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OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
DIVISION OF FUEL CYCLE SAFETY, SAFEGUARDS, AND ENVIRONMENTAL REVIEW

FINAL ENVIRONMENTAL ASSESSMENT  
FOR THE PROPOSED RENEWAL OF SUA-1350, SWEETWATER URANIUM PROJECT  
IN SWEETWATER COUNTY, WYOMING

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## ACRONYMS AND ABBREVIATIONS

ac	acre(s)
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as reasonably possible
CAP	Corrective Action Program
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
ER	environmental report
ESA	Endangered Species Act of 1973
ft	foot(feet)
FWS	U.S. Fish and Wildlife Service
Ha	hectare(s)
in.	inch(es)
ISR	in situ recovery
kg	kilogram(s)
km	kilometer(s)
KUC	Kennecott Uranium Company
lb	pound(s)
MCE	maximum credible earthquake
mi	mile(s)
mrem/yr	millirem per year
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NRC	U.S. Nuclear Regulatory Commission
PM	particulate matter
POC	point of compliance
SER	Safety Evaluation Report
SHPO	State Historic Preservation Office
SUP	Sweetwater Uranium Project



# 1 INTRODUCTION

## 1.1 Background

Kennecott Uranium Company (KUC) submitted an application and environmental report (ER) on July 24, 2014, as supplemented on November 14, 2016 and January 12, 2018 (KUC, 2014a, 2016f, 2018) to the U.S. Nuclear Regulatory Commission (NRC) to request renewal of source material<sup>1</sup> License SUA-1350 (KUC, 2015). Under the conditions of License SUA-1350, KUC is authorized to operate a conventional uranium mill facility (currently in standby mode<sup>2</sup>) located in Sweetwater County, Wyoming. If granted as requested, the NRC would authorize KUC under the renewed license to continue activities at the Sweetwater Uranium Project (SUP) site for a period of 10 years.

The SUP facility was operational from February 1981 to April 1983, at which time operations ceased and the facility was placed in standby mode due to market conditions. The facility was acquired in June 1992 by KUC in a joint venture with U.S. Energy Corporation. KUC has retained personnel to maintain the facility and perform environmental monitoring (NRC, 2016b).

Under Title 10 of the *Code of Federal Regulations* (CFR) 51.60 and 40.31(f), KUC provided an ER for its current license renewal request (KUC, 2014a, 2016f, 2018) that largely relied upon previous ERs (KUC, 1994, 2004). The NRC staff reviewed this information and performed an independent analysis. The results of the staff's analysis are documented in this environmental assessment (EA). The NRC staff prepared this EA in accordance with 10 CFR Part 51 that implements the National Environmental Policy Act of 1969 (NEPA), as amended, and pursuant to NRC staff guidance in NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs" (NRC, 2003). The purpose of this EA is to assess the potential environmental impacts of the proposed action, and of reasonable alternatives, including the no-action alternative.

The NRC staff is also performing a detailed safety analysis of the KUC license renewal request to assess its compliance with 10 CFR Part 20, "Standards for Protection Against Radiation," and 10 CFR Part 40, "Domestic Licensing of Source Material." The staff's safety analysis will be documented in a separate Safety Evaluation Report (SER). The NRC decision about whether to renew the KUC license will be based on the results of the NRC staff reviews documented in this EA and in the SER.

## 1.2 The Proposed Action

On July 24, 2014, KUC submitted its request for renewal of source material License SUA-1350 for a 10-year period (KUC, 2014a). License SUA-1350 authorizes KUC to operate a

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<sup>1</sup> Source material means (1) uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores that contain by weight one-twentieth of one percent (0.05%) or more of uranium, thorium, or any combination thereof. Source material does not include special nuclear material.

<sup>2</sup> The standby mode of operation is applicable for any continuous 90-day or longer period when no yellowcake is produced by the mill.

conventional uranium mill at the SUP site, with milling operations to resume after pre-operational license conditions have been met.

Conventional uranium milling operations involve grinding uranium ore, dissolving the uranium, separating the uranium from the solution, and further processing it to produce yellowcake.<sup>3</sup> The process also produces mill tailings—fine-grained, sandy waste materials that remain after the uranium has been extracted from the ore. Mill tailings are regulated as byproduct material and are stored in engineered impoundments at the mill site. Details of the milling process at the SUP facility are described in KUC’s revised ER (KUC, 2016g), and milling operations are expected to resume when such operations are determined to be economically feasible.

If KUC decides to resume operations,<sup>4</sup> it anticipates the mill would run 24 hours per day, 365 days per year. Mill throughput is expected to range from 2,500 to 3,500 tons (dry weight) of ore per day, with an average rate of 3,000 tons per day (KUC, 2014a). Under License SUA-1350, KUC is authorized to produce up to 1,859,748 kilograms (kg) (4,100,000 pounds [lb]) of yellowcake per year (KUC, 2016g).

### **1.3 Need for the Proposed Action**

As discussed in Section 1.2, KUC would perform conventional uranium milling at the SUP facility. The SUP mill is one of only three conventional uranium mill sites in the United States. Yellowcake produced at the SUP site would be used in commercial nuclear power plants. Renewal of License SUA-1350 for a 10-year period would allow KUC to help satisfy the need for domestically produced yellowcake.

### **1.4 Alternatives to the Proposed Action**

#### **1.4.1 No-Action Alternative**

Under the no-action alternative, the NRC would not renew License SUA-1350, and as a result, the mill and overall site would begin decommissioning. KUC has an approved site decommissioning plan (NRC, 1999b). KUC would commence decommissioning activities in accordance with their detailed decommissioning plan outlined in the Final Design Volumes V and VI, as amended (KUC, 1997d, e, 2004). Under License SUA-1350, License Condition 11.3 requires the completion of certain actions when the site begins decommissioning and reclamation. Any changes to the approved decommissioning, reclamation, or operations plans referenced in the license would require NRC review and approval.

The “Environmental Assessment for Source Material License SUA-1350, Renewal for Operations and Amendment for the Reclamation Plan” (NRC, 1999a) evaluated environmental impacts both of the resumption of mill operation and of decommissioning and site reclamation (stabilization of impoundments and decommissioning of land and buildings). The NRC staff finds that the conclusions in that review with respect to decommissioning and reclamation

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<sup>3</sup> Yellowcake is a type of uranium concentrate powder obtained from leach solutions in an intermediate step in the processing of uranium ores. It is a step in the processing of uranium after it has been mined but before fuel fabrication or enrichment.

<sup>4</sup> Operational mode is defined as any time the mill is in the normal commercial production of yellowcake.

accurately capture the no-action alternative; i.e., the denial of the license renewal request. Changes to resource areas are discussed in Chapter 4. By letter dated May 26, 2016, KUC requested a 5-year postponement of the initiation of the requirements for timely decommissioning of the SUP per 10 CFR 40.42(f) (KUC, 2016d). The NRC is reviewing this request, and the environmental impacts of that request will be reviewed as part that review.

## **1.5 Review Scope**

The NRC has reviewed KUC's license renewal request in accordance with NRC's environmental protection regulations in 10 CFR Part 51, which implement Section 102(2) of NEPA. This EA provides the results of the NRC staff's evaluation of the potential environmental impacts of KUC's request and of the no-action alternative.

The NRC staff has prepared this EA in accordance with the requirements in 10 CFR 51.21 and 51.30 and with the associated guidance in NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with Nuclear Material Safety and Safeguard Programs" (NRC, 2003). Pursuant to 10 CFR 51.31(a), the NRC will determine whether to prepare an environmental impact statement or a finding of no significant impact, based on this EA.

In addition to this EA, a SER is being prepared to evaluate the requested renewal against NRC requirements. In preparing these two documents, the staff will evaluate the potential safety and environmental impacts associated with the continued commercial operation of the SUP site. In addition to issuing this EA, if the NRC determines that the proposed action would not result in significant environmental impacts and determines in the SER that health and safety issues are appropriately addressed based on the licensee's application materials (KUC, 2014a, 2016d, 2018), inspection reports (NRC, 2009, 2011, 2013, 2016b) and other applicable references, a renewed commercial source material license would be issued to KUC.



## **2 URANIUM MILLING (PROPOSED ACTION) AND ALTERNATIVE**

### **2.1 Site Description**

The SUP site is located in Sweetwater County, Wyoming, in the Red Desert, approximately 68 kilometers (km) (42 miles [mi]) northwest of Rawlins, Wyoming. The site can be accessed by Minerals Exploration Road connecting U.S. Highway 287 (U.S. 287) and Wamsutter-Jeffrey City Road. The site, as defined by the NRC-licensed area, encompasses approximately 580 hectares (ha) [1,432 acres (ac)] and consists of the mill, ancillary buildings, existing tailings impoundments, a potential additional impoundment area, evaporation ponds, and diversion channels. Bordering the site is an overburden soil pile and a uranium ore pit (KUC, 2016g).

### **2.2 Current Facility Use**

The SUP facility was operational from 1981 to 1983, but is currently in standby mode (i.e., not in operation) due to market conditions. The site currently consists of a mill building, solvent extraction building, ancillary buildings, and an existing tailings impoundment including internal evaporation ponds and a diversion channel (KUC, 2014a).

The site location and layout have remained unchanged since the last license renewal in 2004. Activities at the site that have occurred since the last license renewal include the removal of the catchment basin and addition or removal of liquid storage tanks (KUC, 2014a). Otherwise, the use of adjacent lands and water have remained unchanged. Additional information about land use can be found in Chapter 3.

If the mill becomes operational, milling operations will involve grinding uranium ore, dissolving uranium, and separating uranium from the solution and tailings. The mill circuit is proposed to be the same as the original design and the 1999 revision, as reviewed and approved by the NRC (NRC, 1999a, b).

The requested design throughput annual production of 4,100,000 lb of  $U_3O_8$  per year would remain the same as that reviewed during previous renewals (KUC, 2016g). Milling operations are expected to begin when it is economically feasible to produce uranium. If the license renewal is granted, the mill would be licensed to operate for 10 years.

During standby, the licensee conducts a limited environmental monitoring program, which includes monitoring at one air particulate sampling station, two air radon sampling stations, and two direct radiation measurement locations.

### **2.3 Waste Management**

Waste management and disposal methods are unchanged from those discussed in the 1999 EA (NRC, 1999) as stated in KUC's ER (KUC, 2016g, 2018). KUC has proposed revisions to its Corrective Action Program (CAP); the NRC staff's evaluation of this proposal is being considered concurrently with the safety evaluation for the license renewal.

If operations resume at the SUP, the original tailings impoundment currently at the SUP site would not be used for future waste disposal. KUC plans to construct a new tailings impoundment and evaporation ponds at the site (KUC, 2014a). The evaporation ponds and new tailings impoundment would be lined with a layered system composed of two flexible synthetic membrane liners (60 and 40 mils in thickness, respectively) over a 1 meter (m) (3 feet [ft]) minimum thickness of compacted clay. The impoundment and ponds would be equipped with leak-detection and recovery systems, as specified in Final Design Volumes I, IV, and VII (KUC, 1997a, b, c).

Mill tailings would be disposed of in new tailings impoundment(s) that would be located onsite. Tailings and liquid waste would be transferred via pipeline to the impoundment system, which would consist of a series of synthetically lined cells that are designed for phased construction and reclamation. The 300-ac impoundment area may contain up to six cells to provide the required adequate disposal capacity for the life of the project. The impoundment area would be fenced to keep game animals and livestock out of the tailings impoundment. Radioactive waste management remains unchanged from the NRC's previous assessment in 1999 (NRC, 1999a).

No revisions are proposed by KUC to the previously approved design for the new tailings impoundment and evaporation ponds. The NRC staff previously concluded that, "... the liner design meets the requirements of Appendix A, Criterion 5A(2)" and that the "[s]tability of the synthetic liner system was addressed by the licensee's testing and placement plans (Volume IV, Section 3.3)" (NRC, 1999a). With regard to geotechnical design aspects, the NRC staff previously concluded that, "The earth construction and geotechnical engineering designs of the ponds and impoundment meet...the requirements of 10 CFR 40, Appendix A, for stability and longevity" (NRC, 1999a).

## **2.4 Decommissioning and Remediation**

KUC has an NRC-approved decommissioning plan for the SUP site (NRC, 1999b). The plan was amended in 2004 to include catchment basin contamination (NRC, 2005). An EA was completed for the amendment in May 2005 (NRC, 2005). Decommissioning the mill and land would include demolition of buildings and disposal of contaminated debris, equipment, and soil in the impoundment (KUC, 2014a). KUC is currently implementing a groundwater CAP as required by SUA-1350 License Condition 11.3. This CAP and subsequent activities address groundwater contamination from the existing impoundment. Details regarding groundwater contamination are documented in annual CAP reviews (KUC, 2016c). During review of this license renewal request, staff noted (NRC, 2016a) that the CAP, as specified in License Conditions 11.3 and 11.5, was not achieving compliance with the groundwater protection standard limits approved for the site. Staff also noted that the groundwater contamination may extend beyond the western boundary. KUC responded by letter dated September 1, 2016, committing to develop a characterization plan to better delineate the western margins of the potential groundwater plume (KUC, 2016e). KUC subsequently submitted a proposed characterization plan on September 15, 2016 (KUC, 2016g).

Groundwater restoration will continue to be conducted under the CAP, as authorized by the NRC license. As part of the license renewal review, the NRC staff is evaluating in its SER, License Conditions 11.3 and 11.5 with respect to the operation of the CAP. Under its most



recent proposal, KUC would be required to submit a revised CAP that fully characterizes the extent of the plume and acceptable methods for achieving and demonstrating compliance for those parameters that exceed the groundwater standards. Mill decommissioning and tailings area reclamation are governed by NRC regulations and the impacts from the planned decommissioning of land were evaluated in the 1999 EA; the licensee's current plan is unchanged from that which the NRC previously reviewed. Onsite restoration would include regrading and seeding disturbed areas. Future mitigation for windblown tailings would be conducted in accordance with Final Design Reports, Volume VI and Volume VI Part 2, and the existing impoundment reclamation plan.



### **3 DESCRIPTION OF THE AFFECTED ENVIRONMENT**

This chapter describes the existing regional and local environmental conditions at and near the SUP site (see Figure 3.1). The information forms the basis for assessing the potential environmental impacts of the proposed action in Chapter 4.

#### **3.1 Land Use**

The SUP site is located in the Great Divide Basin. The primary land uses in the area are mineral development (including uranium, oil and gas), grazing (including cattle, sheep, wild horses, and wildlife), and recreation (including hunting and camping). Other ancillary activities are electricity transmission, gas transmission, and livestock and wildlife watering wells (KUC, 2014a; NRC, 2016b).

The region in which the site lies is primarily used for livestock grazing, dispersed recreation, wildlife range, oil and gas production, and mineral exploration. The rangeland surrounding the site supports cattle, sheep, horses, and antelope. The area's climate is harsh for agriculture; it is characterized by low precipitation and a short growing season. The growing season for Rawlins is approximately 100 days. Soil and climate conditions are not conducive to crop production and would most likely prevent the area from being used for any agricultural purpose except rangeland, as the NRC noted previously (NRC, 1999a). Other oil extraction and uranium exploration activities occur near the site and within the Great Divide Basin. As required by License Conditions 11.2 and 12.3, KUC submitted its annual land-use report, in which it stated there are no residences, wildlife preserves, sanctuaries, or designated recreation areas within 5 mi of the SUP site (KUC, 2016a, 2016b).

Oil and gas development and production continue in the area. A 24-inch (in.) buried gas pipeline and other gas development activities are shown in Figure 3.2. Oil and gas drilling activities are occurring to the west, north, and south of the SUP facility, creating additional traffic along Sweetwater County Road 4-23 south of the facility. Ur-Energy, Inc. is conducting uranium exploration drilling and well completion work approximately 4 mi due north of the facility. A gas booster station related to gas development in the area has been installed west of the SUP facility (see Figure 3.2) (KUC, 2016a).

Ur-Energy, Inc.'s Lost Creek project (an in situ uranium recovery operation) commenced production in August 2013. This facility is approximately 6 mi northeast and downwind of the SUP facility (KUC, 2016a). As shown in Figure 3.2, most of the infrastructure for the Lost Creek project lies more than 5 mi northeast of the SUP facility, with the exception of one deep disposal well. Extensive uranium-related claim staking occurred within a 5-mi radius of the facility, primarily to the north and west. A 230-kilovolt (kV) power line from the Jim Bridger Power Plant passes through the area. A 34.500-kV power line feeds the SUP facility from the north (see Figure 3.2). There are two mobile homes near the south edge of the site's chain link fence. These homes are used by the site overseer and facility security personnel (KUC 2016a).

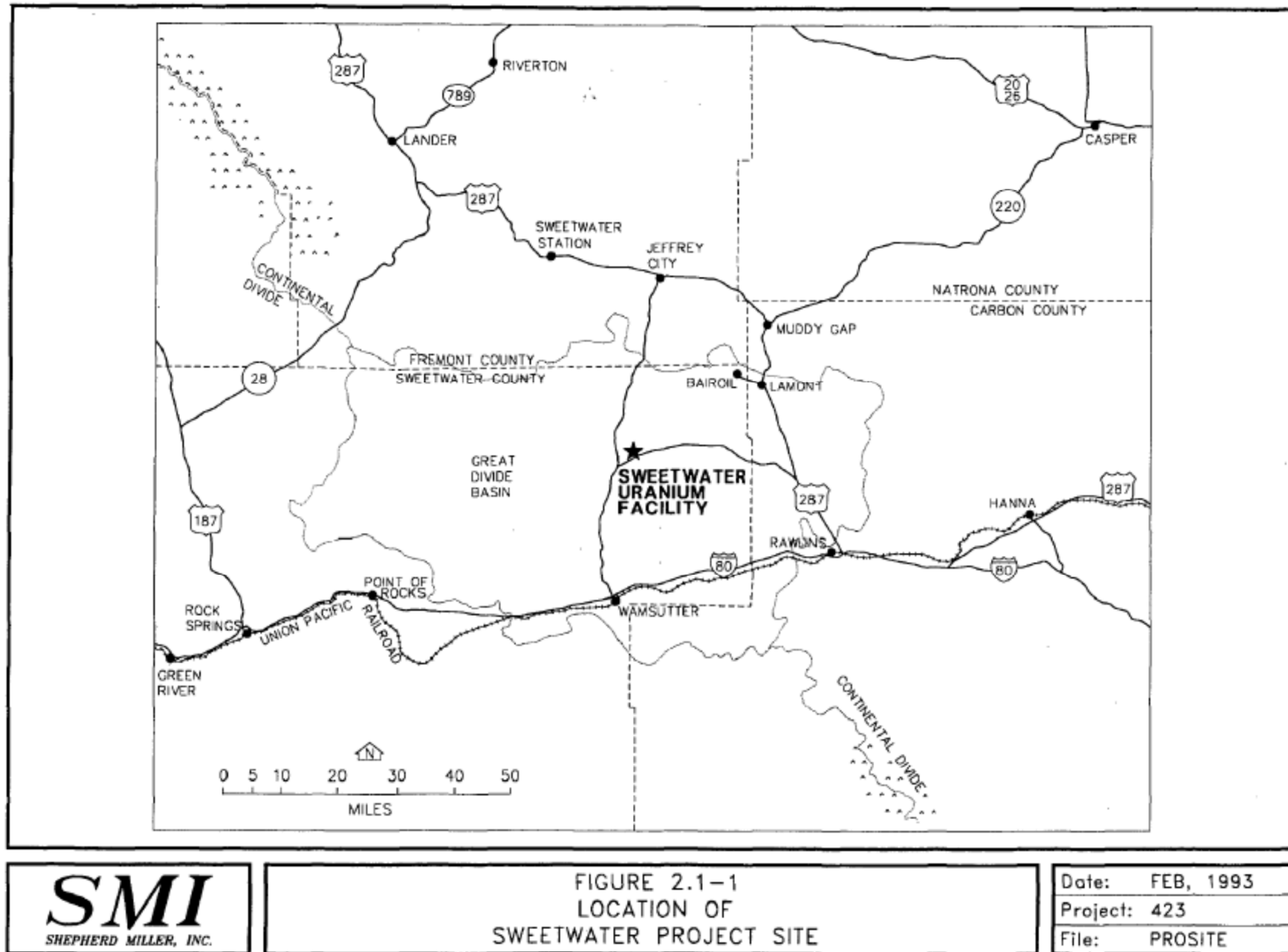


Figure 3.1. Geographical Location of the Sweetwater Uranium Project (KUC, 2016a)

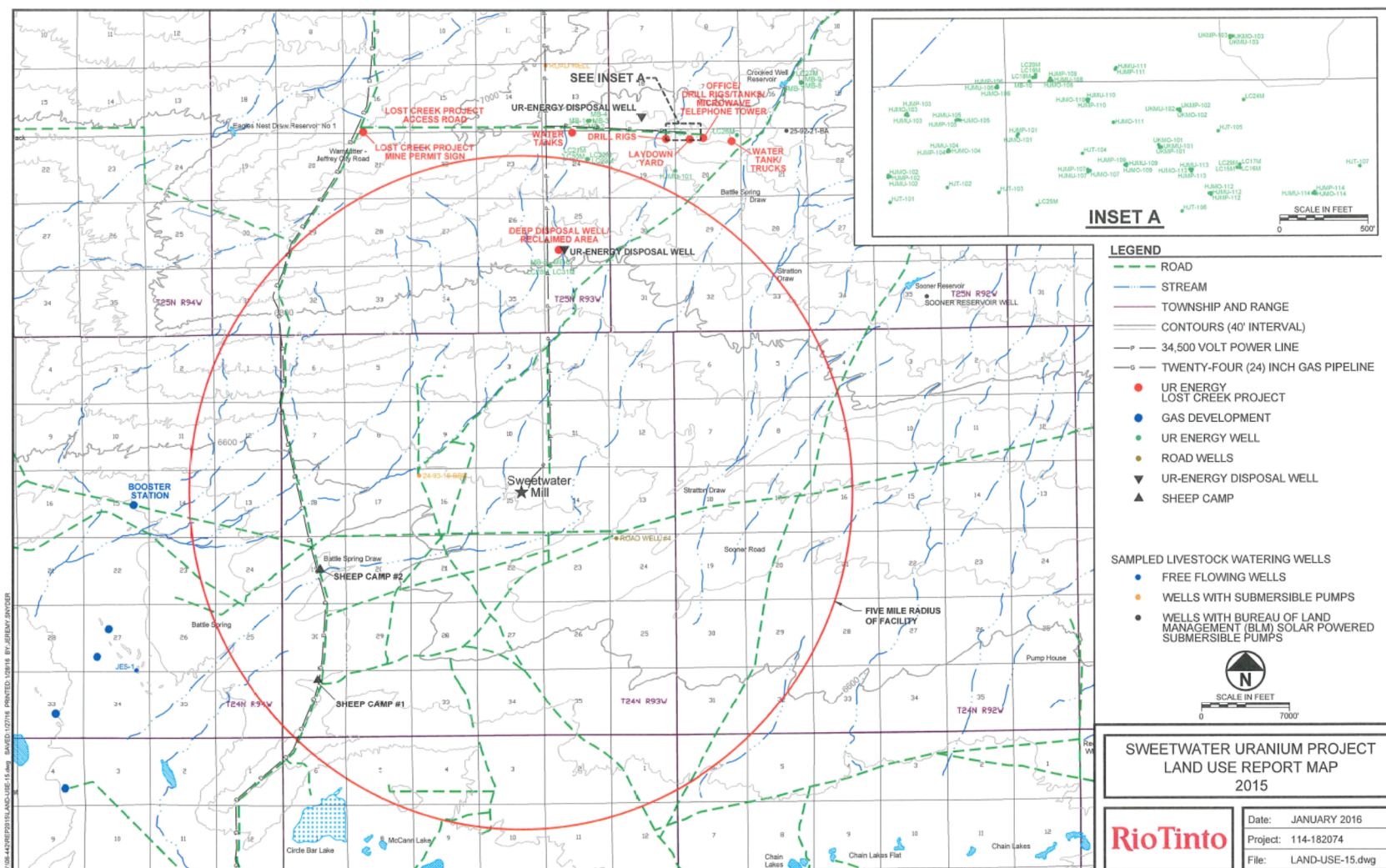


Figure 3.2. Land-Use Activities in the Vicinity of the Sweetwater Uranium Mill (KUC 2016b)

## **3.2 Transportation**

The transportation system serving the project site includes both public roads and railroad. The railroad is located 42 mi south of the site. No new roads are proposed. The primary public road is U.S. 287, which runs from Rawlins north to Jeffrey City. Several County roads serve the area, including Minerals Exploration Road (County Road 63) and Crooks Gap Road (County Road 23). Mineral Exploration Road is the most direct route to the site from paved U.S. 287. Average annual daily traffic counts on U.S. 287, south of Muddy Gap in Carbon County, were 2,428 and 2,556 in 2016 and 2015, respectively (WY DOT, 2018). Kennecott is responsible for maintaining 8 mi of paved access roads in Carbon County in and around the SUP site (KUC, 2018).

In standby mode, the estimated daily traffic associated with the SUP site would be four employees traveling to and from the site daily. There would be an additional four trips for deliveries and visitors. If KUC goes to full operational status, there would be approximately 35 employees traveling to the site daily and approximately 35 visitors and deliveries daily (KUC, 2016g).

## **3.3 Geology and Seismology**

### **3.3.1 Regional and Local Geology**

As discussed in the 1999 EA (NRC, 1999a), the SUP site is located in south-central Wyoming in the Red Desert area of the Great Divide Basin. Dominant rock types in the basin consist of conglomerates, sandstones, siltstones, mudstones, and lignitic and subbituminous coals. All of these rocks are of continental origin and were deposited under fluvial, lacustrine, and paludal conditions. The Tertiary rocks have been divided into six formations, the oldest being the Fort Union Formation of Paleocene age that is only known from drilling records. The Fort Union is unconformably overlain by sediments of Eocene age of the Green River, Wasatch, and Battle Spring Formations. These beds are conformably overlain by the Eocene Bridger Formation, which in turn is unconformably overlain by the Brown's Park Formation of Oligocene to Miocene age. Holocene alluvium consisting of sands, silts, and gravels covers much of the present surface.

The uranium deposits in the area are contained in the Battle Spring Formation, which outcrops partially in the area of the SUP site. It consists of interfingered beds of arkosic sandstone, siltstone, and mudstone. The sandstones are generally fine to coarsely grained, poorly sorted, and slightly clayey. These sandstones often grade into interchannel deposits of siltstone and mudstone. The uranium contained in the Battle Spring Formation was previously mined and milled near the SUP site. Uranium deposits in the area include those at Green Mountain and Sheep Mountain in Fremont County, Wyoming (KUC, 2016e).

The Battle Spring and Wasatch Formations are the two most important aquifers in the Great Divide Basin. The Battle Spring Formation underlies the site and interfingers with the Wasatch Formation to the southwest of the site (NRC, 1999a). According to the license application, only a portion of the Battle Spring Formation is exposed or immediately underlies the alluvium in the project area. This formation was deposited as a typical deltaic conglomerate and consists of

intercalated and interfingered beds of arkosic sandstone, siltstone, and mudstone. The sandstones are generally fine to coarsely grained, poorly sorted, and slightly clayey (KUC, 2014a). The application further provides that at and around the SUP site, the sandstones are lenticular, often grading laterally into interchannel deposits of siltstone and mudstone. Siltstone and mudstone are the most continuous and have the greatest lateral extent. The sandstones of the Battle Spring Formation are host rocks for uranium mineralization in the area (KUC, 2014a).

The NRC staff confirmed that the licensee's regional geologic descriptions are consistent with more recent characterizations, including (1) U.S. Geological Survey (USGS, 2016) data on the geologic units in Sweetwater County, Wyoming, (2) the description of the regional geology and stratigraphy of the Great Divide Basin by Abzalov and Paulson (2012), and (3) the characterization of the hydrogeology of Sweetwater County in described by Mason and Miller (2005). The NRC staff finds that the previous site-specific geological studies remain consistent with current literature, experience, and inspections.

### **3.3.2 Seismicity**

The seismicity analysis for the site was presented in the 1995 ER Addendum (KUC, 1995). The deterministic hazard analysis concluded that seismogenic potential is primarily associated with the Green Mountain Segment of the South Granite fault and Chicken Springs fault system. KUC submitted updated information pertaining to seismicity at the SUP site (KUC, 2016a). KUC summarized its review of information regarding a fault northeast of the Lost Creek In Situ Recovery (ISR) facility as identified in (Lost Creek ISR, LLC, 2007). KUC indicates that the Lost Creek fault is not characterized as an active fault in the Lost Creek ER (Lost Creek ISR, 2007) nor is it included in active fault surveys by U.S. Geological Survey (USGS, 2016) or the Wyoming State Geological Survey (Casey et al., 2002). The Lost Creek facility is approximately 5 to 6 mi north of the SUP facility. The Wyoming State Geological Survey publication documents a seismological characterization of Sweetwater County, Wyoming. The NRC staff notes that the deterministic analysis of regional active faults in or near Sweetwater County presented by Casey et al. (2002) is consistent with previous findings (NRC, 1999b) regarding seismic hazards at the SUP facility.

## **3.4 Water Resources**

### **3.4.1 Surface-Water Resources**

The SUP site is located in the east-central portion of the Great Divide Basin in an area north of the playa and alkali lakes that occupy the topographically lowest part of the basin. There are no natural surface waters located within a 5-mi (8-km) radius of the site. Several closed lakes lie approximately 5 to 10 mi to the south and southeast of the site, including Circle Bar Lake, Hansen Lake, and several other lakes in Chain Lakes Flat. All runoff from the site area, however, empties into Battle Spring Flat (KUC, 2014a, 2016f).

The Great Divide Basin is an internally drained basin defined by a bifurcation of the Continental Divide. The site lies in the east-central portion of this basin in the ephemeral Battle Spring Draw watershed. The Battle Spring Draw watershed empties into Battle Spring Flat, a playa located approximately 9.7 km (6 mi) southwest of the site (KUC, 2016g). In most instances, surface-

water flow infiltrates the soil before reaching Battle Spring Flat. Any runoff that reaches Battle Spring Flat is eventually lost to soil infiltration and evaporation (KUC, 2016g).

There is very little surface water in the Great Divide Basin (EPA, 2018). Some shallow perennial lakes are located a few miles south of the site in Chain Lakes Flat, which is near the center of the basin. Heavy precipitation can cause some surface flow in draws, but these flows are infrequent because average annual precipitation is only about 12.7 to 15.2 centimeters (cm) (5 to 6 in.). No surface drainage leaves the basin (KUC, 2016g).

### **3.4.2 Groundwater Resources**

Hydrogeologic units that occur beneath the SUP site and in the vicinity include the following: recent alluvial, windblown, and lake deposits; the Eocene Battle Spring Formation; the Paleocene Fort Union Formation; and the Cretaceous Lance Formation. These units are classified as aquifers (saturated) and depending on their hydrologic characteristics, yield groundwater to wells and springs. The Battle Spring and Wasatch Formations are the two most important aquifers in the Great Divide Basin (NRC, 1999b).

The site is located within a closed groundwater system. The low point of this groundwater basin is found at approximately 1981 meters (m) (6500 ft) south and southwest of the site. Groundwater moves toward the center of the basin and discharge occurs principally in the playa lakes to the south (Chain Lakes) and southwest (Battle Spring Flat) of the site. Because the basin is also closed topographically, the discharged water is ponded, and most of this water is lost to evaporation. In addition, there is some discharge from springs near Battle Spring and Chain Lakes Flats. This water is also subject to evaporation (NRC, 1999b).

The Battle Spring Aquifer is recharged mainly by infiltration of precipitation in its outcrop area near the perimeter of the Great Divide Basin. Precipitation also may seep into the aquifer in smaller amounts throughout the basin, especially in areas where sand dunes directly overlie the surface (NRC, 1999b).

There are wells in the Battle Spring or Wasatch Formations. The Battle Spring Formation underlies the site and interfingers with the Wasatch Formation southwest of the site. This water is used for potable water supplies for industry, stock watering, domestic use, and miscellaneous other uses. All non-KUC water uses within an 8-km (5-mi) radius of the site are for only for stock watering. These water uses are controlled by the U.S. Bureau of Land Management (BLM), the State of Wyoming, and private parties. There are no non-KUC domestic or potable water supplies down-gradient of the site (KUC, 2016a).

The SUP's potable water wells are the only ones used as sources of drinking water in the area. The BLM maintains three water wells with tanks for livestock and wildlife watering along Sweetwater County Road 63 (1 mi southeast, 4 mi east, and 5 mi northeast of the facility) as well as at least seven wells equipped with solar-powered submersible pumps for livestock and wildlife watering in the general area (KUC, 2014a).



### 3.4.3 Hydrology and Water Quality

A leak in the upper portion of the single-layer synthetic liner at the existing tailings impoundment caused tailings water to seep downward into the underlying geologic materials (Shepherd Miller, Inc., 1994). Evaporation was used to lower the water level in the impoundment to below the elevation of the damaged liner. Since the mid-1980s, mine personnel have operated an enhanced evaporation system in the tailings impoundment consisting, at various times and as conditions warranted, of a spray system, liner drip system, and/or flooded evaporation lagoons to decrease fluid volumes in the impoundment and evaporate pumpback water (KUC, 2016g). A groundwater-pumping system north and west of the tailings impoundment was initiated in 1986 to recover contaminated groundwater and the associated contamination in the Battle Spring Aquifer. KUC continues to pump groundwater and discharge wastewater to the tailings impoundment for subsequent evaporation (KUC, 2016a).

As discussed in Section 2.4 of this EA, KUC is implementing a CAP, in accordance with SUA-1350 License Conditions 11.3 and 11.5, to restore groundwater concentrations of chromium, U-nat, and Ra 226-228 in areas that were affected by previous milling activities. However, the staff determined the CAP is not currently achieving compliance with the groundwater protection standard limits identified in License Condition 11.3. In a recent submittal, KUC proposed revisions to its CAP. The NRC staff is reviewing potential revisions to the CAP concurrent with its license renewal review. License SUA-1350 also requires that the groundwater protection standards apply to point of compliance wells TMW-15, 16, 17, and 18, which are located near the perimeter of the existing tailings impoundment.

During operations, KUC would use the following methods to monitor groundwater at the new tailings impoundments and evaporation ponds (KUC, 2017):

- injection of bromide into the tailings stream to create a unique chemical signature in the tailings solution
- monitoring of the leak-detection and recovery systems for the new tailings impoundment and evaporation ponds
- monitoring of wells (located near the southwest corner of the new tailings impoundment and completed above a clay layer in the unsaturated zone) for the presence of bromide-bearing fluids
- groundwater monitoring of the Battle Spring Aquifer

The NRC staff's technical evaluation of this proposal will be presented in the staff's SER.

## 3.5 Ecological Resources

### 3.5.1 Terrestrial and Aquatic Ecology

Vegetation at the SUP site consists of Wyoming sagebrush, big sagebrush, grasses, and other shrubs. Large wild and domestic animals occurring on or near the SUP site include pronghorn antelope (*Antilocapra americana*), cattle, feral horses, and sheep. Prairie dog towns were not evident within 8 km (5 mi) of the SUP site. Various bird species traverse the site, and the most abundant raptor species in the region is the ferruginous hawk (*Buteo regalis*). Greater sage-

grouse (*Centrocercus urophasianus*) (hereafter referred to as sage-grouse) have also been noted within 8 km (5 mi) of the site. A few reptiles and amphibians occur in the general region. Most species recorded in the area are associated with sagebrush habitats and a reclaimed pit lake, which provides one of the few permanent high-quality water sources in the immediate region (KUC, 2014a). A very small wetland habitat, associated with the reclaimed mine pit, contains cattails (*Typha* spp.), sedges (*Cyperaceae* spp.), and other wetland associated species (KUC, 2014a).

### **3.5.2 Threatened and Endangered Species**

The U.S. Fish and Wildlife Service (FWS) has identified five wildlife species currently designated as listed, or involved in the listing process, under the Endangered Species Act of 1973 (ESA) as having the potential to occur in Sweetwater County. The interior least tern (*Sterna antillarum*) and whooping crane (*Grus americana*) are listed as endangered, the piping plover (*Charadrius melodus*) is listed as threatened, the yellow-billed cuckoo (*Coccyzus americanus*) is listed as proposed threatened, and the sage-grouse is listed as a candidate species. Only the sage-grouse has the potential to occur on or in the vicinity of the SUP site. In addition, the FWS has identified two plant species listed as threatened under the ESA as having the potential to occur in Sweetwater County: the Ute ladies'-tresses (*Spiranthes diluvialis*) and western prairie fringed orchid (*Platanthera praeclara*). Neither species has been documented on or in the vicinity of the SUP site (KUC, 2014a).

No current threatened and endangered species have been documented on or in the vicinity of the SUP site. Furthermore, no designated critical habitat is present for any listed or proposed listed species (FWS, 2017). Potential habitat for the candidate sage-grouse is present, and this species is the only one known to occur within the vicinity of the SUP site (KUC, 2014a). In addition, no federally listed rare, threatened, and endangered plant species are known to occur within the SUP site.

The FWS was contacted by letter dated April 20, 2017, for an updated list of threatened and endangered species for Sweetwater County (NRC, 2017a). The FWS response, dated May 23, 2017, included a list of rare, threatened, and endangered species that could occur in Sweetwater County (FWS, 2017). None of the identified species were identified on the SUP site or are potentially affected by the proposed action; therefore, no further consultation with FWS is needed.

## **3.6 Climatology, Meteorology, and Air Quality**

### **3.6.1 Meteorology and Climatology**

The climate of the site vicinity is determined by its location in a high elevation desert basin, and includes abundant sunshine, little rainfall that occurs primarily in the warmer months, moderate to high wind speeds, and a large diurnal variation in temperature. Thunderstorms are common in the spring and summer in Wyoming. However, precipitation is relatively low in the site area; typically, rainfall averages range from a few hundredths to an inch per month. Heavy local storms occur and can produce 2.5 to 5.1 cm (1 to 2 in.) of rainfall. According to Hydrometeorological Report No. 55-A (NWS, 2017), the 6-hour probable maximum precipitation estimated for the site is 26.7 cm (10.5 in.).

### **3.6.2 Air Quality**

The U.S. Environmental Protection Agency (EPA) has established standards to protect human health and welfare and to protect against damage to the environment and property. These standards include the National Ambient Air Quality Standards (NAAQSs), which address six common air pollutants: (1) carbon monoxide, (2) lead, (3) nitrogen dioxide, (4) particulate matter, (5) ozone, and (6) sulfur dioxide. Compliance with the NAAQSs is determined for each pollutant, and an area is classified to be “in attainment” when concentration levels are below the thresholds. The Upper Green River Basin Area has been classified as a nonattainment area for the ozone 8-hour NAAQS. This basin is located within portions of Sweetwater, Lincoln, and Sublette Counties. Sheridan County is in nonattainment for the particulate matter 24-hour NAAQS (EPA, 2017). All other surrounding counties are in attainment for all pollutants.

### **3.7 Noise**

Due to the rural location of the SUP facility, the most significant noise source in the area is from traffic along access roads and the surrounding area. The site is located in Sweetwater County, approximately 68 km (42 mi) northwest of Rawlins, Wyoming. Bairol, located approximately 36 km (22 mi) northeast, is the nearest community to the SUP site. With the exception of resident onsite personnel, the nearest resident is located 28 km (17 mi) east of the site (KUC, 2016a).

### **3.8 Historic and Cultural Resources**

The National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their undertakings on historic properties. Historic properties are defined as resources that are eligible for listing on the National Register of Historic Places (NRHP). The criteria for eligibility are listed in 36 CFR 60.4 and include (1) association with significant events in history; (2) association with the lives of persons significant in the past; (3) embodiment of distinctive characteristics of type, period, or construction; and (4) sites or places that have yielded or are likely to yield important information (ACHP, 2012). The historic preservation review process (NHPA Section 106) is outlined in regulations the Advisory Council on Historic Preservation issued in 36 CFR Part 800.

Historical and cultural resources present at the SUP site are described in the 1999 and 2005 EAs (NRC, 1999a, 2005). In 1993, Pronghorn Archeological Services conducted a Class III cultural resource inventory; 1,520 ac (615 ha) of land to be impacted by mill operations were surveyed for potential resources. The survey yielded three sites and five isolates. Two of the sites (48SW9827 and 48SW9828) were determined to be not eligible, and one site (48SW9829) was considered to be eligible for inclusion in the NRHP. However, after consultation with the State Historic Preservation Office (SHPO), the Office recommended site 48SW9829 remain unevaluated until such time that more investigative work is deemed necessary due to potential impacts by site activities (NRC, 2005). KUC stated that no work had been performed or is planned in the area of 48SW9829, and therefore no further evaluation has been completed (KUC, 2018). In addition, according to a recent search of the NRHP, there are no registered sites within 3 mi of the proposed facility (NPS, 2017).

KUC is required by License Condition 9.8 to perform an archaeological survey and obtain approval before disturbing any previously unsurveyed areas, and to cease work if buried cultural deposits are unearthed until approval to proceed is granted by the NRC and SHPO (NRC, 2015). License Condition 9.8 will be revised to include previously surveyed areas containing any site determined to be potentially eligible. Therefore, KUC would be required to perform additional testing at site 48SW9829 to determine its eligibility prior to any disturbance in that area.

### **3.9 Visual and Scenic Resources**

There are no residents in close proximity to the SUP site; the nearest resident is located 17 mi (28 km) east of the site. The nearest town is 36 km (22 mi) from the SUP. KUC's ER estimated the visibility of the tallest mill structure (about 80 ft), under conditions of maximum visibility, to be about 9 km (5.5 mi) (KUC, 2014a). Because of the curvature of the earth, the structure would be below the horizon beyond this point. Further, reduced visibility and small variations in topography limit the view of this structure to shorter distances (KUC, 2014a).

### **3.10 Socioeconomics**

The SUP site is located in Sweetwater County, approximately 68 km (42 mi) northwest of Rawlins. Bairoil is the nearest community to the site, located approximately 36 km (22 mi) northeast of the site. The nearest resident is located 28 km (17 mi) east of the site. Populations have increased since the 2000 census bureau data, as discussed in the 2005 EA (NRC, 2005). The 2010 census data for communities within 80 km (50 mi) of the site are Rawlins 9,259; Sinclair 433; Wamsutter 451; Bairoil 106; and Jeffrey City 58 (Census Bureau, 2017). These populations are consistent with data provided by KUC in its ER (KUC 2016f), as shown in Table 3-1. These data are also consistent with the American Community Survey 2012–2016 5-year estimates of the 2016 population in these five communities of 10,032, slightly lower than the numbers reported in the 2010 census (U.S. Census, 2018).

The communities in the area include Jeffrey City to the north, Bairoil to the northeast, Wamsutter to the south, and Rawlins to the southeast. There have been no changes to the potentially affected population within a 5-mi radius of the SUP site. The nearest resident is still located 17 mi (28 km) east of the site. There are no permanent residents within a 5-mi radius of the SUP facility. Although not a permanent resident, the Site Security Officer who occupies a trailer onsite when not on duty and sleeping in the Security Trailer, is considered the nearest resident for purposes of the calculation of dose to the nearest member of the general public (NRC, 2015).

**Table 3-1. Population of the Nearest Communities**

<b>Community</b>	<b>Distance (km)</b>	<b>Direction</b>	<b>Population (year)</b>
Bairoil, Wyoming	36	Northeast	108 (2012)
Jeffrey City, Wyoming	50	North	58 (2010)
Rawlins, Wyoming	63	East-Southeast	9,113 (2012)
Wamsutter, Wyoming	43	South	464 (2012)
Sinclair, Wyoming	44	East-Southeast	433 (2010)
<b>Total</b>			10,176

Source: Section 3.10 of KUC (2016f)

### **3.11 Public and Occupational Health**

Background doses to the public were determined to be approximately 212 millirem per year (mrem/yr) whole body, for the region, which is approximately one-third of the average annual average dose of 620 mrem (NRC, 1999a). Results from NRC-specific MILDOS-AREA dose modeling (based on expected ore grade from Green Mountain mine), including radon, indicated effective whole-body doses to the nearest resident of no more than 0.23 mrem/yr; and to residents of Bairoil, the nearest community, of 0.24 mrem/yr, as a result of the resumption of mill operations. The effective doses in Bairoil are slightly higher because of the direction of the prevailing winds. These exposure values are very small fractions of either the background dose rate, the average annual dose rate in the United States, or NRC public exposure limits in 10 CFR Part 20.

KUC's environmental monitoring program, which includes sampling for air particulate, air radon, soil, vegetation, and direct radiation during operations, is consistent with Regulatory Guide 4.14 (NRC, 1980). With the exception of the recent relocation of one sampling location, the air particulate, air radon, soil, and direct radiation program has not changed since the NRC's previous safety and environmental analyses in 1999 and 2004. Semiannual effluent monitoring results and annual as low as reasonably achievable (ALARA) audit reports indicate that KUC has maintained potential radiation exposure levels below regulatory limits. Airborne particulate sampling is conducted at a single location downwind of the tailings impoundment and ore stockpiles. Samples are collected semiannually and analyzed for U-nat, Ra-226, Th-230, and Pb-210.

Radiation Protection Standards at 10 CFR Part 20 provide limits on worker exposure to radiation and incorporate the principle of maintaining doses ALARA. Radiation safety measures that comply with these 10 CFR Part 20 standards must be implemented at the SUP site to protect workers and to ensure radiation exposures and doses are below occupational limits as well as being ALARA. The calculated annual external dose estimate for the maximally exposed worker for the period from 2004 to 2013 was 132 mrem/yr (KUC, 2014a). This is significantly below the dose limits specified in 10 CFR Part 20. KUC's compliance with NRC radiation protection requirements was also evaluated (and found acceptable) in multiple inspections since the last license renewal (NRC, 2009, 2011, 2013, 2016a).

### **3.11.1 Radiological Offsite Impacts**

Radiological impacts from milling operations at the SUP site have been previously estimated and documented in monitoring reports during and after operation of the mill. Groundwater contamination has occurred as a result of tailings pond leakage in 1984. KUC is currently implementing a CAP to reduce further spread of contamination. Revisions to the CAP are being considered concurrently with this license renewal review, including potential changes to applicable license conditions to ensure compliance with the groundwater protection standards as specified in SUA-1350 and applicable requirements.

Although no guidelines concerning acceptable limits of radiation exposure have been established for the protection of species other than humans, limits for humans are generally conservative for other species. Doses from gaseous effluents to terrestrial biota (such as birds and mammals) are quite similar to those calculated for humans and arise from the same dispersion pathways and considerations. Because the effluents of the facility would be monitored and maintained within safe radiological protection limits for humans, no adverse radiological impact is expected for animals residing on or near the SUP site. This is consistent with findings in previous NRC reviews of these activities (NRC, 1999a, 2005).

Site personnel must wear individual monitoring devices for external exposure (thermoluminescent dosimeters, film badges, or other National Voluntary Laboratory Accreditation Program-approved devices), regardless of whether or not it can be demonstrated that it is unlikely that site workers would receive doses from external sources in excess of 10 percent of the limits. This is done because radioactive materials are being actively handled onsite and exposures requiring monitoring could occur, especially during maintenance operations and other activities not related to normal operations (KUC, 2014a).

### **3.11.2 In-Plant Safety**

The office, shop, and mill buildings have 9-kg (20-lb) portable, dry-chemical fire extinguishers, and all vehicles are equipped with 1.1- to 4.5-kg (2.5- to 10-lb) portable, dry-chemical fire extinguishers. There are also two 68-kg (150-lb) portable, dry-chemical extinguishers onsite. An over-tank sprinkler system capable of foam injection is installed in the solution extraction building. Fire hydrants with 76 m (250 ft) of hose are installed every 183 m (600 ft) around the mill area. In addition, there are fire hydrant hose stations in most project buildings (KUC, 2014a).

An onsite Radiation Safety Officer is part of the facility staff. A safety engineer also would be included on the staff during mill operations. During operations, at least one person trained in first aid would be present during each work shift. The office building contains a first aid treatment room, and an ambulance is maintained onsite at all times (KUC, 2014a).

As required by 10 CFR Part 20 and KUC license conditions, the radiological safety program includes the basic elements needed to ensure that exposures are kept ALARA. A revised radiation safety program was submitted and approved by NRC in 1994, and has not been subsequently revised.

KUC is required by License Condition 12.3 to submit an annual ALARA audit report to the NRC during the first quarter of the following year. The licensee has also submitted a Radiation Protection Program for Decommissioning (KUC, Section 12 of Volume VI, Part 2, June 9, 1999e) that was previously reviewed and accepted by the NRC (NRC, 1999b). The NRC's safety evaluation of the licensee's radiation safety program will be documented in the staff's SER.

### 3.12 Waste Management

The primary source of solid and liquid byproduct material generated at the SUP facility would be mill tailings. Other wastes produced by the SUP facility and other ancillary buildings would primarily be recycled in various milling operations, discharged to the tailings impoundment, or discharged to a sanitary waste leach field. All waste disposal would occur onsite; no waste would be hauled off site, other than municipal waste. Waste volumes for standby and operations are described in the Table 3-2 below.

Additional information about mill waste disposal can be found in the NRC's 1999 EA for the SUP facility (NRC 1999a), which is based upon standby and proposed operational impacts that are unchanged in the current license renewal request. Tailings from operations would be stored onsite in up to six double-lined tailings impoundments, and the NRC staff have determined that those impoundments would provide adequate disposal capacity during all phases of the SUP.

**Table 3-2. Waste Volumes Generated at the SUP Site**

<b>SUP Status</b>	<b>Solid Waste (T/yr)</b>	<b>Liquid Waste (T/yr)</b>
Standby (11e2)	0	113,000
Standby (all other material)	1.1	121
Operations (11e2)	1,095,000	273,000
Operations (all other material)	15.5	1,865
Source: KUC, 2018		





## **4 ENVIRONMENTAL IMPACTS**

In this chapter, the NRC staff presents its evaluation of the potential environmental impacts from the proposed continuation of site activities for 10 years and from reasonable alternatives to that proposed action. In performing this evaluation, the NRC staff reviewed the KUC license renewal application and ER; collected information from local, state, and federal government agencies; and then independently evaluated the environmental impacts on the various resources of the affected environment. The staff applied the guidelines outlined in NUREG-1748 (NRC, 2003) in performing its evaluation.

In evaluating the significance of potential impacts in this EA, the NRC staff used the following significance levels identified in NUREG-1748 (NRC, 2003), which account for context and intensity:

**SMALL:** The environmental effects are not detectable or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource.

**MODERATE:** The environmental effects are sufficient to noticeably alter but not destabilize important attributes of the resource.

**LARGE:** The environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The NRC staff's analysis of potential environmental impacts from the proposed action is based on (1) KUC's operating over the proposed 10 year period and (2) data that reflect current site conditions and activities.

In addition to the KUC proposed action, the NRC staff also analyzed the no-action alternative. Under the no-action alternative, the NRC would not renew License SUA-1350, and as a result, all operations (including those activities in standby mode) at the SUP site would be required to cease. Site decommissioning would begin, and KUC would begin groundwater remediation, site reclamation in accordance with the Final Design Volumes V, VI, and VI Part 2 (KUC, 1997d), and decommissioning in accordance with the Final Design Volume VI, Part 2 (Mill Decommissioning Plan) (KUC, 1997e).

### **4.1 Land Use**

Under the proposed action, KUC has not identified significant changes in onsite land use in the near future, and with the renewal of the license, operations would continue to be conducted within the limits of the license boundary. No additional construction activities are proposed if the facility would remain in standby mode; however if KUC begins operations, construction of up to six impoundments may be needed. The NRC has previously approved the design of these impoundments, and their impacts have been assessed; the current license renewal proposal does not differ from that which the NRC reviewed and approved in 1999 (NRC, 1999a, b). The current land use in the region would remain unchanged. As discussed in Section 3.1, no onsite

changes to land use have occurred since the license amendment and renewal in 2004. If the facility were to begin operating, activities associated with operations would be of short duration and would be completed as described in the 1999 license amendment EA (NRC, 1999a). Therefore, impacts on land use from operations (including standby mode) under the proposed action are expected to be SMALL.

Under the no-action alternative, operational impacts on land use would be limited because under this alternative, site operations would cease as the facility shuts down in a manner protective of the environment and public health and safety. KUC would begin reclamation and decommissioning activities. As discussed in Section 3.1, no onsite changes to land use have occurred since the license amendment and renewal in 2004. There would be short-term effects in land use associated with the required and approved mill decommissioning and tailings impoundment reclamation activities discussed in the 1999 EA. These impacts would be limited to the license boundary. Reclamation of the surface would begin under an approved reclamation plan, whose impacts have already been evaluated (NRC, 1999a). During decommissioning, approximately 965 ac would be reclaimed (KUC, 2018). Therefore, impacts on land use under the no-action alternative would also be SMALL.

## **4.2 Transportation**

Under the proposed action, in standby mode, approximately four employees would commute to and from the site daily with an additional four trips being made for deliveries and visitors. If mill operations were to resume, the estimated 35 permanent employees would likely commute to the site from Rawlins by way of U.S. 287 and Mineral Exploration Road. As many as 35 additional delivery and transportation vehicle trips would occur each day (KUC, 2016a). Mill-related material would be shipped under transportation regulations associated with the shipment of yellowcake. Rural two-lane highways are generally rated for up to 2,800 passenger trips per hour. Therefore, the number of daily vehicle trips added for operation of the mill would not disrupt the traffic in this rural area. Therefore, transportation impacts under the proposed action would be SMALL.

Under the no-action alternative, the license would not be renewed and KUC would begin reclamation and decommissioning activities. There would be short-term effects on transportation associated with required and approved mill decommissioning and tailings impoundment reclamation activities. It is anticipated that 20 crew members would travel back and forth to the site during site decommissioning via U.S. 287 and County Road 63 (KUC, 2018). No significant changes have been made in transportation corridors, proposed decommissioning activities, or nearby residential population since the reclamation plan was approved (KUC, 2016g). Therefore, the impacts under the no-action would also be SMALL.

## **4.3 Geology and Soils**

Under the proposed action, there would be no additional construction activities associated with renewal of the SUP license, but up to six additional lined tailings impoundments may be constructed if operations resume, as evaluated in the 1999 EA (NRC, 1999a). A groundwater contamination event was noted at the site following an EPA site-screening inspection at the facility in February 1989. As described above in Sections 2.4 and 3.3, KUC would continue to

implement the CAP and remediation of contaminated soils and, because no new manufacturing facilities would be constructed and no changes are proposed in the operation of the facility, impacts for the proposed action on soil would be SMALL.

Under the no-action alternative, the license would not be renewed and KUC would begin reclamation and decommissioning activities. The project area soils and subgrade geologic formations have been impacted by previous operations by wind dispersion of tailings, leaks of diesel fuel storage tanks, and seepage of mill and solvent extraction fluids (KUC, 2016a). As previously discussed, KUC continues to implement the CAP to address issues associated with legacy groundwater contamination, and has proposed revisions to its CAP. The NRC staff's review of the CAP, including potential revisions to the license, are being considered concurrently with this license renewal review. Under the no-action alternative, the CAP would similarly continue during decommissioning activities, because these activities are required independent of the facility's operating status. Therefore, the impacts would also be SMALL.

## **4.4 Water Resources**

### **4.4.1 Surface Waters**

The NRC staff previously determined that the operation of the mill and reclamation of the site would have a minimal effect on the surface waters in the site vicinity (NRC, 1999a); this evaluation remains accurate because the licensee's operational and reclamation plans are unchanged since that review. These findings apply to the current license renewal request because (1) mill effluents will not discharge to surface waters, (2) the site will not use any surface water in its milling process, (3) there will be no change in the milling process that would result in a significant change in the environmental impacts at the site, and (4) mill liquid effluents (spills) should not leave the mill area. KUC will not use any surface water for mill operations or reclamation (KUC, 2014a; NRC, 1999a). Thus potential impacts on surface water under the proposed action would be the same as those evaluated for the currently licensed facility and would remain SMALL.

Under the no-action alternative, the license would not be renewed, and KUC would begin reclamation and decommissioning activities. Impacts on surface waters would be the similar to those under the proposed action. Surface-water characteristics and precipitation have not changed significantly since the decommissioning and reclamation plans were approved. Therefore, under the no-action alternative the impacts on surface waters would also be SMALL.

### **4.4.2 Groundwater**

The tailings impoundment has a single 36-mil synthetic liner that leaked several times between 1980 and 1984, and was repaired. Actions were taken to reduce the wave action that led to failure of the liner seams on the side slopes of the tailings pond. The contamination did not leave the site but did enter the upper aquifer. An NRC-approved groundwater CAP was used to reduce the contaminated plume created by the leaks (NRC, 1999b). KUC continues to implement the CAP and to treat the groundwater (NRC, 2016b). Appropriate revisions to the CAP are under evaluation for the present license renewal review. Any necessary revisions will be reflected in the NRC's SER.

Considering the current extent and depth of contamination, the continuous spread of contamination despite the actions taken to confine it, and the likelihood of existing small leaks that are difficult to detect, the impacts for a standby condition are MODERATE. During operations, the facility would produce additional effluents; however, KUC stated that it would not use the current impoundment for any new tailings, and that the new tailings impoundments would be double lined, and a leak-detection system would be used (KUC, 2014a). The CAP, with any necessary revisions, would allow adequate monitoring to mitigate impacts that would further groundwater contamination. Therefore, in consideration of the proposed revisions to the program, as well as current efforts to contain previous contamination, impacts on groundwater during operations would be SMALL to MODERATE.

In the event that the license is not renewed, KUC would begin decommissioning at the SUP site. The groundwater is currently being restored under an NRC-approved CAP and this effort would continue through decommissioning. Appropriate revisions to the CAP are under evaluation for the present license renewal review. Any necessary revisions will be reflected in the NRC's SER. Compliance with groundwater standards would have to be achieved before license termination. There have been no other significant changes to the resource since the decommissioning and reclamation plans were approved. Therefore, groundwater impacts under the no-action would be SMALL.

#### **4.5 Ecological Impacts**

As discussed in Section 3.5, no current threatened and endangered species have been documented in the study area. Furthermore, no designated critical habitat is present for any listed or proposed listed species. Potential habitat for the candidate sage-grouse is present and this species is the only one known to occur within the vicinity of the SUP site. Under the proposed action, KUC does not plan any new construction or any changes for the standby or operational modes that could disturb ecological resources. The environmental impacts related to construction of the tailings impoundments have been evaluated previously by the NRC (NRC, 1999a). Thus, the NRC staff has determined that the impact on ecological resources from the proposed action would be SMALL.

Under the no-action alternative, KUC would begin reclamation and decommissioning activities. There would be associated short-term impacts on the ecological habitat while these activities proceed. However, the FWS has confirmed (FWS, 2017) that there are no threatened or endangered species located in the affected area. There is a sage-grouse core area within 1.5 mi (2.4 km) of the SUP site. State regulations exempt existing land uses prior to August 1, 2008, from core area stipulations. Impacts would therefore also be SMALL.

#### **4.6 Climatology, Meteorology, and Air Quality**

Under the proposed action, no new facilities would be constructed for either the standby or operational modes. Impacts on climatology, meteorology, and air quality for the standby mode are not expected to change from current conditions and would be SMALL. Impacts under the operational mode are expected to be the same as those previously assessed (and unchanged as currently proposed) for operations in the 1999 EA (NRC, 1999a). Emissions generated from

operations at the SUP facility would be minor, and would not impact the present NAAQSs attainment status, and impacts would be SMALL.

Under the no-action alternative, KUC would begin reclamation and decommissioning activities. There are expected to be short-term impacts on the air quality associated with activities related to the approved reclamation and decommissioning activities such as fugitive dust emissions. Air-quality impacts would be mitigated by using dust-control measures such as wetting down affected areas. Therefore, the expected impacts under the no-action alternative would also be SMALL.

#### **4.7 Noise**

As discussed in Section 3, there are no residents in close proximity to the SUP site. Noise levels are expected to range between 80 and 85 dB(A) at a distance of 15 m (50 ft) from operating heavy equipment (KUC, 2018). These are not levels of concern for occupational workers for 8 hours (OSHA, 2018). Additionally, noise from the site is not detectable at the nearest town, which is approximately 36 km (22 mi) from the SUP facility. This distance from the facility to the nearest community helps mitigate offsite noise impacts. The closest resident is 28 km (17 mi) from the site. Thus, noise from the site is not detectable at the location of the nearest resident. Therefore, the impacts would be SMALL.

Under the no-action alternative, KUC would begin reclamation and decommissioning activities. There have been no significant changes to the resource, including the location of the closest resident, since the 2004 renewal and 1999 approval of the reclamation and decommissioning plans. There would be an increase over ambient noise levels associated with increased site activities associated with decommissioning. However, these impacts would be of short duration and due to the distance of the closest resident, impacts are expected to be SMALL.

#### **4.8 Historic and Cultural Resources**

Under the proposed action, KUC does not plan for any new construction or any changes for either the standby or operation modes that could disturb any historic and cultural resources. This includes the potential construction of additional tailings impoundments if KUC were to resume operations. Therefore, all historic and cultural resources were addressed during the last license renewal, because there are no other material changes or changes in KUC's proposed activities. Thus, the NRC staff has determined that the proposed action would have no effects on historic and cultural resources because no new ground-disturbing activities are expected to occur.

Based on the license condition and commitments made by the licensee, as stated in Section 3.8, the NRC staff considers that historical and cultural resources would be protected from destruction or disruption by the proposed activities. If site 48SW9829 were disturbed by standby or operational activities, KUC would be required to perform additional archaeological testing to determine its eligibility for listing. There have been no other significant changes to the resource since the previous evaluation. Therefore, impacts on historic and cultural resources would be SMALL.

Under the no-action alternative, the license would not be renewed, and KUC would begin reclamation and decommissioning activities. No additional cultural sites have been identified since the approval of the decommissioning and reclamation plans. Therefore, the resources would likewise remain unaffected and therefore the impacts would be SMALL.

#### **4.9 Visual and Scenic Resources**

Under the proposed action, no additional construction activities are proposed, other than the potential construction of additional tailings impoundments that the NRC evaluated in the 1999 EA (NRC, 1999a). There would not be any new buildings or any changes to existing structures for either the standby or operation modes. The facility would not otherwise change in appearance. Visual impacts would not be substantially different than those already present and, therefore impacts under the proposed action would be SMALL.

In the event that the license is not renewed, KUC would begin reclamation and decommissioning activities. The SUP site is located in a Class IV Visual Resource Area (BLM, 2008). The site would be reclaimed by removing the facility and stabilizing the surface. Over time the land would be regraded and revegetated to be consistent with the existing topography and landscape. Therefore, impacts on visual and scenic resources would be SMALL.

#### **4.10 Demographics and Socioeconomics**

If KUC were to commence operations, the SUP site would provide long-term employment for 30 to 35 people, and there would be other temporary employment. If KUC continued to operate in standby mode, KUC would continue to employ approximately four people at the SUP site. KUC noted that most of the employees commute from Rawlins (KUC 2016a). Continued operations would generate direct and indirect tax revenues. Public services (e.g., schools, police and fire protection, etc.) may be minimally impacted by operations of the mill. The NRC staff concludes that such impacts to socioeconomics from the SUP would be SMALL.

Under the no-action alternative, the license would not be renewed and KUC would begin to decommission the SUP. There would be a short-term increase in employment to complete these activities. It is expected that 10 to 20 workers would be required for site reclamation activities. These activities would be temporary and employment opportunities would end when reclamation and decommissioning are concluded. The economy of the area has not significantly changed since approval of the decommissioning and reclamation plans, and such potential changes would have at most minimal effects. Therefore, the impacts would be SMALL.

#### **4.11 Public and Occupational Health**

Based upon the staff's previous safety reviews of the licensee's public and occupational radiation protection program and NRC inspections of the SUP facility (NRC, 2009, 2011, 2013, 2016b), the NRC staff concludes the potential radiation doses to occupationally exposed workers and members of the public during normal operations would be within NRC limits and would be SMALL.

Expected exposures are less than 0.25 percent (0.0025) of the corresponding 10 CFR 20 standard of 100 mrem/yr for the public and approximately 0.14 percent (0.0014) of the regional background radiation. Therefore, the NRC staff concludes that the impacts of resuming the mill operations would be SMALL. Regarding the protection of workers, the radiological health and safety impacts from operations at the site were assessed during the previous reviews (NRC, 1999a, 2005), and the staff's evaluation of these impacts remains accurate, because the proposed activities are unchanged, and as confirmed by NRC inspections (NRC, 2009, 2011, 2013, 2016a).

The NRC staff previously evaluated impacts from accidents due to equipment failure, failure of storage tanks and piping, risk of fires and explosions, and transportation accidents (NRC, 1999a). The radiological impacts from accidents would be SMALL for workers if KUC followed its radiation safety and accident procedures and SMALL for the public because of the facility's remote location. The nonradiological public and occupational health and safety impacts from normal operations and accidents, driven primarily by risks from chemical exposure, would be also be SMALL, consistent with the NRC staff's safety and environmental review of KUC's chemical and accident safety procedures.

If the license is not renewed, KUC would begin reclamation and decommissioning activities. There would be a short-term increase in exposure associated with the effort to complete these activities. Standard operating procedures and safety and health practices for workers would be mandated under NRC requirements and the license. Offsite radiation doses would be monitored and action would be taken if any radiation levels approach the regulatory limits. During decommissioning, radiation doses would not be expected to exceed regulatory standards. Therefore, the impacts would be SMALL.

#### **4.12 Waste Management**

The proposed action is not expected to cause additional impacts on waste management beyond the impacts described in the NRC's 1999 EA for the license renewal and the reclamation design for the SUP site. Because no new manufacturing facilities would be constructed and no changes are proposed in the standby and operational modes for the facility, the impacts for the 10-year renewal period would be expected to be similar to those of the existing standby mode and operations assessed in the 1999 EA (NRC, 1999a). Considering that the rate of waste generation from standby mode (which includes waste from groundwater cleanup) is not expected to change significantly from current levels, the impact for the proposed action on waste management for the standby mode would be expected to be SMALL.

Waste types generated during operations would be the same as those generated during standby mode; however, waste volumes would be increased due to the additional operational time of the facility and would be extended in duration until the proposed 10-year license expires. Considering that the rate of waste generation would not be more than originally proposed and evaluated by the NRC (NRC, 1999a), the impacts for the proposed action on waste management, consistent with the NRC staff's evaluation of groundwater in Section 4.4.2 would be SMALL to MODERATE.

Under the no-action alternative, KUC's license would not be renewed, so site decommissioning activities would commence. A number of wastes would be generated during decommissioning, including steel, concrete, cinder block, contaminated soils, and windblown tailings. All 11e.2 byproduct material would be disposed of in the existing tailings impoundment (KUC, 2018). Wastes generated under the CAP to address groundwater contamination would be pumped to the existing tailings impoundment. These wastes and associated cleanup activities would be subject to monitoring under an approved plan. Therefore, the impacts would be SMALL.



## **5 CUMULATIVE IMPACTS**

Present activities in the vicinity of the SUP site include dispersed ranching, oil and gas exploration, and the operations of the Lost Creek in situ uranium recovery mill, currently operating approximately 9.8 km (6.1 mi) north of the SUP site. Oil and gas operations are primarily in the vicinity of Bairoil, Wyoming, and along the Wamsutter-Cooks Gap Road to the southwest of the project site. The NRC staff also reviewed data from EPA's NEPA Assist tool, the Generic Environmental Impact Statement (NRC, 2009), and the most recent BLM Resource Management Plan environmental impact statement to determine if additional activities have occurred or are planned in the area, which included an increase in oil and gas extraction operations.

If the SUP were to stay in standby mode or resume operations, there could be additional impacts on the resource areas evaluated in Chapter 4 of this EA. However, those cumulative impacts are expected to be SMALL, based on the limited nature of the proposed activities, and the small deviations from current activities that would result, as evaluated by the NRC staff previously (see e.g., NRC, 1999a). Cumulative impacts may occur as a result of other regional activities in addition to the proposed action, which could impact certain resource areas, including transportation, geology, and soils. However, the impacts, in conjunction with other actions in the area would be small due to the limited traffic produced by the operation, and operational practices to prevent erosion and protect air quality. This region is classified as in attainment for air-quality standards. This would not be adversely affected by the small potential increase in fugitive dust from the facility.



## 6 LICENSE CONDITION CHANGES

Proposed changes in **BOLD**.

9.8 The licensee shall have an archeological survey performed prior to disturbing any previously unsurveyed areas **or previously surveyed areas containing any sites determined to be potentially eligible for listing in the National Register of Historic Places**. Such surveys shall be submitted to the NRC and the State Historic Preservation Office (SHPO) for review and approval. No such disturbance shall occur until authorization to proceed has been granted by the NRC and SHPO. In addition, all work in the immediate vicinity of any buried cultural deposits unearthed during the disturbance of land shall cease until approval to proceed has been granted by the NRC and SHPO.



## **7 AGENCIES AND PERSONS CONSULTED**

The NRC staff consulted with other agencies regarding the proposed action in accordance with NUREG-1748 (NRC, 2003). These consultations are intended to ensure that the consultation requirements under ESA Section 7 of the and under NHPA Section 106 are met.

### **7.1 U.S. Fish and Wildlife Service**

NRC staff contacted FWS by letter dated April 20, 2017, requesting FWS assistance in identifying the presence of endangered or threatened species or critical habitat at the KUC's SUP site and in the vicinity. By letter dated May 23, 2017, FWS notified the NRC that, from the information available to FWS, no federally listed or proposed endangered or threatened species occur within the area affected by the proposed action.

### **7.2 Wyoming State and Historic Preservation Office (WY SHPO)**

A copy of the Draft EA was sent to the Wyoming State Historic Preservation Office for comment by letter dated March 26, 2018 (NRC, 2018a). On April 9, 2018, the WY SHPO notified NRC that it had no comments related to the historic and cultural resources on the proposed license renewal (WY SHPO, 2018).

### **7.3 Wyoming Department of Environmental Quality (WDEQ)**

A copy of the draft EA was sent to the State of Wyoming Department of Environmental Quality (WDEQ) by letter dated March 26, 2018 (NRC, 2018b). The DEQ stated that they had no comments on the draft EA (WDEQ, 2018).



## **8 CONCLUSION**

Based on its review of the proposed action, and in accordance with the requirements in 10 CFR Part 51, the NRC staff has determined that renewal of NRC License SUA-1350, authorizing continued operations at KUC's uranium mill facility in Sweetwater County, Wyoming, for a period of 10 years would not significantly affect the quality of human health, safety, and the environment. In its license renewal request, KUC is proposing no changes in how it processes uranium, and no significant changes in KUC's authorized operations are planned during the proposed license renewal period. As discussed in the evaluation above, approval of the proposed action would not result in a significant radiological risk to public health or the environment; therefore, the NRC staff has determined that pursuant to 10 CFR 51.31, preparation of an environmental impact statement is not required for the proposed action and, pursuant to 10 CFR 51.32, a finding of no significant impact is appropriate.





## **9 LIST OF PREPARERS**

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