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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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July 26, 2017

17-NWP-092

Mr. Doug S. Shoop, Manager
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: H5-20
Richland, Washington 99352

Mr. Ty Blackford, President and CEO
CH2M Hill Plateau Remediation Company
PO Box 1600, MSIN: H7-30
Richland, Washington 99352

Re: Administrative Order Docket Number 14156 – Corrective Action 1 Submittal, Structural Integrity Evaluation for PUREX Storage Tunnels 1 and 2

Reference: See Page 2

Dear Mr. Shoop and Mr. Blackford:

The Department of Ecology (Ecology) received Letter 17-AMRP-0201 (reference) from the United States Department of Energy, Richland Operations Office (USDOE-RL). This letter submitted to Ecology the structural integrity evaluations for PUREX Storage Tunnels 1 and 2.

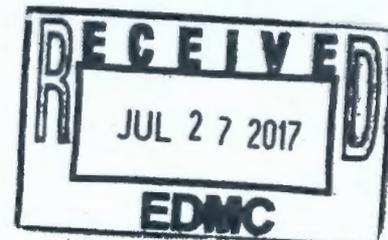
By submitting these engineering reports, USDOE-RL met the intent of Corrective Action 1 in the PUREX Administrative Order Docket Number 14156. However, after reviewing the engineering reports, Ecology has comments on both reports for Tunnels 1 and 2. Our comments are attached in two Review Comment Records (RCRs). One RCR contains comments for Tunnel 1 and the other for Tunnel 2.

We look forward to working with USDOE-RL on responses to our comments.

If there are any questions, please contact Stephanie Schleif, Facility Transition Project Manager, at stephanie.schleif@ecy.wa.gov or (509) 372-7929, or Ron Skinnarland, Waste Management Section Manager, at ron.skinnarland@ecy.wa.gov or (509) 372-7924.

Sincerely,

Alexandra K. Smith
Program Manager
Nuclear Waste Program



ss/jvs
Enclosures (2)
cc: See page 2



1245185

Mr. Shoop and Mr. Blackford
July 26, 2017
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17-NWP-092

Reference: Letter 17-AMRP-0201, dated June 29, 2017, "Administrative Order Number 14156 –
Corrective Action 1 Submittal, Structural Integrity Evaluation for PUREX Storage
Tunnels 1 and 2"

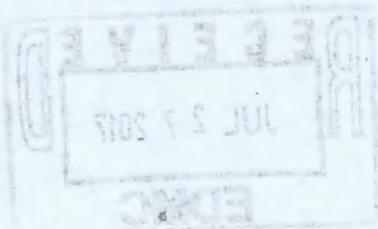
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cc electronic:

Dave Bartus, EPA
Dennis Faulk, EPA
Duane Carter, USDOE
Al Farabee, USDOE
Moses Jaraysi, CHPRC
Jon Perry, MSA
Rose Ferri, YN
Ken Niles, ODOE
Annette Carlson, Ecology
Daniel Heuston, Ecology
Edward Holbrook, Ecology
Stephanie Schleif, Ecology
Ron Skinnarland, Ecology
Brigitte Weese, Ecology
CHPRC Correspondence Control
Environmental Portal
Hanford Facility Operating Record
MSA Correspondence Control
USDOE-RL Correspondence Control

cc: Rod Skeen CTUIR
Jack Bell, NPT
Russell Jim, YN
Susan Leckband, HAB
Administrative Record (PUREX)
NWP Central File

S-2-1



Review Comment Record

**Washington State Department of Ecology
Nuclear Waste Program**

Date: July 25, 2017

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Document Title(s)/Number(s)

CHPRC-03364, PUREX Tunnel 1 Engineering Evaluation

Document Manager	Phone	Project Manager	Phone	Facility Site ID	Cleanup Site ID
Brigitte Weese	(509) 372-7936	Stephanie Schleif	(509) 372-7929	CUG - 25, WA7890008967	

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	USDOE Response	Ecology Response	Open/Close	Reviewer Initials
1	General	The report is not clear on the potential factors leading to the collapse of Tunnel 1 on May 9. While the report does a good job evaluating the cause of the roof collapse on Tunnel 1 in one section (Section 9), it is inconsistent with the potential factors contributing the collapse in another section (Section 2).	Provide clarification on the factors contributing to the collapse.	Administrative Order Docket # 14156				SS
2	Pg. 1, Section 2	The report identifies the design life of the cover for Tunnel 1 as months. This covers serves to prevent run on into the tunnel and is a consideration for safe storage of waste inside the tunnel. Because the design life is only months, DOE needs to provide further evaluation to Ecology of the control of run on for tunnel 1, if grouting does not proceed before the end of the design life for the cover.	With the short design life of the cover how will this impact the schedule for grouting, assuming the cover will be in place until conclusion of grouting and that the cover is serving to prevent run on.	Administrative Order Docket # 14156				SS
3	Pg. 1 and 2, Section 2	The engineering evaluation for Tunnel 1 did not take into account the structural degradation of wood timbers due to long term exposure of high levels of radioactivity or effects of wood decay and insect attacks.	Why were these considerations not taken into account for this evaluation?	Administrative Order Docket # 14156				DH
4	Pg. 5, Section 9, and Pg. 9, Design Information	The discussion of soil over the tunnel has a varying depth from 7.7 ft. to 9.5-ft. with an average of 8.2 ft. The calculation then uses 8 ft. as the depth of cover. Unless a variable depth profile matching actual conditions is used, the conservative approach would have been to assume 9.5 ft. of soil is covering tunnel.	Provide clarification for why a less conservative soil cover depth was used.	Administrative Order Docket # 14156				PMG

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Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	USDOE Response	Ecology Response	Open/Close	Reviewer Initials
8	Pg. 5, Section 9 and & Pg. 28, Roof Pressures	<p>Pg. 5 states that the LIDAR topographic survey data analyzed the depth of the soil berm over the tunnel, and the depth varied from 7.7 ft. to 9.5 ft., with the average depth at 8.2 ft.</p> <p>Pg. 28 states that the soil height over the tunnel roof were found to vary from 7.8 to 9.5 ft., with an average of 8.3 ft.</p>	Please provide clarification on the varying depths of the soil berm on Pg. 5 versus Pg. 28.	Administrative Order Docket # 14156				BW
5	Pg. 5, Section 9	Was vibration from construction work around the site taken into consideration as a potential cause of the partial roof collapse?		Administrative Order Docket # 14156				PMG
6	Pg. 5, Section 9	Was the location of any of the material stored in Tunnel 1 taken into consideration in regards to radiological degradation?		Administrative Order Docket # 14156				PMG
7	Pg. 5, Section 9	It is unclear whether the added soil weight (soil fill added after the partial collapse of Tunnel 1) was considered in the earth pressure calculations of Tunnel 1.	Please provide clarification.	Administrative Order Docket # 14156				BW
9	Pg. 6, Section 11	<p>Chapter 11 (Risk of Future Failure) states: "The risk of future failure of the tunnel (partial or global collapse) is consider high based on significant design overstress of the timber wall supports noted in the structural evaluation herein and on the recent partial roof collapse. As a result, the existing Tunnel 1 structure presents an extreme collapse hazard until such time that physical evaluation of remaining timber members and their supports can be performed."</p> <p>Corrective Action 1 of Administrative Order Docket #14156 requires USDOE to: "...assess if there is an immediate risk for further failures in PUREX Storage Tunnels 1."</p> <p>The Engineering Evaluation for PUREX Storage Tunnel 1 as presented above states "Tunnel 1 structure presents an extreme collapse hazard until such time that physical evaluation of the remaining timber members and their supports can be performed."</p>	<p>Provide clarification on whether "extreme collapse hazard" is equivalent to "immediate risk of further failure" as stated in the Order.</p> <p>This comment may also apply to the deliverable for corrective action 2.</p>	Administrative Order Docket # 14156				DH

Review Comment Record		Washington State Department of Ecology Nuclear Waste Program				Date: July 25, 2017		
						Page 3 of 3		
Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	USDOE Response	Ecology Response	Open/Close	Reviewer Initials
10	Pg. 33, Progressive Failure of Roof Timbers	The following is stated: "Further study may be warranted using numerical methods and by assigning spring constants to individual timbers and investigating the loss of individual timber members." Is this further study obtainable with current information that is on hand? If so, why were the individual timbers not further investigated to this degree in the Tunnel 1 Engineering Evaluation?	Please provide clarification on the further study.	Administrative Order Docket # 14156				BW

Review Comment Record

**Washington State Department of Ecology
Nuclear Waste Program**

Date: July 25, 2017

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Document Title(s)/Number(s)

CHPRC-03365, PUREX Tunnel 2 Engineering Evaluation

Document Manager	Phone	Project Manager	Phone	Facility Site ID	Cleanup Site ID
Brigitte Weese	(509) 372-7936	Stephanie Schleif	(509) 372-7929	CUG-25, WA7890008967	

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	USDOE Response	Ecology Response	Open/Close	Reviewer Initials
1	Pg. 3, Section 4 and Pg. 9, Section 9	The engineering evaluation for Tunnel 2 did not take into account potential for degradation of structural steel supports and bolt and welded connections due to adverse effects from corrosion, material defects, and long-term exposure to high levels of radioactivity. The report also did not evaluate adverse effects on the structure from heavy rainfall.	Why were these considerations not taken into account for this evaluation?	Administrative Order Docket # 14156				DH
2	Pg. 6, Section 9, and Pg. 6, Section 10	Section 9 states: "Based on overstressed conditions in structural support members and connections and uncertainty of additional unknown stresses induced during original construction, Tunnel 2 has a potential risk of localized collapse . Section 10 (Risk for Future Failure) states: "The risk of future failure of the tunnel (partial or global collapse) is considered high based on identified design overstress conditions and problems.	Provide clarification on whether "potential risk" is equivalent to "immediate risk of further failure" as stated in the Order. This comment may also apply to the deliverable for Corrective Action 2.	Administrative Order Docket # 14156				DH
3	Pg. 6, Section 9	Section 9 states: " Stabilization of the tunnel is recommended to be implemented as soon as possible to minimize risk of failure ." Is the risk of failure immediate?	Ecology will review the submittal for Corrective Action 2 of the Order for Tunnel 2 to determine whether the corrective actions to ensure safe storage of the waste are sufficient to meet this statement.	Administrative Order Docket # 14156				DH