# Gallery of Geology: Uranium Mining in the Grants Area

Virginia T. McLemore and Bonnie A. Frey

New Mexico Geology, v. 39, n. 1 pp. 25-27, Online ISSN: 2837-6420.
*https://doi.org/10.58799/NMG-v39n1.25*

*This page is intentionally left blank to maintain order of facing pages.*

# Gallery of Geology

*Virginia T. McLemore and Bonnie A. Frey*
New Mexico Bureau of Geology and Mineral Resources
ginger@nmbg.nmt.edu, bonnie.frey@nmt.edu

Figure 1. William Chenoweth standing over a brass cap marking Milepost 16 on the New Mexico/Arizona state line. Uranium-vanadium deposits in the Salt Wash Member of the Morrison Formation were found in this area in 1918, but could not be mined since the Navajo Reservation was closed for mining at that time. *Photo by V.T. McLemore in 1983.*

Figure 2. Navajo miners leaving the King Tutt Point mine in the Salt Wash Member of the Morrison Formation on King Tutt Mesa in eastern Carrizo Mountains, San Juan County. From 1950–1953, the mine produced 429 tons of ore averaging 0.31% $U_3O_8$ and 2.62% $V_2O_5$. *Photo by K.G. Hatfield in 1953.*

Figure 3. Surface plant of Kermac's Section 22 mine, Ambrosia Lake subdistrict, McKinley County. The headframe is for a shaft that is 826 ft deep. *Photo by W.L. Chenoweth in 1961.*

Figure 4. Grade control engineer checking the grade of blasted ore with a T-probe (grade control instrument) at the Dysart No. 1 mine, Ambrosia Lake subdistrict, McKinley County. *Photo by K.G. Hatfield in the late 1950s.*

Figure 5. Grade control engineer checking grade of blasted ore with a T-probe at the Homestake-Sapin Partners Section 25 mine, Ambrosia Lake subdistrict, McKinley County. Photo by U.S. Atomic Energy Commission geologists in the 1960s.

Figure 6. Dump truck being loaded with ore at the Homestake-Sapin Partners Section 25 mine, Ambrosia Lake subdistrict, McKinley County. Photo by U.S. Atomic Energy Commission geologists in the 1960s.

# Gallery of Geology

Figure 7. Mine official showing visitors how an overhead mucking machine operates at the Homestake mine, Ambrosia Lake subdistrict, McKinley County. *Photo by U.S. Atomic Energy Commission geologists in the 1960s.*

Figure 8. Headframe of Anaconda's Woodrow mine, Laguna subdistrict, Cibola County. The 230 ft deep shaft was adjacent to a collapsed ore-bearing breccia pipe in the Jackpile and Brushy Basin members of the Morrison Formation. This mine produced 5,326 tons of ore averaging 1.26% $U_3O_8$, 1953–1956. *Photo by W.L. Chenoweth in 1961.*

Figure 9. Bokum Resources shaft at Marquez Canyon, McKinley County. Shaft was never completed due to high water flow. *Photo by W.L. Chenoweth in 1981.*

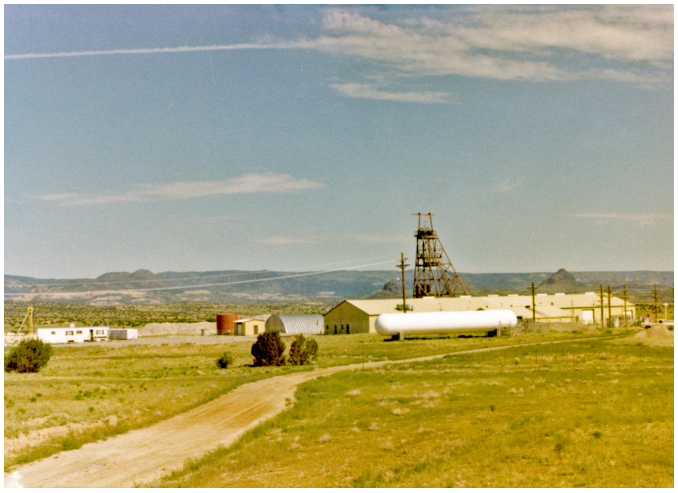

Figure 10. Surface plant at Kermac's Rio Puerco mine, Sandoval County. *Photo by W.L. Chenoweth in 1981.*

Figure 11. Virginia McLemore standing at a stockpile of illegally mined uranium-vanadium ore from the Shadyside area of King Tutt Mesa, eastern Carrizo Mountains, San Juan County, New Mexico. In the late 1970s, the Grand Junction office of the U.S. Department of Energy received reports of some uranium mining taking place on King Tutt Mesa, but mining was terminated by the Navajo Police Department as the individuals from Farmington, New Mexico did not have the proper permits. *Photo by W.L. Chenoweth in September 1983.*


Figure 12. Navajo vanadium miners, Shadyside area, King Tutt Mesa, eastern Carrizo Mountains, San Juan County. *Photo by U.S. Geological Survey geologists in October 1942.*

Figure 13. Ambrosia Lake in a rare moment when the lake contained water, October 2014. The structure in the background is the Section 12 headframe of the Section 11/12 mine, owned by Hydro Resources. The mine has a second headframe at the west end of the mine, in Section 11. *Photo by Bonnie A. Frey.*

# Gallery of Geology

Figure 14. The eastern headframe of the Section 11/12 mine, Ambrosia Lake subdistrict, McKinley County. The mine shaft is 500–520 feet deep (George Lotspeich, Hydro Resources, personal comm., 2014). Cumulative production from 1961–1963 was 211,873 pounds $U_3O_8$, with a production grade of 0.15% $U_3O_8$, likely depleting the deposit resource. The mine operated until 1980 (McLemore et al., 2013). *Photo by Bonnie A. Frey in October 2014.*

Figure 16. Outcrop in St. Anthony mine, October 2015, which shows the Dakota Formation lying unconformably above the Jackpile Sandstone of the Morrison Formation. A white arrow indicates the contact. The white hue of the sandstone immediately below the base of the Dakota is likely due to kaolinite "dusting" on the Jackpile sand – this is a common feature of the Jackpile. Bruce Thomson is standing on lower Jackpile Sandstone beds in mine-pit floor. *Photo by Bonnie A. Frey.*

Figure 15. Sampling at the waste rock pile of Section 11/12 mine. Students from New Mexico Tech and the University of New Mexico collected samples for ongoing column and leach studies to investigate uranium transport. *Photo by Bonnie A. Frey in October 2014.*

Figure 17. St. Anthony mine west pit viewed from the west–southwest. Waste piles are visible behind the pit. The cumulative production of the mine from 1953–1960 was 2.5 million pounds of $U_3O_8$ with a production grade of 0.17% $U_3O_8$. Vanadium was also recovered. The historic resource estimate was about 3.9 million tons of ore (McLemore et al., 2013). *Photo by Bonnie A. Frey in October 2015.*

Resource and production data from McLemore, V.T., Hill, B., Khalsa, N., Lucas-Kamat, S.A., 2013, Uranium resources in the Grants uranium district, New Mexico: An update, *in* Zeigler, K., Timmons, J.M., Timmons, S., Semken, S., eds., Geology of Route 66 region: Flagstaff to Grants, New Mexico Geological Society, Guidebook, 64th Annual Field Conference, Guidebook, p. 117–126. ISBN: 978-1-58546-09901. Repository: 2013002, **http://nmgs.nmt.edu/repository/index.cfml?rid=2013002.**