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

September 28, 2018

Greg Kruse, Manager
U.S. Operations
Uranium One USA, Inc.
907 Poplar Street, Suite 260
Casper, WY 82601

SUBJECT: URANIUM ONE USA, INC. - NRC INSPECTION REPORT 040-08502/2018-001 AND NOTICE OF VIOLATION

Dear Mr. Kruse:

This letter refers to the announced routine U.S. Nuclear Regulatory Commission's (NRC) inspection conducted onsite from August 7-9, 2018, at your Willow Creek In-Situ Recovery Project in Johnson and Campbell Counties, Wyoming. Additional inspection effort was conducted by the NRC inspectors in the office through September 26, 2018.

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. A preliminary exit meeting was held with you and your staff on August 9, 2018. A final exit was held telephonically with you and members of your staff on August 20, 2018. Following an NRC review, additional information was gathered to support the inspection findings. As a result, the findings discussed with you on August 20, 2018, were revised. The final inspection findings were subsequently presented telephonically to you on September 28, 2018.

Based on the results of this inspection, the NRC has determined that two Severity Level IV violations of NRC requirements occurred. These violations involve your failure to: (1) request a license amendment prior to modifying the NRC licensed boundary; and (2) indicate the total quantity of Class 7 radioactive materials on shipping papers. These violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at https://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html. These violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. In accordance with the NRC Enforcement Policy, Section 2.3.2.b, the violations are being cited in the Notice because they were identified by the NRC during the inspection and do not meet the criteria for a non-cited violation.

The NRC has concluded that information regarding: (1) the reason for the violations; (2) the corrective actions that have been taken and the results achieved; and (3) the date when full compliance will be achieved are adequately addressed on the docket in an email dated August 31, 2018 (NRC's Agencywide Documents Access And Management System (ADAMS) Accession Number ML18248A170). Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

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 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: 040-08502
License: SUA-1341

Enclosures:
1. Notice of Violation
2. NRC Inspection Report 040-08502/2018-001
w/Attachment: Supplemental Information

cc w/enclosures:
Guy Cameron, Director, WY Homeland Security
Ryan Schierman, Natural Resources Program Manager, WDEQ
Robin Jones, Land Quality District 1 Supervisor, WDEQ
Mark Rogaczewski, Land Quality District 3 Supervisor, WDEQ

NOTICE OF VIOLATION

Uranium One USA, Inc.
Casper, Wyoming

Docket No. 040-08502
License No. SUA-1341

During an U.S. Nuclear Regulatory Commission (NRC) inspection conducted onsite August 7-9, 2018, with continued in-office review through September 26, 2018, two violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

A. License Condition 9.4(c) of Radioactive Material License SUA-1341, Amendment 5, dated September 29, 2016, requires, in part, that a license amendment be obtained if a proposed change is not consistent with NRC's previous conclusions, or the basis of, or analysis leading to the conclusions of actions, designs, or design configurations analyzed and selected in the site or project safety evaluation report or environmental assessment, to include all supplements and amendments to these documents.

   Contrary to the above, from April 11, 2012, to August 31, 2018, the licensee failed to obtain a license amendment for a proposed change not consistent with NRC's previous conclusions, or the basis of, or analysis leading to the conclusions of actions, designs, or design configurations analyzed and selected in the site or project safety evaluation report or environmental assessment, to include all supplements and amendments to these documents. Specifically, the licensee modified the NRC licensed boundary on April 11, 2012, October 29, 2012 and February 12, 2013, which changed the licensing basis used to support the NRC's previous conclusions based on the site safety evaluation report and site environmental assessment submitted as part of a license renewal package on June 30, 1998, and failed to request or obtain a license amendment for the proposed change.

This is a Severity Level IV violation (NRC Enforcement Policy Section 6.3)

B. Title 10 CFR Part 71.5(a) requires, in part, that a licensee who transports licensed material outside the site of usage, as specified in the NRC license, or when transport is on public highways, or delivers licensed material to a carrier for transport shall comply with the applicable requirements of the U.S. Department of Transportation regulations in Title 49 CFR Parts 107, 171 through 180, and 390 through 397.

   Title 49 CFR 172.202(a)(5) requires, in part, with exceptions not applicable here, that the shipping description of a Class 7 hazardous on the shipping paper must include the total quantity of hazardous materials as indicated by mass or volume, or activity.

   Contrary to the above, between August 3, 2017, and May 2, 2018, the licensee transported licensed material outside the site of usage, and failed to indicate the total quantity of hazardous material by mass or volume, or activity in the shipping description on the shipping papers that accompanied two 11.e(2) shipments, which are a Class 7 hazardous material.

This is a Severity Level IV violation (NRC Enforcement Policy Section 6.8)

The NRC has concluded that information regarding the reason for the violations; the corrective actions taken and planned to correct the violation and prevent recurrence; and the dates when full compliance was achieved and will be achieved for pending actions were addressed on the docket (ML18248A170). However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not

accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region IV, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or in 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. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 28th day of September 2018.

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	040-08502
License:	SUA-1341
Report:	040-08502/2018-001
Licensee:	Uranium One USA, Inc.
Locations Inspected:	Willow Creek Project Johnson and Campbell Counties, Wyoming
Inspection Dates:	August 7-9, 2018 (onsite) August 10-September 26, 2018 (in-office review)
Inspectors:	Bernadette Baca, Health Physicist Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety Marti Poston, Health Physicist Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
Accompanied by:	David W. Adams, CHP, Health Physicist Uranium Recovery Program Land Quality Division Wyoming Department of Environmental Quality Reid Brown, Project Principal Uranium Recovery Program Land Quality Division Wyoming Department of Environmental Quality Alan Thompson, Project Principal Uranium Recovery Program Land Quality Division Wyoming Department of Environmental Quality
Approved by:	Janine F. Katanic, PhD, CHP, Chief Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Uranium One USA, Inc. In-Situ Recovery Facility
NRC Inspection Report 040-08502/2018-001

The U.S. Nuclear Regulatory Commission (NRC) performed a routine health and safety onsite inspection from August 7-9, 2018, at the Willow Creek Project with continued in-office review of additional information through September 26, 2018. The inspection included observations of site activities, independent radiation surveys, review of records, and interviews with site personnel. Two violations related to regulatory and license requirements were identified.

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. An unresolved item, regarding a licensed boundary modification through a SERP, was closed and a violation issued for a failure to obtain a license amendment for changes to the NRC licensed boundary. The licensee submitted an amendment request as a corrective action and this violation was closed. 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 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 *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. The inspectors closed a violation associated with wellfield bleed identified in a previous inspection. (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 resin and the management, storage, transportation, and disposal 11.e(2) wastes were conducted in accordance with the license and regulatory requirements, with two exceptions. The inspectors identified a violation associated with the shipment of byproduct material. The licensee provide corrective actions and this violation was closed. (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 May 31, 2017. The site was in the process of transitioning from recirculation mode into a care and maintenance mode. The site was operating selected production wells, as recovery wells, in order to maintain an inward hydraulic gradient in the Mine Units (MU).

Uranium processing and yellowcake drying operations at the Irigaray facility will continue on a limited basis for the small amount of material extracted during the recirculation mode. The Irigaray facility processed loaded resin from another NRC licensed facility for conversion into yellowcake product. The licensee stated that the toll milling contract with the other NRC licensee ends in January 2019 and they expect to cease all processing and drying activities at that time. The Christensen Ranch satellite facility was in recirculation mode until it can be transitioned to care and maintenance.

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

1.1 Inspection Scope

Ensure the licensee has established an organization to administer the technical programs and to perform internal reviews, self-assessments and audits.

1.2 Observations and Findings

a. Organizational Structure

The inspectors reviewed the licensee's current organizational structure for the Willow Creek Project. At the time of the inspection, the Willow Creek Project facility operation had approximately 17 full-time employees, a reduction in employees since the last inspection. Contractors are used as necessary for special tasks, such as dryer campaigns at Irigaray. All management positions were filled with qualified employees. The Radiation Safety Officer (RSO) position remains vacant and the Manager of Health, Safety and Environment, who meets the RSO qualifications of License Condition (LC) 9.12, was performing the RSO duties. The Manager of Health, Safety and Environment was supported by a full-time qualified radiation safety technician (RST).

The radiation safety duties were shared between the RST and the RSO with assistance provided, as needed, by RSO designees. The inspectors determined the licensee had sufficient employees to implement the radiation protection program, groundwater monitoring and environmental programs at current operating levels.

b. Safety and Environmental Review Panel (SERP)

NRC Radioactive Materials License SUA-1341, Amendment 5, LC 9.4 of the performance based license requires, in part, that the licensee establish a SERP process to evaluate if program changes, tests or experiments require an NRC license amendment prior to implementation. The inspectors reviewed the following SERP evaluation completed since the July 2017 inspection:

SERP-17-03 2017 Annual Review of License Renewal Application Section 7.5, "Effects of Accident"

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 inspectors concluded the licensee correctly implemented the performance-based license and the evaluation did not require prior NRC approval.

During the NRC inspection in January 2013 (ML13063A408), the inspectors identified an issue associated with SERP 12-01A, dated April 11, 2012; SERP 12-01B dated October 29, 2012; and SERP 13-02, dated February 12, 2013. These SERP evaluations were conducted by the licensee to review and approve the installation of multiple wellfield modules and modify the NRC licensed boundary. Based on the licensee's determination that extending the NRC licensed boundary did not require a license amendment, as documented in these three SERPs, a total of 15 perimeter wells and approximately 1,000 feet of distribution trunk line were installed outside the NRC licensed boundary. The NRC inspectors identified the use of a SERP to modify the NRC licensed boundary, in lieu of submitting a NRC license amendment request, as an unresolved item (URI) [URI-040-08502-2013-001-01]. The URI was referred to the NRC's Office of General Counsel (OGC) for review. On August 3, 2018, OGC determined that the licensee did not comply with LC 9.4(c) when they modified the NRC licensed boundary using the SERP process.

The OGC decision closes URI-040-08502-2013-001-01 and it was determined by OGC that the use of a SERP to modify the NRC licensed boundary was a violation of LC 9.4(c) because the licensing basis, as documented in the site safety evaluation report (ML081060065) and the site environmental assessment (ML081060063), was changed. The failure to request a license amendment prior to modifying a NRC licensed boundary in accordance with the requirements of LC 9.4(c) was identified as a violation [VIO-040-08502-2018-001-01]. The licensee submitted a license amendment request dated August 31, 2018 (ML18253A051) to modify the NRC licensed boundary to the NRC. The amendment request is under review by the NRC Headquarters. Therefore, this violation was closed.

c. Audits and Inspections

Title 10 *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 inspectors reviewed the audits and inspections generated by the licensee since the previous inspection. The RSO, RST and RSO-designees (trained and qualified operators) performed and documented the daily walk-throughs. Site procedures allow trained and qualified operators to perform the daily walk-throughs on

days when radiation safety employees were not available, such as weekends and holidays. The RSO or RST 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 RST failing to perform the required review. If delays in review occurred, the reason for the delay was documented on the form (illness, document misplaced, etc.). The weekly and monthly reviews by the RSO/RST were conducted at the required frequencies.

The licensee conducted an annual radiation safety audit. The inspectors reviewed the annual audit for calendar year 2017 (CY2017). The audit, performed by a licensee contractor on April 24, 2018, included an evaluation of occupational exposures, radiation survey results, public dose, training, and compliance with license and regulatory requirements. The determination of the public dose is to be conducted in accordance with the requirements of 10 CFR 20.1301 and 10 CFR 20.1302. The inspectors reviewed the public dose assessment and identified two errors demonstrating compliance with the dose limits for members of the public.

Both errors involved incorrect data used in calculating dose to members of the public. In the first error, the radon concentrations for monitoring locations AS-7 and IR-13 were incorrectly represented (i.e. wrong values used) for the first two quarters of CY2017 in the environmental report and the dose calculation. This error resulted in the licensee to under-represent the public dose at these monitoring locations by approximately 10 mrem for each location. The licensee reported radon doses for AS-7 and IR-13 of 3.5 millirem (mrem) and 16.2 mrem respectively. The actual public doses reported due to radon should have been 13.23 mrem and 28.6 mrem for AS-7 and IR-13, respectively.

In the second error, when determining public dose based on uranium particulate, the licensee used an effluent concentration limit (ECL) of 1.95 E-12 microcurie per milliliter (µCi/ml), based on a ratio of Class W and Class D material approved by the NRC. This ratio was based on a lung solubility test for operations at the Irigaray site with the dryer operating within a specific dryer temperature range. The licensee was currently operating at a higher temperature outside of this range. Since the licensee did not complete a revised lung solubility test, the licensee committed to using an ECL for Class Y material (9.0E-14 µCi/ml). By using an incorrect ECL, the licensee under estimated the dose to the public from uranium particulate. The contribution of uranium particulate in effluent to public dose should have been reported as 0.027 mrem rather than the 0.001 mrem value reported, and increased the total contribution of uranium particulate from 0.551 mrem to 0.577 mrem.

The highest public dose was reported by the licensee for CY2017 was 16.8 mrem for individuals staying at the Irigaray man-camp (IR-13). Correcting both the radon concentration and the uranium particulate effluent values increases the dose to 29.2 mrem/year, a value well below the 100 mrem/year limit of 10 CFR 20.1301. The two errors were identified as a minor violation of 10 CFR 20.1302. Although these issues should be corrected, they constitute a violation of minor significance in that is not subject to enforcement action in accordance with Section 2 of the NRC Enforcement Policy. In an email dated August 31, 2018 (ML18248A170), the licensee committed to submitting a revision of the public dose determination when the contractor completes both the effluent and public dose corrections to the CY2017 semi-annual environmental report.

d. Additional Protocols

The inspectors 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 inspectors 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 CY2017 for Uranium One USA, Inc. on August 8, 2017. The NRC completed its review and determined the financial assurance was acceptable on April 23, 2018 (ML18107A724).

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 was maintaining financial assurance in accordance with license requirements. An unresolved item, regarding a licensed boundary modification through a SERP, was closed and a violation issued for a failure to obtain a license amendment for changes to the NRC licensed boundary. The licensee submitted an amendment request as a corrective action and this violation was closed. 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 recovery activities were conducted in accordance with regulatory requirements and the license.

2.2 Observation and Findings

a. Uranium Recovery

At the time of the inspection, the licensee had stopped injecting lixiviant on May 31, 2017, and MU 9, 11 and 12 were in recirculation. A small number of production wells, now operating as recovery wells, were at a minimum flow (5 to 10 gallons per minute) to ensure an inward hydraulic gradient is maintained for each mine unit. All other mine units were either in restoration or have completed the restoration process. At the time of the inspection, the recovery fluids going to the Central Processing Plant (CPP) were bypassing the production circuit and were sent to the sand filters, the reverse osmosis units, and then split for disposal between the deep disposal wells (DDW) or the permeate pond.

b. Site Tours

The inspectors conducted a site tour to observe in-situ uranium recovery activities at the Christensen Ranch facility and Irigaray CPP. The inspectors also observed multiple groundwater, livestock, and surface water sampling stations; MUs and header houses; a DDW; an effluent sampling station; and selected environmental monitoring stations.

The inspectors 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 inspectors 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 No. 016337, Serial Number 36543, calibration due date of October 26, 2018, calibrated to radium-226). The inspectors 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 inspectors did not identify any areas which had not already been posted as radiation areas by the licensee. The inspectors 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.

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.

3.2 Observations and Findings

a. Occupational Exposures

The inspectors reviewed the licensee’s occupational exposure records for CY2017. 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 5.6 millirem (mrem).

The licensee conducted air sampling, in part, for assessment of internal exposures. The inspectors reviewed the licensee’s radon-222 air sampling records and the uranium particulate and worker breathing zone results for CY2017. The inspectors 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 inspectors. Four bioassay results were above the lower limit of detection for uranium and only one of these bioassays was above the 15 micrograms per liter (µgms/L) action level for investigation. On March 3, 2018, a sample was collected from an employee who was working under a recent radiation work permit (RWP), which once analyzed, measured 15.8 µgms/L. 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 6.9 mrem.

The CEDE and DDE were combined to report dose as total effective dose equivalent (TEDE). The maximum TEDE assigned for a worker for CY2017 was 12.6 mrem. The average TEDE assigned to employees was 9.45 mrem. The inspectors determined that occupational exposures were appropriately determined and no occupational dose limits were exceeded.

b. Radiation Work Permits and Respiratory Protection

Since the previous inspection, 41 RWPs were issued and involved the use of respirators, forced ventilation from a fume hood or natural ventilation. RWPs used standard personnel protective equipment, such as gloves, Tyvek suits and rubber boots as the needs of the RWP directed. For all RWPs where respiratory protection was required, powered air purifying respirators (PAPRs) were used. The inspectors identified all employees who wore PAPRs since the previous inspection and verified all employees were currently medical qualified for PAPRs and had current respiratory protection training. The inspectors reviewed the components of the respiratory protection program and determined the program met the license and regulatory requirements.

c. Radiation Protection Surveys

The inspectors reviewed the licensee's routine contamination and gamma radiation surveys conducted since the August 2017 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 DDW. Monthly contamination spot checks were conducted on clean trash containers, and respirators. Quarterly spot checks for contamination are conducted on employees, vehicles and equipment in the wellfield. Free release surveys at the Willow Creek project site since the previous 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 inspectors

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 inspectors 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 inspectors observed survey meters used by licensee personnel when exiting restricted areas. The survey meters examined by the inspectors were observed to be in calibration and were used appropriately by the licensee's employees.

e. Training

The inspectors reviewed the licensee's training program. Employees were provided with initial radiation protection training at hire and an annual refresher. Employees preparing shipping paperwork had current U.S. Department of Transportation, Subpart H training and the acting RSO and Sr. RST had recently completed RSO refresher training. The inspectors determined the licensee's training programs met the license and regulatory requirements.

3.3 Conclusions

The licensee implemented a radiation protection program meeting the requirements of 10 CFR Part 20 and the license. Occupational doses were less than established regulatory limits.

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.

4.2 Observations and Findings

a. Environmental and Effluent Monitoring

The semi-annual environmental reports (SAER) were submitted timely by the licensee in accordance with the requirements of 10 CFR 40.65. Submissions were initially reviewed and evaluated by the NRC and the review of these documents, for July 1 to December 31, 2017, was provided to the licensee under separate correspondence dated June 14, 2018 (ML18159A501).

The inspectors reviewed the July 1 to December 31, 2017, SAER and identified an error in the effluent stack emission calculations. The licensee conducted effluent monitoring for uranium particulate at the Irigaray CPP when the dryer was operating for: (1) either processing Willow Creek project material; or (2) performing toll milling for another NRC licensed facility. The inspectors reviewed the effluent monitoring results and identified that the licensee's contractor preparing the semi-annual stack sampling results was incorrectly applying a correction factor to the laboratory's analytical results. The correction factor, based on the specific activity of natural uranium, was being applied to convert results reported in micrograms/filter to picocuries/filter. In May 2000, the laboratory began reporting the results in picocuries/filter and the conversion factor was no longer necessary. The application of this factor resulted in erroneously reporting a lower activity for natural uranium being emitted as effluent from the stacks dating back to May 17, 1997. The licensee recalculated the effluent releases and determined the revised quantities were 30 percent higher than initially calculated. The inspectors compared the new values to the Wyoming Department of Environmental Quality (WYDEQ) permit limits and the effluent amounts did not exceed the WYDEQ permit limits.

The application of this correction factor and submission of incorrect results, as part of the SAER, was identified as an issue of low safety significance and a minor violation of 10 CFR 40.65. Title 10 CFR 40.65 requires the submission of SAER report which specifies the quantity of each principle radionuclide released via effluents. Although error in the effluent stack calculations should be corrected, they constitutes a violation of minor safety significance that is not subject to enforcement action in accordance with Section 2 of the NRC Enforcement Policy. The licensee contacted its contractor regarding the error in the effluent stack calculations while the inspectors were onsite and committed to submitting a revision to the most recent SAER to correct the stack sampling calculation errors when the contractor completes both the effluent and public dose corrections (ML18248A170).

b. Wellfield and Excursion Monitoring

The inspectors examined the reportable and non-reportable spill reports since the last inspection pursuant to the requirements of LC 12.2. Since the last inspection, the licensee had two reportable spills of 11,800 gallons recovery fluid on August 1, 2018 (ML18226A213), and 4,130 gallons recovery fluid on August 6, 2018 (ML18228A721). Neither spill left the site boundary or entered a waterway.

The inspectors reviewed licensee records regarding monitoring well levels and reported excursions. Since the last inspection, the licensee had one monitoring well (4MW15) enter excursion status on July 2, 2018 (ML18198A341). The licensee implemented corrective actions and sampled in accordance with LC 11.2. On August 29, 2018, the licensee informed the NRC monitoring well 4MW15 was no longer in excursion status (ML18247A073).

At the time of the inspection, the licensee was no longer injecting lixiviant into the wellfield and the wellfield was being transitioned in a care and maintenance mode. The inspectors 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. The inspectors calculated average percent bleed from the 3rd Quarter 2017

through the 2rd Quarter 2018 data, as 7.9 percent for MU 7, 4.1 percent for MU 8, and 3.5 percent for MU 10.

The inspectors reviewed MU 5-2 wellfield flows, monitoring well data for elevated levels, and excursions to validate an inward hydraulic gradient. The licensee was previously cited for failure to maintain a bleed in MU 5-2 from June 2015 to July 2016 [VIO-040-08502-2016-001-01] (ML16243A088). The inspectors determined the licensee has maintained an overall positive bleed to MU 5-2 since the previous inspection, therefore, the violation from the 2016 inspection report was closed.

c. Mechanical Integrity Testing

The inspectors reviewed the Mechanical Integrity Testing (MIT) records from July 1, 2017, to July 31, 2018. During the review, 637 MITs were completed. Of the 637 wells tested, only eight wells failed. Of the eight failures, one well was repaired and passed its subsequent MIT testing, two were converted from injection to recovery wells which were approved by the Wyoming Department of Environmental Quality, and the remaining five wells were plugged.

4.3 Conclusions

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. The inspectors closed a previous inspection violation associated with wellfield bleed.

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 inspectors reviewed transportation activities since the last inspection. The licensee made yellowcake, resin, and 11.e(2) byproduct shipments. The licensee had a current waste disposal contract for 11.e(2) byproduct waste in place with Energy Fuel's White Mesa facility in Utah.

The inspectors reviewed the licensee's procedures and shipping records associated with the yellowcake, resin, and 11.e(2) byproduct shipments. The inspectors identified shipping paperwork issues with two 11.e(2) byproduct shipments that had a total activity incorrectly calculated based on the volume of waste material in the shipment. The waste volume determined to be in shipment numbers 03/17 (August 23, 2017) and 01/18 (May 2, 2018) was 56.6 cubic yards each. However, the licensee used 46 cubic yards in the total activity calculation for each shipment. When 46 cubic yards of waste is used

in the activity calculation, the total activity of each shipment was underestimated by 38 percent for shipment 03/17 and 8 percent for shipment 01/18.

Title 49 CFR 172.202(a)(5) requires the total quantity of hazardous material covered by the description in the shipping papers must be indicated by mass, volume or activity for Class 7 materials. By using incorrect data in the calculation for the total activity of two shipments, the licensee failed to represent the total quantity of hazardous material in the shipping papers by activity for Class 7 material. This was identified as a violation [VIO-040-08502-2018-001-02]. The licensee indicated, in an email dated August 31, 2018, they had modified standard operating procedure HP-19, "*Shipping Radioactive Materials*", Section 8.0, "*Byproduct Material Shipments*" to require the RSO to review byproduct material shipment paperwork for accuracy prior to shipment. (ML18248A170). Therefore, the violation was closed.

b. Inspection of Byproduct Waste Storage

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

c. Wastewater Treatment Activities

The licensee processed liquid effluent either through reverse osmosis units, stored in storage tanks, or disposed to a DDW or one of four evaporation ponds. Consistent with LC 10.7, the licensee has been disposing of plant and wellfield operations wastewater to DDW injection and evaporation ponds.

The licensee has two DDWs. The inspectors reviewed the 3rd Quarter 2017 through 2nd Quarter 2018 Class I Injection Well reports for each of the two DDWs. The licensee did not exceed the WYDEQ permitted daily volume of 156,240 gallons per day for the DDWs. The licensee had one exceedance for injection pressure on February 11, 2018, of 1039.9 pounds per square inch due to operator error during training. The WYDEQ permitted pressure limit is 1035 pounds per square inch. The system recognized the Hi-Hi alarm and shut the well down as expected. There was not an adverse impact to the system.

The inspectors reviewed the licensed activities associated with a selected DDW and reviewed records to determine if the licensee was processing and disposing of wastes through the deep disposal wells and evaporation ponds in accordance with regulatory and license commitments.

d. Pond Inspections

The licensee conducted weekly inspections of the ponds and documented these inspections as required by LC 10.6 and LC 11.4. License Condition 10.6 requires ponds to have at least 2 feet of freeboard for the evaporation, permeate, brine, and backwash ponds. License Condition 11.4 requires the licensee to perform and document visual structural inspections and measurements of pond freeboard. The inspectors reviewed the pond inspection records and identified the licensee had not documented the

freeboard results of the Christensen Ranch permeate pond since February 22, 2017. The licensee indicated an ice storm had damaged the measurement device located in the permeate pond and it fell into the pond. The licensee attempted to retrieve the device without success and it was not replaced when weather permitted. The licensee made passive level assessments of the Christensen Ranch permeate pond freeboard using a high water mark known to be approximately 1.8 feet from the top of the pond, but had not documented the assessments since the device was lost. The failure to document the freeboard of the permeate pond was identified as a minor violation of LC 11.4. Although the lack of documentation as required by LC 11.4 should be corrected, it constitutes a violation of minor safety significance that is not subject to enforcement action in accordance with Section 2 of the NRC Enforcement Policy. The issue was discussed with the licensee, who committed to installing a measuring mechanism for the permeate pond and documenting the freeboard values. On August 15, 2018, the licensee installed a measuring device indicating the number of feet of freeboard for the permeate pond and submitted photos confirming this activity to the NRC on August 20, 2018 (ML18254A132).

5.3 Conclusions

The licensee continued to maintain a waste disposal agreement as required by the license. The shipment of yellowcake and resin and the management, storage, transportation, and disposal 11.e(2) wastes were conducted in accordance with the license and regulatory requirements, with two exceptions. The inspectors identified a violation associated with the shipment of byproduct material. The licensee provided corrective actions and this violation was closed.

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 inspectors reviewed the following procedures in the Emergency Response Plan for Willow Creek: 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 inspectors 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 inspectors verified new employee and refresher training included emergency response, procedures were reviewed and updated annually, and local emergency

response and law enforcement organizations were provided updates of changes to the emergency response information at the facility.

Visitors to the site were provided site orientation training, which included evacuation gathering points.

b. Fire Protection

The inspectors 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 inspectors 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 have coordinated with local law enforcement and emergency response organizations for emergency response purposes.

7 Exit Meeting Summary

The NRC inspectors presented the preliminary inspection findings to the licensee's representatives at the conclusion of the onsite inspection on August 9, 2018. Additional in-office review of licensee information was conducted through August 20, 2018. During the inspection, the licensee did not identify any information reviewed by the NRC as proprietary which was included in this report. A final exit meeting was conducted telephonically on August 20, 2018.

SUPPLEMENTAL INSPECTION INFORMATION

Partial List Of Persons Contacted

Licensee Personnel

Greg Kruse, Manager, US Operations
Scott Schierman, Manager, Health Safety and Environmental
Kevin Filbert, Environmental Specialist
Larry Arbogast, Senior Radiation Safety Technician
Scott Graham, Operations Supervisor
Trevor Merchant, Tech Services Engineer
Susan Brubaker, Environmental Sampler

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

VIO-040-08502-2018-001-01	Failure to request a license amendment to modify the NRC licensed boundary as required by License Condition 9.4(c).
VIO-040-08502-2018-001-02	Failure to represent the total quantity of hazardous material by activity for Class 7 material on shipping papers in accordance with 10 CFR 71.5 and 49 CFR 172.202.

Closed

URI-040-08502-2013-01-01	Approval through the SERP process of monitoring wells operating outside the NRC licensed boundary.
VIO-040-08502-2016-001-01	Failure to maintain wellfield bleed.
VIO-040-08502-2018-001-01	Failure to request a license amendment to modify the NRC licensed boundary as required by License Condition 9.4(c).

Attachment

VIO-040-08502-2018-001-02	Failure to represent the total quantity of hazardous material by activity for Class 7 material on shipping papers in accordance with 10 CFR 71.5 and 49 CFR 172.202

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
DAC	Derived Air Concentration
DDE	Deep Dose Equivalent
DDW	Deep Disposal Well
ECL	Effluent Concentration Limit
gpm	gallons per minute
IP	NRC Inspection Procedure
ISL	In-Situ Leach
LC	License Condition
MIT	Mechanical Integrity Testing
µCi/ml	microcurie per milliliter
µgms/L	micrograms/liter
µR/hr	microroentgen per hour
mrem	millirem
MU	Mine Unit
NRC	U.S. Nuclear Regulatory Commission
OGC	Office of General Counsel
PAPR	Powered Air Purifying Respirator
pCi	picocurie
psig	pound per square inch-gauge
RG	Regulatory Guide
RSO	Radiation Safety Officer
RST	Radiation Safety Technician
RWP	Radiation Work Permit
SAER	Semi-Annual Environmental Report
SERP	Safety and Environmental Review Panel
TEDE	Total Effective Dose Equivalent
URI	Unresolved Item
VIO	Violation
WDEQ	Wyoming Department of Environmental Quality

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ADAMS ACCESSION NUMBER: ML18256A065

■ SUNSI Review By: MRP	ADAMS ■ Yes ☐ No	■ Non-Sensitive ☐ Sensitive	■ Publicly Available ☐ Non-Publicly Available	Keyword: NRC-002
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