



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

May 09, 2014

MEMORANDUM TO: Docket File 040-07580

THRU: Linda L. Howell, Acting Director */RA/*
Division of Nuclear Materials Safety

FROM: Robert J. Evans, Ph.D., P.E., C.H.P., Senior Health Physicist */RA/*
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

SUBJECT: NRC SITE VISIT AT FMRI, MUSKOGEE, OKLAHOMA

On April 23-24, 2014, U.S. Nuclear Regulatory Commission (NRC) staff conducted a site visit at FMRI in Muskogee, Oklahoma. The site visit was conducted to allow for the transitioning of the NRC project managers, to observe the status of the facility, and to discuss the status of the license with FMRI staff. Enclosed to this Memorandum is the NRC's trip report for this site visit.

In summary, FMRI continues to maintain control over the site and continues to ship work-in-progress (WIP) material to a uranium mill in Utah. The NRC staff did not identify any significant safety concerns during the site tour.

CONTACT: Robert J. Evans, RIV/DNMS
817-200-1234

Docket No.: 040-07580
License No.: SMB-911

Enclosure: NRC Trip Report

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 040-07580

License: SMB-911

Licensee: FMRI

Facility: FMRI's rare earths recovery facility

Location: Number Ten Tantalum Place
Muskogee, OK 74403

Dates: April 23-24, 2014

Inspector: Robert J. Evans, Ph.D., P.E., C.H.P., Senior Health Physicist
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

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Approved by: Linda L. Howell, Acting Director
Division of Nuclear Materials Safety

Attachment: Photographs of the FMRI Site

Enclosure

NRC Trip Report

1 Background

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated May 8, 2003, the licensee committed to decommission the site in four phases. (This letter is referenced in License Conditions 10 and 26.) The licensee commenced with Phase 1 work in 2005. Phase 1 decommissioning includes removal of work-in-progress (WIP) residue material from Ponds 2 and 3 and transfer of this material to an out-of-state uranium mill for use as alternate feed material. The licensee started by excavating, bagging, and shipping WIP material from Pond 3.

The licensee completed the removal of WIP material from Pond 3 in 2010. The licensee then reshaped the slopes of Pond 3 for erosion control. During 2011, the licensee removed and packaged all remaining Pond 3 material stored in the onsite drying bed, and the licensee reshaped the drying bed for erosion control.

The licensee started removing WIP material from Pond 2 in August 2011. The licensee suspended this work in December 2011. The licensee resumed bagging operations in Pond 2 during July 2012. The licensee subsequently stopped bagging operations in October 2012 because the storage areas (Chem A and Chem C Buildings) were almost full of bagged material. The licensee estimated that it had removed roughly 3,000 tons of WIP material from Pond 2, and that roughly 5,000 tons of material remained. The licensee plans to resume bagging operations when it has sufficient space to store the newly bagged material. The licensee indicated that these excavation and bagging operations may recommence by the summer of 2016.

The licensee previously shipped WIP material to an out-of-state uranium mill in 2006-2009. The licensee estimated that it had shipped 13,204 tons of WIP material in 672 individual shipments during this time frame. The licensee resumed shipping operations in late-September 2013. To support this evolution, the licensee also updated its transportation plan in September 2013. Since September 2013, the licensee has shipped 29 intermodals to the mill in Utah. Each intermodal contained between 18-20 tons of WIP material for processing as alternate feed material by the mill. The licensee shipped the intermodals by truck to the port of Tulsa, by rail to the Salt Lake City area, and by truck to the Utah mill.

By letter dated June 21, 2011, the licensee requested NRC approval for consent for indirect change of control of the license from Fansteel to Green Lantern Acquisition 1. The licensee submitted a second letter dated June 21, 2011, requesting modification of the license to support the proposed change in ownership. The NRC subsequently approved the transfer by Amendment 14 to License SMB-911 dated October 2, 2012. However, by letter dated April 12, 2013, the licensee informed the NRC that the indirect change of control did not happen. In response, the NRC issued an Order in December 2013 that voided Amendment 14. The Order restored Amendment 13 as the current version of the license.

2 Site Status

At the time of the site visit, the Muskogee site was in standby. The licensee had temporarily suspended Phase 1 decommissioning work with the exception of shipment

of bagged WIP material. The licensee stated that the shipping schedule was determined, in part, by shipping costs and availability of decommissioning funds. The licensee continued to decontaminate, survey, and free-release scrap material from the facility. The licensee also continued to operate the wastewater treatment system in accordance with decommissioning plan instructions. Further, the licensee continued to conduct routine site monitoring and surveys in accordance with license requirements.

Site staffing consisted of a general manager and two technicians. The general manager reported to the president who occasionally visited the site. The radiation safety officer visited the site approximately once per week. All other work activities were performed by contractors on an as-needed basis. At the time of the site visit, several contract electricians were conducting work onsite.

3 Site Observations and Findings

The NRC staff toured the FMRI site. The tour included all buildings where material was being stored and the outdoor ponds. The buildings were generally in good condition, although one building with stored bags had openings in the roof. The licensee acknowledged that some of the stored material had been in storage since the 1990s. The NRC staff noted that at least one or more drums containing concrete debris in one building had degraded to the point that potentially contaminated material could escape confinement.

The NRC staff observed the status of the various site ponds. The ponds were noted to contain water, but the water level was below the freeboard limits. The NRC staff did not observe leakage from any of the ponds. The NRC also observed the waste water treatment system including ground water interceptor trench, sump houses, calcium oxide tanks, and treatment basins. The system appeared to be operating as designed.

The NRC staff conducted a review of the licensee's inventory of stored material. The licensee had 2,169 bags of WIP material in storage. At the time of the site visit, the licensee was storing 343 bags of WIP material in the Thermite Building, 714 bags in the Chem C Building, and 1,112 bags in the Chem A Building. Since the licensee resumed shipment operations in September 2013, the licensee had shipped 583 bags of WIP to the mill in Utah for use as alternate feed material.

During the site tours, the NRC staff noted that the licensee was storing all WIP material indoors, and no WIP material was being stored or staged in outdoor areas. (License Condition 25 allows the licensee to store WIP material in outdoor staging areas, as long as certain conditions are met.) The licensee was also storing bagged soil in the Sodium Reduction Building. The licensee plans to dispose of this material as part of Phase III decommissioning.

The NRC inspector measured the ambient gamma exposure rates using a Ludlum Model 2401-S microRoentgen meter calibrated to cesium-137 (NRC No. 079765, calibration due date of 11/07/14). The background exposure rates ranged from 8-10 microRoentgens per hour ($\mu\text{R/hr}$). The exposure rates were measured at various locations around the site. The highest measurements, approximately 1,000 $\mu\text{R/hr}$, were obtained in the vicinity of bagged WIP material. One packaged intermodal was surveyed, and the contact exposure rate was approximately 200-500 $\mu\text{R/hr}$. No area was identified that met the definition of a radiation area (5,000 $\mu\text{R/hr}$).

4 Conclusions

The licensee appeared to be conducting decommissioning operations in accordance with license requirements, although the licensee was approximately 10 years behind schedule. The NRC staff did not identify any significant safety issues during the site tours.

5 Meeting Summary

The NRC staff discussed the status of the license with the licensee. In particular, the NRC staff discussed the status of each condition of the license, in part, to ensure that the licensee understood the NRC's expectations for implementing all conditions of the license. The NRC staff also discussed the license conditions that will be removed during a future license amendment, including Conditions 29, 40, 50, and 51.

By letter dated February 28, 2014, the licensee submitted a closure plan to the State of Oklahoma for Ponds 6 and 7. The NRC staff discussed its expectations for license compliance, if the licensee conducts remediation of Ponds 6 and 7 as stipulated in its letter to the State of Oklahoma. For example, if the licensee conducts remediation of these two ponds, it may have to update the Phase 2 work plan that was previously submitted to the NRC in accordance with License Condition 37.

The NRC staff discussed the intent of License Condition 30 with the licensee. This condition requires the licensee to excavate and dispose of all WIP from Ponds 2 and 3. The NRC staff is aware that the licensee previously concluded, through its Radiation Safety Committee, that WIP material did not include comingled material. The WIP material that was comingled with soil or sand would not be excavated in Phase I, but would be removed in Phase III. The licensee made this decision, in part, because the Utah mill may not consider comingled material as alternate feed material.

Finally, the NRC staff discussed the license requirements for reports to be submitted to the NRC, in particular, the reports discussed in License Conditions 31, 37, 41, and 54. The licensee provided a status of the reports referenced in these license conditions. Certain reporting dates were adjusted by Amendment 14 to the license, which was subsequently revoked. The licensee was reminded of its responsibility to provide new dates, through the license amendment process, for NRC review and approval.

6 Persons Contacted

J. Burgess, General Manager, FMRI
B. Compennolle, President, FMRI
L. McCaskill, Environmental Programs Specialist, Oklahoma Department of
Environmental Quality



Figure 1: Partially excavated Pond 2

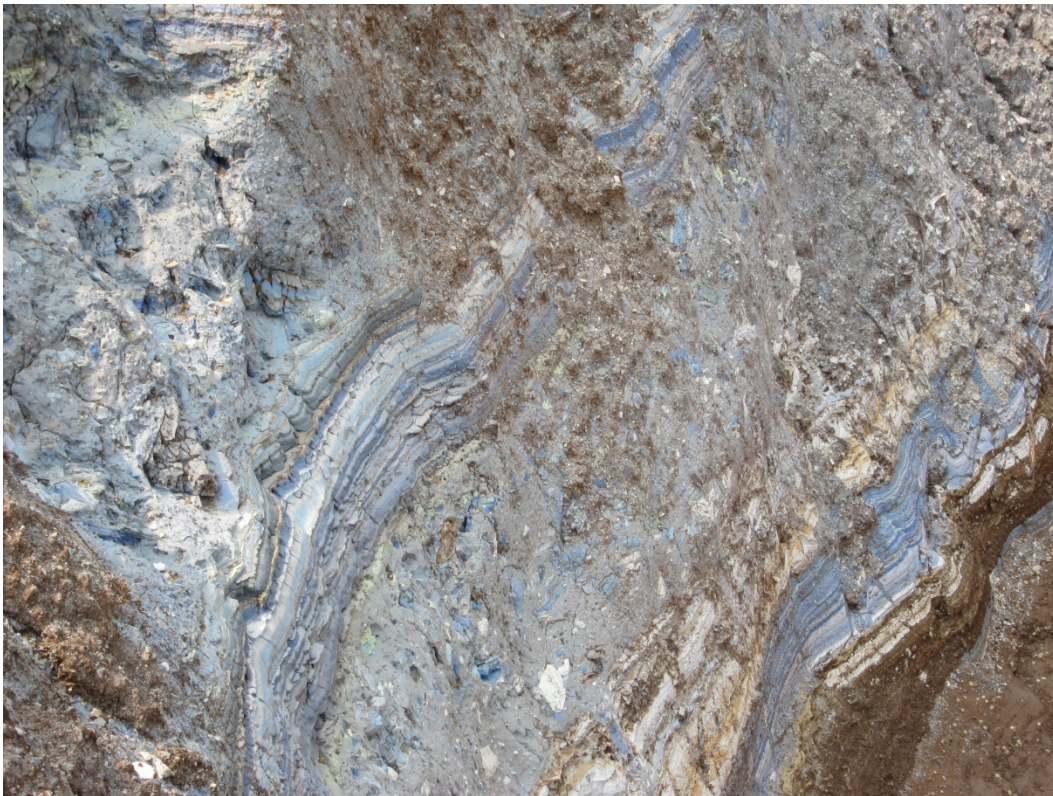


Figure 3: Close-up view of WIP material in Pond 2



Figure 3: Former Pond 3, partially filled with rainwater



Figure 4: Pond 7, currently scheduled to be remediated in 2015



Figure 5: Pond 6, currently scheduled to be remediated in 2015



Figure 6: WIP material in storage in Chem A building

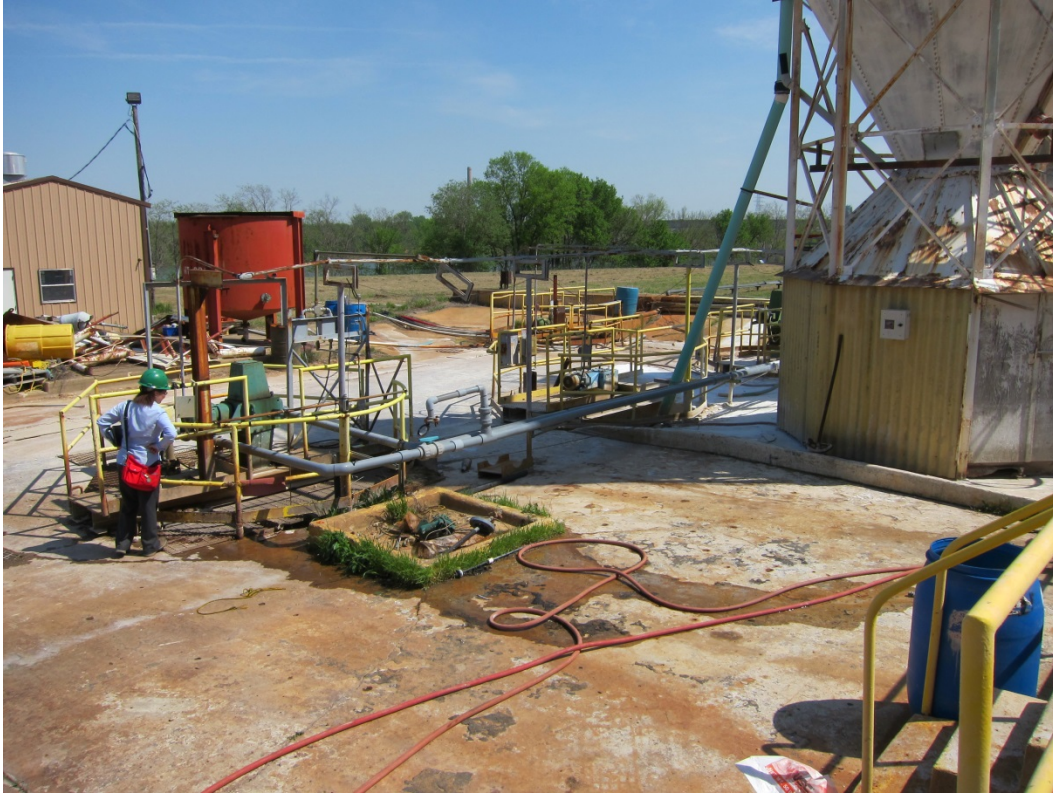


Figure 7: Operating waste water treatment system



Figure 8: Intermodal loaded with WIP material, staged for shipment to mill