



# Long-Term Stewardship of Uranium Mills in the United States – Regulatory Issues

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## Outline:

- NRC's Responsibility
- Law Governing Mill Decommissioning
- Roles and Responsibilities at Legacy Sites
- Historical Perspective on Regulatory Oversight
- NRC Uranium Recovery Sites in Decommissioning
- Case Studies of Decommissioning Mills in New Mexico
- Legacy Sites – Lessons Learned
- Ongoing and New Regulatory Challenges

## **NRC's Responsibility:**

- Regulatory oversight for milling activities; no authority over mining of uranium
  - **URANIUM MILLING** - “Any activity that results in the production of byproduct material...”
  - **BYPRODUCT MATERIAL** - “The tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content...”

## **U.S. Law Governing Mill Decommissioning:**

- **Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA).**
  - **TITLE I: Remedial action at inactive, abandoned, unlicensed sites**
  - **TITLE II: Licensing/Oversight/Remediation of uranium recovery facilities licensed by the NRC or an Agreement State in or after 1978**

## **Roles and Responsibilities at Title I Sites:**

- **U.S. Environmental Protection Agency (EPA) establishes standards for cleanup and disposal**
- **U.S. Department of Energy (DOE) identifies and remediates all Title I sites to EPA standards**
- **DOE also remediates any vicinity properties**
- **NRC evaluates and concurs in DOE's site remediation plans and that site remediation has been adequately completed**
- **DOE becomes the long-term site custodian under NRC General License**

## **Roles and Responsibilities at Title II Sites:**

- **EPA establishes standards for cleanup and disposal of byproduct material**
- **NRC or Agreement State reviews license applications, issues license, conducts inspections, and oversees decommissioning to EPA standards**
- **NRC reviews and concurs on DOE's Long Term Surveillance Plans for conventional mills**
- **NRC or the Agreement State terminates specific license**
- **NRC concurs in Agreement State license termination**
- **DOE becomes the long-term site custodian under NRC General License**

# Historical Perspective on Regulatory Oversight :

- **Milling activities in the U.S. peaked in the 1950's to 1970's**
- **Uranium Mill Tailings Radiation Control Act - 1978**
- **EPA standards at 40 CFR 192 promulgated in 1983, amended 1987**
- **Final NRC regulations at 10 CFR Part 40, Appendix A promulgated in 1985 (no ground water), amended 1987**
- **Regulatory framework finalized after the peak of milling**

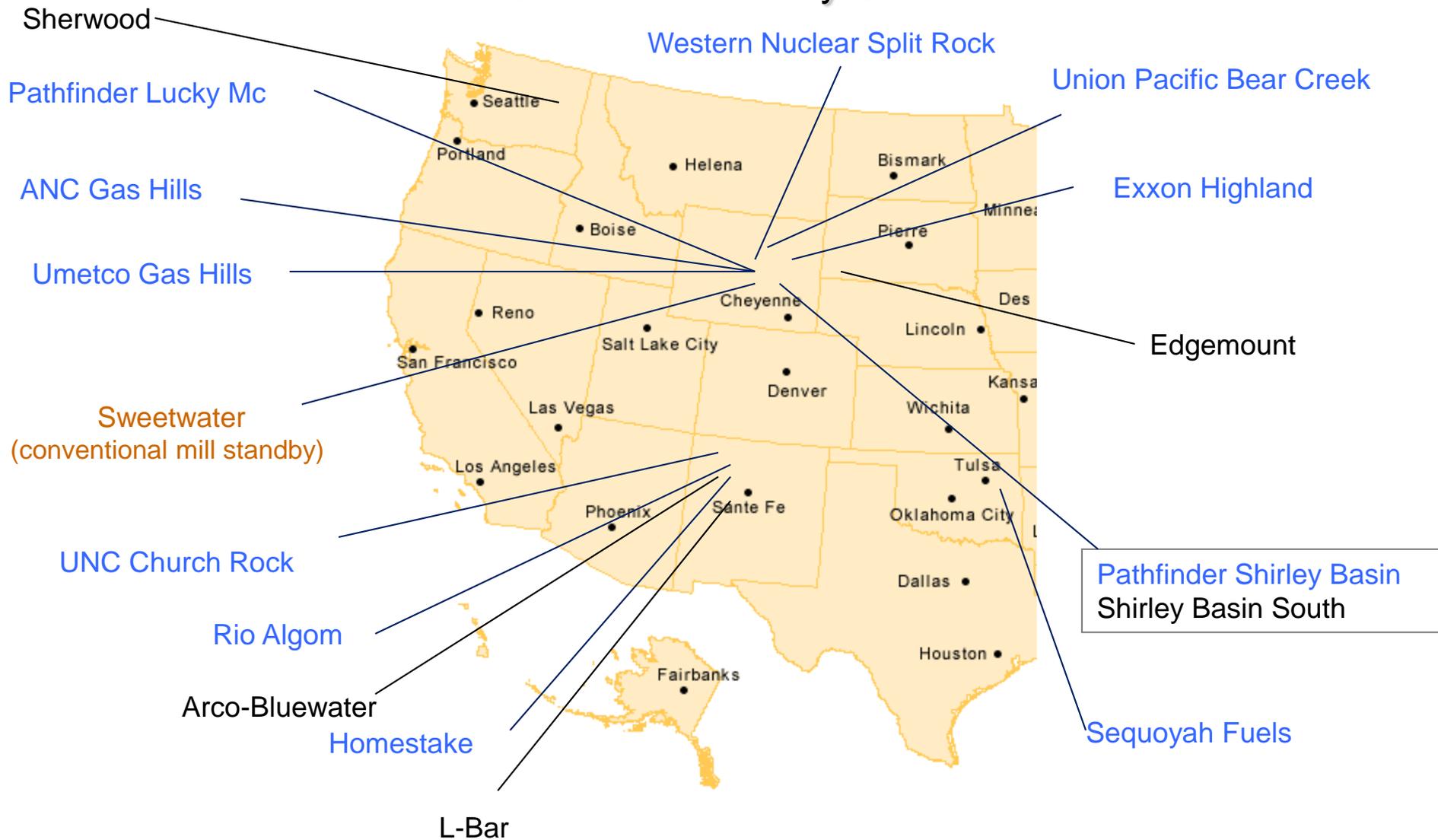
## **NRC Uranium Recovery Sites in Decommissioning**

- **38 Uranium Recovery sites**
  - **21 Title I (Inactive, pre-1978 sites)**
  - **17 Title II (Active, post 1978 sites)**
    - **12 Conventional mills (1 in standby, 11 undergoing reclamation)**
    - **5 Completed decommissioning (DOE License for long term stewardship)**

# Title I Uranium Recovery Sites



# Title II Uranium Recovery Sites



Note: Colorado, Texas, and Utah are agreement states

# Case Studies of Decommissioning Mills in New Mexico

- **ARCO-Bluewater – DOE General License**
  - Decommissioning began 1989
  - Surface reclamation completed in 1995
  - License terminated in 1997
  - Site under DOE long-term care/custody
  
- **Homestake-Grants – Decommissioning**
  - Decommissioning began 1990
  - Surface reclamation complete 1995
  - Groundwater restoration ongoing
  - License termination expected in 2017
  
- **Rio Algom-Ambrosia Lake – Decommissioning**
  - Decommissioning began 2003
  - Surface reclamation nearly complete
  - Groundwater reclamation completed in 2001
  - License termination expected in 2011

## **Case Studies of Decommissioning Mills in New Mexico (cont.):**

- **UNC Church Rock – Decommissioning**
  - Decommissioning began: 1982
  - Surface reclamation nearly complete
  - Groundwater restoration ongoing
  - Potential site for disposal of Northeast Church Rock mine tailings
  - License termination – TBD
- **L-Bar – DOE General License**
  - Decommissioning began 1986
  - Surface reclamation completed in 2000
  - License terminated in 2004
  - Site under DOE long-term care/custody

## **Legacy Sites: Conventional Mills - Lessons Learned**

- **Established regulatory framework essential to avoiding contamination**
- **Adequate financial assurance necessary to prevent orphaned sites**
- **Groundwater contamination = Time + \$**
- **Groundwater flow and transport modeling key to identifying remediation strategies and long-term performance**
- **Long-term stewardship, including post closure groundwater monitoring ensures long-term performance**

# Ongoing and New Regulatory Challenges

- Addressing long-standing contamination
- Public confidence
- Licensing new facilities