



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

March 14, 2017

Mr. John H. Ellis, President
Sequoyah Fuels Corporation
P.O. Box 610
Gore, OK 74435

SUBJECT: NRC INSPECTION REPORT 040-08027/2017-001

Dear Mr. Ellis:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted February 13 and 14, 2017, at your Sequoyah Fuels Corporation site near Gore, Oklahoma. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

The inspection included a review of the status of your onsite disposal cell and an inspection of areas routinely reviewed. The results of the inspection were presented to you and your staff at the conclusion of the onsite inspection on February 14, 2017. The enclosed report presents the results of this inspection. No violations were identified and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

J. Ellis

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Should you have any questions concerning this inspection, please contact Mr. Donald Stearns, Health Physicist, at 817-200-1176, or the undersigned at 817-200-1549.

Sincerely,

/RA/

Lee E. Brookhart, Acting Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 040-08027

License No. SUB-1010

Enclosure:

NRC Inspection Report 040-08027/2017-001

Attachment

Supplemental Information

cc w/encl:

J. Matthews

R. Ware

A. Enstrom

W. Andrews

S. Hill

J Harris

M. Broderick

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 040-08027

License: SUB-1010

Report: 040-08027/2017-001

Licensee: Sequoyah Fuels Corporation

Location: P.O. Box 610, Gore, Oklahoma

Dates: February 13 - 14 2017

Inspectors: Gerald Schlapper, Ph.D., C.H.P., Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety
Region IV

Donald Stearns, Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety
Region IV

Approved by: Lee E. Brookhart, Acting Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety
Region IV

Enclosure

EXECUTIVE SUMMARY

Sequoyah Fuels Corporation
NRC Inspection Report 040-08027/2017-001

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the Sequoyah Fuels Corporation site near Gore, Oklahoma. The inspectors concluded that Sequoyah Fuels Corporation (the licensee) was conducting decommissioning activities in accordance with regulatory and license requirements.

Management Organization and Controls

- The licensee had sufficient staff for the work in progress. The licensee conducted its technical reviews and Reclamation Plan changes in accordance with the performance based license requirements. (Section 1.2)

Radiation Protection/Maintenance and Surveillance Testing

- The licensee conducted its radiation protection program in accordance with the requirements of 10 CFR Part 20 and the license. (Section 2.2)

Emergency Preparedness/Fire Protection

- The licensee maintained emergency response programs that included instructions for responding to individuals who become injured at the facility. Hazards were communicated to responding organizations. (Section 3.2)

Environmental Protection

- The licensee's effluent and environmental monitoring programs were conducted in accordance with license and regulatory requirements. Monitoring results for liquid and gaseous releases indicated that radioactive effluent releases were less than regulatory limits. The licensee continued implementation of a groundwater corrective action program. The licensee implemented a fertilizer distribution program in accordance with license requirements. (Section 4.2)

Report Details

Summary of Plant Status

NRC Source Materials License SUB-1010, License Condition 51 requires the licensee to conduct decommissioning in accordance with the Reclamation Plan dated July 2008, as amended. The licensee commenced with site decommissioning activities in April 2009. To decommission the site, the licensee planned to dismantle and remove systems and equipment, demolish structures, treat sludges and sediments, remediate contaminated soils, and treat wastewater. Most of the residual waste material will be placed in an onsite cell for permanent disposal.

The licensee possessed approximately 11,000 tons of bagged raffinate sludge, material previously removed from the clarifier basins. The licensee also possessed approximately 850 bags of sediments removed from the emergency basin, north ditch, and sanitary lagoon. The licensee continued to store the bagged sludge and sediment material under cover for placement in the on-site cell or possible transfer to an out-of-state uranium mill for use as alternate feed material. If the material is to be placed in the cell, this must be done while appropriate locations are still available within the cell.

Prior to the inspection visit, the licensee had conducted tests for movement of the bags to the cell. On February 2, 2017, a representative from the Oklahoma Department of Environmental Quality (DEQ) observed the licensee during the test movement of the raffinate bags to the disposal cell. The DEQ representative did not observe any problems associated with the movement of the bags. During the week of February 6, 2017, the licensee moved an additional 45 bags of raffinate sludge into the disposal cell. On February 9, 2017, The Cherokee Nation and the State of Oklahoma jointly filed and were granted a temporary restraining order to stop placement of the raffinate material in the cell. The request was granted by Sequoyah County District Judge, Jeff Payton. The licensee immediately ceased placement of bags in the cell upon receipt of the Temporary Restraining Order.

1 Management Organization and Controls. (88005)

1.1 Inspection Scope

The inspectors assessed site staffing to determine if the licensee had adequate staff for the work underway. The inspectors reviewed the licensee's decommissioning activities to determine if these activities were being conducted in accordance with Reclamation Plan requirements.

1.2 Observations and Findings

The licensee's organizational structure is presented in Section 2.2 and Figure 2-1 of the license application that outlined the Reclamation Plan. The commitments in the Reclamation Plan application are incorporated by reference in Section 9.1 of Amendment 35 to License SUB-1010. The organizational requirements for reclamation are also provided in Section 1.0 of the Quality Assurance (QA) Plan. The licensee's onsite staff consisted of five individuals who are Sequoyah Fuels employees, two of which supply primarily administrative support. The licensee used contractors for QA oversight, geotechnical support, cell construction, radiation safety support, and

miscellaneous site maintenance activities as needed. The number of contractors varied, depending on the work in progress but normally is around a total of 30 contractors. At the time of inspection, all management-level positions were filled with experienced staff. The inspectors concluded that the licensee had sufficient staff to ensure compliance with license and regulatory requirements.

The inspectors reviewed the controlled document master list of Standard Operating Procedures (SOP). The list indicated that there were currently 41 procedures in use. Procedure A-201, "Standard Operating Procedures" required that procedures be reviewed with a periodicity of 2 years. The inspectors noted that listed procedures had review dates that ranged from January through October of 2016 and thus all procedures were current in accordance with Procedure A-201 and that the Master List of Procedures had been updated. The inspectors also noted that the Controlled Document List recorded 39 Operating Instructions that are specific in nature to certain activities. Operating Instructions have no requirement for periodic review. At the time of the inspection there were four active Temporary Operating Procedures (TOP). The licensee's procedure, TOP 12-002 which was approved on October 10, 2012, allowed conditional release of an inflatable pipe plug, pump, and other equipment without continuous oversight and control. The licensee's procedure, TOP 14-001 which was approved on July 25, 2014, allowed conditional release of a barge and pump to the unrestricted area (Pond 3) to allow for transfer of water from Pond 3 to Pond 5 without continuous control. The licensee's procedure, TOP 16-004 which was approved on November 1, 2016, allowed release of a float to the Storm Water Reservoir, outside the restricted area, without a requirement for continuous controls. The float is to be returned to the restricted area when not in use. Temporary Operating Procedure TOP 17-001, was approved on January 13, 2017 to allow placement of bagged raffinate material into the disposal cell.

Sections 2.2 and 2.8 of the licensee's application of the Reclamation Plan required routine corporate oversight inspections. The application commitments are incorporated by reference in Section 9.1 of Amendment 35 of License SUB-1010, approved December 21, 2010 (ML#102740426). The inspectors reviewed inspections conducted by the parent company, General Atomics, during the second, third, and fourth quarters of 2016. Inspections were conducted by Mr. Paul Pater on June 28 and 29, 2016, Mr. Kim Moore on September 14 and 15, 2016, and Mr. Paul Pater on December 14 and 15, 2016. The corporate oversight inspections included a review of current operations, availability of calibrated radiation survey instruments, routine contamination and radiation surveys, air sampling requirements and results, survey of items for unrestricted release, reclamation plan requirements, implementation of license condition 54, and numerous other records. There were no findings on non-compliance. The inspectors concluded that the corporate reviews met regulatory requirements.

NRC Source Materials License SUB-1010, Amendment 35, License Condition 51 requires the licensee to conduct site decommissioning in accordance with the NRC-approved Reclamation Plan. License Condition 54 authorizes the licensee to make changes to Reclamation Plan under certain conditions, delegating additional regulatory authority to SFC for various aspects of license activities. Determinations concerning the performance based license are made by the Plant Review Committee (PRC). The licensee furnished an annual report, submitted to the NRC on January 22, 2016 (ML16041A426) that provides a description of changes made during calendar year 2015.

The inspectors noted that there have been no such changes to the license that have been made since the last inspection.

The licensee produced daily surveillance reports as part of the quality assurance (QA) program. The daily QA reports summarize activities on site and discuss the general conditions of the site and the disposal cell. The reports outlined areas needing attention, such as work activities performed by the various contractors, any quality assurance testing and surveying, ongoing discussions and any key decisions, important communications, and minor design modifications. The NRC inspector reviewed a sampling of the daily QA reports generated and noted that the reports which were signed by the quality assurance manager were informative of ongoing work at the site.

1.3 Conclusions

The licensee had sufficient staff for work in progress. The licensee conducted its technical reviews and Reclamation Plan changes in accordance with the performance based license requirements.

2 Radiation Protection/Maintenance and Surveillance Testing (83822/88025)

2.1 Inspection Scope

The inspectors examined the licensee's radiation protection and maintenance and surveillance programs for compliance with license and 10 CFR Part 20 requirements.

2.2 Observations and Findings

The inspectors conducted site tours to observe the storage of radioactive material and to conduct independent surveys within the radiologically controlled area. Radiation levels were measured using a micro-Roentgen instrument, Thermo Scientific Model RadEye B20, Serial Number 096532, with a calibration due date of November 07, 2017. Areas were found to be posted to indicate existing radiological conditions. Radiation measurements made during the inspection were consistent with the measurements documented in routine surveys performed by the licensee. In addition, the inspectors performed surveys in unrestricted areas at the site. The exposure rates in unrestricted areas ranged from 10 to 15 $\mu\text{R/hr}$, compared to a normal background rate of approximately 8-12 $\mu\text{Roentgens per hour}$ ($\mu\text{R/hr}$).

The licensee conducts monitoring of site workers for internal and external exposure to radioactive materials. The licensee's procedure H-401, "Personnel Radiation Exposure Monitoring", dated May 31, 2016, detailed worker monitoring. External exposure with Optically Stimulated Luminescent (OSL) dosimeters was limited to those individuals who were authorized to utilize the x-ray fluorescence system. Since the last inspection of this data there were no significant exposures noted from external sources. Internal exposure monitoring was based on analysis of breathing zone label samplers and bioassay measurements. The licensee's procedure H-402, "Bioassay Program," dated May 31, 2016, outlined the bioassay program at the site. The NRC inspectors reviewed the bioassay data for the period June 21, 2016 through January 31, 2017 and determined that the maximum uranium content in any bioassay sample was 2.40 micrograms of uranium per liter of urine, which is well below any regulatory limit

and within the licensee's ALARA goal limit of 10 micrograms per liter. Based on 868 samples analyzed, 9 exceeded the detection limit of 1.00 microgram per liter, which is well below the site's ALARA goal of less than 5 percent.

The Hazardous Work Permit (HWP) as described in licensee procedure H-204, "Hazardous Work Permit," dated April 29, 2016, served as a radiation work permit but also identified other existing or potential safety and health hazards. The procedure also provided means to eliminate the hazards or supply protection to the worker. The HWP may be used independently or may be utilized when health and safety controls are not addressed in an operating procedure. The NRC inspectors reviewed the procedure and concluded that the procedure incorporated protective actions to establish a safe work environment, personnel protective equipment and clothing, sampling and survey requirements, and any special instructions related to control of all hazards. At the time of inspection, there were 7 active HWPs, 3 remaining from 2016 and 4 generated during 2017. Remaining HWPs from 2016 addressed the movement of water processing equipment necessary for transferring impacted storm water, repair of cuts and tears in the synthetic liner for clarifier 2A and demolition of the main process building. Those written and approved in 2017 dealt with movement of raffinate bags to the cell, removal of contaminated piping and placement into the cell, receipt of material in the cell, and decontamination of equipment utilizing a pressure washer.

During an NRC inspection conducted in April 2013 (ML13184A136), the inspectors concluded that the licensee had failed to maintain documentation demonstrating that only properly calibrated and maintained radiological survey meters were being used during decommissioning. In response, the licensee and its instrument calibration contractor implemented various corrective actions as described in the licensee's letter dated July 31, 2013 (ML13221A179). During this inspection, the inspectors reviewed the licensee's program for maintenance and calibration of radiation survey instruments and verified that the licensee continued to comply with license requirements and approved procedures.

Portable radiation survey instruments were calibrated on a 6-month frequency with most instruments forwarded to the parent company, General Atomics (GA) for calibration. General Atomics was licensed for calibration services by the State of California, License Number 0145-37, Amendment 187, Item 24. For those instruments not calibrated by the parent company, recognized and licensed commercial suppliers were utilized. The licensee maintained a data base of instruments and calibration due dates. The inspectors verified that instruments with past due calibrations were removed from use and placed in a dedicated storage location while awaiting shipment for calibration. The inspectors performed a spot check of instruments in the field and found that all were within the calibration due dates and working properly. The inspectors concluded that the licensee possessed an adequate quantity and variety of instruments with capability to measure alpha, beta, and gamma radiation.

The inspectors reviewed the calibration certificates for 20 portable survey instruments and two low background counting instruments. Calibration included the selection of a proper operating voltage and efficiency determination. The low background counting systems are calibrated on a quarterly frequency and the inspectors determined that the calibrations were current. The licensee performed a daily source check of each instrument to be used each day to ensure that the instruments were operating properly.

The licensee occasionally issued respiratory protection equipment to the workers who may be exposed to airborne contaminants. The inspectors reviewed the licensee's process for issuing, cleaning, and testing of respiratory equipment. The inspectors also reviewed the licensee's program for medical evaluation and fit testing of the individuals who may wear respiratory equipment. On July 14, 2016, a total of 10 individuals were evaluated, tested, and approved by Express Test Corporation of Tulsa, Oklahoma to wear respiratory equipment.

The licensee performed periodic radiation and contamination surveys of selected areas including the water treatment building, maintenance shop, storage pads, laboratories, break rooms, and clothing change areas. The inspectors reviewed those surveys and concluded that the surveys were properly performed at the required intervals. The inspectors also reviewed surveys of items released from the controlled areas.

2.3 Conclusions

The licensee conducted its radiation protection and maintenance and surveillance programs in accordance with the requirements of 10 CFR Part 20 and the license.

3 Emergency Preparedness/Fire Protection (88050)

3.1 Inspection Scope

The purpose of this portion of the inspection was to ensure that the licensee was maintaining emergency preparedness and fire protection programs during decommissioning in accordance with regulatory and license requirements and was prepared for emergency events.

3.2 Observations and Findings

The licensee's emergency response instructions are outlined in licensee Procedure X-100, "Emergency Response," dated June 29, 2016. The procedure acknowledged that no process lines were in operation at the site. Thus, the events of concern were those common to the construction industry to include slips, trips and falls, fire and severe weather events. However, at this site, radioactive material may be involved as a contaminant. The procedure noted that the senior Sequoyah Fuels Corporation employee will function as the emergency coordinator. The procedure discussed safety precautions, training requirements, equipment availability, facilities to be utilized, and emergency coordinator duties. The procedure clearly specified that the presence of radioactive material would not influence response to fire or personnel injury. Attachment 1 of the procedure, presented an emergency response site map that detailed locations of hazardous materials. The list of hazards was updated annually through a report sent electronically to the Oklahoma Department of Environmental Quality (OKDEQ), who forwarded the report to local agencies. Attachment 2 of the procedure, provided contact information for emergency services supporting the site. The NRC inspectors verified the information listed was current. Attachment 3 to the procedure, contained a bullet list of information in the form of a notice to emergency response personnel. Corporate compliance inspections noted previously in this report, verified the availability of fire extinguishers across the site. The NRC inspectors reviewed completion of monthly fire extinguisher inspections which listed the type, content, and

location of extinguishers and verified the current inspection data for a random selection of extinguishers across the site.

3.3 Conclusion

The licensee maintained emergency response programs that included instructions for responding to individuals who become injured at the facility.

4 Environmental Protection (88045)

4.1 Inspection Scope

The inspectors reviewed the licensee's environmental protection program for compliance with regulatory and license requirements.

4.2 Observations and Findings

License Condition 49 of License SUB-1010, specifies that the licensee implement a groundwater compliance monitoring program. Groundwater monitoring wells were located at various depths to monitor different groundwater units. License conditions also specify groundwater protection standards in the form of maximum contaminant levels for various elements. Results of the groundwater monitoring program were presented in the 2015 Annual Groundwater Monitoring Report submitted to the NRC on March 29, 2016 (ML16110A180). The report of the results for 2016 was currently in preparation.

The Semi-Annual Effluent Report for the second half of 2016 was issued on February 13, 2017 (ML17055C421). This report satisfied the requirements of 10 CFR 40.65. The report stated that there were no airborne releases for the third or fourth quarter of 2016. Liquid releases for the reporting periods were less than one percent of the allowed liquid effluent concentration levels. For the third quarter of 2016 there were 1.24E+07 liters of liquid released. Concentration in micro-curies per milliliter of natural uranium (U) was 2.17E-09, Thorium-230 (Th-230) at 5.08E-10, and Radium-226 (Ra-226) at 1.70E-10. Similarly for the fourth quarter of 2016, released liquid volume was 5.44E+07 liters with isotopic concentrations presented in the same order of 1.76E-09 (U), 1.84E-10 (Th-230) and 9.40E-11 (Ra-226) micro-curies per milliliter. The NRC inspectors determined that the results showed compliance with regulatory and license requirements.

NRC source material license SUB-1010, License Condition 9.1 authorizes the licensee to apply fertilizer onto licensee-owned or controlled lands. Crops produced on the land cannot be used directly as human food but are allowed to be utilized by cattle for grazing and for production of hay or seed materials. The license specifies that the licensee monitor a control plot in order to implement program controls and comply with requirements for best agricultural practices. Representatives of the Oklahoma State University Extension Service continued to provide oversight of the land application program. The activity must also comply with requirements of the licensee's Oklahoma Pollution Discharge Eliminations System Permit (OPDES), effective October 1, 2015. The license requires an annual report summarizing fertilizer distribution activities during the previous year. The required annual report describing the program for 2015 was submitted to the NRC on April 26, 2016 (ML16137A115). Based on review during the

last inspection, the NRC inspectors determined that the submittal complied with license requirements. The annual report describing the program for 2016 was currently in preparation and will be reviewed during a future inspection.

4.3 Conclusion

The effluent and environmental monitoring programs were implemented in accordance with license and regulatory requirements. The sample results indicated that liquid and gaseous radioactive effluent releases were less than regulatory limits. The licensee continued to implement a groundwater corrective action program. The licensee continued to use ammonium nitrate solution as a fertilizer on land used to produce hay. The licensee implemented the fertilizer distribution program in accordance with license requirements.

5 Exit Meeting

The inspectors reviewed the inspection scope and preliminary results during an exit meeting conducted at the conclusion of the onsite inspection on February 14, 2017. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Sequoyah Fuels Corporation

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R. Miller, Contractor, RMA
S. Munson, Manager, Health, Safety and Environment
B. Reid, Director, Decommissioning, RMA
K. Schlag, Manager, Quality Assurance, RMA

INSPECTION PROCEDURES USED

IP 83822	Radiation Protection
IP 88005	Management Organization and Controls
IP 88025	Maintenance and Surveillance of Safety Controls
IP 88045	Effluent Control and Environmental Protection
IP 88050	Emergency Preparedness

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
cpm	counts per minute
HWP	Hazardous Work Permit
IP	Inspection Procedure
µR/hr	microRoentgens per hour
NRC	U.S. Nuclear Regulatory Commission
OKDEQ	Oklahoma Department of Environmental Quality
OPDES	Oklahoma Pollution Discharge Elimination System
pCi/g	picocuries per gram
PRC	Plant Review Committee
SOP	Standard Operating Procedure
TOP	Temporary Operating Procedure
QA	Quality Assurance

NRC INSPECTION REPORT 040-08027/2017-001, SEQUOYAH FUELS DATED
MARCH 10, 2017

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DATE	3/7/17	3/7/17	3/10/17	

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