

Hanford Challenge

See attachment



April 15, 2024

Comments Submitted Electronically at: <https://nw.ecology.commentinput.com/?id=tNePGUiA5>
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

RE: Public Comment Period for 2,000-Gallon Test Bed Initiative Demonstration Draft Research, Development, and Demonstration Permit

To Whom It May Concern:

Thank you for the opportunity to submit comments on the 2,000-Gallon Test Bed Initiative Demonstration Draft Research, Development, and Demonstration (RD&D) Permit. We appreciate Washington State Department of Ecology's (Ecology) efforts to share information about the permit in a public meeting on March 20, 2024.

Hanford Challenge is a non-profit, public interest, environmental, and worker advocacy organization located in Seattle, WA. We are an independent 501(c)(3) organization incorporated in the State of Washington since 2008 and registered in Oregon. Our mission is to create a future for the Hanford Nuclear Site that secures human health and safety, advances accountability, and promotes a sustainable environmental legacy.

Hanford Challenge has members who work at the Hanford Site. Other members of Hanford Challenge work and/or recreate near Hanford, where they may also be affected by hazardous materials emitted into the environment by Hanford. All members have a strong interest in ensuring the safe and effective cleanup of the nation's most toxic nuclear site for current and future generations, and who are therefore affected by conditions that endanger human health and the environment.

We want to express our appreciation to Ecology for insisting on a public meeting despite it not being a requirement, having staff from Ecology answer our questions, following up with our staff to address our concerns, committing to work with U.S. Department of Energy (USDOE) to track down information that wasn't available at the meeting, and being open to our suggestions to improve accessibility for the public in the future. We also appreciate the clarity in the draft permit about many aspects of this test that were confusing in the application that was submitted by USDOE in spring of 2023. We were happy to see that many of the original questions that we shared with Ecology after reviewing the permit application in May 2023 had been addressed in the draft permit that is out for public comment.

Background

The concept of grouting Hanford's tank waste is now progressing to a 2,000-gallon demonstration of the Test Bed Initiative (TBI) and this Draft RD&D Permit is part of ensuring the test will be compliant with state and federal requirements. USDOE has indicated that it would like grout to be the cleanup plan for a larger

volume of pre-treated tank waste liquids. This scaling up of grouted tank waste has been referenced in different ways. A Phase 3 of the Test Bed Initiative for 500,000 gallons of liquid tank waste seems to have been replaced by hoping for grout to be the treatment selected for “supplemental treatment.” This is the yet-to-be-decided tank waste treatment solution for the portion of tank waste the Waste Treatment Plant does not have the capacity to treat, around 40% of the tank waste. We would like to note that as work to vitrify Hanford’s tank waste progresses, there have been some indications that the glass may be able to hold more waste than originally anticipated and that supplemental treatment may not be needed at all. We mention the supplemental treatment dilemma, because it is part of the bigger picture that the Test Bed Initiative is attempting to prove. Hanford Challenge thinks we can wait on this decision and instead focus on vitrification.

Hanford Challenge does not endorse the current plans to grout Hanford’s tank waste because we do not think grout has met the “as-good-as-glass” litmus test. Our position on grout has been misunderstood as being totally against grout and against shipping Hanford waste off site. Neither are true. We want tank waste treatment and disposal done right, without cutting corners.

We continue to support the long-standing litmus test of “as-good-as-glass” for any alternative tank waste immobilization technology and have yet to see grout pass this test. We remain unconvinced that grout will pass tests it failed in the past related to large waste volume disposal issues, high costs, technical issues with the grout formulas and variability of Hanford’s tank wastes, and issues with long-lived radionuclides not staying immobilized. We are also wary of a highly curated test being used by USDOE to greenlight a larger grout program at Hanford due to the high variability in the waste chemistry from tank to tank. Testing grout using an in-tank pretreatment system for SY-101 liquid waste only tells us about grouting waste from SY-101. As we see it, USDOE has grossly oversold the promise of grout as a faster, cheaper solution for Hanford’s tank waste to Congress, the Federally Funded Research and Development Center, the National Academy of Sciences, the Government Accountability Office, and others, which has created an unsettling amount of pressure for grout to work. When there are such high expectations of success, it can be hard to pull the brakes on grout and change course even when information and data contradict those promises.

Hanford Challenge’s concerns with grout were shared most recently in our December 2023 [comments on the EPA Treatability Variance](#), our webpage asking “[Should we grout tank waste at Hanford?](#),” our June 2022 [comments to the National Academy of Sciences](#) on the Federally Funded Research and Development Center report on Supplemental Low Activity Waste, our January 2022 [comments on the Draft Waste Incidental to Reprocessing Evaluation for the Test Bed Initiative](#), our September 2021 [comments on the Draft Environmental Assessment for the Test Bed Initiative](#), a June 2021 timeline titled “[Why Grout Failed at Hanford: Chronology of the Failed Grout Program](#),” an April 2021 FAQ titled “[Relabeling and Grouting Tank Waste at Hanford Frequently Asked Questions](#),” and a January 2021 paper “[Grouting 80% of Hanford’s Tank Waste?](#)” responding to a 2020 report from USDOE to Congress in favor of grouting Hanford tank waste.

When it comes to treating Hanford’s tank waste we care about:

- What radionuclides and chemicals are in the final grouted waste form.
- Where the waste is treated.

- How technical issues are addressed. For example: grout formulas, nitrates, nitrites, Technetium-99, and Iodine-129 leaching out of the grout.
- How cost savings and schedule projections have been calculated.
- What major assumptions have been made and how they have effectively been communicated to the public.
- How systemic issues have been addressed to prevent another large-scale government project to treat tank waste from going off the rails.
- How consent has been achieved for disposal facility siting and transportation routes.
- How the public and stakeholders have been meaningfully involved in reviewing and providing input on a complete and thorough plan that describes grouted tank waste aspirations.

The overall assumptions about grout being faster and cheaper than vitrification seem to be based on everything going smoothly in this test. Setting aside our concerns about grout, it seems like USDOE would learn more about grout if testing was completed on tank waste that is more representative of the complex, varied chemistry in Hanford's tanks. USDOE should want to work through the uncertainties and uncover challenges, rather than set up a test with simplified waste and fail later because the conclusions do not translate to the more complex tank waste.

Hanford Challenge is wary of the conclusion that because grout worked on a small, curated 3-gallon liquid waste sample, then it is going to work on 2,000 gallons of SY-101 waste, and because the 2,000-gallon sample is assumed to work, then all the cost and schedule estimates will hold up on larger and more complex waste volumes. It is important to note that grout has yet to be proven effective on more complex Hanford tank waste and this 2,000-gallon test may not provide information on the more complex, varied tank waste that would be involved in a scaled-up grout project.

Given the challenging nature of immobilizing tank waste, any technology will inevitably face significant technical issues that must be managed to produce technical solutions. However, the tank waste project has been plagued by mismanagement that consistently leads to cost increases and delays. This is true of vitrification and it's true of grout. Until these systemic mismanagement issues are addressed, delays and cost overruns are inevitable—regardless of the technical ability to immobilize Hanford tank waste. Stated another way, no solution is faster and cheaper at Hanford without big tradeoffs. Hanford is a big site with a lot of money flowing into it. President Joe Biden approved a historic \$3.05 billion Hanford cleanup budget for 2024—a \$205 million increase from 2023 and the first time Hanford's budget has been more than \$3 billion.

Specific systemic issues we are concerned about include: suppression of safety and technical concerns, especially when profits and careers are on the line; overly controlled information sharing with the public and regulators; and fraud. All these issues have historically resulted in preventable delays, cost overruns, and have put workers in harm's way. What has changed to prevent those same issues from derailing the next "greatest thing"—grout?

One of the pieces of the Hanford cleanup puzzle is reclassification and reinterpretation of high-level waste (HLW). The following points make clear our opposition to USDOE's Federal Register Notice reinterpretation of HLW. Despite verbal assurances that USDOE does not intend to apply the

reinterpretation at Hanford right now, Hanford Challenge is concerned that USDOE will use the HLW reinterpretation in the future. USDOE should not have unilateral authority to reclassify HLW waste. An open avenue must remain to challenge the reclassification of the waste and to hold USDOE accountable. Hanford Challenge is not categorically against the reclassification of HLW. Under certain conditions, reclassifying HLW could be appropriate. Hanford Challenge believes that the reclassification of HLW could be acceptable where:

- There is a presumption that HLW (which includes long-lived radionuclides and chemicals) will be vitrified and buried in a deep, geological repository;
- There is an agreed-upon understanding that long-lived radionuclides presumptively require disposal in a geological repository;
- The use of reclassification is used in “special and unusual” circumstances – not wholesale to reclassify substantial portions of HLW and never for expediency or economic cost-savings reasons;
- The HLW has been treated and key radionuclides have been removed;
- An independent entity (such as a new agency or commission created for the purpose of nuclear waste disposition) makes the determination to reclassify the waste;
- There has been an open, transparent, and inclusive process involving interested stakeholders;
- The State of Washington and the affected Tribal Nations concur;
- There is a comprehensive report specifying what waste volumes/concentrations are being left at Hanford, for how long, and why;
- An assessment of the cumulative impact on the environment and future generations is prepared and made publicly available; and
- There is a judicial process available for aggrieved parties to challenge a determination in federal court.

What is being proposed?

As we understand it, USDOE’s tank farm contractor will use an in-tank pretreatment system to remove mostly Cesium-137 from the liquid tank waste of tank SY-101 in the 200-West area. Treated waste will be moved into a “delay tote” for a radiological test to make sure enough Cesium-137 was removed. If the radiological test fails, then the waste goes back into the tank. If it passes, then the waste goes into the “process totes.” It is estimated that it will take two weeks to fill the totes, with operations assumed to be running 24/7.

There are six process totes, and once all of them are filled, samples will be taken from each tote to find out if the waste meets the criteria to be shipped to Texas and Utah. The samples must be sent to the lab the same day they are taken. And then we wait.

The lab has 100-180 days to get a report back about the sampling results. The sampling results must show that the waste meets the Waste Acceptance Criteria for disposal at the offsite facility before the waste is shipped offsite. If limits are not met, then they look for mistakes that could have been made, and if results still indicate that levels of contaminants are too high, then the waste goes back in the tank.

Once the results are back and confirm that the waste meets the offsite facilities' acceptance criteria, USDOE has 90 days to ship the waste off site but can request an additional 90 days. At the long end it could be a year before the pretreated waste goes offsite, at the lower end, 190 days.

Because the permit is just about what happens at Hanford, we're filling in the blanks a bit during the wait. We're assuming based on references in the report that information about the waste in the totes is sent to the offsite facilities so they can figure out their grout formulas. As we understand it, the grout recipe is tailored to the waste it is going to be mixed with. We need more information about this piece of the puzzle.

Then the totes are shipped by truck. Half will go to Waste Control Specialists in Texas, and half to EnergySolutions in Clive, Utah. The offsite facilities decide if they accept the waste or not. Offsite facilities have to confirm that everything is labeled properly etc. If not, then it comes back to Hanford. If yes, then it stays for grouting and disposal.

Comments

- **Ensure Toxic Vapor Protections:** Add permit conditions that require protection for workers from toxic chemical vapor exposure consistent with the terms and conditions of the Vapor Lawsuit Settlement Agreement.
- **Add Detail About Disposition Plan for Bounce-Back Waste:** Add detail to the permit about the disposition plan that Ecology is requiring USDOE to provide in the event that waste that was shipped to the offsite facilities is sent back to Hanford. In a conversation with Ecology, we learned that the Treatability Variance would prohibit disposal of any grouted waste at the Hanford site. Please include a reference in the permit to how the Treatability Variance addresses concerns about disposal of waste that has already been mixed with grout and does not meet the requirements for shallow burial at the offsite facilities. Is it accurate to say that once the waste has been mixed with grout, it is the responsibility of the offsite facility?
 - “This permit does not authorize on-site disposal of the pretreated waste removed from SY-101. If for any reason the pretreated waste is not accepted for disposal outside the State of WA, the Permittees shall notify Ecology prior to waste being returned to Hanford and will provide Ecology the disposition plan before allowing the waste to be returned to Hanford. The waste will remain subject to all applicable LDR standards base on the waste codes set forth in Permit Condition II.K.1” [Permit Condition II.K.5](#) (p.20)
- **Clarify Footnote 7 on p.34 of the [Permit](#) Section 4.2.1:** Please update the permit language to explain this footnote. Does this footnote have to do with grout formulas? Please also explain what the difference is between taking a sample from each process tote vs. composite sampling?
 - “In the event sampling each process tote does not meet the off-site treatment facility waste profile needs, a composite sampling approach will be developed. Data quality objectives to support the laboratory preparatory method work in Section 4.2.2 may drive additional sampling considerations.”
- **Update [Permit](#) section 3.7.5 (p.27):** This section of the permit includes a list of reasons waste from process totes might be returned to the tank. Why does this section not include a bullet point

about waste from process totes returning to tank SY-101 if sampling results don't comply with requirements? Please update this section to include this potential reason for waste returning to the tank.

- **Add a Section on Grout Failure:** Please add a section to the permit that clarifies what constitutes failure for grout. This is not clear in the permit as written and it would be extremely helpful to know how this is being defined even if failure is not anticipated.
- **Clarify Sampling Procedure:** Clarify the language in the permit about whether it is one discrete sample per tote or two 250 ml samples per tote (and four 250ml samples for the final tote filled). The following references from the Data Quality Objectives (DQO) Sampling Plan and the Sampling and Analysis Plan (SAP) Sampling Plan include the contradictory language:

DQO Sampling Plan

- (p.24) 7.0 STEP 6 – SPECIFY PERFORMANCE OR ACCEPTANCE CRITERIA “However, the project has chosen to implement a judgmental approach to sampling by simply specifying **at least one discrete sample from each tote.**”

SAP Sampling Plan

- (p.6) 4.2 SAMPLE COLLECTION “Sampling will occur after the last process tote is filled. RPP-RPT-61636 specifies **at least one discrete sample from each process tote**”
 - (p.6) 4.2 SAMPLE COLLECTION “HLMI has indicated the suite of analysis required by RPP-RPT-61636 will require approximately 250 mL, and another 250 mL will be required to support sorptive stir bar analytical method development, therefore, **two 250 mL samples of pretreated SY-101 supernatant must be collected from each tote.** Suffixes ‘A’ and ‘B’ will be used to distinguish replicate samples for each tote. Process tote samples will be obtained using 250-mL sample bottles that, when approximately 90 percent or more full, will provide sufficient material for all required analyses.”
- **Address Potential Fire Risk from Electric Blankets:** At the public meeting about the permit on March 20th, the speaker for USDOE was not aware of the plan to use electric blankets around the totes to prevent freezing and directed us to submit our question about this as a comment. Please address in the permit the potential fire risk from electric blankets, as described in [the Independent Qualified Registered Professional Engineer \(IQRPE\) Design Assessment Report](#) on page 35. We appreciate that Ecology worked with USDOE to track down an answer to our question about the fire risk from electric blankets. The answer we received in an email from Ecology on April 9th would be helpful information to include in the permit.

"The totes themselves are designed to ensure containment and shielding is maintained during transportation and storage for a temperature range of -40 to 158 degrees F in accordance with CFR 173.412. There is no nearby combustible material for the blankets to ignite. The blankets sit directly on top of the non-combustible steel totes and the blankets do not produce enough heat to overheat the pretreated waste.

The function of the electric heat blankets are to help reduce precipitate formation in the pretreated waste prior to sampling. The electric heat blankets are ETL/CSA Certified, which means that they have been independently evaluated for conformance to strict safety standards including fire safety. They have an internal thermostat with redundant thermometers to ensure the temperature is maintained within the desired range. The controller for each blanket is designed to automatically cut power to the blanket if it detects a temperature that exceeds the set point. This style of heat blanket is used throughout the oil and gas and chemical manufacturing industries."

- **Clarify Radiological Dose Rate Survey:** We were directed to include this question in our comments as USDOE presenters were unable to answer it during the public meeting about the permit on March 20th. Can you explain how the delay tote radiological dose rate survey works and what would cause the waste to be sent back to tank SY-101? Is this test done each time the delay tote is filled? Please add language to explain this more clearly in the permit. The process is first mentioned on page 25 section 3.7 and page 26 section 3.7.3 of the [permit](#).
- **Clarify Consent-Based Process:** Require an attachment to the permit that includes information about how broad-based, full, free, prior, and informed consent has been achieved for offsite disposal and transportation routes.
- **Keep the Focus on Vit:** Grout does not meet the “as-good-as-glass” criteria. Please keep the focus on vitrifying tank waste and wait to press go on any alternative tank waste immobilization forms that do not meet the “as-good-as-glass” criteria.
- **Improve the Public Process:** In the future, please provide a high-level overview of the cleanup work the administrative tool (permit) is planned to facilitate and how that tool protects the environment, workers, and the public, instead of overly focusing on the administrative tool itself. Remember that the general public is unlikely to read the documents and is instead relying on the public meeting for information to formulate their comments. Please set an expectation that USDOE and contractor staff provide answers to questions instead of directing attendees to submit their questions as a comment. Questions are meant to help attendees understand the issue so they can write informed comments. How are attendees supposed to write informed comments to influence the decision-making process if that information is not provided? Please note that answers do not need to be highly technical, but rather provide clarity in plain language about the work being planned, not just the administrative framework in which that work takes place. We appreciate that Ecology worked with USDOE to track down answers to two of our outstanding questions about the TBI budget and fire risk from electric blankets.
- **Require Transparency with the Public:** If the solution to the complex chemistry of Hanford's pre-treated tank waste is to increase the grout to waste ratio (more grout, less waste), how does this impact total grouted waste volumes, which are already significantly more compared to a glassified waste form? Please add a permit condition that requires USDOE to share information with the public about the grout to waste ratios as this test is conducted. We are concerned that the test will be touted as a success, even if higher grout to waste ratios are needed at the treatment/disposal facilities. If higher grout to waste ratios are needed, this could dramatically increase the cost of disposal. We urge USDOE and Ecology to be transparent with the public about

the specifics of how much grout is needed to successfully solidify the liquid waste from this test and how this impacts cost projections for any future use of grout as a disposal medium.

Thank you so much for considering our comments,

A handwritten signature in black ink that reads "Nikolas F. Peterson". The signature is written in a cursive, slightly slanted style.

Nikolas F. Peterson, Executive Director