

Public Understanding of Cleanup Levels DRAFT FAQ

Public Involvement Committee Meeting, Hanford Advisory Board

Wednesday, June 5, 2013 at the Red Lion Hanford House in Richland

Cleanup Levels

The better the public understands how cleanup levels are set to determine what the acceptable levels of residual contamination may be left at Hanford, the more effective and meaningful their input into cleanup decisions will be. We must stay informed in order to stay involved and provide meaningful input.

Here are some frequently asked questions exploring the factors that play a role in setting cleanup levels.

Q. How are cleanup levels set?

A. Through a mix of:

- Land use restrictions that limit exposure to hazardous and radioactive materials
- State and Federal Toxic and Radioactive contamination standards
- Complex numerical models that assess allowable residual risks.

Q. Who determines acceptable levels of residual contamination?

A. A number of parties play different roles:

○ **Responsible Parties:**

- The Environmental Protection Agency (EPA)
<http://yosemite.epa.gov/r10/cleanup.nsf/sites/hanford>
- The Washington State Department of Ecology (Ecology)
<http://www.ecy.wa.gov/programs/nwp/>
- The Department of Energy (DOE)

<http://www.hanford.gov/>

○ **Affected Parties:**

- Tribes
- The Public
- The Workforce
- State of Oregon

<http://www.oregon.gov/ENERGY/NUC/SAF/Pages/index.aspx>

Q. How do current and reasonably anticipated future land uses and exposure scenarios play a role in setting cleanup levels?

- A.** Future land use directly affects the amount of radiation that a person, animal, or ecosystem (also called “receptors”) will receive. Generally, clean up levels may be lower where receptors come into contact with radioactive or hazardous materials. But if people or important portions of an ecosystem have high exposures to a contaminated area, cleanup standards must be more stringent.

Land use regulation allows the least exposure possible by limiting access and use of contaminated land. When that cannot be accomplished, cleanup standards are set to meet minimal regulatory requirements, while precluding access to and use of contaminated soil and water using barriers or deed restrictions.

Q. What will the land be used for and how can someone be exposed?

A. Types of Future Uses:

- Unrestricted Use
- Tribal Use (differs somewhat by tribe both in uses and levels)
- Subsistence Farming
- Agricultural Use
- Residential Use
- Surface Residential Use
- Recreational
- Monument and Ecosystem Restricted Use
- Industrial Use
- Surface Industrial Use
- Waste Management Area
- Surface Residential
- Recreational
- Monument and Ecosystem Restricted
- Surface Industrial

Types of Exposure Scenarios:

- **Broad-Area Scenarios:**
 - Recreational Use: avid hunter, avid angler, casual user
 - Nonresidential tribal
- **Local-Area Exposure Scenarios – Residential:**
 - Subsistence Farmer
 - Confederated Tribes of the Umatilla Indian Reservation (CTUIR) Native American Resident scenario
 - Yakama Nation Native American Resident scenario
- **Local-Area Exposure Scenarios – Occupational:**
 - Industrial worker scenario
 - Resident Monument Worker scenario

Q. Which laws play a role in setting cleanup levels?

A. Many federal and state laws:

- Model Toxics Control Act (MTCA)
- Resource Conservation and Recovery Act (RCRA)
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Safe Drinking Water Act (SDWA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Superfund Amendments & Reauthorization Act (SARA)
- Toxic Substances Control Act
- Atomic Energy Act
- Nuclear Waste Policy Act

Q. How do different standards apply to protect water, air and soil?

A.

Water:

- Drinking water standards
- Ambient water quality standards
- DOE protective limits or guides
- Toxic Substance Control Act and Polychlorinated Biphenyl contamination standards
- Risk limits

Air:

- Air pollution standards under Federal and State Law
- Accidental exposure standards
- Criteria Pollutant Standards
- Hazardous Air Pollutant Standards
- Aquatic, Terrestrial and Avian protection standards

Soil:

- Federal and State standards
- Groundwater protection levels
- Specific soil concentration limits
- Ingestion, dermal exposure and other pathway standards
- Risk Limits

Q. What are exposure pathways and how are they linked?

A. Two general exposure pathways exist

Direct exposure: contact with contaminated areas including soil, air, and water.

Leaching from sources through soils

Groundwater – potential use as drinking water (future drilling of wells)

- o Columbia River – drinking water

Q. When can I give my input about how cleanup levels are set?

A.

Draft documents

- o RI/FSs, RFI/CMSs
- o EECA's
- o IRMs, ERAs
- o Proposed Plans

Environmental Assessments

Draft EIS

RODs

RCRA sampling and analysis plan

Work plans

Q. How are exposure scenarios developed?

A. To allow the maximum levels of contaminant to remain and to minimize the cost and extent of cleanup actions taken.

Q. What is the health risk of any given contaminant level and where can I find that information?

A.

EPA
Ecology
Department of Health
National Institutes of Occupational Safety and Health
Occupational Safety and Health Administration
DOE
Others

Q. What measurements are used for setting cleanup levels for specific contaminants and what do they mean?

Water:

picoCuries/liter

Parts per million, also reported as millParts per billion (ppb) (isn't it just parts per billion, not millParts?) and micrograms per liter

Air:

picoCuries/liter

parts per million by volume

parts per million by volume

milligrams per cubic meter of dry air

Soil:

mg/kg (ppm)

ug/kg (ppb)

pCi/g

Container:

such as 99% empty

clean closed

Q. What health effects are we preventing by having protective cleanup levels?

A.

All health effects
Cancer
Non-cancer illness
Terrotagenesis (uncontrolled noncancerous growth)
Mutagenesis (mutations)
Organ damage
Brain damage
Hundreds of specific diseases

Q. How is risk estimated?

A. By using complex mathematical tools combined with Federal and State guides on pathway analysis, contaminant effects levels and historic and current data on levels of contaminations, the movement of water and waste, and other factors.

Q. How is the Columbia River protected? Who is responsible for cleaning up contaminants that get into the river?

A.

- **By exhuming major sources of pollution**
- **By slowing the movement of contamination into the river using barrier walls, ion exchange treatment, vapor extraction and other techniques.**
- **By immobilizing waste in place chemically (such as using the mineral apatite to tie up radioactive strontium)**
- **Who is responsible? - DOE**

Q. How do the properties of contaminants- how they move in the environment, uptake in organisms, time-span for damage (how long they stay in or pass through an organism)- influence how cleanup levels are set?

A. As with soil cleanup, modeling is used to assess the levels of contaminant movement with the parameters adjusted to show the least impact, then exposures being limited by

access limits, and then by removal of the most serious sources, with the balance being allowed to slowly migrate through the environment and decay.

Q. How can the public give meaningful input on cleanup levels?

A.

- By suggesting what the appropriate land use scenarios are
- By suggesting appropriate cleanup levels
- By suggesting appropriate cleanup methods and means
- By helping suggest the policies that should be used to make cleanup decisions.

E.g. Use a Scenario:

- Proposed cleanup levels for Plutonium-238 in the 300 Area: A cleanup level of 155 in an industrial use area is equivalent to a cleanup level 39 in a residential use area.

Q. What points in decision process allow for input on how cleanup levels are set?

Draft documents

○RI/FSs, RFI/CMSs

○EECA's

○IRMs, ERAs

○Proposed Plans

Environmental Assessments

Draft EIS

RODs

RCRA sampling and analysis plan

Work plans

Filing suit following CERCLA cleanup for inadequacy.