Level Waste	1,478.6	922.1	62%	364.4	325.2	89%	433.9	349.4	81%	561.1	243.2	43%	119.2	4.4	4%	n/a	n/a	n/a
Pretreatment	2,517.3	1,410.5	56%	761.7	645.8	85%	679.9	380.4	56%	890.0	378.6	43%	185.8	5.6	3%	n/a	n/a	n/a
Shared Services	4,726.9	3,632.6	77%	1,047.0	977.9	93%	451.7	395.0	87%	1,436.5	1,143.0	80%	453.5	133.2	29%	1,338.1	983.5	73%
<b>Total HLWPT/SS</b>	<b>8,722.8</b>	<b>5,965.2</b>	<b>68%</b>	<b>2,173.1</b>	<b>1,948.9</b>	<b>90%</b>	<b>1,565.5</b>	<b>1,124.8</b>	<b>72%</b>	<b>2,887.6</b>	<b>1,764.8</b>	<b>61%</b>	<b>758.5</b>	<b>143.2</b>	<b>19%</b>	<b>1,338.1</b>	<b>983.5</b>	<b>73%</b>
Undistributed Budget	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Total WTP</b>	<b>13,625.2</b>	<b>8,246.8</b>	<b>61%</b>	<b>3,092.9</b>	<b>2,583.1</b>	<b>84%</b>	<b>2,219.2</b>	<b>1,534.2</b>	<b>69%</b>	<b>4,386.6</b>	<b>2,701.2</b>	<b>62%</b>	<b>2,209.8</b>	<b>270.3</b>	<b>12%</b>	<b>1,716.8</b>	<b>1,158.0</b>	<b>67%</b>
Source: Preliminary WTP Contract Performance Report - Format 1, Data for January 2016																		
<p>Note: In September 2012, the LBL Replan was incorporated into the project OTB baseline resulting in increases/decreases to the LBL facility budgets, which correspondingly increased/decreased the facility/function to-date percent complete values. In October 2012, the PT/HLW/SS Interim Work Plan was incorporated into the project OTB baseline resulting in decreases to the PT/HLW/SS facility budgets, this was due to a work scope shift from the Distributed budget to UB. Percent Complete Values shown for PT, HLW and SS have been frozen with the September 2012 values due to the Interim Work Plan and budgets being moved into UB. UB value for the project for PT/HLW/SS is \$2,014M. The percent complete values for the Total WTP are the current total LBL BCWP added to the frozen HLW/PT/SS BCWP values. In March 2014, Project Controls and Project Management work scope was moved out of Shared Services control accounts into the facilities with new control accounts being set up in the facilities. These will now be seen under Project Management/Shared Services by facility. The Shared Services PMB value has not been changed to reflect this change due to the freeze on HLW/PT and SS and the budgets remaining in UB. October 2014 data reflects the incorporation of Direct Feed LAW and the split of Shared Services into LBL Facility Services and Project Services. July 2015 LBL percent complete data is a total of LAW-BOF-LAB and LBL Facility Services. The Project Services Allocation account (zPSA), as shown on the CPR Format 1, is not added to LBL for percent complete purposes.</p>																		