

Office of Legacy Management Land and Site Management

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Office of Legacy Management Established December 2003

■ Offices in

- ◆ Grand Junction, Colorado
- ◆ Pittsburgh, Pennsylvania
- ◆ Morgantown, West Virginia
- ◆ Washington, DC
- ◆ Rocky Flats, Mound, Fernald, Las Vegas

Legacy Management Goals

Goal 1 - Protect Human Health and the Environment
– Long Term Stewardship

Goal 4 - ...Real Property Reuse – alternate energy

Legacy Management Program

- Management of remedies involves ground water and surface water
 - ◆ Sampling according to *Ground Water Compliance Action Plan – similar to a ROD*
 - ◆ Variety of methods

Site Remediation

■ Ground water cleanup

◆ Natural flushing

- ◆ UMTRA standards set by U.S. Environmental Protection Agency
- ◆ Model-based time limits and alternate concentration limits

◆ Bioremediation

- ◆ Phytoremediation
- ◆ Nutrient enhancements for biological remediation

Site Remediation

- Ground water cleanup (continued)
 - ◆ Monitored natural attenuation
 - ◆ Sampling and modeling
 - ◆ Relies upon natural processes, such as ion exchange and precipitation
 - ◆ Active Treatments
 - ◆ Evaporation
 - ◆ Resin IX at Fernald
 - ◆ Zero Valent Iron

LM Site Map



LM Site Inventory

- 22 Title I sites specified in Uranium Mill Tailings Radiation Control Act
 - ◆ Resulted in creation of 19 disposal cells
 - ◆ Contain approximately 40 million cubic yards of encapsulated uranium mill tailings

Old and New Rifle, Colorado, UMTRA Sites

- Surface remedial action completed in 1996
 - ◆ Involved relocating tailings and other contaminated materials to alternative disposal site
 - ◆ Surface remediation was decoupled from groundwater – some source remains below groundwater surface at some locations



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Ground Water Cleanup

- Two water-bearing zones
 - ◆ Alluvium/colluvium
 - ◆ Wasatch Formation
- Contamination mostly limited to alluvium
 - ◆ Alluvium relatively shallow
 - ◆ Complex inter-mixture of fine and coarse grain materials

Ground Water Cleanup (continued)

- Wells installed at Old and New Rifle Sites
- Chemical analyses 1996 to present
- Contaminants of concern (COCs) identified
 - ◆ U, V, Se, As, Mo, NO₃
- Flow-and-transport modeling performed for COCs

Ground Water Cleanup (continued)

- Natural flushing selected as compliance strategy for both sites, with
 - ◆ Continued monitoring
 - ◆ Institutional controls
- Documents produced
 - ◆ *Site Observational Work Plan (SOWP)*
 - ◆ Like RI/FS
 - ◆ *Ground Water Compliance Action Plans (GCAPs)*
 - ◆ Like ROD

Status of Old and New Rifle Sites

- Old Rifle: Received NRC and CDPHE concurrence on GCAP

Continued monitoring

- New Rifle: GCAP under final review

Continued monitoring

LM needs

- Improved contaminant transport modeling
 - ◆ Key to remedial actions under UMTRA
 - ◆ 100 year clock – predictions must be defensible
 - ◆ Understanding of uranium transport processes
 - ◆ How does bio affect retardation?
 - ◆ Is it predictable?

LM Needs

- If bio-treatments can work to stabilize uranium, how long will it last without nutrient source?
 - ◆ Microcosm relation to redox conditions
 - ◆ Buffering of reducing conditions
 - ◆ Stable mineral forms
 - ◆ In-situ bio coatings

LM Needs

- ◆ All LM sites – long term monitoring
 - Telemetry for remote sites
 - Optimization of network
 - How many wells, how often sampled
 - Surrogates for difficult contaminants
 - Interpretation of data
 - Seasonality
 - Frequency of sampling
- ◆ Sites under remediation
 - Contaminant transport modeling