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(06679774)



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

18-AMRP-0007

OCT 18 2017

Ms. Alexandra K. Smith, Program Manager
Nuclear Waste Program
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Ms. Smith:

ADMINISTRATIVE ORDER NUMBER 14156 - CORRECTIVE ACTION 1 SUBMITTAL,
STRUCTURAL INTEGRITY EVALUATIONS FOR PUREX STORAGE TUNNELS 1 AND 2
RESPONSE TO COMMENTS

The U.S. Department of Energy Richland Operations Office (RL) received formal comments from the Washington State Department of Ecology (Ecology) letter (17-NWP-092) dated July 26, 2017, regarding the structural integrity evaluations for PUREX Storage Tunnels 1 and 2. These evaluations were provided to Ecology by letter (17-AMRP-0201) dated June 29, 2017, to satisfy Corrective Action 1 of Administrative Order Number 14156. RL and CH2M HILL Plateau Remediation Company met with Ecology on August 29, 2017, to discuss Ecology's comments on the structural integrity evaluations. Attached are the final responses to comments.

If you have any questions, please contact me, or your staff may contact Joe Franco, Assistant Manager for the River and Plateau, on (509) 373-9971.

Sincerely,

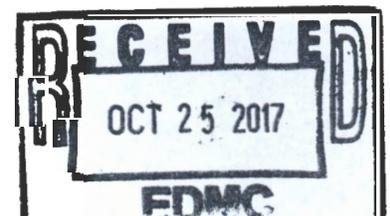

Doug S. Shoop
Manager

AMRP:DBC

Attachments:

1. PUREX Tunnel 1 Review Comment Record
2. PUREX Tunnel 2 Review Comment Record

cc: See page 2



Ms. Alexandra K. Smith
18-AMRP-0007

-2-

OCT 18 2017

cc w/attachs:

L. T. Blackford, CHPRC

L. C. Buelow, EPA

R. M. Geimer, CHPRC

M. N. Jaraysi, CHPRC

K. Niles, ODOE

S. N. Schleif, Ecology

B. L. Weese, Ecology

Administrative Record (PUREX Storage Tunnels, S-2-1)
Environmental Portal

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

Project Manager

Facility Site ID

Cleanup Site ID

Brigitte Weese

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CUG - 25,
WA7890008967

Item No.	Pg. # Sec. # Para./Sent.	Comment or Question	Modification Needed	Basis/Justification	U.S.D.O.E. 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.		Section 9 amplifies the potential factors listed in Section 2.			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.		The cover design life exceeds the scheduled date for completion of grouting.			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?		DOE/CHPRC did the analysis based on original conditions of the building material. Because the original condition came back as over stressed, DOE/CHPRC did not feel the need to consider these factors.			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.		The 8 feet reference for the calculations was the original design for the tunnel. Because the calculations came back as overstressed, DOE/CHPRC did not feel the need to factor in the additional load from the soil.			PMG

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8	Pg. 5, Section 9 and & Pg. 28, Roof Pressures	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 feet with the average depth at 8.2 ft. 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.	Please provide clarification on the varying depths of the soil berm on Pg. 5 versus Pg. 28.		Pg. 28 was the data from the geotechnical report. Pg. 5 included the consolidated information. Additionally, the original condition was overstressed at the 8 feet design soil load.			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?			The vibration from construction work around the site was taken into consideration. The only activities at the time was MSA road work. The zone of influence of the MSA road work was well away from the impact zone. WTP is also well away from the impact zone.			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?			DOE/CHPRC had the rad data for all of the cars, but because the original conditions were overstressed, DOE/CHPRC did not need to incorporate the rad data.			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 the Tunnel 1.	Please provide clarification.		The addition of soil over the collapsed portion of Tunnel 1 did not add an additional load to the top of the tunnel. The addition of the soil reduced the load on the vertical timbers.			BW

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9	Pg. 6, Section 11	<p>In Chapter 11 (Risk of Future Failure), it 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>In Corrective Action 1 of Administrative Order Docket #14156 it requires DOE to: "...assess if there is an immediate risk for further failures in PUREX Storage Tunnels 1." Whereas, in the Engineering Evaluation for PUREX Storage Tunnel 1 as presented above it 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. This comment may also apply to the deliverable for corrective action 2.</p>		<p>Tunnel 1 has already collapsed. In order to obtain more information, DOE/CHPRC would have to send someone into the tunnel. Given the lack of structural integrity and the significant radiation dose, it is not safe to enter the tunnel.</p>			DH
10	Pg. 33, Progressive Failure of Roof Timbers	<p>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."</p> <p>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?</p>	<p>Please provide clarification on the further study.</p>		<p>In order to do the further analysis, DOE/CHPRC would need to send someone into the tunnel to obtain further information. Given the lack of structural integrity and the significant radiation dose, it is not safe to enter the tunnel.</p>			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

Project Manager

Facility Site ID

Cleanup Site ID

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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	The evaluation was based on original conditions. Because the evaluation came back as over stressed, DOE/CHPRC stopped there.			DH
2	Pg. 6, Section 9, and Pg. 6, Section 10	In Section 9 it 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 . In Section 10 (Risk for Future Failure) it 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	Tunnel 2 has not failed. However, given the number of overstressed structural members, the risk of collapse is high.			DH
3	Pg. 6, Section 9	In Section 9 it 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	Ecology comments on Corrective Action 2 will be addressed when received.			DH