



OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

INSPECTION REPORT

DOE-OIG-20-52

August 2020

ALLEGATIONS REGARDING THE WASTE TREATMENT AND IMMOBILIZATION PLANT AT THE HANFORD SITE

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Department of Energy
Washington, DC 20585

August 31, 2020

MEMORANDUM FOR THE SECRETARY

FROM: Teri L. Donaldson
Inspector General
Office of Inspector General

SUBJECT: INFORMATION: Inspection Report on “Allegations Regarding the Waste Treatment and Immobilization Plant at the Hanford Site”

BACKGROUND

The Department of Energy’s mission at the Hanford Site (Hanford) is environmental cleanup, as Hanford produced two-thirds of the nation’s plutonium during World War II and The Cold War. In May 1989, the Department, the United States Environmental Protection Agency, and the State of Washington Department of Ecology signed the landmark Hanford Federal Facility Agreement and Consent Order, commonly known as the Tri-Party Agreement. The Tri-Party Agreement outlines legally enforceable milestones for Hanford cleanup over the next several decades.

In support of the Department’s mission at Hanford, two Federal offices oversee the Department’s mission: Richland Operations Office and the Office of River Protection (River Protection). Richland Operations Office is responsible for nuclear waste and facility cleanup, and overall management of Hanford. River Protection is responsible for cleanup of Hanford tank waste. This includes the retrieval and treatment of Hanford’s tank waste and closure of Tank Farms to protect the Columbia River. In order to address the environmental risk posed by the radioactive waste stored at Tank Farms, the Department is constructing a treatment facility called the Waste Treatment and Immobilization Plant (WTP). The WTP’s mission is to treat the 56 million gallons of radioactive and chemical wastes into a stable glass form for permanent disposal.

On April 30, 2019, the United States Office of Special Counsel referred a whistleblower disclosure to the Secretary of Energy (OSC File No. DI-15-3042). The Secretary of Energy referred the issue to the Office of Inspector General for evaluation. In the disclosure, the complainant alleged misconduct related to the Department’s management of the WTP at Hanford. Detailed below are the complainant’s eight allegations:

- The Department proposed and accepted an early start for the WTP Low-Activity Waste Facility knowing that it would create safety risks for workers and that costs would exceed the Government’s funding profile.

- The Department has repeatedly paid Bechtel National Inc. (Bechtel) for work it did not perform, including a \$4.5 million performance incentive for reducing sodium in pretreatment and a \$6.65 million performance incentive for an incomplete Documented Safety Analysis to support direct feed low-activity waste operations.
- Bechtel cancelled numerous procurements that it deemed unnecessary following a change in the proposed design for the WTP Pretreatment Facility, which the Department accepted without asking for a refund of monies already paid. Instead, the Department rewarded Bechtel by entering into contract modification number 366, which directed Bechtel to replace failed designs with new, standardized designs and included a \$67 million project management incentive.
- The Department improperly reduced its August 2015 findings regarding Bechtel's repeated failure to correctly execute commercial grade dedications for nuclear-quality equipment from Level 1 to Level 2, which prevented the initiation of a root cause analysis, the imposition of additional fines, and a “cure” notice. These commercial grade dedication failures continue to date.
- The Department improperly closed design defect findings from a September 2015 independent review of direct feed low-activity waste vitrification system design and operability.
- The Department submitted Resource Conservation and Recovery Act permit applications that knowingly misrepresented design and equipment quality.
- The Department's use of the unconventional, fast-track¹, design-build² approach, wherein technology development activities, plant design, and construction occur simultaneously to construct the WTP, has led to significant cost increases and schedule delays.
- The Department has failed to make a specific determination regarding whether to terminate construction of the WTP or establish a new, complete performance baseline in light of known performance baseline deviations, in violation of Department Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets* (November 2010) (Department Order 413.3B).

During our inspection, the complainant expressed additional concerns related to the following allegations: refund of monies; improperly closed design defect findings from a September 2015

¹ Fast-Track: According to Government Accounting Office reporting, fast-tracking was considered the simultaneous activities of design, construction, and technology advancement; or in other words, beginning construction activities on a section prior to the completion of design in the same section.

² Design-Build: According to Department Order 413.3B, design-build is defined as the project delivery method whereby a single contract is awarded for both design and construction.

independent review; Resource Conservation and Recovery Act permit applications; and the Department's WTP design-build approach. We initiated this inspection to review the facts and circumstances regarding the eight allegations and additional concerns.

RESULTS OF INSPECTION

Our review of the allegations regarding WTP substantiated some with qualifications, but other allegations were not substantiated:

- We substantiated that the Department proposed and accepted an early start for the WTP Low-Activity Waste Facility by deciding to direct feed low-activity waste. In addition, we substantiated that the Department's early start created worker safety risks that the Department had not yet analyzed. Finally, we substantiated that costs for the Department's early start were not included in the Government's WTP funding profile. ([Allegation #1](#))
- We did not substantiate that River Protection repeatedly paid Bechtel for work it did not perform. Specifically, we did not substantiate that River Protection paid Bechtel for work it did not perform on the \$4.5 million performance incentive fee for reducing sodium in the Pretreatment Facility and for the \$6.65 million fee for an incomplete documented safety analysis supporting the Low-Activity Waste Facility. ([Allegation #2](#))
- We did not substantiate that River Protection should have asked for a refund of monies after Bechtel cancelled numerous procurements that it deemed unnecessary following design changes at the Pretreatment Facility. In addition, we did not substantiate that River Protection rewarded Bechtel with a \$67 million Project Management Incentive through contract modification number 366. ([Allegation #3](#))
- We did not substantiate that River Protection improperly reduced its August 2015 findings from a Priority Level 1 finding to a Priority Level 2 finding in an audit of Bechtel's nuclear-quality equipment. In addition, we determined that River Protection's act of reducing the finding Level did not prevent the initiation of a root cause analysis, the imposition of additional fines, or a "cure" notice. Finally, we substantiated that commercial grade dedication issues have been a long-standing problem and that commercial grade dedication failures continue. ([Allegation #4](#))
- We did not substantiate that River Protection improperly closed design defect findings from a September 2015 independent review of the direct feed low-activity waste vitrification system design and operability. ([Allegation #5](#))
- We did not substantiate that River Protection submitted Resource Conservation and Recovery Act permit applications that knowingly misrepresented design and equipment quality. ([Allegation #6](#))

- We substantiated that the Department’s fast-track, design-build approach contributed to significant cost increases and schedule delays. ([Allegation #7](#))
- We substantiated that a performance baseline deviation occurred at WTP. However, we did not substantiate that the Department failed to make a specific determination regarding whether to terminate construction of WTP or establish a new, complete performance baseline due to the deviation that occurred. Finally, we did not substantiate that the Department’s actions did not comply with Department Order 413.3B. ([Allegation #8](#))

While we confirmed some specific details included in the allegations, we are not making any formal recommendations.

Due to the nature of the disclosure, this report did not follow our customary process for inspections regarding obtaining Department comments and holding an exit conference. In addition, the Office of Inspector General will not be publicly releasing the report until advised by the United States Office of Special Counsel. The Office of Inspector General is available to discuss the need for any additional information with the United States Office of Special Counsel.

Attachments

cc: Deputy Secretary
Chief of Staff
Acting General Counsel

ALLEGATIONS REGARDING THE WASTE TREATMENT AND IMMOBILIZATION PLANT AT THE HANFORD SITE

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ALLEGATIONS REGARDING THE WASTE TREATMENT AND IMMOBILIZATION PLANT AT THE HANFORD SITE

BACKGROUND

The Department of Energy's mission at the Hanford Site (Hanford) is environmental cleanup, as Hanford produced two-thirds of the nation's plutonium during World War II and The Cold War. From 1943 to 1987, Hanford discharged millions of gallons of radioactive waste to 177 large underground tanks, referred to as Tank Farms. Currently, the tanks hold an estimated 56 million gallons of waste. In support of the Department's mission at Hanford, two Federal offices oversee the Department's mission: Richland Operations Office and Office of the River Protection (River Protection). Richland Operations Office is responsible for nuclear waste and facility cleanup, and overall management of Hanford. River Protection is responsible for cleanup of Hanford tank waste, which includes retrieval and treatment of Hanford's tank waste and closure of Tank Farms to protect the Columbia River.

In order to address the environmental risk posed by the radioactive waste stored at Tank Farms, the Department is constructing a treatment facility called the Waste Treatment and Immobilization Plant (WTP). The WTP's mission is to treat the 56 million gallons of radioactive and chemical wastes into a stable glass form for permanent disposal. In December 2000, the Department awarded Bechtel National, Inc. (Bechtel) a \$4.3 billion cost-reimbursable contract to design and complete the WTP. In June 2002, workers began construction of WTP, which is the largest construction project of its kind in the world and is comprised of five major facilities: Pretreatment, Low-Activity Waste (LAW) Vitrification, High-Level Waste (HLW) Vitrification, Analytical Laboratory, and the Balance of Facilities.

In May 1989, the Department, the United States Environmental Protection Agency, and the State of Washington Department of Ecology (Ecology) signed the landmark Hanford Federal Facility Agreement and Consent Order, commonly known as the Tri-Party Agreement (TPA). The TPA outlines legally enforceable milestones for Hanford cleanup over the next several decades. The TPA spells out how Ecology and the Federal government will cooperate to ensure that cleanup of dangerous and radioactive nuclear waste at Hanford is compliant with Federal law. In addition, the TPA allows the state and federal governments to oversee cleanup of radioactive and chemical contamination at Hanford by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act. RCRA requires "cradle to grave" management of hazardous waste by all generators, transporters, and owners/operators of treatment, storage, and disposal facilities handling hazardous wastes. RCRA and Washington State's Hazardous Waste Management Act govern the management (treatment, storage, and disposal) of hazardous and dangerous wastes to minimize the threat to human health and the environment. Ecology's role at Hanford is to keep the public and the environment safe from the dangers of mixed radioactive and chemically hazardous waste by overseeing the Department's cleanup activities at Hanford. Ecology fulfills its responsibilities by issuing permits that outline general conditions for the treatment, storage, and disposal of dangerous wastes.

In addition, the TPA is a living document and a legally binding contract. Due to alleged violations of the TPA, Ecology filed a complaint against the Department because the Department was behind schedule with WTP construction. To resolve the action without litigation, a Federal

judge issued the Consent Decree in 2010, which included new milestones for hot commissioning³ of WTP. Subsequently, an Amended Consent Decree between the Department and Ecology, dated March 11, 2016, set new court-ordered milestones for WTP.

Below are two tables. The first table shows the progression of dates for hot commissioning and the second table shows the progression of completion dates for all waste treatment at the major WTP facilities.

Deadlines for WTP Facility Hot Commissioning

WTP Facility	At Contract Inception (2000)	Tri-Party Agreement, Rev. 7 (July 2007)	Contract Mod. A143 (January 2009)	Consent Decree (2010)	Contract Mod. 387 (March 2017)	Amended Consent Decree (March 2016)
Pretreatment	1/31/2011	1/31/2011	2/28/2019	12/31/2019	TBD ⁴	12/31/2033
High-Level Waste	1/31/2011	1/31/2011	7/30/2019	12/31/2019	TBD	12/31/2033
Low-Activity Waste	1/31/2011	1/31/2011	5/30/2019	12/31/2019	3/13/2020	12/31/2023

Deadlines for Completing Waste Treatment

WTP Facility	Tri-Party Agreement, Rev. 4 (February 1996)	Tri-Party Agreement, Rev. 7 (July 2007)	Tri-Party Agreement, Rev. 8 (July 2011)
Pretreatment	12/31/2028	12/31/2028	12/31/2047
High-Level Waste	12/31/2028	12/31/2028	12/31/2047
Low-Activity Waste	12/31/2028	12/31/2028	12/31/2047

Due to the complexity of the WTP project, the Department has faced technical issues during design and construction. As originally planned, WTPs' major facilities were to start operations at the same time (see the hot commissioning dates above). However, as early as 2006, significant technical issues began to surface related to the Pretreatment and HLW facilities, particularly related to mixing vessel design, such as pulse-jet mixers. To address those issues, in August 2012, River Protection directed the contractor to halt production engineering work and construction on the WTP. Later in 2012, the Secretary of Energy redirected River Protection's focus away from significant construction and production engineering efforts on the Pretreatment and HLW facilities and onto the LAW Facility.

To begin treating waste as soon as practicable, the Department developed a sequenced approach that would treat low-activity waste first, as soon as 2022. This approach is called the direct feed LAW (DFLAW) strategy. DFLAW capitalizes on River Protection's ability to complete

³The objective of hot commissioning testing is to demonstrate, using radioactive or hazardous feed, that the facility is ready to commence unrestricted hot operations with all products and secondary wastes produced in accordance with the requirements.

⁴ Due to technical issues with the Pretreatment and HLW facilities, River Protection did not establish milestones for Pretreatment and HLW facilities under contract modification 387.

construction and commissioning of the LAW Facility, Balance of Facilities, and the Analytical Laboratory, while simultaneously working to resolve technical issues with the Pretreatment and HLW facilities. The contractor responsible for managing Tank Farms, Washington River Protection Solutions (WRPS), will feed treated waste from Tank Farms to the WTP LAW Facility where the waste will be mixed with glass-forming materials. The Department plans to operate DFLAW and make as much progress as possible on the treatment and disposal of low-activity waste until a more permanent pretreatment facility is available.

DETAILS OF FINDINGS

The following table lists each allegation, our conclusion, and the page number where detailed information regarding each allegation is located.

	Allegation	Substantiated	Page
1	The Department proposed and accepted an early start for the WTP Low-Activity Waste Facility, knowing that it would create safety risks for workers and that costs would exceed the Government's funding profile.	Yes, with qualifiers.	5
2	The Department has repeatedly paid Bechtel for work it did not perform, including a \$4.5 million performance incentive for reducing sodium in pretreatment and a \$6.65 million performance incentive for an incomplete Documented Safety Analysis to support direct feed Low-Activity Waste operations.	No	10
3	Bechtel cancelled numerous procurements that it deemed unnecessary following a change in the proposed design for the WTP Pretreatment Facility, which the Department accepted without asking for a refund of monies already paid. Instead, the Department rewarded Bechtel by entering into contract modification number 366, which directed Bechtel to replace failed designs with new, standardized designs and included a \$67 million Project Management Incentive.	No	15
4	The Department improperly reduced its August 2015 findings regarding Bechtel's repeated failure to correctly execute commercial grade dedications for nuclear-quality equipment from Level 1 to Level 2, which prevented the initiation of a root cause analysis, the imposition of additional fines, and a "cure" notice. These commercial grade dedication failures continue to date.	Yes to a portion; No to a portion.	21
5	The Department improperly closed design defect findings from a September 2015 independent review of direct feed Low-Activity Waste vitrification system design and operability.	No	25
6	The Department submitted Resource Conservation and Recovery Act permit applications that knowingly misrepresented design and equipment quality.	No	30
7	The Department's use of the unconventional fast-track, design-build approach, wherein technology development activities, plant design, and construction occur simultaneously to construct the WTP, has led to significant cost increases and schedule delays.	Yes, with qualifiers.	36
8	The Department has failed to make a specific determination regarding whether to terminate construction of the WTP or establish a new, complete performance baseline in light of known performance baseline deviations, in violation of Department Order 413.3B.	Yes to a portion; No to a portion.	43

Details concerning each allegation are included below.

Early Start to the Low-Activity Waste Facility, Worker Safety Risks, and Funding Profile (Allegation #1)

Complainant Allegation

The Department proposed and accepted an early start for the WTP Low-Activity Waste Facility (LAW Facility), knowing that it would create safety risks for workers and that costs would exceed the Government's funding profile.

Early Start to the LAW Facility

We substantiated that the Department proposed and accepted an early start for the LAW Facility by deciding to direct feed low-activity waste to the LAW Facility. Specifically, the Department changed its original approach for processing low-activity waste due, in part, to technical issues identified at the Pretreatment and HLW facilities. Those technical issues challenged the Department and its contractor's ability to meet Consent Decree and contractual milestones. To address those challenges, the Department developed a new approach to keep part of the WTP mission moving forward.

Due in part to technical issues identified at the Pretreatment and HLW facilities, the Department changed its original approach for processing low-activity waste. Originally, the Department planned for all WTP facilities to start hot commissioning at the same time. However, as early as 2006, the External Flowsheet Review Team⁵ identified 28 technical issues that the Department had to address to assure the successful operation of WTP. Subsequently, other groups also raised issues, including the Defense Nuclear Facilities Safety Board (DNFSB) and Ecology. For example, technical issues included hydrogen accumulation, mixing of waste, ventilation system challenges, and erosion/corrosion in piping at the Pretreatment Facility. In August of 2012, the Department addressed the identified technical issues by instructing Bechtel to halt engineering and construction work on the Pretreatment and HLW facilities until Bechtel could adequately reduce the risk with associated technical issues.

These technical issues challenged the Department's ability to meet Consent Decree milestones and Bechtel's ability to meet contractual milestones. Specifically, the Consent Decree (October 2010) required the Department to hot commission the Pretreatment, LAW, and HLW facilities by December 31, 2019. Additionally, the WTP contract required Bechtel to hot commission the Pretreatment Facility by February 28, 2019, the LAW Facility by May 30, 2019, and the HLW Facility by July 30, 2019. With the Pretreatment and HLW facilities on hold, the Department found it difficult to achieve these milestones without taking alternative actions.

To address those challenges, the Department developed a new approach to keep part of the WTP mission moving forward. For example, the purpose of the Pretreatment Facility was to process and separate tank waste into low-activity and high-level waste components. After processing,

⁵ Bechtel assembled the External Flowsheet Review Team to include the foremost experts from the chemical processing industry, the glass industry, the nuclear waste industry, national laboratories, and universities. The team's charter was to challenge the design of WTP through a thorough and critical review.

the Pretreatment Facility would send low-activity waste components to the LAW Facility and high-level waste components to the HLW Facility. When the Department halted construction activities, using the Pretreatment Facility was no longer an option for processing low-activity waste. To address this, in November 2013, River Protection directed WRPS, who operates Tank Farms, to prepare a cost and technical proposal to support a new approach called DFLAW. The DFLAW approach would bypass treating tank waste through the Pretreatment Facility in favor of a system called the Low-Activity Waste Pretreatment System (LAWPS), which would have processed tank waste to create a low-activity waste stream. LAWPS would have pretreated tank waste by removing cesium-137 (cesium) and solid particles. Using LAWPS would have allowed the Department to send the low-activity waste directly to the LAW Facility, thereby enabling the earlier treatment of some tank waste.

However, the LAWPS cost and schedule did not allow River Protection and its contractors to meet Consent Decree milestones. In March 2016, the Court amended the Consent Decree to require the Department to hot commission the LAW Facility by December 31, 2023. Nevertheless, by early 2017, the Department's analysis showed that the total LAWPS project cost had increased by more than 50 percent and suffered potential schedule delays of up to 5 years. At the time, senior Department officials were concerned that the LAWPS cost growth and schedule risk potentially threatened Departmental commitments to provide sufficient waste feed to initiate glass production at WTP. According to Department Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, (Department Order 413.3B) projects with cost growth greater than 50 percent require a reassessment of the alternative selection process. As a result, River Protection tasked WRPS to arrange for an external expert review of LAWPS. In October 2017, the External Expert Review Team concluded that River Protection could not complete the existing LAWPS design within the required schedule or within budget. To achieve the commitment date, the External Expert Review Team recommended a first feed pretreatment technique called the Tank Side Cesium Removal (TSCR) system, which was based on a design similar to a system demonstrated at the Savannah River Site. Subsequent to the review, River Protection decided to pursue the TSCR option, and accelerated work in support of it in March 2019.

As currently envisioned, the TSCR system will also bypass the Pretreatment Facility by processing liquid tank waste and sending low-activity waste components directly to the LAW Facility. Specifically, TSCR will first process liquid waste to remove solids. Then, it will transfer the remaining liquid through ion exchange (IX) columns that remove cesium from the liquid and immobilize it.

Safety Risks for Workers

We substantiated that the Department's early start created worker safety risks that the Department had not yet analyzed. Previously Bechtel had conducted a safety analysis on the Pretreatment Facility, but TSCR was not part of the analysis. Therefore, a new safety analysis was required. As the contractor responsible for TSCR, WRPS was responsible for conducting a new safety analysis. WRPS conducted its safety analysis in accordance with Department

Standard (Department Standard) 1189-2008, *Integration of Safety into the Design Process*, which sets forth the Department's expectations for the early integration of safety into the project's design.

We noted that to identify and mitigate TSCR safety risks, River Protection and WRPS created multiple safety documents, including the TSCR Preliminary Documented Safety Analysis (PDSA). The TSCR PDSA addressed the identification and mitigation of safety risks of normal operations, abnormal events, and postulated accidents. The PDSA also identified preventative and mitigative features to protect workers, the public, and the environment. For worker safety, the PDSA evaluated many potential accident scenarios including flammable gas accidents, loss of confinement, high-energy impact events, air blow events, direct radiation, external events, and natural events. In addition, the PDSA analyzed passive and active controls, which would protect workers.

Given the expectation to incorporate safety into the DFLAW design, the complainant also alleged that there were additional safety concerns that the Department had not analyzed. In particular, the complainant alleged that River Protection does not currently have the capability to safely dispose of the spent TSCR IX columns, potentially underestimating the doses to workers as the cesium is processed, monitored, stored, and processed again. In addition, the complainant alleged that the storage of vented IX columns may not be included in the Department's Environmental Impact Statement (EIS) Record of Decision.

Ion Exchange Column Disposal

We substantiated the additional allegation that the Department does not currently have the capability to dispose of the spent TSCR IX columns, which potentially underestimates radiation doses to workers as the cesium is processed again after storage. As of March 2020, we specifically noted that the Department had not determined a strategy for how to transfer the waste from inside the IX column to the HLW melter for final disposition. Though River Protection has analyzed the safety risk to workers for the processing, storing, and monitoring of cesium, it has not analyzed safety risk to workers for the final processing of the TSCR IX columns after the HLW campaign. However, we noted that the Department will need to conduct such an analysis at some point to be compliant with Department Order 420.1C, *Facility Safety*. According to Department Order 420.1C, Hazard Category 2 nuclear facilities must be designed to facilitate safe deactivation, decommissioning, decontamination, and demolition at the end of facility life. A facility is classified as Hazard Category 2 if it has the potential for significant onsite consequences. Both the TSCR and Tank Farms are classified as Hazard Category 2 facilities.

According to River Protection officials, the Department has not determined a method for how to dispose of the waste in the IX columns. Furthermore, the disposal of the cesium IX columns is not a current Department priority and will not be a priority until the end of the HLW mission. Therefore, the TSCR PDSA and other safety documents do not analyze the safety risk that the disposal of the radioactive waste in the IX columns poses to the public, environment, and workers. The Department's EIS Supplement Analysis explains that the cesium IX columns would be stored on the IX column Storage Pad until the HLW Facility is ready to treat them.

According to a River Protection official, the pad will hold 150 IX columns, though the Department only expects to create 120 columns after operating TSCR for 5 years. However, the Department has not specified how it will transfer the waste from the storage pad to the HLW melter as the IX columns are currently an unacceptable HLW stream. Finally, we did not identify a requirement for the Department to document a long-term strategy; however, Ecology clarified that the IX columns cannot be indefinitely stored on a pad and would need to be dispositioned in some manner. As of September 2019, Ecology considered requiring River Protection to document how it would incorporate the IX media into the HLW Facility.

TSCR IX Column Ventilation

We did not substantiate the additional allegation that storage of vented IX columns may be outside of the Department's EIS Record of Decision. The complainant alleged that the EIS Record of Decision did not cover the TSCR IX columns because it only evaluated the storage of similar unvented waste forms. We determined that in the Supplement Analysis to the EIS, River Protection did compare the IX columns to similar unvented waste forms. For example, the Supplement Analysis evaluated the comparison for waste-management evaluation purposes only, but independently evaluated TSCR IX columns for normal operations and facility accidents related to public and occupational health and safety. In contrast to the other waste forms, TSCR IX columns are vented for safety purposes to prevent the accumulation of flammable gas inside the column. For example, according to River Protection officials, the IX columns vent hydrogen to prevent internal hydrogen buildup, which could trigger a flammable gas event. Moreover, the safety functions of the TSCR IX columns protect workers from a release of cesium, direct radiation exposure, a flammable gas event, and injury from an IX column explosion. According to River Protection officials, the IX columns will not vent cesium because it is not a gas. Instead, the cesium will be bonded to the media within the IX column. Furthermore, River Protection's evaluation of TSCR IX columns showed that any postulated safety risks to workers and the environment were bounded by prior EIS accident analysis.

Finally, our work indicated that the Department followed the appropriate documentation requirements by independently evaluating TSCR impacts on the EIS. For example, the Department noted in its Record of Decision that it had determined through a Supplement Analysis to the EIS that the IX Column Storage Pad did not represent significant new circumstances or information relevant to environmental concerns, per 10 Code of Federal Regulation (CFR) 1021.314, *Supplemental environmental impact statements*.

Funding Profile

We substantiated that total costs for the Department's early start were not included in the Government's WTP funding profile. Specifically, we determined that the Department did not have an established funding profile that as of December 2019 included costs to dispose of TSCR IX columns. Furthermore, the Department's current plan is to dispose of the IX Columns in the HLW Facility after it has processed all high-level tank waste. However, the Department has not determined the future HLW Facility scope and associated costs, as we discuss in Allegation #8, "Performance Baseline Deviation, Baseline Change Proposal, and Department Order 413.3B

Compliance.” Until the Department determines how it will dispose of the IX columns, the total disposal cost is unknown. Finally, we noted that TSCR construction and operations costs are included under WRPS’ contract to operate Tank Farms, not in Bechtel’s WTP funding profile.

Sodium and Documented Safety Analysis Performance Incentive Fees (Allegation #2)

Complainant Allegation

The Department has repeatedly paid Bechtel for work it did not perform, including a \$4.5 million performance incentive for reducing sodium in pretreatment and a \$6.65 million performance incentive for an incomplete Documented Safety Analysis (DSA) to support DFLAW operations.

\$4.5 Million Sodium Reduction Performance Incentive Fee

We did not substantiate the allegation that River Protection paid Bechtel a \$4.5 million performance incentive fee (Fee) for sodium reduction work it did not perform. Specifically, Bechtel demonstrated that its efforts met the requirements to earn the Fee and River Protection agreed that Bechtel met those requirements.

In January 2009, River Protection modified Bechtel’s contract to include a Fee aimed at reducing lifecycle costs at the WTP. The Fee focused Bechtel’s efforts on reducing the quantity of process-added waste sodium in the Pretreatment Facility. According to the modification, Bechtel could earn up to a maximum of \$15 million after demonstrating sodium reduction in two phases: (1) model and bench scale testing and (2) cold commissioning. Under the first phase, Bechtel could earn 30 percent of the total available Fee for the completion of the initial model and bench scale testing for runs demonstrating sodium reduction, as indicated in the table below.

Metric Tons Sodium Reduced		Incentive Fee
At Least	But Less Than	
5,000	10,000	\$ 3,000,000
10,000	15,000	\$ 6,000,000
15,000	20,000	\$ 9,000,000
20,000	25,000	\$ 12,000,000
25,000		\$ 15,000,000

In September 2012, Bechtel submitted an invoice to River Protection stating that it had demonstrated a reduction of over 25,000 metric tons of process-added waste sodium based on completion of the initial model and bench scale testing. For this work, Bechtel requested payment of 30 percent of the \$15 million. River Protection rejected payment of this Fee in March 2013 due to unresolved technical issues. Specifically, River Protection concluded that Bechtel had not performed all the activities required by the contract, including the lack of flowsheet testing at laboratory, bench, or engineering scale to demonstrate that sodium additions in the process had been reduced.

In November 2014, Bechtel submitted a second request for the same payment, which River Protection rejected in January 2015 because of unresolved technical issues. The complainant

pointed to these two rejections as one of the reasons why River Protection should not have paid the Fee.

Following the second rejection of the sodium reduction incentive Fee, River Protection and Bechtel engaged in multiple formal and informal discussions between April and July 2015 to resolve the differences. During these discussions, River Protection reevaluated Bechtel's support for its sodium reduction. To demonstrate to River Protection that it had earned the Fee, Bechtel presented documentation from applicable tests showing that it had reduced the sodium as required by the contract. River Protection concluded that the assumed flowsheet had not been tested at laboratory, bench, or engineering scale to demonstrate that sodium additions in the process had been reduced. Bechtel asserted that results from testing supported sodium reduction regardless of the stated test objectives. Bechtel used results from other activity tests to support the reduction of sodium. According to River Protection officials, Bechtel's efforts resulted in an outcome equivalent to bench scale testing and met contract requirements.

At the conclusion of discussions between River Protection and Bechtel officials, River Protection found that Bechtel satisfied its contractual requirements. On August 6, 2015, the WTP Deputy Assistant Manager, the Federal Project Director (FPD), and the River Protection Contracting Officer (CO) signed a form that validated the performance claimed and approved payment of the Fee.

On October 13, 2015, River Protection issued a Justification Memorandum outlining the history of the sodium reduction incentive Fee. The driver for the preparation and issuance of the Justification Memorandum was to document the history of River Protection's decision to approve payment of the Fee. The decision to pay this Fee was contentious, as there was internal debate whether to pay the Fee. The Justification Memorandum outlined River Protection's conclusion that Bechtel had essentially met the contract requirements for the Fee. In addition, the Justification Memorandum stated that under the doctrine of substantial performance, Bechtel had met the Department's intent to reduce WTP lifecycle costs by reducing sodium.

Finally, the complainant alleged that River Protection management was aware that payment of the Fee constituted fraud because Bechtel did not perform the required bench scale testing and modeling. As support for this allegation, the complainant provided internal minutes from a February 2015 meeting documenting that River Protection officials thought that payment of the Fee provided no value to the government. We did not substantiate the complainant's allegation that River Protection's payment of the Fee was fraudulent. We interviewed personnel familiar with the Fee and they agreed that payment of the Fee was inappropriate at that time because Bechtel had not met the requirements to earn the Fee. However, officials we spoke to stated that based on Bechtel's subsequent work and additional evaluation of the documentation, it was appropriate to pay the Fee. After reviewing documentation, we concluded that River Protection's assessment appeared reasonable and that River Protection approved the Fee after receiving and reviewing additional documentation from Bechtel. Furthermore, River Protection employees that we interviewed, including the CO, the former Deputy Assistant Manager, and the WTP FPD, stated that the Department was correct to have paid the Fee.

\$6.65 Million Documented Safety Analysis Performance Incentive Fee

We did not substantiate the allegation that River Protection paid Bechtel a \$6.65 million Fee for work it did not perform for the LAW DSA. The complainant asserted that River Protection paid Bechtel for work it did not perform because the LAW DSA was incomplete and acceptance of the DSA was conditional, meaning that Bechtel's work was incomplete. We found that Bechtel fulfilled the Fee requirements and that River Protection paid Bechtel according to contractual requirements, consistent with both Federal and Department guidelines.

The LAW DSA incentive was part of a larger group of incentives to achieve hot commissioning of the LAW Facility. The LAW DSA was the first in a series of incentives that also included such items as startup testing, readiness to operate, and successful demonstration of hot commissioning. A DSA is a documented analysis of the extent to which a facility can operate safely with respect to workers, the public, and the environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety.

Contractual Requirements

We found that River Protection paid the LAW DSA Fee according to contractual requirements. Bechtel's contract included language that specifically listed a \$6.65 million Fee once River Protection approved the LAW DSA. The milestone for the Fee stipulated that the LAW DSA receive River Protection's approval by August 15, 2018. On May 7, 2018, Bechtel submitted the LAW DSA to River Protection for approval. On May 17, 2018, River Protection approved it with certain conditions. For example, one condition specified that Bechtel should complete planned design and operational safety improvements based on a stated schedule and provide River Protection with quarterly status updates. Another item included completion of a hazard assessment as part of the second annual update to the DSA. Therefore, according to River Protection, Bechtel met its contractual requirement.

Federal Regulations

We found that River Protection paid the LAW DSA Fee according to relevant federal regulations. Specifically, 10 CFR 830, *Nuclear Safety Management*, section 202, *Safety Basis*, specifies that the contractor responsible for a Hazard Category 1, 2, or 3, such as the WTP, a Department nuclear facility, must establish and maintain the safety basis for the facility. Bechtel is the contractor responsible for the WTP safety basis. A safety basis documents the safety analysis and hazard controls that provide reasonable assurance that a Department nuclear facility can operate safely and in a manner that adequately protects workers, the public, and the environment. The LAW DSA constitutes the WTP safety basis. Included in the language of 10 CFR 830, is a requirement that the Department will work with the contractor to ensure an appropriate DSA, and that the DSA must contain any conditions or changes required by the Department. Additionally, 10 CFR 830 stipulates that the contractor responsible for the facility must update the safety basis to keep it current (annually if necessary) and reflect changes in the facility by incorporating any changes directed by the Department. The DSA is a living document. The language in 10 CFR 830 is contrary to the complainant's allegations that the DSA was incomplete because River Protection placed conditions on its approval.

Departmental Guidelines

We found that River Protection paid Bechtel according to relevant Department guidelines. Department Standard 3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, describes an acceptable DSA preparation method as listed in 10 CFR 830. According to Department Standard 3009-94, the process of developing a DSA may require numerous iterations, depending on the complexity of the facility and the level of detail required. Additionally, the DSA development goes beyond the conceptual design and construction of the facility. The DSA should capture the full spectrum of missions expected to occur over the lifetime of the facility, including decontamination and decommissioning. In our opinion, River Protection's approval of the LAW DSA, with conditions, was consistent with Department Standard 3009-94, given the Department's history of making changes to the WTP design.

Related Sub-Allegation

In addition to the allegations stated above, the complainant also alleged that River Protection improperly paid Bechtel a \$4.1 million Fee based on requirements in its Performance Evaluation and Measurement Plan (PEMP). We did not substantiate this allegation. Specifically, we found that River Protection paid Bechtel according to its PEMP and the Department's Acquisition Guide.

We found that River Protection paid Bechtel the Fee based on requirements Bechtel completed in its PEMP. River Protection awarded Bechtel \$4.1 million of the \$6.3 million (65 percent) available for the performance period. A PEMP is a mechanism to motivate the contractor to deliver excellent performance with quality products and services while achieving contract performance. Through the PEMP, River Protection incentivized Bechtel's performance in the following areas:

- Self-Analysis/Assessments/Discovery/Action
- Environmental, Safety & Health
- Quality Assurance Program
- Project Leadership/Management
- Technical Issue Resolution

These PEMP objectives target a combination of objective and subjective performance requirements for each component and are weighted at 20 percent. River Protection outlined its review of Bechtel's performance in the five areas as listed below:

- Self-Analysis/Assessments/Discovery/Action (87 percent)
- Environmental, Safety & Health (75 percent)
- Quality Assurance Program (50 percent)
- Project Leadership/Management (66 percent)
- Technical Issue Resolution (47 percent)

Our review of the documentation associated with awarding the Fee, such as the Award Fee Evaluation Report, found that Bechtel met the requirements set forth in the PEMP and the Acquisition Guide. In January 2015, Bechtel submitted a self-assessment for the Fee for the period. On March 4, 2015, River Protection approved payment of the Fee. We also found that the multiple levels of required review advocated for this outcome. The Fee process utilized a review system to ensure a full and fair performance evaluation. The Performance Evaluation Monitors submitted their opinion on Bechtel's performance and then the Performance Evaluation Board submitted their input and recommendation. After that, the CO reviewed the documentation provided. Lastly, the Fee Determining Official made a final decision to award the Fee after reviewing input and documentation from prior reviews.

Additionally, we found that River Protection paid the Fee according to the Department's Acquisition Guide, which explains requirements for awarding a Fee. The Department's Acquisition Guide stipulates that the Fee shall only be paid when the CO determines the terms and conditions of the contract have been met. As stated above, River Protection's CO determined Bechtel met all requirements for the Fee.

Cancelled Procurements and Contract Modification Number 366 (Allegation #3)

Complainant Allegation

Bechtel cancelled numerous procurements that it deemed unnecessary following a change in the proposed design for the WTP Pretreatment Facility, which the Department accepted without asking for a refund of monies already paid. Instead, the Department rewarded Bechtel by entering into contract modification number 366 (Mod 366), which directed Bechtel to replace failed designs with new, standardized designs and included a \$67 million Project Management Incentive.

Cancelled Procurements

We did not substantiate that River Protection should have asked for a refund of monies after Bechtel cancelled numerous procurements. Bechtel not only cancelled some procurements, but also suspended some that it deemed unnecessary following design changes and other concerns at the WTP Pretreatment and HLW facilities. Specifically, we determined that River Protection was obligated to reimburse Bechtel for costs incurred that met contractual requirements. Moreover, we found that Bechtel suspended or cancelled some Pretreatment and HLW procurements in response to a series of events starting in 2011. Finally, we noted that Bechtel took action to disposition the procurements it had previously suspended.

Procurement Refunds

We determined that River Protection was obligated to reimburse Bechtel for costs that met contractual requirements. Bechtel's WTP contract is a cost-reimbursement type contract. A cost-reimbursement contract requires Bechtel to provide the Government a best level of effort and if its incurred costs are allowable, allocable (applicable to the specific contract), and reasonable, then according to the CO there is not a basis to question Bechtel's costs as unallowable and request a refund. Furthermore, according to River Protection contracting officials, the Government can only obtain a refund of monies if it identifies fraud, waste, or abuse.⁶ However, there are circumstances that can occur where River Protection could challenge the reimbursement of Bechtel's incurred costs. For example, according to the CO, if Bechtel repeatedly designed the same item incorrectly, then River Protection could possibly question costs based on willful misconduct.

In addition, under a cost-reimbursement contract, River Protection influences contractor performance through incentive fees, which it structures to financially motivate a contractor to achieve contract requirements. If contractor performance does not meet expectations, then under certain circumstances River Protection can withhold fee or require a refund of fee paid. For

⁶ According to the United States Agency for International Development, Office of Inspector General, fraud is deception intended to result in gain. Waste is the careless expenditure, mismanagement, or abuse of resources. Abuse is excessive or improper use of a thing contrary to the rules for its use.

example, the River Protection CO stated that for one milestone Bechtel lost \$3 million in fee because it did not submit all required documentation by the due date. However, the costs associated with completing that work were reimbursable because they met contract requirements.

Finally, we did not identify other applicable circumstances that should have prompted River Protection to request a refund of costs incurred for Pretreatment and HLW procurements. For example, we reviewed Bechtel's contract terms and did not note provisions or regulations that allowed River Protection to request a refund of costs incurred for cancelled or suspended procurement expenditures. In addition, we reviewed information provided by the complainant, contract modifications, other relevant documents, and held discussions with River Protection technical and contracting officials. Based on those efforts, we did not identify applicable circumstances that warranted requesting a refund of incurred costs paid to Bechtel.

Replaced Designs

We found that Bechtel suspended or cancelled some Pretreatment and HLW procurements in response to a series of events starting in 2011. Specifically, changes to WTP funding and prior unresolved technical issues at the Pretreatment and HLW facilities affected construction progress and some procurements.

We noted that changes to WTP funding affected Pretreatment and HLW procurements. In September 2011, Bechtel notified River Protection that ongoing developments in funding at the Congressional level could affect the WTP project. Subsequently, in November 2011, River Protection notified Bechtel that significant reductions in project funding would occur for fiscal year 2012. As a result, Bechtel began suspending numerous Pretreatment and HLW procurements for parts and materials in late 2011 and 2012. Some of the suspended procurements were associated with vessels whose costs accounted for the most significant portion of suspended costs.

Furthermore, unresolved technical issues at the Pretreatment and HLW facilities affected construction progress and procurements. In December 2010, the DNFSB reported on unresolved technical concerns regarding the Pretreatment and HLW facilities and made recommendations to address those concerns. One of DNFSB's concerns related to the Department's plan to use computational fluid dynamics to verify the design of the pulse-jet mixer vessel. Due to these and other concerns, River Protection directed Bechtel to halt engineering and construction work on the Pretreatment and HLW facilities in August 2012. Subsequently, in November 2012, the Secretary of Energy notified DNFSB that the Department had low confidence in the validity of computational fluid dynamics and that it would replace it with a full-scale testing program. After determining that a full-scale testing program was a lengthy and expensive process, the Department pursued a design solution to replace the five large-scale vessel designs with a standard design. The Department concluded that this strategy would substantially reduce testing costs and schedule duration. For example, testing five vessels would have cost approximately \$900 million and would have taken up to 8 years to complete. Conversely, testing a single standardized design would have cost between \$147 and \$180 million and would have taken 3 years to complete. In April 2016, via contract Mod 366, River Protection directed

Bechtel to replace the vessel designs with designs that were “standardized to the extent possible.” River Protection’s decision to change vessel designs permanently changed the need for some procurements related to the previous designs.

Disposition of Suspended Procurements

We noted that Bechtel took action to disposition the procurements it had previously suspended. Specifically, in December 2014, to determine ways to reduce costs, Bechtel performed an analysis of the 56 most expensive procurements (valued at \$181 million) to determine the cost to maintain the procurements in suspension. According to Bechtel’s analysis, it cost nearly \$5.3 million a year to maintain the procurements in suspension. Subsequently, in April 2015, we received a congressional request to review questionable contract practices related to those procurements. To address that request, we conducted an audit and issued the Audit Report on *Management of Suspended Procurements at the Waste Treatment and Immobilization Plant Project* (OIG-SR-17-04, February 2017). Our report showed that the Department and Bechtel did not act to maximize savings from the suspended procurements. In addition, we noted that due to this lack of action, Bechtel had not terminated 5 of the most costly procurements (\$128 million of the \$181 million) as of January 2017. Eventually, Bechtel recommended terminating 28 procurements (including the 5 most costly), fulfilling 6, and retaining 22 in suspension. The Department reviewed Bechtel’s analysis, performed its own analysis, and concluded that Bechtel’s recommendations appeared reasonable.

To address the issues we identified in our report, we recommended that River Protection and Bechtel evaluate future impacts of changes to the WTP project on existing procurements, review and ensure that requirements for the management of procurements are clearly stated, and ensure that Bechtel effectively managed its suspended procurements. In response to our recommendations, River Protection required, among other items, quarterly suspended procurement status updates from Bechtel and performed annual assessments on procurements. In addition, River Protection reviewed the WTP contract to ensure requirements for management of procurements are clearly stated. Finally, River Protection completed two assessments of Bechtel’s suspended procurements. We noted that the assessments, conducted in 2018 and 2019, identified no findings or opportunities for improvement, stated that Bechtel continues to be transparent and proactive on existing purchase orders, and continues to pursue cost reductions for suspended procurements.

Contract Modification No. 366

We did not substantiate that River Protection rewarded Bechtel with a \$67 million Project Management Incentive Fee (PMI Fee) through Mod 366. Specifically, we determined that the \$67 million associated with Mod 366, executed in April 2016, represented a cumulative net-available PMI Fee for contract years 2009 through 2019. River Protection included the PMI Fee in Bechtel’s contract starting in 2009, which it updated on a biannual or annual basis. The available PMI Fee has fluctuated between \$3 million and \$9.6 million annually from 2009 through 2016. Moreover, Mod 366 updated Bechtel’s contract and listed, among other items, a maximum allowable PMI Fee of \$9.6 million for 2016.

In addition, we noted that Mod 366 did not provide fee associated with the suspension or cancellation of Pretreatment or HLW procurements. In fact, we determined that Bechtel earned its PMI Fee based on an annual scorecard, as documented in its PEMP. Furthermore, we noted that Mod 366 did not increase the overall total award fee available to Bechtel. Rather, Mod 366 transferred \$500,000 from another PEMP award fee category (Cost Incentive Fee) to the PMI Fee, which increased the total cumulative PMI Fee by \$500,000 in 2016. Therefore, the adjustment was not a net increase in Bechtel’s available PEMP award fee.

The table below illustrates the breakdown of Bechtel’s available PMI Fee from 2009 through 2019 as listed in Mod 366. Through 2019, Bechtel had the opportunity to earn over \$79 million, had unearned PMI Fee of over \$12 million, and had net PMI Fee of over \$67 million.

Modification 366 - Project Management Incentive Fee

Year	Period	Available	Earned	Unearned
		<i>a</i>	<i>b</i>	<i>c = a - b</i>
2009	2009-A	\$ 2,188,838	\$ 1,584,719	\$ 604,119
	2009-B	\$ 2,188,837	\$ 1,349,418	\$ 839,419
2010	2010-A	\$ 2,000,000	\$ 1,379,000	\$ 621,000
	2010-B	\$ 2,000,000	\$ 1,521,600	\$ 478,400
2011	2011-A	\$ 2,000,000	\$ 1,348,000	\$ 652,000
	2011-B	\$ 2,000,000	\$ 1,426,000	\$ 574,000
2012	2012-A	\$ 3,150,000	\$ 1,571,850	\$ 1,578,150
	2012-B	\$ -	\$ -	\$ -
2013	2013-A	\$ 3,780,000	\$ 1,869,210	\$ 1,910,790
	2013-B	\$ 5,300,000	\$ 2,745,000	\$ 2,555,000
2014	2014-A	\$ 5,300,000	\$ 3,580,000	\$ 1,720,000
	2014-B	\$ 3,780,000	\$ 2,671,200	\$ 1,108,800
2015	2015	\$ 9,100,000*		
2016	2016	\$ 9,600,000*		
2017	2017	\$ 9,100,000*		
2018	2018	\$ 9,100,000*		
2019	2019	\$ 9,100,000*		
Total		\$ 79,687,675	\$ 21,045,997	\$ 12,641,678
Available (a)		\$ 79,687,675		
Unearned (c)		<u>12,641,678</u>		
Net Available (a - c)		\$ 67,045,997		
* Mod 366 was signed on April 11, 2016 and established projections for the Available fee (column a) for 2015-2019.				

Related Sub-Allegations

In addition to the allegations stated above, the complainant alleged that Bechtel and River Protection had inappropriately dispositioned Pretreatment and HLW procurements that we had not analyzed in our previous audit work. Specifically, the complainant alleged that: (1) Bechtel made 11 unnecessary procurements that we had not addressed in our prior audit work; (2) River Protection should have received a refund for a low-activity waste carbon dioxide decontamination system (LAW CO2 System); (3) emergency turbine generators (ETG) were sold back to the vendor and the Government was not made whole; and (4) Bechtel did not return a \$15 million incentive fee it received for defective black cell vessels. We address each sub-allegation separately below.

Sub-Allegation 1: Eleven Procurements

The complainant alleged that Bechtel made 11 procurements that we did not analyze as part of our prior audit work. We did not substantiate this allegation.

We determined that 10 of the 11 procurements identified by the complainant were included as part of the original 56 Pretreatment and HLW procurements we reviewed and addressed in our Audit Report, *Management of Suspended Procurements at the Waste Treatment and Immobilization Plant Project* (OIG-SR-17-04, February 2017). For the eleventh item, we found that Bechtel cancelled the procurement in May 2005. Based on our work, we did not identify a fee associated with this procurement.

Sub-Allegation 2: Carbon Dioxide Decontamination System

The complainant alleged that River Protection should have received a refund for the LAW CO2 System. In addition, the complainant alleged that despite having planned the cancellation of this system, Bechtel was still earning fee and installing it as of August 2018. We did not substantiate these allegations.

We found that River Protection had removed the LAW CO2 System requirement from Bechtel's contract with Contract Modification 449, March 2019, because it was no longer needed.

According to a River Protection technical official, River Protection and Bechtel determined that the LAW CO2 System was no longer needed for the following reasons:

- Bechtel's contract required the LAW CO2 System for decontaminating low-activity waste product containers. However, Bechtel proposed, and River Protection accepted, a different decontamination method because Bechtel's proposal represented a cost savings and a safety improvement. River Protection and Bechtel now estimate that contamination levels in the LAW Facility are much lower than previously thought.
- The LAW CO2 System added additional hazards to workers. Bechtel identified the LAW CO2 System as a safety significant item when it completed the LAW Documented Safety Analysis. Items classified as safety significant are associated with additional hazards to workers, and all safety significant items require mitigation.

- The LAW CO2 System required a \$12 million software update. Due to obsolescence of the software, an upgrade would have been required to operate the system. Bechtel placed the purchase order for the LAW CO2 System in September 2003 as a long lead procurement and in August 2010 the vendor completed fabrication.

According to River Protection officials, Bechtel did not receive an incentive fee associated with the removal or purchase of the LAW CO2 System. However, we determined that River Protection reduced Bechtel's total contract cost by \$4.8 million, as finalized in contract modification 465.

Sub-Allegation 3: Emergency Turbine Generator

The complainant alleged that the ETGs were sold back to the vendor and that the Government was not made whole. We substantiated that Bechtel sold the ETGs back to the vendor. Specifically, Bechtel purchased the ETGs in June 2012 for \$3.1 million and sold them back to the vendor for \$2.4 million (77 percent of the purchase price). In addition, we found that Bechtel initially suspended its ETG purchases in May 2013 as the vendor participated in a commercial grade dedication survey. According to the FPD, at the time of suspension the vendor had partially completed the order and offered to buy them back for \$2.4 million in March 2018. Concerned about future obsolescence, River Protection determined that accepting the vendor's offer was a prudent decision while the Department determined the future path forward for the Pretreatment and HLW facilities and whether it would need ETGs. Lastly, we determined that the Government received a credit for the \$2.4 million vendor buyback in July 2019.

Sub-Allegation 4: Black Cell Vessel \$15 Million Incentive Fee

The complainant alleged that Bechtel did not return a \$15 million incentive fee it received for the delivery of defective black cell vessels. We substantiated this allegation.

We confirmed that River Protection had not received a refund from Bechtel. In April 2003, River Protection modified Bechtel's contract through modification A029 to include various construction milestones and related incentive fees, including a \$15 million fee for black cell vessels. In September 2003, the vendor delivered the black cell vessels and in October 2003 Bechtel noted nonconformance issues with the vessels. Despite the noted issues, River Protection paid Bechtel its \$15 million incentive fee in November 2003. In February 2004, after nonconformance issues continued, River Protection requested that Bechtel return the fee. Bechtel did not return the fee as requested. However, we noted that a subsequent contract modification eliminated River Protection's ability to recover that incentive fee. Specifically, in January 2009, River Protection and Bechtel restructured the WTP contract under modification A143. The modification represented a global settlement for all outstanding issues prior to the date of execution. According to an August 2013 Justification Memorandum that River Protection sent to the Deputy Assistant Secretary for Acquisition and Contract Management, the Richland Operations Office, Office of Chief Counsel, and Department Headquarters Office of General Counsel, all concurred that modification A143 removed the opportunity for River Protection to obtain a refund of the \$15 million incentive fee paid to Bechtel.

Commercial Grade Dedication Audit Finding Downgrade and Continued Failures (Allegation #4)

Complainant Allegation

The Department improperly reduced its August 2015 findings regarding Bechtel's repeated failure to correctly execute commercial grade dedications (CGD) for nuclear-quality equipment from Level 1 to Level 2, which prevented the initiation of a root cause analysis, the imposition of additional fines, and a "cure" notice. These CGD failures continue to date.

Commercial Grade Dedication Audit Finding Downgrade

We did not substantiate that River Protection improperly reduced its August 2015 findings from a Level 1 finding to a Level 2 finding in an audit of Bechtel's nuclear-quality equipment. For the purpose of our review, to improperly take an action meant that a regulation, law, procedure, or precedent existed that would have prevented an action from being taken. We found that in August 2015, the Manager, River Protection (Manager) downgraded a proposed audit Level 1 finding to a Level 2 finding. In addition, we identified several factors that indicated the Manager's downgrade of the finding Level appeared reasonable. These factors address the complainant's allegation that the finding Level downgrade prevented the initiation of a root cause analysis, the imposition of additional fines, and a "cure" notice. Finally, we found evidence to support that Bechtel conducted a root cause analysis and addressed the audit's recommendations.

In August 2015, the River Protection Quality Assurance Division issued a report titled, *River Protection Audit of Bechtel Commercial Grade Dedication Program* (CGD Audit) with a Level 2 finding. The purpose of the CGD Audit was, in part, to evaluate the adequacy, implementation, and effectiveness of Bechtel's CGD Program as implemented by Bechtel's Quality Assurance Manual. The Quality Assurance Division concluded that Bechtel's CGD Program was generally compliant with requirements but lacked sufficient process detail for some key CGD activities that ensured effective and consistent implementation, and sustainment of CGD performance. The draft CGD Audit report submitted for management review recommended a Level 1 finding. According to River Protection's Issue Reporting and Resolution procedure, a Level 1 finding is an issue that has a high potential or actual consequence to the project or mission. A Level 2 finding is an issue that does not warrant a Level 1 finding or the cause is not readily identifiable at the time of discovery. Prior to the final report's issuance, the Manager issued an internal memorandum documenting the decision to downgrade the audit finding from a Level 1 to a Level 2. The Manager's main justification for the downgrade was that River Protection needed to clarify contractual requirements to reduce the discrepancy between Department expectations and Bechtel's efforts.

In addition, we identified several factors indicating that the Manager's downgrade of the finding Level appeared reasonable. For example, we determined that the Manager had the authority to downgrade the finding. Specifically, the applicable audit procedure states that the Manager must be briefed on Level 1 findings for final determination and concurrence. After discussions with members of his staff and Bechtel, the Manager decided to issue the CGD Audit report with a

Level 2 finding. Moreover, we determined that this decision did not necessarily prevent the initiation of a root cause analysis, the imposition of additional fines, or a “cure” notice. For example, with the downgraded finding level, the Manager also required Bechtel to follow several requirements associated with a Level 1 finding, such as to submit a root cause analysis, a corrective action plan to prevent recurrence, and an extent of condition review. Furthermore, we determined that the Manager’s decision did not necessarily prevent the Department’s Office of Enforcement (Enforcement) from initiating an investigation or imposing fines. We spoke with Enforcement officials to determine what type of events would cause it to initiate an investigation. According to an Enforcement official, there is no “bright line” that determines what will or will not be investigated. Rather, the decision is made on a case-by-case basis. Additionally, Enforcement officials explained that priority levels are a designation given to findings by River Protection and have no bearing on Enforcement’s decision to initiate an investigation.

Moreover, we noted that River Protection required Bechtel to ensure that its causal analysis and corrective actions addressed all aspects of the CGD Audit report. For example, River Protection required Bechtel to submit a corrective action plan that included:

- Immediate and remedial actions to correct the identified deficiencies
- An extent of condition
- A root cause analysis
- Corrective actions to prevent recurrence
- Compensatory actions instituted until final corrective actions were implemented
- Actions to correct previously identified deficiencies

In response to River Protection’s request, we noted that Bechtel completed these requirements and addressed the CGD Audit recommendations. Specifically, we noted that Bechtel submitted a corrective action plan, as well as a root cause analysis. In accordance with River Protection’s audit procedure, the audit team and the Manager reviewed Bechtel’s causal analysis prior to acceptance of the corrective action plan. Bechtel’s corrective action plan identified 9 immediate compensatory measures that it had taken to correct the deficiencies identified in the CGD Audit report and 19 corrective actions to prevent recurrences. After Bechtel completed its corrective action plan, River Protection conducted a surveillance of Bechtel’s efforts to determine the effectiveness of the corrective actions. In March 2019, the Quality Assurance Division determined that Bechtel’s corrective actions to prevent recurrence of conditions identified in the CGD Audit report were adequately implemented and effective. However, we noted that the surveillance team identified seven findings, which we discuss in further detail in Allegation #5, 2015 Low-Activity Waste Independent Review Closures. These findings were related to legacy processes executed before Bechtel’s corrective actions were fully mature. Where necessary, the Quality Assurance Division expanded its review to ensure that the conditions identified were not systemic weaknesses. The surveillance team concluded that the conditions identified indirectly related to Bechtel’s CGD Program and did not preclude the Quality Assurance Division from closing its finding from the CGD Audit.

As an additional step to determine if the Manager’s downgrade of the finding level deviated from past practices, we reviewed prior Level 1 findings from the Quality Assurance Division. Specifically, we reviewed nine previously identified Level 1 findings and compared them to the

CGD Audit finding. We determined that the previous Level 1 findings generally identified a programmatic failure to implement requirements. While the CGD Audit identified numerous issues related to consistent implementation of the CGD Program, the CGD Audit concluded that Bechtel's CGD Program was generally compliant with requirements. Therefore, we concluded that because the CGD Audit did not indicate a programmatic failure similar to the previous nine Level 1 findings, the finding level was open for management interpretation and decision consistent with the applicable audit procedures.

Finally, during our review, we became aware that the Manager may have experienced undue, outside pressure to downgrade the finding level of the CGD Audit. In order to address this concern, we reviewed the emails of those involved with the decision to downgrade the finding level; however, our review of emails did not reveal any undue pressure to downgrade the finding level. Instead, the emails related to the finding level downgrade revealed additional clarification as to why the Manager elected to downgrade the finding level. Specifically, emails sent among River Protection management documented that Bechtel officials were reluctant to accept a Level 1 finding because of the perception that, among other items, Enforcement would initiate an investigation. Rather than prolong a dispute over priority levels between River Protection and Bechtel, the Manager and members of his staff agreed that issuing a Level 2 finding with the requirements of a Level 1 finding would be the best course of action to maintain forward momentum on the WTP project. Further, the Manager and members of his staff concluded that this course of action would avoid Bechtel's reluctance to accept the finding while ensuring that Bechtel took the appropriate corrective actions to address the CGD Audit findings. Finally, we also interviewed River Protection management and staff with knowledge of the finding level downgrade. Through those interviews, we did not identify any corroborating evidence that the Manager relented to outside pressure to downgrade the finding level.

Continued CGD Failures

We substantiated that there have been long-standing concerns with CGD issues at Bechtel and that CGD failures continue to date. Specifically, our Audit Report on *Department of Energy's Quality Assurance: Commercial Grade Dedication of Items Relied on for Safety* (DOE-OIG-19-30, May 2019), identified weaknesses in the implementation of CGD procurements at WTP, as well as weaknesses in the dedication acceptance Bechtel performed. We concluded that the issues with the implementation of CGD were the result of weaknesses in Department oversight to ensure that the contractors followed appropriate standards. The report included recommendations such as performing an extent of condition review to determine if the identified CGD concerns were part of a larger systemic issue and to implement corrective actions. As of December 2019, the Department had addressed and closed all report recommendations. Specifically, the Department published a CGD Handbook in July 2019 to address the consistent implementation of CGD. In addition, Bechtel previously completed an extent of condition review in December 2018 and took action to close the issues identified in its review. Due to Bechtel's efforts, River Protection determined that although our audit report documented weaknesses within Bechtel's CGD program, River Protection's CGD Audit had already identified the same the programmatic weaknesses. Therefore, River Protection concluded that Bechtel had already taken the necessary steps to address our report's recommendations. In addition, River Protection ensured that each of the non-programmatic examples within our report

were captured within Bechtel's corrective action system. Finally, as discussed earlier in this report, River Protection completed a surveillance in March 2019 to verify that Bechtel's corrective actions were effective and adequately implemented to prevent recurrence. Furthermore, our Audit Report on *Procurement of Parts and Materials for the Waste Treatment and Immobilization Plant at the Hanford Site* (DOE-OIG-16-03, November 2015) found that Bechtel did not always identify or resolve issues with nonconforming items resulting from vendor errors in a timely manner after they were identified. In response to our recommendations, Bechtel created a corrective action plan, among other things, to address the issues found in the report. Moreover, our Audit Report on *The Department of Energy's \$12.2 Billion Waste Treatment and Immobilization Plant – Quality Assurance Issues – Black Cell Vessels* (DOE/IG-0863, April 2012) found that the Department had procured and installed vessels in WTP that did not always meet quality assurance and/or contract requirements. Weaknesses in quality assurance records associated with black cell and hard-to-reach processing vessels occurred because of deficiencies in Bechtel's implementation of its quality assurance program and a lack of Department oversight. To address our recommendations, River Protection performed an audit of Bechtel's quality assurance program and a surveillance to ensure Bechtel had taken all necessary actions to address our audit's findings. The Department has addressed and closed all recommendations for these two reports.

Bechtel and River Protection continue to address ongoing CGD concerns. For example, in 2018, Bechtel created a specialized requirements verification matrix approach (Approach) to ensure CGD procurements implement new Documented Safety Analysis requirements. The Approach focuses on enhancing safety and quality by demonstrating, through objective evidence, that CGD procurements fully address the requirements for each system, structure, or component needed. Although Bechtel created the Approach to address CGD issues, according to River Protection officials, issues continue within Bechtel's CGD Program. For example, in May 2019, River Protection's Quality Assurance Division completed a surveillance⁷ of Bechtel's Approach to determine if it provided reasonable assurance that CGD procurements will perform their safety functions. Overall, the surveillance determined that the Approach did document the objective evidence needed to ensure items will perform their safety functions. However, the Quality Assurance Division noted that the Approach had limitations. Specifically, River Protection identified seven adverse conditions. Five of the adverse conditions related to documentation errors, such as Bechtel not documenting the adequacy of a supplier's CGD process implementation, as well as Bechtel not ensuring that procurement documents included technical and quality requirements needed for testing. The other two adverse conditions related to ineffective implementation of controls, such as inadequately controlling that procurements conformed to requirements. Finally, according to a River Protection official, the Quality Assurance Division will continue to perform annual surveillances of Bechtel's CGD program in addition to its regular triennial audit schedule. The purpose of adding the annual surveillance is to monitor Bechtel's efforts and to ensure that Bechtel identifies and corrects its CGD issues in a timely manner.

⁷ An audit evaluates a program's compliance with established procedures and the effectiveness of implementation. A surveillance is a more targeted review. For example, surveillances may be performed specifically to follow up on previous audit findings.

2015 Low-Activity Waste Independent Review Closures (Allegation #5)

Complainant Allegation

The Department improperly closed design defect findings from a September 2015 independent review of DFLAW vitrification system design and operability.

Improper Closed Findings

We did not substantiate that River Protection improperly closed design defect findings from a September 2015 independent review of the DFLAW vitrification system design and operability. Specifically, River Protection conducted the independent review of select LAW Facility systems, which is tied to the DFLAW vitrification system design and operability, outside of its normal assessment procedure and addressed identified issues in accordance with the purpose of that review.

We found that River Protection conducted an independent review of select LAW Facility systems outside of its normal assessment procedure. In February 2014, River Protection decided to review 13 LAW Facility systems, as well as several other broad-based areas, such as electrical systems and control system design maturity, to identify potential vulnerabilities with the design and operability of the facility. According to River Protection officials, the best approach to accomplish its objective was to conduct an independent review of the LAW Facility systems outside of its normal procedures due to some key factors, including the large scope of work and time constraints related to testing the facility systems and qualifying assessors. The normal assessment procedure would have inadequately covered the review's scope of the work because the procedure expected the assessment team to evaluate a program, process, equipment, or activity over a period of 1 to 2 weeks. River Protection planned to complete the review within 5 months; therefore, River Protection concluded it was not feasible to perform the extensive testing as required by the normal assessment procedure.

In addition, River Protection wanted a team of experts from a variety of disciplines and locations to perform the review. Under the normal assessment procedure, qualified assessors that conduct reviews may or may not be experts on the program or process they assess. Furthermore, the normal assessment procedure required assessors to undergo a qualification process. The qualification process required assessors to participate in at least two assessments as an observer, complete classroom training, read and understand the assessment procedure, and complete several other required elements. According to River Protection, requiring the team of experts to undergo this qualification process was unreasonable because it would have resulted in additional time needed. We noted that this would negatively affect their ability to complete the review within the planned timeframe. Finally, by conducting the review outside the normal assessment procedure, the assessors were less restricted in their assessment of the LAW Facility systems. For example, according to River Protection, it wanted the assessors to have the freedom to make judgment calls on the systems reviewed based on their personal experience, rather than against a

specific requirement such as a Department Order, policy, or procedure. Under River Protection’s normal assessment procedure, qualified assessors review a program, process, equipment, or activity against specified requirements.

Finally, we determined that River Protection addressed the issues identified by the independent review of the LAW Facility systems in accordance with the purpose of that review. In September 2015, the independent review team completed its review and wrote a report called the *WTP Low-Activity Waste Facility Design and Operability Review and Recommendations Report* (LAW D&O Report). The LAW D&O Report identified 519 vulnerabilities and made recommendations to improve or correct overarching issues found during the review. According to River Protection, it used the term “vulnerability” instead of “finding” because it considered the conclusions made by the review team to be comments on the design of the LAW Facility systems rather than formal findings. If an identified vulnerability rose to the level of a finding, then River Protection entered it into the issues management system and followed the normal procedure for managing corrective actions. The 519 identified vulnerabilities flagged potential future operational challenges, as well as reflected opportunities for River Protection to adjust its oversight of the contractor. According to River Protection, because vulnerabilities were not formal findings, it did not require that the vulnerabilities be resolved through normal processes.

Related Sub-Allegations

In addition to the allegation stated above, the complainant also alleged that the Department: (1) tried to rewrite the LAW D&O Report to reduce its results; (2) closed findings without following a rigorous process; (3) relied upon general service contractors with conflicts of interest to close findings; (4) allowed inexperienced federal staff to close findings; and (5) allowed the responsible FPD to accept risks associated with closing report vulnerabilities without updating the Department’s risk register or project contingency calculations. We did not substantiate the five allegations and address each one separately below.

Sub-Allegation 1: Rewritten Report

The complainant alleged that River Protection tried to reduce the review team’s results by rewriting the report. We did not substantiate this allegation.

We noted that River Protection had concerns about the draft LAW D&O Report’s factual accuracy. For example, River Protection was concerned that the review team did not consider that some of the identified 519 vulnerabilities were not part of Bechtel’s contract or that Bechtel had previously self-identified issues and had tracked them to closure. Initially, River Protection attempted to rewrite the draft LAW D&O Report to address some of its concerns. However, River Protection did not rewrite it because the review team raised concerns that a rewritten report would inadequately represent the review team’s perspective on the vulnerabilities identified. Instead, River Protection left the draft LAW D&O Report unchanged and asked a team of Federal senior technical advisors to conduct a separate technical review of the LAW D&O Report to determine how many vulnerabilities were new, how many vulnerabilities were previously known to Bechtel, and if Bechtel’s contract required a modification. This technical review produced a separate report that incorporated the information from the LAW D&O Report,

as well as the factual accuracy feedback from Bechtel. River Protection then formally transmitted the separate report to Bechtel to use as the basis for its responses. In addition, we determined that all 519 vulnerabilities identified in the LAW D&O Report were included and unchanged in the technical report. Further, one of the technical report's recommendations directed Bechtel to disposition all 519 vulnerabilities, after which River Protection reviewed the basis for closure on each vulnerability. Finally, in January 2018, the LAW FPD stated that Bechtel had dispositioned each identified vulnerability from the LAW D&O Report and that the recommendations from the technical report could be closed.

Sub-Allegation 2: Closure of Findings

The complainant alleged that closures of the findings were superficial, without an objective basis, and did not follow the rigor of the corrective actions process. We did not substantiate this allegation.

We noted that River Protection created a rigorous process to objectively disposition the LAW D&O Report vulnerabilities. Specifically, River Protection created a new desk instruction to disposition the vulnerabilities that invoked the normal assessment procedure for closing out findings. River Protection created the desk instruction because it conducted the LAW D&O review outside of the normal assessment procedure. Therefore, resolution of the vulnerabilities also fell outside the normal assessment procedure's process for managing corrective actions. The desk instruction outlined expectations for closing the LAW D&O Report vulnerabilities and referred to the appropriate normal assessment procedure for closing vulnerabilities River Protection determined to be of a higher significance level.

Furthermore, in accordance with the desk instruction, River Protection engineers documented their review of the vulnerability's resolution in River Protection's Issues Management System. At a minimum, each disposition included the vulnerability basis, Bechtel's response, additional relevant information, expectations for scheduled completion, and a statement declaring the vulnerability's disposition.

Finally, River Protection wanted to provide a clearer path for dispositioning the vulnerabilities. Therefore, the process outlined in the desk instruction followed River Protection's normal assessment procedure for managing corrective actions. For example, as part of dispositioning the vulnerabilities, the LAW FPD signed off on the closure, which signified agreement with the disposition. This is consistent with the normal assessment procedure's requirement that management approve of the assessor's acceptance of the closure.

Sub-Allegation 3: Use of General Service Contractors

The complainant alleged that closure of the findings utilized general service contractors who had conflicts of interest instead of qualified Federal staff. We substantiated that River Protection assigned general service contractors to help close vulnerabilities. However, we did not substantiate that it was improper for River Protection to have general service contractors assist Federal staff.

We identified at least one instance where a general service contractor, noted for his expertise in ventilation, worked on the LAW D&O review and helped disposition vulnerabilities. It is understandable that such a situation can appear to be a conflict of interest. However, we noted that the general service contractor's role was to assist less experienced Federal employees to determine if Bechtel's corrective actions were adequate. In addition, the general service contractor could only recommended closure. We noted that only River Protection Federal staff were responsible for signing vulnerability closure recommendations and that the LAW FPD was ultimately responsible for determining whether the closure recommendation was adequate. This is consistent with the normal River Protection assessment procedure, which is that the assessor of a finding evaluates the correctives actions for adequacy and then management signs off on the evaluation and closure of the finding. Therefore, we concluded that it was not wrong nor a conflict of interest for the general service contractor to assist with closing vulnerabilities.

Sub-Allegation 4: Department Staff Reviewing Outside Their Area of Expertise

The complainant alleged that closures of the findings utilized River Protection staff reviewing scope that was not in their area of expertise or without the requisite skill. We did not substantiate this allegation.

We did not identify examples of River Protection engineers assigned to closeout vulnerabilities that were outside of their area of expertise. Rather, the LAW FPD assembled a team of Federal engineers to review Bechtel's closure information and tasked them with dispositioning vulnerabilities within their identified area. Disposition of the vulnerabilities required professional judgment because the vulnerabilities did not necessarily represent a noncompliance with a requirement, such as a Department Order, policy, or procedure. In addition, the engineers could reach out to one of the general service contractors, who may have had more knowledge in an area, for assistance in evaluating the adequacy of Bechtel's response.

Furthermore, we did not identify any instances where the engineers reviewing vulnerabilities did not have the requisite skill. For example, in the course of our work, we reviewed a 2018 Management Assessment on the Technical Qualification Program (Management Assessment) at River Protection. The purpose of the Management Assessment was to evaluate the qualification of River Protection technical personnel who provide assistance, guidance, direction, or oversight that could affect the safe operation of nuclear facilities. We did not identify any issues in the Management Assessment that would have affected any of the engineers' ability to adequately review vulnerabilities.

However, we did identify one engineer who had issues with a qualification card, as well as difficulty passing a qualification board. The Management Assessment mentioned one individual as someone who we determined dispositioned LAW D&O Report vulnerabilities. However, the issue was not that the individual was not qualified; rather, it was a situation where unauthorized approvers had signed the individual's qualification card. Once identified, River Protection management corrected the error before the Management Assessment was completed. Furthermore, the Management Assessment did not identify issues with the individual's competencies documented on the qualification card.

Finally, we noted that this individual initially failed the oral qualification board to become a Safety System Oversight Engineer. However, we noted that extenuating circumstances may have led to the initial failure. For example, this individual was the first engineer at River Protection to go through the oral qualification process. According to a River Protection senior official, it was not a knowledge issue; rather, the issue was that the individual struggled to stand before a panel board and effectively answer questions. In addition, English was this person's second language, which, according to this individual's manager, may have led to communication barriers. Lastly, an evaluator asked the individual questions during the oral qualification board that were later determined by River Protection management to be inappropriate.

Sub-Allegation 5: Risk Register/Contingency Funding

The complainant alleged that in many cases, the LAW FPD signed that he "accepted" the risk for the vulnerabilities, but there is no indication that the risks were transferred to the Department's risk register or that WTP project contingency calculations were updated. We substantiated that the risks were not transferred to the risk register and that the contingency funding was not updated. However, because none of the risks associated with the LAW D&O Report were determined to be significant, River Protection did not update the risk register nor the contingency funding.

Consistent with a Department order, River Protection established a risk register to document the risks associated with the WTP. Department Order 413.3B, states that once risks are identified and prioritized, sound risk mitigation strategies and actions are developed and documented in the Risk Register. Department Guide 413.3-7A, *Risk Management Guide*, further explains that the risk register is the information repository for each identified risk and provides a common, uniform format to present identified risks. According to River Protection officials, its risk register covers high-level risks and has a threshold for when identified risks are included on the register.

Moreover, when a risk is added to the risk register, an amount of money needed to pay for the realization of the risk is calculated. This amount is referred to as "contingency." Department Order 413.3B states that contingency is the portion of the project budget that is available for risk uncertainty within the project scope and is controlled by Federal personnel. According to River Protection officials, the WTP has not historically received contingency funding.

We determined that none of the LAW D&O Report's vulnerabilities were transferred to the risk register. In fact, we noted that the LAW FPD signed several of the vulnerability closure forms with a statement that indicated awareness of the risk and concurrence with the closure of the vulnerability. In addition, according to River Protection officials, the LAW D&O Report vulnerabilities did not rise to the level of inclusion on the River Protection risk register. Guide 413.3-7A explains that risks are a result of a subjective process and can vary because different project teams may prepare risk reports. River Protection considered the vulnerabilities to be low risk, even if they occurred, with little to no impact to the project. Furthermore, because River Protection did not transfer any risks to the risk register, the contingency fund was not required to be updated.

Misrepresented Resource Conservation and Recovery Act Permit Submittals (Allegation #6)

Complainant Allegation

The Department submitted Resource Conservation and Recovery Act permit applications that knowingly misrepresented design and equipment quality.

Permit Submittals

We did not substantiate that River Protection submitted RCRA permit applications (permit submittals) that knowingly misrepresented design and equipment quality to Ecology. For the purpose of our review, we interpreted “knowingly misrepresented” to mean that River Protection submitted applications fraudulently or with the intent to deceive. We found that in order to issue a RCRA permit for the WTP project, Ecology developed a unique process called “phased permitting.” In addition, we found that permit submittals undergo a multi-level review process prior to final approval. In our opinion, such a varied review process decreases the likelihood of someone submitting misrepresented permit submittals to Ecology. However, if individuals or management colluded to misrepresent permit submittals, it would be difficult to detect. Finally, we reviewed specific permit submittals for equipment the complainant stated River Protection misrepresented to Ecology.

Phased Permitting

In order to issue a RCRA permit for the WTP project, Ecology developed a unique process called phased permitting. Phased permitting is a process where Ecology allowed the Department to begin constructing the WTP project without having completed all the necessary designs, as required by the Washington Administrative Code⁸ (WAC). In September 2002, under phased permitting, Ecology issued a Dangerous Waste Permit⁹ (Waste Permit) that allowed River Protection and Bechtel to begin constructing WTP. At that time, Bechtel had not provided all elements of the WTP designs or other information required for the Waste Permit. Therefore, as part of its approval, Ecology required Bechtel and River Protection to submit additional detailed information and permit submittals as Bechtel completed them. Under phased permitting, Ecology has incorporated new information into the Waste Permit by modifying it. These submissions of new information are what the complainant called RCRA permit applications and, for simplicity, we will refer to as “permit submittals.” In 2002, Ecology concluded that phased permitting was the best process to move the WTP project forward and treat tank waste as soon as possible. Phased permitting will conclude once Ecology has reviewed and accepted all required documents to complete the Waste Permit. Furthermore, the Department cannot begin operating WTP until it conducts performance demonstration tests¹⁰ and Ecology provides written authorization.

⁸ WAC establishes design, operation, and monitoring requirements for Washington’s hazardous waste disposal facilities.

⁹ The Dangerous Waste Permit is a portion of the Hanford Sitewide RCRA permit that Ecology issued in 1994. According to WAC, facilities that treat, store, and/or dispose of dangerous waste must obtain a permit for these activities.

¹⁰ The purpose of the demonstration test, conducted during Cold Commissioning, is to collect data for use in the Final Risk Assessment Report and to demonstrate that the LAW Vitrification System meets specified performance standards.

In contrast, Ecology's standard RCRA permitting process requires a completed design prior to issuing a construction permit. According to Ecology, the phased permitting process has enabled it to review WTP documents in a more manageable way. Additionally, Ecology told us that it developed phased permitting, which is an accepted deviation to WAC, with input and approval from the United States Environmental Protection Agency.

Review Process

We found that permit submittals undergo a multi-level review process prior to final approval by Ecology. For example, prior to sending permit submittals to River Protection and Ecology for informal review, Bechtel performs multiple reviews of the permit submittals, including design information. After Bechtel's internal reviews, River Protection and Ecology conduct an independent assessment and send any identified issues to Bechtel for disposition. After dispositioning the comments, Bechtel sends responses to River Protection and Ecology for review and concurrence. We found this review process to be consistent with documentation we reviewed and River Protection's RCRA Permitting procedure, *Resource Conservation and Recovery Act Permitting*, which provides guidance for the review and approval of environmental permit documentation.

After the informal reviews are complete, a permit submittal undergoes a formal review process. Specifically, the formal review process is comprised of certifications, submittals, and reviews, as required by WAC. When required, both Bechtel and River Protection senior management certify that permit submittals are true, accurate, and complete, prior to sending them to Ecology, in accordance with WAC. In addition, permit submittals may include a review by a third party Independent, Qualified, Registered, Professional Engineer, who certifies applicable portions of the permit submittal's design package in accordance with WAC. Once Ecology receives a permit submittal, it conducts a formal review. For example, according to Ecology, once it receives a permit submittal, it conducts completeness and deficiency reviews. If it identifies any issues, it may reject the permit submittal or may request additional information. Furthermore, depending on the nature of the permit submittal, it may be subject to a public comment period. Subsequent to a public comment period, according to Ecology, it works with River Protection and Bechtel to resolve any comments that require resolution and will then formally publish its decision.

In addition to the formal and informal review processes, Ecology and River Protection conduct onsite inspections at WTP. According to Ecology, its engineers and permit writers conduct system-by-system walk downs every 2 weeks to verify equipment installation and check general conditions to validate that equipment will be operable and safe. Furthermore, according to a River Protection official, River Protection will also conduct selected system reviews, including onsite inspections, to support Ecology. Ultimately, WTP's ability to accept tank waste is contingent on Ecology's determination that Bechtel and River Protection have met all conditions of the final WTP Waste Permit.

Specific Permit Submittals

The complainant alleged that River Protection knowingly misrepresented three permit submittals to Ecology. Specifically, according to the complainant, permit submittals, including design packages for the LAW Facility thermal catalytic oxidizer (TCO), caustic scrubber, and High Efficiency Particulate Air (HEPA) preheaters, were knowingly misrepresented. We did not substantiate the allegation.

We found that River Protection and Ecology reviewed these permit submittals and associated design packages in accordance with the processes outlined in the previous section and River Protection's RCRA Permitting procedure, *Resource Conservation and Recovery Act Permitting*. We asked River Protection personnel who reviewed these permit submittals if they were aware of any information that River Protection had knowingly misrepresented to Ecology. According to them, they were unaware of such an occurrence and three engineers added that if mistakes had occurred that they were unintentional. In addition, they were unaware of any significant concerns with equipment designs or quality and did not consider WTP equipment or facilities to be unsafe or to have incomplete designs subsequent to their reviews.

Furthermore, we found that Ecology accepted these permit submittals for inclusion in the Waste Permit. Specifically, in May 2016, Ecology published its decision to accept the permit submittals for inclusion in the Waste Permit and provided its responses to public concerns. However, we learned that Ecology initially rejected the HEPA preheaters permit submittals in March 2015 because it determined that the submittal was not "true, accurate, or complete." According to Ecology, it based its rejection on comments received during the public comment period, which expressed concerns over the HEPA preheater's material selections and corrosion evaluation. To address these concerns, Ecology returned the permit submittal to Bechtel and River Protection for corrective action and resubmission. In May 2016, Ecology approved the corrected HEPA preheaters permit submittal. Although Ecology rejected the permit submittals for not being "true, accurate, or complete," we did not identify any information that indicated the submittals were knowingly misrepresented. According to Ecology, it did not conclude that River Protection had attempted to deceive the agency. Rather, Ecology considered the issue to be an error on Bechtel's part. Once Ecology identified the issue and brought it to Bechtel's attention, Bechtel apologized and freely provided the correct information.

Moreover, we found that Bechtel had installed and inspected the equipment identified by the complainant. According to River Protection, Bechtel completed installation of the caustic scrubber and TCO at WTP in February and December 2017, respectively, and the HEPA preheaters in September and October 2017. For oversight of installation, Bechtel conducted field inspections and River Protection conducted surveillances of the installed equipment. River Protection's surveillance did not identify any concerns and concluded that Bechtel had installed the equipment in accordance with the Waste Permit. Subsequent to the installation and surveillance, Bechtel and River Protection provided permit submittals in 2019 with updates for the TCO and caustic scrubber to Ecology. The submittals included updated structural integrity reports for both items and an updated mechanical data sheet for the caustic scrubber. According to the permit submittals, these updates keep the Waste Permit current with routine changes to the facility or its operation, in accordance with WAC.

Lastly, we asked Ecology if it had identified situations when River Protection had submitted misrepresented permit submittals over the years. According to Ecology, it had identified issues with permit submittals, but it did not suspect that the issues were intentional. Furthermore, Ecology stated that issues with permit submittals, such as omissions, mistakes, or technical issues, are common. In fact, it finds issues in almost all information provided, including permit submittals not affiliated with WTP. However, Ecology stated that it also relies on River Protection's permit submittal review process, as well as River Protection and Bechtel's quality assurance and quality control programs, to ensure equipment is installed correctly and will operate as designed. Moreover, Ecology relied on legally enforceable signed certifications for permit submittals, which stated that the information provided was true, accurate, and complete. We asked Ecology if it considered legal or enforcement action for violations of the certification statement, it replied that it had not.

Related Sub-Allegations

In addition to the above allegation, the complainant alleged that River Protection: (1) submitted permit submittals with equipment design and CGD issues; (2) misrepresented an Environmental Risk Assessment Work Plan (RAWP) to Ecology; and (3) submitted WTP consent decree milestones to the District Court based on an unlimited funding profile.

Sub-Allegation 1: Equipment Design and Quality Issues

The complainant alleged that there were equipment design problems and CGD issues with certain equipment. We did not substantiate this allegation. Specifically, the complainant referred to TCO and caustic scrubber vulnerabilities identified in River Protection's 2015 LAW D&O Report and a 2015 River Protection CGD Audit Report. We addressed how River Protection dispositioned concerns raised in those reports in our discussions on Allegation #4, "Commercial Grade Dedication Audit Finding Downgrade and Continued Failures," and Allegation #5, "2015 Low-Activity Waste Independent Review Closures." In Allegation #5, we discussed that Bechtel had dispositioned the 519 vulnerabilities and that River Protection had closed all of them after it reviewed Bechtel's taken actions.

In Allegation #4, we discussed that CGD issues continue at WTP. To address the complainant's specific concerns highlighted in the 2015 CGD Audit report regarding the TCO and caustic scrubber, we reviewed Bechtel's taken actions to disposition those concerns. To address the 2015 CGD Audit Report findings, Bechtel completed a 2015 root cause analysis. According to the root cause analysis, Bechtel evaluated 58 CGD issues for the TCO and caustic scrubber and determined that 5 caustic scrubber issues did not meet CGD requirements. Bechtel further determined that the remaining 53 issues met requirements; however, it found opportunities for improvement for 45 of the 53 issues. Bechtel attributed the opportunities for improvement to the lack of an agreed upon standard between itself and River Protection for evaluating the adequacy of documentation. In response to our inquiry, Bechtel stated that its root cause analysis addressed the deficiencies noted in the 2015 CGD Audit Report. We reviewed documentation subsequent to the root cause analysis and found that Bechtel had reviewed and accepted the manufacturer's verification of CGD activities for the caustic scrubber in 2017 and had

recompleted and accepted its verification of CGD activities for the TCO in 2018. In addition, the River Protection Quality Assurance Division agreed with Bechtel and considered these issues adequately addressed.

Finally, Ecology was aware of the TCO and caustic scrubber vulnerabilities and CGD concerns. According to Ecology, it had concerns over the vulnerabilities following its review of the 2015 LAW D&O Report. Consequently, it held extensive discussions with Bechtel and River Protection regarding the identified vulnerabilities. Ultimately, in May 2016, Ecology determined River Protection and Bechtel had adequately addressed those concerns. Moreover, in response to the public comments, Ecology acknowledged that River Protection determined that Bechtel had successfully implemented its revised CGD program in accordance with Department CGD requirements.

Sub-Allegation 2: Environmental Risk Assessment Work Plan

The complainant alleged that River Protection misrepresented a 2014 RAWP¹¹ permit submittal to Ecology. For example, the complainant stated that the submittal did not include updated information for DFLAW. We substantiated that the information mentioned was not included in the 2014 RAWP permit submittal; however, we did not substantiate that River Protection's omission was a misrepresentation. Specifically, we found that the DFLAW information was not included in the September 2014 RAWP because at the time the Waste Permit only included the WTP baseline configuration.¹² According to Ecology, it did not agree to the operation of WTP with the DFLAW configuration until it signed the March 2016 Amended Consent Decree. According to a River Protection official, between 2015 and 2016 River Protection had discussed with Ecology the idea of including a DFLAW analysis in the RAWP permit submittal. However, in the 2014 timeframe, River Protection was required to submit documentation to support the baseline configuration. According to the same official, Bechtel and River Protection agreed with Ecology that including information about DFLAW would be beneficial to highlight any changes in risk that it caused. Finally, the official added that this process was a collaboration among Ecology, Bechtel, and River Protection as part of the informal review process.

To prepare for the DFLAW operations, Ecology has incorporated permit documents and designs into the Waste Permit. According to a River Protection official, River Protection has sent multiple versions of the RAWP to Ecology, the latest occurring in August 2019, in accordance with the phased permitting process. In addition, further modifications of the RAWP are required to update estimated data with actual data collected through performance demonstration tests. We noted that the August 2019 submittal included new and updated documents to support the DFLAW approach and that Ecology submitted it for public comment in early 2020. In August 2020, Ecology accepted the new and updated documents for incorporation into the Waste Permit.

Lastly, we found that Ecology was aware of concerns similar to those raised by the complainant. For example, Ecology received public comments in 2015 stating that the RAWP permit submittal

¹¹ According to Ecology, the Risk Assessment Work Plan outlines how Bechtel and River Protection will conduct risk assessments required under WAC.

¹² In the Baseline Configuration, River Protection will use the Pretreatment Facility to support the treatment of high-level waste and low-activity waste from the tanks.

was not “true, accurate, or complete,” among other concerns. In January 2016, Ecology responded that it disagreed with the comments and said that much of the documentation in the submittal would require updates or revisions in order to meet the requirements of the Waste Permit.

Sub-Allegation 3: Consent Decree Milestones

The complainant alleged that River Protection submitted WTP consent decree milestones to the United States District Court, Eastern District of Washington (Court) based on an unlimited funding profile. We did not substantiate this allegation. Specifically, we found that in October 2014, the Department submitted WTP milestones to the Court based on a limited funding profile. That funding profile supported the Department’s proposal for completing hot commissioning of the LAW Facility by December 31, 2022. According to River Protection officials, the Department prepared its funding profile based on its historical funding levels for WTP. Furthermore, the Department did not propose milestone dates for the Pretreatment and HLW facilities due to unresolved technical issues. However, the Department committed to establishing milestones for Pretreatment and HLW facilities following the resolution of all technical issues.

In October 2014, Ecology submitted to the Court its proposed milestones for the completion of WTP. Specifically, Ecology proposed completion of LAW Facility hot commissioning by July 31, 2022; completing WTP hot commissioning, as a whole, by September 30, 2029; and achieving initial plant operations for all of WTP by September 30, 2031. Ultimately, the Court did not select the Department nor Ecology’s proposal. Rather, in March 2016, the Court set new milestones for completing LAW Facility hot commissioning by December 31, 2023; completing hot commissioning for the Pretreatment and HLW facilities by December 31, 2033; and achieving WTP initial plant operations by December 31, 2036. Following the Court’s decision, River Protection created a funding profile that could meet the new milestones. This new funding profile was significantly greater than the previous limited funded version. According to a River Protection official, River Protection briefed the Secretary of Energy and the Office of Management and Budget on the funding required to meet the Court-ordered milestones. According to the same official, when the Department agreed to the 2016 Amended Consent Decree, it believed it could meet the Court’s new milestones.

Finally, the complainant expressed concern that because the Department based the milestones on an unlimited funding profile, it would be unable to meet them. As previously stated, the Department agreed to the Court’s milestones based on the amount of funding it thought it would receive. However, if the Department is unable to meet the Court’s milestones, it must notify Ecology. Specifically, according to the 2016 Amended Consent Decree, the Department must notify Ecology if it determines that a serious risk has arisen that may cause it to be unable to meet a milestone. In September 2019, the Manager of River Protection issued a serious risk notification to Ecology stating that the Department could not project with certainty when the Pretreatment and HLW facilities would be completed. In May 2020, the Department submitted a proposal to the State of Washington to amend the Consent Decree. As of August 2020, River Protection stated that the Consent Decree-related work at Hanford has been interrupted since March 2020 due to the COVID-19 pandemic.

Waste Treatment and Immobilization Plant Increased Costs and Delays (Allegation #7)

Complainant Allegation

The Department's use of the unconventional, fast-track, design-build approach, wherein technology development activities, plant design, and construction occur simultaneously to construct the WTP, has led to significant cost increases and schedule delays.

Fast-Track, Design-Build

We substantiated that the Department's fast-track, design-build approach contributed to significant cost increases and schedule delays. Specifically, on multiple occasions over the last 2 decades, the Government Accountability Office (GAO) and DNFSB provided criticism of and concern for the Department's use of the fast-track, design-build as the project management approach for the WTP.

Based on the body of work completed by GAO and DNFSB, we reviewed 13 reports, going back as far as 1993, which provided criticism of and/or concern for the Department's use of the fast-track, design-build approach. For example, in 1998, prior to the current WTP contract, GAO expressed concern that the Department's use of design-build on complex projects affected the Department's risk and reported that three other major Department design-build projects had experienced cost overruns and schedule changes. Other examples from GAO and DNFSB are summarized below.

- In 2015, GAO reiterated that the Department's use of design-build led to cost and schedule overruns, stating that in 2000 WTP was expected to cost \$4.3 billion and be completed in 2011. In 2006, the Department increased the project baseline to \$12.3 billion and extended completion to 2019. GAO criticized the Department for continuing the design-build approach without fully implementing aggressive risk mitigations as required by the Department's project management order. For example, the River Protection had not developed aggressive risk mitigation strategies that addressed all technical uncertainties at HLW or LAW facilities.

- In 2012, GAO stated:

We and others have raised concerns about DOE's use of the design-build approach for the WTP because some sections of this facility are constructed before designs are complete and before technology issues are fully resolved, which has led to significant cost increases and schedule delays.

GAO further stated that under the approach, the Department had constructed and fabricated WTP components that may not function as designed or may not meet nuclear safety standards.

- In 2007, GAO provided a compilation report identifying design-build as an issue across the Department and called out the WTP specifically. Of note, GAO pointed out that the Department had not systematically demonstrated the workability of critical technologies reflected in the design prior to committing construction costs.
- In 2006, GAO stated that the Department’s use of design-build had proven “regrettable” as the project was already 150 percent above original cost estimates and 6 years behind schedule.
- In 2004, GAO criticized the Department’s use of fast-track, design build for WTP. GAO cited high risks, excess costs, schedule overruns, potential for significant reworks, and decreased capabilities as concerns for WTP. The report further pointed out that the conditions at WTP departed from the Department’s own guidance for the use of design build.
- In 2002, DNFSB cautioned the Department of the associated risks for fast-tracking construction. Specifically, that late design changes could create expensive modifications, and that construction schedule and costs could outpace design. DNFSB pointed out that the Department’s design and construction strategy for WTP was ill-suited based on its complexity and first-of-a-kind nature.

Related Sub-Allegations

In addition to the allegation stated above, the complainant further alleged that the Department continued to use the fast-track, design-build approach through 10 revisions of Department Order 413.3B, despite its limitations for complex projects. The complainant also stated that despite GAO and DNFSB findings, the Department has not taken action to “change course” from fast-track, design-build.

We substantiated the sub-allegation that the Department continued the use of the fast-track, design-build approach through 10 revisions of Department Order 413.3B; however, we did not substantiate that the use of design-build for WTP was in violation of Department Order 413.3B. In addition, we did not substantiate that the Department has not taken action based on GAO recommendations to address fast-track, design-build.

Sub-Allegation 1: Department Order 413.3B

We substantiated that the Department utilized the design-build approach through 10 revisions of Department Order 413.3B. However, we noted that the award for the WTP design-build contract preexisted Departmental guidance on design-build. During our review of Department Order 413.3B and prior revisions, we did not identify any specific language that prohibited the use of design-build for projects like the WTP. We also noted that previous versions of Department Order 413.3B defined and provided guidance on “fast-track;” however, the current version does not define this term.

We identified 10 revisions of Department Order 413.3B since its first approval in October 2000; the Department awarded the WTP design-build contract in December 2000. The Department first introduced provisions for design-build in March 2003 as guidance within Department Manual 413.3-1, *Project Management and the Project Management Manual*. However, the design-build provisions were not officially included in Department Order 413.3B until its July 2006 revision (revision 413.3A), 6 years after contract award. Since the inclusion of design-build in the 2006 revision of Department Order 413.3B, we did not identify any specific prohibitions for the use of design-build for first-of-a-kind, complex projects like the WTP. Instead, the 2006 revision stated “design-build can be used most successfully” with projects that have few “unknowns” or new technology requirements, little to no program or system integration, and are not unique or first-of-a-kind. Subsequent revisions and the current version state, “design-build is normally used most successfully with projects that have well-defined requirements with limited complexity and risk.”

Furthermore, during our review of the 10 revisions of Department Order 413.3B, we noted that the 2006 revision stated:

In some instances, design-build projects may be managed in a close coupled or fast-track fashion, whereby the initiation of facility construction precedes the development of detailed facility design, e.g., construction begins during the preliminary design stage of a project.

However, in the revisions from 2010 through 2018 this definition of “fast-track” is absent. Instead, Department Order 413.3B states:

To address potential mission impacts, aggressive risk mitigation strategies are required for close-coupled or fast-tracked, design-build projects. Risk management strategies must be outlined in the RMP [Risk Management Plan] and at a minimum must address:

- All technical uncertainties
- The establishment of design margins to address the unique nature of the design
- Increased technical oversight requirements

Sub-Allegation 2: Department Responses to GAO Recommendations

We did not substantiate that the Department has not taken action based on GAO’s recommendations to address fast-track, design-build. Instead, we noted that the Department, for the most part, took action to address GAO’s recommendations, and that GAO accepted the Department’s actions and closed the recommendations.

We concluded that the Department was generally responsive to GAO’s recommendations. Based on our review of 6 GAO reports, we identified that 7 of 23 recommendations related to design-build. The Department implemented 4 of the 7 recommendations, but decided not to implement 2 recommendations, and deemed 1 as no longer applicable. For example, in Report RCED 93-

99, GAO recommended that the Department “begin construction of the plant only after the design is sufficiently complete that DOE can demonstrate that the plant can be started and operated efficiently.” GAO determined this recommendation was no longer applicable in 1996 after the Department showed intent to proceed with a fixed-price privatization contract to immobilize Hanford’s HLW. GAO stated that through this action, the Department had shifted responsibility, risk, and the cost of facility design, construction, and operations to private companies.

In Report 04-611, GAO recommended:

The Secretary of Energy should follow more closely DOE’s project management order and implementing guidance when acquiring complex nuclear waste treatment plants at Hanford and other DOE sites, especially by avoiding a fast-track, concurrent approach to the design, technology development, construction, and testing of such plants.

In the recommendation’s status comments, GAO stated that the Department sent a letter accepting GAO’s recommendation that it would discontinue using a fast-track, design-build approach to complete the project, and would widen the timeframe between design and construction to at least 1 year before resuming major construction. Subsequent review by GAO found that the Department had discontinued the fast-track, design-build approach for complex, first-of-a-kind facilities. GAO considers this recommendation as “closed-implemented.”

In Report 06-602T, GAO recommended:

The Secretary of Energy should discontinue using a fast track, design-build approach to completing the project and consider the feasibility of completing at least 90 percent of the facility design or facility component design before restarting construction, and ensure that the project’s major technical and safety problems have been addressed before restarting construction.

In the recommendation’s status comments, GAO stated that the Department had maintained a 1-year separation between design completion and construction activities instead of discontinuing fast-track, design build as recommended. GAO further stated that the Department had taken steps to ensure that the design of each component was at least 90 percent complete before construction and installation in the WTP. GAO considers this recommendation as “closed-implemented.”

In Report 07-336, GAO recommended:

To improve decision making and oversight for major DOE construction projects, including how project technology readiness is measured and reported, the Secretary should evaluate and consider adopting a disciplined and consistent approach to assessing TRLs [Technology Readiness Level] for projects with critical technologies that includes directing DOE Acquisition Executives to ensure that projects with critical technologies reach a level of readiness commensurate with acceptable risk—analogue to TRL 7—before deciding to approve the preliminary design and commit to definitive cost and schedule estimates, and at least TRL 7 or, if possible, TRL 8 before committing to construction expenses.

In the recommendation’s status comments, GAO stated that the Department issued its Technology Readiness Assessment Guide (Guide), incorporating a tailored technology assessment model used by other Government agencies. GAO noted that while the Guide lowered the standard to achievement compared to best practices, it acknowledged that the Guide represented a significant commitment by the Department to address technology issues and overall was responsive to its recommendation. GAO considers this recommendation as “closed-implemented.”

In Report 13-38, GAO recommended:

To improve DOE’s management and oversight of the WTP project; and that the Secretary of Energy should not resume construction on the WTP’s pretreatment and high-level waste facilities until critical technologies are tested and verified as effective, the facilities’ design has been completed to the level established by nuclear industry guidelines, and Bechtel’s preliminary documented safety analyses complies with DOE nuclear safety regulations.

In the recommendations status comments, GAO stated that the Department stopped work on the Pretreatment and HLW facilities while it worked to resolve technical issues. GAO verified that from 2013 through 2017 almost all expended funds went to technical issue resolution, and not procurement and construction activities for these two facilities. GAO considers this recommendation as “closed-implemented.”

Finally, in Report 15-354, GAO recommended:

- 1) To improve DOE's management and oversight of the WTP project, the Secretary of Energy should, in accordance with DOE's Office of River Protection quality assurance policy, conduct an extent-of condition review for WTP's High-Level Waste and Low-Activity Waste facilities' systems that have not been reviewed by DOE; and
- 2) To improve DOE's management and oversight of the WTP project, the Secretary of Energy should consider whether or to what extent construction activities for the High-Level Waste and Low-Activity Waste facilities should be further limited until

aggressive risk mitigation strategies are developed and employed to address technical challenges that DOE, the contractor, and others have identified but not yet resolved.

In the recommendation's status comments, GAO stated that Department officials:

Did not consider it necessary to stop work due to recurrence of problems in certain areas because they plan to evaluate the extent of the contractor's implementation of corrective measures over the next year, and have allowed work to continue because they believe the contractor's quality assurance program is generally adequate.

GAO stated that the Department did not conduct a full extent-of-review for the LAW Facility and deemed it unlikely that the Department would conduct a full extent-of-condition review for the HLW Facility as recommended. In consideration of this, GAO stated that the Department was unlikely to implement the recommendation. As of February 2020, the recommendation status is marked as "closed, not implemented" in GAO's tracking system. The recommendation to further limit construction activities was also marked as "closed, not implemented" due to a similar response from the Department.

We reviewed 13 reports, going back as far as 1993, which provided criticism of and/or concern for the Department's use of the fast-track, design-build approach. These reports are provided below.

- GAO Report 15-354 - *HANFORD WASTE TREATMENT: DOE Needs to Evaluate Alternatives to Recently Proposed Projects and Address Technical and Management Challenges*, May 2015
- GAO Report 13-484T - *DEPARTMENT OF ENERGY: Concerns with Major Construction Projects at the Office of Environmental Management and NNSA*, March 2013
- GAO Report 13-38 - *HANFORD WASTE TREATMENT PLANT: DOE Needs to Take Action to Resolve Technical and Management Challenges*, December 2012
- GAO Report 07-762 - *NUCLEAR WASTE: DOE Should Reassess Whether the Bulk Vitrification Demonstration Project at Its Hanford Site Is Still Needed to Treat Radioactive Waste*, June 2007
- GAO Report 07-336 - *DEPARTMENT OF ENERGY: Major Construction Projects Need a Consistent Approach for Assessing Technology Readiness to Help Avoid Cost Increases and Delays*, March 2007
- GAO Report 06-602T - *HANFORD WASTE TREATMENT PLANT: Contractor and DOE Management Problems Have Led to Higher Costs, Construction Delays, and Safety Concerns*, April 2006

- DNFSB Letter 2005419-2058, *Interim Seismic Criteria for the Waste Treatment Plant, Hanford Site*, April 2005
- GAO Report 04-611 - *NUCLEAR WASTE: Absence of Key Management Reforms on Hanford's Cleanup Project Adds to Challenges of Achieving Cost and Schedule Goals*, June 2004
- GAO Report 03-930T - *NUCLEAR WASTE: Challenges and Savings Opportunities in DOE's High-Level Waste Cleanup Program*, July 2003
- DNFSB Letter 2002730-2102 - *Seismic Design of the Pretreatment, High-Level Waste (HLW) Facilities of the Hanford Waste Treatment Plant*, July 2002
- GAO Report RCED-99-267 - *NUCLEAR WASTE: DOE's Hanford Spent Nuclear Fuel Storage Project—Cost, Schedule, and Management Issues*, September 1999
- GAO Report RCED 99-13 - *NUCLEAR WASTE: Department of Energy's Hanford Tank Waste Project - Schedule, Cost, and Management Issues*, October 1998
- GAO Report RCED-93-99 - *NUCLEAR WASTE: Hanford Tank Waste Program Needs Cost, Schedule, and Management Changes*, March 1993

Performance Baseline Deviation, Baseline Change Proposal, and Department Order 413.3B Compliance (Allegation #8)

Complainant Allegation

The Department has failed to make a specific determination regarding whether to terminate construction of WTP or establish a new, complete performance baseline in light of known performance baseline deviations, in violation of Department Order 413.3B.

Performance Baseline Deviation

We substantiated that a performance baseline deviation occurred at the WTP. Specifically, a deviation occurred when in late 2012 the Secretary of Energy redirected River Protection's focus away from construction and production engineering efforts at the Pretreatment and HLW facilities and onto the LAW and support facilities. According to Department Order 413.3B, a number of anticipated events can cause a deviation. For example, a performance baseline deviation occurs when the cost to complete a project will exceed the baseline Total Project Cost, the project will not meet the completion date, or the project will not meet performance and scope parameters. In August 2012, when River Protection provided final direction to Bechtel to halt production-engineering work and construction, Bechtel no longer could meet the WTP performance baseline schedule.

Baseline Change Proposal

We determined that the Department did not fail to make a specific determination to address the WTP performance baseline deviation. Specifically, based on requirements in Department Order 413.3B, the Department took appropriate action to address the deviation. According to Department Order 413.3B, when a deviation occurs, the approving authority must make a specific determination whether to terminate the project or establish a new performance baseline by submitting a baseline change proposal. The Department's Office of Project Management (Project Management) independently monitors, assesses, and reports on project execution performance. It also validates project performance baselines of the Department's largest construction and environmental cleanup projects prior to budget requests to Congress. According to Project Management, from 2015 to 2016, the Department took action to suspend funding for the Pretreatment and HLW facilities. The Department made that decision so that it could focus its efforts on addressing the technical challenges at the Pretreatment and HLW facilities and pursue efforts on the DFLAW approach.

After the deviation occurred, the Department began efforts to create a new WTP performance baseline. Specifically, in February 2014, the Department directed Bechtel to submit a cost proposal that factored in the impacts to the Pretreatment and HLW missions as well as the new DFLAW approach. Bechtel's cost proposal led to Baseline Change Proposal (BCP)-02, which was signed in December 2016. BCP-02 included the same Pretreatment and HLW facility scope and schedule as in BCP-01. Furthermore, the Department only included enough funding in BCP-02 for continued work on resolution of technical and quality control issues, progression of design for the Pretreatment and HLW facilities, and limited HLW Facility construction. In addition,

BCP-02 included the scope, schedule, and required funding to complete the DFLAW approach. The table below outlines the components included in each of the WTP baselines from contract inception to the current BCP-02.

Waste Treatment and Immobilization Plant Baseline Changes

Facilities	Original Baseline	BCP-01	BCP-02
Pretreatment	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule	Monetary Suspension ¹
High-Level Waste (HLW)	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule	Monetary Suspension ¹
Low-Activity Waste (LAW)	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule
Analytical Laboratory (LAB)	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule ²
Balance of Facilities (BOF)	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule	Construction Cost / Scope / Schedule ²
Effluent Management Facility (EMF)	N/A	N/A	Construction Cost / Scope / Schedule
Total Project Cost	\$5.781B	\$12.263B	\$16.813B
Signed	March 2003	December 2006	December 2016
Completion Date	July 2011	November 2019	August 2023 ³
¹ Funding primarily for resolving technical issues.			
² Minimum to run DFLAW configuration.			
³ This date only relates to DFLAW configuration.			

The Department continued to follow Department Order 413.3B after the performance baseline deviation occurred. For example, from 2012 through 2019, the Department worked to resolve the significant technical issues related to the Pretreatment and HLW facilities. According to an interview with Project Management in December 2019, as long as the Department takes efforts to keep a project moving forward, the project is compliant with Department Order 413.3B. The Department resolved the technical issues for the Pretreatment and HLW facilities in 2017 and 2019, respectively. Around April 2019, the Department began the process to determine a new path forward for the Pretreatment and HLW facilities. This process is called an Analysis of Alternatives and is part of the critical decision steps of Department Order 413.3B. River Protection officials expected completion of the Analysis of Alternatives in July 2020. Upon completion, the Department will select a path forward for the Pretreatment and HLW facilities, and ultimately the HLW mission. After the Department selects a path forward, Project Management officials stated that the Department will obtain a new baseline change proposal for the WTP.

Department Order 413.3B Compliance

We did not substantiate that the Department's actions were not compliant with Department Order 413.3B. According to Project Management, when a performance baseline deviation occurs, action is required to continue the project within its mission scope in an efficient manner. The Department addressed the deviation when it placed the Pretreatment and HLW facilities in monetary and construction suspension and began efforts to resolve the identified technical issues.

In addition, according to Project Management, a deviation does not automatically render a project noncompliant with Department Order 413.3B. As long as the Department took action to address the WTP performance baseline deviation, it maintained compliance with Department Order 413.3B. In fact, according to Project Management, WTP has not been out of compliance since the 2012 deviation occurred. Furthermore, the Department concluded that the best course of action was to move forward with efforts to begin DFLAW to process low-activity waste while at the same time resolving the technical issues at the Pretreatment and HLW facilities. Waiting to process liquid tank waste heightens environmental risk if leaked into the environment.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

On April 30, 2019, the United States Office of Special Counsel referred a whistleblower disclosure to the Secretary of Energy (OSC File No. DI-15-3042). The Secretary referred the issue to the Office of Inspector General (OIG) for evaluation. The complainant alleged misconduct related to the Department of Energy's Office of River Protection's (River Protection) management of the Waste Treatment and Immobilization Plant (WTP) at the Hanford Site. The complainant made allegations associated with WTP quality assurance and design-build issues, improperly paid incentive fees, and compliance with Department Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets* (November 2010).

During our inspection, the complainant expressed additional concerns related to the following allegations: refund of monies; improperly closed design defect findings from a September 2015 independent review; Resource Conservation and Recovery Act permit applications; and the Department's WTP design-build approach. We initiated this inspection to review the facts and circumstances regarding the initial allegations and additional concerns.

Scope

This inspection was conducted from July 2019 through August 2020 at River Protection and the Richland Operations Office in Richland, Washington. Our scope included a review of the complainant's eight allegations brought to our attention at the River Protection and the Richland Operations Office. Our scope also included the WTP prime contractor, Bechtel National, Inc. in Richland, Washington. This inspection was conducted under Office of Inspector General project number S19RL011.

Methodology

To accomplish our inspection objectives, we:

- Formed a cross-functional team of auditors and inspectors to review the allegations;
- Interviewed and obtained a signed statement from the complainant;
- Reviewed applicable laws, regulations, orders, guidance, policies, and procedures;
- Conducted site visits at River Protection and the Richland Operations Office in Richland, Washington;
- Interviewed key current and former Federal and contractor personnel;
- Interviewed key State of Washington Department of Ecology personnel;

- Obtained and reviewed documents and emails concerning various aspects of the inspection; and
- Reviewed related Government Accountability Office and OIG prior reports.

We conducted this allegation-based inspection in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation*. We believe that those standards require that we plan and perform the inspection to obtain sufficient, appropriate evidence to provide a reasonable basis for our conclusions and observations based on our inspection objective. We believe the evidence obtained provides a reasonable basis for our conclusions and observations based on our inspection objective. Accordingly, because of the nature of this inspection, it did not include a review of internal controls. Finally, we relied on computer-processed data to satisfy our objective related to the allegations. However, we did not conduct a data reliability assessment because none of the data used to materially support our findings was obtained from data extracts from databases, data warehouses, or data collected from forms or surveys. We primarily used information that was widely accepted and obtained from sources generally recognized as appropriate. If an inspection relies on information that is used for widely accepted purposes and is obtained from sources generally recognized, as appropriate, it may not be practical or necessary to conduct procedures to verify the information.

Due to the nature of the disclosure, this report did not follow our customary process for inspections with regards to obtaining Department comments and holding an exit conference. In addition, the OIG will not be publicly releasing the report until advised by the Office of Special Counsel. The OIG is available to discuss the need for any additional information with the Office of Special Counsel.

RELATED REPORTS

Office of Inspector General

- Audit Report on [*Department of Energy's Quality Assurance: Commercial Grade Dedication of Items Relied on for Safety*](#) (DOE-OIG-19-30, May 2019). The audit found weaknesses in the implementation of commercial grade dedication procurements at the Department's Waste Treatment and Immobilization Plant (WTP) and Salt Waste Processing Facilities projects. Specifically, our audit identified weaknesses in the dedication acceptance process performed in accordance with *Quality Assurance Requirements for Nuclear Facility Applications* and the Department's guidance. The commercial grade dedication process includes two parts, the completion of a technical evaluation, and the implementation of a method(s) of acceptance.
- Audit Report on [*Management of Suspended Procurements at the Waste Treatment and Immobilization Plant Project*](#) (OIG-SR-17-04, February 2017). The audit found that the Department and Bechtel National, Inc. (Bechtel) had not fully resolved issues with suspended procurements for WTP's Pretreatment Facility. Specifically, neither the Department nor Bechtel has fully acted to terminate all of the 28 procurements recommended for termination. Although Bechtel initially suspended the procurements due to funding constraints, subsequent events resulted in major changes to the project, with circumstances increasing the expected duration of the suspensions as well as affected the need for certain items.
- Management Alert on [*The 2020 Vision One System Proposal for Commissioning and Startup of the Waste Treatment and Immobilization Plant*](#) (DOE-IG-0871, October 2012). The review found that if the *2020 Vision One System* was successfully implemented, it offered several cost and schedule benefits. However, implementation involves potentially significant project risks that, in our view, require additional analysis. Specifically, (1) not all costs associated with the proposal were included in existing estimates; (2) key technology attributes needed for the proposal may be inadequately developed to support operations; and (3) modifying permits needed for the proposal may significantly delay implementation.
- Audit Report on [*The Department of Energy's \\$12.2 Billion Waste Treatment and Immobilization Plant – Quality Assurance Issues – Black Cell Vessels*](#) (DOE-IG-0863, April 2012). The audit found that the Department had procured and installed vessels in the WTP that did not always meet quality assurance and/or contract requirements. For the vessels that we reviewed, we identified multiple instances where quality assurance records were either missing or were not traceable to the specific area or part of the vessel. We also found that the Department paid the WTP contractor a \$15 million incentive fee for production of a vessel that was later determined to be defective. Although the Department demanded return of the fee, it did not follow up on the matter and the fee was never reimbursed.

Government Accountability Office

- Audit Report on [*DOE Needs to Take Further Actions to Address Weaknesses in Its Quality Assurance Program*](#) (GAO-18-241, April 2018). The Government Accountability Office (GAO) found that the Department has taken several actions to identify and address quality assurance problems at the WTP at its Hanford Site in Washington. Among the actions taken is the implementation of the Managed Improvement Plan by the Department's Office of River Protection and the WTP contractor. The plan is intended to ensure that the WTP can operate in compliance with Department-approved safety and quality requirements. The contractor has stated that the plan is fully implemented, but GAO found that a number of key activities may be incomplete and Office of River Protection officials will be unable to verify the extent of implementation until December 2018. In addition, Department audits have found that previously identified quality assurance problems have recurred in key areas, such as the procurement of items that do not meet requirements or perform as specified.
- Audit Report on [*DOE Needs to Evaluate Alternatives to Recently Proposed Projects and Address Technical and Management Challenges*](#) (GAO-15-354, May 2015). The GAO reported that the Department's two proposed facilities may help achieve Hanford's waste treatment mission by expediting treatment of some waste and addressing some technical challenges within the WTP's Pretreatment Facility. However, the Department selected the facilities based on past proposals and excluded other potential alternatives from consideration. The proposed facilities are at the initiation phase of the Department's project management process. During this phase, under its project management order, the Department is to develop statements of mission need that do not identify a particular facility or technology solution in order to preserve the flexibility to explore alternatives. The Department, however, developed narrow statements of mission need based on facilities it had proposed in prior years but never constructed. Without revising these statements to allow the Department flexibility, the scope of alternatives the Department analyzes will exclude consideration of other potentially viable alternatives.
- Audit Report on [*DOE Needs to Take Action to Resolve Technical and Management Challenges*](#) (GAO-13-38, December 2012). The GAO reported that the Department faces significant technical challenges in successfully constructing and operating the WTP project that is to treat millions of gallons of highly radioactive liquid waste resulting from the production of nuclear weapons. The Department and Bechtel identified hundreds of technical challenges that vary in significance and potential negative impact and have resolved many of them. Remaining challenges include (1) developing a viable technology to keep the waste mixed uniformly in WTP mix tanks to both avoid explosions and so that it can be properly prepared for further processing; (2) ensuring that the erosion and corrosion of components, such as tanks and piping systems, is effectively mitigated; (3) preventing the buildup of flammable hydrogen gas in tanks, vessels, and piping systems; and (4) understanding better the

waste that will be processed at the WTP. Until these and other technical challenges are resolved, the Department will continue to be uncertain whether the WTP can be completed on schedule and whether it will operate safely and effectively.

- Audit Report on [*Contractor and DOE Management Problems Have Led to Higher Costs, Construction Delays, and Safety Concerns*](#) (GAO-06-602T, April 2006). The GAO reported that since the waste treatment plant construction contract was awarded in 2000, the project's estimated cost has increased more than 150 percent to about \$11 billion, and the completion date has been extended from 2011 to 2017 or later. There are three main causes for the increases in the project's cost and completion date: (1) the contractor's performance shortcomings in developing project estimates and implementing nuclear safety requirements; (2) Department management problems, including inadequate oversight of the contractor's performance; and (3) technical challenges that have been more difficult than expected to address.
- Audit Report on [*Absence of Key Management Reforms on Hanford's Cleanup Project Adds to Challenges of Achieving Cost and Schedule Goals*](#) (GAO-04-611, June 2004). The Government Accountability Office (GAO) reported that the Department's initial approach called for treating 10 percent of the Hanford Site's high-level waste by 2018 and for operating the plant until treatment was completed in 2046, well past a regulatory deadline to complete treatment by 2028. In 2002, the Department decided to accelerate cleanup by about 20 years and reduce the project's \$56 billion cost by \$20 billion. In the short term, however, several factors, including the accelerated approach and contractor performance problems, have lengthened construction time and raised contract costs by \$1.4 billion to \$5.7 billion.