



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

November 7, 2018

CERTIFIED MAIL

Ms. Julie Reddick
[REDACTED]
[REDACTED]

Dear Ms. Reddick:

FREEDOM OF INFORMATION ACT REQUEST (FOI 2018-01360)

This letter is in response to the electronic Freedom of Information Act (FOIA) request you submitted to this office seeking:

A copy of two letters, with all attachments: 16-WTP-0203 (dated about October 2016) and 17-WTP-0015 (dated about January 2017.). The title of each is "Response to Improper Incentive Payment Complaint (OIG File No. 16-0442-C)."

In a letter dated August 7, 2018, you were notified by this office that the U.S. Department of Energy (DOE) Office of River Protection (ORP) completed its search of its files for responsive documents and identified documents that contain DOE Office of Inspector General (IG) equities. For that reason, your request, along with the documents, was transferred to the DOE Headquarters (HQ) FOIA Office for a release determination. This office was recently notified by the IG that the IG completed its review of the documents and has requested that ORP respond directly to you with the ORP-generated information within both documents. The IG will respond directly to you regarding the IG-generated information within both documents.

Enclosed are copies of 16-WTP-0203 and 17-WTP-0015. As Attachment 1 of both letters was generated by the IG, that office will respond directly to you with a release determination. If you have any questions about the processing of your request under HQ, you may contact Mr. Alexander Morris at Alexander.Morris@hq.doe.gov, or by mail at DOE HQ, 1000 Independence Avenue, SW, MA-46, Washington, DC 20585, or at (202) 586-3159.

You may contact DOE Richland Operations Office FOIA Public Liaison, Richard Buel, at (509) 376-3375, or by mail at P.O. Box 550, Richland, Washington, 99352 for any further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, Maryland 20740-6001, email at ogis@nara.gov; telephone at (202) 741-5770; toll free at 1-877-684-6448; or facsimile at (202) 741-5769.

Ms. Julie Reddick

-2-

November 7, 2018

If you have any questions regarding your request, please contact me at our address above or at (509) 376-6288.

Sincerely,

-Original Signed By-

Dorothy Riehle
Freedom of Information Act Officer
Office of Communications
and External Affairs

OCE:DCR

Enclosures

memorandum

OCT 31 2016

DATE: OCT 31 2016

REPLY TO
ATTN OF: OIG:DPK 16-WTP-0203

SUBJECT: RESPONSE TO IMPROPER INCENTIVE PAYMENT COMPLAINT (OIG File No. 16-0422-C)

TO: Stacy Charboneau, Associate PDAS
For Field Operations, EM-3

The U.S. Department of Energy (DOE), Office of River Protection (ORP) is providing this memorandum to the DOE Office of Environmental Management in response to an Office of Inspector General memorandum (Attachment 1) from John Dupuy, Assistant Inspector General for Investigations. In accordance with Departmental Order 221 the details of the complaint are described below:

A \$4.5 million performance incentive was added to the Bechtel contract for the purpose of reducing the amount of sodium added to the pretreatment solution at the Water Treatment Plant, Richland Operation Office Richland, WA. This incentive was awarded in August 2015 despite previous rejections of the award due to the determination that the incentive was originally implemented based on a faulty solubility equation. Once the formula was corrected, there was no need for Bechtel to reduce the amount of sodium included in the pretreatment solution, so they didn't. The \$4.5 million payment rewarded work not performed.

ORP reviewed the Office of Inspector General's memorandum and provides the following rationale ORP used when proceeding with the approval of the \$4.5 million performance incentive as related to the sodium reduction effort for the pretreatment solution at the Waste Treatment and Immobilization Plant (WTP).

OFFICIAL USE ONLY

~~May be exempt from public release under the Freedom of Information Act (5 U.S.C. 552), Exemption number (b) and category 5, Privileged Information~~

~~Department of Energy review required before public release~~

Name/Org: ~~William F. Hamel/WTP~~ Date: ~~10/28/16~~

Guidance (if applicable): ~~N/A~~

DOES NOT CONTAIN
OFFICIAL USE ONLY INFORMATION

D. Riehle, RL/ORP FOIA

Name/Org: Officer Date: 11/7/20

~~Official Use Only~~

Bechtel National, Inc. (BNI) and ORP engaged in a number of discussions regarding the Incentive Fee requirements, in particular task B.4 – summarize testing and modeling (applicable Contract section in Attachment 2). The discussions supported a re-evaluation by ORP of BNI's work in regard to completing the Sodium Incentive Fee.

During this time, ORP at one point concluded that the assumed flow sheet had not been tested at laboratory, bench, or engineering scale to demonstrate that sodium additions in the process would have been reduced because the testing documentation referenced to support sodium reduction were essentially those used to support selection of the Equipment Option.

There is a degree of subjectivity when it comes to this requirement because the record does not show any formal language preventing BNI from using the Equipment Option selection testing data to support the sodium reduction initiative. BNI stated they relied upon this data to establish the Pretreatment Facility flow sheet at the time.

BNI also made the assertion that their Sodium Incentive Work Initial Plan stated that a key part of the plan for reducing sodium would be the culmination of the efforts to mitigate post-filtration solids formation as part of resolving the Cesium Ion Exchange Process System (CXP) solids technical issue. The first step of technical resolution was to implement either the CXP solids resolution "Equipment Option" or "Heat and Dilute Option."

To support use of the Equipment Option additional clarification with respect to some of the testing and resin (ion exchange) performance above 45°C and post-filtration precipitation was necessary.

The WTP Contract (see section C.7(b)(7)(v), Attachment 3) requires Pretreatment Facility to have the capability of operating filtration at 45°C (or higher) to increase filter flux rates. In order to minimize post-filtration precipitation, the design temperature for cesium IX has been aligned with this contract requirement. This testing was aimed at determining if there were issues associated with operating the columns at this temperature. Results and conclusions in the report indicate no issues were found at 45°C. The amount of sodium included in the G2 model run supporting the sodium reduction fee request will prevent post-filtration precipitation at 45°C.

Stacy Charboneau
16-WTP-0203

-3-

Summary key results from the applicable G2 model runs are in the following table.

Run Results	Sodium Reduction Run	WTP Contract Run
Leach Scenario	UFP2	UFP1
Duration (Years), Last HLW Canister	16.62	20.90
Duration (Years), End of PT	16.61	20.76
HLW Canister Count	10,653	13,516
LAW Vit Containers	32,639	38,348
Leach Caustic (MT Na)	11,962	35,335
UFP62A/B Caustic (MT Na)	3,985	6,057
Total UFP Caustic – (MT Na)	15,946	41,392
PT Mission Duration (70% Availability)	23.7	29.7

The comparison indicates the waste sodium (total ultrafiltration process system [UFP] caustic [MT Na]) was reduced from 41,392 MT in the 2008 WTP Contract Run to 15,946 MT in the Sodium Reduction Run, resulting in a reduction of 25,446 MT of process added waste sodium.

The reduction came about by implementing design changes and process improvements, some of which are listed below:

- Perform leaching in UFP-VSL-00002A/B instead of UFP-VSL-00001A/B
- Increase the ultrafiltration temperature from 35°C to 45°C
- Optimize the UFP train operations
- Institute improved blending in CXP feed system and control temperatures at or above 45°C
- Incorporate improved high-level waste glass formulation models
- Incorporate improved process decision logic for caustic and/or oxidative leaching.

OCT 31 2016

Stacy Charboneau
16-WTP-0203

-4-

In summary, ORP determined BNI met the contract requirements for the Incentive Fee – that is, BNI has provided the DOE with what was required in the contract.



Kevin W. Smith
Manager

Attachments (3):

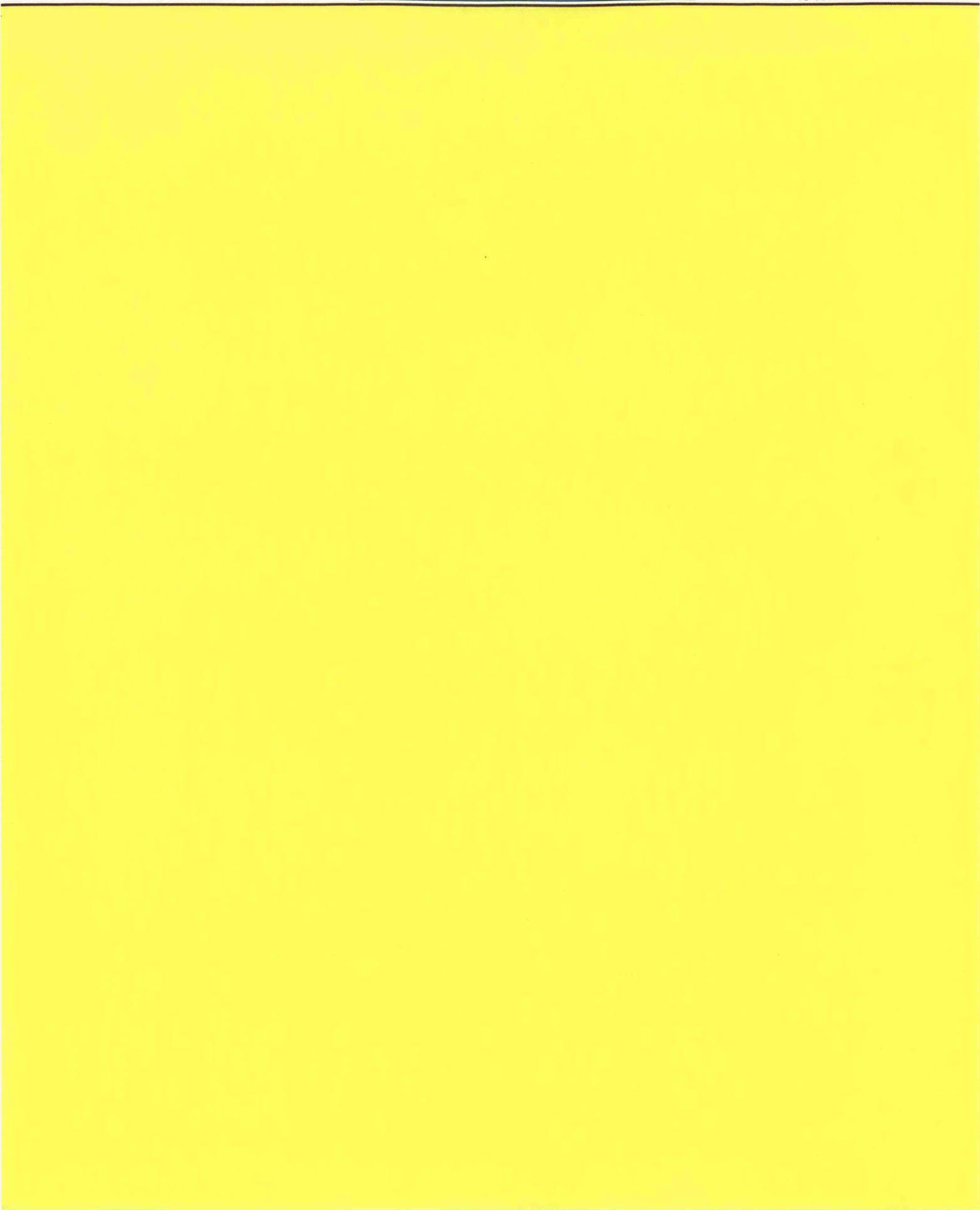
1. Office of Inspector General Memorandum
2. Applicable Contraction Section: Incentive Fee E.2 – Sodium Reduction
3. WTP Contract Section C.7(b)(7)(v)

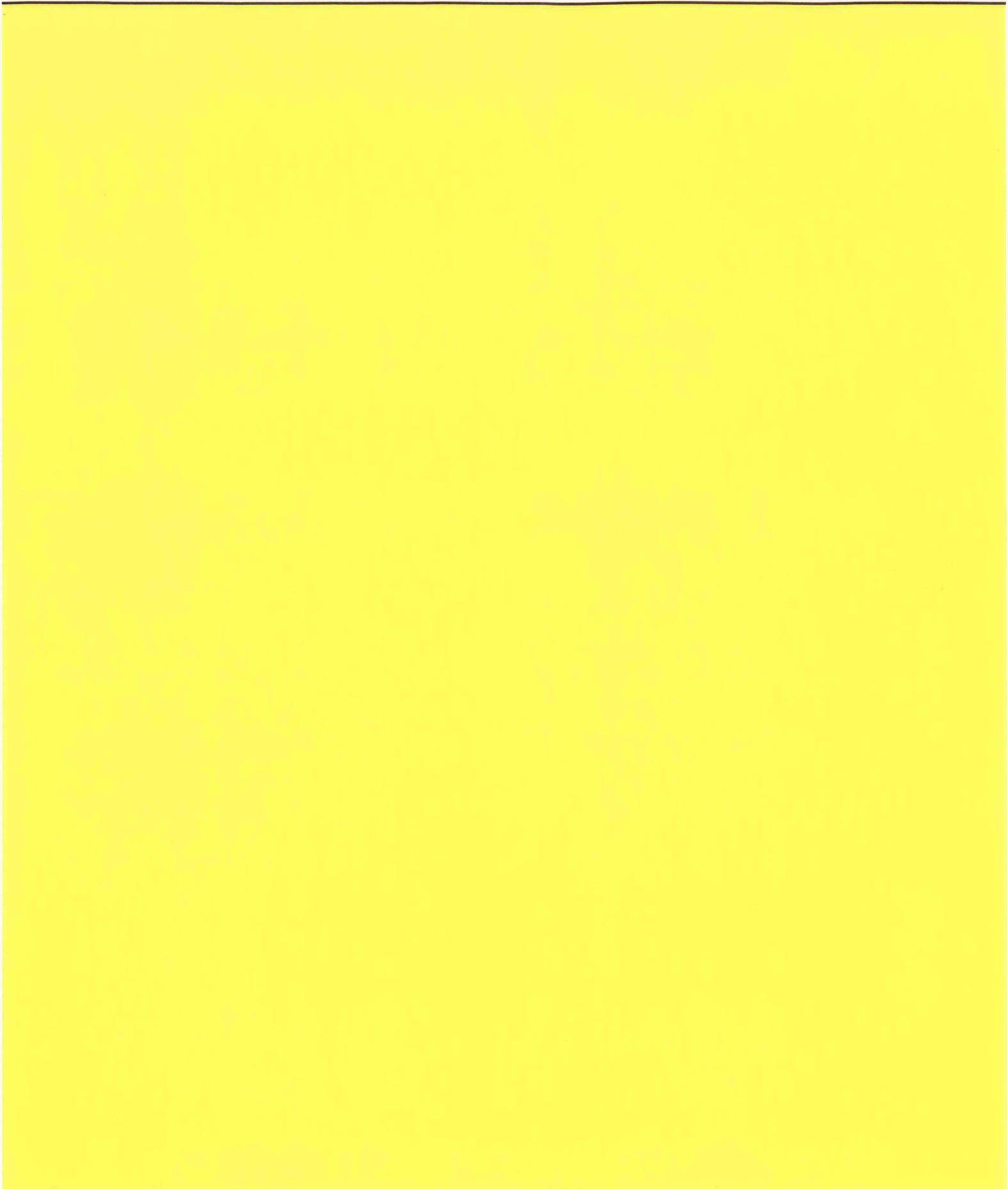
cc:

T.C. Harms, EM-5
J.J. Mocknick, EM-3
L.C. Suttora, EM-11

Attachment 1 was generated by the Office of Inspector General (IG). The IG will make a release determination and provide the response directly to the requestor.

Attachment 1
16-WTP-0203





Attachment 2

INCENTIVE FEE E.2 – SODIUM REDUCTION

“The Contractor may optimize the process flowsheet, feed delivery and blending considerations, glass formulations, and the physical plant configuration to reduce the quantity of process-added waste sodium. The incentive requires the Contractor to reduce the mass of waste sodium added in the Waste Treatment and Immobilization Plant (WTP) baseline flowsheet compared to the estimate presented in 24590-WTP-MRR-PET-08-002, Rev. 2, *WTP Contract Run-G(2) Dynamic Model Run Results Report*.

This proposal and technical outcome:

- Shall not result in an increase in the quantity of High-Level Waste (HLW) canisters produced over the River Protection Project mission or an extension of the mission duration.
- May include options to limit aluminum leached from HLW solids in combination with improvements of aluminum waste loading in the HLW glass, and pretreatment facility process optimization.

Successful demonstration that sodium additions in the process have been reduced should be determined using process models, technology testing (laboratory, bench, and engineering scale), and information from the literature and/or consultants. WTP Cold Commissioning process demonstration of the optimized flowsheet is required.”

Not used at this time: “The WTP Cold Commissioning simulant composition and Cold Commissioning strategy shall be selected with DOE concurrence. The recommended stimulant shall consider demonstration of the optimized process flowsheet. The WTP Cold Commissioning demonstration may be part of or separate from the Cold Commissioning performance testing, at the Contractor’s discretion.”

“The Contractor, if electing to pursue this incentive, shall present a proposal to DOE on the strategy, approach, work products, specific measurements, and cost and schedule for achieving this performance objective. Costs associated with developing a proposal shall assume use of WTP Management Reserve (MR) to fund a baseline change proposal, shall not be considered new Contract Scope and shall be accounted for separately. Funding associated with executing a proposal shall be from a mutually agreed apportionment between Contractor’s MR and Government’s Owner’s contingency as reflected in an approved baseline change proposal (BCP). In the event the cost at completion exceeds the BCP value, the difference is funded in the same proportion.”

The technical outcome will be provided in an interim and final summary report that shall:

- Identify the proposed optimized flowsheet(s) as a function of feed type and predicted sodium use

- Identify feed staging and blending strategies to reduce sodium use
- Identify glass formulations to increase aluminum loading in HLW glass, to the extent that this approach is used
- Summarize laboratory testing, bench scale testing, engineering scale testing and modeling results that demonstrate the reduced usage
- Specify the plant testing requirements needed to confirm assumptions (interim report)
- Document WTP cold commissioning results used to confirm the assumptions and results

Information and data gained from lab and engineering scale testing to close External Flowsheet Review Team issues about leaching, ultrafiltration performance, and process limits can be credited to earn the sodium reduction fee enhancement.

Enhanced fee for Sodium Reduction will be determined based on the Contractor's success in reducing sodium in accordance with the following stepped schedule:

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

* Fee earnings in the table represent earnings at the applicable Sodium-reduction level achieved and are cumulative.

Enhanced fee shall be earned and payable upon the Contracting Officer's determination of the Contractor's completion of the following activities:

1. "Completion of initial model and bench scale testing for runs demonstrating sodium reduction: 30% of the fee for the predicted improvement. If the runs are also demonstrated on the Pretreatment Engineering Platform and engineering scale melter tests (if aluminum loading in the high-level waste glass is part of the strategy) fee is increased to 50% of the fee for the predicted improvement."
2. **Not used at this time:** "Completion of cold commissioning testing and final report (Section C.6, *Standard 5 Commissioning: (e) Cold Commissioning, (5) Cold Commissioning Results and Documentation*): final fee determination, less any fee paid under paragraph (1.) Above."

Total Available Fee for E.2 Sodium Reduction = \$15,000,000

Attachment 3

WTP Contract

Section C
Contract No. DE-AC27-01RV14136

- (7) The Pretreatment Facility shall have the established capability to conduct sludge washing, caustic leaching, and oxidative leaching on HLW sludge and entrained solids. The Pretreatment Facility shall include the following capabilities to permit operational flexibility for sludge washing, caustic leaching, and oxidative leaching flowsheet and treatment capacity:
- (i) Provide two ultrafiltration trains to support solid-liquid separation, sludge washing, caustic leaching, and oxidative leaching. The ultrafilter surface area for each train shall be approximately 1,500 square feet, unless the Contractor demonstrates that greater average filter flux rates can be achieved with an alternative design.
 - (ii) Provide the capability to mix chemical reagents used in the leaching processes, in line with ultrafiltration vessel recirculation pumps, to shorten mixing times.
 - (iii) Perform caustic leaching between 80 and 90°C to enhance leaching kinetics.
 - (iv) Include the capability to remove heels from the ultrafiltration feed vessels to move treated solids forward in the process and minimize recycle.
 - (v) Operate filtration at 45°C or higher to increase filter flux rates and potentially reduce caustic required in leaching.
 - (vi) Add caustic to ultrafilter permeate vessels to minimize the potential for post-filtration precipitation of aluminum species and reduce the volume of permeate that must pass through the ultrafilters.
 - (vii) Increase the capacity of the cesium ion exchange system to a nominal 30 gallon/minute flowrate. This shall accommodate the increased waste volume resulting from caustic increases required to effectively conduct sludge washing, caustic leaching, and oxidative leaching on HLW sludge and entrained solids.
 - (viii) Provide the capability to perform caustic leaching in the ultrafiltration feed preparation vessel in addition to the ultrafiltration feed vessel.

memorandum

DATE: **JAN 31 2017**

REPLY TO
ATTN OF: **OIG:IAB 17-WTP-0015**

SUBJECT: **RESPONSE TO IMPROPER INCENTIVE PAYMENT COMPLAINT (OIG File No. 16-0422-C)**

TO: **Stacy Charboneau, Associate Principal Deputy Assistant Secretary for Field Operations, EM-3**

- References
1. **OIG memorandum from J.E. Dupuy, "Improper Incentive Payment (OIG File No. 16-0422-C), dated December 16, 2016.**
 2. **OIG memorandum from J.E. Dupuy, "Improper Incentive Payment (OIG File No. 16-0422-C), dated August 11, 2016.**
 3. **ORP letter from S. Charboneau and J.R. Eschenberg to L.J. Simmons, BNI and W.J. Johnson, WRPS, "Transmittal of Design Oversight Report: Basis for Sodium Estimate, A-09-AMWTP-RPPWTP-002," 09-WTP-016, dated February 11, 2009.**

The U.S. Department of Energy (DOE), Office of River Protection (ORP) is submitting this memorandum to the DOE Office of Environmental Management in response to memorandum (Reference 1) to provide a more detailed response to memorandum (Reference 2) in accordance with Departmental Order 221 the details of the complaint are described below:

A \$4.5 million performance incentive was added to the Bechtel contract for the purpose of reducing the amount of sodium added to the pretreatment solution at the Water [sic] Treatment Plant, Richland Operation Office Richland, WA. This incentive was awarded in August 2015 despite previous rejections of the award due to the determination that the incentive was originally implemented based on a faulty solubility equation. Once the formula was corrected, there was no need for Bechtel to reduce the amount of sodium included in the pretreatment solution, so they didn't. The \$4.5 million payment rewarded work not performed.

OFFICIAL USE ONLY

~~May be exempt from public release under the Freedom of Information Act (5 U.S.C. 552), Exemption number (b) 5, Privileged Information~~

~~Department of Energy requires review before public release~~

Name/Org: William F. Hamel/WTP Date: 01/30/2017

Guidance (if applicable): N/A

DOES NOT CONTAIN
OFFICIAL USE ONLY INFORMATION

D. Riehle, RL/ORP FOIA Officer Date: 11/07/2017

~~Official Use Only~~

ORP reviewed the Office of Inspector General's memorandum (Reference 1) and provides the following rationale to specifically address each of the enduring issues documented in Reference 1.

Issue # 1: A \$4.5 million performance incentive was awarded in August 2015, despite previous rejections of the award.

ORP's response:

Bechtel National, Inc. (BNI) and ORP engaged in a number of discussions regarding the Incentive Fee requirements, in particular task B.4 – summarize testing and modeling (applicable Contract section in Attachment 2). The discussions supported a re-evaluation by ORP of BNI's work in regard to completing the Sodium Incentive Fee.

ORP at one point concluded that the assumed flow sheet had not been tested at laboratory, bench, or engineering scale to demonstrate that sodium additions in the process would have been reduced because the testing documentation referenced to support sodium reduction were essentially those used to support selection of the Equipment Option.

There is a degree of subjectivity when it comes to this requirement because the formal record on this subject does not include any language preventing BNI from using testing data relied upon to select the Equipment Option, to support demonstration of sodium reduction. BNI stated these test results contributed significantly to the selection of the Pretreatment flowsheet at the time, and therefore supported the sodium reduction initiative.

BNI also made the assertion that their Sodium Incentive Work Initial Plan stated that a key part of the plan for reducing sodium would be the culmination of the efforts to mitigate post-filtration solids formation as part of resolving the Cesium Ion Exchange Process System solids formation technical issue. The first step in technical resolution of the solids issue was to implement either the "Equipment Option" or "Heat and Dilute Option" to modify the plant equipment configuration and optimize the process flowsheet.

To support use of the Equipment Option additional clarification with respect to some of the testing and resin (ion exchange) performance above 45°C and post-filtration precipitation was necessary.

The WTP Contract (see section C.7(b)(7)(v), Attachment 3) requires Pretreatment Facility to have the capability of operating filtration at 45°C (or higher) to increase filter flux rates. In order to minimize post-filtration precipitation, the design temperature for cesium IX has been aligned with this contract requirement. This testing was aimed at determining if there were issues associated with operating the columns at this temperature. Results and conclusions in the report indicate no issues were found at 45°C.

Summary key results from the applicable G2 model runs are in the following table.

Run Results	Sodium Reduction Run	WTP Contract Run
Leach Scenario	UFP2	UFP1
Duration (Years), Last High-Level Waste Canister	16.62	20.90
Duration (Years), End of PT	16.61	20.76
High-Level Waste Canister Count	10,653	13,516
Low-Activity Waste Vit Containers	32,639	38,348
Leach Caustic (MT Na)	11,962	35,335
UFP62A/B Caustic (MT Na)	3,985	6,057
Total UFP Caustic – (MT Na)	15,946	41,392
Pre-Treatment Mission Duration (70% Availability)	23.7	29.7

As shown in the table, the waste sodium (total ultrafiltration process system [UFP] caustic [MT Na]) was reduced from 41,392 MT in the 2008 WTP Contract Run to 15,946 MT in the Sodium Reduction Run, resulting in a reduction of 25,446 MT of process added waste sodium.

Issue #2: The solubility equation that indicated a need to reduce the amount of sodium added to the pretreatment solution was faulty.

ORP's Response:

The aluminum solubility correlation (the solubility equation) used by BNI to support demonstration of sodium reduction and subsequent request for payment of the contractual incentive fee represented a very conservative method to determine the amount of caustic (sodium hydroxide) additions to the Pre-Treatment process that are

necessary to remove aluminum from tank waste feed and ultimately reduce the volume of high level waste needing vitrification.

In 2009 ORP Letter 09-WTP-016, Reference 3, ORP determined that:

The empirical model [solubility equation]... appears to fit the solubility of gibbsite [aluminum mineral present in waste feed] in pure NaOH solutions at 25°C quite well. But the solutions processed in the WTP will not be pure NaOH solutions; rather they will contain a variety of other electrolytes, most notably sodium nitrate. This issue is explicitly discussed in CCN: 160514 and the model predictions are compared to published values for the solubility of gibbsite in NaOH/NaNO₃ [sodium hydroxide/sodium nitrate] media. The results show that at low NaOH concentrations, the gibbsite solubility predicted by the model agrees well with the measured value. However, at NaOH concentrations more likely to be encountered in WTP, the model under-predicts the gibbsite solubility. That is, the predicted solubility is less than that actually measured. Based on this, the model provides a conservative basis for WTP design; representing an upper bound for the amount of NaOH required. Given the large capital investment involved, using the model described in CCN: 160514 as a basis for the WTP design is appropriate, even if it does not necessarily represent the best estimate of the NaOH required to fulfill the RPP mission.

Issue #3: The performance incentive was implemented based on the faulty solubility equation.

ORP's Response:

The aluminum solubility correlation (the solubility equation) used by BNI to support demonstration of sodium reduction and subsequent request for payment of the contractual incentive fee represented a very conservative method to determine process sodium additions. Please see response to Issue #2 above for details.

Issue #4: Once the solubility equation was corrected there was no need for BNI to reduce the amount of sodium included in the pretreatment solution.

ORP's Response:

Reference 3 also concluded that the WTP aluminum solubility model, while suitable for tank sizing, was not applicable as a basis for a nominal estimate for process chemical use or mission duration (estimated sodium hydroxide addition was

consistently higher than observed values in diluted tank waste), and therefore provided recommendations to improve the quality of information supporting the estimated sodium additions. ORP formally requested BNI provide a plan and schedule to update the dynamic flowsheet model used for predicting throughput and chemical consumption over the mission life. This update to the dynamic flowsheet model was to enhance the gibbsite solubility model to include, as a minimum, the effects of the nitrate ion present.

The BNI proposal that ORP formally accepted to address the request above relied on reviewing solubility work being performed for the DOE Office of Environmental Management Technology programs at the Institute for Clean Energy Technology (ICET), Mississippi State University, and at the Hanford 222-S Laboratory, with the intent of incorporating the results into WTP gibbsite solubility algorithms used to predict caustic addition requirements. The work was expected to be completed in 2011; however, BNI formally stated in their interim report that the ICET results were still not available, and the follow-up work at the Hanford 222-S Laboratory was canceled. BNI also noted that if, at some future date, the ICET and/or 222-S Laboratory data on aluminum solubility measurements were to result in less-conservative algorithms for use than the current WTP model, the result would only improve sodium usage (less caustic added) above the values quoted in their interim report.

Issue #5: As BNI had no need to reduce the sodium in the pretreatment solution, the incentive award payment rewarded work that was not performed.

ORP's Response:

Ultimately, BNI was able to demonstrate success in meeting the sodium reduction fee milestone as written in the contract mainly due to implementation (at DOE's direction) of the pretreatment flowsheet change known as the "Equipment Option," which was aimed at prevention/mitigation of post-filtration solids formation in the Cesium Ion Exchange Process system. The "Equipment Option" had the additional benefit of significantly reducing the amount of sodium additions necessary for the pretreatment process. Since the contract language in the sodium reduction fee milestone did not specifically prohibit BNI from using the "Equipment Option" flowsheet enhancements (specifically reduced sodium additions), BNI opted to use the "Equipment Option" optimized flowsheet to demonstrate they had exceeded the maximum number of metric tons of sodium reduction per the incentive fee stepped schedule.

JAN 31 2017

In summary, ORP determined BNI met the contract requirements for the Incentive Fee – that is, BNI has provided DOE with what was required in the contract.


Kevin W. Smith
Manager

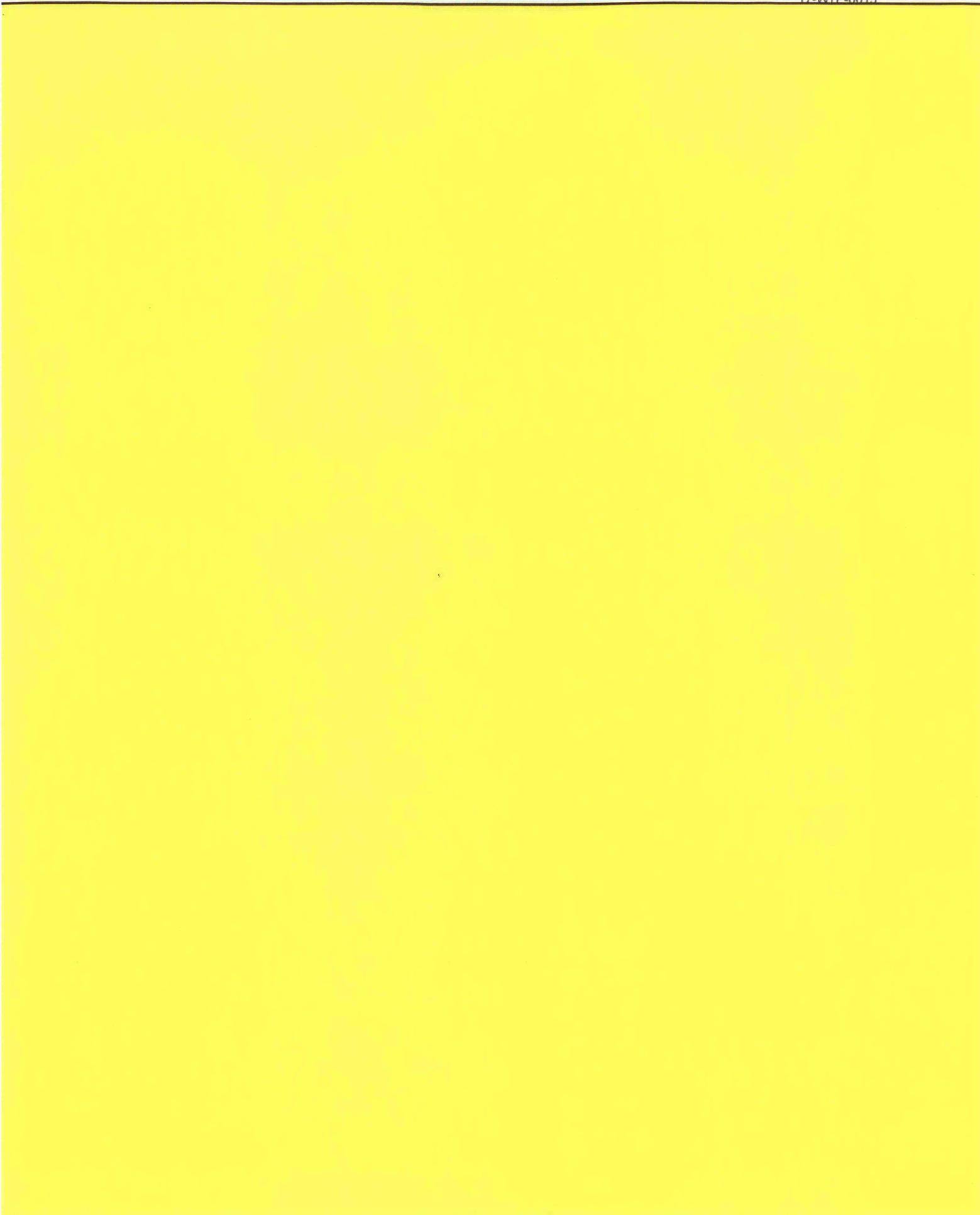
Attachments: (3)

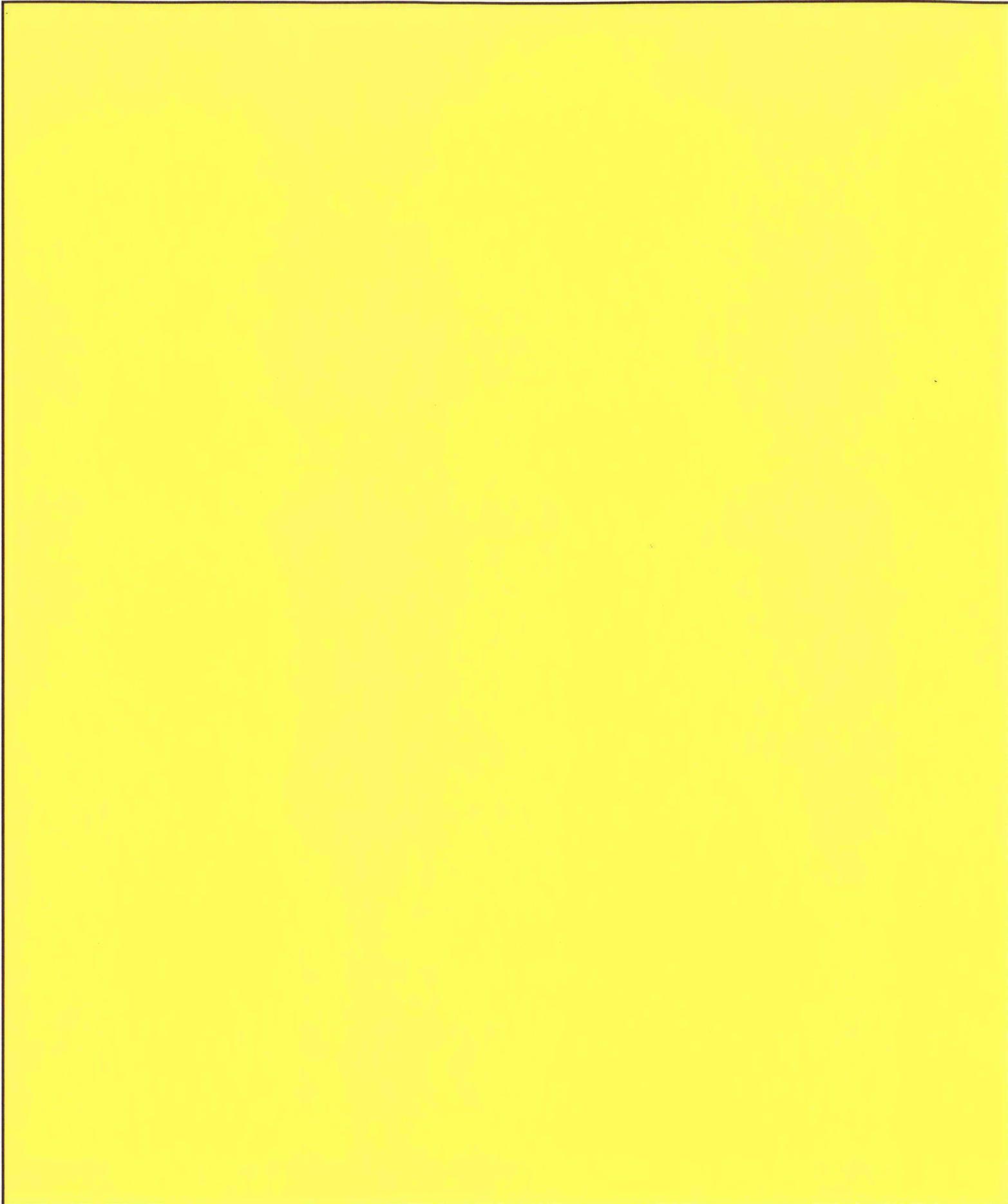
1. Office of Inspector General Memorandum, Reference 2
2. Applicable Contraction Section: Incentive Fee E.2 – Sodium Reduction
3. WTP Contract Section C.7(b)(7)(v)

cc w/attach:

J.J. Mocknick, EM-3
T.C. Harms, EM-5
L.C. Suttora, EM-11

The IG will make a release determination and provide the response directly to the requestor.





Attachment 2

INCENTIVE FEE E.2 – SODIUM REDUCTION

“The Contractor may optimize the process flowsheet, feed delivery and blending considerations, glass formulations, and the physical plant configuration to reduce the quantity of process-added waste sodium. The incentive requires the Contractor to reduce the mass of waste sodium added in the Waste Treatment and Immobilization Plant (WTP) baseline flowsheet compared to the estimate presented in 24590-WTP-MRR-PET-08-002, Rev. 2, *WTP Contract Run-G(2) Dynamic Model Run Results Report*.

This proposal and technical outcome:

- Shall not result in an increase in the quantity of High-Level Waste (HLW) canisters produced over the River Protection Project mission or an extension of the mission duration.
- May include options to limit aluminum leached from HLW solids in combination with improvements of aluminum waste loading in the HLW glass, and pretreatment facility process optimization.

Successful demonstration that sodium additions in the process have been reduced should be determined using process models, technology testing (laboratory, bench, and engineering scale), and information from the literature and/or consultants. WTP Cold Commissioning process demonstration of the optimized flowsheet is required.”

Not used at this time: “The WTP Cold Commissioning simulant composition and Cold Commissioning strategy shall be selected with DOE concurrence. The recommended stimulant shall consider demonstration of the optimized process flowsheet. The WTP Cold Commissioning demonstration may be part of or separate from the Cold Commissioning performance testing, at the Contractor’s discretion.”

“The Contractor, if electing to pursue this incentive, shall present a proposal to DOE on the strategy, approach, work products, specific measurements, and cost and schedule for achieving this performance objective. Costs associated with developing a proposal shall assume use of WTP Management Reserve (MR) to fund a baseline change proposal, shall not be considered new Contract Scope and shall be accounted for separately. Funding associated with executing a proposal shall be from a mutually agreed apportionment between Contractor’s MR and Government’s Owner’s contingency as reflected in an approved baseline change proposal (BCP). In the event the cost at completion exceeds the BCP value, the difference is funded in the same proportion.”

The technical outcome will be provided in an interim and final summary report that shall:

- Identify the proposed optimized flowsheet(s) as a function of feed type and predicted sodium use

- Identify feed staging and blending strategies to reduce sodium use
- Identify glass formulations to increase aluminum loading in HLW glass, to the extent that this approach is used
- Summarize laboratory testing, bench scale testing, engineering scale testing and modeling results that demonstrate the reduced usage
- Specify the plant testing requirements needed to confirm assumptions (interim report)
- Document WTP cold commissioning results used to confirm the assumptions and results

Information and data gained from lab and engineering scale testing to close External Flowsheet Review Team issues about leaching, ultrafiltration performance, and process limits can be credited to earn the sodium reduction fee enhancement.

Enhanced fee for Sodium Reduction will be determined based on the Contractor's success in reducing sodium in accordance with the following stepped schedule:

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

* Fee earnings in the table represent earnings at the applicable Sodium-reduction level achieved and are cumulative.

Enhanced fee shall be earned and payable upon the Contracting Officer's determination of the Contractor's completion of the following activities:

1. "Completion of initial model and bench scale testing for runs demonstrating sodium reduction: 30% of the fee for the predicted improvement. If the runs are also demonstrated on the Pretreatment Engineering Platform and engineering scale melter tests (if aluminum loading in the high-level waste glass is part of the strategy) fee is increased to 50% of the fee for the predicted improvement."
2. **Not used at this time:** "Completion of cold commissioning testing and final report (Section C.6, *Standard 5 Commissioning: (e) Cold Commissioning, (5) Cold Commissioning Results and Documentation*): final fee determination, less any fee paid under paragraph (1.) Above."

Total Available Fee for E.2 Sodium Reduction = \$15,000,000

Attachment 3

WTP Contract

Section C

Contract No. DE-AC27-01RV14136

- (7) The Pretreatment Facility shall have the established capability to conduct sludge washing, caustic leaching, and oxidative leaching on HLW sludge and entrained solids. The Pretreatment Facility shall include the following capabilities to permit operational flexibility for sludge washing, caustic leaching, and oxidative leaching flowsheet and treatment capacity:
- (i) Provide two ultrafiltration trains to support solid-liquid separation, sludge washing, caustic leaching, and oxidative leaching. The ultrafilter surface area for each train shall be approximately 1,500 square feet, unless the Contractor demonstrates that greater average filter flux rates can be achieved with an alternative design.
 - (ii) Provide the capability to mix chemical reagents used in the leaching processes, in line with ultrafiltration vessel recirculation pumps, to shorten mixing times.
 - (iii) Perform caustic leaching between 80 and 90°C to enhance leaching kinetics.
 - (iv) Include the capability to remove heels from the ultrafiltration feed vessels to move treated solids forward in the process and minimize recycle.
 - (v) Operate filtration at 45°C or higher to increase filter flux rates and potentially reduce caustic required in leaching.
 - (vi) Add caustic to ultrafilter permeate vessels to minimize the potential for post-filtration precipitation of aluminum species and reduce the volume of permeate that must pass through the ultrafilters.
 - (vii) Increase the capacity of the cesium ion exchange system to a nominal 30 gallon/minute flowrate. This shall accommodate the increased waste volume resulting from caustic increases required to effectively conduct sludge washing, caustic leaching, and oxidative leaching on HLW sludge and entrained solids.
 - (viii) Provide the capability to perform caustic leaching in the ultrafiltration feed preparation vessel in addition to the ultrafiltration feed vessel.