

June 10, 2014

Mr. Jon F. Winter, Director,
Safety Health and Environment
Uranium One USA, Inc.
907 N. Poplar Street, Suite 260
Casper, Wyoming 82601

SUBJECT: ACCEPTANCE FOR REVIEW AND REQUEST FOR ADDITIONAL
INFORMATION, RE-DRYING OF HONEYMOON DRIED YELLOWCAKE
AMENDMENT REQUEST, URANIUM ONE, USA, INC., WILLOW CREEK
PROJECT, CAMPBELL AND JOHNSON COUNTIES, WYOMING, SOURCE
MATERIALS LICENSE SUA-1341, (TAC NO. J00721)

Dear Mr. Winter:

By letter dated February 28, 2014, Uranium One, USA, Inc., submitted a request for a license amendment for re-drying dried yellowcake from the Honeymoon, Australia, facility at its Willow Creek Project in Campbell and Johnson Counties, Wyoming. The request was supplemented with additional technical information in a letter dated March 27, 2014. The submissions are publicly available in the U.S. Nuclear Regulatory Commission's (NRC) Agencywide Documents Access and Management System (ADAMS) at accession numbers ML14066A112 and ML14113A421, respectively.

The NRC staff finds the request acceptable for review. However, NRC staff requires additional information from Uranium One, USA, Inc., in order to complete the technical review. The request for additional information is provided in the enclosure. Within 30 days, please either provide the information requested or inform us of the date you expect to provide the information.

If you have any questions concerning this letter, please contact me, either by telephone at (301) 415-7777, or by e-mail at ron.linton@nrc.gov.

J. Winter

2

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

/RA/

Ron C. Linton, Project Manager
Uranium Recovery Licensing Branch
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

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

Enclosure:
Request for Additional Information

cc: Luke McMahan, PG

J. Winter

2

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Request for Additional Information (RAI)
Request to re-dry Honeymoon, Australia, facility dried yellowcake

No. 1

Licensee's Statement or Position

By letters dated February 28, 2014 (Agencywide Documents Access and Management System ML14066A112), and March 27, 2014 (ML14113A421), Uranium One, USA, Inc., (Uranium One or the licensee) provided discussion, diagrams, and maps of the facility, equipment, and area where the re-drying of the Honeymoon, Australia (Honeymoon) yellowcake will take place. The main entry of the Honeymoon yellowcake into the Willow Creek dryer will be at the drum tipping station and interconnected conveyance system.

Technical Basis

NRC staff has determined that the drum tipping station is the main entry of the yellowcake into the re-drying process, and this may have the potential for airborne yellowcake dust. Regulatory Guide 8.31, C., 3.1, states that adequate ventilation should be provided in all facility areas in which radioactive materials might be spilled, suspended, or volatilized (e.g., engineered controls), and isolation should be provided for yellowcake drying, packaging, and shipping areas from other accessible facility areas. The licensee has agreed in Materials License SUA-1341, License Condition 9.12, to follow the guidance in Regulatory Guide 8.31, as revised, or NRC approved equivalent. NRC staff has determined that the drum tipping station is a critical step in the process where Honeymoon uranium yellowcake may become suspended in the air. The drum tipping station is not isolated from other accessible areas.

RAI

The licensee shall demonstrate that the drum tipping station and interconnected conveyance system are isolated from other accessible facility areas, or provide adequate (portable) containment and ventilation (with filtration) to prevent potential dispersion of yellowcake to other accessible facility areas. That is, the licensee shall describe its proposed radiological controls for any location or operational situation where the Honeymoon yellowcake is not fully contained within an enclosed space.

No. 2

Licensee's Statement or Position

The licensee stated in its letter dated March 27, 2014, that the Honeymoon yellowcake drying circuit consists of a rotary batch oil heated, vacuum dryer operated at less than 200-degrees Celsius. The operating temperature of the Honeymoon rotary vacuum dryer was not sufficient to burn-off or remove the residual organics that may have carried over from the strip solution to the final precipitated yellowcake. As a result, the dried Honeymoon yellowcake can have a small amount of residual organic present that must be removed in the Willow Creek dryer/calciner. The licensee stated the Willow Creek dryer must be operated at higher temperatures than that of the Honeymoon vacuum dryer to reduce the

residual organic concentration to meet the specification of the conversion facilities for further processing. The licensee indicated in its letter dated March 27, 2014, that temperatures were increased (on hot plates in a laboratory) to 650-degrees Celsius and held for one hour.

Technical Basis

NRC staff reviewed the technical and impact analysis from the licensee's February 28, 2014, letter and the supplemental technical and impact analysis from the licensee's March 27, 2014, letter but did not find any information about the drying process system, specifically operating temperatures, at Willow Creek. The NRC staff cannot determine if the temperatures suggested in the March 27, 2014, letter, i.e., 650-degrees Celsius, is within the design basis operating temperature for the Willow Creek dryer. Uranium One did not discuss what will be the optimum drying temperature and how long they will operate at that temperature. The NRC staff is requesting this information consistent with NUREG-1569, Acceptance Criteria 3.2.3(5), which states the description of the equipment used and materials processed in the recovery plant, satellite processing facilities, well fields, and chemical storage facilities is acceptable if it meets specifications, quantities, locations, and operating conditions such as flow rates, temperatures, and pressures of radioactive materials and those hazardous materials with the potential to impact radiological safety, are clearly identified together with the hazards associated with these materials.

In addition, License Condition 9.6 states that written standard operating procedures (SOPs) shall be established and followed for all operational process activities involving radioactive materials that are handled, processed, stored, or transported by the licensee at or between the Irigaray and Christensen Ranch sites. It appears that the licensee has not written SOPs for the potential changes in dryer times and temperatures.

RAI

- a. The licensee shall demonstrate that the Willow Creek dryer can operate safely within the recommended temperature as provided in a vendor or technical specification to remove the remaining solvents in the Honeymoon yellowcake. The licensee shall furnish to the NRC staff the vendor's or manufacturer's technical specifications that include the maximum design basis operating temperature for the Willow Creek dryer.
- b. The licensee shall provide a technical analysis that includes the optimum drying temperature, how they achieve this optimum drying temperature, and the required residence time the yellowcake must remain in the dryer to remove the organics.
- c. In addition, the licensee shall commit to writing SOPs, in accordance with License Condition 9.6, that describes the optimum drying temperature and drying time, prior to operation of the Honeymoon yellowcake reprocessing system.

No. 3

The licensee's statement or position

The licensee's February 28, 2014, letter states the combined quantities of re-dried Honeymoon yellowcake (570,000 lbs.) and the licensee's forecasted annual production (600,000 lbs.) from Willow Creek will total almost 1,200,000 lbs. This quantity of uranium is below the annual licensed production capacity of 2,500,000 lbs. The licensee further stated that the proposed action is not anticipated to result in a significant change to the types or amounts of any effluents that may be released off-site.

Technical Basis

NUREG 1569, Appendix A, states that the review should include the updates and changes to any site characterization information important to the evaluation of exposure pathways and doses including site location and layout, uses of adjacent lands and waters, population distributions, meteorology, the geologic or hydrologic setting, ecology, background radiological or non-radiological characteristics and other environmental features. The NRC staff determined from the licensee's statement that the proposed action is not anticipated to result in a significant change to the types or amounts of any effluents that may be released off-site but that there may be some change (although not significant) to the types or amounts of any effluents that may be released. The licensee should identify changes that would occur or state clearly that there are no changes.

RAI

The licensee should identify and explain what changes to the types or amounts of any effluents that may be released or clearly state that there are no changes. This information is necessary for the NRC to complete its review of the potential environmental consequences of the proposed operational activities.

No. 4

Licensee's Statement or Position

Notwithstanding the license conditions as determined from the License Renewal Application (ML081850689, ML083110405, ML092110700, ML103280266, ML120820095, ML12206A436) and analyzed in the Safety Evaluation Report (ML13015A356), the licensee stated in Section 4.1.2 of the License Renewal Application that airborne uranium radioactive emissions in the Irigaray Central Processing Plant (CPP) are a result of yellowcake particulate emissions from the drying/packaging circuit, and that the Irigaray CPP employs a multi-hearth dryer for yellowcake processing. The process uses a hydrogen peroxide precipitation and a washing stage that forms a cake that does not require high-temperature firing to remove chemical contaminants. In the February 28, 2014, letter, Uranium One stated the Honeymoon yellowcake is being laboratory tested to determine the optimum dryer temperature and dryer retention time requirements needed to reduce residual organic levels to acceptable concentrations for further processing at the converters. Although the optimum temperature has not been determined, Uranium One, in its letter dated March 27, 2014,

stated that the testing for the operating temperature will increase to 650-degrees Celsius and hold for one hour. Furthermore, Uranium One stated in its March 27, 2014, letter that they will utilize the site action level of 25-percent of the Derived Air Concentration (DAC) for soluble uranium as the guideline to determine if additional control measures are needed to maintain ALARA. Notwithstanding the license condition identified in the Safety Evaluation Report for establishing an adequate DAC for uranium, Uranium One needs to determine if a higher operating temperature, as determined from the laboratory temperature test, will impact and possibly increase the natural uranium solubility classification from Day/Week (D/W) to Year (Y).

In addition, License Renewal Application, Table 5.6, provides the proposed solubility classes for uranium, based on plant location. This table indicates that the yellowcake will be either Class D or Class W, or a combination of Class D and W, based on location.

Technical Basis

According to 10 CFR Part 20, Appendix B, Table 1, there are natural uranium concentration limits for three classifications based on lung solubility. The most conservative or the concentration that can produce the highest dose is the Y classification. The increase in drying temperature can change the product that could result in a final chemical form at the Appendix B, Table 1 concentration limits for Classification Y. The NRC staff cannot determine from the relationship between hot plate temperature testing and the final dryer operating temperature, the solubility of the natural uranium. Uranium One needs to identify the final operating dryer temperature, how that final operating dryer temperature was achieved, and whether this final operating dryer temperature changes the final chemical form to a product that would be classified as "Y" and the action limits.

RAI

- a. Uranium One shall explain how the hot plate temperature testing relates to the final dryer operating temperature and how the final operating temperature affects the chemical form of the final product and the solubility of the uranium. This explanation should discuss in sufficient detail as to whether Uranium One can remain at the current solubility as identified in the Safety Evaluation Report (NRC, 2013), or whether Uranium One needs to use the Class Y solubility classification during the drying of the Honeymoon yellowcake.
- b. The licensee should update the proposed uranium solubility classifications presented in License Renewal Application, Table 5.6, as appropriate.

No. 5

Licensee's Statement or Position

Enclosure 3 to the licensee's letter dated February 28, 2014, provides recommended text for inclusion in the License Renewal Application. The recommended text includes two paragraphs on Page 3-32b that are "open ended," meaning that the licensee plans to obtain and report additional information at a later date when the information becomes available.

The missing information includes compatibility of the Honeymoon uranium with the Willow Creek recovery process and identification of any additional equipment that may be needed for re-drying.

Technical Basis

The licensee presented proposed License Renewal Application text using information that was available at the time of submittal to the NRC.

RAI

The licensee shall provide the information to the NRC and update the two paragraphs, as appropriate, if the information is available. Alternatively, the licensee shall commit to updating the proposed text in the License Renewal Application through its performance-based license condition (License Condition 9.4) in a timely manner.

No. 6

Licensee's Statement or Position

Enclosure 2 to the licensee's letter dated February 28, 2014, includes a technical and impact analysis of the proposed change. This enclosure provides a discussion of the operational procedure that will be used. In addition, the licensee's letter dated March 27, 2014, provides additional discussions of the operational details.

Technical Basis

License Condition 9.6 states that written SOPs shall be established and followed for all operational process activities involving radioactive materials that are handled, processed, stored, or transported by the licensee at or between the Irigaray and Christensen Ranch sites. The SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed in accordance with 10 CFR Part 20.

The licensee's letters do not provide all necessary step-by-step instructions for operating the system. For example, the instructions do not clearly specify how the drum is opened, placed into the tipping station, removed from the tipping station, and re-lidded. In addition, the licensee has not clearly addressed how it will control the spread of loose yellowcake while handling opened drums. Further, the discussions presented in the letters do not clearly explain how the licensee knows when the drum is empty and requires replacement. Finally, the discussions do not provide contingency actions, such as what actions to take if the conveyor system becomes clogged.

RAI

- a. The licensee shall commit to developing SOPs, in accordance with License Condition 9.6, for all pertinent phases of the re-drying operation, including, but not limited to, the drum tipping station, the conveyor system, and drying operations specific to the Honeymoon yellowcake. The SOPs shall provide step-by-step instructions, including

contingency actions, and shall be in place prior to operating the Honeymoon yellowcake re-drying system.

- b. The licensee shall address radiological controls while the drum is opened in the SOPs. Alternatively, the licensee could provide the radiological controls in a radiation work permit to supplement SOPs. This licensee-approved procedure shall be in place prior to operating the Honeymoon yellowcake re-drying system.

No. 7

Licensee's Statement or Position

Enclosure 5 to the licensee's February 28, 2014, letter includes updated figures from the License Renewal Application. Included in this enclosure is a revised Figure 3.11, Irigaray Processing Facility Process Flow Diagram, which was updated to show the proposed Honeymoon yellowcake reprocessing system.

Technical Basis

The proposed changes to the NRC-approved process flow path have not been incorporated in a second related drawing. In particular, NRC staff has determined that License Renewal Application, Figure 4.1, Irigaray Process Unit Drying/Packaging Unit Schematic, should also be updated similar to Figure 3.11.

RAI

The licensee shall provide an updated License Renewal Application, Figure 4.1, as part of the application process, or commit to updating Figure 4.1 through the performance-based license condition (License Condition 9.4).

No. 8

Licensee's Statement or Position

The licensee's February 28, 2014, letter references License Renewal Application, Section 3.4.1.3, in several places. The NRC staff questioned whether this section number was correct.

Technical Basis

License Renewal Application, Section 3.4.1.3, refers to the Elution and Precipitation Circuit, while Section 3.4.1.4 refers to the Yellowcake Dewatering, Drying and Packaging Circuit. Unless the License Renewal Application has been renumbered in recent years, the correct reference should be 3.4.1.4 which refers to yellowcake drying.

RAI

The licensee shall confirm the referenced section from the license application, and update the submittal as appropriate.