Riverton, Wyoming, Processing Site: Additional Characterizations of the Surficial Aquifer

This fact sheet provides information about additional characterization work conducted at the Uranium Mill Tailings Radiation Control Act Title I processing site at Riverton, Wyoming. This site is managed by the U.S. Department of Energy Office of Legacy Management.

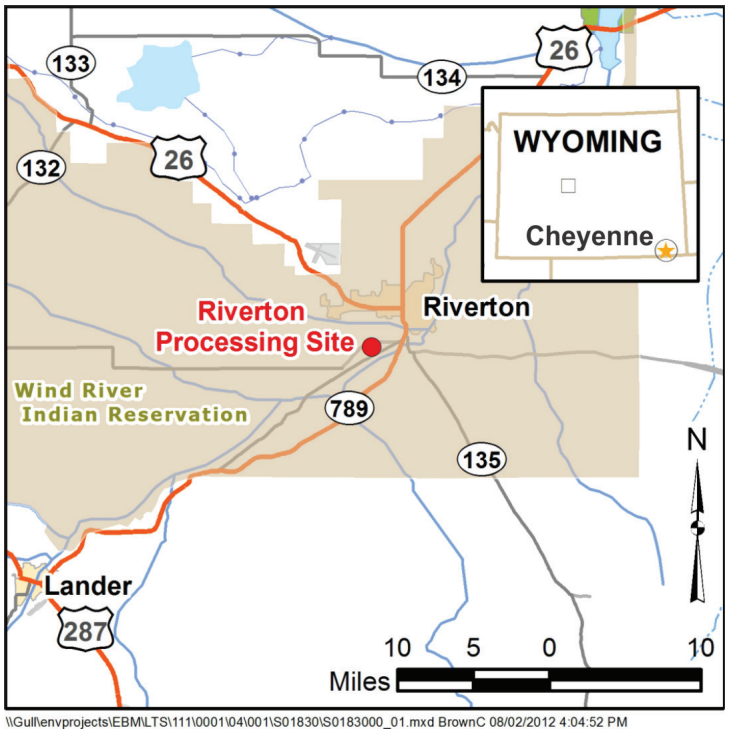
Site Description and History

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) manages the Riverton, Wyoming, Processing Site in Fremont County, 2 miles southwest of the town of Riverton and within the boundaries of the Wind River Indian Reservation (Northern Arapaho and Eastern Shoshone) on land now owned by Chemtrade Refinery Services. The site is the location of a former uranium- and vanadium-ore processing mill that operated from 1958 to 1963. Milling operations created radioactive mill tailings. The tailings were removed from the site in 1988 and relocated to the Gas Hills East disposal site 45 miles away. DOE completed surface remediation of the Riverton site in 1989.

Groundwater Compliance Strategy

Milling operations at the site resulted in contamination of the shallow groundwater at the Riverton site. DOE conducted groundwater characterization studies and computer modeling at the site in the 1990s and recommended a natural flushing compliance strategy, which was approved by the U.S. Nuclear Regulatory Commission. Natural flushing refers to the removal of contaminants from groundwater by natural processes as groundwater flows through the aquifer and transports, distributes, and dilutes contaminants. To be used as a compliance strategy, natural flushing must be complete within a 100-year regulatory time frame. DOE has conducted verification monitoring to document site conditions and assess the progress of natural flushing since 1998. Data collected during verification monitoring are reported annually in Verification Monitoring Reports. In addition, the Northern Arapaho Environmental Office has conducted studies and provided verification monitoring support during the verification monitoring period.

Results of the verification monitoring indicated that natural flushing was generally progressing as expected until June 2010, when a record flood caused the Little Wind River to overflow and flood a large area downgradient of the former mill site. Groundwater sampling conducted 2 weeks after the flood showed significant increases in contaminant concentrations in monitoring wells where the flooding occurred. The spikes in contaminant concentrations are attributed to the flood waters mobilizing residual contamination in soil.



Location of the Riverton, Wyoming, Processing Site

Additional Characterizations

DOE conducted additional characterization work at the site in 2012 and 2015, including extensive groundwater, surface water, and soil sampling, well installation, and laboratory tests. A better understanding of the Riverton site was obtained from the characterization work including aquifer properties, geochemistry, extent of groundwater contamination, and secondary contaminant sources. Results indicate that the 2010 flood of the Little Wind River caused a mobilization of contaminants in the unsaturated zone that resulted in temporary spikes of contaminant concentrations in the surficial aquifer. Work continues to assess the characterization data and evaluate the viability of the natural flushing compliance strategy.

Contacts

Documents related to the Riverton site are available on the LM website at: https://www.lm.doe.gov/riverton/Sites.aspx.

Refining the site conceptual model at a former uranium mill site in Riverton, Wyoming, USA (Environmental Earth Sciences journal) is available on the LM website at https://www.lm.doe.gov/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=11125.

Enhanced Characterization of the Surficial Aquifer, Riverton, Wyoming, Processing Site, Data Summary Report is available on the LM website at https://www.lm.doe.gov/Riverton/S09545_EnhancedChar.pdf.

2012 Enhanced Characterization and Monitoring Report, Riverton, Wyoming, Processing Site is available on the LM website at https://www.lm.doe.gov/Riverton/S09799/S09799_Riverton.pdf.

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