

Grouting 2,000 Gallons of Tank Waste

*Draft Waste Incidental to Reprocessing
Evaluation for the Test Bed Initiative
(TBI WIR "tee-bee-ai weer")*

COMMENT DEADLINE: WED FEB 2, 2022



The Waste Treatment Plant is expected to vitrify (immobilize in glass) 40-50% of the low-activity waste at Hanford. The U.S. Department of Energy (USDOE) is pushing for grout to be used instead of glass for the remainder of the waste (approximately 28 million gallons). This comment period is focused on a process USDOE is using to test and promote grout.

The TBI WIR Evaluation is part of the push for grout—to test using grout as a way to immobilize tank waste and clear the path for scaling it up. 2,000 gallons of SY-101's tank waste would be pretreated inside the tank to remove cesium. Then the waste would be shipped offsite, likely to Perma-Fix NW, and mixed with grout. The grouted waste would be shipped to an offsite disposal facility in Texas or Utah for final storage.

We are currently commenting on Phase 2 of the TBI WIR plan. Phase 1 tested the process with 3 gallons of tank waste. If Phase 2 is successful, USDOE will scale up and test 500,000 gallons of tank waste under Phase 3. If you imagine 3 gallons of milk, that doesn't seem like such a big deal, but when 3 gallons of milk become 2,000 gallons or even 500,000 gallons, suddenly that's a lot of milk. In this case, the milk is toxic radioactive tank waste.

Read on to see Hanford Challenge's concerns and sample comments.



WHAT IS WIR "WEER"?

The way the United States classifies nuclear waste determines how it must be treated and disposed. One category of nuclear waste is high-level waste (HLW). Federal law defines HLW by its source, how it was created. High-level waste comes from reprocessed spent (used) nuclear fuel and requires permanent isolation.

Waste Incidental to Reprocessing (WIR) is the method that USDOE currently uses at Hanford to reclassify HLW. The WIR process focuses on three criteria:

- 1. As fully as possible, key radionuclides must first be removed from tank wastes.*
- 2. All applicable (10 CFR 61C) safety requirements must be met.*
- 3. Wastes must be in a solid form with radionuclide concentration limits not exceeding Class-C low-level waste (10 CFR 61.55).*

The WIR process was created by USDOE through an internal order declaring that they could redefine HLW on their own. This process has never gone through a formal public review. It isn't a rule, regulation or law.



*Image of the inside of an underground tank at Hanford
Image courtesy Oregon Department of Energy*

WHAT IS WIR "WEER"?

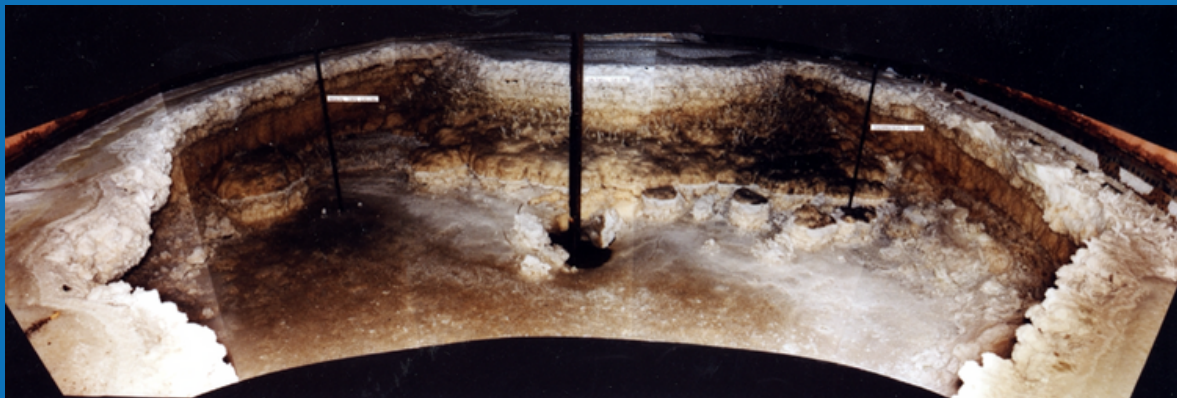
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The WIR process was challenged in 2002, resulting in a federal court decision declaring that the WIR determination was contrary to the federal law. The only final WIR determination made at Hanford, that we are aware of, was for the Phase 1 three gallon Test Bed Initiative test that was done without any public notice or opportunity to comment in 2017. There are several draft WIR evaluations in progress at Hanford related to tank closure and tank waste disposal.

The labeling of nuclear waste as high-level or low-level is very important, because it determines what rules and restrictions apply to the final disposal of the waste. High-level waste must be immobilized in glass and buried in a deep geologic repository, while low-level waste can be buried in a near-surface landfill.

WIR outlines three criteria that the HLW must meet in order to demonstrate that it will not pose an unacceptable risk if managed as low-level or transuranic waste.

This comment period addresses how USDOE would use the WIR process to change the classification of 2,000 gallons of tank SY-101's liquid waste from high-level to low-level in order to immobilize the waste in grout and ship it off-site for disposal.



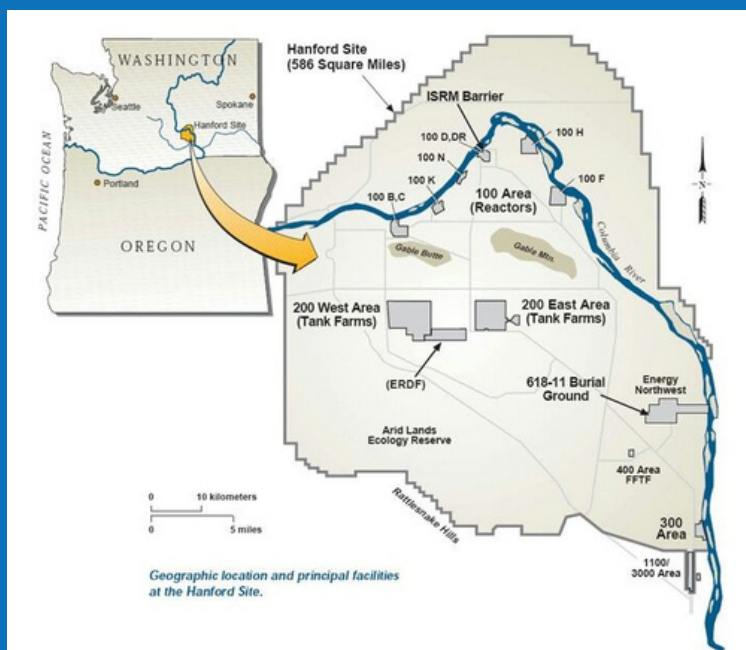
*Image of the inside of an underground tank at Hanford
Image courtesy Washington State Department of Ecology*

HANFORD CHALLENGE CONCERNS



Hanford Challenge's first concern is that while we support efforts to vitrify Hanford's tank waste, we don't believe that USDOE should use the WIR process to reclassify this waste, and should instead be using a Nuclear Regulatory Commission (NRC) determination. The use of WIR has been found to be contrary to the law under the Nuclear Waste Policy Act.

The second concern is with Perma-Fix Northwest, one of the offsite facilities chosen to grout Hanford's tank waste. Perma-Fix NW does not have the necessary permits to perform the Test Bed Initiative work. In addition, the Environmental Impact Statement for the facility is from 1998. A lot has changed in Richland since 1998. There is a new apartment complex within 1.5 miles of the facility, and a daycare center located less than a mile away. Even more worrisome are the safety issues with Perma-Fix NW. The facility has a recent history of serious worker over-exposures, two unreported fires, and a lack of coordinated agency oversight. Sending 2,000 gallons of tank waste to Perma-Fix NW could unnecessarily endanger the nearby community.



Map of the Hanford Nuclear Site
Image courtesy U.S. Department of Energy



Image of Workers removing radioactive waste at C Farm Tanks
Image courtesy Washington River Protection Solutions



Image of Tanks holding High-level waste
Image courtesy Washington State Department of Ecology



HANFORD CHALLENGE CONCERNS



The third concern regards USDOE's rush to grout tank waste. Proponents claim that grout will be "faster, better, and cheaper" than vitrification. However, life-cycle cost estimates show glass is competitive or cheaper than grout. Furthermore, each batch of waste must be tested to develop the correct grout recipe. This ends up being a lengthy, time consuming process. Finally, grouting radioactive tank waste does not provide long-term protection of human health and the environment, because radionuclides do not remain immobilized in grout over time and can leach out into the environment. Vitrification is still the best option.

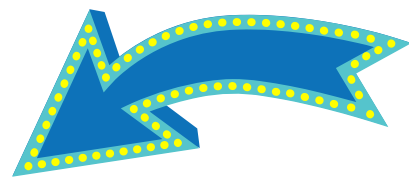
The fourth concern is with implications for scaling up the TBI WIR process. The first test, Phase 1, wasn't publicized at all and grouted 3 gallons of tank waste liquids at Perma-Fix NW. We are in Phase 2. How will conclusions about grouting 2,000 gallons be used to justify Phase 3, grouting 500,000 gallons of treated tank waste? Reports have indicated that grout could result in quadrupled waste volumes compared to glass (vitrification). We're extremely concerned about having these "tests" be used to greenlight a huge scale up without fully understanding the costs and technical challenges. Just because I can make a cup of coffee doesn't mean I should open a coffee shop.

**Tank SY-101
located here**



Aerial view of Hanford's tank farms and Waste Treatment and Immobilization Plant. Image courtesy Washington River Protection Solutions

HANFORD CHALLENGE SUGGESTED COMMENTS



NRC Determination Not WIR Determination: Vitrifying Hanford's tank waste liquids is important, however USDOE should use an NRC determination process not the WIR process to decide if Hanford's tank waste liquids have been treated to remove sufficient concentrations of radionuclides.

Don't Send Waste to Perma-Fix Northwest: Perma-Fix NW has a recent history of serious worker over-exposures, two unreported fires, and a lack of coordinated agency oversight. The facility has demonstrated that it is incapable of safely treating tank waste. Do not send 2,000 gallons of tank waste to Perma-Fix NW. Doing so may put nearby communities, workers, and the environment at risk.

Focus Should Remain on Vitrifying Tank Waste: Before locking ourselves in to the Test Bed Initiative, let's see how well the Waste Treatment Plant (WTP) performs in vitrifying the tank waste. There is a lot we still don't know and maybe the WTP will be able to treat more than the predicted 40-50% of the low-activity waste. Maybe there won't be any Supplemental Low-Activity Waste to speak of because it can all be vitrified. Instead of hastily grouting the waste now and regretting it later, let's wait and see how vitrification goes.

Conclusions Don't Scale Up: Phase 2 sets a precedent for the treatment and final disposal of Hanford's tank waste. The 2,000 gallons in Phase 2 could scale up to 500,000 gallons in Phase 3, and afterwards USDOE may decide to use the TBI WIR process to grout the remaining tank waste. The analysis in the Phase 2 TBI WIR is not sufficient to support a larger scale project.

Resources

- [U.S. DOE Fact Sheet](#)
- [TBI WIR Evaluation](#)
- [Presentation from U.S. DOE Public Meeting on Nov 18, 2021](#) (video link)
- Hanford Challenge [suggested comments](#)
- Hanford Challenge [report on Perma-Fix Northwest](#) "*Risky Business at Perma-Fix Northwest*"
- Hanford Challenge [report on Grout](#) "*Why Grout Failed at Hanford*"

SUBMIT COMMENTS

Email: TBIWIR@rl.gov by midnight on **Wednesday February 2**