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OFFICE OF RIVER PROTECTION
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

MAY 15 2018

18-ECD-0032

Ms. Alexandra K. Smith, Program Manager
Nuclear Waste Program
Washington State
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Ms. Smith:

MAY 2018 QUARTERLY REPORT FOR THE STATE OF WASHINGTON VS. U.S. DEPARTMENT OF ENERGY, CASE NO. 08-5085-RMP, FOR WASTE TREATMENT AND IMMOBILIZATION PLANT CONSTRUCTION AND STARTUP ACTIVITIES AND TANK RETRIEVAL ACTIVITIES – JANUARY 1, 2018, THROUGH MARCH 31, 2018

This letter transmits the U.S. Department of Energy May 2018 Quarterly Report (Attachment) under Section IV-C-1 of the subject referenced Consent Decree, for the period of January 1, 2018, through March 31, 2018. Pursuant to the Consent Decree, this report provides the status and progress made during the reporting period.

As requested by the Washington State Department of Ecology, copies of the directives given to contractors for work required by the Consent Decree are included in the Attachment.

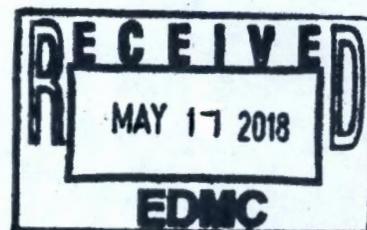
If you have any questions, please contact Thomas W. Fletcher, Assistant Manager, Waste Treatment and Immobilization Plant Project, (509) 376-4941, or Glyn D. Trenchard, Assistant Manager, Tank Farms Project, (509) 373-4016.

Brian T. Vance
Manager

ECD:RLE

Attachment

cc: See page 2



Ms. Alexandra K. Smith
18-ECD-0032

-2-

MAY 15 2018

cc w/attach:

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E.A. Connell, EM-4.4
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J.D. McDonald, Ecology
K. Niles, Oregon Energy
D. Rowland, YN
Administrative Record
BNI Correspondence
WRPS Correspondence

cc w/o attach:

M. Johnson, CTUIR
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M.J. Turner, MSA
J. Bell, NPT (Acting)
G. Bohnee, NPT
R. Buck, Wanapum
R. Longoria, YN (Acting)

**Attachment
18-ECD-0032
(54 Pages Excluding Cover Sheet)**

**U.S. Department of Energy, Office of River Protection
Quarterly Report, January 1, 2018, through March 31, 2018, and
Tank Farm / Waste Treatment and Immobilization Plant
Direction Letters**

Office of River Protection Quarterly Report

January 1, 2018, through March 31, 2018¹

Consent Decree, *State of Washington v. Dept. of Energy*, No: 08-5085-FVS (October 25, 2010)

Amended Consent Decree, *State of Washington v. Dept. of Energy*, No: 2:08-CV-5085-RMP
(March 11, 2016)

Second Amended Consent Decree, *State of Washington v. Dept. of Energy*,
No: 2:08-CV-5085-RMP (April 12, 2016)²



**2440 Stevens Center Place
Richland, Washington 99352
Office of River Protection**

B.J. Harp, Deputy Manager
Office of River Protection

Date

¹Except where otherwise expressly stated, the narrative descriptions of progress in this report cover the period from January 1, 2018, through March 31, 2018. Earned Value Management System data and descriptions cover the period ending February 28, 2018.

² The cited consent decrees are between the State of Washington and U.S. Department of Energy. For each of these decrees, there are companion, separate consent decrees with the State of Oregon, as Intervener, under the same case numbers.

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Acronyms and Abbreviations

BNI	Bechtel National, Inc.
BOF	Balance of Facilities
C#V	ventilation system for potential contamination zones C#
CGD	commercial grade dedication
CV	cost variance
DFLAW	direct-feed low-activity waste
DOE	U.S. Department of Energy
DSA	documented safety analysis
Ecology	Washington State Department of Ecology
EMF	effluent management facility
EVMS	Earned Value Management System
FY	fiscal year
HEPA	high-efficiency particulate air
HIHTL	hose-in-hose transfer line
HLW	High-Level Waste (Facility)
LAB	Analytical Laboratory
LAW	Low-Activity Waste (Facility)
LBL	Low-Activity Waste Facility, Balance of Facilities, and Analytical Laboratory
ORP	Office of River Protection
PJM	pulse-jet mixer
PT	Pretreatment (Facility)
SCBA	self-contained breathing apparatus
SHSV	standard high-solids vessel
SV	schedule variance
USACE	U.S. Army Corps of Engineers
WRPS	Washington River Protection Solutions LLC
WTP	Waste Treatment and Immobilization Plant

Introduction

The U.S. Department of Energy's Office of River Protection submits the following information to satisfy its obligation to provide "a written report documenting the WTP construction and startup activities and tank retrieval activities," as required by Section IV-C-1 of the Amended Consent Decree in *State of Washington v. United States Department of Energy*, No: 2:08-CV-5085-RMP (March 11, 2016) and Second Amended Consent Decree, same case (April 12, 2016).

Except where otherwise expressly stated, the narrative descriptions of progress in this report cover the period from January 1, 2018, through March 31, 2018. Earned Value Management System data and descriptions cover the period ending February 28, 2018; this includes the facility completion percentage estimates included at various locations in the Waste Treatment and Immobilization Plant section.

As the Washington State Department of Ecology has requested, written directives, not previously submitted, for the period addressed by this report for work required by the Amended Consent Decree are included with this report. (Waste Treatment and Immobilization Plant provided directives through February 16, 2018, in the last quarterly report.)

Tank Farm Actions and Milestones

Number	Title	Due Date	Status
<i>Actions</i>			
D-16E-02	Have a spare A-E-1 ¹ reboiler available by December 31, 2018.	12/31/2018	On Schedule
<i>Milestones</i>			
D-16B-03	“Of the 12 Single-Shell Tanks referred to in B-1 and B-2, complete retrieval of tank waste in at least 5.”	12/31/2020	Notice given that a serious risk has arisen. See letter 16-ORP-0097. ²
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	Notice given that a serious risk has arisen. See letter 16-ORP-0097. ²

1 The Consent Decrees referred to the 242-A reboiler as “A-E-1”; the correct designation is “E-A-1.”

2 16-ORP-0097, 2016, “State of Washington v. Moniz, Case No. 2:08-CV-5085-RMP (E.D. WA),” (external letter to M. Bellon, Washington State Department of Ecology), from K. W. Smith, U.S. Department of Energy, Office of River Protection, Richland, Washington, December 6.

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

Single-Shell Tank Retrieval Program

Quarterly Statement: Tank retrieval activities have complied with milestones already come due as of the date of this report. There are no missed milestones that may affect compliance with other milestones. The U.S. Department of Energy (DOE) formally notified the Washington State Department of Ecology (Ecology) on December 6, 2016, that a serious risk had arisen that DOE may be unable to meet Amended Consent Decree Milestones B-2 and B-3. As stated in DOE notification letter 16-ORP-0097, “State of Washington v. Moniz, Case No. 2:08-CV-5085-RMP (E.D. WA)”:

DOE’s ability to achieve these milestones has been adversely impacted by the expanded and extended use of self-contained breathing apparatus (SCBA) within all tank farms (i.e., all SST and Double-Shell Tank [DST]) farms resulting from issuance of the June 20, 2016 Demand Letter by the Hanford Atomic Metal Trades Council (HAMTC) to DOE and WRPS; the Stop Work Order issued by HAMTC on July 11, 2016; and the Memorandum of Agreement (MOA) entered into between HAMTC and WRPS on August 31, 2016.

Tank Farms Assistant Manager: Glyn Trenchard

Federal Program Manager: Jeff Rambo

Accomplishments in the Reporting Period

Completed Accomplishments:

- Removed long-length equipment to support Tank C-105 post-retrieval sampling.
- Issued C-105 Tank Sampling and Analysis Plan for post-retrieval sampling.
- Completed long-length equipment removal actions at Tank AX-102 and Tank AX-104:
 - AX02 pit D-R1C saltwell pump
 - AX02 pit D-R1C saltwell screen
 - AX04 pit A-R5A sluicer.
- Completed the Tank C-105 waste volume video. A video of the tank interior was accomplished as the first step in determining the final waste volume.
- Completed all of the six A Tank Farm ventilation duct isolation seal loop verifications. As-built drawings show the existing ventilation ducts isolated with grout, but to date, no grout isolation has been found.
- Completed installation of foundations for the AX Tank Farm control trailers.
- Completed installation of the ingress/egress tent.
- Completed installation of the ingress/egress tent at AN Tank Farm to support 20 hose-in-hose transfer line (HIHTL) removals planned in fiscal year (FY) 2018.

Ongoing Activities:

- Installation of the caustic and water system piping from A-285 Building to the AX Tank Farm fence line continues.
- Installation of the electrical infrastructure inside AX Tank Farm to support waste retrieval activities continues.
- Removal of HIHTL shield plates and hose barns between and within the C Tank Farm (POR104 valve box) and AN Tank Farm continues. Temporarily halted removing shield plates and hose barns over 20 HIHTLs between the C Tank Farm and the AN Tank Farm, and within C Tank Farm. This effort was suspended during the month of February until the completion of the AN Tank Farm ingress/egress tent. Tent construction was needed to support the work force on supplied air.
- AX-101 pit cleanout of AX01A continues.
- Fieldwork (excavations) continues for the installation of the pads for A Tank Farm exhausters (POR518/519).

Accomplishments Expected in the Next Reporting Period

- Issue C-105 Tank Sampling and Analysis Plan for post-retrieval sampling.
- Complete AX-101 pit cleanout of AX01D and AX01C (as resources allow).
- Install caustic and water piping and conduits from 241-A-285 to A Tank Farm fence.
- Perform the Tank C-105 computer/CAD measuring system calculation for remaining waste volume. The video will be reviewed and compared to CAD drawings to estimate waste volume.
- Submit the Tank C-105 Retrieval Completion Certification to Ecology.
- Complete Tank C-105 post-retrieval sampling for the retrieval data report.
- Complete 4 Tank C-105 well No. 30 post-retrieval gamma scans.
- Continue installation (underground conduit) of the AX Tank Farm retrieval control trailers.
- Remove the long-length in-tank equipment to support Tank C-105 post-retrieval sampling.
- Disconnect power from C-105 raw water skids (C Tank Farm layout).
- Disconnect 27 Tank C-105 electrical skids (C Tank Farm layout).
- Disconnect power from 2 hydraulic power units (C Tank Farm layout).
- Install the electrical power infrastructure in AX Tank Farm.
- Remove legacy long-length equipment from Tank AX-102 and Tank AX-104:
 - AX02 pit C-R1A P200 pump
 - AX04 pit A-R5A saltwell pump and screen

- AX04 pit D-R1B sluicer
- AX04 pit B-R14 pump
- AX04 pit A-R5B pump.
- Disconnect 20 HIHTLs. Eight between the POR104 valve box and Tank C-105 and 12 between C Tank Farm and within AN Tank Farm.

Issues Encountered in the Reporting Period

- Reduced worker efficiencies associated with mandatory use of supplied air continues to impact work in the tank farms.
- Two stop works were issued in January and one in February concerning use of SCBA face masks, which resulted in lost work days in the A, AX, and C tank farms. One stop work resulted from a foreign object in a face mask and the other one from skin irritations. In the C Tank Farm, the activities impacted by the stop works included disconnecting excess retrieval equipment, removal of shield plates on the HIHTLs, and removal of the HIHTLs. In AX Tank Farm, removal of legacy long-length equipment and pit cleanout were impacted. At A Tank Farm, in-tank video inspections were delayed. Two stop work issues occurred in March related to the condition of the SCBA equipment. Additional staff have been certified to inspect and repair the equipment, in conjunction with a process to increase specific identification of items of concern to the user.

Issues Expected in the Next Reporting Period

- Reduced worker efficiencies associated with mandatory use of supplied air are expected to continue to impact work in the tank farms.

Actions Initiated or Taken to Address Potential Schedule Slippage

- Washington River Protection Solutions LLC (WRPS) continues to increase the number of health physics technicians, industrial hygiene technicians, and skilled construction workforce to support tank waste retrieval efforts in the A and AX tank farms to support Amended Consent Decree Milestone B-2, “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,” and Milestone B-3, “Of the 12 SSTs referred to in B-1 and B-2, complete retrieval of tank wastes in at least 5.” These increases are taking place through additional hiring or transfers from other onsite contractors to support the removal of existing in-tank equipment and the installation of the waste retrieval systems in the single-shell tanks.
- A substantial increase in construction personnel is planned in May. The increase in personnel is expected to recover some schedule slippage. WRPS is increasing construction and support personnel for field work in AX and A tank farms. Currently, there are four crews deployed in AX Tank Farm. Schedule slippage refers to the Milestones B-2 and B-3, where DOE has already provided notice to Ecology that a

serious risk has arisen where DOE may be unable to meet these milestones. See December 6, 2016, DOE Office of River Protection (ORP) letter 16-ORP-0097.

Tank Waste Retrieval Work Plan Status

Tank	TWRWP	Expected Revisions	Retrieval Technology		
			First	Second	Third
AX-101	RPP-RPT-58932, Rev. 1	Complete	Sluicing with ERSS	High-Pressure Water deployed with ERSS	–
AX-102	RPP-RPT-58933, Rev. 1	Complete	Sluicing with ERSS	High-Pressure Water deployed with ERSS	–
AX-103	RPP-RPT-58934, Rev. 1	Complete	Sluicing with ERSS	High-Pressure Water deployed with ERSS	–
AX-104	RPP-RPT-58935, Rev. 1	Complete	Sluicing with ERSS	High-Pressure Water deployed with ERSS	–
C-105	RPP-22520, Rev. 8	Complete	MARS-V	MARS-V High-Pressure Water Spray	Chemical Dissolution Process with ERSS

ERSS = extended reach sluicer system.
 MARS-V = Mobile Arm Retrieval System-Vacuum.
 TWRWP = tank waste retrieval work plan.

Accomplishments in the Reporting Period

- None.

Accomplishments Expected in the Next Reporting Period

- None.

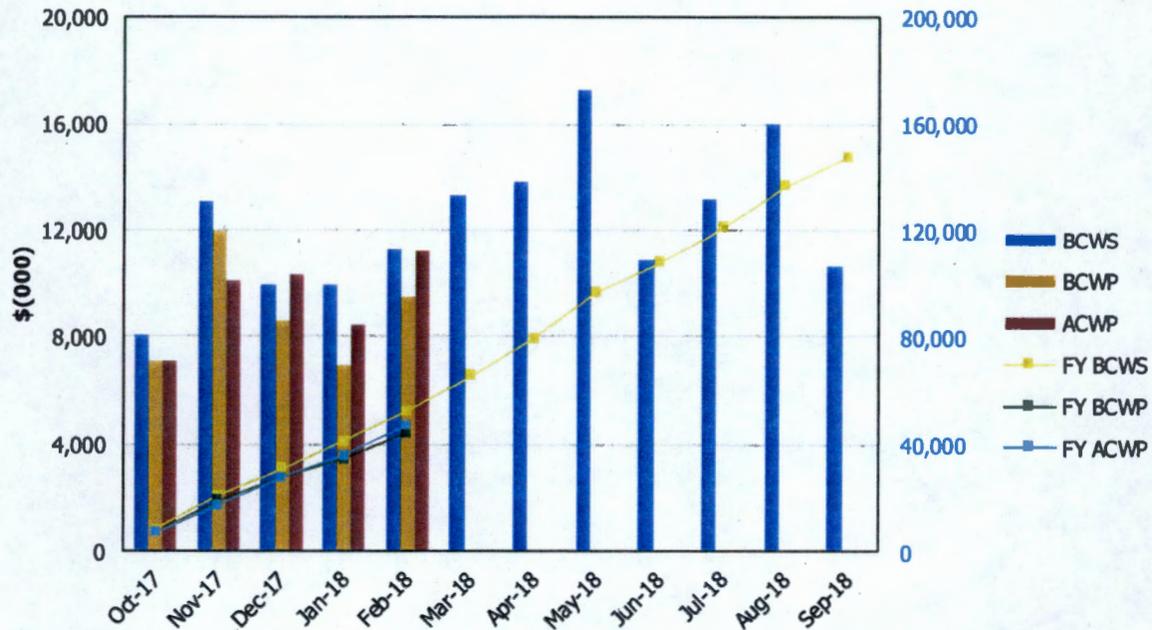
Tank Farm Earned Value Management System Quarterly Analysis

Earned Value Data: Fiscal Year 2018

February-18

Tank Farms ORP-0014
WBS 5.2 - Retrieve and Close SSTs

EVMS Monthly and Fiscal Year Values



Earned Value Month

Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2017	\$8,053	\$7,119	\$7,127	0.88	1.00	\$8,053	\$7,119	\$7,127	0.88	1.00
Nov 2017	\$13,058	\$11,996	\$10,119	0.92	1.19	\$21,111	\$19,115	\$17,246	0.91	1.11
Dec 2017	\$9,964	\$8,572	\$10,318	0.86	0.83	\$31,075	\$27,686	\$27,563	0.89	1.00
Jan 2018	\$9,940	\$6,911	\$8,464	0.70	0.82	\$41,015	\$34,597	\$36,027	0.84	0.96
Feb 2018	\$11,310	\$9,456	\$11,225	0.84	0.84	\$52,326	\$44,053	\$47,252	0.84	0.93
Mar 2018	\$13,313					\$65,639				
Apr 2018	\$13,839					\$79,477				
May 2018	\$17,292					\$96,770				
Jun 2018	\$10,845					\$107,614				
Jul 2018	\$13,133					\$120,747				
Aug 2018	\$15,991					\$136,738				
Sep 2018	\$10,612					\$147,350				

CTD	\$855,897	\$848,716	\$885,803	0.99	0.96
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- | | |
|---|--|
| 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. |

Earned Value Management System Quarterly Analysis

Project Earned Value Management System (EVMS) reflects data for December 2017, January 2018, and February 2018.

Schedule Variance Summary:

Work completed ahead of the planned schedule is reported as a favorable SV for the month in which it is completed, but results in an unfavorable SV in the month the work was planned.

For the December EVMS reporting period, a net **unfavorable** schedule variance (SV) of (\$1,393,000) was reported, primarily due to the following:

- Two activities were completed earlier than the planned scheduled work for December, resulting in an unfavorable SV for December 2017:
 - Tank C-105 third technology retrieval operations scheduled to be performed from December 2017 through February 2018 were completed ahead of schedule in November 2017. This unfavorable SV will show in the months of December 2017 through February 2018.
 - Installation of the HIHTL at the A Tank Farm and the AX Tank Farm double-shell tank receiver Tank 1 was completed in November 2017, ahead of schedule. This work was scheduled to be performed in December 2017.

For the January EVMS reporting period, a net **unfavorable** SV of (\$3,029,000) was reported, primarily due to the following:

- One project was completed earlier than planned and one was delayed, resulting in an unfavorable SV for January 2018:
 - Tank C-105 third technology retrieval operations scheduled to be performed from December 2017 through February 2018 were completed ahead of schedule in November 2017. This unfavorable SV will show in the months of December 2017 through February 2018.
 - Installation of AX Tank Farm infrastructure equipment (e.g., diversion box, HIHTL) has been delayed because resources were reassigned to higher priority work (e.g., equipment removal from AX Tank Farm, Tank AX-102, and Tank AX-104).

For the February EVMS reporting period, a net **unfavorable** SV of (\$1,854,000) was reported, primarily due to the following:

- Tank C-105 third technology retrieval operations scheduled to be performed from December 2017 through February 2018 were completed ahead of schedule in November 2017. This unfavorable SV will show in the months of December 2017 through February 2018.
- Delays associated with unexpected site conditions related to the Tank AX-104 pit 04B riser 14 pump removal. The pump was temporarily stuck when attempts were made to lift

it out of the riser and required additional field preparation activities, including videos of current pump status and engineering evaluation of lifting techniques to provide a path forward for safe removal.

Cost Variance Summary:

For the December EVMS reporting period, a net **unfavorable** cost variance (CV) of (\$1,746,000) was reported, primarily due to the following:

- Excavation costs continued to increase for the north area of the SX Tank Farm interim barrier because much of the area must be excavated by hand, by personnel wearing SCBA. Minimal machine excavation is allowed due to unknown ground interferences inside SX Tank Farm.
- Costs increased because of training for the three additional A Tank Farm and AX Tank Farm retrieval construction crews and support staff hired to support FY 2018 retrieval construction work scope.

For the January EVMS reporting period, a net **unfavorable** CV of (\$1,566,000) was reported, primarily due to the following:

- Excavation costs continued to increase for the north area of the SX Tank Farm interim barrier because much of the area must be excavated by hand, by personnel wearing SCBA. Minimal machine excavation is allowed due to unknown ground interferences inside SX Tank Farm.
- Degradation of the existing pump in Tank AX-104 pit 04B riser 14 has necessitated additional field preparation activities, including videos of current pump status and engineering evaluation of lifting techniques to provide a path forward for safe removal.
- Vapor and beryllium controls, which require specific personal protective equipment (e.g., SCBA and gloves), additional monitoring, sampling, and work package development continue to impact the efficiency of personnel working in the tank farms.

For the February EVMS reporting period, a net **unfavorable** CV of (\$1,767,000) was reported, primarily due to the following:

- Excavation costs continued to increase for the north area of the SX Tank Farm interim barrier because much of the area must be excavated by hand, by personnel wearing SCBA. Minimal machine excavation is allowed due to unknown ground interferences inside SX Tank Farm.
- Degradation of the existing pump in Tank AX-104 pit 04B riser 14 has necessitated additional field preparation activities, including videos of current pump status and engineering evaluation of lifting techniques to provide a path forward for safe removal.
- Vapor and beryllium controls, which require specific personal protective equipment (e.g., SCBA and gloves), additional monitoring, sampling, and work package development continue to impact the efficiency of personnel working in the tank farms.

Retrieval Labor Hours on Self-Contained Breathing Apparatus

Tank Farms Assistant Manager: Glyn Trenchard

Federal Program Manager: Jeff Rambo

Labor Hours Expended on Single-Shell Tank Retrieval Self-Contained Breathing Apparatus
 January 1, 2018, through March 31, 2018.

	SCBA Direct Labor Hours	SCBA Subcontractor Hours¹	Total SST Operation Hours	Total Hours²	Total Percent on SCBA	Detrimental Impacts Days³
C Tank Farm	14,222	2,230	16,452	72,387	23%	54
A/AX Tank Farms	17,475	2,750	20,225	82,913	24%	55
Total	31,697	4,980	36,677	155,300	24%	55

¹ Subcontractor hours include labor hours from subcontractors including North Point Electrical Contracting, Inc.; Geophysical Survey, Inc.; Fowler General Construction; American Electric; BNL Technical Services; and Intermech Inc.

² Includes all labor hours supporting SST farms in retrieval including support outside farm fence (Engineering, Project Management, and other support accounts).

³ Detrimental impacts are presented as the number of days in which a stop work related to SCBA use prevented field operations from continuing. It is limited to SCBA stop works only and excludes vapor impacts (i.e., AOP-15 events).

SCBA = self-contained breathing apparatus.

SST = single-shell tank.

Spare Reboiler Requirement Status

Tank Farms Assistant Manager: Glyn Trenchard

Federal Program Manager: Paul Hernandez

Below is a description of activity and progress made for the spare E-A-1 reboiler for the 242-A Evaporator, including a description of cost and schedule performance.

- WRPS awarded a not-to-exceed design/build contract to ABW Technologies in the amount of \$461,000 for fabrication of a spare reboiler, with delivery prior to December 31, 2018. Total estimate at completion is \$776,000.
- Fabrication of the spare 242-A Evaporator reboiler is complete. The reboiler shell, tubes, and tube sheet have been successfully hydro tested. ABW Technologies is currently completing the final document package required for delivery. WRPS remains on schedule to have a spare E-A-1 reboiler available for the 242-A Evaporator by December 31, 2018, as required by the Second Amended Consent Decree.

Written Directives for Tank Farms

Written directives given by DOE to the Tank Operations Contractor from January 1, 2018, through March 31, 2018, for work required by the Consent Decrees.

No letters of direction were issued to WRPS during the reporting period in reference to Contract No. DE-AC27-08RV14800, *Tank Operations Contract*.

Waste Treatment and Immobilization Plant Project

Federal Project Director: Tom Fletcher³

Deputy Federal Project Director: Joni Grindstaff

Quarterly Statement: The Waste Treatment and Immobilization Plant (WTP) Project has complied with applicable milestones already come due as of the date of this report. There are no missed milestones that may affect compliance with other milestones.

The WTP Project continues to focus on completion of the Low-Activity Waste (LAW) Facility, Balance of Facilities (BOF), and Analytical Laboratory (LAB) (collectively referred to as LBL, including direct-feed low-activity waste [DFLAW] and LBL Facility services).

As of February 2018, DFLAW modifications for the WTP Project were 39 percent complete, engineering design was 77 percent complete, procurement was 25 percent complete, and construction was 25 percent complete. As of February 2018, total LBL facilities were 63 percent complete, engineering design was 88 percent complete, procurement was 73 percent complete, construction was 79 percent complete, and startup and commissioning was 26 percent complete.

Accomplishments during the Reporting Period

- Significant accomplishments during the reporting period are noted in project reports for the Pretreatment (PT) Facility, High-Level Waste (HLW) Facility, LAW Facility, BOF, and LAB.

Accomplishments Expected Next Reporting Period

- In accordance with the additional funding received for the HLW Facility in the *Consolidated Appropriations Act, 2018*, enacted on March 23, 2018, ORP will determine which additional activities could be performed at the HLW Facility in FY 2018. ORP will continue discussions with DOE's Office of Environmental Management about the direction to provide Bechtel National, Inc. (BNI) regarding engineering, procurement, and construction activities for the HLW Facility.
- ORP will continue to meet with Ecology about the matters discussed in this report and will update Ecology as circumstances develop.
- ORP will continue to provide oversight of BNI progress on the actions recommended by the Project Performance Review to improve confidence in the timely completion of design, procurement, construction, startup, and commissioning of the WTP facilities needed for DFLAW.
- Other accomplishments expected in the next reporting period are noted in the project reports for the PT Facility, HLW Facility, LAW Facility, BOF, and LAB.

³ Tom Fletcher was named Assistant Manager/Federal Project Director for the Waste Treatment and Immobilization Plant Project effective March 18, 2018, replacing Bill Hamel.

Issues Encountered during the Reporting Period

- Congress provided funding to DOE and other federal agencies during the reporting period through several continuing resolutions. In both FY 2016 and FY 2017, Congress appropriated \$690 million for the WTP Project. As of February 28, 2018, FY 2018 funding for the WTP Project remained subject to a Continuing Resolution that limited funding to the \$690 million level appropriated in FY 2017. Funding for the remainder of FY 2018 was appropriated by the *Consolidated Appropriations Act, 2018*, enacted on March 23, 2018⁴.
- Other issues encountered during the reporting period are noted in project reports for PT Facility, HLW Facility, LAW Facility, BOF, and LAB.

Issues Expected in the Next Reporting Period

- Other issues expected in the next reporting period are noted in project reports for PT Facility, HLW Facility, LAW Facility, BOF, and LAB.

⁴ The Explanatory Statement that accompanied the Consolidated Appropriations Act, 2018, contained the following provision:

Office of River Protection. – The agreement includes funding above the budget request to resume design and engineering work on the High-Level Waste Treatment Facility, to resolve the five remaining technical issues on the Pretreatment facility, to ensure compliance with 2016 Consent Decree and Tri-Party Agreement milestones, ... Not less than 90 days prior to the implementation of any changes to the current program of record for ... the Waste Treatment Plant, the Department shall submit to the Committee on Appropriations of both Houses of Congress a report that includes the technical justification and business case, any impact of such changes on the 2016 Consent Decree and Tri-Party Agreement, any necessary regulatory or permit changes by Washington or any other state, any necessary National Environmental Policy Act analysis, and any impact of such changes on site infrastructure.

Explanatory Statement at 47.

Waste Treatment and Immobilization Plant Milestones

Milestone	Title	Due Date	Status
Waste Treatment and Immobilization Plant Project			
D-00A-06	Complete Methods Validations	06/30/2032	On Schedule
D-00A-17	Hot Start of Waste Treatment Plant	12/31/2033	Under Analysis ¹
D-00A-01	Achieve Initial Plant Operations for WTP	12/31/2036	Under Analysis ¹
Pretreatment Facility			
D-00A-18	Complete Structural Steel Erections Below Elevation 56' in PT Facility	12/31/2009	Complete
D-00A-19	Complete Elevation 98' Concrete Floor Slab Placements in PT Facility	12/31/2031	On Schedule
D-00A-13	Complete Installation of Pretreatment Feed Separation Vessels FEP-SEP-O0001A/1B	12/31/2031	On Schedule
D-00A-14	PT Facility Construction Substantially Complete	12/31/2031	Under Analysis ¹
D-00A-15	Start PT Facility Cold Commissioning	12/31/2032	Under Analysis ¹
D-00A-16	PT Facility Hot Commissioning Complete	12/31/2033	Under Analysis ¹
High-Level Waste Facility			
D-00A-20	Complete Construction of Structural Steel to Elevation 14' in HLW Facility	12/31/2010	Complete
D-00A-21	Complete Construction of Structural Steel to Elevation 37' in HLW Facility	12/31/2012	Complete
D-00A-02	HLW Facility Construction Substantially Complete	12/31/2030	Under Analysis ¹
D-00A-03	Start HLW Facility Cold Commissioning	06/30/2032	Under Analysis ¹
D-00A-04	HLW Facility Hot Commissioning Complete	12/31/2033	Under Analysis ¹
Low-Activity Waste Facility			
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

Milestone	Title	Due Date	Status
Balance of Facilities			
D-00A-12	Steam Plant Construction Complete	12/31/2012	Complete
Analytical Laboratory			
D-00A-05	LAB Construction Substantially Complete	12/31/2012	Complete

¹ As described in the PT Facility and/or HLW Facility sections, the DOE is considering an option to continue preservation and maintenance of the PT and HLW facilities for a period of 3 to 5 years, while DOE is focusing its efforts on bringing direct-feed low-activity waste into operation. Accordingly, certain milestones in this table are marked as “Under Analysis.” As discussed in this report, DOE asked the U.S. Army Corps of Engineers to perform an initial parametric analysis of certain options and funding scenarios to evaluate the likelihood of achieving PT- and HLW-related milestones. DOE is considering milestones A-1 and A-17 as being “Under Analysis” because the definition of Section IV-A-2: “Hot Start of Waste Treatment Plant” means the initiation of simultaneous operation of the Pretreatment (PT) Facility, High-Level Waste (HLW) Facility and Low-Activity Waste (LAW) Facility (including as needed the operations of the Analytical Laboratory (LAB) and the Balance of Facilities) treating Hanford tank wastes and producing a waste glass product.” Hence, if one of the five facilities is “Under Analysis,” DOE is conservatively considering the WTP milestone as “Under Analysis.”

DOE	=	U.S. Department of Energy.	LAW	=	low-activity waste.
HLW	=	high-level waste.	PT	=	pretreatment.
LAB	=	analytical laboratory.	WTP	=	Waste Treatment and Immobilization Plant.

WTP Earned Value Management System Quarterly Analysis

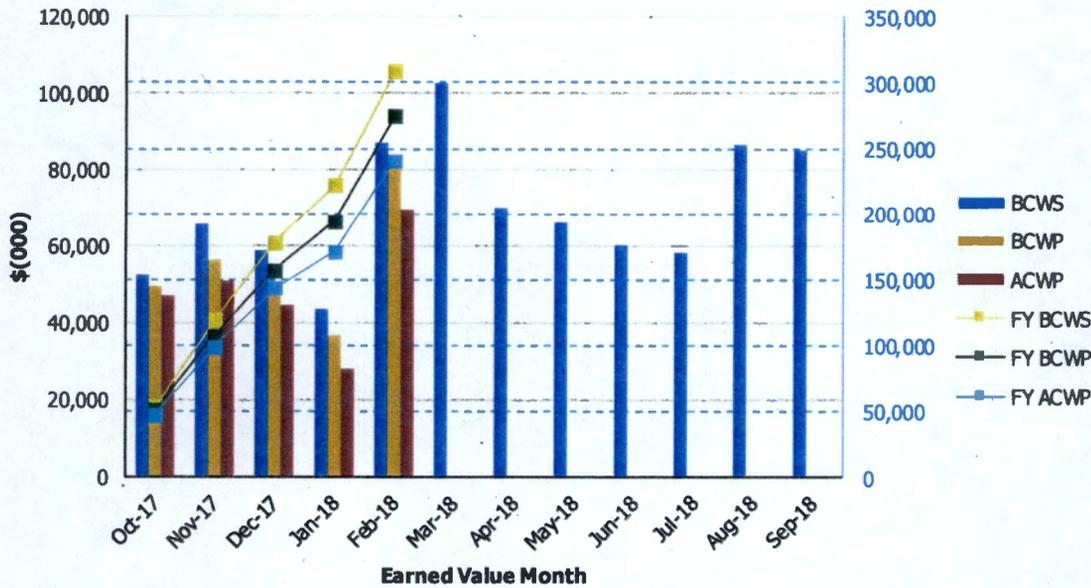
EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2018 Earned Value Data

Data as of: February 2018

**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 2017	\$52,662	\$49,804	\$46,894	0.95	1.06	\$52,662	\$49,804	\$46,894	0.95	1.06
Nov 2017	\$65,935	\$56,513	\$51,026	0.86	1.11	\$118,597	\$106,317	\$97,920	0.90	1.09
Dec 2017	\$58,797	\$50,134	\$44,924	0.85	1.12	\$177,394	\$156,452	\$142,844	0.88	1.10
Jan 2018	\$43,622	\$36,665	\$28,076	0.84	1.31	\$221,016	\$193,117	\$170,920	0.87	1.13
Feb 2018	\$86,995	\$80,565	\$69,775	0.93	1.15	\$308,011	\$273,683	\$240,695	0.89	1.14
Mar 2018	\$102,969									
Apr 2018	\$69,899									
May 2018	\$65,992									
Jun 2018	\$60,334									
Jul 2018	\$58,502									
Aug 2018	\$86,614									
Sep 2018	\$85,308									
PTD	\$10,819,605	\$10,731,579	\$10,624,109	0.99	1.01					

ACWP = actual cost of work performed.
 BCWP = budgeted cost of work performed.
 BCWS = budgeted cost of work scheduled.
 CPI = cost performance index.

PTD = project to date.
 EVMS = earned value management system.
 FY = fiscal year.
 SPI = schedule performance index.

Performance Tracking	SV (\$x1,000)	CV (\$x1,000)
Cumulative (through Feb. 2018)	(\$88,026)	\$107,470
Fiscal Year 2018 to-date	(\$34,329)	\$32,987
December 2017	(\$8,663)	\$5,211
January 2018	(\$6,956)	\$8,589
February 2018	(\$6,430)	\$10,790

SV = schedule variance.

CV = cost variance.

Earned Value Management System Analysis

The EVMS is intended to provide a status of how the contractor is progressing against its planned work (i.e., schedule), and whether it is costing more or less to complete the work than planned. The project plan is measured by expressing the schedule in terms of dollars spread over the anticipated project duration, and then for each month, determining how much of the planned work was accomplished or “earned,” as measured in equivalent dollars. If more work is accomplished than planned, then the project is ahead of schedule and has a favorable SV. Similarly, if less work is accomplished, the project is behind schedule and has an unfavorable SV. Accomplished work is reported in the month it was completed, which may not be when it was planned. For example, work completed in a month earlier than planned would be reported as a favorable SV for the month in which it was completed, but would be reported as an unfavorable SV in the month it was planned. The end result would be the overall cumulative SV netting out to zero over these months. Likewise, work completed late will recover an earlier reported unfavorable SV.

The CV measures the actual cost of work performed against the earned dollar value of that performed work. As an example, assume \$10,000 of work was planned to-date, \$8,000 was reported as being performed (earned), at an actual cost of \$9,000. This work would be reported as being \$2,000 behind schedule [a negative or unfavorable SV: $\$8,000 - \$10,000 = (\$2,000)$], and has cost \$1,000 more [a negative or unfavorable CV: $\$8,000 - \$9,000 = (\$1,000)$] than was planned for completing that work scope. Likewise, a favorable or positive CV would be reported if it cost less to complete the work than the performed dollar value of the work.

The SV and CV are reported for each monthly period, fiscal year to-date, as well as for the project-to-date value. The monthly variances can fluctuate significantly (for reasons noted earlier), so the fiscal year or cumulative-to-date report provides a better indicator of the overall project completion status, and can give a reasonable projection of how the project will finish, based on the progress-to-date.

Schedule Variance Summary:

For the December 2017 EVMS reporting period, a net **unfavorable** SV of approximately (\$8.6 million) was reported, primarily due to the following:

- LBL Commissioning continues to show an unfavorable SV due to a planned delay of staffing increases. The LBL staffing needs to support commissioning are being evaluated. The future staffing level of commissioning personnel will be based on the outcomes of the evaluation. This control account will continue to show a negative SV until staffing levels in the budgeting tools are realigned with the commissioning execution plan via the baseline change control process.
- DFLAW Plant Material reported an unfavorable SV because of delays in procurement of steel platforms.
- DFLAW Construction reported an unfavorable SV because of planned delays in a construction subcontract change process for liner plate work scope. In addition, Construction craft reported an unfavorable SV because of site work deferment resulting from a change in FY 2018 project execution priorities.
- LBL Construction, Startup, and Commissioning reported an unfavorable SV because work planned for this month was performed ahead of schedule and prior to formation of the Waste Treatment Completion Company accounts. The work scope planned for this reporting period has been previously earned.
- PT Facility Plant Equipment reported an unfavorable SV because of delays of the shipment of stored equipment and work performed ahead of schedule associated with the fabricated equipment and plugs. In addition, Plant Material reported an unfavorable SV because of delays in steel and pipe deliveries.
- HLW Facility Plant Equipment reported an unfavorable SV because vendor delivery of cranes and cable reeling equipment is behind schedule, and Plant Material is unfavorable because of vendor delays in completing fabrication of the remaining pipe spools. In addition, HLW Facility Engineering is reporting an unfavorable SV because resources are supporting higher WTP priorities.

For the January 2018 EVMS reporting period, a net **unfavorable** SV of approximately (\$7.0 million) was reported, primarily due to the following:

- LBL Commissioning continues to show an unfavorable SV due to a planned delay of staffing increases. The LBL staffing needs to support commissioning are being evaluated. The future staffing level of commissioning personnel will be based on the outcomes of the evaluation. This control account will continue to show a negative SV until staffing levels in the budgeting tools are realigned with the commissioning execution plan via the baseline change control process.
- DFLAW Plant Material continues to report an unfavorable SV due to previously deferred procurement activities for waste transfer line piping.

- DFLAW Construction reported an unfavorable SV due to a planned delay of installation for waste transfer line piping. Installation of the waste transfer line piping at this time would interfere with critical path construction activities at the Effluent Management Facility (EMF) processing building. Installation of the waste transfer line piping will occur following bulk EMF construction. The monthly SV for these activities will continue until the budgeting tools are realigned with the construction execution plan via the baseline change control process.
- DFLAW Construction reported an unfavorable SV because of planned delays in a construction subcontract change process for liner plate work scope.
- HLW Facility Plant Equipment reported an unfavorable SV because vendor delivery of cranes and cable reeling equipment was behind schedule, and Plant Material was unfavorable because of vendor delays in completing fabrication of the remaining pipe spools. In addition, HLW Facility Engineering was reporting an unfavorable SV because HLW Facility resources are supporting higher WTP priorities.
- BOF reported an unfavorable SV because of early procurement of the glass former equipment. This was offset because of a delay in the LAW Facility gas analyzers and thermocouple/thermowell procurements.

For the February 2018 EVMS reporting period, a net **unfavorable** SV of approximately (\$6.4 million) was reported, primarily due to the following:

- LBL Commissioning continues to show an unfavorable SV due to a planned delay of staffing increases. The LBL staffing needs to support commissioning are being evaluated. The future staffing level of commissioning personnel will be based on the outcomes of the evaluation. This control account will continue to show a negative SV until staffing levels in the budgeting tools are realigned with the commissioning execution plan via the baseline change control process.
- DFLAW Plant Material continues to report an unfavorable SV due to previously deferred procurement activities for waste transfer line piping. The majority of transfer line piping has been received onsite and the remainder will arrive in the next 2 months.
- DFLAW Engineering reported an unfavorable SV due to late performance of engineering activities to support the EMF calculation confirmation and design of the EMF electrical and instrumentation systems.
- DFLAW Construction reported an unfavorable SV due to a planned delay of installation for waste transfer line piping. Installation of the waste transfer line piping at this time would interfere with critical path construction activities at the EMF processing building. Installation of the waste transfer line piping will occur following bulk EMF construction. The monthly SV for these activities will continue until the budgeting tools are realigned with the construction execution plan via the baseline change control process.
- HLW Facility Engineering reported an unfavorable SV because of delays in long-range planning, procurement, and concrete slab releases due to the HLW Facility's resources supporting higher WTP priorities.

- HLW Facility Plant Equipment reported an unfavorable SV because of delays in vendor fabrication of mechanical handling cranes and the closed-circuit television prototype camera.
- HLW Facility Plant Material reported an unfavorable SV because of vendor delays in completing fabrication of the remaining pipe spools.

Cost Variance Summary:

For the December 2017 EVMS reporting period, a net **favorable** CV of approximately \$5.2 million was reported, primarily due to the following:

- LBL Commissioning reported a favorable CV because current spending priorities are different than the existing plan. Revised plans are currently being developed for implementation so that commissioning activities are aligned with the available spend plan.
- LBL Startup reported a favorable CV because of efficiencies in procedure development and level-of-effort positions not being staffed up as anticipated due to system turnovers not occurring as planned.
- DFLAW Construction craft, however, reported an unfavorable CV because of increased efforts to complete punch list items associated with the LAW Facility pipe, electrical, and melter work scope. In addition, LAW Facility Construction subcontracts reported an unfavorable CV due to greater than estimated repairs on the ventilation system for potential contamination zone C5 (C5V) high-efficiency particulate air (HEPA) duct, as well as delays due to scaffolding modifications/setup and required weekend overtime.
- PT Facility also reported an unfavorable CV because technical team reviews and comment resolutions are taking more time than expected regarding T4 in relation to pulse-jet mixer (PJM) vessel mixing and control, T5 in relation to erosion/corrosion in piping and ancillary vessels, and T7 in relation to evaluating vessel and equipment structural integrity.

For the January 2018 EVMS reporting period, a net **favorable** CV of approximately \$8.6 million was reported, primarily due to the following:

- LBL Commissioning reported a favorable CV because current spending priorities are different than the existing plan. Revised plans are currently being developed for implementation so commissioning activities will be aligned with the available spend plan.
- LBL Startup reported a favorable CV because of efficiencies in procedure development and because level-of-effort positions were not filled as anticipated.
- LAW Facility Engineering reported a favorable CV because a substantial amount of work scope regarding draft 24590-LAW-DSA-NS-18-0001, *Documented Safety Analysis for the Low-Activity Waste Facility* (DSA) was completed earlier than planned.

For the February 2018 EVMS reporting period, a net **favorable** CV of approximately \$10.8 million was reported, primarily due to the following:

- LBL Commissioning reported a favorable CV because current spending priorities are different than the existing plan. Revised plans are currently being developed for implementation so commissioning activities will be aligned with the available spend plan.
- General/Other Services reported a favorable CV because of labor attrition and reduced labor costs due to positions not being filled as anticipated.
- HLW Facility Engineering and Facility Services reported a favorable CV due to level-of-effort resources supporting higher WTP priorities.
- HLW Facility Plant Equipment reported a favorable CV as a result of determining some previous accrued costs, which had been entered as “estimated actuals,” were higher than the final cost payments made on equipment purchase orders now in closure. The favorable CV is the result of correcting the previous over accrual of cost in the February 2018 EVMS reporting period.
- PT Facility Plant Equipment reported a favorable CV as a result of determining some previous accrued costs, which had been entered as “estimated actuals,” were higher than the final cost payments made on equipment purchase orders now in closure. The favorable CV is the result of correcting the previous over accrual of cost in the February 2018 EVMS reporting period.
- Facility Services Construction reported an unfavorable CV because of increased hours from employee training and craft support, combined with early receipt of additional tools, equipment, and services charged against a level-of-effort account not planned for this month.
- LAW Facility Construction reported an unfavorable CV because of ongoing scaffold builds and removals, combined with temporary construction removals and relocations to support completion of punch list work scope.

WTP Project Cumulative through February 2018

The WTP Project is behind the planned work scheduled by approximately (\$88 million) through February 2018, but it has cost approximately \$107.4 million less to perform the work than originally estimated. The cumulative-to-date SVs and CVs are reported against the LBL/DFLAW Performance Measurement Baseline.

Note: Because the HLW Facility, PT Facility, and Project Services baselines have not been updated since 2012, the variances for the PT Facility and Project Services are reported against interim two-year BNI work plans, while the HLW Facility is reported against a five-year work plan (also referred to as the Internal Forecast).

Project Performance Review

Nearly all of the Project Performance Review actions discussed in the last quarterly report have been completed and implemented, or are in the process of implementation. The status of the ongoing near-term actions recommended by the Project Performance Review are listed below:

- BNI and ORP continue to discuss a strategy to complete an operational readiness review prior to the start of cold commissioning.
- BNI is expected to streamline WTP baseline change management processes (i.e., frequency and efficiency) to achieve baseline execution objectives.
- BNI will continue to resolve and close “low-significance” and “find and fix” level C conditions reports to eliminate the backlog of these condition reports as higher resource priorities allow.

Pretreatment Facility

Federal Project Director: Tom Fletcher

Facility Federal Project Director: Wahed Abdul

The PT Facility will separate radioactive tank waste into high-level waste and low-activity waste 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, engineering design was 85 percent complete, procurement was 56 percent complete, construction was 43 percent complete, and startup and commissioning was 3 percent complete. The physical percent complete analysis for the PT Facility was frozen in September 2012, pending development of a revised baseline to address technical and design issues.

ORP and BNI continue to work on resolving the remaining technical issues identified in the “Third Order Regarding Motions to Modify Consent Decrees”,⁵ which includes,⁶ “Ensuring Control of the Pulse Jet Mixers” (i.e., T4 in relation to PJM vessel mixing and control); “Protecting Against Possible Erosion and Corrosion” (i.e., T5 in relation to erosion/corrosion in piping and ancillary vessels); and “Ensuring Ventilation Balancing” (i.e., T8 in relation to facility ventilation/process offgas treatment).

Preliminary engineering work, documented previously in a BNI and ORP study, was completed and demonstrates how the standard high-solids vessel (SHSV) design can be implemented in the PT Facility (i.e., T6 in relation to design redundancy and in-service inspection). The engineering study showed that 16 SHSVs can be incorporated into the PT Facility, while meeting the PT Facility throughput contract requirements. Ecology was briefed on the design concept in February 2018.

Quarterly Statement: There are no missed milestones that may affect compliance with other milestones.

Accomplishments during the Reporting Period

- At the request of ORP, the U.S. Army Corps of Engineers (USACE) has been conducting a parametric analysis of certain options and funding scenarios to evaluate the likelihood of achieving PT- and HLW-related Consent Decree milestones in the event a decision is made to keep those facilities in preservation mode for another 3 to 5 years so as to allow DOE to focus funding and efforts on the completion of DFLAW commissioning.⁷ ORP

⁵ *State of Washington v. Dept. of Energy*, No: 2:08-CV-5085-RMP (March 11, 2016) (EDF-221).

⁶ At the outset of U.S. Department of Energy’s identification of the technical issues, the issues were grouped into eight issues. During the litigation, some issues were combined with others into five groups of issues. Consequently, the descriptions of the issues listed above may be both different by number and somewhat different by description.

⁷ See footnote 4 above.

entered into an Interagency Agreement with the USACE on January 16, 2018, to perform this assessment. The USACE work commenced on February 21, 2018.

- DOE directed BNI to perform a study of the necessary elements of any continued preservation and maintenance plan for the PT and HLW facilities. BNI issued this study, *Evaluation of Potential Continued Preservation and Maintenance, and Restart of Facilities*, on February 13, 2018.
- BNI completed data analysis and documentation for the recently completed full-scale PJM mixing systems testing of the SHSV test design prototype.
- ORP continued to work with BNI on completing documentation for the remaining technical issues described as T4, T5, T6, T7 (i.e., T7 in relation to seismic ground motion criteria changes around 2005), and T8.

Accomplishments Expected in the Next Reporting Period

- BNI will continue to focus on facility preservation and preventative maintenance at the PT Facility to protect equipment and structures and ensure design documents are maintained, while the emphasis is placed on DFLAW/LBL activities. Work will continue on technical issue resolution related to erosion/corrosion in piping and vessels and progression of the conceptual design incorporating the SHSV test design prototype.
- ORP expects to receive an evaluation from the USACE (noted above) after it completes its parametric analysis of certain options and funding scenarios evaluating the likelihood of achieving PT- and HLW-related milestones in the event a decision is made to keep those facilities in preservation mode for another 3 to 5 years so as to allow DOE to focus funding and efforts on the completion of DFLAW commissioning.
- A workshop is planned for April 11, 2018 (originally planned for March), to strategize and develop options to make progress on the PT Facility.
- BNI is expected to issue an update to the localized corrosion test basis document supporting closure of technical issue T5 and closure of the T5 corrective action plan by the end of the next reporting period (originally planned for April 2018). Comment resolution on the T5 corrosion test report has taken longer than expected.
- BNI is expected to issue the methodology for the vessel structural integrity verification supporting final resolution of technical issue T7 by the end of the next reporting period (originally planned for April 2018). Comment resolution has taken longer than expected.
- ORP and BNI will continue to work on resolving the remaining technical issues described as T4, T5, T6, T7, and T8. Resolution of the remaining technical issues, with notification to the Defense Nuclear Facilities Safety Board, has shifted 2 months since the last quarterly report and is now expected in the July/August 2018 timeframe.

Issues Encountered during the Reporting Period

- The PT Facility planned work was reprioritized because of the need for additional resources to support DFLAW/LBL activities. Reduced resources resulted in a slower pace on technical issue resolution related to erosion/corrosion in piping and vessels and

progression of the conceptual design incorporating the SHSV test design prototype. Congress provided funding to DOE and other federal agencies during the reporting period through several continuing resolutions. As of February 28, 2018, FY 2018 funding for the WTP Project remained subject to a Continuing Resolution that limited funding to the \$690 million level appropriated in FY 2017. Funding for the remainder of FY 2018 was appropriated by the *Consolidated Appropriations Act, 2018*, enacted on March 23, 2018.⁸

- *Impact:* Delay in completing PT Facility redesign activities.
- *Actions initiated or taken to address potential project schedule slippage:* ORP is analyzing the potential impacts of continued funding limitations on the WTP Project by considering the forthcoming USACE parametric analysis, the BNI parametric analysis, the PT workshop discussions, and other inputs, as appropriate.

Issues Expected in the Next Reporting Period.

- The PT Facility planned work will continue to be reprioritized due to increased focus on higher priority DFLAW/LBL activities. Work is continuing on technical issue resolution related to erosion/corrosion in piping and vessels and progression of the conceptual design incorporating the SHSV test design prototype at a slower pace due to the reduced resources.
 - *Impact:* The PT Facility redesign is likely to continue to be delayed. ORP is analyzing the impacts of this delay and other factors on its ability to achieve Amended Consent Decree milestones for the PT Facility.
 - *Actions initiated or taken to address potential project schedule slippage:* ORP is analyzing the potential impacts of continued funding limitations on the WTP Project by considering the forthcoming USACE parametric analysis, the BNI parametric analysis, the PT workshop discussions, and other inputs, as appropriate. A workshop is planned for April 11, 2018, to strategize and develop options regarding the PT Facility.

Status of Outstanding WTP Technical Issues

ORP has determined the nuclear safety technical issues, “Preventing Potential Hydrogen Build-Up” (i.e., T1 and T3) and “Preventing Criticality” (i.e., T2) have been sufficiently resolved to allow engineering to proceed in support of design and safety basis development. Work will continue on resolving remaining technical issues, “Ensuring Control of the Pulse Jet Mixers” (i.e., T4), “Protecting against Possible Erosion and Corrosion” (i.e., T5), and “Ensuring Ventilation Balancing” (i.e., T8). Resolution of the remaining technical issues, with notification to the Defense Nuclear Facilities Safety Board, is expected in the July/August 2018 timeframe.

ORP worked with BNI to develop closure packages for each technical issue, defining work scope, required deliverables, and technical issue closure criteria. The status of each of the five

⁸ See footnote 4 above.

technical issues identified in the Third Order Regarding Motions to Modify Consent Decrees is provided below:

- ***Preventing Potential Hydrogen Build-Up:***
 - *Issue:* This issue encompasses two separate but related hydrogen risks:
 - Risk of combustion in vessel headspace due to hydrogen accumulation (i.e., T1).
 - Risk of hydrogen in piping and ancillary vessels that could lead to a hydrogen deflagration or detonation in a piping system (i.e., T3).
 - *Status:*
 - *Hydrogen in Vessels:* As noted in previous quarterly reports, this technical issue has been sufficiently resolved to allow engineering to proceed in support of design and safety basis development.
 - *Hydrogen in Piping and Ancillary Vessels:* As noted in previous quarterly reports, this technical issue has been sufficiently resolved to allow engineering to proceed in support of design and safety basis development.
- ***Preventing Criticality:***
 - *Issue:* A total of 16 Hanford waste tanks may contain plutonium particles of the size and density that makes them prone to settling in a WTP process vessel into a configuration that could result in an inadvertent criticality event (i.e., T2).
 - *Status:* As noted in previous quarterly reports, this technical issue has been sufficiently resolved to allow engineering to proceed in support of design and safety basis development.
- ***Ensuring Control of the PJMs:***
 - *Issue:* Concern with adequacy of PJMs and PJM controls to adequately mix high-solids slurries in PT Facility process vessels (i.e., T4 [“Ensuring Control of the Pulse Jet Mixers”]).
 - *Status:*
 - As noted in previous reports, BNI is conducting a test program to demonstrate the ability of PJM vessels to adequately mix high-solids slurries in the PT Facility. Results from the first and second phase of PJM control system testing were previously provided. The final phase of PJM control system testing is complete.
 - ORP and BNI identified a proposed PJM mixing SHSV design to replace a number of vessel designs in the PT Facility. A prototype of the 16-foot-diameter SHSV design was commissioned for the final stage of PJM control system testing to support resolution of PJM mixing and control issues applicable to vessels with high-solids concentrations and non-Newtonian slurries. Testing demonstrated the required PJM control parameters and control approach to be used during the qualification of the design for the SHSV implementation. PJM controls testing was completed in April 2017. Mixing testing was completed in September 2017. BNI completed data analysis and documentation for the recently completed

full-scale PJM mixing system testing and the results from the final stage testing are expected to provide the required design and operations information to perform PT Facility design.

- ***Protecting against Possible Erosion and Corrosion:***

- *Issue:* Uncertainties exist in waste feed characteristics and the ability to meet a 40-year service life; requiring confirmation of the erosion/corrosion design basis, including margin, through testing and analysis (i.e., T5).
- *Status:*
 - BNI is developing an engineering study for jet impingement erosion in PJM vessels.
 - BNI is developing an engineering calculation to address localized erosion wear allowance for PJM vessels.
 - Laboratory scale corrosion testing to assess localized corrosion material degradation mechanisms is complete. This testing involved immersion of small metal samples in fluids representing anticipated WTP chemistries. Material degradation mechanisms evaluated included pitting, crevice cracking, and stress cracking.
 - A testing program to provide the technical information to underpin the design basis for erosion and corrosion was implemented.
 - A WTP basis of design change notice establishing the erosion/corrosion basis of design parameters has been issued.
 - A pipe loop test platform to evaluate wear in piping is complete and the test plan is in final development. Additional assessments are being made to determine how much of this testing is required.
 - BNI is expected to issue an update to the localized corrosion test basis document supporting closure of technical issue T5 and closure of the T5 corrective action plan by the end of the next reporting period (originally planned for April 2018). Comment resolution on the T5 corrosion test report has taken longer than expected.

- ***Ventilation System:***

- *Issue:* There are multiple technical challenges associated with the PT Facility ventilation system, including cascading airflows from lower to higher contaminated areas and performance of HEPA filters (i.e., T8).
- *Status:*
 - Resolution of this technical issue requires completing engineering/nuclear safety assessments to ensure the PT Facility ventilation system meets performance requirements, which will be initiated once the PJM testing and its ventilation demands are finalized.

- Testing of HEPA filters to ensure filters can withstand environmental conditions and loading during normal and off-normal operating conditions is complete. HEPA filter design and qualification testing have been performed and reported under the HLW Facility project. Several filter designs were under consideration for testing and qualification. One of the filter designs has successfully completed Nuclear Quality Assurance-1 qualification testing at Mississippi State University for all WTP normal and abnormal conditions. Based on the successful filter design bounding all WTP normal and abnormal conditions, it was concluded that alternative filter designs and testing were not required. The final test report was issued in September 2017.

High-Level Waste Facility

Federal Project Director: Tom Fletcher

Facility Federal Project Director: Wahed Abdul

The HLW Facility will receive the separated high-level waste concentrate from the PT Facility. This concentrate will be blended with glass formers, converted into molten glass in one of the two HLW Facility 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, engineering design was 89 percent complete, procurement was 81 percent complete, construction was 43 percent complete, and startup and commissioning was 4 percent complete. The physical percent complete analysis for the HLW Facility was frozen in September 2012, pending development of a revised baseline to address technical and design issues.

Work on the HLW Facility is performed in accordance with the FY 2017 through FY 2021 Interim Work Plan. Through FY 2017, BNI was working under a limited construction and procurement authorization, and BNI's efforts were focused on completing activities required to resume full-production engineering, procurement, and construction of the HLW Facility (i.e., DOE Decision 2A, "Authorization to Resume HLW Procurement and Construction"). To support the DOE Decision 2A objective, BNI submitted a facility completion plan identifying the strategy for obtaining full-production authorization, which was approved by ORP.

As previously reported, BNI provided the final *Design and Operability Disposition Report* to ORP, summarizing the issue resolutions path forward. ORP reviewed all disposition comments for adequacy. Based on completion of the *Design and Operability Disposition Report*, BNI notified ORP it had completed the required criteria for DOE Decision 2A pending ORP approval of the updated 24590-WTP-PSAR-ESH-01-002-04, *Preliminary Documented Safety Analysis to Support Construction Authorization: HLW Facility Specific Information*, to align facility design with the nuclear safety basis. This was a primary focus of the ORP-chartered Safety Basis Review Team in FY 2017.

ORP approved Rev. 7 of the updated HLW Facility Preliminary DSA and issued a letter to BNI in FY 2017 indicating DOE Decision 2A criteria for authorization to resume HLW Facility procurement and construction activities have been met.

Quarterly Statement: There are no missed milestones that may affect compliance with other milestones.

Accomplishments during the Reporting Period

- At the request of ORP, the USACE has been conducting a parametric analysis of certain options and funding scenarios to evaluate the likelihood of achieving PT- and HLW-related Consent Decree milestones in the event a decision is made to keep those facilities in preservation mode for another 3 to 5 years so as to allow DOE to focus

funding and efforts on the completion of DFLAW commissioning.⁹ Results from the USACE parametric analysis will be considered by ORP along with other analyses, to support long-range planning options. ORP entered into an Interagency Agreement with the USACE on January 16, 2018, to perform this assessment. The USACE work commenced on February 21, 2018.

- DOE directed BNI to perform a study of the necessary elements of any continued preservation and maintenance plan for the PT and HLW facilities. BNI issued study *Evaluation of Potential Continued Preservation and Maintenance, and Restart of Facilities*, on February 13, 2018.
- ORP and BNI staff participated in a workshop on March 8, 2018, to strategize and consider options for advancing the HLW Facility. The workshop focused on documenting scope changes resulting from design and nuclear safety updates, funding required to implement continued preservation and maintenance activities, and strategies for retaining core competencies. The path forward includes continued long-range planning and analysis around decisions needed to support HLW Facility completion milestones.
- BNI is continuing fabrication of RLD-7 and RLD-8 vessels. These vessels are located in the wet process cell and must be installed prior to concrete slab placement, which will support roof installation and building enclosure.

Accomplishments Expected in the Next Reporting Period

- In accordance with the additional funding received for the HLW Facility in the *Consolidated Appropriations Act, 2018*, enacted on March 23, 2018, ORP is expected to determine which additional activities could be performed at the HLW Facility in FY 2018. ORP will continue discussions with DOE Office of Environmental Management staff about the direction to provide BNI regarding engineering, procurement, and construction activities for the HLW Facility.
- BNI will continue to focus on facility preservation and preventative maintenance at the HLW Facility to protect equipment and structures and ensure that design documents are maintained, while the emphasis is placed on DFLAW/LBL activities.
- ORP expects to receive an evaluation from the USACE (noted above) after it completes its parametric analysis of certain options and funding scenarios evaluating the likelihood of achieving PT- and HLW-related milestones in the event a decision is made to keep those facilities in preservation mode for another 3 to 5 years so as to allow DOE to focus funding and efforts on the completion of DFLAW commissioning.
- BNI will continue to update its long-range planning documents to support a future rebaseline effort as resources become available.

⁹ See footnote 4 above.

Issues Encountered during the Reporting Period

- The HLW Facility planned work has been reprioritized because of the need for additional resources to support DFLAW/LBL activities. Reduced resources have resulted in limited engineering assets to perform production work and in construction curtailment. Reprioritizing work activities impacted design and construction such that installation of roofing and siding on the facility is not expected in the near term. Congress provided funding to DOE and other federal agencies during the reporting period through several continuing resolutions. As of February 28, 2018, FY 2018 funding for the WTP Project remained subject to a Continuing Resolution that limited funding to the \$690 million level appropriated in FY 2017. Funding for the remainder of FY 2018 was appropriated by the *Consolidated Appropriations Act, 2018*, enacted on March 23, 2018.
 - *Impact:* Delay in completing HLW Facility redesign activities.
 - *Actions initiated or taken to address potential project schedule slippage:* ORP is analyzing the potential impacts of continued funding limitations on the WTP Project by considering the forthcoming USACE parametric analysis, the BNI parametric analysis, the HLW workshop discussions, and other inputs, as appropriate.

Issues Expected in the Next Reporting Period

- The HLW Facility planned work will continue to be reprioritized due to increased focus on higher priority DFLAW/LBL activities. Additional funding for the HLW facility provided by the *Consolidated Appropriations Act, 2018*, enacted on March 23, 2018, will allow ORP to evaluate and prioritize key engineering and nuclear safety activities to be performed over the next 2 years.
 - *Impact:* The HLW Facility redesign is likely to continue to be delayed. ORP is analyzing the impacts of this delay and other factors on its ability to achieve Amended Consent Decree milestones for the HLW Facility.
 - *Actions initiated or taken to address potential project schedule slippage:* ORP is analyzing the potential impacts of continued funding limitations on the WTP Project by considering the forthcoming USACE parametric analysis, the BNI parametric analysis, the HLW workshop discussions, and other inputs, as appropriate.

Low-Activity Waste Facility¹⁰

Federal Project Director: Tom Fletcher

Facility Federal Project Director: Wahed Abdul

The 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 Facility's two melters at a design capacity of 30 metric tons per day, heated to 2,100°F, 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 February 2018, the LAW Facility was 68 percent complete overall, engineering design was 89 percent complete, procurement was 82 percent complete, construction was 92 percent complete, and startup and commissioning was 16 percent complete.

Quarterly Statement: There are no missed milestones that may affect compliance with other milestones.

Accomplishments during the Reporting Period

- In February 2018, BNI briefed ORP on its reevaluation of the DFLAW/LBL completion schedule to accelerate the LAW Facility DSA approval, construction, startup, and commissioning to achieve production of glass by December 2021, as referenced in ORP letter 17-WTP-0208 REISSUE, "Reissue – Contract No. DE-AC27-01RV14136 – Programmatic Actions Needed to Ensure Certainty of Completion of Waste Treatment and Immobilization Plant Facilities Needed for Direct-Feed Low-Activity Waste." BNI's updated DFLAW/LBL schedule showed a November 2022 completion date, which is approximately 10 months later than the contractual completion date of January 15, 2022. ORP directed BNI to reevaluate the DFLAW/LBL optimized schedule to pull the completion schedule date closer to the contract completion date.
- In March 2018, BNI briefed ORP on a revised DFLAW/LBL optimized schedule, which brought the schedule back in line with the contract completion date of January 15, 2022. ORP is reviewing BNI's latest DFLAW/LBL optimized schedule and associated documentation. The effect of this action is not anticipated to affect DOE's ability to achieve the Amended Consent Decree milestone date for LAW Facility Hot Commissioning Complete of December 31, 2023.
- BNI formally submitted the LAW Facility DSA to ORP for approval on March 23, 2018. ORP is conducting a final review of the DSA and is developing the safety evaluation report for approval of the DSA.

¹⁰ Information about the related Low-Activity Waste Pretreatment System and tank-side cesium removal is included in the monthly reports submitted under the *Hanford Federal Facility Agreement and Consent Order* (also known as the Tri-Party Agreement or TPA).

- BNI completed and froze the design of the LAW Facility.
- BNI awarded the contract for the LAW Facility programmable protection system software and hardware procurements.
- BNI construction completed the 8-week walkdowns of the following systems that support turnover to the Startup organization:
 - Heat trace electrical system
 - Fire detection and alarm system 1
 - Fire protection water system 1
 - Process control system 2
 - LAW container finishing handling system 1 and 2.
- BNI construction completed the follow-on, 3-week walkdowns before turning the following systems over to the Startup organization:
 - Process control system 4
 - Chilled water system 1.
- BNI construction turned the following LAW Facility systems over to the Startup organization:
 - Instrument air systems 1, 2, and 4
 - Medium voltage (13.8/4.16 kv) system
 - Atmospheric reference ventilation system
 - Demineralized water systems 2 through 5
 - CIV systems 1 and 2
 - Fire detection and alarm system 2
 - Fire protection water system 2.
- BNI construction completed melter No. 1 modifications of the glass pour seal head for air lance installations and the insulation.
- BNI construction completed insulation of the thermal catalytic oxidizer.
- BNI awarded the contract for the truck bay canopy steel.

Accomplishments Expected in the Next Reporting Period

- ORP will continue to review BNI's latest DFLAW/LBL optimized schedule and associated documentation to ensure the completion schedule date of January 15, 2022, is achievable. The effect of this action is not anticipated to affect DOE's ability to achieve the Amended Consent Decree milestone date for LAW Facility Hot Commissioning Complete of December 31, 2023.
- ORP is expected to conduct a final review of the LAW Facility DSA, with approval of the DSA and LAW Safety Evaluation Report expected in the next reporting period.
- BNI is expected to complete the requirements of contract milestone A-5, "Final LBL Physical Plant Complete," and submit the documentation to ORP for review in late April/early May 2018, ahead of the contract milestone date of June 28, 2018.

- BNI is expected to complete installation of remaining melter system support equipment for melter No. 1 and melter No. 2 including primary offgas spool fittings (Hiltap fittings), glass pour seal head assemblies, and seismic conduit supports.
- BNI construction is expected to turn the following systems over to the Startup organization:
 - Direct current electrical system – DCE-L-01
 - Instrument service air – ISA-0
 - Uninterruptible power electrical system 1
 - Low-voltage electrical (480/208/120 V) system 2
 - Chilled water system 2
 - Domestic (potable) water system.
- BNI is expected to issue the material requisition for purchase of the pressure safety valve for the sodium hydroxide reagent system.
- BNI is expected to issue the material requisition for purchase and award of the pressure sensor and alarm panel.

Issues Encountered during the Reporting Period

- None.

Issues Expected in the Next Reporting Period

- The concern with BNI's commercial grade dedication (CGD) program noted in previous reports (e.g., November 2017 Quarterly Report) remains an issue for the WTP Project.
 - *Impact:* This puts at risk some of the equipment purchased, which performs a specific safety function in the LAW Facility. The consequence of identified CGD deficiencies are:
 - Material requisitions with vendors are in the process of being revised or reestablished to incorporate the new CGD documentation and test requirements.
 - CGD plans produced by both vendors and WTP are in the process of being updated; additional documentation and testing will be required to meet the updated CGD plans; where test results or documentation cannot demonstrate items meet the required critical characteristics, items will need to be repurchased to replace existing equipment.
 - *Actions initiated or taken to address potential project schedule slippage:*
 - Efforts to qualify existing items to the new CGD plans are ongoing. These actions will modify existing requisitions or reopen closed material requisitions as necessary to upgrade the CGD plans and provide additional documentation and testing of items, or generating new material requisitions to purchase replacement equipment that cannot be qualified.
- Concerns remain related to BNI's latest DFLAW/LBL optimized schedule (noted above). ORP's review of the optimized schedule and associated documentation will continue.

Balance of Facilities

Federal Project Director: Tom Fletcher

Facility Federal Project Director: Jason Young

BOF will provide services and utilities to support operation of the main production facilities: PT, HLW, LAW, and LAB. As of February 2018, BOF was 72 percent complete overall, engineering design was 92 percent complete, procurement was 84 percent complete, construction was 93 percent complete, and startup and commissioning was 37 percent complete. Design of the EMF was 79 percent complete.

BNI Engineering has completed the requirements verification matrix and developed the draft test matrix for each BOF system. This completes and freezes the design for BOF. BNI Engineering efforts are focused on completion of the EMF design, supporting the EMF dangerous waste permit applications, supporting EMF procurement activities, and providing field support for BOF startup activities. Construction was focused on formwork and rebar installation to support placement of the EMF second-lift walls. These efforts will now shift to a focus on topping slab completion and utility rack placement. Startup testing continues for BOF systems. Functional testing is complete for the water treatment facility. The cooling tower facility is preparing for testing of the medium-voltage system and large cooling water pumps. The chiller compressor plant is preparing for medium-voltage testing in support of upcoming testing of the chill water pumps and rotary screw air compressors.

The BOF are designed to support operation of the entire WTP, and construction is complete for the majority of BOF systems. To improve operational flexibility and support WTP operations in a DFLAW configuration, additional construction and facility modifications are required.

Operational flexibility improvements to the BOF include:

- Design and construction of an EMF to concentrate effluents from the LAW Facility, allow transfer of secondary effluent stream to the Liquid Effluent Retention Facility/Effluent Treatment Facility, and provide a low point drain for potential contaminated systems during DFLAW operations.
- Addition of a fourth rotary screw air compressor to the chiller compressor plant and piping reconfigurations to optimize operations at a reduced facility output level.
- Modifications to steam plant piping and equipment to optimize operations at a reduced facility output level.
- Construction of a fenced area to separate the portion of WTP actively operating in a DFLAW configuration from construction activities for the HLW and PT facilities.
- Improved isolation capabilities for BOF systems to maintain safe control and isolation within the DFLAW operations area.

Quarterly Statement: There are no missed milestones that may affect compliance with other milestones.

Accomplishments during the Reporting Period

- EMF equipment permitting package No. 1 was approved by Ecology with an effective date of March 5, 2018.
- ORP formally submitted the EMF equipment package No. 2 permit modification to Ecology and the 45-day public comment period began on March 5, 2018.
- BNI placed the first section of the EMF second-lift walls.
- BNI continued placement of the EMF topping slabs.
- BNI completed the turnover of the cooling tower medium-voltage system to support startup testing.
- BNI completed installation of medium-voltage, motor-starter kits for the cooling towers.

Accomplishments Expected in the Next Reporting Period

- ORP and BNI are expected to submit the EMF equipment permitting package No. 3 to Ecology for formal review.
- BNI is expected to complete placement of the EMF low-point drain second-lift walls.
- BNI is expected to complete functional testing of the water treatment facility potable water, process service water, and deionized water systems.
- BNI is expected to continue placement of the EMF topping slabs.
- BNI is expected to complete balancing of the cathodic protection system.
- BNI is expected to complete placement of the EMF processing building second-lift walls.

Issues Encountered during the Reporting Period

- Continued delays during BOF system completion and turnover to startup, as described below, are impacting the project schedule.
 - *Impact:* Delayed BOF system completion and turnover to startup are extending the construction schedule and narrowing the available periods for startup testing. However, the effect of the delays in the project schedule are not anticipated to affect DOE's ability to achieve Amended Consent Decree milestones for the LAW Facility at this time.
 - *Actions initiated or taken to address potential project schedule slippage:*
 - BNI is conducting weekly management meetings to evaluate system completion against the schedule and emphasize the need for system punch list completion.
 - Production meetings are focused on completion of outstanding work items.

- The startup testing organization introduced additional rigor into system reviews prior to turnover.

Issues Expected in the Next Reporting Period

- Continued delays during BOF system completion and turnover to startup, as described above.

Analytical Laboratory

Federal Project Director: Tom Fletcher

Facility Federal Project Director: Jason Young

The LAB will support WTP operations by analyzing feed, vitrified waste, and effluent streams. As of February 2018, the LAB was 70 percent complete overall, engineering design was 89 percent complete, procurement was 89 percent complete, construction was 97 percent complete, and startup and commissioning was 26 percent complete.

During this reporting period, engineering efforts were focused on the completion of all requirements verification matrices and the development of system test matrices. These two activities are the key requirements for completing the design freeze for LAB systems. Startup efforts are focused on scheduling the appropriate turnover sequence for LAB systems for startup testing. Personnel and equipment are moving into the temporary offsite laboratory space. This will allow methods development to occur in parallel with system startup testing.

Quarterly Statement: There are no missed milestones that may affect compliance with other milestones.

Accomplishments during the Reporting Period:

- BNI established the temporary offsite laboratory space to support LAB methods development in parallel with LAB startup and commissioning activities.
- BNI continued turnover of LAB systems and startup testing of systems as they became available. BNI has completed the turnover of 15 LAB systems for startup testing.
- BNI completed the requirements verification matrices and development of all LAB system test matrices. This completes and freezes the design for LAB.

Accomplishments Expected in the Next Reporting Period

- BNI is expected to turn over the LAB C1V system for startup testing.
- BNI is expected to turn over the LAB chilled water system for startup testing.
- BNI is expected to continue turnover of LAB systems and startup testing of systems as they become available.

Issues Encountered during the Reporting Period

- None.

Issues Expected in the Next Reporting Period

- None.

Written Directives for WTP¹¹

Written directives given by DOE to the WTP contractor from February 17, 2018, through March 31, 2018, for work required by the Consent Decrees.

Four letters of direction were issued to BNI during the reporting period in reference to Contract No. DE-AC27-01RV14136, *Design, Construction, and Commissioning of the Hanford Tank Waste Treatment and Immobilization Plant*. The letters are listed below and copies are attached:

- 18-QAD-0016, “Contract No. DE-AC27-01RV14136 – U.S. Department of Energy, Office of River Protection Request for Investigation of Issues With Structural Steel Material Records,” dated March 6, 2018
- 18-CPM-0038, “Contract No. DE-AC27-01RV14136 – Notification to Bechtel National, Inc. of Expectations of Satisfactory Project (Performance) Management and Continued Withholding of Provisional Fee,” dated March 23, 2018
- 18-CPM-0039, “Contract No. DE-AC27-01RV14136 – Award Fee Determination for Period 2017,” dated March 26, 2018
- 18-CPM-0045, “Contract No. DE-AC27-01RV14136 – Transmittal of Contract Modification No. 420, Definitize Effluent Management Facility Differing Subsurface Conditions,” dated March 29, 2018.

¹¹ Written directives given by the U.S. Department of Energy to the Waste Treatment and Immobilization Plant contractor from January 1, 2018, through February 16, 2018, for work required by the Consent Decrees were provided in the last quarterly report.

Enclosure

(8 Pages Excluding Cover Sheet)

Written Directives from February 17, 2018, through March 31, 2018

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OFFICE OF RIVER PROTECTION

P.O. Box 450, MSIN H6-60
Richland, Washington 99352

MAR - 6 2018

18-QAD-0016

Ms. K.D. Irwin
Project Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Ms. Irwin:

CONTRACT NO. DE-AC27-01RV14136 – U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION REQUEST FOR INVESTIGATION OF ISSUES WITH STRUCTURAL STEEL MATERIAL RECORDS

References: See page 3

During recent oversight, the U.S. Department of Energy, Office of River Protection (ORP) reviewed the References and identified the quality records needed to demonstrate that the important-to-safety structural steel could perform its safety function were either missing or of indeterminate quality. This condition is a potentially unrecoverable quality issue. The major Waste Treatment and Immobilization Plant (WTP) facilities, including Low-Activity Waste, are credited in the safety bases to reduce the probability of a release of radioactive and chemically hazardous material by maintaining their structural stability under design basis events and provides support for major WTP systems during normal, abnormal, and accident conditions. Structural steel, in conjunction with reinforced concrete structures, is integral to performing functions relied on in safety basis accident analyses.

ORP is concerned with the age of the issue coupled with the apparent lack of appropriate corrective actions and a documented extent of condition to evaluate whether the issue pertains to other accepted items (e.g., rebar, hangers, piping).

ORP directs Bechtel National, Inc. (BNI) to promptly investigate the facts and circumstances surrounding the procurement, receipt, and acceptance of materials installed in WTP described herein to justify the continuation of work. Within 14 calendar days of receipt of this letter, BNI shall brief ORP concerning the results of the investigation to determine the extent of condition, to provide a technical basis for continuation of procurement activities, and the controls to be applied for the continued receipt, acceptance, and installation of important-to-safety items in all WTP facilities, including the Effluent Management Facility. Within 30 calendar days of receipt of this letter, BNI shall submit formal documentation of the investigation, the extent of condition, the implemented controls, and the action plan to remediate the deficiencies identified in the cited condition reports.

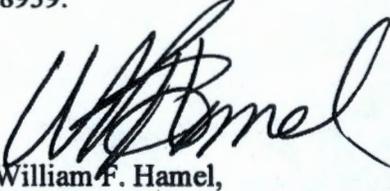
Ms. K.D. Irwin
18-QAD-0016

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MAR - 6 2018

The action taken herein is considered to be within the scope of work of the existing contract and does not authorize the Contractor to incur any additional costs (either direct or indirect) or delay delivery to the Government. If the Contractor considers that carrying out this action will increase contract/project costs or delay of delivery, the Contractor shall promptly notify the Contracting Officer orally, confirming and explaining the notification in writing within ten (10) calendar days, and otherwise comply with the requirements of the Contract clause I.84 FAR 52.243-7, - "Notification of Changes (APR 1984)." Following submission of the written notice of impacts, the Contractor shall await further direction from the Contracting Officer.

If you have any questions, please contact me, or your staff may contact Paul A. Schroder, Director, Quality Assurance Division, (509) 373-8939.



William F. Hamel,
Assistant Manager, Federal Project Director
Waste Treatment and Immobilization Plant

QAD:WBS

cc: L. Fritz, BNI
K.D. Irwin, BNI
D.E. Kammenzind, BNI
B.P. Reilly, BNI
J. Tibble, BNI
P. Fox, DNFSB
BNI Correspondence

- References:
1. 24590-WTP-NCR-CON-13-0057, *LAW Missing Mill test reports for Pour cave and Process Cell hatch plates [RVP]*, issued March 19, 2013.
 2. 24590-WTP-PIER-MGT-13-0440, *MTRs Not Found In MRR Packages for Structural Steel [RVP]*, issued April 15, 2013.
 3. 24590-WTP-GCA-MGT-17-01862, *Structural Steel Mill Test Reports missing from HLW Structural Steel Material Receiving Reports*, issued December 20, 2017.
 4. 24590-WTP-GCA-MGT-17-01863, *Structural Steel Mill Test Reports missing from LAB Structural Steel Material Receiving Reports*, issued December 20, 2017.
 5. 24590-WTP-GCA-MGT-17-01864, *Structural Steel Mill Test Reports missing from LAW Structural Steel Material Receiving Reports*, issued December 20, 2017.



OFFICE OF RIVER PROTECTION
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

MAR 23 2018

18-CPM-0038

Mr. C.K. Binns
Business Services Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Mr. Binns:

CONTRACT NO. DE-AC27-01RV14136 – NOTIFICATION TO BECHTEL NATIONAL, INC. OF EXPECTATIONS OF SATISFACTORY PROJECT (PERFORMANCE) MANAGEMENT AND CONTINUED WITHHOLDING OF PROVISIONAL FEE

- References:
1. ORP letter from W.F. Hamel to K.D. Irwin, BNI, "Concerns with Balance of Facilities Startup," 17-WTP-0163, dated August 23, 2017.
 2. ORP letter from W.F. Hamel to K.D. Irwin, BNI, "Concerns with Schedule Impacts from Baseline Change Proposals," 18-WTP-0021, February 15, 2018.
 3. ORP letter from W.F. Hamel to K.D. Irwin, BNI, "Performance Concerns with Balance of Facilities Startup and Project Baseline Management," 18-WTP-0026, dated March 2, 2018.

The purpose of this letter is to communicate to Bechtel National, Inc. (BNI) the U.S. Department of Energy, Office of River Protection (ORP) expectations for satisfactory Project (Performance) Management of the Waste Treatment and Immobilization Plant (WTP), and to notify BNI that ORP will not be paying the provisional fee previously withheld. ORP is concerned that after several performance issues as listed in the References, that BNI is not making satisfactory progress in meeting the project performance expectations of Demonstration of Hot Commissioning by the January 15, 2022, contract milestone date. As stated in the References, ORP has concerns with ongoing performance issues, and will continue to withhold all provisional fee, pending BNI protracted demonstration of satisfactory performance in the following areas:

- o Developing and maintaining a contract compliant, resource loaded, logic-tied schedule with discrete tasks through contract completion, including credible and accurate critical path network(s) that accurately portray critical work activities toward meeting the contract milestone date of January 15, 2022, for demonstration of Direct Feed Low-Activity Waste (DFLAW) hot commissioning.

Mr. C.K. Binns
18-CPM-0038

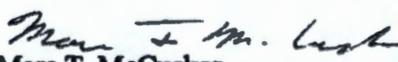
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MAR 23 2018

- Institutionalizing a set of meaningful, credible, and fully transparent project performance metrics that accurately portray project cost and schedule performance against the plan, and include leading indicators that allow for early and effective management intervention for adverse performance trends, resulting in a protracted period of sustained performance toward meeting contract milestone date of January 15, 2022, for demonstration of DFLAW hot commissioning.
- Demonstrating proactive, timely, and thorough responses and closure of conditions adverse to quality. This performance improvement element requires improvement in the timely and effective closure of residual open quality issues and measured improvement of corrective action and general quality assurance programs for completion of engineering, procurement and construction of Laboratory, Balance of Facilities, and Low Activity Waste Facility (collectively known as LBL) and DFLAW facilities, and into startup and commissioning of the DFLAW facilities. ORP and BNI shall meet immediately to collectively agree on all requirements for completion of these responses and closures.

The release of previously withheld provisional fee payments, and future provisional fee payments, will be revisited for Contracting Officer determination once the protracted demonstration of satisfactory performance outlined above has been adequately demonstrated.

If you have questions, please contact me at (509) 376-2760, or you may contact Ronnie L. Dawson at (509) 372-0098.


Marc T. McCusker
Contracting Officer

CPM:RLD

cc: G.A. Jones, RL-AMB
D.C. Kemp, RL-FIN
L. Parker, RL-FIN
T.L. Toon, RL-FIN
BNI Correspondence



OFFICE OF RIVER PROTECTION
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

MAR 26 2018

18-CPM-0039

Mr. Brian Reilly, Project Director
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Mr. Reilly:

CONTRACT NO. DE-AC27-01RV14136 – AWARD FEE DETERMINATION FOR PERIOD 2017

- References:
1. Contract No. DE-AC27-01RV14136 – Section B.8 Award Fee Administration.
 2. Performance Evaluation and Measurement Plan for Award Fee Period 2017, Rev.2.

In accordance with Reference 1, under the subject Contract for Award Fee Period 2017, covering January 1, 2017 through December 31, 2017, the U.S. Department of Energy (DOE), Office of River Protection (ORP), determined Bechtel National, Inc.'s (BNI) Award Fee as follows:

Incentive B.1 – Award Fee-Project Management

Total Available Fee	\$6,472,103
Award Fee Rating (Numerical)	50*
Total B.1 Award Fee for 2017	<u>\$3,245,961</u>

Incentive B.2 – Award Fee-Cost

Total Available Fee	\$1,400,000
Award Fee Rating (Numerical)	40
Total B.2 Award Fee for 2017	<u>\$560,000</u>

Total Award Fee – Period 2017	<u>\$3,805,961</u> 48%*
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*Figure rounded to the nearest whole number.

Mr. Brian Reilly
18-CPM-0039

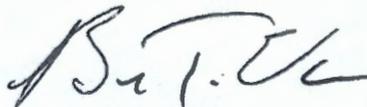
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MAR 26 2018

I am making this determination based on the Federal Project Director's recommendation, BNI's Self-Assessment, and detailed performance input from DOE Headquarters and Environmental Management staff. Evaluating all of the internal and external input and my own personal observations of BNI's performance, I utilized my independent professional judgment to make the determination on the fee awarded to BNI for this rating period.

The Award Fee Determination Scorecard that reflects my determination and identifies the Key Positives and Key Areas for Improvement for the seven Award Fee Objectives will be posted to the ORP website.

If you have any questions, please contact me at (509) 372-2315.



Brian T. Vance
Fee Determination Official

CPM:REC

cc: BNI Correspondence



OFFICE OF RIVER PROTECTION

P.O. Box 450, MSIN H6-60
Richland, Washington 99352

MAR 29 2018

18-CPM-0045

Mr. C.K. Binns
Business Services Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Mr. Binns:

**CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF CONTRACT
MODIFICATION NO. 420, DEFINITIZE EFFLUENT MANAGEMENT FACILITY
DIFFERING SUBSURFACE CONDITIONS**

The purpose of this letter is to transmit an executed original of the subject modification. This modification revises Contract Sections B, *Supplies or Services and Prices/Cost*, by definitizing the negotiations of the Request for Equitable Adjustment for the Effluent Management Facility Differing Subsurface Conditions. The updated conformed contract sections can be accessed from the U.S. Department of Energy, Office of River Protection website.

If you have any questions regarding this contract action, please contact me at (509) 376-5583.

A handwritten signature in blue ink that reads "Ronald E. Cone Jr.".

Ronald E. Cone Jr.
Contracting Officer

CPM:REC

Attachment

cc w/attach:
BNI Correspondence