

# Columbia Riverkeeper Public Comment Guide

By Simone Anter, Staff Attorney  
April 11, 2020





# Introduction

The Hanford Nuclear Site, home to the first nuclear reactor built in the world, now contains over 500 contaminated facilities and structures. Many of these structures, such as underground tanks, cribs, and trenches, were used to contain some of Hanford's most dangerous radioactive and toxic waste. Now, almost 30 years after Hanford transitioned away from plutonium production to cleanup, the aging infrastructure at Hanford poses increased risk of failure and ultimately contamination exposure to people and the environment.

In 2017, Hanford's PUREX Tunnel 1, failed and collapsed, risking radioactive contamination to the environment and people. In the aftermath, the U.S. Dept. of Energy (Energy) moved to fill and stabilize [PUREX Tunnel 2](#) with grout to prevent a similar failure. The PUREX Tunnels made the problem and risk of aging infrastructure at Hanford abundantly clear and prompted Energy to conduct a study and [final report](#) identifying the most at risk structures at Hanford. As a result, Energy has proposed an interim-stabilization plan for three structures identified, the 241-Z-361 Settling Tank, the 216-Z-9 Crib, and the 216-Z-2 Crib. This comment guide will: (1) help you understand Energy's plan to stabilize three structures and how it could impact public health and the environment, and (2) provide suggestions for public comments.

Take a stand for Hanford cleanup: Tell Energy to develop long-term plans for aging infrastructure that protect public health and the Columbia. The public only has until May 22, 2020, to weigh in.

## Submit Comments

- Online:  
[http://bit.ly/Hanford\\_Future](http://bit.ly/Hanford_Future)
- By Mail:  
U.S. Department of Energy  
Attn: Jennifer Colborn  
P.O. Box 450, H6-60  
Richland, WA 99352

## Helpful Terms

“Failure” refers to any type of structural break, i.e. a roof collapse, which could expose hazardous or radioactive contaminants to the air or soil or otherwise release contaminants contained in any given structure.

“Soil Covering” indicates how many feet of soil underground structures are buried under. The more soil covering, the less likely a failure will result in contaminant exposure to the air or people.

“Grout” is a type of cement.

“Remedy or Remedial Action” a legal term from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), meaning: “an action taken to effect a long-term restoration of environmental quality.”<sup>1</sup>

“Stabilize” means to fill a structure with grout to prevent a risk of structural failure and reinforce the structure.

<sup>1</sup> See Merriam-Webster Online Dictionary, available at <https://www.merriam-webster.com/legal/remedial%20action>.

# Location of Structures Energy Proposes to Grout

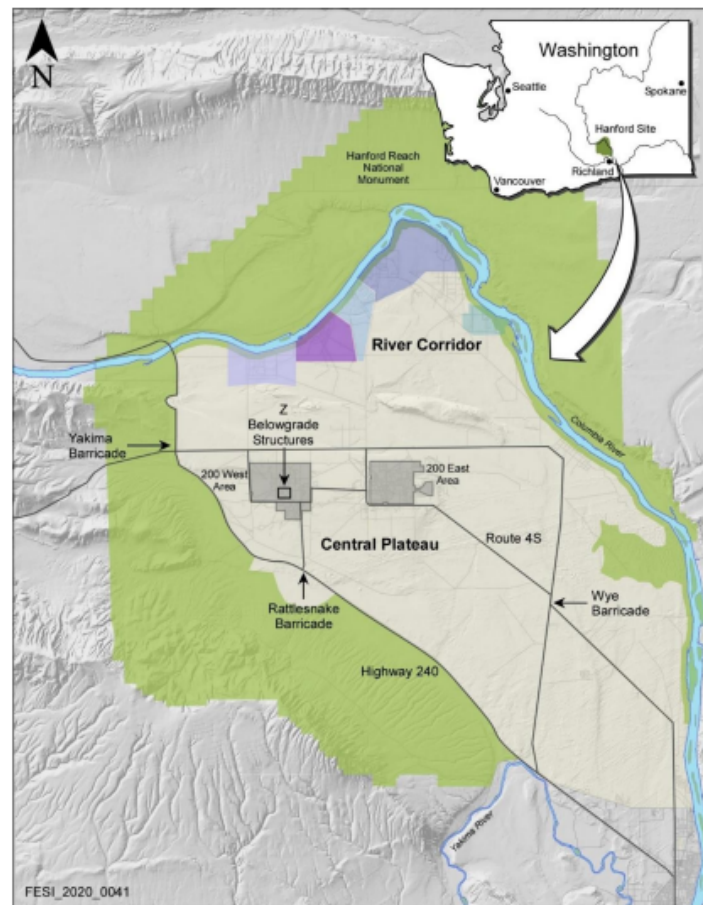


Figure 1 and 2 from: DOE/RL-2020-11,  
DRAFT A FEBRUARY 2020

Figure 1. Z Belowgrade Structures Within the Hanford Site

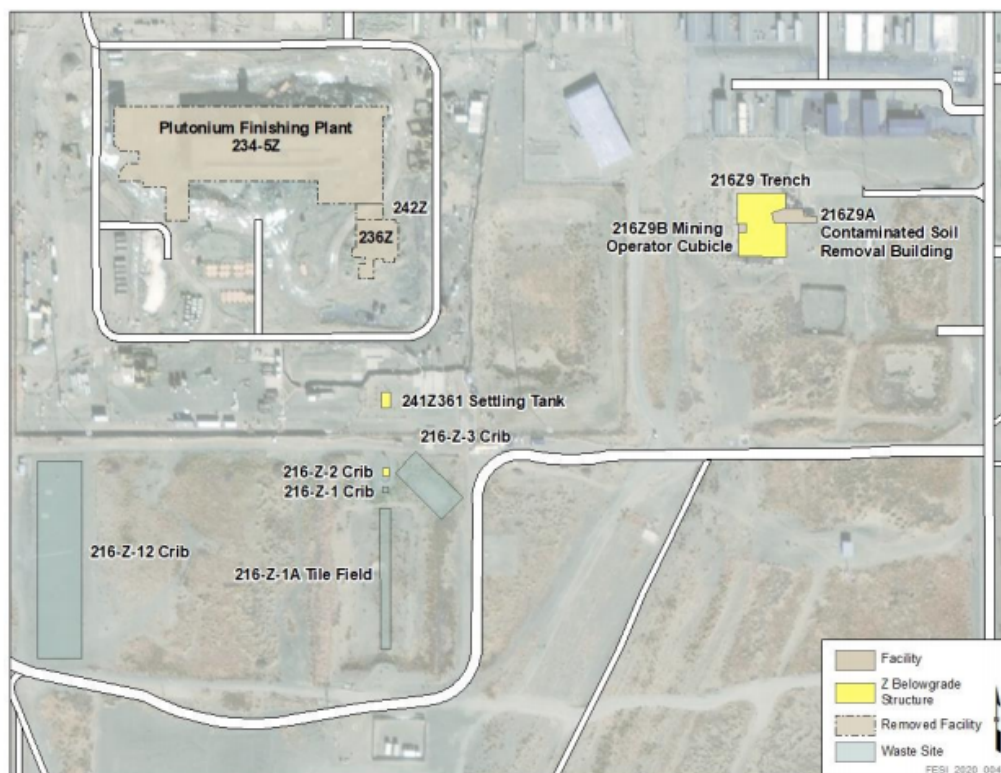


Figure 2. Location of 216-Z-2 Crib, 216Z9 Trench, and 216241Z Settling Tank

# Structures at Issue

## 241-Z-361 (Settling Tank)—Highest Risk of Failure<sup>2</sup>

Size: 28ftL x 15ftW x 19ftH. Reinforced concrete structure with a 3/8-inch-thick steel liner.<sup>3</sup>

Constructed: 1948.<sup>4</sup>

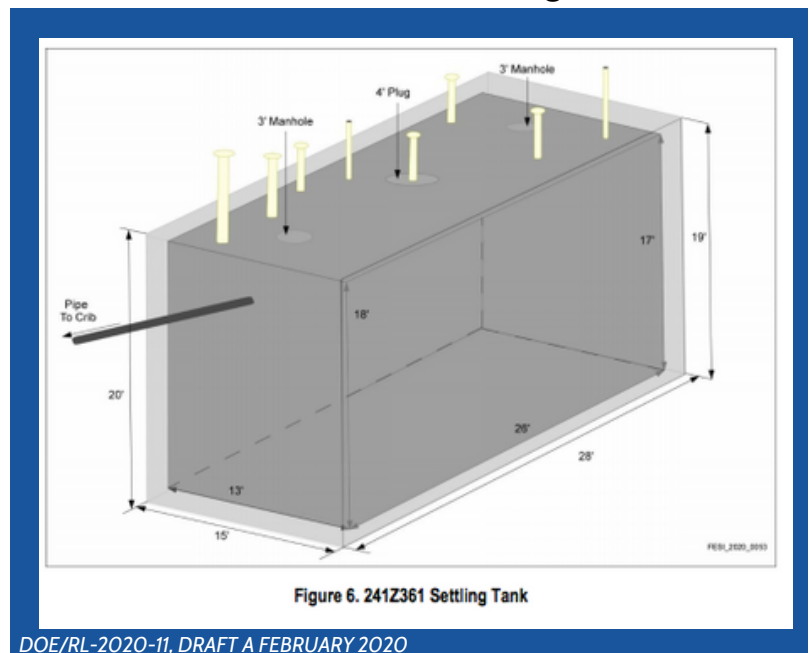
Overview: The Settling Tank handled all neutralized, low-salt, aqueous waste from the Plutonium Finishing Plant (PFP). Pumping out liquid waste from the Tank in 1975 left behind an 8 foot thick sludge with an estimated 26-75kg of plutonium. Structural review of the Tank was based on a 1999 video and found:

- Cracking on the Tank's interior roof;
- Etching of the cement paste off the roof slab; and
- The inner steel plate liner was dissolved or removed over most of the tank area and exposed to the tank contents.<sup>7</sup>

### High Risk Factors Include:

- Obvious deterioration of the structure;
- Large amount of radioactivity present;
- Close proximity to workers; and
- Likelihood of soil and environment exposure if the Tank fails due to soil covering of only 2 ft.<sup>8</sup>

Estimate of Grout Needed: 400 cubic yards.<sup>9</sup>



<sup>2</sup> RL-40 Aging Structures Recommended Action Plan and Summary Report, Report No. 67569-RPT-002 Revision 2, p. 10 (Oct. 2019). [hereinafter "Recommended Action Plan and Summary Report"]

<sup>3</sup> See Stabilizing Disposal Structures At Risk of Failure, U.S. Department of Energy Fact Sheet (2020).

<sup>4</sup> Recommended Action Plan and Summary Report at 3.

<sup>5</sup> *Id.* at 8.

<sup>6</sup> *Id.*

<sup>7</sup> *Id.* at 10.

<sup>8</sup> *Id.*

<sup>9</sup> See Stabilizing Disposal Structures At Risk of Failure, U.S. Department of Energy Fact Sheet (2020).

## 216-Z-9 Waste Storage Crib—Second Highest Risk of Failure<sup>10</sup>

Size: 120ftL x 90ftW x 20ftH, with a concrete cover supported by six concrete columns.<sup>11</sup>

Constructed: 1955<sup>12</sup>

Overview: This enclosed trench, “received solvent and aqueous waste from the recovery of uranium and plutonium by extraction (RECUPLEX) process.”<sup>13</sup> Waste included: carbon tetrachloride, dibutyl phosphate, dibutyl phosphonate, and approximately 1,000,000-gallons of liquid wastes containing plutonium.<sup>14</sup> Even after mined plutonium extraction in 1977, the Crib still contains an estimated 48 kg of plutonium and other chemical and radiological constituents.<sup>15</sup>

Visual inspection revealed:

- Clay tiles on supports holding up the roof have fallen;
- Acid-resistant bricks on the roof have fallen; and
- Other roof degradation.<sup>16</sup>

### High Risk Factors Include:

- Difficulty of stabilizing because the Crib is large;
- No soil cover over the Crib, meaning that failure will result in direct exposure to the environment; and
- Close proximity to workers.<sup>17</sup>

Estimate of Grout Needed: 4,000 cubic yards



Figure 5-4. Interior of 216-Z-9 Crib.

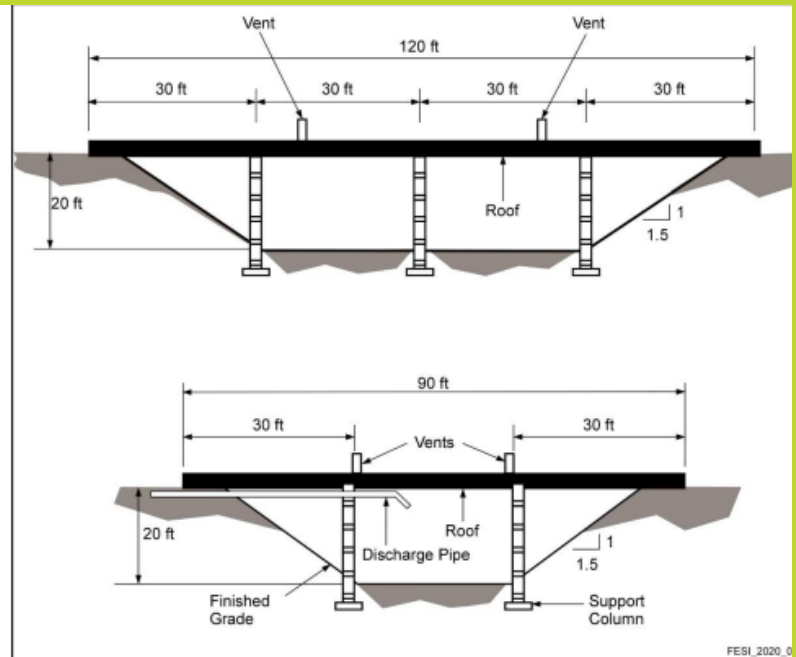


Figure 4. 216Z9 Trench

DOE/RL-2020-11, DRAFT A FEBRUARY 2020

<sup>10</sup> Recommended Action Plan and Summary Report at 11.

<sup>11</sup> See Stabilizing Disposal Structures At Risk of Failure, U.S. Department of Energy Fact Sheet (2020).

<sup>12</sup> Recommended Action Plan and Summary Report

<sup>13</sup> *Id.* at 11.

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

<sup>16</sup> Recommended Action Plan and Summary Report at 11, 12.

<sup>17</sup> *Id.* at 12.

## 216-Z-2 Crib—Lowest Risk Compared to Other Structures<sup>18</sup>

**Size:** 12ftW x 12ftW x 14ftH; a 12-foot-square, 14-foot-tall open-bottom wooden box was installed within the excavation for support.<sup>19</sup>

**Constructed:** 1948<sup>20</sup>

**Overview:** “Together with 216-Z-1, the cribs received about 10 million gallons of waste, mostly from the Plutonium Finishing Plant (PFP). Estimated discharge to cribs includes 6.8 kg of plutonium.”<sup>21</sup>

### High Risk Factors Include:

- Close proximity to workers; and
- Likelihood of radiological exposure because the depth of soil coverage is only 6ft.<sup>22</sup>

**Estimate of Grout Needed:** 140 cubic yards.



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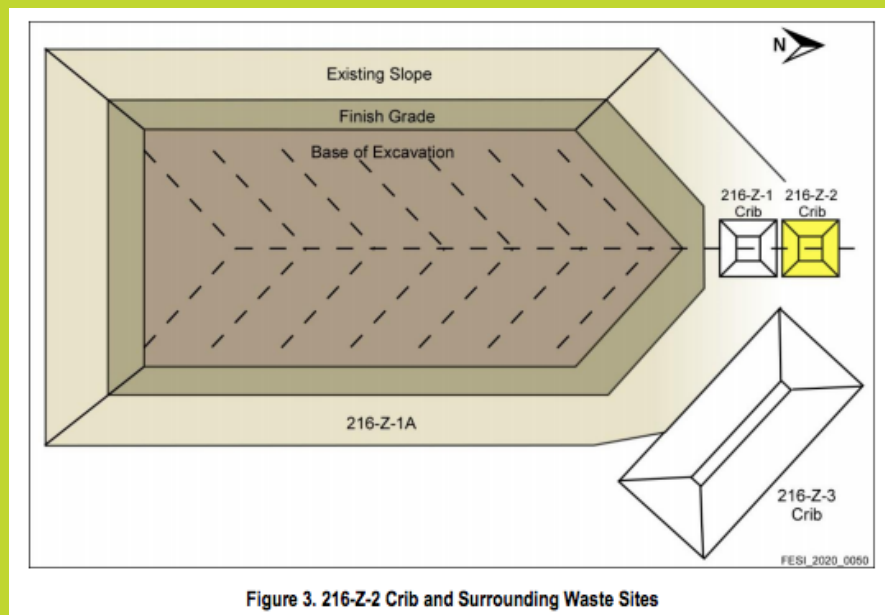


Figure 3. 216-Z-2 Crib and Surrounding Waste Sites

<sup>18</sup> *Id.*

<sup>19</sup> See Stabilizing Disposal Structures At Risk of Failure, U.S. Department of Energy Fact Sheet (2020).

<sup>20</sup> Recommended Action Plan and Summary Report at 3.

<sup>21</sup> See Stabilizing Disposal Structures At Risk of Failure, U.S. Department of Energy Fact Sheet (2020)

<sup>22</sup> Recommended Action Plan and Summary Report at 13, 14.



# Suggested Comments

Suggested Comment 1: Energy must ensure that aging infrastructure does not become long-term waste dumps.

- By filling 241-Z-361, 216-Z-9, and 216-Z-2 with grout (a type of cement), Energy may be setting the stage to leave long-lived, highly radioactive contamination in Hanford's soil.
  - The "Recommended Action Plan and Summary Report" recommends a phased remediation approach, using grouting as an interim measure to stabilize. However it leaves it up to Energy to conduct further engineering studies to develop long-term options for remediation and paths to closure.<sup>23</sup>
  - Over 30 years of delayed cleanup at Hanford has resulted in the high risk of failure of these structures and now grouting in place sets the stage to potentially delay long-term cleanup indefinitely.
  - The Record of Decision for these waste sites indicates that: "the final remedy... is to remove the structures and remove, treat and dispose of contaminated soil from the 216-Z-2 Crib and the 216-Z-9 Crib. The final remedy for the 241-Z-361 Settling Tank is to remove the remaining sludge from the tank and grout in place, while the Remedial Design/Remedial Action Work Plan for this tank considered removing it entirely. The agencies have agreed that this Time Critical Removal Action will not change the selected remedy for the 216-Z-2 Crib, 216-Z-9 Crib and 241-Z-361 Settling Tank." <sup>24</sup>
  - The Tri-Party Agreement (TPA) agencies—Energy, Ecology, and the U.S. Environmental Protection Agency—should explain how grouted waste could be removed, treated, and disposed of outside of 241-Z-361, 216-Z-9, and 216-Z-2. If grouting waste precludes Energy from removing, treating, and disposing of waste in the structures, that needs to be explained, along with a clear explanation of long-term impacts to soils and groundwater.

<sup>23</sup>  
<sup>24</sup> Id. at 11.

<sup>24</sup> See Record of Decision (2011), available here <https://pdw.hanford.gov/document/0093644>.



**Suggested Comment 2:** Energy should not allow grouting in place to become the standard for cleanup at Hanford.

- In 2017, Energy filled the PUREX Tunnel 1 with grout, after its collapse. Then in 2019, the PUREX Tunnel 2 was also grouted.<sup>25</sup> Now, with the recommendation to fill three more structures with grout, grouting in place is becoming the norm for Hanford cleanup.
  - Over 30 years of delayed cleanup at Hanford has resulted in the high risk of failure of these structures.
  - Contamination in these structures will likely outlive and escape containment if it stays in place.
  - Energy must evaluate the long-term risk to soils, groundwater, and the Columbia River from waste in 241-Z-361, 216-Z-9, and 216-Z-2. Energy should not assume that grouting waste in place, provides acceptable long-term protection for the Columbia River.

**Suggested Comment 3:** Energy should provide a clear explanation to the public why the 216-Z-2 Crib was chosen for interim stabilization versus the 216-Z-6 Crib, 241-CX-70 Semiworks Process Waste Tank or the 216-B-12 Crib.

- In the Recommended Action Plan and Summary Report, five structures were identified for stabilization, of those Energy's proposed plan only includes two, adding the 216-Z-6 Crib. The 241-CX-70 Semiworks Process Waste Tank and the 216-B-12 Crib were not included.
  - Energy needs to be transparent in how it chose which structures to stabilize first and why.

**Suggested Comment 4:** Energy should have a clear understanding of the waste present in 241-Z-361, 216-Z-9, and 216-Z-2, and provide this information to the public.

- Energy provides few details about the expected quantity or type of radioactive pollution present in 241-Z-361, 216-Z-9, and 216-Z-2.
  - Energy has not conducted an Environmental Impact Statement for 241-Z-361, 216-Z-9, and 216-Z-2.
  - Aside from estimates ranging from 6.8-75kg of plutonium it remains unclear what other contaminants are present. The presence of other toxic chemicals and radionuclides may further confirm the need to remove-treat-and dispose of the waste once stabilization is complete. Absent this information, Energy may make an unreliable conclusion about the long-term disposition of this contamination.
  - Energy should evaluate whether grouting 241-Z-361, 216-Z-9, and 216-Z-2 will permanently impair the agency's ability to evaluate the contents of the settling tank and cribs.

<sup>25</sup> See Arielle Dreher, PUREX Tunnels Stabilized After Collapse, Tri-Cities Area Journal of Business (May 2019).

# EXAMPLE EMAIL COMMENT TEMPLATE

*The following is a sample email template that you can personalize with your specific concerns. Visit Columbia Riverkeeper's website to submit your comment or send a letter to: [http://bit.ly/Hanford\\_Future](http://bit.ly/Hanford_Future).*

U.S. Department of Energy  
Attn: Jennifer Colborn  
P.O. Box 450, H6-60 Richland,  
WA 99352

**Subject Line:** Public Comment on Energy's Planned Actions for Stabilizing of 241-Z-361, 216-Z-9, and 216-Z-2.

**Comment Body Text:**

Dear Ms. Colborn:

While I understand the need for interim solutions to prevent the failure of aging structures at Hanford, Energy's proposed plan to stabilize the 241-Z-361 settling tank, 216-Z-9 crib, and 216-Z-2 crib raise several concerns that must be addressed.

Specifically, I am concerned that \_\_\_\_\_

**Include your specific concerns in this section. Use suggested comments 1-4 provided above or any other concerns you have about this plan. Include requests for information that you feel Energy has not clearly provided the public.**

**Example:**

- *Energy's plan to fill the three structures with grout is setting the stage for aging infrastructure to become long-term waste dumps at Hanford. By filling 241-Z-361, 216-Z-9, and 216-Z-2 with grout (a type of cement), Energy may be setting the stage to leave long-lived, highly radioactive contamination in Hanford's soil.*
- *Energy, Ecology, and the U.S. Environmental Protection Agency—should explain how grouted waste could be removed, treated, and disposed of outside of 241-Z-361, 216-Z-9, and 216-Z-2. If grouting waste precludes Energy from removing, treating, and disposing of waste in the structures, Energy should proceed with further study and a clear explanation of long-term impacts to soils and groundwater.*

Over 30 years of delayed cleanup at Hanford has resulted in the high risk of failure of these structures and now grouting in place sets the stage to potentially delay long-term cleanup indefinitely. Moving forward, Energy must clearly present a plan for how it will pursue long-term cleanup of and final remedies for the 241-Z-361 settling tank, 216-Z-9 crib, and 216-Z-2 crib once grouting occurs.

Hanford has a vibrant future—one that includes a clean and healthy environment and Columbia River that people, animals, and fish can call home. Energy’s cleanup plans and decisions at Hanford must remember this future.

Sincerely,

[insert your name and address]

*This product is funded through a Public Participation Grant from the Department of Ecology. The content was reviewed for grant consistency but is not necessarily endorsed by the agency.*

