

Central Plateau Approach to Cleanup Decisions

U.S. Department of Energy • Washington State Department of Ecology • U.S. Environmental Protection Agency

Introduction

The Tri-Party Agreement (TPA) agencies, which consist of the Department of Energy (DOE), the Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology), are working on an approach for consistent cleanup decisions across Hanford’s Inner Area. This approach will be applied to cleanup done under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A consistent approach for risk assessments and evaluation of remedial alternatives will streamline the CERCLA process in the Inner Area. As part of this effort, the agencies are asking for stakeholder input from the Hanford Advisory Board (HAB). This input will be used to help the agencies determine which approach to use in the Inner Area. The most helpful input from the HAB will be policy level advice that clearly explains both the rationale for the advice and how the suggested changes could be used to inform cleanup decisions. Keep in mind that these proposals are consistent with CERCLA guidance, the National Contingency Plan, and the State of Washington Model Toxics Control Act (MTCA).

Background Information on the Central Plateau

The Hanford site is roughly divided into the River Corridor and the Central Plateau areas, as shown in Figure 1. The Central Plateau encompasses approximately 75 mi² near the center of the Hanford Site and contains multiple waste sites, contaminated facilities, and groundwater contamination plumes. The Central Plateau cleanup is divided into the following three components:

- **The Inner Area:** approximately 10 mi² in the middle of the Central Plateau encompassing the region where chemical processing and waste management activities occurred.
- **The Outer Area:** greater than 65 mi² and includes much of the open area on the Central Plateau where limited processing activity occurred. This area contains a relatively low number of pipelines, pond sites, and waste sites where some waste disposal has occurred.
- **Groundwater:** Approximately 73 mi² of groundwater beneath the Hanford Site has been contaminated to concentrations above drinking water standards from historic operations conducted in the Central Plateau. Current contaminant plumes from the Inner Area extend beyond the borders of the Central Plateau.

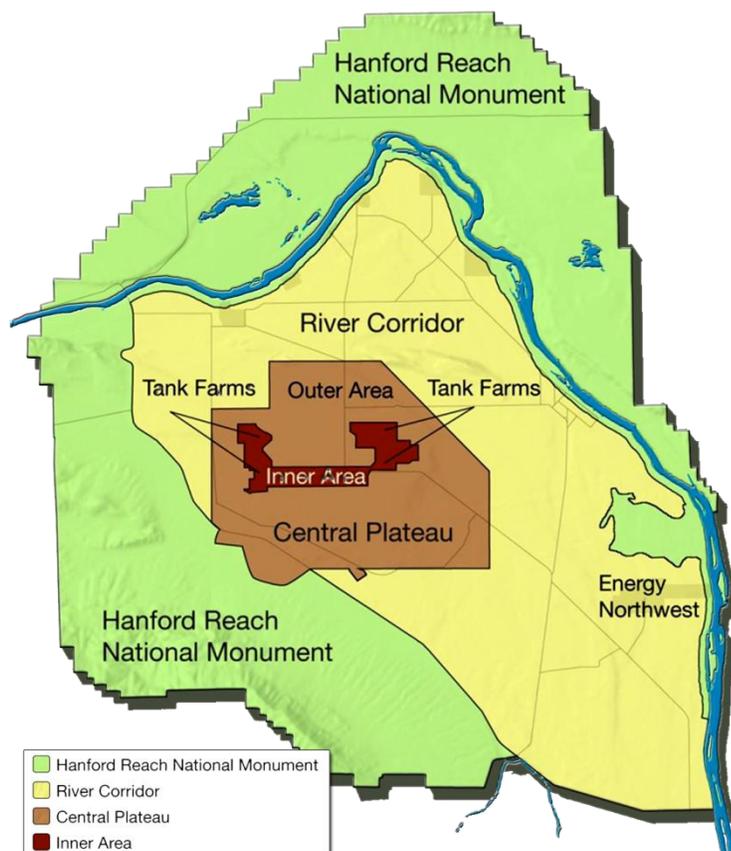


Figure 1. Hanford Site Map

There are currently nine source area operable units (OUs) and two groundwater OUs that still require CERCLA remedial decisions (Figure 2). The assumptions contained in this document are intended to apply to these OUs. The nine OUs include:

1. 200-WA-1/200-BC-1 – 200 West Area waste sites and BC Cribs and Trenches
2. 200-EA-1 – 200 East Area waste sites
3. 200-IS-1 – Pipelines systems waste sites
4. 200-SW-2 – Radioactive landfills
5. 200-DV-1 – Deep vadose zone waste sites
6. 200-CB-1 – B Plant canyon and associated waste sites
7. 200-CP-1 – PUREX canyon and associated waste sites
8. 200-CR-1 – REDOX canyon and associated waste sites
9. 200-BP-5/200-PO-1 – East Area groundwater

There are several Inner Area OUs that already have CERCLA Records of Decision (RODs) or interim action RODs. These include:

- 200-PW-1/200-PW-3/200-PW-6/200-CW-5 – Plutonium and cooling water waste sites
- 200-ZP-1/200-UP-1 – West Area groundwater
- 200-CU-1 – U Canyon

Central Plateau Approach for Inner Area Cleanup Decisions

The approach for the Inner Area has been divided into six categories, which are:

- Reasonably anticipated future land use
- How baseline risk assessments are conducted
- How sites are characterized
- How remedial alternatives are evaluated
- How cleanup levels are determined
- Public Involvement

Each of the following sections have a short explanation, a list of assumptions (formerly called Principles), and questions for the HAB to consider in formulating their advice.

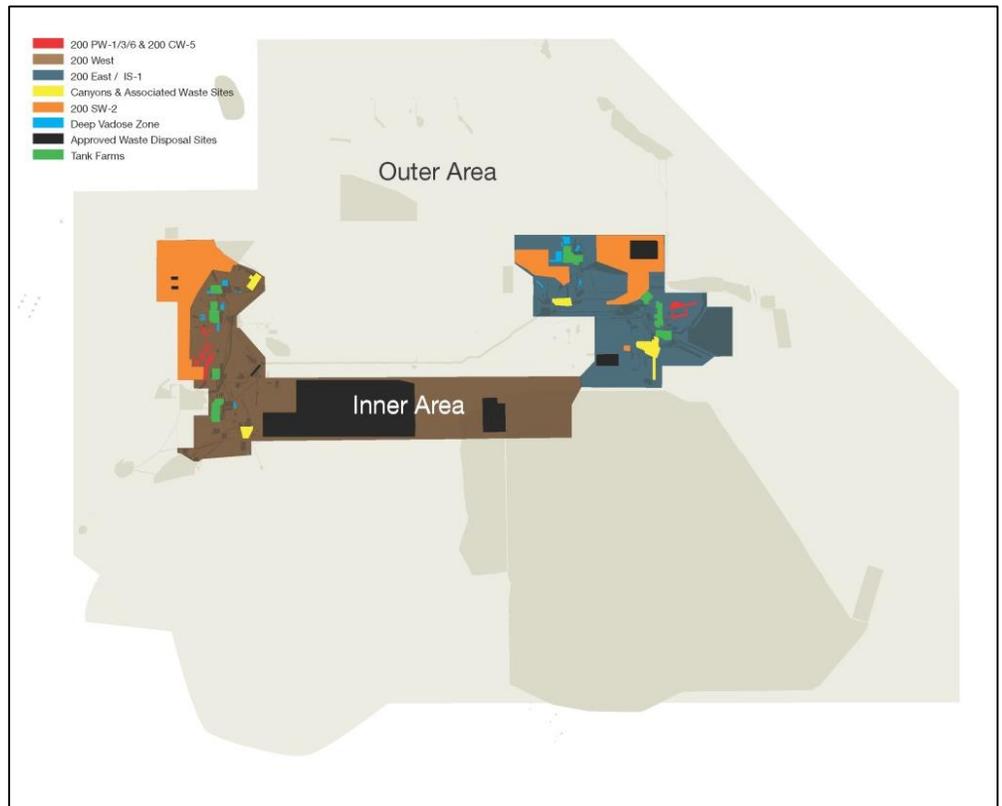


Figure 2. Inner Area Operable Units and Tank Farms

Reasonably Anticipated Future Land Use

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) typically considers two types of land use. The first is residential and it assumes that residents live on the land. The second is industrial and it assumes that people do not live on the land but work there during the day. CERCLA guidance states that a cleanup should be based on the reasonably anticipated future land use.

Assumptions:

- Inner Area land use is industrial.
- The agencies are in agreement that the footprint of the Inner Area is 10 mi².

Questions:

- Is 10 mi² an appropriate size for the Inner Area? What is the basis and rationale for making it larger or smaller?
- Previously, the HAB and others have been concerned about a buffer zone around the Inner Area contamination. Does the HAB support a buffer zone around the Inner Area?

How Baseline Risk Assessments Are Conducted

Under CERCLA, baseline risk assessments (BRA) are conducted to "characterize the current and potential threats to human health and the environment that may be posed by contaminants migrating to groundwater or surface water, releasing to air, leaching through soil, remaining in the soil, and bioaccumulating in the food chain" (Section 300.430(d)(4)). The primary purpose of the BRA is to provide an understanding of the actual and potential risks to human health and the environment posed by a site. Generally, when a BRA indicates that a site presents unacceptable levels of risk, then an action under CERCLA is required. Remedial actions under CERCLA include activities like remove, treat, and dispose (RTD); install covers and caps over contaminated soil; monitored natural attenuation (MNA), monitoring, institutional controls, bioremediation, and others. BRAs use exposure scenarios based on the current and reasonably anticipated future land use.

Assumptions:

- BRA will use the default EPA industrial scenario to determine if there is a need for action.
- State requirements under Model Toxic Control Act (MTCA) Method C will be considered during the determination of the need for action.
- Once a basis for action is determined, cleanup standards for chemicals will be based on MTCA Method C
- BRA will not include residential, intruder, or tribal scenarios.
- BRA will be done on operable unit (OU)-by OU basis.

Questions:

- The HAB has already expressed concern about the assumptions (Principles) that identify that the BRA will not include residential and tribal scenarios. Should the risk assessments include residential and tribal scenario calculations? If so, how would that information be used to inform remedial decisions? If the information is not used to make remedial decisions, how does DOE justify the expense of evaluating those extra calculations?

How Sites Are Characterized

Under CERCLA, sites are characterized to determine the nature and extent of contamination. This provides information for BRAs and the development and evaluation of cleanup alternatives.

Assumptions:

- Similar site approach can be used with proper analysis and use of available information, data, and process knowledge. The similar site approach uses historical data and process knowledge to identify similar sites without characterizing each individual site. Grouping sites may reduce characterization costs because not every site in the similar waste site group will require the same degree of characterization.
- Characterization strategies will consider multiple remedial technologies, risk reduction, regulatory requirements, and cost avoidance. The observational approach can also be a valid strategy where RTD is appropriate. The observational approach to characterization uses historical data to establish a general understanding of the nature and extent of contamination. Limited data is collected before selecting a remedy under this approach.
- The regulatory agencies are willing to consider a plug-in approach. The plug-in approach allows new waste sites to be remediated using already approved cleanup methods provided the new waste sites meet certain conditions. In essence, the new waste sites are being “plugged” into the existing, approved cleanup plan. This approach applies primarily to RTD sites, but could be applied to other potential remedies if justified. The observational approach and plug-in approach also limit characterization costs.
- Post-ROD characterization (meaning limited pre-ROD characterization) is a valid approach but may result in interim action RODs. Post-ROD characterization requires assumptions be made which could result in missing contaminants of concern or other important information.

Questions:

- The similar sites approach uses historical data and process knowledge to identify groups of similar sites and to reduce characterization costs. Does the HAB agree with use of the similar sites approach for waste sites in the Inner Area?
- Does the HAB agree with use of the observational approach for RTD remedies? Should this approach be used with other remedies?
- Does the HAB have recommendations for how DOE could reduce remediation costs using the characterization strategies identified above or other characterization strategies the TPA agencies have not considered? What is the basis and rationale for any recommendations?

How Remedial Alternatives Are Evaluated

Under CERCLA, remedial alternatives are first evaluated based on their overall protection of human health and the environment. One basic way protectiveness is provided is by achieving cleanup levels identified in the selected remedy. Cleanup levels are established for groundwater and soil, depending on the nature of the contamination and the potential exposures for humans and the environment. Determining when and how cleanup levels are achieved involves several factors allowed by state and federal regulations.

Assumptions:

- DOE plans to conduct an evaluation of groundwater protection at the standard point of compliance (POC) immediately beneath each waste site or facility, which is consistent with what has previously been done for Hanford Feasibility Studies. DOE may also choose to perform an analysis in the next Inner Area Feasibility Study to evaluate a conditional point of compliance at the boundary of the Inner Area for groundwater protection.
- DOE plans to conduct an evaluation for human health by direct contact with contaminants and ecological protection based on a 15 ft. deep POC, which is consistent with what has previously been done for Hanford Feasibility Studies. DOE may also choose to perform an analysis in the next Inner Area Feasibility Study to evaluate a conditional point of compliance at 10 ft. below ground surface for direct contact and ecological protection.
- Unlike in the River Corridor, engineered structures and/or mass of contamination will not be removed unless it is a risk management decision.

Questions:

- Does the HAB support DOE evaluating a conditional point of compliance for groundwater? Would the HAB support use of a conditional point of compliance for groundwater (at the Inner Area boundary) in the future? What is the basis and rationale for any recommendations?
- Does the HAB support DOE evaluating a conditional point of compliance for soil depth? Would the HAB support use of a conditional point of compliance for soil (at 10 ft.) in the future? What is the basis and rationale for any recommendations?
- What factors would the HAB recommend be considered in risk management decisions related to engineered structures and removal of the mass of contamination?

How Cleanup Levels Are Determined

Under CERCLA, cleanup levels are set at levels that protect human health and the environment. Cleanup levels are based on preliminary remediation goals (PRGs) developed during the remedial investigation, the anticipated land use, and associated potential exposure pathways.

Assumptions:

- Preliminary Remediation Goals (PRGs) for human health direct contact with radionuclides will be based on the CERCLA risk range instead of dose-based. Previously, PRGs were based on a 15 mrem dose.
- PRGs for chemicals will be based on MTCA Method C (direct contact).
- The approach to set cleanup values for ecological receptors will be the same as for River Corridor.
- Groundwater protection modeling will be based on natural recharge and will not consider irrigation.
- Groundwater protection modeling and PRG development will be based on the process defined in the Graded Approach Document (DOE/RL-2011-50).

Questions:

- Cleanup levels are usually explained using technical jargon and risk ranges. How would the HAB recommend cleanup levels be explained to the public?

Public Involvement

The TPA agencies recognize that public input on cleanup activities plays a vital role in decision-making processes. Successful public involvement occurs when the community has early and meaningful involvement in significant cleanup decisions. For cleanup decisions made in the Inner Area, the TPA agencies agree to do public involvement consistent with the Hanford Public Involvement Plan. The plan discusses the goals of public involvement, public notification and notices, public comment periods, public meetings, Hanford decision-making processes, and other informative topics.



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