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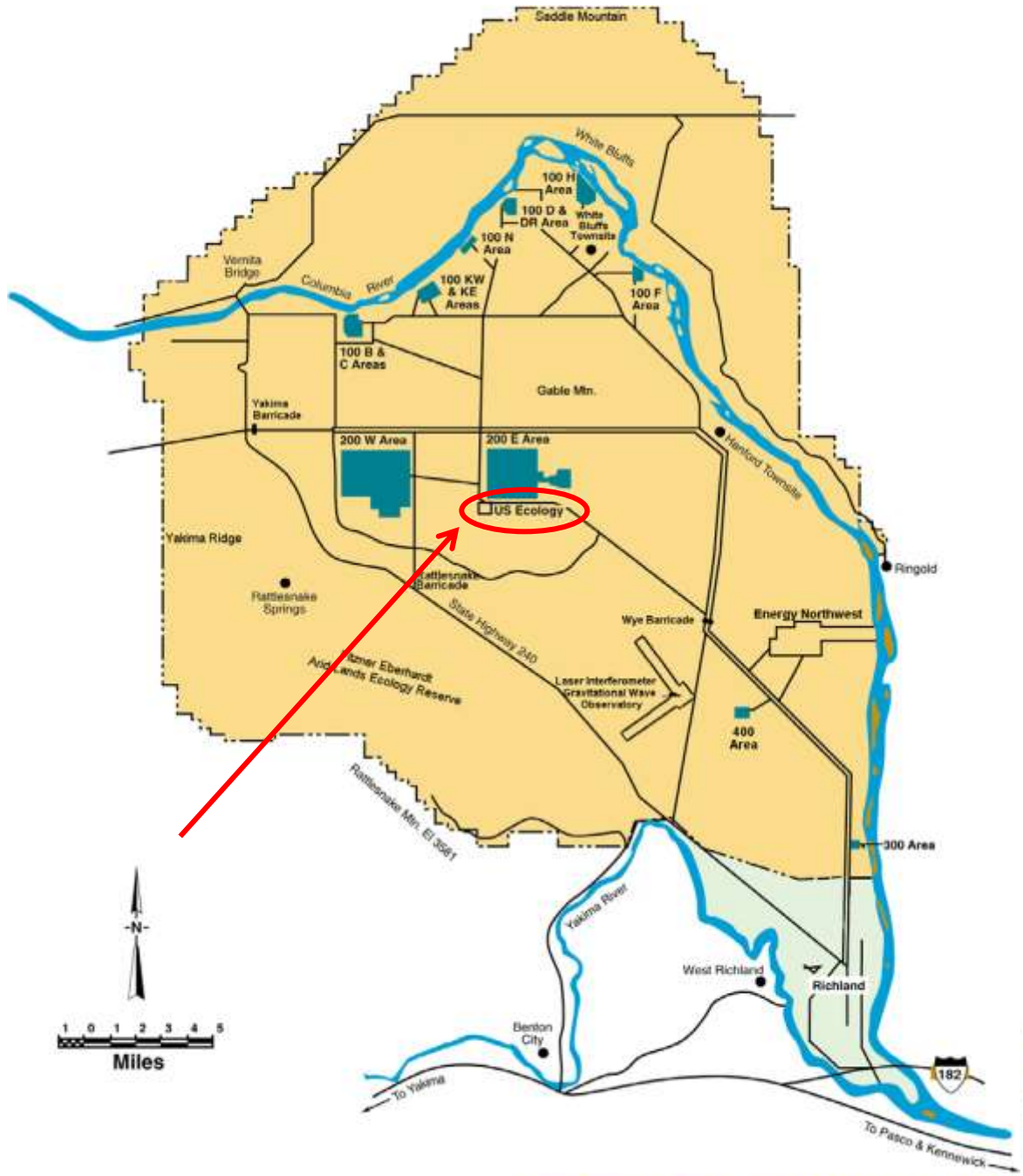
US Ecology
Low-Level Radioactive Waste Facility
History, Ops and Agony of Closure

Earl Fordham

August 24, 2010

Washington State Department of Health

- Near the center of the 586-square mile Department of Energy (DOE) Hanford Site on the Central Plateau.



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- On 100 acres of land leased to the state of Washington.

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LLRW Disposal Site History

- 1964: Washington State and the Atomic Energy Commission (AEC), now Department of Energy (DOE), entered into a 99 year lease agreement for 1,000 acres of land on the Hanford Site. The leased area was later reduced to 100 acres.

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LLRW Disposal Site History

- 1965: The state of Washington leased 100 acres of land to US Ecology, Inc. for the operation of the commercial LLRW site.
- 1965: The facility began accepting waste at the site.
- Shipment record detail variable; especially in the 60’s and 70’s

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Disposal History

- 1965 – 1970: Unauthorized non-radioactive hazardous wastes disposed in the Chemical Trench area.
- 1970: Chemical Trench closed
- Mid 80's: Part 61 & state regs effective
- 1985-86: RCRA federal law passed; becomes effective by license at site

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Tank Farm

- Five steel tanks were buried in the 1960s for the treatment of liquid resin wastes.
- 1985: Snow runoff entered the tanks; 100-120 gallons of liquids were released from the tanks.
- Tanks were pumped; 2 removed & 3 solidified
- Area covered and monitored; recent results show radionuclides and chemicals in vicinity.

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Currently – who is in the lead?

- Land Owner – US Department of Energy
- Land Leasee – State of Washington (Ecology)
- Site Operator – US Ecology, Inc
- Regulator – Washington Department of Health (radionuclides)
- Regulator – Washington Dept of Ecology (chemicals)

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What Does Low-Level Radioactive Waste Look Like?

Preferred package until the late 90's

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Today's package

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How is Waste Packaged for Disposal?

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- Low-level radioactive waste is packaged in containers appropriate to its level of hazard.

- Some low-level radioactive wastes require shielding with lead, concrete or other materials to protect workers, members of the public or the regulations.

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Where Does the Waste Go?

- The waste is placed in shallow-land unlined trenches approximately 1000 feet long, 150 feet wide, and 50 feet deep.
- An interim cover is placed over waste. (8 feet soil and 6 inches of rock over top of waste)
- After trench is closed, the corners are marked and monuments placed.

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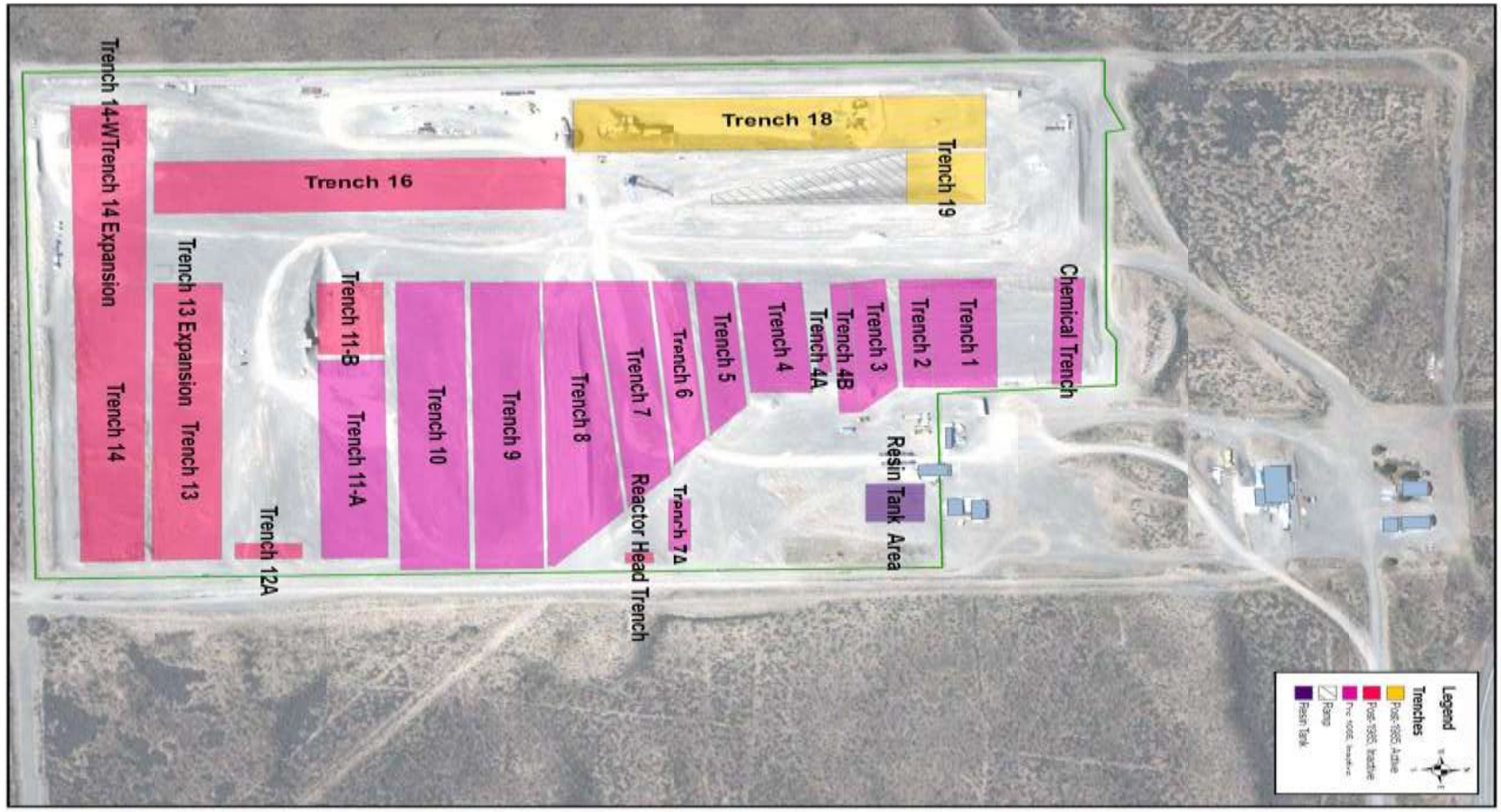

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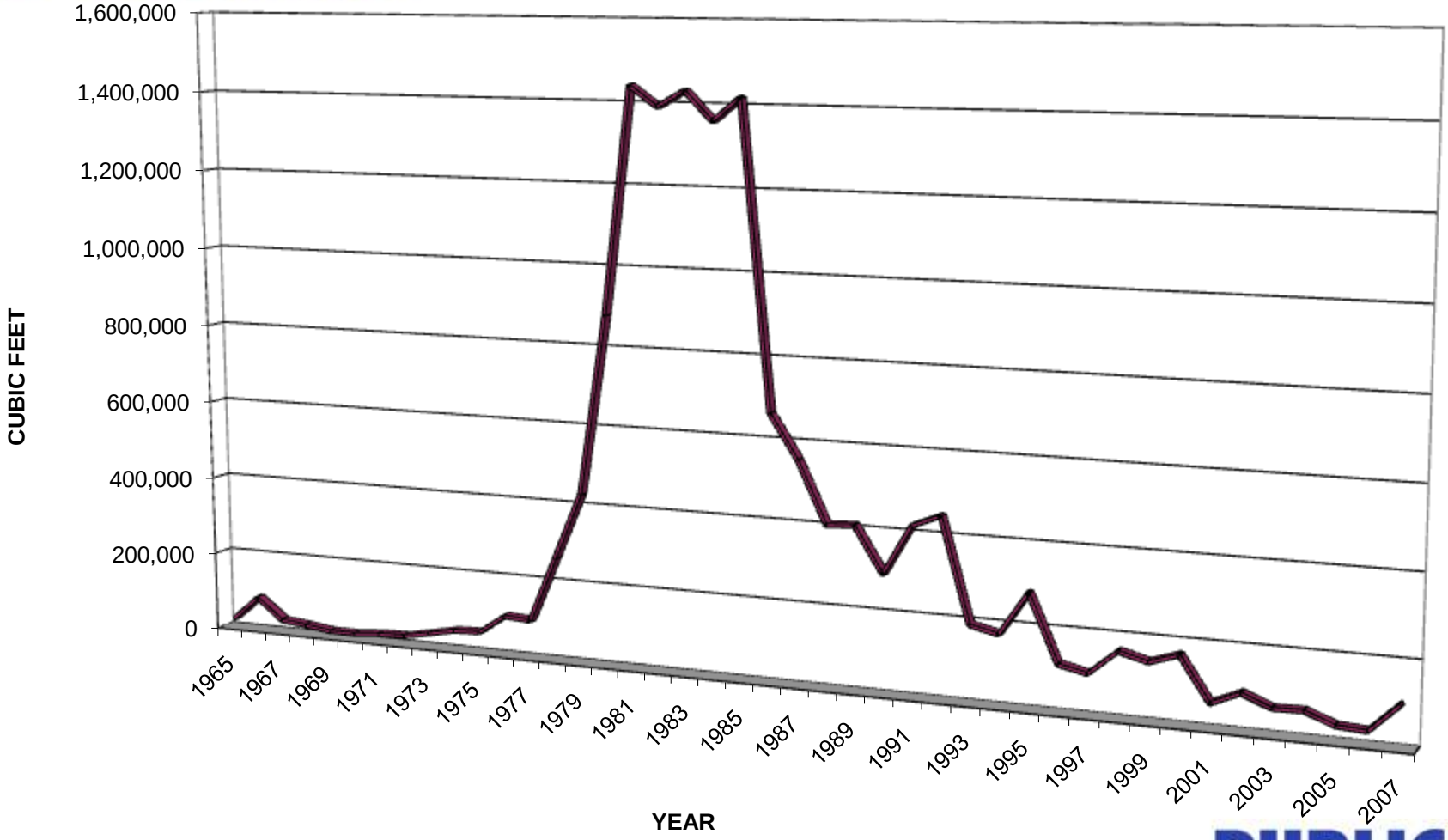
Yearly Volume of Radioactive Waste Disposed Since 1965



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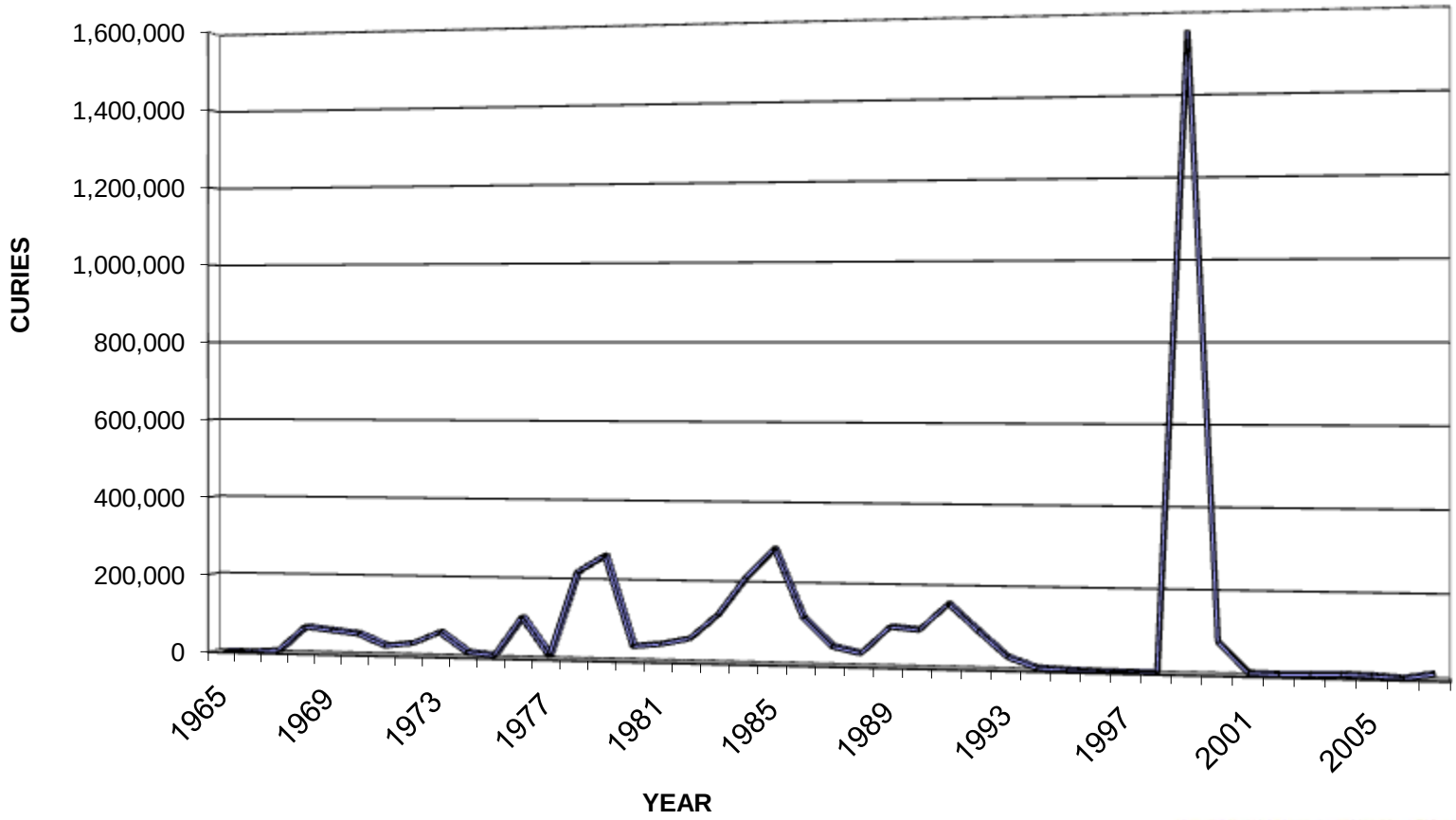
Yearly Activity of Radioactive Waste Disposed Since 1965



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Environmental Monitoring then & now

- Environmental monitoring for radionuclides has been ongoing for over 30 years
- 1965: Periodic soil, groundwater, and vegetation monitoring began
- 1978: Air quality monitoring began
- Mid-1980s: Experimental monitoring began

(very challenging in dry environment)

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- 1987: Site specific annual environmental monitoring program was initiated
- 1988: Chemical Trench Soil Investigation
- 1989 – 1999: Site Soil and Groundwater Investigation
- 1990's – today: chemical investigation
- 2008: Site soil rad investigation

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Current Environmental Monitoring

- US Ecology, Inc routinely monitors soil, groundwater, vegetation, and ambient air for radionuclide analysis (compiled into reports)
- Washington State, Department of Health routinely obtains confirmatory soil, groundwater, vegetation, and ambient air for radionuclide analysis at our lab.

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DOE Contamination

- Vadose zone and groundwater contamination from past DOE activities on the Central Plateau has been well documented.
- Radionuclides contaminating the groundwater include tritium, cobalt 60, strontium 90, technetium 99, iodine 129, cesium 137, and plutonium and uranium isotopes. TCE & chromium compounds are present, too.
- Several plumes are expanding and moving towards the US Ecology Site or have passed.

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Timelines for Closure

- 2056 is the last possible year for disposal operations to cease and closure to begin.
- Site ops may be limited by license limits for 8 specific nuclides (H-3, Tc, I, Ra, U and Pu).
- Land transfers back to federal government in 2063.

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How Will the LLWRF be "Closed"?

- The 2004 Final Environmental Impact Statement dictates the preferred cover alternative.
- The FEIS identifies the GeoSynthetic Cover as the preferred cover alternative.
- Designed cover **must meet or exceed** GeoSynthetic performance criteria.

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Cover Performance Criteria

- Water infiltration rate (≤ 0.5 mm/year).
- Radon 222 emanation rate (≤ 0.62 pCi/m²s).
- Cover depth ≥ five meters.
- Offsite Resident dose ≤ 22 mrem per year.
- Onsite Resident dose ≤ 107 mrem per year.
- RCRA Compliant

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Current Status of LLRWF Closure

- Cover to be constructed in two “Phases”.
- Phase I design cover completed and approved.
- State of Washington has secured DOE ERDF soils for Phase I of the cover.
- US Ecology has selected a contractor.
- Stakeholders petitioned court to stop work.

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Our Final Goal!

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