

---

# **U. S. Department of Energy (DOE) Status and Planned Actions at the Riverton, Wyoming, Uranium Mill Tailing Radiation Control Act (UMTRCA) Title I Site**

April Gil, PhD  
Environment Team Lead  
Office of Legacy Management (LM)  
May 2, 2012



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

# Status and Action Summary

- Surface Remediation
- Groundwater Remediation
- Institutional Controls
- Environmental Monitoring
- Planned Actions



# Surface Remediation

- Surface remediation completed in 1989
  - Cleanup of the mill site was a joint effort between DOE and the State of Wyoming
  - 1.8 million cubic yards of contaminated materials removed and transported to the Gas Hills East UMTRCA Title II disposal site
  - 42 vicinity properties cleaned up
  - Cost of \$49,000,000
  - Cleanup approved by the U.S. Nuclear Regulatory Commission (NRC)



# Surface Remediation (continued)



Mill Site Prior to Remediation 1976



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

# Surface Remediation (continued)



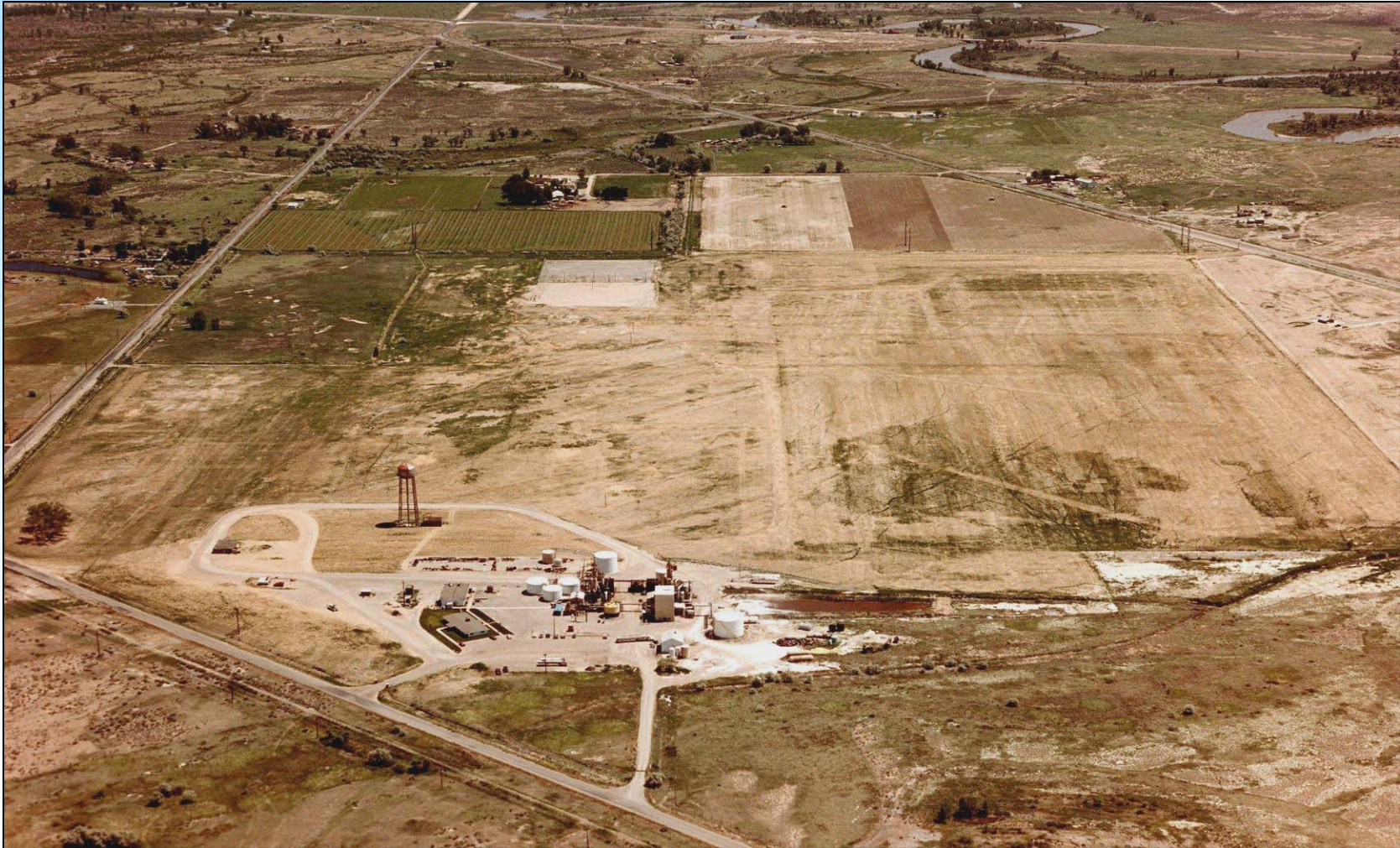
Mill Site During Surface Remediation (1988)



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

# Surface Remediation (continued)



**Mill Site After Surface Remediation (1990)**



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

# Groundwater Remediation

- Site characterization, groundwater modeling, environmental and risk assessments, 1990 through 1998
- Ground Water Compliance Action Plan approved by NRC in 1998
  - Authorizes the natural flushing compliance strategy for groundwater remediation
  - Computer modeling indicates natural flushing will be complete within 100 years
  - Requires an ongoing monitoring program to assess progress and verify protection of public health
  - Requires institutional controls to protect the public and environment during the flushing period



# Institutional Controls

## Protection of the public and the environment

- Contaminated groundwater can pose a hazard if used for drinking water
- Goal of institutional controls is to eliminate access to contaminated groundwater
- Institutional controls require many layers to be effective





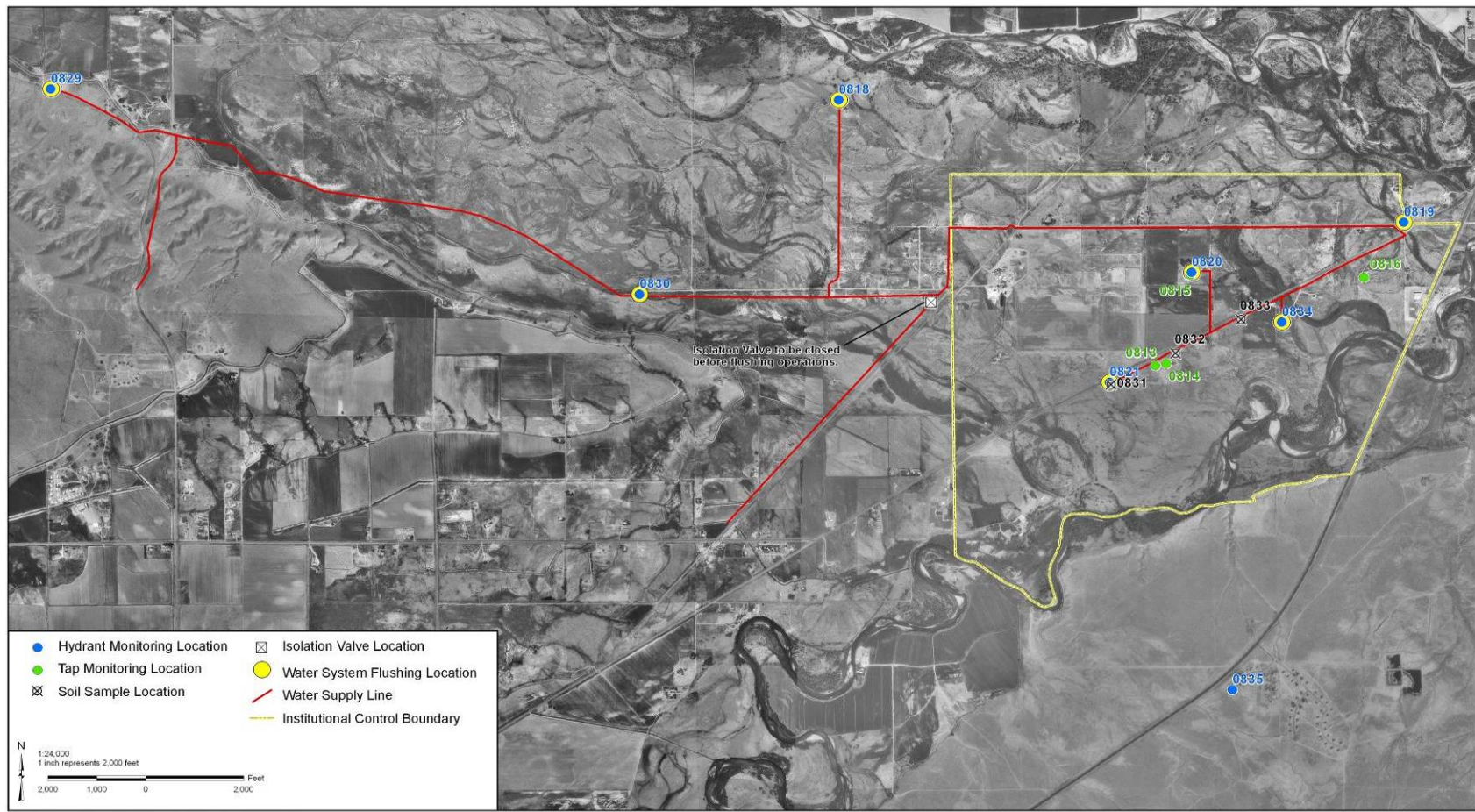
# Institutional Controls (continued)

## Alternate water supply system

- Installed in 1998
- Provides potable water to residents living near the former mill site
- DOE funding of \$850,000 for system construction
  - System upgraded with 1,000,000-gallon storage tank
  - Over 9 miles of distribution pipe installed
- Five-year Cooperative Agreement with the Northern Arapaho Tribe finalized in 2011
  - \$804,000 to address ongoing flushing, maintenance, and capital improvements



# Institutional Controls (continued)



**Alternate Water Supply System and Institutional Controls Boundary**



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

# Institutional Controls (continued)



**Northern Arapaho Utility Organization  
Hydrant Flushing**



**U.S. DEPARTMENT OF  
ENERGY**

Legacy  
Management

# Other Institutional Controls

## Completed and in place

- Institutional control boundary finalized
- Warning signs installed around Oxbow Lake
- Tribal ordinance restricts well installation and surface water impoundments
- Notification of existing groundwater contamination to area drilling contractors
- State of Wyoming alerts DOE if an application for a well permit or gravel permit is made
- Easement and covenant restricting land use on former mill site property owned by Chemtrade

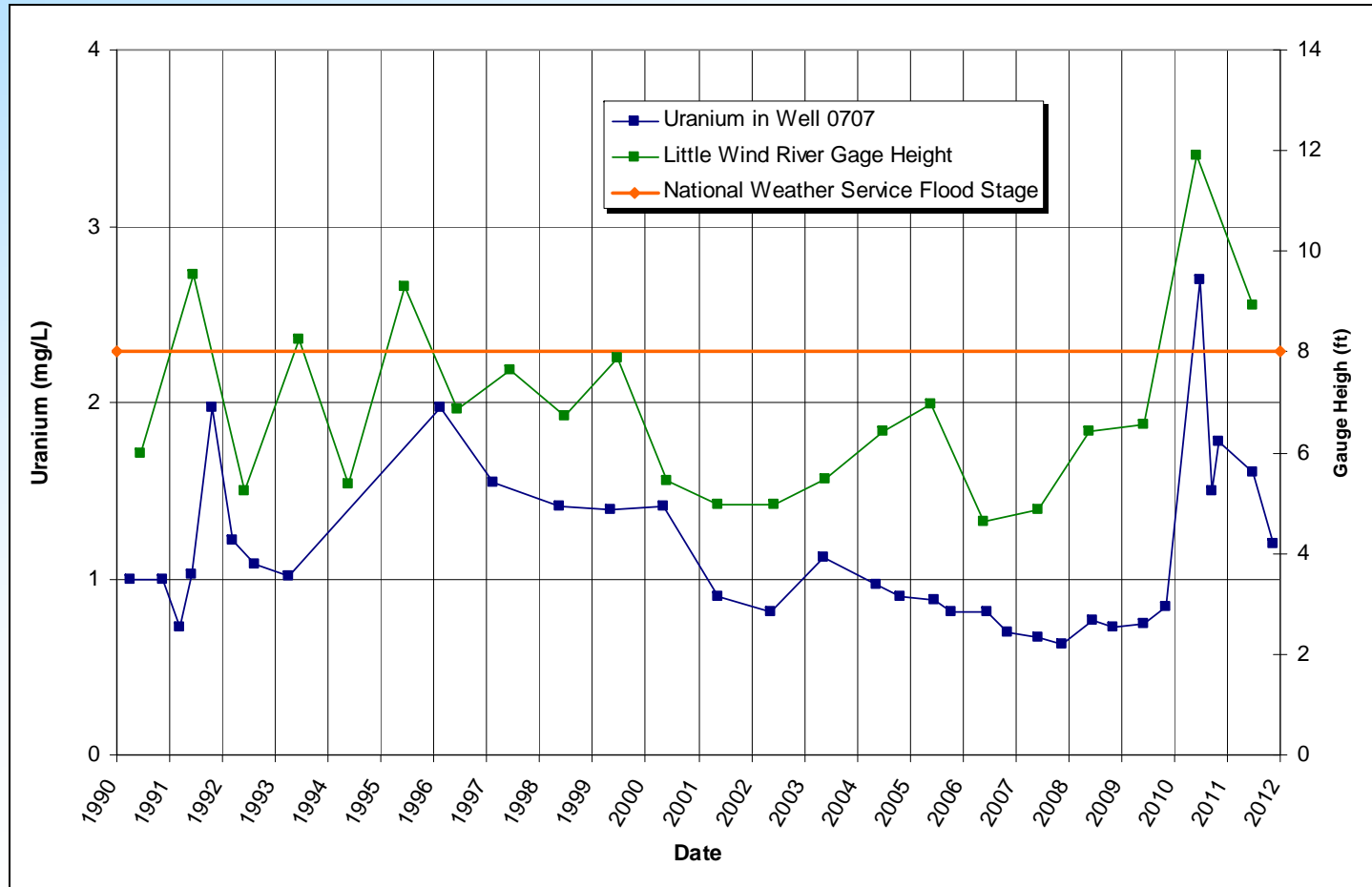


# Environmental Monitoring

- Cooperative Agreement with the Joint Business Council from 2005 to 2011
  - \$739,000 to tribes for oversight, monitoring, reporting, document review, and interagency coordination
- Semiannual monitoring of groundwater, surface water, and domestic wells in the vicinity of the site
- Routine reporting of monitoring results
- Historic flooding of the Little Wind River in 2010 caused a spike in contaminant concentrations in flooded areas



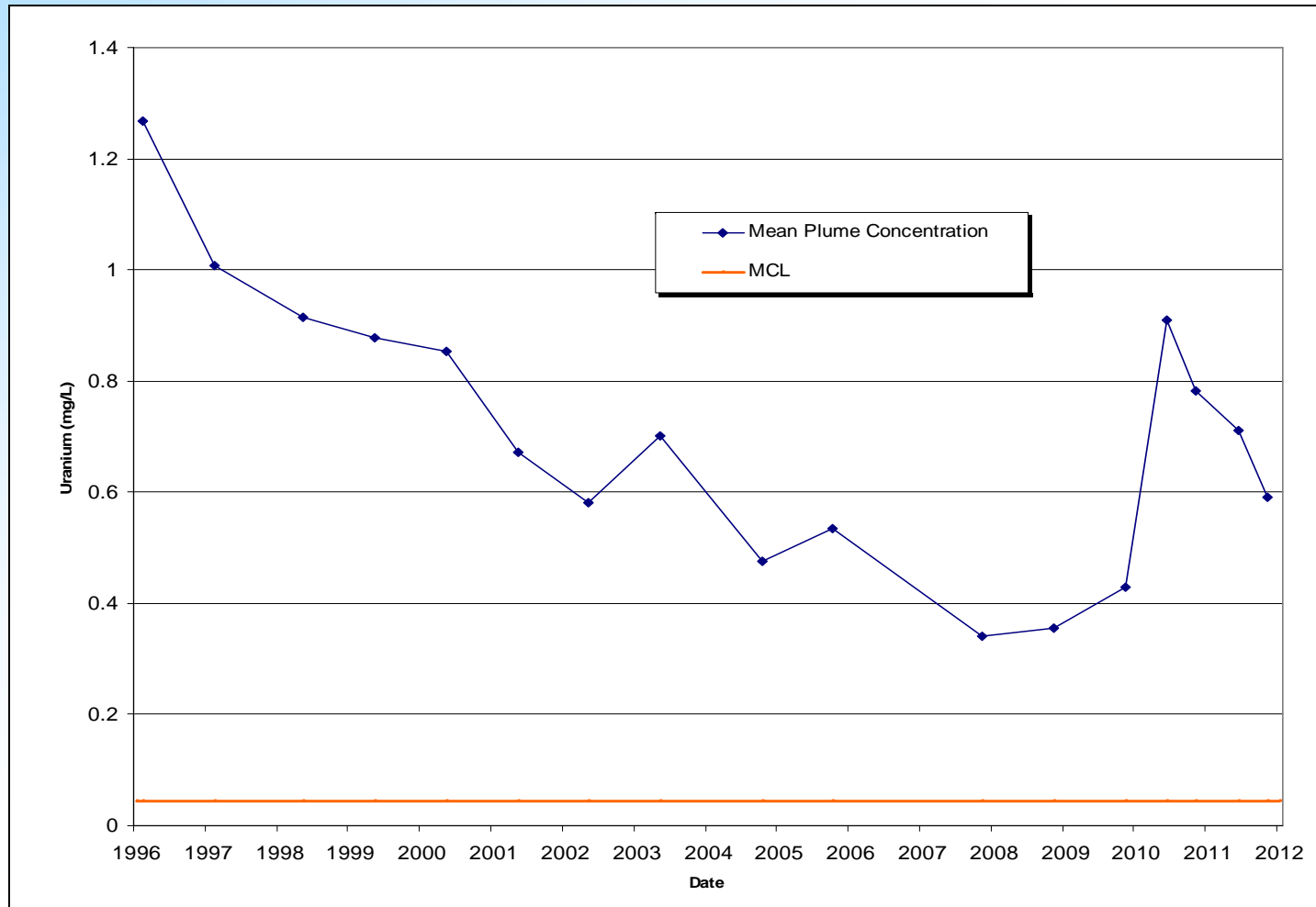
# Environmental Monitoring (continued)



Uranium Concentrations and River Stage



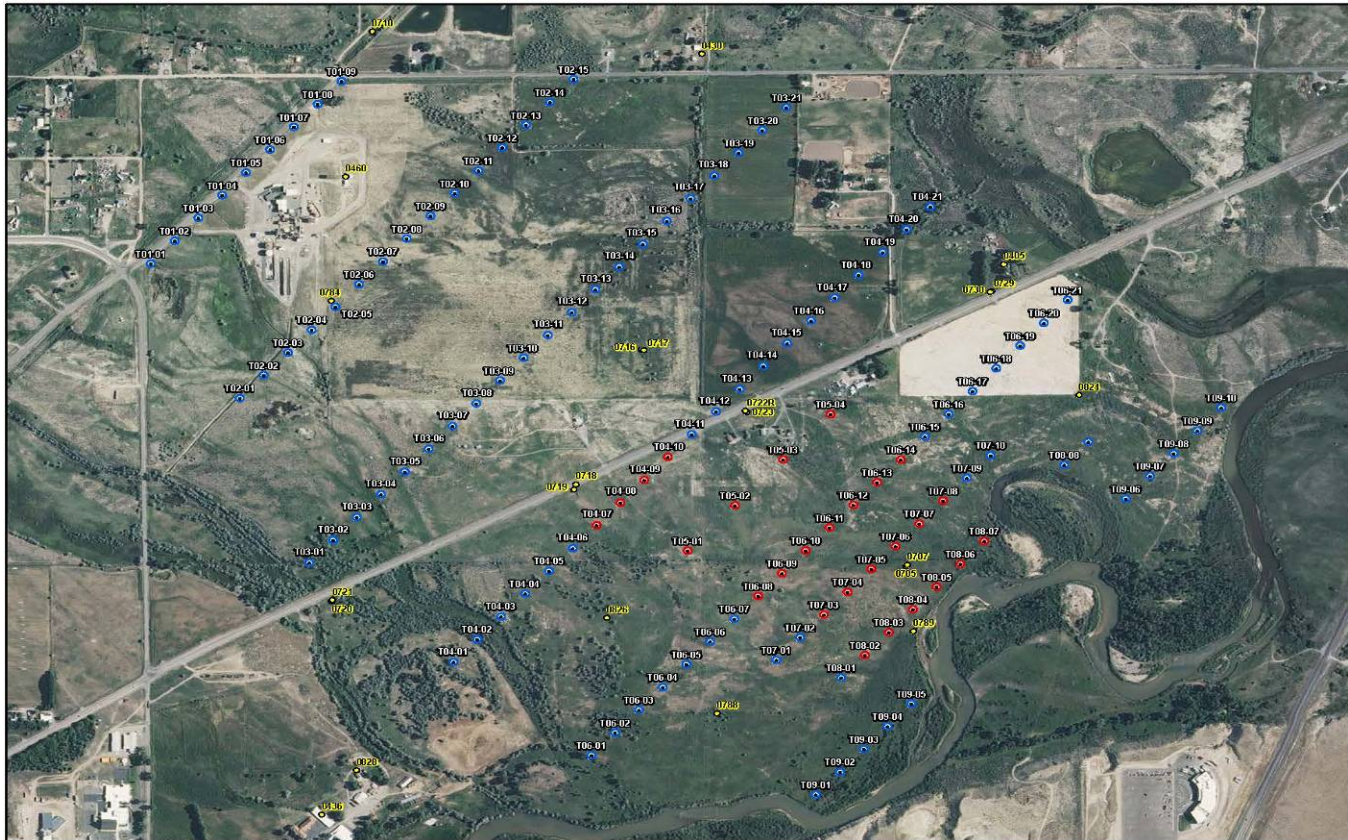
# Environmental Monitoring (continued)



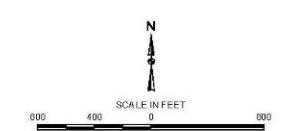
Mean Concentrations in the Uranium Plume



# Aquifer Characterization



- LEGEND**
- Proposed Geoprobe Location
  - Groundwater Sample Location
  - Groundwater and Soil Sample Location
  - Existing Monitoring or Domestic Well



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	With Permission by <b>S.M. Stoller Corporation</b> 1701 S. 600 E. WY 82501-0600
Proposed Borehole Locations Riverton, WY, Processing Site	
DATE PREPARED: January 25, 2012	FILENAME: S0854300

Proposed Sample Locations



# Planned Actions

- Commitment to continue working with the Northern Arapaho and Eastern Shoshone tribes through long-term cooperative agreements
  - Finalize cooperative agreement with the Joint Business Council
- Additional site characterization and groundwater modeling planned in 2012
- Conduct supplemental risk assessment to quantify health and environmental risk
- Adjustment of monitoring programs as new information is obtained



# Monitoring Data Availability

- Geospatial Environmental Mapping System (GEMS):  
[http://gems.lm.doe.gov/imf/sites/gems\\_continental\\_us/jsp/launch.jsp](http://gems.lm.doe.gov/imf/sites/gems_continental_us/jsp/launch.jsp)
  - View data with dynamic mapping capability
- Riverton site page of the LM website:  
<http://www.lm.doe.gov/Riverton/Sites.aspx>
  - Site information
  - Reports
    - Data validation
    - Verification monitoring



# DOE Site Manager Contact Information

April Gil, PhD  
2597 Legacy Way  
Grand Junction, Colorado 81503  
Phone: (970) 248-6020  
E-mail: [April.Gil@lm.doe.gov](mailto:April.Gil@lm.doe.gov)



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management