

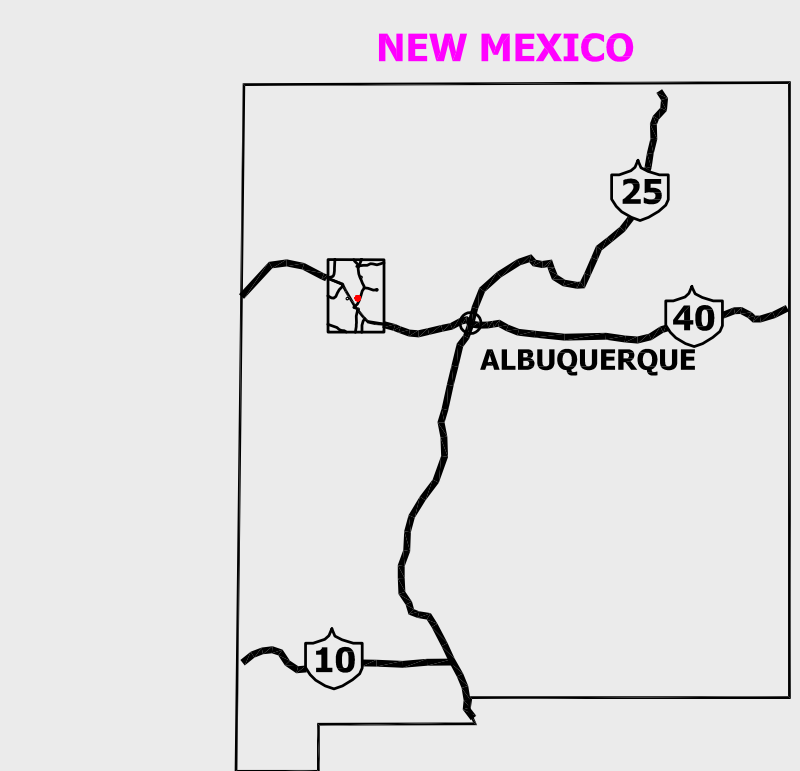
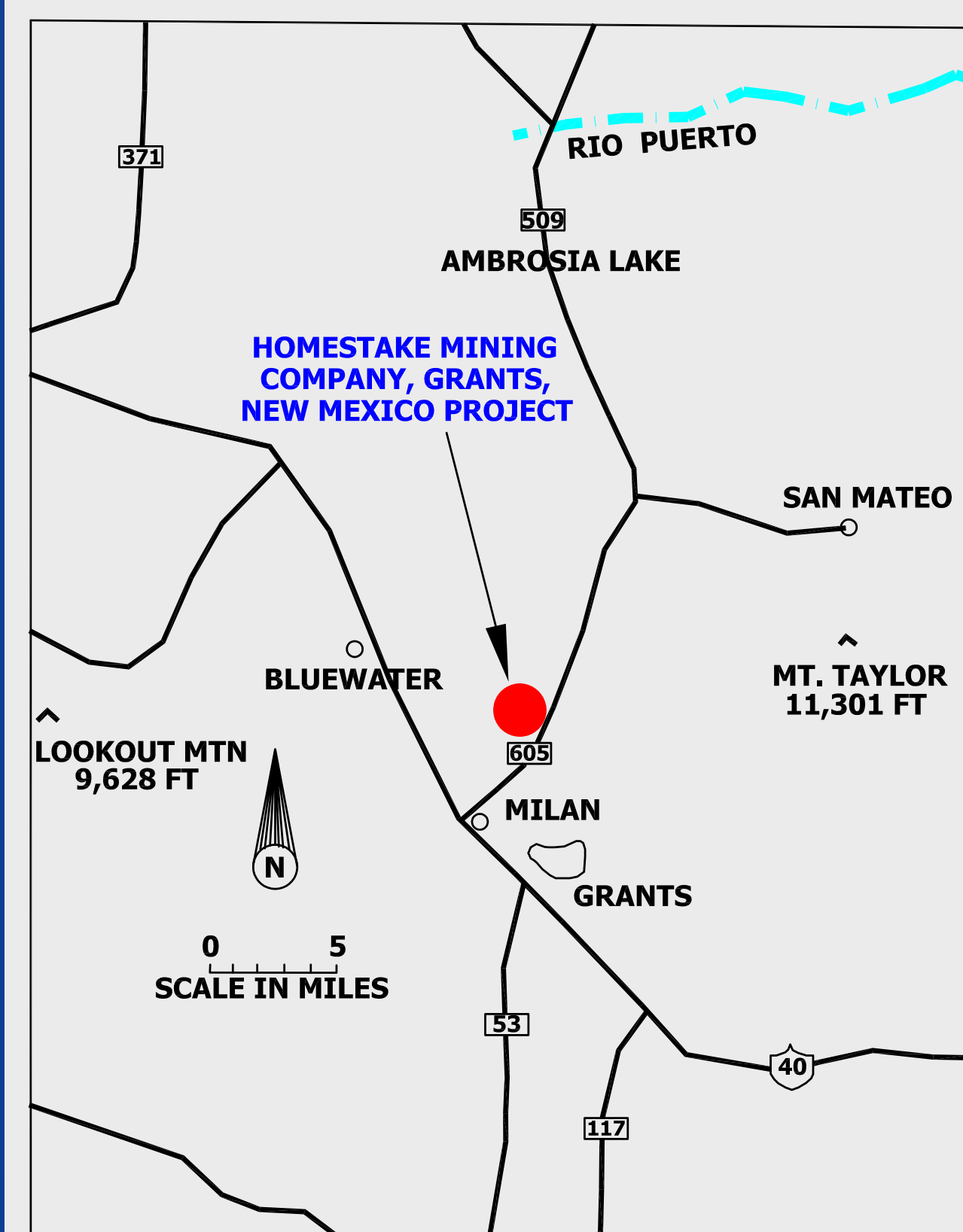
Complexities of Decommissioning a Uranium Mill Site



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Site History

- 1956- Two uranium processing mills were constructed to supply uranium to the Atomic Energy Commission
- 1958- Uranium mining mill operations began at the Homestake Mill Site
- 1961- Groundwater contamination first observed at the site
- 1977- Groundwater remediation activities commence with fresh water injection into the alluvial aquifer
- 1983- The Homestake site was placed on the National Priorities List
- 1989- Groundwater Corrective Action Program was developed for the U.S. NRC
- 1990- Uranium milling operations at the site ceased with approximately 22 million tons of ore processed and 82.5 million pounds of yellow cake produced
- 1993- Decommissioning of the uranium mill began
- 1995- Demolition of the mill and soil clean-up at the site were completed
- 2000- Flushing of the Large Tailings Pile was initiated to reduce concentrations of constituents of concern
- 2010- Groundwater remediation continues at the Homestake site
- 2017- Estimated completion of groundwater remediation and license termination



HOMESTAKE MINING COMPANY, GRANTS, NEW MEXICO PROJECT

Technical Complexities

The groundwater restoration program at the HMC site is a long-term restoration of the San Mateo Alluvial aquifer (Quaternary) and the Chinle formation (Permian).

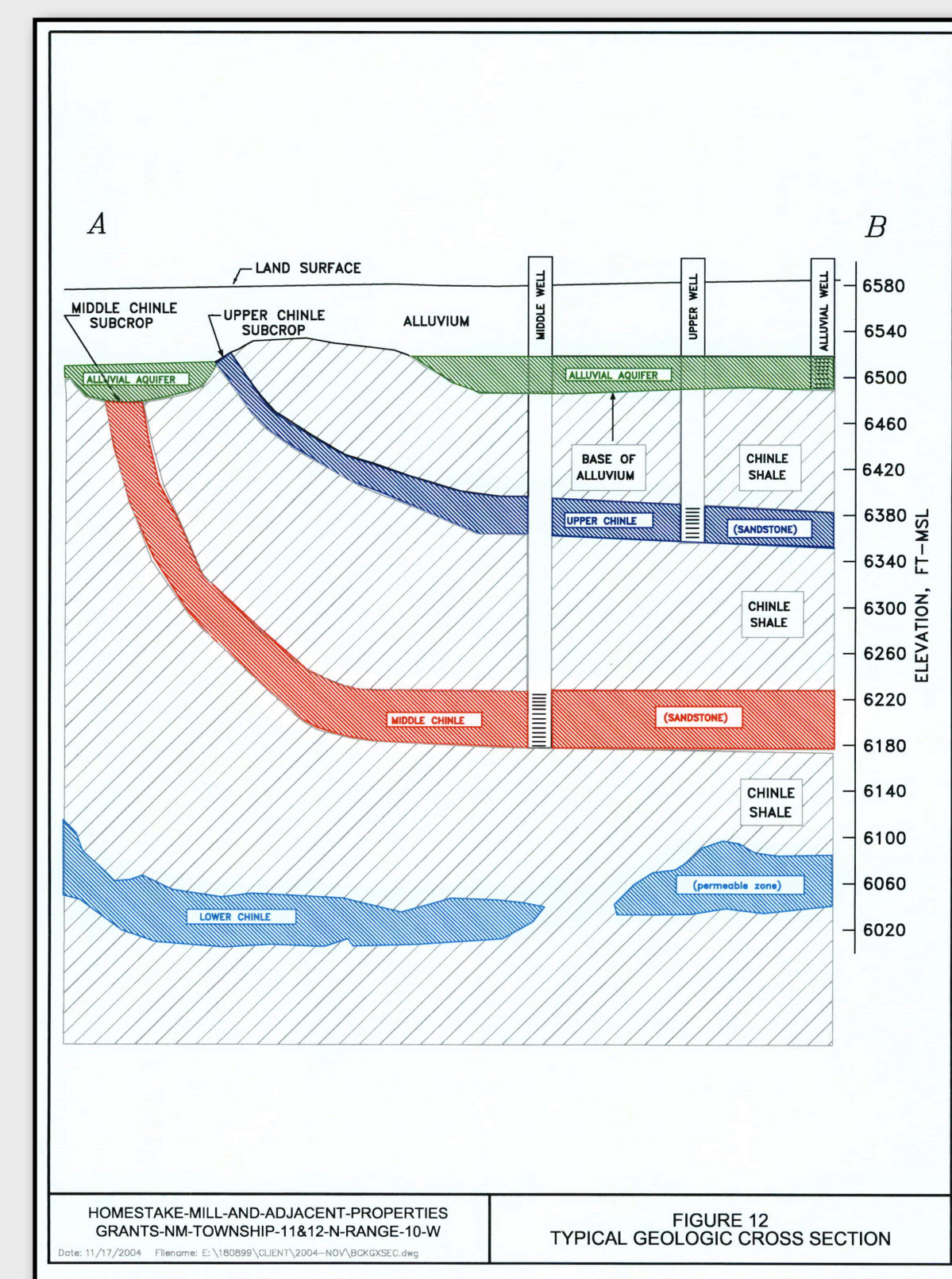
The Alluvial groundwater at HMC is derived from three drainage basins, the Rio San Jose to the northwest, the San Mateo to the north and Lobo Creek to the East.

In each of the three basins, mining activities and natural erosion of upgradient bedrock materials have contributed to the release of high concentrations of uranium, selenium and molybdenum.

Natural and anthropogenic releases have significantly contributed to the contamination of the groundwater upgradient and at the HMC site.

Four aquifers have been impacted at the Homestake Mill:

- Surficial Alluvial aquifer
- Upper Chinle aquifer
- Middle Chinle aquifer
- Lower Chinle aquifer



Regulatory Complexities

The Homestake site is a Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II site.

Activities are regulated by the U.S. NRC under a source and byproduct material license issued in accordance with 10 CFR Part 40.

The State of New Mexico has regulatory authority at the site through the issuance of two water discharge permits.

EPA has regulatory authority at the site under CERCLA.

NRC and EPA signed a Memorandum of Understanding in 1993 to define the regulatory roles and responsibilities of each agency.

- U.S. NRC was designated as the lead regulatory agency for the byproduct material disposal area reclamation and closure activities
- EPA was assigned responsibility to monitor all reclamation activities to assure applicable requirements are met under CERCLA

Major Regulatory Agencies Involved:

- U.S. Nuclear Regulatory Agency
- U.S. Environmental Protection Agency
- New Mexico Environmental Department

Major Permits and Frameworks Regulating Activities:

- U.S. NRC Radioactive Materials License
- Two State Discharge Permits
- State Water Appropriation Permits
- CERCLA Superfund Oversight

Public Interest:

- Bluewater Valley Downstream Alliance
- Multicultural Alliance for a Safe Environment
- Pueblo of Acoma



Groundwater Remediation

Groundwater restoration is mandated by 10 CFR Part 40, Appendix A.

The primary contaminants of concern for all aquifers are uranium, selenium, molybdenum, vanadium, thorium, sulfate, chloride, nitrate, total dissolved solids and radium.

Remediation at the Homestake site consists of the following:

- Injection and extraction wells within the large tailings pile
- Injection and extraction wells within the Alluvial and Chinle aquifers to reverse groundwater flow back to the site
- Reverse osmosis filtration system
- Evaporation ponds
- Crop irrigation



REFERENCES

1. "Code of Federal Regulations, Title 10, Part 40, Appendix A."
2. HOMESTAKE MINING COMPANY, "Grants Reclamation Project Groundwater Corrective Action Program (CAP)" Revision, (2006).