

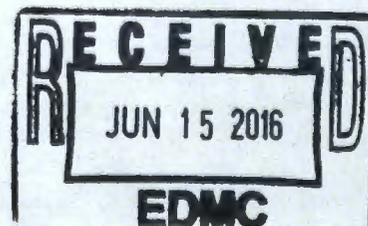
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Final

Office of River Protection
Consent Decree 2:08-CV-5085-RMP (2016)

Monthly Report

June 2016



Office of River Protection

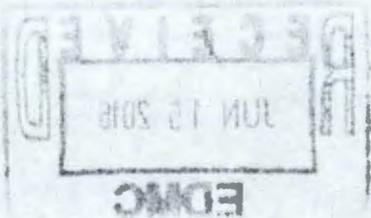
Consent Decree 08-5085-FVS and Consent Decree 2:08-CV-5085-RMP

Monthly Report – June 2016

Project Earned Value Management System reflects April 2016 information

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CD = Consent Decree



CD Milestone Statistics/Status

Milestone	Title	Due Date	Completion Date	Status
Fiscal Year 2020				
D-00A-07 Interim	LAW Facility Construction Substantially Complete	12/31/2020		On Schedule
D-16B-03*	Of the 12 SSTs referred to in B-1 and B-2, complete retrieval of tank waste in at least 5.	12/31/2020		On Schedule
Fiscal Year 2022				
D-00A-08 Interim	Start LAW Facility Cold Commissioning	12/31/2022		On Schedule
Fiscal Year 2023				
D-00A-09 Interim	LAW Facility Hot Commissioning Complete	12/31/2023		On Schedule
Fiscal Year 2024				
D-16B-01*	Complete Retrieval of Tank Waste from the following remaining SSTs in WMA-C: C-102, C-105 and C-111	03/31/2024		On Schedule
D-16B-02*	Complete retrieval of tank wastes from the following SSTs in Tank Farms A and AX: A-101, A-102, A-104, A-105, A-106. AX-101, AX-102, AX-103, and AX-104. Subject to the requirements of Section IV-B-3 DOE may substitute any of the identified 9 SSTs and advise Ecology accordingly.	03/31/2024		On Schedule
Fiscal Year 2030				
D-00A-02 Interim	HLW Facility Construction Substantially Complete	12/31/2030		On Schedule
Fiscal Year 2031				
D-00A-13 Interim	Complete Installation of Pretreatment Feed Separation Vessels	12/31/2031		On Schedule
D-00A-14 Interim	PT Facility Construction Substantially Complete	12/31/2031		On Schedule

Milestone	Title	Due Date	Completion Date	Status
D-00A-19 Interim	Complete Elevation 98 feet Concrete Floor Slab Placements in PT Facility	12/31/2031		On Schedule
Fiscal Year 2032				
D-00A-03 Interim	Start HLW Facility Cold Commissioning	06/30/2032		On Schedule
D-00A-06 Interim	Complete Methods Validations	06/30/2032		On Schedule
D-00A-15 Interim	Start PT Facility Cold Commissioning	12/31/2032		On Schedule
Fiscal Year 2033				
D-00A-04 Interim	HLW Facility Hot Commissioning Complete	12/31/2033		On Schedule
D-00A-16 Interim	PT Facility Hot Commissioning Complete	12/31/2033		On Schedule
D-00A-17	Hot Start of Waste Treatment Plant	12/31/2033		On Schedule
Fiscal Year 2036				
D-00A-01	Achieve Initial Plant Operations for the Waste Treatment Plan**	12/31/2036		On Schedule

* Milestones B-1, B-2, and B-3 narrative changed in accordance with 2016 amended Consent Decree (CD). Per this amendment, there is no longer a milestone B-4.

** Error in the CD - last word of the D-00A-01 milestone should be Plant

CD = Consent Decree.
DOE = U.S. Department of Energy
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-16C-03 series, Submit to State of Washington and State of Oregon Quarterly Report, Due: July 31, 2016, Status: On Schedule.

In accordance with the 2016 Amended Consent Decree, DOE will provide quarterly instead of semiannual reports.

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: On Schedule.

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.

Spare Reboiler Requirement Status

Milestone	Title	Due Date	Status
D-16E-01	DOE must purchase by December 31, 2016 a spare A-E-1* reboiler for the 242-A Evaporator**	12/31/2016	On Schedule
D-16E-02	Have available spare A-E-1* reboiler for the 242-A Evaporator**	12/31/2018	On Schedule

* Error in the Consent Decree (CD), part should be identified as E-A-1

**CD 08-5085-FVS, Part IV B.5 as amended by No. 2:08-CV-5085-RMP dated April 12, 2016

Description of activity and progress made for the spare E-A-1 re-boiler for the 242-A Evaporator:

- Since issuance of the March 11, 2016 amended consent order, DOE has provided the contractor with funding to accelerate the planned fiscal year (FY) 2017 work to design and procure the spare E-A-1 re-boiler. ORP authorized Washington River Protection Solutions LLC (WRPS) to proceed by awarding a not-to-exceed (NTE) contract action. The contractor is currently underway generating a procurement specification for the new spare 242-A Evaporator re-boiler. The current procurement strategy is to award a design/build procurement contract with a vendor by November 20, 2016.
- Efforts continue in regard to the generation of a functions and requirements evaluation document (FRED) Washington River Protection Solutions (WRPS) engineering has completed the failure mode and effects analysis (FMEA) document. An expression of interest was submitted Tuesday, April 19 to solicit responses from NQA-1, ASME Section 8 design and build fabrication vendors. Responses to the expression of interest were due May 30, 2016. A technical evaluation of the 242-A process steam been completed. Results of the technical evaluation support the use of 304L, stainless steel for the fabrication of the re-boiler. A design specification is also being generated for the new spare 242-A Evaporator re-boiler. This specification will be attached to a statement of work (SOW) submitted to the request for proposal (RFP) to solicit a design/ build vendor.

Single-Shell Tank Retrieval Program

Milestone	Title	Due Date	Status
D-16B-03	Of the 12 SSTs referred to in B-1 and B-2, complete retrieval of tank waste in at least 5.	12/31/2020*	On Schedule
D-16B-01	Complete retrieval of tank waste from the following remaining SSTs in WMA-C: C-102, C-105 and C-111	03/31/2024	On Schedule
D-16B-02	Complete retrieval of tank wastes from the following SSTs in Tank Farms A and AX: A-101, A-102, A-104, A-105, A-106, AX-101, AX-102, AX-103, and AX-104. Subject to the requirements of Section IV-B-3 DOE may substitute any of the identified 9 SSTs and advise Ecology accordingly.	03/31/2024	On Schedule

* Pursuant to Section IV-B-5 7 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.

DOE = U.S. Department of Energy
 SST = single shell tank
 WMA-C = C Farm waste management area.

Significant Accomplishments during the Prior Three Months:

- Completed post retrieval samples of Tank C-102.
- Obtained Tank 241-C-105 in-process sample.
- Started preparations for equipment removal of the Tank C-105 Mobile Arm Retrieval System – Vacuum (MARS-V), to ready tank for modification to modified sluicing system (remaining volume of 67,300 gallons)
- Completed removal of ancillary equipment from Tank 241-C-105 pits A and C in preparation for modified sluicing system installation
- Performed the investigation survey request (ISR) to support the containment box, rotary union, and hoses removal for C-105
- Removed hose in hose transfer lines (HIHTL) between the portable instrument valve box and containment box for C-105
- Completed three retrieval technologies at Tank 241-C-111.

- Procured sampling equipment for Tank 241-C-111 post retrieval samples
- Started preparations for post-retrieval sampling of Tank 241-C-111
- Installed the Ingress/Egress Trailers and underground utilities for the A/AX Change trailers (4th and Buffalo)
- Excavated and installed the West Electrical/Telecommunications system for the AX Air and Water Service Building
- Received and inspected the sump pump assembly and discharge for AX-102 and AX-104
- Completed the installation of the Duct Work Supports for AX-102 to AX-104 at R7C
- Completed installation of the duct work from POR126 to AX-102
- Shipped AX-02A and AX-02D cover blocks to ERDF for disposal
- Completed Tank 241-AX-104 cover block removal
- Completed pit cleanout of Tank 241-AX-102, 02A pit.
- Continued pit cleanout of Tank 241-AX-104, 04A pit
- Completed removal of Building AX-80
- Began preparations for pit cleanout of Tank 241-AX-102, 02D pit
- Completed removal of above grade portion of building AX-2707

Significant Planned Activities in the Next Three Months:

- Obtain Tank Waste Retrieval Work Plan (TWRWP) modification approval for Tank C-105 third retrieval technology
- Negotiate contract proposal for installing and performing the third retrieval technology at Tank C-105
- Complete Tank C-105 MARS-V containment box disassembly
- Complete Tank C-105 modified sluicing system design
- Receive Tank C-105 extended reach sluicers
- Complete Tank C-111 post-retrieval sampling
- Issue Tank C-111 Retrieval Completion Certification
- Complete procurement of the water services building to support A/AX
- Complete AX ventilation installation and commence testing at portable exhauster POR-126
- Complete cleanout of Tank 241-AX-104 pits 04A, 04D and initiate debris removal from 04C

- Complete cleanout of Tank 241-AX-102 pits 02D, 02B and initiate debris removal from 02C
- Complete AX-2707 fencing and gate upgrades
- Complete Building AX-2707 below grade removal and disposal
- Complete A/AX infrastructure (water and utilities) design.
- Complete Tank 241-AX-102 and 241-AX-104 Extended Reach Sluicing System (ERSS) procurement.
- Complete A Farm ventilation design

Tank Waste Retrieval Work Plan Status

Tank	TWRWP	Expected Revisions	First Retrieval Technology	Second Technology	Third Technology
AX-101	RPP-RPT-58932, Draft	Initial Approval	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
AX-102	RPP-RPT-58933, Draft	Initial Approval	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
AX-103	RPP-RPT-58934, Draft	Initial Approval	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
AX-104	RPP-RPT-58935, Draft	Initial Approval	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
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 Planned Activities in the Next Three Months:

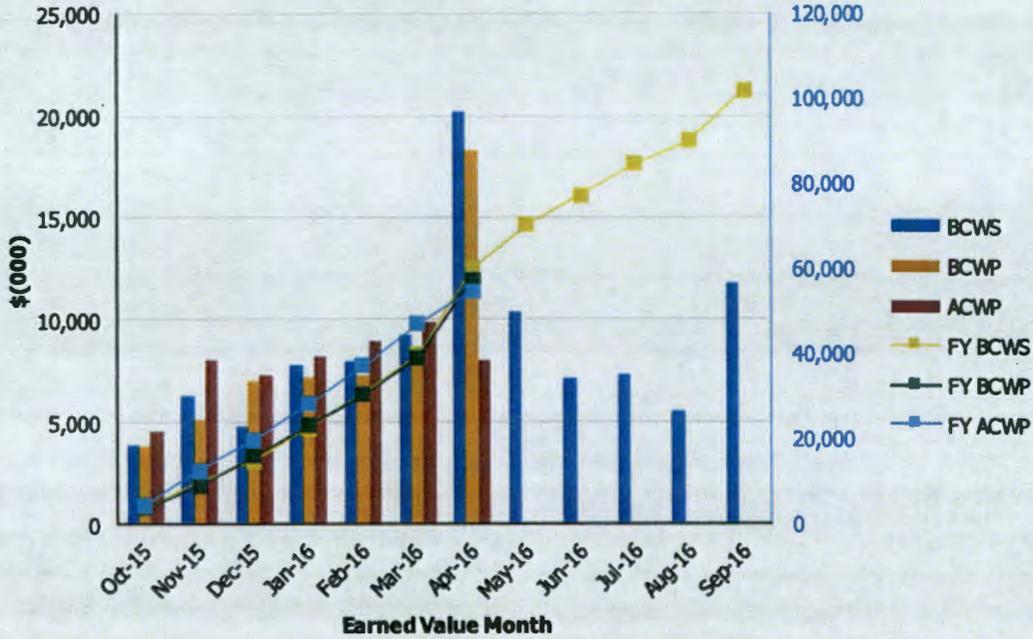
- Finalize AX Farm tank waste retrieval work plans (TWRWPs).
- Modify RPP-22520 *241-C-101 and 241-C-105 Tanks Waste Retrieval Work Plan* (C-105 TWRWP) to include a third technology for Tank C-105 retrieval—Draft TWRWP modification submitted to Ecology for review in April 2016.

Earned Value Data: Fiscal Year 2016

April-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	\$7,948	\$7,288	\$8,959	0.92	0.81	\$30,470	\$30,417	\$37,012	1.00	0.82
Mar 2016	\$9,249	\$8,693	\$9,857	0.94	0.88	\$39,719	\$39,111	\$46,869	0.98	0.83
Apr 2016	\$20,237	\$18,288	\$8,046	0.90	2.27	\$59,956	\$57,399	\$54,916	0.96	1.05
May 2016	\$10,335					\$70,291				
Jun 2016	\$7,086					\$77,377				
Jul 2016	\$7,286					\$84,663				
Aug 2016	\$5,463					\$90,126				
Sep 2016	\$11,793					\$101,919				

CTD \$652,434 \$642,626 \$664,888 0.98 0.97

- 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.

Retrieve and Close Single-Shell Tanks (5.02)

The current month **unfavorable** schedule variance (SV) of (\$1,949K) is due to:

- Delay in hiring additional A/AX Farm construction resources due to re-sequencing/planning of major field work as a result of fiscal year (FY) 2016 deferrals and continue to review existing personnel.
- AX-102 and AX-104 ERSS and support retrieval equipment fabrication have been suspended and re-sequenced

The current month **favorable** cost variance (CV) of \$10,424K is due to:

- Contract Modification 373 (Vapor Impact for FY 2015) was implemented during April which resulted in a point adjustment to FY 2015 work scope. This adjustment provided cost relief to control accounts that were impacted by the implementation of additional respiratory requirements associated with tank farm vapors.

Waste Treatment and Immobilization Plant Project

Milestone	Title	Due Date	Status
D-00A-06	Complete Methods Validations	06/30/2032	On Schedule
D-00A-17	Hot Start of Waste Treatment Plant	12/31/2033	On Schedule
D-00A-01	Achieve Initial Plant Operations for WTP	12/31/2036	On Schedule

WTP = Waste Treatment and Immobilization Plant

The Waste Treatment and Immobilization Plant (WTP) Project currently employs approximately 2,965 full-time equivalent contractor (Bechtel National, Inc. [BNI]) and subcontractor personnel. This includes 542 craft, 457 non-manual, and 142 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 direct feed LAW and LBL facility services). As of April 2016, LBL facilities were 47 percent complete, design and engineering was 72 percent complete, procurement was 63 percent complete, construction was 64 percent complete, and startup and commissioning was 10 percent complete.

In April 2016, the cumulative to-date WTP Project schedule variance (SV) was a negative \$21.5 million, and the cumulative to-date WTP Project cost variance (CV) was a positive \$61.3 million. The cumulative to-date CV and SV is based on the progress of the LBL internal forecast.

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

Significant Accomplishments during the Prior Three Months:

- Contractor issued plutonium (Pu) particulate criticality safety evaluation (CSE) engineering study – DOE Office of River Protection (ORP) formal review continues for approval - (PT)
- Contractor issued Erosion/Corrosion Sliding Bed Report to DOE-ORP for approval pending review at this time – (PT)
- Received and staged the thermal catalytic oxidizer (TCO) and ammonia dilution skid (ADS) on greater than the 48 foot (+48') elevation – (LAW)
- Melter 1 gas barrier lid placed and welding has commenced – (LAW)

- Issued HLW facility hazards analysis to support Preliminary Documented Safety Analysis (PDSA) update - (HLW)
- Completed drilling activities and installation of vertical anodes for cathodic protection system and completed design of rectifier pad – (BOF)
- DOE Office of River Protection (ORP) approved PDSA for the Effluent Management Facility (EMF) – (BOF)

Significant Planned Activities in the Next Three Months:

- ORP approval of Hydrogen in Piping and Ancillary Vessels (HPAV) Preliminary Documented Safety Analysis (PDSA) change package – (PT)
- Issue Simulant Basis, Newtonian / Non-Newtonian document – (PT)
- Complete welding of the gas barrier lid onto melter #1 – (LAW)
- Continue full-scale HEPA filter testing to select and qualify additional filter(s) that will support the WTP ventilation and off-gas needs – (HLW)
- Finalize erosion/corrosion simulant for one-quarter scale jet impingement and pipe loop testing – (PT)
- Issue Phase 1 of the HLW melter off-gas treatment process/process vessel vent engineering study – (HLW)
- Place second melter lid castable refractor – (LAW)
- Completed the fire detection (FDE) Acceptance Test. The final test (24-hr drawdown test) will be following replacement of system batteries – (LAB)
- Complete site energization from permanent power supply – (BOF)

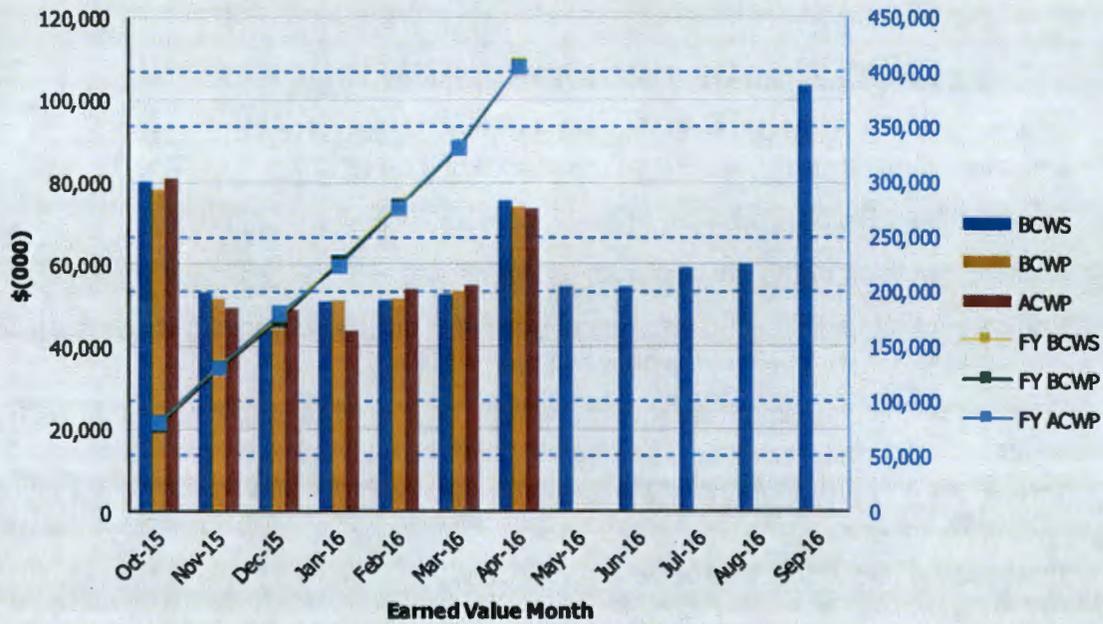
EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: April 2016

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	\$51,349	\$51,492	\$54,112	1.00	0.95	\$278,139	\$277,007	\$276,811	1.00	1.00
Mar 2016	\$52,395	\$53,645	\$54,896	1.02	0.98	\$330,533	\$330,653	\$331,707	1.00	1.00
Apr 2016	\$75,610	\$74,244	\$73,679	0.98	1.01	\$406,144	\$404,897	\$405,387	1.00	1.00
May 2016	\$54,479									
Jun 2016	\$54,206									
Jul 2016	\$58,922									
Aug 2016	\$59,910									
Sep 2016	\$103,355									

PTD	\$9,505,907	\$9,484,443	\$9,423,189	1.00	1.01
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- 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.

Pretreatment Facility

Milestone	Title	Due Date	Status
D-00A-19	Complete Elevation 98' Concrete Floor Slab in PT Facility	12/31/2031	On Schedule
D-00A-13	Complete Installation of Pretreatment Feed Separation Vessels	12/31/2031	On Schedule
D-00A-14	PT Facility Construction Substantially Complete	12/31/2031	On Schedule
D-00A-15	Start PT Facility Cold Commissioning	12/31/2032	On Schedule
D-00A-16	PT Facility Hot Commissioning Complete	12/31/2033	On Schedule

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 Accomplishments during the Prior Three Months:

- Contractor issued plutonium (Pu) particulate criticality safety evaluation (CSE) engineering study – DOE Office of River Protection (ORP) formal review continues for approval

- Contractor provided hydrogen in piping and ancillary vessels (HPAV) Basis of Design change package (BOD) to DOE-ORP for approval - ORP provided comments back to contractor for resolution
- Contractor submitted HPAV Preliminary Documented Safety Analysis (PDSA) change package to ORP for approval - comments provided to contractor; resubmitting HPAV PDSA package
- Contractor issued Erosion/Corrosion Sliding Bed Report to DOE-ORP for approval pending review at this time
- Contractor completed installation of PJMs in SHSVD-T at Greenberry Industrial, Inc.
- Contractor completed installation of SHSVD-T bubblers
- ORP continues to review Waste Treatment and Immobilization Plant (WTP) Criticality Safety Evaluation Report (CSER)

Significant Planned Activities in the Next Three Months:

- ORP formal review and approval of Criticality Safety Evaluation Report (CSER)
- Issue and Transmit to ORP Engineering Study – Proposed Controls for Hydrogen Events in PTF, Rev 0
- Complete Hydrogen unmitigated / mitigated consequence calculation
- ORP Approval of HPAV PDSA Change Package
- Issue PJM Controls Phase 3 test software requirements
- Install SHSVD-T 4” pump suction line
- Complete SHSVD-T Hydro Test
- Issue Simulant Basis, Newtonian / Non-Newtonian document
- Issue Simulant Qualification document
- Finalize erosion/corrosion simulant for one-quarter scale jet impingement and pipe loop testing

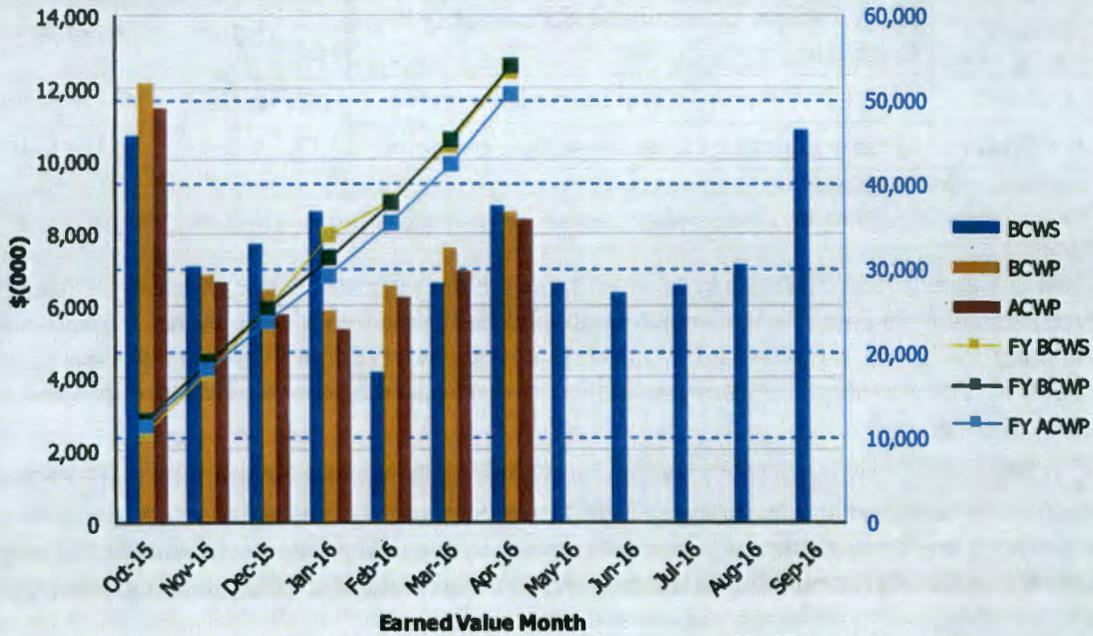
EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: April 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	\$4,105	\$6,545	\$6,220	1.59	1.05	\$38,120	\$37,830	\$35,419	0.99	1.07
Mar 2016	\$6,588	\$7,604	\$6,979	1.15	1.09	\$44,708	\$45,434	\$42,398	1.02	1.07
Apr 2016	\$8,717	\$8,586	\$8,400	0.99	1.02	\$53,425	\$54,020	\$50,798	1.01	1.06
May 2016	\$6,603									
Jun 2016	\$6,311									
Jul 2016	\$6,553									
Aug 2016	\$7,125									
Sep 2016	\$10,826									

PTD \$1,785,825 \$1,785,853 \$1,763,357 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. |

High-Level Waste Facility

Milestone	Title	Due Date	Status
D-00A-20	Complete Construction of Structural Steel to 14' in HLW Facility	12/31/2010	Complete
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	12/31/2030	* On Schedule
D-00A-03	Start HLW Facility Cold Commissioning	06/30/2032	* On Schedule
D-00A-04	HLW Facility Hot Commissioning Complete	12/31/2033	* On Schedule

HLW = high-level waste

* Note – Future HLW milestones are dependent on increased levels of funding becoming available

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 melters, 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. Physical percent complete for the High-Level Waste and Pretreatment facilities is frozen as of September 2012, pending development of a revised baseline to address technical and design issues.

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. Phase 1 of the HLW melter off-gas treatment process/process vessel vent engineering study, which is evaluating options for system changes to improve the design and operability, is ongoing. Process hazard analysis has been completed 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 incorporated into the facility design and subsequently verified prior to completion of HLW facility commissioning.

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. The third full-scale filter has been tested, showing positive and successful test results. Fabrication of the additional filters and testing continues. Qualification testing of Flanders filters has begun.

Significant Accomplishments during the Prior Three Months:

- Completed full-scale tests of three filters of the first HEPA filter design that showed positive results
- PDSA change package for radioactive liquid waste disposal (RLD) vessels 7 and 8 approved by DOE has been incorporated into the PDSA
- Issued the revised RLD system design description incorporating PDSA changes
- Issued the emergency turbine generator system (ETX) SDD
- Completed roof flashing at interface between the annex and the main facility, thereby rain-proofing the annex
- Approved Mississippi State University's NQA-1 quality assurance program for the HEPA filter testing
- Issued HLW facility hazards analysis to support PDSA update
- Completed several engineering studies to disposition some of the design and operability issues and recommendations

Significant Planned Activities in the Next Three Months:

- Continue full-scale HEPA filter testing to select and qualify additional filter(s) that will support the WTP ventilation and off-gas needs
- Issue Phase 1 of the HLW melter off-gas treatment process/process vessel vent engineering study
- Issue the radioactive waste handling system, decontamination handling system, melter handling system, and melter cave support handling system engineering studies
- Issue an engineering study detailing the potential addition of a melter assembly building/airlock and an additional import/export dock for waste handling
- Submit draft PDSA revision to the DOE Office of River Protection (ORP)
- Continue civil build-out of the HLW Facility focusing on weathering in the building

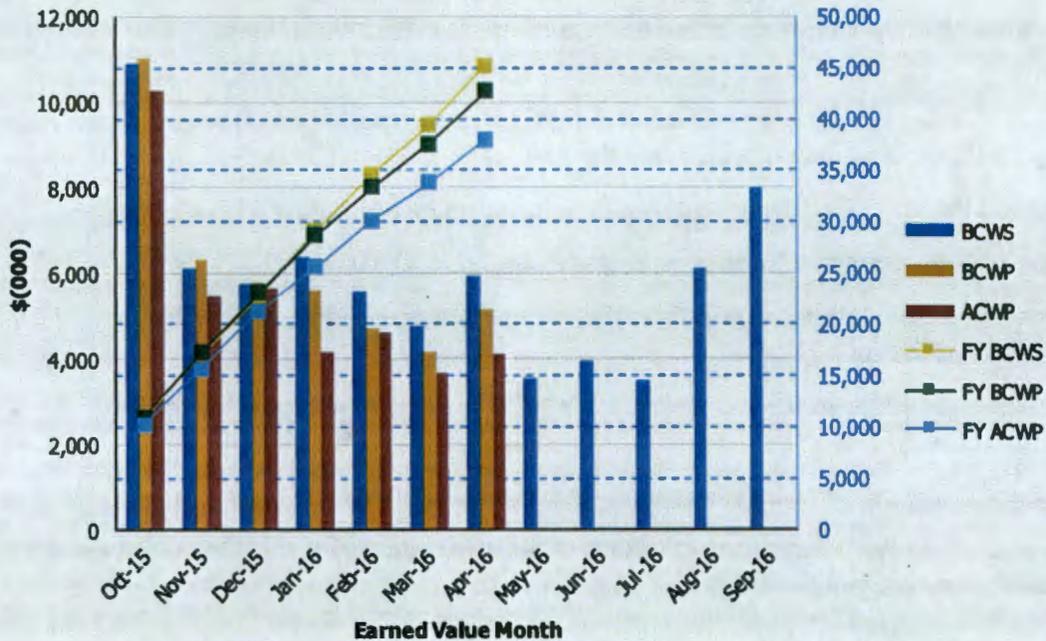
EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: April 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	\$4,711	\$4,631	0.85	1.02	\$34,664	\$33,453	\$30,148	0.97	1.11
Mar 2016	\$4,740	\$4,169	\$3,673	0.88	1.14	\$39,405	\$37,622	\$33,821	0.95	1.11
Apr 2016	\$5,921	\$5,168	\$4,141	0.87	1.25	\$45,325	\$42,789	\$37,962	0.94	1.13
May 2016	\$3,551									
Jun 2016	\$3,923									
Jul 2016	\$3,496									
Aug 2016	\$6,108									
Sep 2016	\$7,974									

PTD \$1,246,613 \$1,243,055 \$1,224,092 1.00 1.02

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Low-Activity Waste Facility

Milestone	Title	Due Date	Status
D-00A-07	LAW Facility Construction Substantially Complete	12/31/2020	On Schedule
D-00A-08	Start LAW Facility Cold Commissioning	12/31/2022	On Schedule
D-00A-09	LAW Facility Hot Commissioning Complete	12/31/2023	On Schedule

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 April 2016, the LAW Facility was 54 percent complete overall, with engineering design 74 percent complete, procurement 71 percent complete, construction 79 percent complete, and startup and commissioning 6 percent complete.

Significant Accomplishments during the Prior Three Months:

- Installed 570 linear feet of process piping
- Installed 2,850 linear feet of conduit and pulled 33,870 linear feet of cable
- Installed 325 process area penetration seals
- Melter 1 gas barrier lid placed and welding has commenced
- Received and staged the thermal catalytic oxidizer (TCO) and ammonia dilution skid (ADS) on greater than the 48-foot (+48') elevation

Significant Planned Activities in the Next Three Months:

- Assemble and install Wet Electrostatic Precipitator (WESP) internals in second vessel
- Complete welding of the gas barrier lid onto melter 1
- Place second melter lid castable refractor
- Complete the radiographic testing on the caustic scrubber
- Continue the re-baselining review process
- Perform additional welds required on the melter shield lids

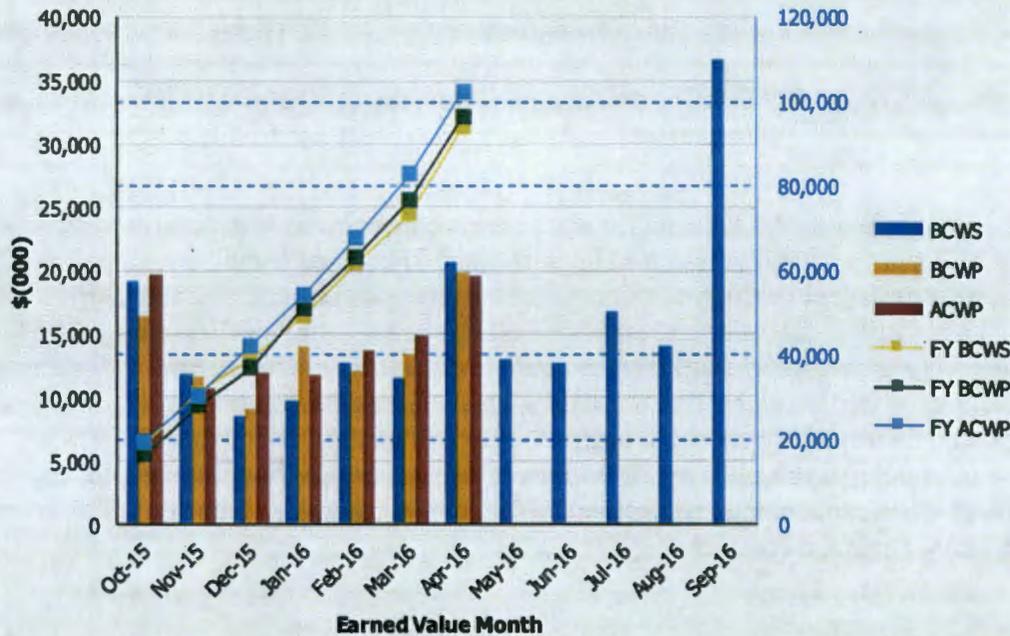
EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: April 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	\$12,055	\$13,698	0.94	0.88	\$61,870	\$63,300	\$67,804	1.02	0.93
Mar 2016	\$11,541	\$13,513	\$14,986	1.17	0.90	\$73,411	\$76,814	\$82,790	1.05	0.93
Apr 2016	\$20,619	\$19,828	\$19,641	0.96	1.01	\$94,030	\$96,641	\$102,431	1.03	0.94
May 2016	\$13,012									
Jun 2016	\$12,664									
Jul 2016	\$16,791									
Aug 2016	\$14,100									
Sep 2016	\$36,630									
PTD	\$1,312,229	\$1,304,897	\$1,303,920	0.99	1.00					

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 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.

Balance of Facilities

Milestone	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 April 2016, BOF was 57 percent complete overall, with engineering design 77 percent complete, procurement 76 percent complete, construction 84 percent complete, and startup and commissioning 17 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 implementing the preliminary design safety analysis (PDSA) for the EMF into the design. Construction efforts are focused on upcoming excavation of the EMF low point drain, 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 Accomplishments during the Prior Three Months:

- Continued installing communications in the switchgear buildings and nonradioactive liquid waste disposal (NLD)
- Continued start-up system testing in support of site energization
- Completed installing and Underwriter's Laboratory (UL) testing of the battery monitoring systems in the switchgear buildings
- Issued Material Requisition Purchase (MRP) order for the rotary screw compressor
- Completed drilling activities and installation of vertical anodes for cathodic protection system and completed design of rectifier pad
- The DOE Office of River Protection (ORP) approved the PDSA for EMF
- Completed Fire Service Water System FSW-B-02 system turnover

Significant Planned Activities in the Next Three Months:

- Award subcontract for soldier piles of EMF low point drain
- Complete site energization from permanent power supply

- Perform 90 percent design review of BOF programmable protection system (PPJ) and 60 percent design review of EMF
- Receive and install rectifier for cathodic protection system
- Complete steam plant modifications for DFLAW

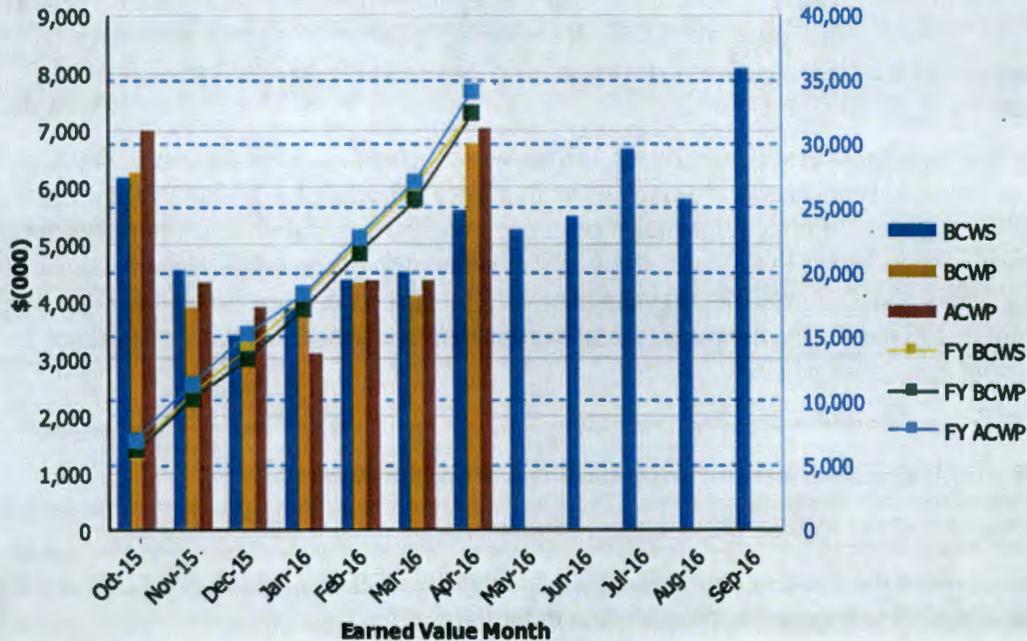
EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: April 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	\$4,344	\$4,357	0.99	1.00	\$22,356	\$21,557	\$22,732	0.96	0.95
Mar 2016	\$4,492	\$4,111	\$4,381	0.92	0.94	\$26,848	\$25,668	\$27,113	0.96	0.95
Apr 2016	\$5,581	\$6,780	\$7,042	1.21	0.96	\$32,429	\$32,448	\$34,155	1.00	0.95
May 2016	\$5,233									
Jun 2016	\$5,487									
Jul 2016	\$6,648									
Aug 2016	\$5,793									
Sep 2016	\$8,092									

PTD	\$461,924	\$457,649	\$457,777	0.99	1.00
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- EVMS = earned value management system.
- FY = fiscal year
- SPI = schedule performance index

Analytical Laboratory

Milestone	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 April 2016, the LAB was 59 percent complete overall, with engineering design 78 percent complete, procurement 88 percent complete, construction 94 percent complete, and startup and commissioning 12 percent complete.

During this reporting period engineering efforts were focused on LAB system reviews to evaluate potential modifications or isolations in support of direct feed, 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 Accomplishments during the Prior Three Months:

- Completed fire service water system turnover
- Completed the fire detection (FDE) Acceptance Test. The final test (24-hr drawdown test) will be following replacement of system batteries
- Continued installation of the test engineers workstation – installed and tested fiber
- Continued development of procedures for the WTP analytical methods development process

Significant Planned Activities in the Next Three Months:

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

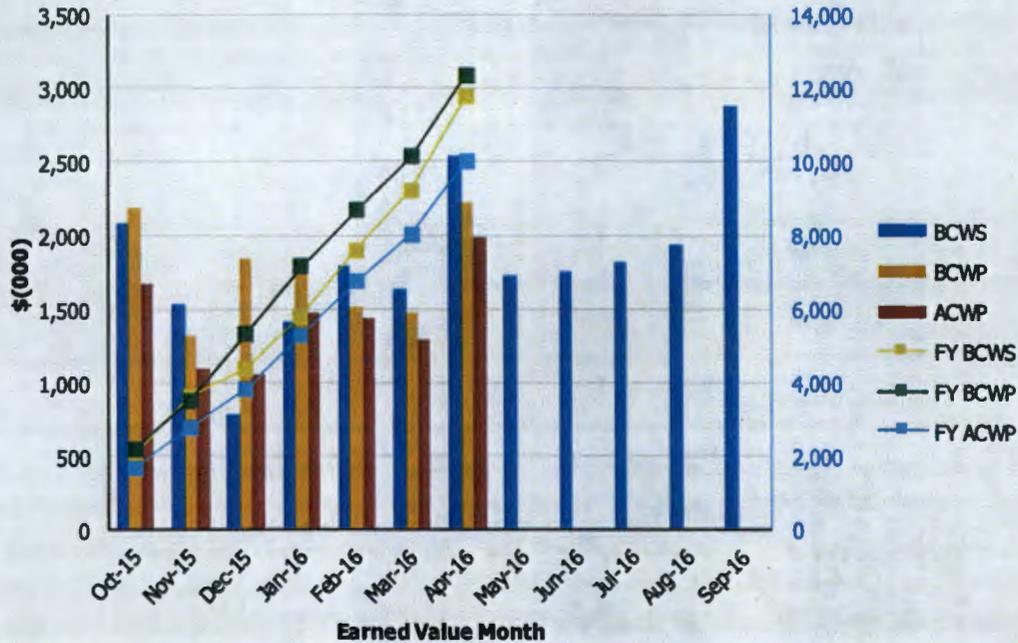
EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2016 Earned Value Data

Data as of: April 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	\$1,511	\$1,438	0.85	1.05	\$7,601	\$8,665	\$6,738	1.14	1.29
Mar 2016	\$1,628	\$1,478	\$1,291	0.91	1.15	\$9,229	\$10,143	\$8,028	1.10	1.26
Apr 2016	\$2,541	\$2,223	\$1,990	0.87	1.12	\$11,770	\$12,366	\$10,019	1.05	1.23
May 2016	\$1,725									
Jun 2016	\$1,758									
Jul 2016	\$1,821									
Aug 2016	\$1,936									
Sep 2016	\$2,880									

PTD	\$324,336	\$323,285	\$318,367	1.00	1.02
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Waste Treatment Plant Project Percent Complete Status (Table)

Waste Treatment Plant Project - (LBL/Project Services) Percent Complete Status
Through April 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
Facilities																		
Low-Activity Waste	2,280.3	1,229.9	54%	536.4	398.7	74%	372.1	265.2	71%	650.2	520.9	79%	706.5	40.0	6%	4.0	4.0	100%
Balance of Facilities	756.4	429.9	57%	140.9	115.6	77%	71.4	54.8	76%	254.4	213.0	84%	280.1	46.3	17%	0.5	0.5	100%
Analytical Lab	530.7	315.3	59%	106.2	82.4	78%	66.4	57.4	88%	180.7	151.8	94%	198.0	23.3	12%	0.5	0.5	100%
Direct Feed LAW	373.8	41.8	11%	80.1	32.1	40%	57.0	1.1	2%	227.7	6.0	3%	0.0	0.0	0%	8.0	2.8	28%
LBL Facility Services	609.8	105.6	17%	0.0	0.0	0%	57.1	15.8	28%	129.0	21.2	16%	264.6	33.9	13%	159.1	34.77	22%
Total LBL	4,550.9	2,122.6	47%	874.6	629.7	72%	623.0	394.0	63%	1,431.0	913.0	64%	1,449.2	143.5	10%	173.1	42.3	24%
Project Services	368.8	301.6	82%	53.7	42.7	79%	34.9	28.0	80%	69.2	63.3	91%	1.7	1.7	100%	209.3	165.9	79%
Total Project Services	368.8	301.6	82%	53.7	42.7	79%	34.9	28.0	80%	69.2	63.3	91%	1.7	1.7	100%	209.3	165.9	79%
Total LBL, DFLAW & Project Services	4,919.7	2,424.2	49%	928.2	672.4	72%	658.0	422.0	64%	1,500.3	976.4	65%	1,450.9	145.2	10%	382.3	208.3	54%
PT/HLW/SS Percent Complete Status Frozen as of September 2012 (due to project rebaselining efforts)																		
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%	1,336.1	983.5	73%
Total HLWPT/SS	8,722.8	5,965.2	68%	2,173.1	1,948.9	90%	1,565.5	1,124.8	72%	2,887.6	1,764.8	61%	758.5	143.2	19%	1,336.1	983.5	73%
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
Total WTP	13,642.5	8,389.4	61%	3,101.3	2,621.3	85%	2,223.5	1,546.8	70%	4,387.9	2,741.2	62%	2,209.4	288.4	13%	1,720.4	1,191.8	69%

Source: Preliminary WTP Contract Performance Report - Format 1, Data for April 2016

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 values 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 HLWPT/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 HLWPT/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. March 2016 LBL percent complete data is a total of LAW-BOF-LAB-DFLAW and LBL Facility Services. The Project Services Allocation account (pPSA), as shown on the CPR Format 1, is not added to LBL for percent complete purposes.