New Mexico Legislative Council Service

INFORMATION BULLETIN

Number 16

Legislative Research, Policy & Committee Services — April 29, 2009

THE LEGACY OF URANIUM MINING & MILLING IN NEW MEXICO

INTRODUCTION

The under-regulated uranium mining and milling industries of the twentieth century left a legacy of abandoned and contaminated mine and mill sites in New Mexico, including piles of windblown mining waste and mill tailings and polluted ground water. While the surface contamination at some of the mill sites has been contained, many of the mine sites remain unremediated, and major aquifers have expanding plumes of contamination. While New Mexico is working to get a handle on this continuing problem, the associated costs are beyond the resources of the state and related tribal entities. The federal government, the principal beneficiary of uranium production prior to the 1970s due to national defense requirements, has a moral obligation to assist with the expense of fully investigating and remediating the legacy of the twentieth century uranium industry in New Mexico.

URANIUM — BACK TO THE FUTURE?

The Grants mineral belt, situated between Shiprock and the Pueblo of Laguna in New Mexico, contains one of the world's richest uranium deposits. During the 30-year period beginning in 1948, the Grants mineral belt produced more uranium than any other district in the world and accounted for one-third of all of the uranium produced in the United States during that period.[1] Through 2002, more than 174,000 tons of uranium oxide (U_3O_8 - also known as "yellowcake") were produced from more than 200 mines located in 18 New Mexico counties; annual production of yellow cake between 1977 and 1982 averaged over $370 million.[2] The price per pound of yellowcake peaked in the early 1980s at almost $40.00 per pound, but declined to $10.00 per pound in 1989.[3] Prior to the 1970s, most of the uranium was sold to the federal government for defense purposes; in the 1970s and 1980s, most of the uranium was sold to fuel nuclear power plants.

The decline in the demand for and the price of uranium with the end of the Cold War and the Three Mile Island nuclear power plant incident resulted in the slowdown in the construction of new nuclear power plants and effectively killed the uranium mining and milling industry in New Mexico by the end of the 1980s. However, the recent increase in demand for new sources of uranium and the subsequent spike in the spot price of uranium to $138 per pound of yellowcake in July 2007[4] has led to increased interest in resuming uranium mining and milling in New Mexico. The federal Energy Information Administration has estimated that New Mexico has reserves of at least 341 million pounds of yellowcake (38 percent of the United States' total reserves) that can be mined at a cost of $50.00 per pound or less.[5] As of April 27, 2009, the spot price for U_3O_8 was $44.00 per pound.[6]

Over the past three years, the Mining and Minerals Division (MMD) of the Energy, Minerals and Natural Resources Department (EMNRD) has received 22 applications for the drilling of exploration holes related to uranium mining; nine of these applications have been approved, 12 have been withdrawn or denied and one is still being processed. In addition, two new mining projects are conducting background environmental studies prior to the formal permitting process.[7] In addition, the Nuclear Regulatory Commission has granted a license for the construction of new in situ leach mining facilities to be located near Church Rock and Crownpoint, New Mexico. Interest also has been expressed in reopening the underground uranium mine located on Mount Taylor.

The potential resumption of uranium mining and milling activities in New Mexico has raised many issues, ranging from the need for new jobs, economic growth and state tax revenue to concerns

about new environmental contamination and desecration of Native American sacred sites. Without a doubt, the awareness of the legacy of past uranium mining and milling in New Mexico has greatly increased.

THE URANIUM MINING AND MILLING LEGACY IN NEW MEXICO

The history of uranium mining in New Mexico has involved a wide variety of activities, including exploratory drilling, small "mom and pop" surface and underground mines and large- scale commercial surface and underground mines.

The New Mexico Bureau of Geology and Mineral Resources has identified nearly 600 mine and exploration sites in McKinley, Cibola and Sandoval counties alone.[8] A recent inventory study conducted by the MMD identified 259 mining sites in New Mexico that produced uranium. Of these sites, 137 have no record of any reclamation activity.[9] In addition to uranium mines, mills used to process ore to yellowcake were constructed and operated at seven sites in New Mexico.[10]

Much has been said and written about the adverse environmental and health impacts of the twentieth century uranium industry in New Mexico. Two specific examples illustrate the extent of the impacts of these activities. In 1969, the United Nuclear Corporation (UNC) began operating an underground uranium mine near Church Rock, New Mexico, approximately 17 miles northeast of the City of Gallup; subsequently, the UNC constructed a uranium milling facility nearby. The mill produced waste products that were stored in three lagoons surrounded by an earthen dam. On the morning of July 16, 1979, the dam failed, sending approximately 1,100 tons of mill waste and 94 million gallons of acidic mill effluent into the Pipeline Arroyo and the North Fork of the Rio Puerco; contaminants were carried 80 miles downstream to a point near Navajo, Arizona. The total amount of radiation released in this spill was more than three times the amount released in the Three Mile Island nuclear power plant incident that occurred less than four months earlier.[11]

In 1958, the Homestake Mining Company opened a uranium mill near the Village of Milan, just to the west of Grants, New Mexico. In 1983, the federal Environmental Protection Agency (EPA) placed the Homestake site on the National Priorities List under the Superfund program due to the potential for radon emissions from the tailings piles. Further investigations revealed contamination of the ground water, and the EPA and Homestake entered into a consent decree for Homestake to provide drinking water to area residents. In 1990, the mill was closed, decommissioned and demolished. Despite more than 30 years and millions of dollars of reclamation activity regarding the tailings piles, the ground water in that area is so contaminated that, in a report issued in May 2008, the Agency for Toxic Substances and Disease Registry, an agency of the federal Department of Health and Human Services, declared the Homestake Mining Company mill site to be a public health hazard.[12]

The cleanup of contaminated abandoned uranium mine sites has been spotty at best. In the spring of 2007, 25 years after the closure of the Northeast Church Rock uranium mine, the EPA removed 5,300 cubic feet of radium-contaminated soil at five residential properties in the Coyote Chapter of the Navajo Nation, located downwind of the mine.

As a result of hearings conducted by the House Committee on Oversight and Government Affairs, five federal agencies (Bureau of Indian Affairs, Department of Energy, EPA, Indian Health Service and Nuclear Regulatory Commission) have prepared a five-year plan to address contamination resulting from uranium mining and milling activities on the Navajo Nation.[13] In consultation and coordination with the Navajo Nation, the federal agencies intend to accomplish the following tasks on the Navajo Nation within the next five years: assess contamination of 500 structures and remediate those posing a health risk; assess contamination of rural Navajo Nation water sources and provide safe water where necessary; identify the highest risk of the 520 abandoned uranium mine sites on the Navajo Nation; complete the cleanup of the Northeast Church Rock Mine; remediate ground water at uranium milling sites; and support health studies related to the effects of uranium radiation.

NEW MEXICO LEGISLATIVE ACTIONS

During the years 2005 through 2008, the New Mexico Legislature held eight interim legislative committee hearings regarding the legacy of past

uranium mining and milling activities and proposals to resume uranium mining and milling in New Mexico. Most of these meetings were conducted at locations on the Navajo Nation and within the Grants mineral belt and included field trips to former mining and milling sites that remain contaminated today. In the 2008 legislative session, two bills (House Bill 342 and Senate Bill 487) were introduced proposing new funding sources for the cleanup of sites contaminated by past uranium mining activities. The Uranium Legacy Cleanup Act, which would have imposed a surtax on future uranium mining and milling operations in New Mexico, passed the legislature but was vetoed by Governor Bill Richardson because it provided an entirely inadequate level of funding for cleanup activities.[14]

Problems related to the contamination of land resulting from uranium mining and milling activities in the twentieth century continued to be a hotly discussed topic during the 2009 legislative session. Senate Joint Memorial 15, which passed both chambers, detailed the nature of the uranium legacy of contaminated sites and requested Congress to allocate funds from the sale of excess federal uranium inventory and from the abandoned coal mine program of the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA) for the cleanup of the contaminated mine sites. The general appropriation bill for fiscal year 2010 includes $150,000 for site assessments of abandoned uranium mines. House Bill 84, essentially a reintroduction of the proposed Uranium Legacy Cleanup Act vetoed by the governor in 2008, was tabled in the House Energy and Natural Resources Committee. That proposal, however, spawned two other bills: House Bill 749, which financed the cleanup of legacy sites through capital outlay funds rather than through a surtax on future uranium mining and milling activities; and House Bill 755, which would have imposed strict liability on the uranium industry for contamination resulting from future mining and milling activities.

House Bill 755 never got out of its second House committee, but House Energy and Natural Resources Committee Substitute for House Bill 749 passed the House by a vote of 65-0 but never received a hearing in a Senate committee. A duplicate of House Bill 749, Senate Education Committee Substitute for Senate Bill 736, received a hearing by the Senate Finance Committee near the end of the session but was tabled. House Joint Memorial 6, which called for the creation of a task force to study the potential impact and regulation of the resumption of uranium mining and milling activities in New Mexico, passed the House by a vote of 31-28 but was not heard by the Senate Rules Committee. This topic will continue to be an item of discussion during the interim and will be the subject of proposed legislation in future sessions.

FUNDING THE URANIUM LEGACY CLEANUP

In past years, funding for the assessment and cleanup of sites contaminated by uranium mining and milling activities has come from a variety of sources, including the operating budgets of the involved federal, state and tribal agencies, the Superfund program pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the federal Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), the Abandoned Mine Lands program pursuant to Title IV of SMCRA and assessments paid by former operators of uranium mines and mills and their successors in interest. This funding, however, has not been adequate to address the full extent of the contamination legacy of the uranium industry in New Mexico.

One source of future funding could be the authorization of a significant portion of funds received pursuant to SMCRA for the cleanup of non-coal mines. Another source could be allocation of a significant share of funds received from the sale by the federal Department of Energy (DOE) of the government's excess uranium inventory, much of which originated in the mines and mills of New Mexico. It is also important that Regions 6 and 9 of the EPA receive sufficient funding to complete the inventory and assessment of abandoned uranium mines and mapping of the continuing contamination of ground water and major aquifers in New Mexico.

CONCLUSION

The uranium industry operating in New Mexico in the twentieth century, which mainly occurred prior to the creation and implementation

of federal or state regulations, left a legacy of unreclaimed mines and contaminated mining and milling sites and underground aquifers.

With respect to uranium milling sites, surface reclamation has been completed at six of the seven mill tailing facilities in New Mexico, and four of the seven sites have been turned over to the Office of Legacy Management within the DOE. Reclamation activities continue at the Homestake Milan, Church Rock and Rio Algom mill sites pursuant to the Nuclear Regulatory Commission license requirements and at the Shiprock mill site under DOE oversight. Ground water and aquifer contamination continue to be a problem even where surface contamination has been cleaned up or contained.

Furthermore, potentially hundreds of abandoned uranium mines in northwest New Mexico remain unreclaimed; the extent of uranium contamination and the cost of cleanup at those sites remain unknown. The impacts of past discharges of mine water on regional ground water quality are also not known.

While the State of New Mexico is taking steps to assess the extent of and characterize the nature of contamination at abandoned uranium mine sites, the state lacks the financial ability to complete the assessment work in a timely fashion or fund the cleanup actions necessary to minimize the adverse health risks represented by those sites if responsible parties are not identified. The uranium mining and milling activities that took place in New Mexico in the twentieth century were undertaken in large part to benefit the federal nuclear weapons program. The federal government in 1978 recognized its responsibility to assist financially in the cleanup of contamination from past uranium milling activities through the passage of the UMTRCA, which provided that the federal government would pay for the cleanup of mill sites that produced uranium solely for government use. Title X of the federal Energy Policy Act of 1992 also provided that the federal government would pay for the cleanup of mill sites that produced uranium for both government and private use in proportion to the amount of uranium that was used for government purposes. If the federal government is responsible for the cost of cleaning up mill sites that produced uranium for national defense purposes, it should also be responsible for the cost of closing and cleaning up the mines that produced the ore for the uranium mills.

ENDNOTES

1. *Uranium - Is the Next Boom Beginning*, New Mexico Bureau of Geology and Mineral Resources, New Mexico Tech, Winter 2007, p. 1.

2. *Ibid*.

3. *Ibid*. at pp. 1-2.

4. The Ux Consulting Company, LLC, www.uxc.com/review/uxc_g_price.html, April 28, 2009.

5. *Uranium - Is the Next Boom Beginning*, New Mexico Bureau of Geology and Mineral Resources, New Mexico Tech, Winter 2007, p. 2.

6. The Ux Consulting Company, LLC, www.uxc.com/review/uxc_prices.aspx, April 28, 2009.

7. Bill Brancard, Director, Mining and Minerals Division, New Mexico Energy, Minerals and Natural Resources Department, April 15, 2009.

8. V. T. McLemore, et al., Database of Uranium Mines, Prospects, Occurrences, and Mills in New Mexico, New Mexico Bureau of Geology and Mineral Resources, New Mexico Institute of Mining and Technology, April 3, 2002.

9. News Release, July 1, 2008, New Mexico Energy, Minerals and Natural Resources Department.

10. Phillips Ambrosia Lake and Shiprock mill sites; Rio Algom Ambrosia Lake mill; Homestake Mining Company Milan mill; Anaconda Bluewater mill; United Nuclear Corporation Churchrock mill; SOHIO/Kennecott L-Bar uranium mill.

11. Doug Brugge and Jamie L. de Lemos, "The Sequoyah Corporation Fuels Release and the Church Rock Spill: Unpublicized Nuclear Releases in American Indian Communities", *American Journal of Public Health*, Vol. 97, No. 9, September 2007.

12. Health Consultation, Homestake Mining Company Mill Site, Milan, Cibola County, New Mexico, Division of Health Assessment and Consultation, Agency for Toxic Substances and Disease Registry, Department of Health and Human Services, May 19, 2008.

13. Health and Environmental Impacts of Uranium Contamination in the Navajo Nation; Five-Year Plan, June 8, 2008.

14. Governor Bill Richardson, Senate Executive Message No. 45, March 3, 2008.

.173613A