



August 16, 2022

Washington State Department of Ecology  
3100 Port of Benton Boulevard  
Richland, Washington 99354

**RE: Public Comment of Hanford Challenge on the WESF Permit Modification**

To Whom It May Concern,

Thank you for the opportunity to submit comments on the Class 2 permit modification to increase the storage capacity for a radioactive hot cell in the Waste Encapsulation Storage Facility (WESF) and update the Facility Personnel Training Plan.

Hanford Challenge is a non-profit, public interest, environmental, and worker advocacy organization located in Seattle, WA. Hanford Challenge is an independent 501(c)(3) membership organization incorporated in the State of Washington with a mission 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 themselves and for current and future generations, and who are therefore affected by conditions that endanger human health and the environment.

WESF is a known high-priority cleanup site at Hanford, and yet the work to move the strontium and cesium capsules out of the underwater storage pools at WESF into dry storage has faced delays. The stainless steel lined concrete storage pools are well past their design life and the concrete has suffered damage from decades of gamma radiation exposure. In the event of an earthquake, failure of the concrete, act of terror, or other accident that causes water to drain from the pools and uncover the capsules, the region would be threatened by a catastrophic release of radioactivity.

Though plans are in place to move the capsules to dry storage by 2025, this date is a delay from the original milestone and Hanford Challenge fears that there may be attempts to postpone moving the capsules to safer dry storage in the face of budget cuts. In the latest WESF inspection report dated July 28, 2022, Derek Cline with the United States Department of Energy ("USDOE"), "confirmed they have not filled any cask storage systems yet, and they continue to

work on preparations and testing. Derek Cline also mentioned that USDOE would be coordinating with Ecology to modify their milestone due date of August 31, 2025." <sup>1</sup> Hanford Challenge urges the WA Department of Ecology to accelerate movement of the WESF capsules to safer storage to meet the 2025 deadline, while ensuring a safe work environment.

Additionally, it is important to note the recent budget update from DOE-RL that shows a declining budget for WESF modifications and capsule storage in the President's 2023 budget.<sup>2</sup> Inadequate funding will cause further delays and make it more difficult for DOE to meet its obligation under the TPA to remove capsules by 2025. Hanford Challenge urges Ecology and USDOE to deliver a unified message on fully funding Hanford cleanup to ensure crucial cleanup work, such as transferring the capsules to dry storage, stays on track.<sup>3</sup>

It has been acknowledged that gamma radiation has weakened the strength of the concrete pools at WESF, however, the only data included in the analysis was for wet concrete, and the concrete at WESF is dry. Although Ecology only regulates hazardous and dangerous wastes in the WESF building and the pad where DOE will store the capsules, it is also incumbent upon Ecology to assure that the conditions are not only safe now, but will be safe throughout the design life of the facilities, and that they will preclude the release of these wastes to the environment. Ecology's authority on this matter can be found under the RCRA requirements that licensees who manage regulated hazardous materials must do so in a manner that does not pose an imminent and substantial risk to human health and safety.<sup>4</sup>

USDOE announced major damage to the concrete in WESF from gamma ray dosage to the concrete in 2011. The damage is now much more severe than it was then from added gamma exposure in the succeeding eleven years. This damage will continue to get worse. The factual and evidential basis for USDOE's assessment utilizes a very small data set for gamma damage to concrete. That entire data set is based solely on concrete which is internally wetted. The concrete at WESF is protected from the water in the pools by a thin stainless-steel liner. That liner prevents water from reaching the concrete. The exterior of the concrete is exposed

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<sup>1</sup> [Dangerous Waste Compliance Inspection on March 31, 2022, at the Waste Encapsulation and Storage Facility \(WESF\)](#)

<sup>2</sup> [Budget Overview for Fiscal Year 2023 Regulator Briefing, June 8, 2022](#)

<sup>3</sup> Hanford Challenge would like to thank Ecology for their recent efforts towards a unified message for fully funding Hanford cleanup in [a letter, dated August 9, 2022](#). Hanford Challenge would like to see USDOE also advocate for a fully funded Hanford cleanup.

<sup>4</sup> With enactment of the Resource Conservation and Recovery Act (RCRA) 42 USC § 6901 et. seq., Congress provided opportunities to bring suit against those who present an imminent and substantial endangerment to health or the environment while contributing to the handling of solid or hazardous waste. RCRA allows the EPA or equivalent state agency, if it receives "evidence that the past or present handling, storage, treatment, transportation or disposal of any solid waste or hazardous waste may present an imminent and substantial endangerment to health or the environment," to "bring suit... against any person... who has contributed or who is contributing to such handling, storage, treatment, transportation or disposal to restrain such person from such handling, storage, treatment, transportation, or disposal, to order such person to take such other action as may be necessary, or both." 42 U.S.C. § 6973(a)

to dry desert soils. These have desiccated the concrete, rendering it dry during the 48 years that it was been in place. Dry concrete is known to be more severely damaged by gamma radiation than wet concrete. As a result, the safety criteria USDOE applies are NOT conservative or protective. The real conditions are worse.

There is an additional small data set for gamma damage to dry concrete. USDOE has scrupulously excluded that data from the assessment of gamma dose impacts on concrete. That data suggests that the concrete is or may be equally damaged at 500 to 2,000 times less aggregate dose for dry concrete than for wet concrete.

The absence of assured data is a major data gap in the risk assessment for this structure, and for other concrete structures exposed to high radiation fields and high aggregate doses. This vastly greater sensitivity to radiation exposure implies that the concrete is damaged more severely, more deeply and more broadly.

This has direct importance and application to WESF. It also has direct and immediate application to the casks DOE has designed, and to the pad on which the casks will sit. The effects of gamma dose on dry concrete also have direct immediate application to assessing the current and future conditions of:

1. The High-Level Waste storage tanks - both single and double-shell, and any newly designed tanks or tank capacity.
2. The High-Level Waste vitrification plant.
3. The Pretreatment Plant
4. The Low-Activity High-Level Waste vitrification plant
5. The High-Level waste glass log storage facility
6. The Low-Activity High-Level Waste glass log storage area &/or facility
7. Any additional new treatment and storage facilities that process high-level waste (high or low-activity)
8. Any concrete used in association with the recycle gas stream(s) from the vitrification facilities (particularly those that contain cesium or its salts in vapor form)
9. Any Cesium separation or pretreatment facilities, and casks associated with wastes from those
10. The Canister Storage Building.
11. The Castor Casks SW of PFP in the 200 West area, and possibly their containment structure.
12. Any other on-site facility in which concrete may be exposed to gamma doses in excess of 5 million rads during their entire design life - AND - any potential extension to that service life.
13. The Columbia Generating Station Reactor
14. The Columbia Generating Station Spent Nuclear Fuel Storage Pool
15. Possibly also at State regulated facilities operated by the US Navy at Bangor Naval Shipyards and/or Bremerton Naval Shipyard
16. Other facilities nationally and internationally

There is a paucity of good real-world data on the dose impacts of gamma exposure on concrete under storage conditions (dry or wet). The dismantlement of the WESF facility once the capsules have been removed provides a unique and rare opportunity to gather the data required to assure the safety of all of these facilities, and of the public and the environment.

It is incumbent on Ecology to require that this concrete degradation data be urgently gathered for use in the assessments under Ecology's various permits, both at Hanford and elsewhere in the State.

The data on the concrete conditions at WESF has direct bearing on the calculation of risk from accidents or events at these facilities. Lacking reliable data, it is simply not possible to assure that the risk of catastrophic accident is low. That absence of significant relevant data requires that these risk assessments assert a high likelihood of failure in any adverse event—including from the simple passage of time. Assuming the adequacy of the existing base of data and standards for assessing safety is a dereliction of Ecology's duties.

The concrete structure at WESF was designed to meet certain structural standards. Those standards apply to holding the building up. Initially they also applied to retaining the water in the basins. With the severe calculated damage to the basin floor and walls, the basin integrity can no longer be assured for its design purposes of retaining the necessary water for cooling and shielding. The structural calculation for any concrete pads used to support the cesium storage casks must also include an evaluation of the aggregate dose to the pad concrete and how they may affect the pads' ability to structurally support the weight of the casks and related equipment. DOE routinely uses buildings and structures far beyond their intended design lives. This is not an argument to extend their design lives. However, based on Hanford experience, the calculations must assure the structural adequacy of the concrete for a period at least twice the intended design life of the facility.

Hanford Challenge comments are summarized below:

- **Accelerate Dry Storage Timeline**: Hanford Challenge urges the WA Department of Ecology to accelerate movement of the WESF capsules to safer storage to meet the 2025 deadline, while ensuring a safe work environment.
- **Request a Compliant Budget**: Hanford Challenge urges Ecology and USDOE to deliver a unified message on fully funding Hanford cleanup to ensure crucial cleanup work, such as transferring the capsules to dry storage, stays on track. Request funding levels based on projections in the 2022 Lifecycle Scope, Schedule and Cost Report and use the report as leverage to advocate for the funding needed to meet the 2025 milestone.
- **Include Catastrophic Release Emergency Response Plans**: Ensure that robust, specific and detailed emergency response plans for a catastrophic release of radioactivity at WESF are included in the permit. The emergency response plan is even more important in light of potential delays to the 2025 milestone.

- **Apply Data Sets Showing Effects of Gamma Dose on Dry Concrete in Ecology's Evaluation of Structural Conditions and Disaster Prevention:** Require that data sets showing the effect of gamma dose on dry concrete are applied to assessments of risk at WESF and other USDOE facilities where concrete structures are exposed to high-dose radiation fields. This data has been excluded and has direct relevance to WESF, the casks DOE has designed for dry storage and the pads the casks will sit upon. Ensure that conditions are safer now and in the future at WESF and other USDOE sites. The data on the concrete conditions at WESF has direct bearing on the calculation of risk from accidents or events at these facilities. Lacking reliable data, it is simply not possible to assure that the risk of catastrophic accident is low. That absence of significant relevant data requires that these risk assessments assert a high likelihood of failure in any adverse event - including from the simple passage of time. Assuming the adequacy of the existing base of data and standards for assessing safety is a dereliction of Ecology's duties.
- **Require Structural Adequacy of Concrete for at Least Twice the Intended Design Life of the Facility:** The concrete structure at WESF was designed to meet certain structural standards. Those standards apply to holding the building up. Initially they also applied to retaining the water in the basins. With the severe calculated damage to the basin floor and walls, the basin integrity can no longer be assured for its design purposes of retaining the necessary water for cooling and shielding. The structural calculation for any concrete pads used to support the cesium storage casks must also include an evaluation of the aggregate dose to the pad concrete and how they may affect the pads ability to structurally support the weight of the casks and related equipment. DOE routinely uses buildings and structures far beyond their intended design lives. This is not an argument to extend their design lives. However, based on Hanford experience, the calculations must assure the structural adequacy of the concrete for a period at least twice the intended design life of the facility.
- **Require Concrete Testing of WESF Storage Pools Post Removal of Capsules to Dry Storage:** There is a paucity of good real-world data on the dose impacts of gamma exposure on concrete under storage conditions (dry or wet). The dismantlement of the WESF facility once the capsules have been removed provides a unique and rare opportunity to gather the data required to assure the safety of ALL of these facilities, and of the public and the environment. Due to the scarcity of data on the effects of gamma radiation on dry concrete, it is incumbent that Ecology require the collection of concrete testing data at WESF for use in assessments under Ecology's permits to make conditions safer now and in the future. This data is extremely important to improve safety at Hanford and elsewhere.

We appreciate the opportunity to comment on increasing the storage capacity of G cell in WESF and updating the Facility Personnel Training Plan. Thank you for considering our comments.

Sincerely,

A handwritten signature in black ink that reads "Nikolas F. Peterson". The signature is written in a cursive style with a large, prominent initial "N".

Nikolas Peterson, Executive Director  
Hanford Challenge