

### UNREVIEWED WASTE MANAGEMENT QUESTION EVALUATION (UWMQE)

UWMQE Number: SRR-UWMQE-2018-00001

Revision: 0

UWMQE Title: Evaluation of Waste Release Testing Results

#### UWMQE Supported Documents

##### TECHNICAL

Number: \_\_\_\_\_ Date: \_\_\_\_\_ Revision: \_\_\_\_\_

Number: \_\_\_\_\_ Date: \_\_\_\_\_ Revision: \_\_\_\_\_

##### SUPPORTING

Number: SRR-CWDA-2016-00086 Date: 11/2018 Revision: 1

Number: SRR-CWDA-2018-00075 Date: 11/2018 Revision: 0

#### 1. Unreviewed Waste Management Question Evaluation

##### Proposed Activity Description

The new data is an evaluation of waste release testing results (ref. SRR-CWDA-2016-00086). The solubilities of I, Pu, Np, U, and Tc were tested under simulated waste tank chemistry conditions using Tank 18 and Tank 12 residual waste samples. Data was collected via measured concentrations (or solubilities) under different chemical conditions (pH and Eh varied). The chemical conditions reflect a range of states so that the results can be used to better understand the impact of transitory waste tank chemical conditions on solubility. The results indicate there may be some variance between the Performance Assessment (PA) assigned and experimental solubilities. While the testing results do not inherently meet the HTF (SRR-CWDA-2010-00128) and FTF (SRS-REG-2007-00002) PA assumptions, a deviation from the assumptions does not necessarily lead to not meeting the PA conclusions.

**NOTE:** Each question below requires Comment / Justification.

- a. Is the Proposed Activity or New Data outside the bounds of the critical inputs/assumptions of the analyses contained in the WD, PA, CA, approved SA(s), or approved UWMQE(s)? For example, does the proposed activity or new information involve a change to the assumed critical design features for a waste tank/disposal unit design as described in the WD, PA, CA, approved SA(s), or approved UWMQE(s) such as critical inputs/assumptions?

Yes  No

##### Comment / Justification:

Since the Tank Farm Waste Determination (WD) Basis Documents (DOE/SRS-WD-2012-001 and DOE/SRS-WD-2014-001) do not prescribe assumed solubilities, the new data is within the bounds of the WD Basis Documents. The impact on the PAs of the change to the solubilities of I, Pu, Np, U, and Tc was evaluated in SRR-CWDA-2016-00086 and the new solubilities were shown to be consistent with the conclusions of the Tank Farm PAs. As demonstrated in SRR-CWDA-2016-00086, even if the experimental results (for Tank 18 and Tank 12 residuals) were conservatively accepted into the PA Waste Release Model (WRM) as representative for other tanks, the newly assigned solubilities would have a negligible impact on Tank Farm peak doses in 1,000 or 10,000 years.

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**1. Unreviewed Waste Management Question Evaluation - continued**

b. Does the New Data involve an increase in the radionuclide inventory or chemical constituents evaluated in the approved WD, PA, CA, approved SA(s), and approved UWMQE(s)?

Yes  No

Comment / Justification:

The new data relates to the solubilities of I, Pu, Np, U, and Tc assumed in PA modeling and in no way impacts the FTF and HTF radionuclide or chemical inventories.

c. Would the radionuclide disposal limits need to be changed to implement the proposed activity?

Yes  No

Comment / Justification:

The new data relates to the solubilities of I, Pu, Np, U, and Tc assumed in PA modeling and in no way impacts the FTF and HTF radionuclide inventories.

d. Is it possible that the Proposed Activity or New Data causes the WD, PA, CA, approved SA(s), or approved UWMQE(s) performance objectives to be exceeded?

Yes  No

Comment / Justification:

The impact of changing the solubilities of I, Pu, Np, U, and Tc assumed in PA modeling was evaluated in SRR-CWDA-2016-00086. As demonstrated in SRR-CWDA-2016-00086, even if the waste release test results were conservatively used in PA modeling, the newly assigned solubilities would have a negligible impact on TF peak doses in 1,000 or 10,000 years (in fact the HTF peak dose decreases by 50%). Because replacing the assumed solubilities for I, Pu, Tc, U and Np does not significantly impact PA conclusions, there is no immediate need to update the current modeling to incorporate the waste release testing data. The new waste release data can be integrated into the next revision to the FTF and HTF PAs or SAs.

**UNREVIEWED WASTE MANAGEMENT QUESTION  
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**2. UWMQE Originator**

IS the activity within the bounds of the existing  
WD, PA, CA or approved SA(s) and approved  
UWMQEs?                      Yes                       No

IS a Special Analysis required?                      Yes                       No

**Comment / Justification:**

The impact of changing the solubilities of I, Pu, Np, U, and Tc assumed in PA modeling was evaluated in SRR-CWDA-2016-00086. Using residual waste samples from Tank 18 and Tank 12, the solubilities of Pu, Np, U, Tc, and I (Tank 12 only) were tested under simulated waste tank chemistry conditions. Data was collected via measured concentrations (or solubilities) over a several week testing period under different chemical conditions (pH and Eh were varied). The chemical conditions reflect a range of states such that the test results can be used to better understand the impact of transitory waste tank chemical conditions on solubility. The experimental results indicate there may be some variance between the actual waste solubilities and the Waste Release Model (WRM) assigned solubilities. For example, Np and I were in all cases more insoluble than assigned in the TF WRM. The other elements - Pu, Tc and U - appeared in most instances to be potentially more soluble than was assumed in the WRM. For example, Pu was relatively insoluble when oxidized, but was still more soluble than calculated by the WRM. Even if the experimental results were conservatively accepted into the PA WRM, the newly assigned solubilities would have a negligible impact on peak doses in 1,000 or 10,000 years. Because replacing the values associated with Pu, Tc, U, Np, and I does not significantly impact FTF and HTF PA conclusions (in fact the HTF peak dose decreases by 50%), there is no immediate need to update the current model to incorporate the waste release testing data. The new waste release data can be integrated into the next revision to the FTF and HTF PAs or SAs.

Check one of the following boxes below and forward to peer reviewer.

- CANCEL the proposed activity. (Document canceled activities as applicable.)
- MODIFY the proposed activity.
- PROCEED to PARC approval (if no SA is required).
- PROCEED with proposed activity; categorical exclusion applies.
- PERFORM Special Analysis.

Originator: Mark H. Layton

Print

Mark H. Layton  
Signature

Date: 11/29/18 Time: 10:00

**UNREVIEWED WASTE MANAGEMENT QUESTION  
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**3. UWMQE Peer Reviewer**

Concur with the UWMQEO's determination?      Yes       No

Comment / Justification:

I reviewed the applicable sections of the HTF PA, FTF PA, HTF 3116 Basis Document, and FTF 3116 Basis Document. Also reviewed the referenced SRNL test report, UWMQE, supporting documents, and UWMQE question responses. I concur with the originator's conclusion that the new data does not alter the HTF or FTF PA/SA conclusions and can proceed.

Peer Reviewer: Kent H. Rosenberger  
Print

  
Signature

Date: 11/29/2018

**UNREVIEWED WASTE MANAGEMENT QUESTION  
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**4. Section 3116 Waste Determination SME Review**


- a. Concur with the UWMQEO's determination? Yes  No
- b. Does the UWMQE impact Section 3116 WD attributes? Yes  No

(If 4 b. "Yes" box is checked above, obtain AGCC Review) (If 4 b. "No" box is checked above, NR box in Section 5)

**Comment / Justification:**

The HTF and FTF 3116 Waste Determinations were issued based, in part, on the results of the HTF and FTF PA's which provide the technical basis and results demonstrating there is reasonable assurance that the 10 CFR 61.41 and 10CFR 61.42 performance objectives will be met after closure of HTF and FTF. Because the new data does not alter the HTF or FTF PA/SA conclusions, I concur with the originator's conclusion that the new data is within the bounds of the existing HTF and FTF 3116 Waste Determinations and supporting Basis Documents. The HTF and FTF 3116 Basis Documents acknowledge that as required by DOE Manual 435.1-1, maintenance of the PA's "will include future updates to incorporate new information, update model codes, analysis of actual residual inventories, and other information as appropriate." Therefore, this UWMQE does not impact the Section 3116 Waste Determination attributes for either HTF or FTF.

Section 3116 WD SME Larry B. Romanowski /  / 12/4/18  
Print Signature Date


WDA Manager or Delegate Steven A. Thomas /  / 12/5/2018  
Print Signature Date

**5. UWMQE AGCC Reviewer**

- If the UWMQE impacts 3116 WD attributes is there a legal objection to the UWMQEO's determination? Yes  No  N/R

**Comment / Justification:**

No legal objection. New data will not be used until SA is completed. Since SA process will be used to evaluate use of this data I see no legal requirement to have DOE approve this PA's. I believe DOE is authorized to PA's is authorized to conclude that UWMQE does not impact 3116 WD attributes.

AGCC or Delegate AGCC Thomas Frank Eyzland /  / 10/12/18  
Print Signature Date

**UNREVIEWED WASTE MANAGEMENT QUESTION  
EVALUATION (UWMQE)**

**6. PARC Chairman**

IS the activity consistent with the existing WD? Yes  No

IS a Special Analysis required? Yes  No

Comment / Justification:

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IF a Special Analysis is required, INDICATE the follow-up action by checking one of the following boxes below and return to the UWMQE Originator

- CANCEL the proposed activity (Document canceled activities as applicable)
- MODIFY the proposed activity to attempt to eliminate the SA
- PERFORM SA

PARC Chairman  
or Designee:

JHAWAN FREEMAN-freeman  
Print

[Signature]  
Signature

Date: 12/10/2018