Regulatory Framework and Compliance Strategy for Tuba City, Arizona, Disposal Site Under UMTRCA

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Outline

- 2021 Global Summit on Environmental Remediation
- Office of Legacy Management (LM)
- Navajo sites program overview
- LM sites on Navajo Nation
- Regulatory framework
- U.S. Environmental Protection Agency (EPA) groundwater protection standards
- Groundwater compliance goals for Tuba City
- Key takeaways

2021 Global Summit on Environmental Remediation

- Why Tuba City case study?
  - Technical challenges
  - Intergovernmental and intercultural perspectives
  - National Laboratory Network to explore innovative solutions
  - Regulatory framework

Abandoned Tuba City processing site

Office of Legacy Management

- LM's **mission** is to fulfill the post-closure responsibilities of the U.S. Department of Energy (DOE) and ensure the future protection of human health and the environment
- LM's **goals** are:
  - Protect human health and the environment
  - Preserve, protect, and share records and information
  - Optimize the use of land and assets
  - Sustain management excellence
  - Engage the public, governments, and interested parties
  - Safeguard former contractor workers' retirement benefits

Navajo Sites Program and Regulatory Overview

- LM manages four former uranium-processing sites on the Navajo Nation
  - Authorized activities: monitoring, maintenance, and emergency measures
- LM is regulated by the U.S. Nuclear Regulatory Commission (NRC)
- EPA has no regulatory role under the Uranium Mill Tailings Radiation Control Act (UMTRCA)
- UMTRCA requires DOE to have cooperative agreement with the Navajo Nation
- LM cooperative agreement is with Navajo Nation Abandoned Mine Lands/Uranium Mill Tailings Remedial Action (NN AML/UMTRA) program
  - NN AML/UMTRA consults with NN EPA technical staff
  - NN AML/UMTRA is building capacity to better review LM documents

LM Sites on Navajo Nation

- Former uranium-processing sites on Navajo Nation

Mexican Hat, Utah, Disposal Site

Tuba City, Arizona, Disposal Site

Shiprock, New Mexico, Disposal Site

Monument Valley, Arizona, Processing Site

Regulatory Framework Under UMTRCA

- UMTRCA Title I
- Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings (40 CFR 192)
  - Surface program
  - Cleanup of former uranium-processing sites
  - Vicinity properties
  - Peripheral properties
  - Mill debris
  - Tailings
  - Construction of engineered disposal cells

Aerial view of original mill site (1956)

EPA Groundwater Protection Standards

Groundwater Program Compliance Options	
Option	Compliance Target
No remediation	• Groundwater already either doesn't exist or meets EPA standards • No threat to human health or environment and groundwater qualifies for supplemental standards due to limited use • No threat to human health or environment and groundwater qualifies for Alternate Concentration Limits (ACLs)
Natural flushing or natural flushing with active remediation	• Implement institutional controls to restrict use of groundwater • 100-year compliance window • Maximum Contaminant Limits (MCLs) • Background • ACLs
Active remediation	• MCLs • Background • ACLs
Technical impracticability	• A form of supplemental standards • Use institutional controls where needed to restrict access to groundwater

Groundwater Compliance Goals for Tuba City Site

- Active remediation to comply with MCLs
  - Nitrate: 10 mg/L
  - Molybdenum: 0.10 mg/L
  - Selenium: 0.01 mg/L
  - Uranium: 0.044 mg/L
- Secondary goals
  - Chloride: 250 mg/L
  - pH: 6.5-8.5
  - Sulfate: 500 mg/L
  - TDS: 500 mg/L

Aerial view of the 50-acre, engineered disposal cell, which was completed in 1990

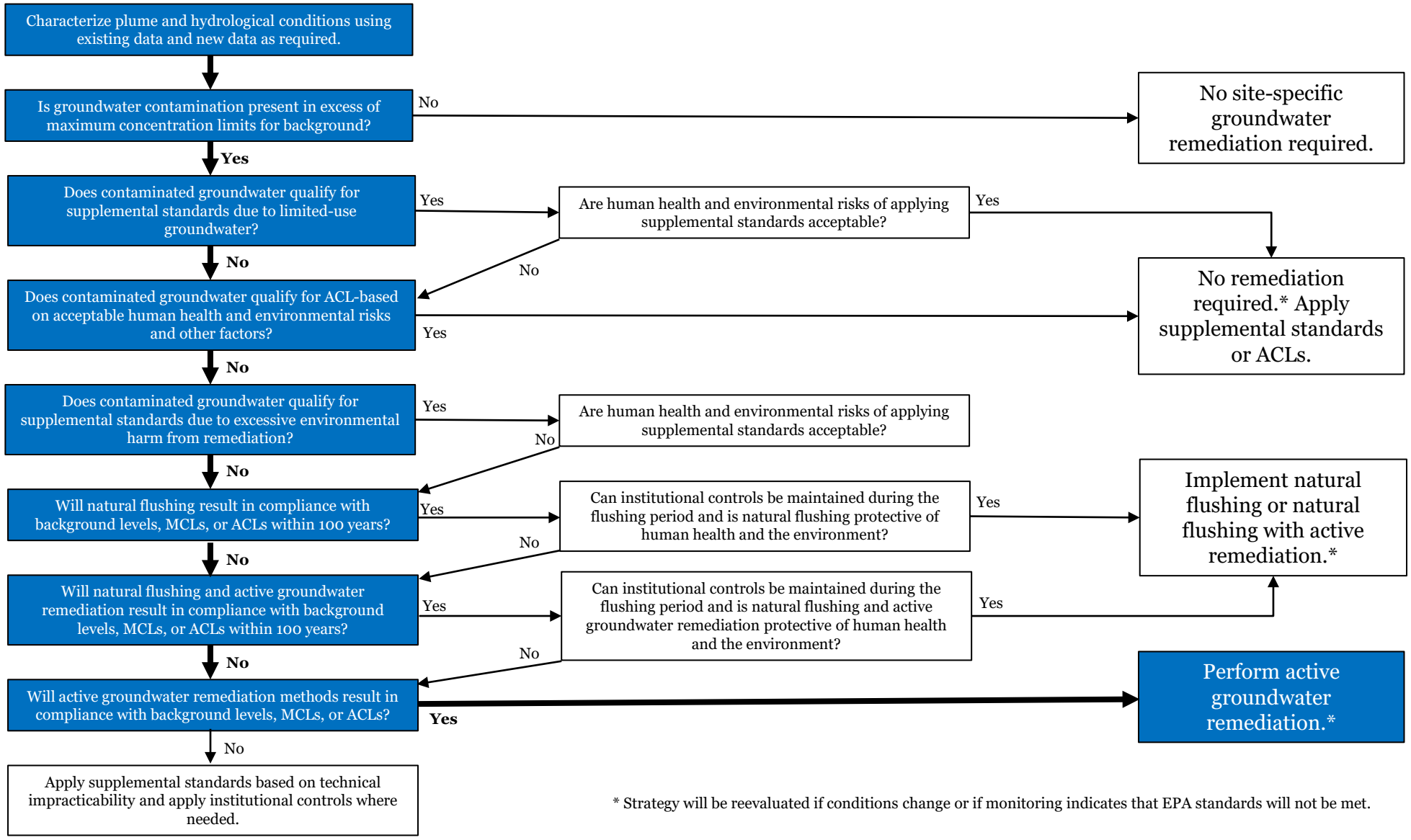
Key Takeaways

- Regulatory framework based on UMTRCA
  - Surface program
  - Groundwater program
  - Rules created by EPA
  - Regulatory authority is with NRC
- Tuba City Groundwater Compliance Strategy
  - Programmatic Environmental Impact Statement decision tree
  - Active remediation
  - MCLs and background

Solar panels supply energy to operate the groundwater-treatment plant

Questions?

Groundwater Compliance Selection Framework



KEY

Bold arrows and colored boxes represent the decision path for Tuba City.

* Strategy will be reevaluated if conditions change or if monitoring indicates that EPA standards will not be met.