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U.S. Department of Energy  
**Office of River Protection**

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

09-WTP-155

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NWP - Richland

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Central Files WTP  
File Name: WTP-Semi-Annual Comp 1  
Cross Reference: X-M-162

Addressees:

HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (HFFACO) (ALSO KNOWN AS TRI-PARTY AGREEMENT) INTERIM MILESTONE M-62-01, "SEMI-ANNUAL COMPLIANCE REPORT FOR THE WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP)," FOR JANUARY 1 THROUGH JUNE 30, 2009

This letter transmits the U.S. Department of Energy, Office of River Protection, Semi-Annual Compliance Report (Attachment) required by Interim Milestone M-62-01 for the period January 01 through June 30, 2009. As stipulated in the M-62-01 milestone, this report includes project summaries of accomplishments, issues encountered, and actions being taken.

If you have any questions, please contact me, or your staff may contact John R. Eschenberg, Assistant Manager, Waste Treatment and Immobilization Plant Project, (509) 376-3681.

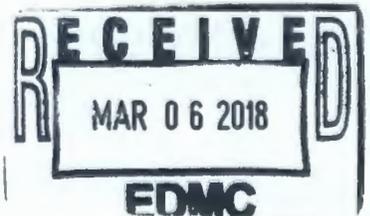
Sincerely,

*Shirley J. Olinger*  
Shirley J. Olinger, Manager  
Office of River Protection

WTP:RLC

Attachment

cc: See page 2



JUL 31 2009

Addressees  
09-WTP-155

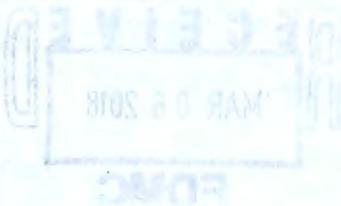
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cc w/attach:

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cc w/o attach:

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ATTACHMENT

09-WTP-155

U.S. DEPARTMENT OF ENERGY (DOE)  
OFFICE OF RIVER PROTECTION (ORP)  
SEMI-ANNUAL PROJECT COMPLIANCE REPORT FOR THE  
WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP)  
January 01 – June 30, 2009

(consisting of 27 pages)

**U.S. DEPARTMENT OF ENERGY (DOE)  
OFFICE OF RIVER PROTECTION (ORP)  
SEMI-ANNUAL PROJECT COMPLIANCE REPORT FOR THE  
WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP)  
January 01 – June 30, 2009**



**U.S. DEPARTMENT OF ENERGY  
OFFICE OF RIVER PROTECTION  
2440 Stevens Center Place  
Richland, Washington 99354**

**June 30, 2009**

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### LIST OF ACRONYMS

BNI	Bechtel National, Inc.
BOF	Balance of Facilities
CDR	conceptual design report
CPS	Cathodic Protection System
CSR	Craft Safety Representative
CY	calendar year
DAFW	days away from work
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EFRT	External Flowsheet Review Team
FY	fiscal year
HFFACO	<i>Hanford Federal Facility Agreement and Consent Order</i>
HLW	High-Level Waste [Facility]
HPAV	hydrogen in piping and ancillary vessel
HVAC	heating, ventilation and air conditioning
IRP	Issue Response Plan
LAB	Analytical Laboratory
LAW	Low-Activity Waste [Facility]
MAR	Material at Risk
ORP	Office of River Protection
P&ID	pipng and instrumentation drawing
PDSA	Preliminary Documented Safety Analysis
PEP	Pretreatment Engineering Platform
PIP	Process Improvement Project
PJM	pulse jet mixer
PMB	performance measurement baseline
PT	Pretreatment [Facility]
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RPP	River Protection Project
SC	Safety Class
SETO	WTP's People-Based Safety
SS	safety significant
SSC	systems, structures and components
STA	Site Technical Authority
TAR	Technical Authority Review
TSG	Technical Steering Group
VPP	Voluntary Protection Program
WRPS	Washington River Protection Solutions, LLC
WTP	Waste Treatment and Immobilization Plant Project

**U.S. Department of Energy, Office of River Protection  
River Protection Project – Waste Treatment and Immobilization Plant Project  
Semi-Annual Compliance Report  
Per Hanford Federal Facility Agreement and Consent Order Milestone M-62-01**

**1.0 INTRODUCTION**

A Semi-Annual Project Compliance Report (M-62-01P) that reflects the status of the U.S. Department of Energy (DOE), Office of River Protection (ORP) Waste Treatment and Immobilization Plant (WTP) Project is required by the *Hanford Federal Facility Agreement and Consent Order* (HFFACO) (Ecology et al. 1989) Milestone M-62-01. As detailed in M-62-01, this report documents for the period from January 1, 2009, through June 30, 2009, ORP's compliance with the HFFACO Milestone M-62-00 series requirements; updates WTP Project progress, activities, and issues relative to those milestones; and identifies activities expected in the near future.

**Hanford Site Background:** Hanford tank waste consists of approximately 53 million gallons of mixed hazardous waste containing 190 million curies of radioactive waste stored in underground storage tanks at the Hanford Site in Richland, Washington. This tank waste will be remediated through treatment and immobilization to protect the environment and meet regulatory requirements. DOE determined through the "Record of Decision for the Tank Waste Remediation System, Hanford Site, Richland, WA" (62 FR 8693) that the preferred alternative to remediate the Hanford tank waste is to:

- Pretreat the waste to prepare it for processing and vitrification;
- Immobilize the low-activity waste for onsite disposal; and
- Immobilize the high-level waste for ultimate disposal in the national repository.

**WTP Complex Description:** The River Protection Project (RPP) WTP complex is being designed, constructed, and commissioned for DOE by Bechtel National, Inc. (BNI) at the Hanford Site under DOE Contract No. DE-AC27-01RV14136. The WTP will be designed, constructed, and permitted to treat and immobilize mixed waste to support the RPP mission.

The WTP complex will receive waste in batches from Hanford's double-shell tank system, operated by the Tank Operations Contractor (Washington River Protection Solutions, LLC [WRPS]), through a pipeline system interface. The pretreatment process will separate (or continue to refine) the waste into low-activity and high-level waste fractions for vitrification. The vitrification process will combine pretreated tank waste with glass-forming materials and melt the mixture into a liquid that is poured into stainless steel containers, where the hot glass cools and hardens. Each container will then be sealed in preparation for storage and permanent disposal. The dangerous waste and radioactive constituents will be immobilized in this durable glass matrix through the WTP process.

The WTP complex waste-processing facilities include the waste-separating Pretreatment (P1) Facility, the glass-making High-Level Waste (HLW) Vitrification Facility, and the glass-making Low-Activity Waste (LAW) Vitrification Facility. These process facilities are supported by the WTP complex Analytical Laboratory (LAB) for process testing and the WTP Balance of Facilities (BOF) for infrastructure and utility services.

Semi-Annual Project Compliance Report for the Waste Treatment and Immobilization Plant, June 2009

**This compliance report reviews each of the WTP Project functional areas, and the overall project. Financial data and earned value data is through June 2009, unless otherwise noted. WTP Project status is also provided monthly through the Project Manager's Meeting and the Quarterly Milestone Review Meeting reports.**

## 2.0 WTP PROJECT ACCOMPLISHMENTS AND ISSUES

### 2.1 Progress to Date

#### 2.1.1 ORP – Project Management

**Safety Record:** WTP management remains focused on safety through improvements in leadership, communication, and disciplined execution of existing programs, as well as shifting the focus of safety improvement efforts from fixing conditions to further improvement in behaviors. Through June 2009 (6/7/09), the WTP Project achieved 6 consecutive months (153 days and over 2.65 million hours) without a days away from work (DAFW) injury. The calendar year (CY) 2009 cumulative recordable injury case rate total<sup>1</sup> through June was 1.50, compared to a rate of 1.12 in CY 2008 and to a rate of 1.16 for the same period in 2007. Although overall rates are higher at this point in the year, BNI management has taken actions, such as fully implementing the revised work control/hazards analysis process and instituting monthly safety walk-downs of the Construction Site with Building Trades Union representatives, which should improve the safety performance and have the rates trending down by the end of the year. (See Section 2.2.5 for additional improvement information.)

#### 2.1.2 WTP Complex Design and Construction

**Project Overview:** Design, procurement, and construction activities continue for all of the facilities. Engineering and Design for the WTP Project is 75% complete, construction is 45% complete, and the overall WTP Project is 49% complete.<sup>2</sup> Overall, there are over 3,000 FTEs working for BNI on the WTP Project, with an average of about 1,500 personnel (1,100 craft and 400 non-manual staff) that work onsite.

Issues associated with the maturity of technology in the WTP design have been evaluated by independent DOE Review Teams and in DOE's design oversight process. The most notable evaluation was the "Comprehensive External Review of the Hanford Waste Treatment Plant Flowsheet and Throughput" (CCN 132846) completed in March 2006 by the External (Expert) Flowsheet Review Team (EFRT). The EFRT was a team of external, distinguished senior professionals from private industry and academia that BNI commissioned in December 2005 to evaluate the technological aspects of the WTP process and evaluate whether the plant will operate as designed. The EFRT identified 28 separate technical issues, some of which had not been previously identified by either BNI or DOE; 3 additional issues were raised by an internal ORP review for a total of 31 issues. In response, BNI developed Issue Response Plans (IRP) for each of the major issues. A Technical Steering Group (TSG) was formed collaboratively

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<sup>1</sup> Recordable injury case rate total = Number of cases times 200,000 divided by cumulative hours; (Per the Occupational Safety and Health Administration, 200,000 represents the number of hours 100 employees working 40 hours per week, 50 weeks per year would work; this provides the standard base for calculating incidence rates.)

<sup>2</sup> Note that some of the percent complete values being reported may be lower than previously reported values. This results from the December 2008 Replan implemented by BNI and elimination of WBS 1.08, which has increased some of the WTP Project Budget-at-Complete (BAC) values. As a result of the increased budget base, several of the project-to-date percent complete values went down, as the percent complete is calculated by dividing the earned value by the BAC value.

between DOE and BNI to develop issue closure criteria and accept the data object quality evidence verifying the closure of the EFRT-identified issues to date. DOE reviewed and approved the IRPs as they were completed; to date 27 of these implementation plans have been closed, and the remaining issues are anticipated to be closed by the end of September 2009. (See Section 3.1 for further discussion.)

**Pretreatment Facility:** Engineering and design is approximately 74% complete, and construction is approximately 25% complete.

PT construction activities have been focused on the civil/structural area during this period. Construction on the walls between the 56' and 77' elevations and slabs at the 56' elevation is continuing. During the past six months a total of 21 placements totaling ~2,500 cubic yards of concrete have been placed. However, placements have been behind schedule recently due to a stand down of the tower crane, man-lifts etc., which resulted from safety issues in the last two months. Installation of structural steel is ahead of schedule, having installed 575 tons of platform steel at the 77' elevation at the West end of the facility. In addition, special protective coatings and installation of grillage and liner plates at the 0' elevations have continued.

Engineering completed the design of all concrete walls between 56' - 77' elevation, meeting a key contract milestone. Design of piping isometric drawings is ahead of schedule, completing more than 1200 feet of piping during the reporting period.

The majority of the technical issues raised by the EFRT have been resolved. Significant effort and progress has been made toward resolution of the remaining issues. EFRT issue M-12, the "Undemonstrated Leaching Process", is the most technically challenging, and is related to the work associated with the waste leaching and ultrafiltration processes to be performed in the PT Facility. Resolution is nearing completion. Tests were completed in April 2009 on a 1 to 4.5 scale-test platform, referred to as the Pretreatment Engineering Platform (PEP), and the preliminary results appear to validate the capability of the system. Draft reports were provided to DOE for review by the end of June 2009. Another key EFRT issue is M-3, Vessel mixing. Details of the second phase of vessel mixing testing and computational fluid dynamics (CFD) analyses have been developed. A large-scale platform has been installed at Richland, and water runs have been ongoing towards simulant tests. Additionally, tests are also planned at the Washington State University campus to determine various fundamental characteristics of the solids movement to allow validation of CFD modeling. It is anticipated that these tests and reports will be completed by the end of September. See Section 2.2 for additional details.

**High-Level Waste Vitrification Facility:** Engineering and design is approximately 80% complete, and construction is approximately 21% complete.

The number of craft personnel at the HLW Facility has increased to approximately 170 to support the placement of concrete walls and slabs, erection of structural steel, and installation of other commodities. During the period from January through June 2009, over 3,040 cubic yards of concrete have been placed, 230 tons of structural steel and 544 tons of rebar have been erected to support construction efforts at various elevations of the facility.

Engineering activities for this period included the issuance of architectural, embedment, structural steel and steel framing, piping, joggle, piping and instrumentation drawings; ventilation and instrument diagrams; and isometric drawings. Additional engineering activities included development of system logic and system block diagrams, review and approval of vendor submittals, and the development and review of engineering specifications for future procurements. The revised ground motion analysis and redesign activities for the HI.W Melter were completed this period. The factory acceptance testing on the two melter cave shield doors was completed at the vendor's facility.

Construction forces continued to install structural steel, decking, beam clips, rebar, concrete embedments, forms, and concrete at upper elevations. At the lower elevations, construction forces continued installing piping and pipe supports, heating, ventilation and air conditioning (HVAC) ductwork, electrical cable tray and conduit, area (cave) liner plating, mechanical equipment steel shapes (such as beams and rails), and coating of concrete and steel components in the facility.

**Low-Activity Waste Vitrification Facility:** Engineering and design is approximately 90% complete, and construction is approximately 54% complete.

Accomplishments this period include: completed melter base #2 fabrication; completed grouting the melter rails; received both glass former mixers; and, completed setting six melter feed process pumps for the LAW Melter Feed Process System and three for the LAW Concentrate Receipt Process System.

Crews continued to install: microporous insulation and stainless steel liner panels on the walls of melter pour caves; partition walls for the C2 Exhaust Filter room; piping in the process cells; the east Crane Maintenance Platform; bulges on the process cell change floor, process cell change floor area, and caustic scrubber tank area; glass former mixer frames and load cells; electrical bus duct for the low voltage electrical system; and, two-hour fire rated partition walls. Crews also continued to repair the intumescent fireproofing.

Currently ORP is working with BNI to resolve the technical issues surrounding the LAW Offgas System. The exit temperature from the exhausters is excessive for carbon bed operating temperatures. This will be resolved by moving the carbon beds upstream of the exhauster. Many actions have been completed to identify and resolve the chemical hazards in the LAW secondary offgas system including: leakage rate calculations and an operability assessment. BNI will have a recommended solution to these concerns in July. The critical path for LAW continues to be procurement and installation of the offgas treatment unit operation components including the thermal catalytic oxidizer. However, there is significant float in the schedule to allow for resolution of these issues without impacting the facility's scheduled completion date, and there are no significant permit impacts.

**Balance of Facilities:** Engineering and design is approximately 75% complete, and construction is approximately 54% complete.

Accomplishments this period include: completed electrical tray installation in the Switchgear Building; completed pressure testing the plant cooling water system supply pipe header in the Chiller Compressor Plant; completed system testing on the early fire water system; and issued the electrical design for the Anhydrous Ammonia Facility.

Crews continued: installation of electrical switchgear drip shields in the switchgear building; installation of piping and supports in the Water Treatment Building and Plant Service Air System; work on power cables from the Building 91 to the rotary screw compressors; and installation of conduits and control cables to overhead cable trays in the Chiller Compressor Plant.

In January, BNI notified ORP that the electrical load estimates for operation of the WTP exceeded the current Interface Control Document (ICD) estimate of 55 MW. The revised electrical load estimate is approximately 70 MW. Electrical load growth of the WTP is currently being resolved through the ICD process.

Bechtel National, Inc. (BNI) identified external defects to an 18-inch Plant Service Air line. This particular carbon steel pipe is coated with a fusion bonded epoxy and appears to have previously sustained mechanical damage during backfill operations and over time became subject to corrosive mechanisms. This Plant Service Air line was installed in late 2002. The pipe is designed to have Cathodic Protection as a method to mitigate corrosion. Energizing the Cathodic Protection system did not occur until February of 2009. In addition, difficulties in system balancing activities has also resulted in a delay to proper operation of the Cathodic Protection system. Based on the identified defects, the Office of River Protection (ORP) sent a letter requesting BNI's plan to evaluate the extent of the underground piping corrosion. BNI sent ORP their Plant Service Air Piping Corrosion Report, which included a detailed evaluation plan to assess the condition of the existing buried permanent plant piping on May 22<sup>nd</sup>, 2009.

The evaluation plan includes excavation of 11 sites for piping inspection. BNI commenced excavations on May 28<sup>th</sup>, and is scheduled to complete the excavations and inspections in late summer or early fall. Based on the results of the piping inspections, BNI will evaluate the need for further excavations.

**Analytical Laboratory:** Engineering and design is approximately 77% complete, and construction is approximately 52% complete.

BNI is substantially complete with the engineering design; however, there are some vendor designs of various components that are still outstanding. BNI formally notified ORP that they had completed fee milestone 'LAB Title 2 Design Complete'. This is the first fee milestone to be completed under the new contract.

Accomplishments this period include: Completion of the LAB Title II Design Complete Activity Milestone; installation of the Hotcell cast/west partition wall trolley covers; issuance of the

design compliance matrix for the in-cell monorail system; and installation of the north exterior Hot Cell wall.

Crews continued installation of: conduit east of the Hotcell; pipe and hangers for the Chill Water and Steam Systems; framing and drywall; components related to the Breathing Air System; and cable tray and conduit for lighting and fire detection and communications.

The Automatic Sampling System (ASX) is a critical system that samples waste from PT, HLW and LAW then transports these through a pneumatic transfer system to the LAB. The HLW and PT samples enter into a receipt station inside of the hot cells. The LAW samples are received in the radioactive laboratory. The design for the LAB components of the ASX are forecast for completion by the end of this fiscal year.

### 2.1.3 Commodities Installations

Based on the construction activities, the total WTP Project commodities placed or installed through June 2009 are summarized in Table 1.

**Table 1. Key Commodity Quantity Progress**

Quantity Progress	Current Forecasted at Completion Quantity	Installed To-Date Through June 2009	Percent Complete
Concrete	262,300 cy	187,250 cy	71.5%
Structural Steel	39,627 ton	13,840 ton	35%
Piping (in buildings)	920,830 ft	155,130 ft	17%
Piping (underground)	116,010 ft	95,500 ft	82%
Conduit (in buildings)	999,900 ft	103,460 ft	10%
Conduit (underground)	193,110 ft	176,160 ft	91%
Cable Tray	98,430 ft	19,990 ft	20%
Cable and Wire	4,931,880 ft	248,370 ft	5%
Heating, Ventilation, and Air-Conditioning Ductwork	4,310,170 lb	970,570 lb	22.5%

#### 2.1.4 Environmental Permits Required for Start of Construction

**Permitting and Licensing:** DOE and BNI continue to work with state and federal regulatory agencies to maintain permits, licenses, and authorizations needed to support WTP construction and commissioning. Permits required to support construction are in place. Permit modifications and revisions on evolving engineering designs are required and submitted on an ongoing basis. Non-radioactive and radioactive air permit applications containing updated design information have been approved. The Washington State Department of Health approved the radioactive air permit in June 2006, and Ecology approved the non-radioactive air permit in December 2006. WDOH approved a report of closure for Radioactive Air Emissions Notice of Construction (NOC) Approval for WTP Diffuse and Fugitive Emissions (Air 09-607, June 18, 2009).

Pursuant to Ecology's direction, renewal applications for WTP sand and gravel general permits are being prepared for submittal next reporting period for the concrete batch plant and pit 30 quarry operations.<sup>3</sup>

The DOE appeal to a 2006 Ecology-proposed permit modification has been resolved and the resulting revised permit conditions were released for a 45-day public comment period beginning October 20, 2008. Specifically, DOE filed the appeal to Ecology's final permitting decision based on two of the new permit conditions: (1) application of the High-Level Vitrification Land Disposal Restriction and (2) requirement for DOE to ensure all waste streams generated at the WTP do not contribute to an exceedance of unspecified environmental standards on disposal at the Hanford Site. Ecology approved the modification to delete the appealed permit conditions and replace them with the agreed-to revised permit conditions on February 20, 2009.<sup>4</sup> In addition, Ecology released permit design packages LAW-018, Miscellaneous Unit Subsystem Equipment for LAW Facility LAW Melter Process System<sup>5</sup> and PTF-095, Pretreatment In-Cell

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<sup>3</sup> Letter from Kelley Susewind, Ecology to Permittee (Bechtel National Incorporated), "Renewal of 2005 Sand & Gravel General Permit coverage", dated June 10, 2009.

<sup>4</sup> Ecology Letter, from Jane A. Hedges to Shirley J. Olinger, ORP, David A. Brockman, RL, and William S. Elkins, BNI, "Final Permit Decision on the 2+2 Appealed Conditions Modification of the Waste Treatment and Immobilization (WTP) Dangerous Waster Permit (DWP)", dated February 20, 2009.

<sup>5</sup> Ecology letter from Ed Fredenburg to Shirley J. Olinger (ORP) and William S. Elkins (BNI), "Submittal of Design Package LAW-018 for Incorporation in the Next Draft Permit for the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion Revision 8c, for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit 10, WA7890008967 (WTP Permit)", dated March 18, 2009.

Handling System<sup>6</sup>, for public comment<sup>7</sup> and the public comment period ended June 6, 2009. Ecology approval of the proposed modifications is anticipated next reporting period.

The Dangerous Waste Permit includes a compliance schedule (Hanford Facility Resource Conservation and Recovery Act Permit, WA7890008967, Dangerous Waste Portion, Part III, Operating Unit 10, and Attachment 51, "Waste Treatment and Immobilization Plant") that requires the submittal of engineering and operational information. Commodity growth, hydrogen buildup in piping and ancillary vessels in the PT Facility, difficulty in mixing heavy fluids in the PT Facility, revised seismic criteria affecting structural design of the PT and HLW Facilities, and a reduced fiscal year (FY) 2006 funding level all contributed to increased project costs and schedule extension. One compliance schedule item was missed this reporting period: Compliance Schedule Item 32, Final Compliance Date, which was due 02/28/2009.

Dangerous Waste Permit Compliance Schedule Item 24 was completed this reporting period. The Compliance Item required the submittal of engineering information for equipment for each LAW Vitrification Miscellaneous Treatment Unit sub-system by June 2, 2006. Submittal of permit design package LAW-018 completed compliance schedule item 24.<sup>8</sup> Ecology acknowledged closure of the compliance schedule item March 18, 2009<sup>4</sup>. In addition, this reporting period Ecology acknowledged completion of Compliance Schedule Item 36, which required the submittal of system descriptions for selected mechanical handling systems for inclusion in the administrative record by 12/31/2009.<sup>9</sup>

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<sup>6</sup> Ecology letter from Brenda Becker-Khaleel, DOEC to Shirley J. Olinger (ORP) and William S. Elkins (BNI), "Submittal of Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit Design Package PTF-095, Revision 0, for the Waste Treatment and Immobilization Plant (WTP), Submitted with Letter 07-ESQ-059", dated December 4, 2007.

<sup>7</sup> Letter, Jane A. Hedges to Shirley J. Olinger, ORP, David A. Brockman, RL, et.al. "Draft Waste Treatment and Immobilization Plant (WTP) Dangerous Waste Permit", Dated April 13, 2009.

<sup>8</sup> Letter, S.J. Olinger, ORP to J. A. Hedges, Ecology, "Submittal of Dangerous Waste Permit (DWP) Package Low-Activity Waste (LAW) - 18 for the Waste Vitrification Facility", 09-ESQ-056, dated February 24, 2009.

<sup>9</sup> Letter, Ed Fredenburg, Ecology, to Shirley Olinger, ORP and William S, Elkins, BNI, "Completion of Compliance Schedule Item 36 in Appendix 1.0 of the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit 10, (Waste Treatment and Immobilization Plant), WA7890008967", dated January 23, 2009.

There are no Dangerous Waste Permit Compliance Schedule items due next reporting period. A report of progress is required every 12 months if no compliance schedule items are completed within the last 12 months.

## 2.2 Near-Term Issues

### 2.2.1 Pulse Jet Mixers Design Closure

New PJM testing is planned to address mixing concerns identified in the EFRT review of WTP. The work is defined in the EFRT IRP for issue M3, "Inadequate Mixing." PJM testing activities will be performed in scaled mixing platforms to: (1) demonstrate re-suspension of settled waste solids of Newtonian slurries<sup>10</sup>; (2) determine mixing times for various vessel mixing functions; (3) determine if a hydraulic "short circuit" could occur in non-Newtonian slurries, which would cause insufficient mixing; (4) confirm post-design basis event mixing of vessels; and (5) demonstrate that normal process mixing successfully meets the flowsheet mixing requirements. The schedule for the various related activities is detailed in the M3 IRP. The IRP is being revised to include the mixing issues identified in the ORP Technology Maturation Plan. Frequent meetings are being held between ORP and BNI to discuss the path forward. Testing will be done during July/August, with final reports expected by the end of September.

### 2.2.2 Hydrogen in Piping and Ancillary Vessels (HPAV)

There has been concern regarding potential hydrogen detonations within WTP piping systems due to accumulations of flammable concentrations of hydrogen gas in piping and ancillary (small) vessels at the WTP, and designing safety controls to mitigate such events. The potentially flammable gas mixtures will be radiolytically and chemically generated, and ignition of significant accumulations is conservatively assumed. WTP is currently identifying and designing controls to prevent/mitigate hydrogen detonations. Where there is no potential for secondary impacts (i.e., impacts to adjacent important-to-safety components), detonations are allowed. However, where there is potential for secondary impacts, controls have been implemented to prevent detonation. Detonations are allowed in small piping, if it can be shown by analysis or testing that the piping system (pipe including hangers and supports) response to a detonation is elastic (i.e., no deformation). Safety controls are developed to prevent/initiate detonations that result in an inelastic response regardless of pipe size.

BNI identified several safety controls to address this concern, including new and revised design features and administrative controls to prevent the accumulation of hydrogen concentrations that could cause detonations and deflagrations large enough to deform the piping or ancillary vessels. In addition, an HPAV database was developed to provide an electronic filing system to document final system designs meeting HPAV safety criteria. The HPAV database also provides a design tool that can be used to evaluate proposed systems changes to ensure the proposed design meets the safety criteria.

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<sup>10</sup> Newtonian slurry has a low-viscosity like a liquid, whereas non-Newtonian slurry has a higher viscosity like a sludge.

The most significant outstanding technical concern is designing the associated pipe hangers and supports to withstand the associated reaction loads from these detonations and deflagrations. Because there is little experimental data regarding such loads, ORP contracted with CalTech to conduct experiments to measure prototypical detonation loads on pipe hangers and supports. Testing commenced in June 2008 and included three testing phases which were completed February 2009. In addition, BNI contracted with Dominion Engineering, to perform HPAV testing which was completed in January 2009. Both testing programs will be used to evaluate any impacts (e.g., reduction in classification of systems, structures, or components) on the safety analysis and design.

Based on recommendations by the HPAV team chartered in February 2009, ORP and BNI are evaluating team recommendations that could result in removing unnecessary complexity in the control strategy while still maintaining safety commensurate to the risk. DNFSB staff were briefed April 15-16, 2009, on the report conclusions, and the path forward. Much progress has been made in understanding the new information gained from recent testing supporting the HPAV effort, including the conclusion that strains greater than yield are acceptable, as provided by ASME Code guidance, for events (loads) that are demonstrated to have sufficiently low frequency of occurrence. The Board staff still has a concern that conservatism of the safety basis may be reduced by this action. DOE has agreed to develop details and keep the Board staff informed.

### **2.2.3 Ultrafiltration System and Leaching Process Design**

EFRT Issue M12, "Undemonstrated Leaching Process," and EFRT Issue M13, "Ultrafilter Area and Flux," raised concerns that the ultrafiltration system and leaching processes had not been demonstrated beyond small-scale laboratory tests. In response, BNI performed modeling to develop optimum ultrafiltration system operating approaches, tested tank waste samples using the optimized flowsheet, and developed simulants. These activities are complete. Testing the ultrafiltration flowsheet with the Pretreatment Engineering Platform (PEP) was completed in April 2009.

Phase 1 testing with the PEP consisted of three integrated tests. These tests provided critical information needed to confirm ultrafiltration system design by demonstrating caustic leaching, oxidative leaching, solids washing, and process control strategies. Evaluation of the Phase 1 data in conjunction with other laboratory testing and modeling will confirm ultrafiltration system design and provide improved estimates of system capacity and projection of mission duration. During testing, the PEP processed approximately 12,000 gallons of a non-radioactive waste simulant developed by Pacific Northwest National Laboratory. The PEP simulant demonstrated all aspects of sludge solids concentration and the sludge treatment flowsheet (e.g., caustic and oxidative leaching, filtration, filter cleaning). Draft closure information for the EFRT Issue M12 was prepared in June 2009. Initial information indicates the M12 issue will be closed. Review of the closure package by the DOE/WTP Technical Steering Group to confirm and approve closure will begin in early July 2009. Closure of M12 will also close EFRT Issue M13.

#### 2.2.4 Material at Risk

The Material at Risk (MAR) update for the Waste Treatment Plant (WTP) is being implemented by the contractor by submitting a Preliminary Documented Safety Analysis (PDSA) Addendum initially for the Pretreatment (PT) Facility followed by the High Level Waste Facility. The scheduled date for final approval of an addendum to the PDSA is July 3, 2009. On May 19th and 20th, members of the EM Technical Authority Board, including ORP's Site Technical Authority (STA), conducted a Technical Authority Review (TAR) of the bases and concept of the PDSA Addendum for PT. Preliminary results indicate a sound technical argument for the MAR update exists to support reclassifying Safety Class (SC) systems, structures and components (SSC) to safety significant (SS) SSC. The TAR will provide recommendations for ORP and the WTP contractor to consider strengthening the documentation of the technical bases including the contractor's Safety Input Review Committee (SIRC) process and ORP process for review and approval of authorization basis documents. The TAR report is expected to be issued in July.

#### 2.2.5 Safety Culture/Safety Improvement Strategy

The WTP safety performance indices have remained stable in FY 2009 while conducting a ramp-up in facility construction and the craft workforce. This performance reflects the commitment to safety by BNI management, the WTP site supervisors, and craft personnel. However, the project's recent unfavorable experience with reportable events and worker injuries is a concern.

WTP has been aggressively working to improve the safety culture and safety injury performance. Some of the existing safety improvement initiatives are producing favorable results.

- VPP - Pursuit of STAR recognition for the Construction Site - this action is considered ongoing.
- Craft Safety Representatives - this program continues to mature and is considered on-going.
- Hand injury, eye injury and soft tissue injury reduction efforts - these actions are considered on-going.
- Upgrades to the Industrial Hygiene program - WTP's Corrective Action Plan calls for this upgrade to be completed by January 31, 2010.
- Fully implement the revised work control/hazards analysis process - This effort is scheduled for full implementation by July 1, 2009.
- Institute monthly safety walk-downs of the Construction Site with Building Trades Union representatives. The process was initiated in May and will continue monthly.
- Continue to implement the new "On-the-Spot Award" program to reinforce desired behaviors. Implementation began in April and will continue - this action is considered on-going.

New initiatives that emphasize avoidance of at-risk behaviors are discussed below. WTP needs to shift several site safety efforts and teams from their focus on conditions toward a focus on behaviors.

- Institute a Senior Supervisor Watch program that relies on Senior Managers or Senior Supervisors to spend time at the workplace providing support to the Construction Site. This support will involve reviewing processes, observing operations and providing additional recommendations on ways to improve safety performance, particularly in the area of improving safety behaviors.
- Strengthen SETO (WTP's People-Based Safety) - Re-invigorate SETO to improve consistency, and elevate the stature of SETO's mission to make it more paramount in the site safety improvement efforts.
- Drive worker behaviors toward the right outcomes through the supervisory chain (i.e., construction superintendents-general foreman-foreman) with a goal of creating and maintaining a shared vision for site safety with supervision.
- Institute Management Oversight of Crane Operations following the stand-down on May 19, 2009 to ensure the message and training provided was understood and effective. Results of that oversight will be reported to the Construction Site Manager. Oversight will be conducted until the Construction Site Manager is satisfied that the oversight can be stopped or the frequency changed.
- Establish Monthly Safety Meetings with Area Superintendents, General Foremen and Foremen. Meetings will be scheduled each month with a standing agenda.

#### 2.2.6 Quality Issues

**Preservation Maintenance Program (Update):** BNI completed the program improvements required to bring its preservation and maintenance program into compliance with its contract and the Federal Acquisition Regulations (FAR) on April 29, 2008. The new management level procedure developed by BNI flowed down requirements into 16 other procedures to ensure an effective program was in place to preserve and maintain government equipment from the time of receipt throughout its useful life. BNI completed an effectiveness review on February 3, 2009, which determined that the actions taken have been effective. BNI found that significant improvements have been made in the identification and preservation of equipment and concluded that although not fully matured the Commissioning and Training organization is performing preservation and predictive maintenance in an adequate and effective manner. On June 9, 2009, DOE completed a surveillance of BNI's program and assessment of the effectiveness. The surveillance concluded that if followed the programmatic changes implemented by BNI in the area of Preservation and Maintenance of Permanent Plant Equipment will ensure government property is adequately maintained to support startup as scheduled. The DOE considers BNI to be in compliance with the contract and considers this item to be closed.

**WTP Black Cell Pipe Spool Issue (Update):** BNI's Authorization Basis and specifications require black cell pipe shop and field welds to include 100% radiography and positive material identification examination. However, until June 2005, neither piping isometric drawings nor the procurement specifications contained sufficient information for pipe fabricators to differentiate black cell spools from non-black cell spools. Black cells are areas where access maintenance and repair will not be available after completion of construction because the areas will be sealed off for the life of the facility. BNI has discovered that some black cell pipe spools were shop-fabricated and sent to the WTP Project without the required examinations. BNI completed a

formal root cause analysis and issued a revision to the report in response to ORP comments. Corrective actions required by the root cause analysis were completed in January of 2009. In addition, BNI proposed examination requirements for pipe spool welds that are inaccessible because of high-radiation hazards or because the welds are in piping and components designated as hard-to-reach. The proposed inspection requirements for hard-to-reach piping and components are equivalent to the black cell. ORP reviewed the proposal and provided extensive comments. The comments were addressed and the final list of areas designated as hard-to-reach was incorporated into the Basis of Design by Basis of Design Change Notice 24590-WTP-BODCN-ENG-08-0008, *Revision of Black Cell and Hard-To-Reach Area NDE Requirements*.

Of the total inventory of the 14,325 black cell and hard-to-reach piping spools, all spools were reviewed to ensure documentation of required examinations. 1,795 spools required additional verification to meet the necessary requirements. Of the 1,795 spools, approximately 279 required physical re-work to bring them into compliance. BNI has completed its review and given final disposition to all of the spools in question. ORP is in the process of verifying completion of corrective actions.

**WTP Fire Protection with DOE-STD-1066, *Fire Protection Design Criteria (Update)*:** ORP has developed, and the DNFSB Board and Staff have agreed with an alternative approach that provides a comparable level of safety to that achieved by the prescriptive requirements contained in Section 14 of DOE-STD-1066-97. To address the gap in meeting DOE-STD-1066 requirements identified in the DNFSB 2004-2 System Evaluation Letter of June 2007, EM-60 has reevaluated the alternate approach using the 2004-2 evaluation checklist. Results of that evaluation are being reviewed by the Program Secretarial Office for approval. Simultaneously, ORP is coordinating with BNI to approve a final ABAR by the end of July. The ABAR approval by the ORP Manager as the authority having jurisdiction (AHJ), will be the final implementing directive for BNI to change/update their plans for equipment design, procurement and facility construction.

**WTP Structural Steel Fire Protection (Update):** On August 1, 2008, ORP formally submitted to the DNFSB the technical approach paper that addresses DNFSB's concerns for the WTP structural steel fire protection. This paper is based on calculations provided to DNFSB staff demonstrating that the progressive structural collapse of the WTP during and after a fire is not an issue. Subsequent to this paper, there were many discussions between DNFSB and ORP staff, and the Board conducted their own analysis. The Board concluded that from a radiological standpoint, the specified structural steel fire protection coatings for all the WTP facilities are adequate. The DNFSB reviewed DOE's three-step strategy for resolving safety issues related to fire protection coatings on structural steel used in the construction of the WTP and issued its findings in a letter on January 8, 2009. In general, the DNFSB found the new fire protection strategy acceptable but noted one concern for potential chemical hazards. Subsequent DNFSB reviews revealed that the planned fire protection coatings are adequate to prevent a structural collapse to prevent release of hazardous chemicals in the event of a design basis fire. In the June 22, 2009 DNFSB's Quarterly Report to Congress, the DNFSB reported that this issue is now considered resolved.

### 3.0 ACTIONS TAKEN OR INITIATED TO RECOVER ANY AGREEMENT SCHEDULE SLIPPAGE

DOE and its contractor are working to resolve issues raised by various review teams, such as the EFRT, in order to successfully complete this project and begin plant operations. DOE continues to evaluate all of the major project management systems, project controls, business systems, and technical processes.

#### 3.1 External Review of Process Flowsheet

EFRT issue resolution has focused on near-term project impacts. To date, 27 of the 31 issues identified by the EFRT have been resolved and approved by the ORP Project Manager (Table 2). The remaining four issues are projected to be complete by late CY 2009. Table 3 provides background, current status, and plan of action for the remaining open issues. These remaining issues are the last of those issues identified in March 2006, when the EFRT completed a critical review of the WTP process flowsheet for BNI. The team identified 17 major issues and 11 potential issues that would prevent the WTP from meeting contract capabilities; 3 additional issues were raised by an internal ORP review, for a total of 31 issues. In response, BNI developed a project response plan describing the proposed actions to address the issues; IRPs were developed, issued, and approved for each issue. The IRPs include the actions required for issue resolution, a schedule for completion, integration with other issues, and integration with the overall project schedule. Examples of some of the identified issues include inadequate ultrafiltration area and flux, undemonstrated leaching process, plugging of process piping, mixing vessels erosion, inadequate mixing systems, instability of baseline ion exchange resin, PT Facility availability, lack of comprehensive feed testing in commissioning, and limited remotability demonstration.

Table 2. Status of EFRT Issue Closure (as of June 2009)

Issue No	EFRT Issue Title	Actual/Forecast Closure Date	Closure Status
M 7a	Lack of Spare LAW Melter	Nov-06(A)	CLOSED
M 7b	Lack of Spare HLW Melter	Nov-06(A)	CLOSED
P 3	Adequacy of Control Scheme	Dec-06 (A)	CLOSED
M 8	Limited Remotability Demonstration	Oct-07 (A)	CLOSED
M10	Critical Equipment Purchases	Oct-07 (A)	CLOSED
P10	Lack of Analysis of Silo Feeds	Oct-07 (A)	CLOSED
M16	Misbatching of Melter Feed	Oct-07 (A)	CLOSED
M 9	Lack of Comprehensive Feed Testing in Commissioning	Oct-07 (A)	CLOSED
M14	Baseline IX resin	Oct-07 (A)	CLOSED
P 8	Effectiveness of Cs-137 Breakthrough Monitoring	Oct-07 (A)	CLOSED

**Table 2. Status of EFRT Issue Closure (as of June 2009)**

Issue No	EFRT Issue Title	Actual/Forecast Closure Date	Closure Status
	System		
P 6	Questionable Cross-Contamination Control	Oct-07 (A)	CLOSED
M 5	Must Have Feed Prequalification Capability	Oct-07 (A)	CLOSED
M10a	Questionable Column Design	Nov-07 (A)	CLOSED
P 2	Effect of Recycle on Capacity	Nov-07 (A)	CLOSED
M 4	Designed for Commissioning Waste vs. Mission Needs	Nov-07 (A)	CLOSED
M 7	Inconsistent Short-term vs. Long-term focus	Nov-07 (A)	CLOSED
P11	Incomplete Process Control design	Dec-07(A)	CLOSED
P 5	Inadequate Process Development	Dec-07(A)	CLOSED
M11	Loss of WTP Expertise Base	Mar-08(A)	CLOSED
P 7	Complexity of Valving	Mar-08(A)	CLOSED
P 1	Undemonstrated Decontamination Factor	Apr-08(A)	CLOSED
M17	HLW Film Cooler Plugging	Apr-08(A)	CLOSED
M15	Pretreatment Facility Availability	Apr-08(A)	CLOSED
M 1	Plugging in Process Piping	Feb-09	CLOSED
M 2	Mixing Vessel Erosion	Oct-08	CLOSED
M 6	Process Operating Limits Not Completely Defined	Dec-08(A)	CLOSED
P 4	Potential Gelation/Precipitation	Dec-08(A)	CLOSED
P 9	Undemonstrated Sampling System	Jun-09	●
M13	Ultrafilter Area and Flux	Jun-09	●
M 3	Inadequate Mixing System Design	Oct-09	●
M12	Undemonstrated Leaching Process	Jun-09	●

Green	Closure Package in Final Review
Yellow	Actions Complete, Package in Preparation
Orange	Actions Not Complete
Red	Closure in Dispute or Closure Package Needs Major Update
Maroon	Behind projected completion date

**Table 3. Open EFRT Issues as of June 2009**

Issue/Topic	Background, Current Status, Plan of Action
<p><b>M3 Inadequate Mixing System Design</b></p>	<p><b>Background:</b> Concerns were raised that fluids with quickly settling solids may not be adequately mixed by Pulse Jet Mixers in selected Pretreatment facility and HLW facility vessels.</p> <p><b>Current Status:</b> PJM mixing requirements were clarified for each PJM mixed vessel based on the function of process vessels. Parametric testing of mock PJMs using glass beads of varying sizes and densities was completed in early August 2008. A second phase of testing is being implemented to further test and evaluate the adequacy of PJM mixed vessels.</p> <p><b>Major activities recently completed include:</b> (1) issuance of a testing specification for conduct of the remaining testing, (2) selection and authorization of testing contractor organizations for the remaining test program that include Energy Solutions, Inc and Mid-Columbia Engineering, Inc. (MCE) Contract funding released to initiate testing program at Washington State University (WSU), (3) receipt, assembly and initiation of functional testing of the engineering scale pulse jet mixing test platform at the Mid-Columbia Engineering, Inc facility, and (4) completion of engineering analyses to accept the designs of 26 of 38 PJM mixed vessels. The MCE 4 foot test rig is in the final stage of completion in preparation for commissioning runs. WSU has initiated preliminary investigations on the 6 inch flume to be used for evaluating the impact of viscosity on jet effectiveness. The large (22x18 foot) radial flume is being equipped to drive 2 prototypic jets at 12.4 meters/second.</p> <p><b>Plan of Action:</b> Activities are underway to prepare for and complete testing and engineering analysis for the closure of the M-3 Inadequate PJM Mixing Issue by the end of September 2009.</p> <p>At the WSU facilities, testing during July/August will measure jet velocity at full scale, and full scale pump sections. At the MCE facilities, testing during July/August will be done for a range of particle sizes and densities in the 8 PJM array.</p>
<p><b>M12 Undemonstrated Leaching Process</b></p>	<p><b>Background:</b> Concerns were raised that the sludge leaching process has not been demonstrated beyond bench scale and the ultrafiltration equipment system may be undersized. The following activities were planned to resolve this issue:</p> <ul style="list-style-type: none"> <li>• Complete design studies to recommend PT facility changes to enhance throughput capability</li> <li>• Perform baseline process modeling using the baseline feed vector to project the vitrification campaign duration</li> <li>• Analyze actual radioactive waste samples and conduct small scale waste leaching experiments which represent the majority of Hanford wastes</li> <li>• Develop waste simulants for process testing based on the waste analyses</li> <li>• Perform integrated, pilot-plant testing using the PEP to demonstrate leach process scale-up with a selected waste simulant.</li> </ul> <p><b>Current Status:</b> Simulant testing, which started on November 21, 2008, is complete. Test objectives for the completed tests have been achieved. Phase I integrated testing is complete. Data analysis to support issue closure is scheduled to be complete by August 2009. Final Research and Technology reports will be issued by December 2009.</p>

**Table 3. Open EFRT Issues as of June 2009**

Issue/Topic	Background, Current Status, Plan of Action
<p><b>M13 Ultrafilter Area and Flux</b></p>	<p><b>Background:</b> ORP and EFRT assessments concluded the ultrafiltration system as designed by BNI would not have adequate capacity to meet contract requirements and accomplish ORP's mission requirements.</p> <p><b>Current Status:</b> BNI issued a study showing how the filter surface area, using horizontal orientation filters, could be increased by a factor of two. Subsequently, a study looking at vertical filters was performed. BNI is currently retaining their horizontal filter design due to increased surface area, simpler draining, and simpler hydrogen venting relative to the vertical design.</p> <p>All closure criteria in the M13 plan appear to have been completed, as demonstration of the viability of the design concept occurred during testing of the Pretreatment Engineering Platform (testing of the proposed configuration to confirm/project system performance is part of the M12 IRP effort).</p> <p><b>Plan of Action:</b> M13 will be closed following the successful completion of Phase 1 testing in the Pretreatment Engineering Platform (PEP). See Plan of Action for M12.</p>
<p><b>P9 Undemonstrated Sampling Process</b></p>	<p><b>Background:</b> Concerns were raised that the LAW and HLW melter feed sampling system (e.g. fluid samplers) may not prove adequate for handling slurries. This system is critical to the success of WTP operation. The completion of the planned testing is necessary to ensure sampling system adequacy. The capability of the current baseline sampling equipment needs to be confirmed.</p> <p><b>Current Status:</b> The testing program has been partially completed. Design changes to the prototypical sampler have been identified based on testing. Alternative designs are being evaluated. Closure package to be reviewed by BNI and ORP at the September 2009 TSG.</p> <p><b>Plan of Action:</b> The current plan is that all lab work and reports will be completed to support closure of the issue by September 30, 2009.</p>

#### 4.0 BUDGET AND COST STATUS

**Status:** On December 22, 2006, a new WTP Project baseline with a Total Project Cost (TPC) of \$12.263 billion was approved by the DOE Secretarial Acquisition Executive. The components of the TPC were an \$8.786 billion performance measurement baseline (PMB), \$3.477 billion in contingencies, fee, and other project costs. Through May 2009, DOE has received a series of approved adjustments to the PMB that have increased the PMB and decreased contingencies by a total of \$1,139 million. Many of these adjustments were anticipated at the time of the performance baseline approval in December 2006, but were only rough estimates or based on Monte Carlo risk analysis (a multi-iteration, statistical technique) for the costs. The proposed adjustments were initiated to: (1) resolve issues resulting from an external technical review of the WTP process flowsheet; (2) implement facility capacity modifications in the PT Facility; and (3) complete early startup and commissioning of the LAW Facility.

In addition, by December 2008 there were about \$345 million of additional adjustments awaiting DOE approval. These adjustments, along with other changes to the baseline were provided to DOE on December 19, 2008. DOE has evaluated BNI's revision to the PMB; however, the final dollar values were adjusted based on the revised contract signed between ORP and BNI on January 16, 2009. The funds for these proposed adjustments were drawn from the contractor's Management Reserve. Management Reserve use is tracked and reported monthly to DOE. These proposed adjustments and strategies have not resulted in a change to the TPC of \$12.263 billion.

The commissioning of the LAW Facility and BOF and LAB will now be in conjunction with commissioning of the PT and HLW Facilities. Dates for the turnover to the plant operations contractor and contract completion have not changed. Substantial completion of the LAW Facility construction has been delayed by about two years, and construction completion for BOF and LAB have also been similarly impacted.

BNI continues to review work processes in an effort to mitigate future overruns. These include receipt of vendor information, document reviews, and identification, timely analysis, and closure of technical issues. Strong attention continues to be given to vendor performance through enhanced team and collaboration efforts with vendors. BNI has set up a focused equipment group with senior engineers to strengthen production focus on key equipment procurements.

**Budget:** Total funding available for the WTP Project in FY 2009 is \$1,036 million, which includes \$690 million new budget authority, and \$346 million of FY 2008 uncosted but committed carryover.

**Costs:** For FY 2009, contractor costs through June 2009 are \$526 million with a forecasted fiscal year spend of about \$725 million. ORP anticipates an additional \$15 million in technical support costs, resulting in a total FY 2009 anticipated WTP Project spend of about \$740 million. Total WTP Project spend to-date is about \$5,205 million.

**5.0 DOE/DOE CONTRACTOR COMPLIANCE/STATUS OF HFFACO MILESTONES**

The December 2006 approved baseline assumes consistent Congressional appropriations of \$690 million from FY 2007 through construction and commissioning completion.

HFFACO Milestones M-62-07B, M-62-08, and M-62-11, have previously been reported as missed. Milestone M-62-09, due this reporting period, was missed. Negotiations regarding HFFACO milestones began in May 2007 with the public being provided the opportunity to review and comment on the draft schedule of Single-Shell Tank Retrieval and Closure and WTP activities/milestones. Negotiations continued through most of 2008, unsuccessfully, resulting in the State of Washington filing a Complaint in November. The State's lawsuit asserts that DOE has missed, or is certain to miss, the milestones listed in Table 4. These matters are now subject to that pending lawsuit.

**Table 4. Impacted HFFACO Milestones**

Milestone	HFFACO Date	Description
M-062-00	12/31/2028	Complete Pretreatment Processing and Vitrification of Hanford High-Level (HLW) and Low-Activity (LAW) Tank Wastes.  Compliance with the work schedules set forth in this M-62 series is defined as the performance of sufficient work to assure with reasonable certainty that DOE will accomplish series M-62 major and interim milestone requirements.
M-062-00A	02/28/2018	Complete WTP Pretreatment Processing and Vitrification of Hanford HLW and LAW Tank Waste.  Tank Waste processing shall complete the WTP pretreatment and vitrification of no less than 10% of Hanford's Tank waste by mass and 25% by activity.
M-062-07B	12/31/2007	Complete Assembly Of Low-Activity Waste Vitrification Facility Melter #1 So That It Is Ready For Transport And Installation In The LAW Vitrification Building (BNI Baseline Schedule Activity 4DL321A200 As Part Of DOE Contract No. DE-AC27-01RV14136).
M-062-08	06/30/2006	Submittal Of Hanford Tank Waste Supplemental Treatment Technologies Report, Draft Hanford Tank Waste Treatment Baseline, And Draft Negotiations Agreement In Principle (AIP).  DOE will submit a supplemental Treatment Technologies Report that describes the technical, financial, and contractual alternatives, which, in combination with the WTP and any required additional LAW vitrification facilities, are needed to treat all of Hanford's Tank Wastes.
M-062-09	02/28/2009	Start Cold Commissioning - Waste Treatment Plant.  DOE Will Start Cold Commissioning Of Its Tank Waste Treatment Plant. Start Of Cold Commissioning Is Defined As Introduction Of First Feed Simulant Into A Process Building.

**Table 4. Impacted HFFACO Milestones**

Milestone	HFFACO Date	Description
M-062-10	01/31/2011	<p>Complete Hot Commissioning - Waste Treatment Plant.</p> <p>DOE Will Achieve Sustained Throughput Of Pretreatment, Low-Activity Waste Vitrification And High-Level Waste Vitrification Processes, And Demonstrate WTP Treatment Complex Availability To Complete Treatment of no less than 10% of the tank waste by mass and 25% of the tank waste by activity by December 2018.</p>
M-062-11	06/30/2007	<p>Submit A Final Hanford Tank Waste Treatment Baseline.</p> <p>Following The Completion Of Negotiations Required In M-62-08, DOE Will Modify Its Draft Baseline As Required And Submit Its Revised Agreed-To Baseline For Treating All Hanford Tank Waste (HLW, LAW, and TRU) by 12/31/2028.</p>

## **6.0 AREAS OF NON-COMPLIANCE**

One Dangerous Waste Permit Compliance Schedule Item was missed this reporting period (see Section 2.1.4). The status of HFFACO milestones is addressed in Section 5.0.

## 7.0 REFERENCES

- 62 FR 8693, 1997, "Record of Decision for the Tank Waste Remediation System, Hanford Site, Richland, WA," *Federal Register*, Vol. 62, pp. 8693-8704, February 26
- CCN 132846, letter, BNI to ORP, "Report of External Flowsheet Review Team for the Hanford Waste Treatment and Immobilization Plant-Final Report Titled: 'Comprehensive Review of the Hanford Waste Treatment Plant Flowsheet and Throughput'," dated March 17, 2006
- DOE Contract No. DE-AC27-01RV14136 between the U.S. Department of Energy and Bechtel National, Inc., dated December 11, 2000
- DOE O 420.1B, 2005, *Facility Safety*, U.S. Department of Energy, Office of Environment, Safety and Health, Washington, D.C.
- DOE-STD-1066-97, 1997, *Fire Protection Design Criteria*, U.S. Department of Energy, Washington, D.C.
- Ecology 2007, *Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, WA7890008967, Rev. 8c, Washington State Department of Ecology, Olympia, Washington
- Ecology et al. 1989, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington
- Resource Conservation and Recovery Act of 1976*, 42 USC 6901, et seq., as amended