



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064**

June 7, 2001

Rick Cables, Regional Forester
U.S. Forest Service
P.O. Box 25127
Lakewood, Colorado 80225-0127

**SUBJECT: MINING RESEARCH CORPORATION TERMINATED LICENSE SITE
(AEC LICENSE R-00143)**

Dear Mr. Cables:

The Nuclear Regulatory Commission has been reviewing previously terminated licenses to determine if adequate documentation exists to demonstrate that the sites were properly decommissioned. One of the docket files reviewed was the license issued by the U.S. Atomic Energy Commission (AEC), the NRC's predecessor, to Mining Research Corporation (MRC) of Boulder, Colorado. A recent review of this docket file by the Oak Ridge National Laboratory, which assisted the NRC in its preliminary review, determined that site decommissioning records were incomplete. As a result, the NRC conducted a thorough review of this docket file to determine the current radiological status of the former locations of use.

MRC had three AEC licenses that were active between 1952-1957. MRC conducted operations in two general locations, Dove Creek, Colorado, and Edgemont, South Dakota. The NRC has determined that the former licensee did not process uranium ore in Colorado, but the licensee did process ore on properties located near Edgemont, South Dakota. The records indicate that strip mining, below-surface mining, and in-situ leaching operations were conducted at two locations.

The primary Edgemont Mining District mining claims mentioned in the docket file were the Lion, McElhaney, McKnight, Mathias Peak, Virginia C, Barker & Howell, Marty, and Gull mining claims/leases. Most of these mining claims had been investigated by the South Dakota School of Mines and Technology on behalf of the U.S. Forest Service (USFS) during 1994. These investigations were documented on USFS Mine Database Field Data Forms. The NRC's records indicate that above-ground processing of uranium ore occurred on the Lion claims and in-situ leach operations were conducted at the Virginia C claim. Field Data Forms were available for both of these locations, and the forms indicate that each site contained radioactive material. Both locations are situated in the Black Hills National Forest.

The purpose of this letter is to request that you provide the NRC with any additional information that you may have about these claims and your future plans, if any, for the land where the Lion and Virginia C claims were located. In particular, the NRC wants to know if these two sites contain residual radioactive material and whether the sites require remediation under current USFS or NRC requirements. Details of our request for information were provided to Mr. Daryl Gusey of your staff by Mr. Robert Evans of our staff on June 5, 2001.

U.S. Forest Service

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To support you in this endeavor, we would be willing to conduct radiological surveys and sampling, including collection of soil samples for laboratory analysis, at the two sites. The NRC recently attempted to locate the Lion and Virginia C claims in the field but were unsuccessful because of potential map discrepancies, a lack of identifiable landmarks, and the ruggedness of the terrain. If the NRC were to conduct onsite surveys of the properties, we would need your assistance in locating and accessing these remote properties.

If you have any questions concerning this letter, please contact D. Blair Spitzberg, Ph.D., Chief, Fuel Cycle & Decommissioning Branch, at (817) 860-8191 or Mr. Robert Evans, Health Physicist, at (817) 860-8234.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 999-90004
License No.: AEC R-00143 (Expired)

Enclosure: Site Status Report

cc w/enclosure:
Vern Schmitt, Group Leader
U.S. Forest Service
P.O. Box 25127
Lakewood, Colorado 80225-0127

Colorado Radiation Control Program Director
South Dakota Radiation Control Program Director

bcc w/enclosure (ADAMS E-mail distribution):

EWMerschoff

DDChamberlain

LLHowell

CLCain

DBSpitzberg

RJEvans

JTBuckley, NMSS/DWM/DCB

ERPogue, NMSS/DWM/DCB

SWMoore, NMSS/DWM/DCB

FCDB File

MIS System

RIV Nuclear Materials File - 5th Floor

DOCUMENT NAME: s:\dnms\fcdb\rje\99990004.wpd R:\ dnms\

RIV:DNMS:FCDB	C:FCDB	D:DNMS
RJEvans	DBSpitzberg	DDChamberlain
/RA/	/RA/	/LHowell for/
06/05/01	06/05/01	06/06/01

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ENCLOSURE

Site Status Report

Final ORNL Score: 16

Docket No. 999-90004

License Nos. C-02621, R-00143, P-03399

Licensee Name: Mining Research Corporation

Site Names: University Claims, Slick Rock Mining District
Dove Creek, Colorado

Edgemont Mining District Claims
Fall River County, South Dakota

Site Addresses: 4215 Balsam Street (office address)
Wheatridge, Colorado

1320 Pearl Street (office address)
Boulder, Colorado

Box 96 (local mailing address)
Dove Creek, Colorado

P.O. Box 356 (local mailing address)
Edgemont, South Dakota

Regional Contact: Robert Evans, PE, CHP, Health Physicist
Fuel Cycle & Decommissioning Branch
Division of Nuclear Materials Safety
Region IV

Background Information:

Public records obtained from the State of Colorado and the U.S. Department of Energy, Grand Junction Project Office, revealed that Mining Research Corporation (MRC) was formed in Delaware on May 1, 1951. The Livingston Uranium Company (LUC) was incorporated at the same time. LUC was a wholly owned subsidiary of MRC. LUC was organized for the purpose of designing, constructing, and operating a pilot plant to determine the feasibility of MRC's uranium processing concepts. The two companies were controlled by two brothers, Curly and J. Sterling Livingston.

On July 17, 1952, MRC and LUC obtained funding from the J. H. Whitney & Company and Spencer Chemical Company (Whitney-Spencer Group) for development of a pilot plant and subsequent commercial development of uranium ore extraction processes. Upon receipt of funding, LUC began constructing a pilot plant at the University Claims site near Dove Creek, Colorado.

By letter dated September 2, 1952, MRC applied for a U.S. Atomic Energy Commission (AEC) license to possess a small quantity of uranium oxide for use as an analytical reagent. MRC needed the material for calibration of a fluorimeter. AEC License C-02621 was issued to MRC on September 4, 1952, with an expiration date of September 1, 1953. This license allowed MRC to possess 1 pound of refined source material as an analytical reagent only. This license expired without being renewed.

The AEC issued Contract AT-(05-1)-165 to MRC for testing an in-situ leach process at the Dove Creek pilot plant. The operations were unsuccessful, in part, because the area being tested did not contain uranium ore. MRC moved its operations from Colorado to South Dakota during January 1953. During April 1953, MRC attempted to obtain a new contract from the AEC. MRC proposed to provide the AEC with source material processed from low grade ore obtained from mining claims situated in and around Edgemont, South Dakota.

By letter dated May 5, 1953, MRC submitted an application to the AEC for a source material license. The company wanted to process 175 tons of ore that was possessed under LUC's AEC Source Material License P-01322. The AEC issued Source Material License R-00143 to MRC on May 7, 1953. This license allowed MRC to process raw source material.

AEC Contract AT-(05-1)-232 was issued during August 1953 to allow MRC to conduct in-situ leaching operations in Fall River County, South Dakota. MRC could not successfully conduct in-situ leach operations for several reasons, including site geology, low uranium concentration in the ore, and presence of vanadium and titanium in the finished product. MRC also started leaching ore in portable tanks on several properties not specifically listed in the original contract.

MRC suffered financial losses and eventually the Whitney-Spencer Group withdrew funding for the projects. MRC subsequently had to scale down its operations. Docket file records indicate that MRC suspended all uranium production operations during September 1954. License R-00143 expired on June 1, 1955.

During May 1955, a routine inspection was conducted at the MRC site in Edgemont. The inspector noted that the Edgemont office had been vacated by MRC during October or November 1954. The inspector concluded that MRC had violated the AEC's security procedures by moving all classified and restricted information to an unauthorized location in Wheatridge, Colorado.

During May 1956, MRC requested that the AEC extend the expiration date of the AT-(05-1)-232 contract. MRC felt that its in-situ leaching operations could be successful under different operating conditions. The AEC granted the extension but later decided to deny any further extensions. The contract expired on June 30, 1956.

MRC submitted a license application to the AEC during October 1956 for shipment of source material from local mines to the AEC's Edgemont district ore buying station. In its application, MRC stated that all pilot plant operations had been discontinued and that MRC had assumed all properties previously controlled by LUC. The AEC issued Source Material License P-03399 to MRC on November 5, 1956, which allowed MRC to transfer and deliver possession of and title to raw source material. This license did not allow MRC to process source material. This license expired on November 1, 1957.

Records in the docket file suggest that MRC transported ore from the Gull property leases located east of Edgemont to the Edgemont mill. (The Edgemont mill was remediated by TVA and control of the property was subsequently transferred to the U.S. Department of Energy during 1996.) Public records obtained from the Fall River county court house indicate that MRC quit-claimed all interest in the Gull properties during December 1957, effectively ending MRC's presence in the Edgemont Mining District. MRC apparently ceased to exist around 1962.

Site Status:

Records indicate that MRC held leases for mining claims around the city of Edgemont, South Dakota. Most leases were located to the north and east of the city. During its peak, MRC held leases to almost 6,700 acres of land. The records indicate that strip mining, below-surface mining, and in-situ leach operations were conducted at multiple locations using semi-portable equipment. Records also indicate that the licensee processed and sold at least 2318 pounds of source material to the AEC. The material was processed mainly by crushing and percolation leaching the raw ore in portable tanks. Records indicate that the licensee conducted only limited in-situ leach operations.

The primary mining claims mentioned in the docket file were the Lion, McElhaney, McKnight, Mathias Peak, Virginia C, Barker & Howell, Marty, and Gull mining claims/leases. The Lion, McElhaney, and McKnight claims were located adjacent to each other in Sections 10 and 15 of Township 8 South, Range 3 East. The Virginia C claim was located in Township 7 South, Range 2 East, Sections 26 and 27.

Records indicate that uranium processing operations occurred mainly at two locations, the Lion and the Virginia C claims. Above ground processing of ore occurred at the Lion claims, while limited in-situ leach operations occurred at the Virginia C claim. The Lion and Virginia C claims are currently located in the Black Hills National Forest, land controlled by the U.S. Forest Service (USFS).

On May 23, 2001, NRC inspectors attempted to locate the Lion and Virginia C claims, but the inspectors were unable to locate these claims, in part, because of the ruggedness of the terrain and because of map discrepancies. However, the inspectors contacted the staff at the USFS's Hell Canyon district office in Custer, South Dakota, and obtained additional information about most of the claims listed above.

According to the information provided by the Hell Canyon district office, during 1994, the South Dakota School of Mines and Technology, located in Rapid City, South Dakota, conducted field reviews on behalf of the USFS. These reviews were documented on Field Data Forms and were to be added to the USFS's mine database. The reviews included a combination of the Lion and McKnight claims as well as the Virginia C claims.

With regard to the Virginia C claim, the field reviewer noted that the claim covered about 40 acres of land and consisted of one large pit and several smaller pits. Several large mine spoils piles were observed. The reviewer also documented the discovery of "exposed yellowcake ore" in one area. The reviewer obtained a radiological count rate of >5000. (The survey meter units were not listed, but units of counts per second and counts per minute were listed on other Field Data Forms.)

Two field reviews were conducted at the Lion and McKnight claims. The first site covered about 30 acres and consisted of mine spoils and abandoned ore. The radiation count rate was listed as 12,000 (no units provided). The second site covered about 60 acres and also consisted of mine spoils and an abandoned ore pile. The reviewer documented that the site contained "very hot ore" and "site recommended high on list for remediation." Documentation indicated that a radiation count rate of 12,000 counts per second was observed on the abandoned ore pile.

The NRC also obtained copies of Field Data Forms for the Barker & Howell, Gull, Lion, and Mathias Peak claims. The USFS field reviewer observed mine spoils but no ore or tailings. With regard to the Mathias Peak claim, the reviewer concluded that this site should be ranked high on the list for possible remediation because of extremely steep pit walls, standing water, and accessibility to the public.

The USFS did not have Field Data Forms for the McElhaney and Marty claims. The McElhaney claims were located adjacent to the McKnight claims; therefore, the NRC reviewer determined that if the McElhaney claims were a significant health and safety hazard, it would have been observed by the USFS field reviewer during the review of the Lion and McKnight claims. The Marty claims were located near the Gull claims. The NRC reviewer noted that MRC held leases to the Marty claims after it had suspended all uranium processing operations. Therefore, MRC most likely did not conduct processing operations at the Marty claims.

In summary, the NRC does not recommend closure of this terminated site file. The Lion and Virginia C claims both appeared to have had residual radioactive material according to the 1994

onsite reviews conducted on behalf of the USFS. These two sites were also the only sites listed in the docket file records where active ore processing had been conducted. Therefore, additional review of the Lion and Virginia C claims is recommended.