UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

December 6, 2018

Walt Nelson, Coordinator
Safety, Health, Environment and Quality
Crow Butte Resources, Inc.
86 Crow Butte Road
Post Office Box 169
Crawford, NE 69339-0169

SUBJECT: NRC INSPECTION REPORT 040-08943/2018-001

Dear Mr. Nelson:

This letter refers to the announced routine U.S. Nuclear Regulatory Commission (NRC) inspection conducted onsite from November 5-8, 2018, at your Crow Butte Project facility in Dawes County, Nebraska. This inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and to confirm compliance with the Commission's rules and regulations and the conditions of your license.

Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, tours of the uranium recovery facilities and environmental monitoring locations, conduct of independent radiation measurements, and interviews with personnel. The inspection findings were discussed with you at the conclusion of the onsite inspection on November 8, 2018. No violations were identified.

In accordance with Title 10 of the *Code of Federal Regulations* Part 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 Management System (ADAMS), accessible from the NRC Web site at https://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Should you have any questions concerning this matter, please contact Ms. Marti Poston, Health Physicist, at (817) 200-1181 or the undersigned at (817) 200-1151.

Sincerely,

/RA/

Janine F. Katanic, PhD, CHP, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket: 040-08943
License: SUA-1534

Enclosure:
NRC Inspection Report 040-08943/2018-001

cc w/enclosure:
Julia Schmitt, Manager
Nebraska Department of Health and
Human Services

David Miensbach, P.E.
Groundwater Unit Supervisor
Nebraska Department of Environmental Quality

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No.:	040-08943
License No.:	SUA-1534
Report No.:	040-08943/2018-001
Licensee:	Crow Butte Resources, Inc.
Locations Inspected:	Crow Butte Project Dawes County, Nebraska
Inspection Dates:	November 5-8, 2018
Inspector:	Martha R. Poston, Health Physicist Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
Accompanied by:	Linda Howell, Deputy Division Director Division of Nuclear Materials Safety Muhammadali Abbaszadeh, Health Physicist Work Leader, Radioactive Materials Compliance Team Critical Infrastructure Division Homeland Security Section Office of Compliance and Enforcement Texas Commission on Environmental Quality
Approved by:	Janine F. Katanic, PhD, CHP, Chief Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
Attachment:	Supplemental Inspection Information

Enclosure 2

EXECUTIVE SUMMARY

Crow Butte Resources, Inc., In-Situ Recovery Facility
NRC Inspection Report 040-08943/2018-001

The U.S. Nuclear Regulatory Commission (NRC) performed a routine health and safety onsite inspection from November 5-8, 2018, at the Crow Butte Project which included observations of site activities, independent radiation surveys, review of records, and interviews with site personnel. In summary, the licensee was conducting operations in accordance with regulatory and license requirements described below.

Management Organization and Controls

The organizational structure and staffing levels maintained by the licensee during the inspection period met the requirements specified in the license and were sufficient for the work in progress. The licensee was maintaining financial assurance in accordance with license requirements. The licensee has a written safety policy and standard operating procedures. The licensee conducted audits and inspections as required by regulatory requirements and the license. (Section 1.2)

In-Situ Leach (ISL) Facilities

The licensee conducted in-situ leach recovery and operations in accordance with the license and regulatory requirements. Radiological controls including signs and postings were implemented in accordance with license and regulatory requirements. (Section 2.2)

Radiation Protection

The licensee implemented a radiation protection program meeting the requirements of Title 10 of the *Code of Federal Regulations* (CFR) Part 20 and the license. Occupational doses were less than established regulatory limits. (Section 3.2)

Effluent Control and Environmental Protection; and Maintaining Effluents from Materials Facilities As Low As Is Reasonably Achievable (ALARA)

The licensee conducted environmental monitoring in accordance with license requirements. The licensee reported the results in semi-annual reports to the NRC. The licensee was documenting spills and conducting excursion sampling as specified in the license. (Section 4.2)

Inspection of Transportation Activities; and Radioactive Waste Processing, Handling, Storage and Transportation

The licensee continued to maintain a waste disposal agreement, as required by the license. The shipment of yellowcake and the management, storage, transportation, and disposal 11.e(2) wastes were conducted in accordance with the license and regulatory requirements. (Section 5.2)

Emergency Preparedness and Fire Protection

The licensee has standard operating procedures associated with emergency preparedness and fire protection sufficient to meet the requirements of the application. Employees and visitors are provided emergency preparedness and fire protection training as applicable. The licensee coordinated with local law enforcement and emergency response organizations for emergency response purposes. (Section 6.2)

Report Details

Site Status

At the time of the inspection, the licensee had ceased the in-situ recovery of uranium. Injection fluids were discontinued on April 25, 2018. The site was in the process of transitioning from recirculation mode into a care and maintenance mode. Of the 11 mine units constructed at the facility, 1 mine unit (#1) has completed groundwater restoration and its related wells and well house have been decommissioned; 4 mine units (#2-5) were is stabilization mode; 2 mine units (#6&7) were in restoration; and the remaining 4 mine units (#8-11) are in "bleed only"/recirculation mode in order to maintain an inward hydraulic gradient in the mine units.

Uranium processing and yellowcake drying operations at the Crow Butte Project are planned to continue on a limited basis for the small amount of material extracted during the recirculation mode. The licensee stated that the processing of water through the plant systems for the North Platte Water Treatment Facility are also planned to continue.

1 Management Organization and Controls (Inspection Procedure (IP) 88005)

1.1 Inspection Scope

Ensure the licensee has established an organization to administer the technical and safety policies, programs and procedures necessary to satisfy the license and regulatory requirements and perform internal reviews, self-assessments and audits. Specifically, the inspector should determine that the licensee has:

- Implemented an organization in accordance with the license with defined qualifications, responsibilities and functions to administer the safety program;
- Implemented a policy for facility safety and ensure that management and staff understand their role under these policies;
- Implemented procedures that ensure the use of current procedures and that procedures exist for all facility functions affecting safety, and;
- Implemented a series of internal reviews, self-assessments and audits to identify and correct deficiencies.

1.2 Observations and Findings

a. Organizational Structure

The inspector reviewed the licensee's current organizational structure for the Crow Butte Project. At the time of the inspection, the Crow Butte Project had approximately 19 full-time employees, a reduction from 34 full-time employees since the last NRC inspection conducted on June 20-22, 2017.

Since the previous NRC inspection, the organizational structure has changed to remove some positions and reflect realignment of responsibilities, such as the Manager of Safety, Health, Environment and Quality (SHEQ), which was eliminated and the duties

and responsibilities assumed by the SHEQ coordinator. The organizational chart reflects the movement of individuals from one job position to another and a redistribution of responsibilities to address attrition or a reduction in mid-level management staffing.

The inspector found that the movement of duties and responsibilities associated with attrition and the recent reduction in force at the mid-management level did not have a negative impact on essential functions such as operations and radiation protection. The radiation safety officer (RSO) is supported by one full-time health physics technician (HPT). The RSO and the HPT meet the qualification requirements in Section 2.4 of Regulatory Guide 8.31, "*Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities will be As Low As Reasonably Achievable*," in accordance with License Condition (LC) 9.6.

The radiation safety duties were shared between the HPT and the RSO with assistance provided, as needed, by RSO designees. The RSO designees' training and qualifications were reviewed and found to be in compliance with the commitments made in the licensee's submittals dated March 4, 2014 (ADAMS Accession ML14064A143), and May 15, 2014 (ADAMS Accession ML14135A414), as required by LC 9.7.

Groundwater monitoring and environmental surveillance programs are performed by other members of the SHEQ staff and support by designated operations staff. The inspector determined the licensee had sufficient employees to implement the radiation protection program, groundwater monitoring and environmental programs at current staffing levels.

The licensee has a written safety policy, CAM-CG-02-06, "Safety Health, Environment and Quality Policy." Interviews with managers and staff at the Crow Butte Project indicate a strong commitment to safety exists at all levels of the organization.

The licensee has standard operating procedures that address operational activities involving radioactive and non-radioactive materials associated with licensed activities, radiation protection, environmental surveillance, and emergency response in accordance with the requirements of LC 10.1.2.

b. Safety and Environmental Review Panel

NRC Radioactive Materials License SUA-1534, Amendment 3, LC 9.4 of the performance based license requires, in part, that the licensee establish a Safety and Environmental Review Panel (SERP) process to evaluate if program changes, tests or experiments require an NRC license amendment prior to implementation. The inspector reviewed the following SERP evaluations completed since the June 2017 inspection:

SERP-17-03 New Liner System for Commercial Evaporation Pond #4

SERP-17-04 Revisions to the Approved License Renewal

In accordance with LC 9.4, the licensee is expected to submit a description of each change, test or experiment approved by the SERP, including a summary of each safety and environmental evaluation to the NRC in a future annual report. The inspector concluded the licensee correctly implemented the performance-based license and the evaluations did not require prior NRC approval.

c. Audits and Inspections

The inspector reviewed the routine site inspections generated by the licensee since the previous NRC inspection, in accordance with the requirements of LC 9.2, 9.7 and 11.1.9. The licensee was conducting and documenting a daily walk-though of all work and storage areas of the facility to ensure that good radiation practices were being followed.

In accordance with LC 9.7, site procedures allow trained and qualified operators to perform daily walkthroughs on days when the radiation safety staff is not available, such as weekends and holidays. The RSO or HPT reviews the walk-through documentation upon return to the facility. A spot check of the daily walk-throughs conducted since the previous inspection revealed no examples of the RSO or HPT failing to perform the required review. If delays in performing the review occurred, the reason for the delay was documented on the form (illness, document misplaced, etc.). The weekly and monthly reviews by the RSO/HPT were conducted at the required frequencies. The inspector observed that the majority of the daily, weekly and monthly walkthroughs were performed by operations and radiation safety working together.

Title 10 of the *Code of Federal Regulation* (CFR) 20.1101(c) requires that the licensee shall periodically (at least annually) review the radiation protection program content and implementation. The licensee conducted an annual radiation safety audit. The inspector reviewed the annual audit for calendar year 2017 (CY2017). The audit, performed by members of the health physics organization from the licensee's corporate headquarters on April 10-12, 2018, included an evaluation of occupational exposures, radiation survey results, public dose, training, and compliance with license and regulatory requirements. The licensee submitted a copy of the ALARA audit on July 3, 2018 (ML18192C006). The inspector determined that the audit met the requirements of 10 CFR 20.1101(c) and LC 11.1.2.

The highest public dose was reported by the licensee for CY2017 was 15.9 mrem for individuals staying at the nearest occupied residence. This dose represents a decrease in public dose from 66 mrem in CY2015 and 32.4 mrem in CY2016.

d. Additional Protocols

The inspector verified the licensee had provided the NRC with appropriate CY2017 documentation to comply with 10 CFR 75.11, which related to the Agreement between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the US. The licensee provided the necessary forms which provide contact information, the capacity of production, the actual annual production, and the quantity of material on hand. The inspector concluded the reports were accurate, complete, and consistent for CY2017.

e. Financial Assurance

In accordance with LC 9.5, the licensee submitted its annual financial assurance updates for CY2018 for Crow Butte Operations on May 31, 2017 (ML17170A162). The NRC completed its review and determined the financial assurance was acceptable on March 7, 2018 (ML18045A065).

1.3 Conclusions

The organizational structure and staffing levels maintained by the licensee during the inspection period met the requirements specified in the license and were sufficient for the work in progress. The licensee has a written safety policy and a clear management commitment to safety. The licensee conducted audits and inspections as required by regulatory requirements and the license.

2 In-Situ Leach (ISL) Facilities (IP 89001)

2.1 Inspection Scope

Determine if in-situ leach activities were conducted in accordance with regulatory requirements, the license, and in a manner that will protect the environment and the safety and health of workers and the public.

2.2 Observation and Findings

a. Uranium Recovery

The licensee stopped injecting lixiviant on April 25, 2018, and mine units 8-11 were in bleed only mode to ensure an inward hydraulic gradient is maintained. All other mine units were either in stability sampling, restoration or have completed the decommissioning process.

b. Site Tours

The inspector conducted a site tour to observe in-situ uranium recovery activities at the Central Processing Plant (CPP). The inspector also observed multiple mine units and header houses; a deep disposal well (DDW); an effluent sampling station; and selected environmental monitoring stations.

The inspector observed all entrance areas to the facilities and wellfields were posted with the words, “Any Area Within This Facility May Contain Radioactive Material”, as required by LC 9.11. Additionally, the temporary storage of byproduct waste materials was located in fenced and locked restricted areas, which were appropriately posted.

The inspector conducted independent radiological surveys of the gamma exposure rates present in the CPP, header houses and wellfields. The surveys were conducted using a Ludlum Model 19 microroentgen rate meter (NRC 016337, serial 36543, calibration due date of October 26, 2018, calibrated to radium-226). The inspector noted the as-found gamma exposure rates were consistent with the licensee’s measurements. The licensee had several areas conservatively posted as radiation areas. The inspector did not identify any areas which had not already been posted as radiation areas by the licensee. The inspector determined the licensee identified and posted radiation areas as required by 10 CFR 20.1902.

2.3 Conclusion

The licensee conducted in-situ recovery and operations in accordance with the license and regulatory requirements. Radiological controls including signs and postings were implemented in accordance with license and regulatory requirements and in a manner that will protect the environment and the health and safety of the worker and the public.

3 Radiation Protection (IP 83822)

3.1 Inspection Scope

Determine whether the licensee's radiation protection program was conducted in compliance with the license and 10 CFR Part 20 requirements. Specifically, verify the performance of the radiation protection program commensurate with the risk involved with licensee activities and the following program elements: (1) Occupational Exposure; (2) Radiation Work Permits and Respiratory Protection; (3) Radiological Surveys; (4) Instrumentation, and; (5) Training.

3.2 Observations and Findings

a. Occupational Exposures

The inspector reviewed the licensee's occupational exposure records for CY2017 and the first three quarters of CY2018. Occupationally monitored employees included plant and wellfield operators and health physics, laboratory and maintenance employees. Employees were monitored for external exposure using optically stimulated luminescence dosimeters which were exchanged on a quarterly basis. These results are reported as the deep dose equivalent (DDE). The highest DDE assigned for CY2017 was 158 millirem (mrem). The highest DDE for the first three quarters of CY2018 was 48 mrem.

The licensee conducted air sampling, in part, for assessment of internal exposures. The inspector reviewed the licensee's radon-222 air sampling records and the uranium particulate and worker breathing zone results for CY2017 and the first three quarters of CY2018. The inspector confirmed the licensee had conducted air sampling at the required intervals. The appropriate exposures were calculated and recorded for each employee.

Bioassay results since the previous inspection were reviewed by the inspector. One bioassay result was above the lower limit of detection for uranium and above the 15 micrograms per liter (µg/L) action level for investigation. On December 6, 2017, a sample was collected from an employee who was working under a recent radiation work permit (RWP), which once analyzed, measured 17 µg/L. But a another sample collected that same day and subsequent days (December 11, 12, 13 and 18) all measured upon analysis at the lower limit of detection. The licensee investigated the results and determined, via interview with the employee, that the sample was contaminated because the individual did not follow the collection protocol for the sample. The individual was retrained on the proper protocol for collecting samples. Spike and blank samples were utilized as required by radiation protection plan.

Internal dose or committed effective dose equivalent (CEDE) was assigned based on radon monitoring, uranium particulate monitoring and bioassay results. Based on time studies, the licensee differentiated between employees working in or around the CPP and employees working in the wellfield for the assignment of CEDE. The highest CEDE assigned to a worker for CY2017 was 142 mrem.

Committed effective dose equivalent and DDE were combined to report dose as total effective dose equivalent (TEDE). The maximum TEDE assigned for a employee for CY2017 was 300 mrem. The average TEDE assigned to employees was 150 mrem. The inspector determined that occupational exposures were appropriately determined and no occupational dose limits were exceeded. Committed effective dose equivalent and TEDE were not assigned for CY2018 at the time of the inspection.

b. Radiation Work Permits and Respiratory Protection

Since the previous NRC inspection, 5 RWPs were issued and involved the use of respirators. RWPs used standard personnel protective equipment, such as gloves, Tyvek suits and rubber boots as the needs of the RWP directed. The inspector identified all employees who wore respiratory protection since the previous inspection and verified all employees were currently medical qualified for respirators and had current respiratory protection training. The inspector reviewed the components of the respiratory protection program and determined the program met the license and regulatory requirements.

c. Radiation Protection Surveys

The inspector reviewed the licensee's routine contamination and gamma radiation surveys conducted since the previous NRC inspection. The licensee conducted weekly removable contamination surveys in designated clean areas of the facility, such as lunchrooms and office areas. Monthly gamma radiation surveys were conducted in the CPP, wellfield and DDWs. Monthly contamination spot checks were conducted on trash containers and respirators.

Quarterly spot checks for contamination are conducted on employees, vehicles and equipment in the wellfield. Free release surveys at the Crow Butte Project since the previous NRC inspection were reviewed and determined to be performed in accordance with LC 9.6, LC 9.8, RG 8.30, "*Health Physics Surveys in Uranium Recovery Facilities,*" Revision 1, and RG 8.31, "*Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities will be As Low As Is Reasonably Achievable*," Revision 1. The inspector verified that surveys were being conducted and documented as required. No contamination issues or unposted radiation areas were identified during any of the surveys reviewed.

d. Radiation Safety Instrumentation

The inspector reviewed the licensee's operability, calibration and maintenance records for survey instruments. Instruments reviewed were identified to be in calibration. The licensee uses an offsite vendor to perform annual calibration for radiation safety instrumentation. The inspector observed survey meters used by licensee personnel when exiting restricted areas. The survey meters examined by the inspector were observed to be in calibration and were used appropriately by the licensee's employees.

e. Training

The inspector reviewed the licensee's training program. Employees were provided with initial hazard communication and radiation protection training at hire and an annual refresher. Employees preparing shipping paperwork had current U.S. Department of Transportation (DOT) training. Other employees are provided with DOT training appropriate for their job responsibilities. Annual refresher training also includes Job Hazard Analysis, Confirmed Space Entry, Fire Protection, and Emergency Response. The inspector determined the licensee's training programs met the license and regulatory requirements. All licensee staff completed annual refresher safety training on April 23, 2018, or April 26, 2018.

3.3 Conclusions

The licensee implemented a radiation protection program meeting the requirements of 10 CFR Part 20 and the license. The licensee's radiation protection program was commensurate with the risk involved based on licensee activities and the addressed the required program elements.

4 Effluent Control and Environmental Protection (IP 88045); and Maintaining Effluents from Material Facilities As Low As Is Reasonably Achievable (ALARA) (IP 87102)

4.1 Inspection Scope

Determine if the environmental and effluent monitoring programs are adequate to monitor the impacts of site activities on the local environment. Specifically, determine if the effluent control and environmental monitoring program is conducted in accordance with the license and procedural requirements and in a manner that supports the principles of ALARA.

4.2 Observations and Findings

a. Environmental and Effluent Monitoring

Since the previous NRC inspection, the licensee had submitted three *Semiannual Radiological Effluent and Environmental Monitoring Reports.* These reports are as follows: (1) 1st and 2nd quarter of 2017, submitted August 23, 2017 (ML17244A285); (2) 3rd and 4th quarter of 2017, submitted February 27, 2018 (ML18066A570), and; (3) 1st and 2nd quarter of 2018, submitted August 29, 2018 (ML18254A198). These reports were submitted in a timely manner in accordance with the requirements of 10 CFR 40.65. The environmental monitoring program consisted of air particulate, radon, surface water, private water wells, sediment and ambient gamma exposure rate as required by LC 11.2.3.

The licensee monitors plant emissions for radon, radon progeny and uranium particulate at seven locations in the CPP and at eighteen locations outside the CPP. Air filters are collected and counted routinely. The environmental stations outside the CPP are also monitored for radon using a track etch and gamma using optically stimulated luminescence dosimeters. The inspector reviewed the monitoring/counting results from the air filters since the previous NRC inspection and determined that all results were

below the effluent limits of 10 CFR Part 20. Radon and direct gamma levels were also well within the appropriate limits established in the environmental monitoring program in LC 11.2.3.

b. Wellfield and Excursion Monitoring

License Condition 11.1.5 specifies excursion monitoring well sampling requirements and the criteria for placing a groundwater monitoring well on excursion status. The licensee's excursion sampling program requirements include biweekly monitoring of wells in active mine units, weekly sampling of wells in excursion status, and well sampling in mine units under restoration. The inspector reviewed groundwater sampling records since the previous NRC inspection to determine whether the license was collecting samples and the required frequency and whether excursions were properly identified. Data from the two known excursions were reviewed to ensure that the monitoring frequency had been increased according to the license requirements. The inspector concluded that the license was implementing the excursion monitoring program in accordance with the license.

The inspector reviewed the spill records since the last NRC inspection. According to the licensee's records, there were five spills, resulting in a total of 58,592 gallons of unrecovered fluid. Of the total unrecovered fluid, 28,262 gallons of production fluid was released.

The inspector observed recent well monitoring sampling to determine whether sampling is being performed in accordance with the license requirements. The inspector observed the sampling of Well SM3-3 and verified the sampling was performed in accordance with the well sampling procedures in the facility's operating manual.

At the time of the NRC inspection, the licensee was no longer injecting lixiviant into the wellfield and the wellfield was being transitioned in a care and maintenance mode. The inspector reviewed the licensee's injection, production, and quarterly wellfield reports. Selected recovery wells were in operation in order to maintain the hydraulic gradient; i.e., a bleed.

c. Mechanical Integrity Testing

The inspector reviewed the Mechanical Integrity Testing (MIT) records from July 1, 2017, to November 5, 2018. During the review, 1569 MITs were completed. Of the 1569 wells tested, there were no failures. The inspector observed MIT testing of Injection well I3745. The testing was performed in accordance with the requirements of the license as detailed in LC 10.1.4 and the applicable procedure, CBR-SOP-023, "Mechanical Integrity Testing." Through observation and discussion, the inspector was able to determine that the individual performing the testing had the appropriate knowledge and understanding of the procedure and the implemented the necessary safety measures to protect the environmental.

4.3 Conclusions

The licensee conducted environmental monitoring in accordance with license and procedural requirements. The licensee reported the results in semi-annual reports to the NRC. The licensee was documenting spills and conducting excursion sampling as specified in the license.

5 Inspection of Transportation Activities (IP 86740); and Radioactive Waste Processing, Handling, Storage and Transportation (IP 88035)

5.1 Inspection Scope

Determine if storage and disposal activities were conducted in compliance with regulatory and license requirements.

5.2 Observations and Findings

a. Inspection of Transportation Activities

The inspector reviewed transportation activities since the last NRC inspection. The licensee made four yellowcake shipments and four 11.e(2) byproduct shipments. Yellowcake shipments were made to the Cameco Blind River Facility. Waste shipments were made the Energy Fuel's White Mesa Facility (White Mesa) in Blanding, Utah. The licensee had a current waste disposal contract for 11.e(2) byproduct waste in place with White Mesa.

The inspector reviewed the licensee's procedures and shipping records associated with the yellowcake and 11.e(2) byproduct shipments. No issues or items of concern were identified.

b. Inspection of Byproduct Waste Storage

The inspector observed all 11.e(2) byproduct material waste storage bins were staged within restricted areas with surrounding fences and locked entries. The inspector performed an ambient gamma radiation survey of the containers and confirmed the areas were appropriately posted and controlled in accordance with 10 CFR Part 20 regulations.

c. Wastewater Treatment and Disposal Activities

The licensee processed liquid effluent either through reverse osmosis units, stored in storage tanks, or disposed to a DDW or to the ponds. Consistent with LC 10.2.6, the licensee has been disposing of plant and wellfield operations wastewater to DDW injection and evaporation ponds.

The licensee has two DDWs. The inspector reviewed the CY2017 through 2nd Quarter 2018 Class I Injection Well reports for each of the two DDWs. The licensee did not exceed the permitted limits for natural uranium and radium-226 concentrations in the waste water.

d. Pond Inspections

The licensee conducted daily and weekly inspections of the ponds and documented these inspections as required by LC 11.2.1. LC 10.2.5 requires the research and development ponds to have at least 3 feet of freeboard and requires the commercial solar evaporation ponds to have at least 5 feet of freeboard. The inspector reviewed the pond inspection records and determined that pond inspections were performed as required by the license conditions.

5.3 Conclusions

The licensee continued to maintain a waste disposal agreement as required by the license. The shipment of yellowcake and the management, storage, transportation, and disposal of 11.e(2) wastes were conducted in accordance with the license and regulatory requirements.

6 Emergency Preparedness (IP88050); and Fire Protection (IP 88055)

6.1 Inspection Scope

Determine if the licensee's emergency preparedness and fire protection programs are adequate to protect the safety and health of employees, members of the public, and the environment.

6.2 Observations and Findings

a. Emergency Preparedness

The inspector reviewed the following procedures in the Emergency Response Plan for Crow Butte: medical emergencies; fires and explosions; electrical and gas emergencies; chemical emergencies; natural disasters; radiological emergencies; security plan and security threats; transportation emergencies; evacuation procedures; and emergency reporting.

The inspector also reviewed the following standard operating procedures related to emergency response telephone numbers, firefighting, emergency medical services for ambulance and life flight, transportation accidents involving radioactive material, spills, and personnel decontamination procedures. The inspector verified new employee and refresher training included emergency response. Visitors to the site were provided site orientation training, which included evacuation gathering points.

b. Fire Protection

The inspector reviewed the fire protection program developed by the licensee. The fire protection plan met the minimum requirements of 29 CFR 1910.39. Employees are trained on fire prevention and fire extinguisher use as part of new employee orientation.

The inspector reviewed the procedures related to flammable and combustible material control, spill control, firefighting procedures, emergency response information and emergency response telephone numbers. The fire protection plan was provided in new employee orientation and annual refresher training.

6.3 Conclusions

The licensee maintained and implemented standard operating procedures associated with emergency preparedness and fire protection sufficient to meet the requirements of the application. Employees and visitors were provided emergency preparedness and

fire protection training as applicable. The licensee has coordinated with local law enforcement and emergency response organizations for emergency response purposes.

7 Exit Meeting Summary

The NRC inspector presented the inspection findings to the licensee's representatives at the conclusion of the onsite inspection on November 8, 2018. During the inspection, the licensee did not identify any information reviewed by the NRC as proprietary which was included in this report.

SUPPLEMENTAL INSPECTION INFORMATION

Partial List Of Persons Contacted

Licensee Personnel
Doug Pavlick, General Manager, US Operations[+]
Walt Nelson, Safety, Health, Environment and Quality Coordinator[*,+]
Tami Dyer, Radiation Safety Officer[*,+]
Casey Yada, Health Physics Technician[*,+]
Tate Hagman, Plant Supervisor[*,+]
Robert Tiensvold, Restoration Manager
Brian Taylor, Senior Safety Specialist[+]
Chris Klein, Pulling Unit Operator
Michelle O'Donnell, Laboratory Foreman
Linda Turnbull, Chemical Technician

Attended entrance - *
Attended exit meeting - [+]

Inspection Procedures (IP) Used

IP83822	Radiation Protection
IP86740	Inspection of Transportation Activities
IP87102	Maintaining Effluents from Materials Facilities ALARA
IP88005	Management Organization and Controls
IP88045	Effluent Control and Environmental Protection
IP88035	Radioactive Waste Processing, Handling, Storage and Transportation
IP89001	In-Situ Leach (ISL) Facilities
IP88050	Emergency Preparedness
IP88055	Fire Protection

Items Opened, Closed and Discussed

Opened

None

Closed

None

Discussed

None

List of Acronyms

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
CEDE	Committed Effective Dose Equivalent
CFR	*Code of Federal Regulations*
CPP	Central Processing Plant
CY	Calendar Year
DDE	Deep Dose Equivalent
DDW	Deep Disposal Well
DOT	Department of Transportation
ECL	Effluent Concentration Limit
HPT	Health Physics Technician
IP	NRC Inspection Procedure
ISL	In-Situ Leach
LC	License Condition
MIT	Mechanical Integrity Testing
µCi/ml	microcurie per milliliter
µg/L	micrograms/liter
mrem	millirem
NRC	U.S. Nuclear Regulatory Commission
RG	Regulatory Guide
RSO	Radiation Safety Officer
RWP	Radiation Work Permit
SERP	Safety and Environmental Review Panel
SHEQ	Safety Health Environmental and Quality
TEDE	Total Effective Dose Equivalent

IR 040-08943/2018-001; CROW BUTTE RESOURCES, INC. – Dated December 6, 2018

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