

ENVIRONMENTAL ASSESSMENT  
FOR AMENDMENT OF SOURCE MATERIAL LICENSE SUA-1350  
FOR THE CATCHMENT BASIN RECLAMATION

KENNECOTT URANIUM COMPANY  
SWEETWATER URANIUM PROJECT  
SWEETWATER COUNTY, WYOMING

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## 1.0 INTRODUCTION

### 1.1 Background Information

The Sweetwater Uranium Project (Site) is located in Sweetwater County, Wyoming, in the Red Desert, approximately 68 km (42 miles) northwest of Rawlins, WY. Site access is provided by the paved Minerals Exploration Road connecting Highway 287 with the Wamsutter - Jeffrey City Road. The Site, as defined by the NRC-licensed area, occupies approximately 445 hectares (1,100 acres), consisting of a mill, ancillary buildings, existing tailings impoundment, and the area of proposed impoundments, evaporation ponds, and diversion channels. Bordering the Site is an overburden soil pile and an uranium ore pit.

The Site is licensed and operated by Kennecott Uranium Company (KUC) under NRC Source Materials License SUA-1350, which was obtained in February 1979, to permit processing of uranium ore. Mill construction occurred in 1979 and 1980, and it processed ore mined from an adjacent open pit from February 1981 through April 1983. Mill tailings were disposed of in a 24.3-hectare (60-acre) below-grade lined impoundment, which was partially filled.

The mill has been in standby status since cessation of operation in 1983, and enough staff were retained to maintain the facility and perform environmental monitoring. Current license conditions authorize operation of an ion exchange uranium recovery facility and disposal of a limited amount of byproduct material originating off-site. Ore may not be processed at the Site until certain conditions are met and a pre-operational inspection is completed (License Condition 9.4).

During operations, uranium ore and other feed material were sized and transported to the semi-autogenous grinding mill. Resultant slurry was then pumped to the leach circuit, where the uranium materials were dissolved through the addition of a solution of sulfuric acid, sodium chlorate and steam heat. Discharge from the leach circuit was pumped to a series of six countercurrent decantation thickeners where the uranium-rich (pregnant) acid solution was separated from the barren tailings. Tailings, sand-sized solid particles, were pumped to a double-lined storage impoundment, while the uranium-rich solution was filtered and pumped to a solvent extraction system. The solution passed through a series of stages in which dissolved uranium was transferred from the aqueous phase to an organic or solvent phase. Kerosene was a component of the solvent extraction process, and as discussed below is consistent with diesel range organics (DRO) detected in soils and ground water. Uranium was removed from the organic phase by ammonium sulfate and then precipitated by the injection of ammonia gas. The final precipitate, commonly called "yellowcake" ( $U_3O_8$ ), was washed, calcined (dried under high heat), and packed into 55-gallon steel drums. Finished product was shipped to a uranium hexafluoride conversion plant and eventually manufactured into fuel for nuclear power plants.

### 1.2 Need for Proposed Action

During mill operations, fluids from the counter-current decantation and solvent extraction processes were discharged to a catchment basin located 305 meters (1,000 feet) west of the lined tailings impoundment (see Figure 1). The catchment basin is approximately 42.7 meters (140 feet) square, 3.7 meters (12 feet) deep, and the bottom is approximately 19.8 meters (65 feet) square. The basin sides were lined with concrete, while the bottom was unlined. Organics, metals, and radionuclides (byproduct material) have slowly migrated through the soil

beneath the basin into the underlying Battle Spring Aquifer.

To quantify the nature of the soil contamination, KUC collected over 500 subsurface soil samples, the results of which indicated that only nine samples contained DRO in excess of the 2,300 mg/kg Wyoming Department of Environmental Quality soils standard. The maximum DRO soil concentration was 4,870 mg/kg.

KUC also assessed ground-water contamination through ground-water sampling and analysis, the results of which indicated that the primary contaminants are DRO and radionuclides (Ra-226 and natural uranium (U-nat)). The current highest concentration of DRO is 630 mg/l, which occurs in one well. DRO concentrations in other wells are currently either non-detect or below 5 mg/l. Minute concentrations of volatile organic compounds and metals (aluminum, iron, and manganese) also occur in the ground water at the Site. KUC proposes to revise the current corrective action plan (CAP) to include ground water and soils remediation in the catchment basin area to address contamination that would otherwise not be addressed in the current CAP.

### 1.3 Proposed Action

The proposed action is a modification of the license conditions to NRC license SUA-1350 that will allow KUC to amend the ground-water CAP and the approved decommissioning plan to remediate soil and ground-water contamination below and adjacent to the catchment basin. Remediation will involve the excavation of soils exhibiting DRO concentrations in excess of 2,300 mg/kg (Wyoming Voluntary Remediation Program standard). The catchment basin is located within the area of contamination, which occupies approximately 3,345 square meters (4,000 square yards). Deepest DRO contamination in excess of 2,300 mg/kg is approximately 12.2 meters (40 feet).

KUC expects to excavate approximately 91,747 cubic meters (120,000 cubic yards) of DRO-contaminated soil including approximately 20,261 cubic meters (26,500 cubic yards) of material containing Ra-226 in excess of the standards found in Criterion 6(6), 10 CFR 40, Appendix A. Contaminated soils will be transported to the existing tailings impoundment for disposal. Residual contamination that remains under some structural foundations will be isolated with plastic sheeting prior to backfilling to be removed during future decommissioning operations. A zone of perched fluid overlying a clay lens and adjacent to the catchment basin will be removed during the soil excavation program.

After excavation and prior to backfilling, a verification sampling program will be undertaken to consist of surveying 10-meter grids on the excavation floor and walls and collecting composite samples from each 10-meter grid. Samples will be analyzed for radium-226, DRO, total extractable hydrocarbons, and oil range hydrocarbons. The resulting excavation will be backfilled with clean fill obtained from the sides of the Ore Pad, Overburden Pile, or another suitable source of clean fill to an elevation above the surrounding ground surface to form a slight mound. Mounding will prevent the accumulation of surface water on the excavation area. Soil excavation is expected to require approximately 5 months.

After completing the soil excavation program, contaminated ground water will be extracted and conveyed to the lined tailings impoundment. The purpose of water extraction is to prevent further migration of contamination and remediate ground water to meet ground-water protection standards. At this point in time, extraction will occur using three pumping wells (TMW-91, 96,

and 102) at a rate of 22.7 liters per minute (6 gallons per minute) from each well. Ground-water monitoring will occur quarterly at the well locations presented in Table 1. Ground-water monitoring will continue until the catchment basin ground-water protection standards presented in Table 2 and existing Site ground-water protection standards have been met. Figure 2 presents the pumping and monitoring well locations.

**Table 1  
Well Monitoring Network**

Well	Sampling Interval	Parameters
Pumping Wells - TMW-91, 96, 102	Quarterly	Table 5-5
Monitoring Wells TMW-92, 93, -94, -95, -97, -98, -99, -100, -101, -104, -111,-112, -113, -115	Quarterly	Table 5-5

1. Table 5-5 of the May 12, 2005, revised license amendment request.

**Table 2  
Catchment Basin Ground-Water Protection Standards**

Parameter	Ground-Water Protection Standard (mg/l)
1,1-Dichloroethane	3.0 (2)
1,1-Dichloroethene	0.007(1)
DRO	10(3)
GRO	10(3)
Naphthalene	1.5(3)
Toluene	1(1)
1,1,1-Trichloroethane	0.20(1)
1,2,4-Trimethylbenzene	0.012(4)
1,3,5-Trimethylbenzene	0.012(4)
m+p Xylenes	10(1)
Manganese	0.2(5)
Aluminum	1.8(5)
Iron	0.6(5)

- 1) - EPA MCL
- (2) - Wyoming Drinking Water Equivalent Level
- (3) - Wyoming VRP, Fact Sheet 12
- (4) - EPA RBC - Tap Water
- (5) - Background

#### 1.4 Review Scope

##### 1.4.1 Federal and State Authorities

NRC source material licenses are issued under Title 10, Code of Federal Regulations, Part 40 (10 CFR Part 40). In addition, the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), as amended, requires persons who conduct uranium source material operations to obtain a byproduct material license to own, use, or possess tailings and wastes generated by the operations.

This draft environmental assessment (EA) has been prepared in accordance with 10 CFR Part 51, "Licensing and Regulatory Policy and Procedures for Environmental Protection," which implements NRC's environmental protection program under the National Environmental Policy Act (NEPA) of 1969. In accordance with 10 CFR Part 51, an EA serves to: (a) briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI); (b) facilitate preparation of an EIS when one is necessary; and (c) aid the NRC's compliance with NEPA when an EIS is not necessary. Evidence presented herein includes a detailed description of the proposed action, impacts associated with the proposed action, and effects of the "No-Action" alternative. In undertaking this project, the licensee committed to complying with all applicable Federal and State regulations.

##### 1.4.2 Basis of NRC Review

The NRC staff has assessed the environmental impacts associated with the request for a license amendment to modify the CAP and reclamation plan, and documented the results of the assessment in this report. The staff performed this appraisal in accordance with the requirements of 10 CFR Part 51.

In conducting its assessment, the staff considered the following:

- Information contained in the previous environmental evaluations of the Sweetwater project;
- Information contained in KUC's application, and supplementary information;
- Information contained in land use and environmental monitoring reports;
- Personal communications with staff for the Sweetwater facility, State of Wyoming, and Federal agencies (see Section 8); and
- Information derived from NRC staff site visits and inspections of the Site.

## **2.0 ALTERNATIVES**

The proposed action is a modification of the license conditions to NRC license SUA-1350 that will allow KUC to amend the ground-water CAP and the approved decommissioning plan to remediate soil and ground-water contamination below and adjacent to the catchment basin. The alternatives available to the NRC are to:

- (1) Proposed Action - revise the license with such conditions as are considered necessary or appropriate to protect public health and safety and the environment;  
or
- (2) No Action Alternative - deny the license amendment request.

## **3.0 DESCRIPTION OF AFFECTED ENVIRONMENT**

### **3.1 Land Use**

The 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. The relatively flat surface of the Site is broken by a few low ridges.

The Great Divide Basin is an internally drained basin bounded on most sides by major structural uplifts - the Sweetwater Uplift to the north and northeast, the Rawlins Uplift to the east and southeast, the Rock Springs Uplift to the west and the Wind River Uplift to the northwest. To the south, the Great Divide Basin is separated from the Washakie Basin by Laney Rim and Cathedral Bluffs. Elevations in the immediate project area range from 1981 to 2041m (6500 to 6700 feet) above mean sea level. The surface slope is less than one degree - approximately 12.2 m (40 feet) per mile.

The licensee provided a land use survey by letter dated February 25, 2004, indicating that there is no change to local land use. The region where the Site lies is still primarily used for livestock grazing, dispersed recreation, wildlife range, oil and gas production, and mineral exploration. Rangeland surrounding the Site supports cattle, sheep, horses, and antelope. The area's climate is harsh for agriculture, with low precipitation and a short 100-day growing season. Soil and climate conditions are not conducive to crop production and will most likely prevent the area from being used for any agricultural purpose except rangeland. Primary recreational pursuits in the Great Divide Basin consist of hunting and sightseeing. Antelope, sage grouse and, to a lesser extent, mule deer are hunted in the Red Desert area.



### 3.2 Geology and Soils

Geomorphology of the Site, in its present configuration, is a result of tectonic activity associated with the Laramide orogeny (Late Cretaceous - 63 to 96 million years ago (MY)). The basin floor is a plateau marked by elongated ridges and isolated mountains, and the general altitude is 1,981 to 2,286 meters (6,500 to 7,500 feet) above mean sea level. Playa and alkali lakes are located south of the site at the lowest basin elevations.

Approximately 7,012 meters (23,000 feet) of consolidated sediments of Paleozoic Era (240 to 570 MY), Mesozoic Era (63 to 240 MY), and Cenozoic Era (present to 63 MY) occur in the Great Divide Basin. Sediments originated from various tectonic events including down-warping/erosion (Paleozoic Era), marine deposition (Paleozoic Era), and uplifting, erosion, and basin extrusion (Cenozoic Era). Tertiary Period (2 to 63 MY) rock sequences occurring in the basin consist of conglomerates, sandstones, siltstones, mudstones, lignitic and subbituminous coal. All Tertiary rocks are of continental origin deposited under fluvial, lacustrine, or paludal (marsh or swamp) conditions. Six formations comprise the Tertiary series including the Fort Union Formation, Green River Formation, Wasatch Formation, Battle Spring Formation, Brown's Park Formation, and recent alluvium.

At the Site, the two geologic formations of concern are the alluvium and the Battle Spring Formation. Although, the Bridge and Brown's Park formations overlie the Battle Spring Formation regionally, they do not appear in the site-specific stratigraphy. Alluvium consists of sands, silts, and gravels and covers much of the present surface. The Battle Spring Formation is a typical deltaic conglomerate (consolidated alluvial fan) consisting of intercalated and interfingering sandstone, siltstone, and mudstone. Sandstones are lenticular while the siltstones and mudstones are more contiguous and extensive.

### 3.3 Water Resources

#### 3.3.1 Surface Water

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 discharges into Battle Spring Flat, a playa located approximately 9.7 km (6 miles) southwest of the site.

Little surface water exists in the Great Divide Basin. 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; however, these flows are infrequent, since average annual precipitation is approximately 12.7 to 15.2 cm (5 to 6 inches). No surface drainage leaves the basin.

#### 3.3.2 Ground Water

Within the Great Divide Basin, the Battle Spring and Wasatch formations are the most important aquifers. Uses of these aquifers include potable water supplies for industry, stock watering, domestic, and miscellaneous. All non-Kennecott water uses within a 16.1-km (10-mile) radius of the Site are for stock watering purposes. These wells are owned by the Bureau of Land Management (BLM), the State of Wyoming, and private parties. There are no non-Kennecott

domestic or potable water supplies down gradient of the Site because the 16.1-km (10-mile) radius circle encompasses the hydrologic low point of the basin, Battle Spring Flat.

Uppermost hydrogeologic units underlying the Site and immediate vicinity include recent alluvial, windblown, and lake deposits and the Eocene Battle Spring Formation that interfingers with the Wasatch Formation southwest of the Site. The Site is located within a closed ground-water system with the basin low point within the 1981-m (6500-foot) contour south and southwest of the site. Regionally, ground water 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. Since the Basin is also closed topographically, the discharged water is ponded and primarily 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. The Battle Spring Aquifer is recharged mainly by infiltrating precipitation at its outcrop area near the perimeter of the Great Divide Basin. Precipitation may also seep into the aquifer in smaller amounts throughout the basin, especially in areas where sand dunes directly overlie the surface.

In the immediate vicinity of the catchment basin, the Battle Spring Formation consists of alternating, discontinuous beds of siltstone and sandstone. Aquifer test data indicates that the Battle Spring Formation behaves as an unconfined aquifer near the catchment basin although it is confined or semi-confined in other locations. Ground-water gradients are 0.003 ft/ft toward the southwest; hydraulic conductivity and Darcy velocity are respectively 0.019 cm/sec (54 ft/day) and 0.00019 cm/sec (0.54 ft/day) assuming 30 percent porosity.

### 3.4 Ecology

Most of the Site vegetation consists of Wyoming sagebrush, big sagebrush, grasses, and a variety of forbs and other shrubs. No Federally listed rare, threatened, and endangered (RTE) plant species are known to occur within the Site area based on recent observations and a wildlife survey done in 1997 (KUC, 1998). Large wild and domestic animals occurring on or near the survey area include: pronghorn antelope, cattle, feral horses, and sheep. Additionally, prairie dog towns were not evident within 8 km (5 miles) of the Site. Various bird species traverse the Site, and the most abundant raptor species in the region is the ferruginous hawk. Sage grouse have also been noted within 8 km (5 miles) of the Site. A few reptiles and amphibians occur in the general region, but little riparian vegetation and permanent water exists in the area, which restricts the habitat for most species.

The Fish and Wildlife Service (FWS) was contacted in September 2004, for an updated list of threatened and endangered species for Sweetwater County. The list was received on September 21, 2004 (FWS, 2004). According to the latest information, RTE species within Sweetwater County include the bald eagle (*Haliaeetus leucocephalus*), blackfooted ferret (*Mustela nigripes*), Ute ladies-tresses (*Spicantes diluvialis*), bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*). None of these species were identified onsite.

### 3.5 Meteorology, Climatolgy, and Air Quality

The climate of the Site vicinity is determined by its location in a high elevation desert basin, with the following general features: abundant sunshine, little rainfall occurring 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 in general. As a rule, however, precipitation is light in the site area, typically a few hundredths of an inch. Heavy local storms occur which can produce 2.5 to 5.1 cm (1 or 2 inches) of rainfall. The 6-hour probable maximum precipitation (PMP) at the site is 26.7 cm (10.5 inches), according to the Hydrometeorological Report No. 55-A (Hansen, et al., 1988).

### 3.6 Socioeconomic

The Site is located in Sweetwater County, approximately 68 km (42 miles) northwest of Rawlins. Bairoil is the nearest community to the Site, located approximately 36 km (22 miles) northeast of the Site. The nearest resident is located 28 km (17 miles) east of the Site. The 2000 census data for communities within 80 km (50 miles) of the site are: Rawlins 8,538, Sinclair 423, Wamsutter 261, and Bairoil 97 (Census Bureau, 2000).

### 3.7 Historical and Cultural Resources

Previous descriptions of the historical and cultural resources at the site are presented in the 1999 Environmental Assessment undertaken as part of a license renewal action (NRC, 1999). As discussed in the previous EA, 1,520 acres of area to be impacted by resumed mill operations was surveyed for potential resources. This new survey resulted in new sites, 48SW9827, 48SW9828, and 48SW9829, and five isolated sites. Site 48SW9829 is considered to be eligible for inclusion in the National Register of Historic Places; however, the State Historic Preservation Office (SHPO) indicated that eligibility should remain unevaluated until such time that more investigative work is deemed necessary due to potential impacts by site activities.

On March 5, 1998, NRC staff requested BLM consultation with tribal entities to assess the absence or presence of culturally significant areas to Native American tribes on the Sweetwater Site. The BLM replied on May 13, 1998, that none of the four groups contacted expressed an interest in this project. Based on the license condition and commitments made by the licensee, the NRC staff considers that historical and cultural resources will be protected from destruction or disruption by the proposed activities.

### 3.8 Public and Occupational Health

During the current standby mode, KUC has not conducted, performed, or measured stack, surface water, soil, or vegetation samples. In addition, airborne particulate sampling is 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. This approach has been approved by NRC staff. This level of environmental monitoring is also considered adequate for the catchment basin reclamation activity. Personnel monitoring will follow standard procedures to maintain potential doses as low as is reasonably achievable (ALARA).

### 3.9 Transportation

General transportation information is provided in the 1999 EA. Transportation activities associated with the proposed action include mobilization of earth moving and excavation equipment to the Site over public roads, transporting contaminated materials from the catchment basin area to the existing tailings impoundment, transporting backfill materials to the catchment basin excavation, and demobilizing excavation and earth moving equipment from the Site over public roads.

## **4.0 EVALUATION OF ENVIRONMENTAL IMPACTS**

### **4.1 Introduction**

Environmental impacts estimated before the original construction of the facility were assessed (NRC, 1978) and impacts during previous operations (1981-1983) were documented in environmental reports at that time. Impacts of future operations and decommissioning were estimated in the 1999 EA (NRC, 1999) for license renewal. Environmental monitoring on and near the Site, as required by license conditions 11.5 and 11.6, would alert the licensee to increased radiation levels to allow for appropriate corrective actions, as required.

### **4.2 Land Use**

All operations associated with the proposed action will occur within the current processing area of the site. Therefore, no additional impacts to land use beyond the Site boundaries are expected.

### **4.3 Geology and Soils**

Activities associated with the proposed action will include excavating contaminated geologic materials comprising the geologic units discussed in Section 3.2. KUC estimates the total volume of excavated material to be 91,747 cubic meters (120,000 cubic yards) that will be disposed of within the existing tailings impoundment as 11e.(2) byproduct material. The entire excavation will be backfilled with soils obtained from onsite sources.

KUC considers this action necessary to remove contamination source terms and expedite the ground-water remediation activities. Because the area of operations is localized, no geologic or soils impacts are expected beyond the excavation area.

### **4.4 Water Resources**

#### **4.4.1 Surface Water Impacts**

The NRC staff has determined previously that the operation of the mill and reclamation of the Site will have minimal effects on the surface waters in the Site vicinity (NRC, 1999). Because the catchment basin is within the Site, soil remediation and ground-water restoration activities will similarly have minimal impacts on surface water bodies in the Site vicinity.

#### 4.4.2 Ground Water Impacts

The existing tailings impoundment has a leak detection system and a single 36-mil synthetic liner that leaked several times between 1980 and 1984, and was subsequently repaired. Actions were taken to reduce the wave action that led to failure of the liner seams on the sideslopes of the tailings pond. Contamination did not leave the Site but did enter the upper aquifer. An NRC-approved Ground-Water Corrective Action Program (CAP) is reducing the contaminated plume created by the leaks. Ground-water protection standards will be met before license termination, and afterwards, DOE, as the Site custodian, will continue ground-water monitoring to ensure the standards are maintained.

As previously stated, ground water beneath the catchment basin is contaminated with DRO and radionuclides (Ra-226 and U-nat), with minute amounts of volatile organic compounds and metals (aluminum, iron, and manganese). The proposed project seeks to eliminate this contamination to the extent practicable, by removing the source term (i.e., contaminated soil) and extracting contaminated ground water. Public exposure to contaminated ground water by ingestion is not likely because an exposure pathway does not currently exist. However, exposure to workers by dermal contact, ingestion, or inhalation is possible during the excavation of contaminated soil and potential well drilling. The licensee's Health and Safety Program provides the necessary procedures to protect workers from the aforementioned exposures.

The proposed action would place the contamination on top of the tailings impoundment. This additional material will not impact the existing tailings fluid plume because of the relatively small amount of additional byproduct material and the existing CAP. The only alternative to the active restoration program is to leave the contamination in-place. Such an alternative perpetuates the contaminated ground water condition, which does not serve to protect public health and safety and the environment. Undertaking the proposed project will improve ground-water quality and is, therefore, the more protective alternative.

#### 4.5 Ecology

Site activities associated with the proposed action are not expected to impact rare, threatened, and endangered species. Site activities will occur in an industrial area of the Site that does not contain any previously identified rare, threatened, or endangered species. Information contained in September 21, 2004, FWS telefax transmittal (FWS, 2004) confirms previous conclusions that no impacts to such species would occur. Furthermore, the concentrations of DRO in soils and ground water are too low to promote the formation of a sheen or slick on the surface of the 60-acre tailings impoundment. Therefore, no injuries or deaths to migratory birds are anticipated, as a result of the proposed project.

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

Fugitive dust is expected to be generated by excavation during soil cleanup, and by wind erosion from developed areas. Dust and radon levels will be controlled through water spraying.

#### 4.7 Socioeconomic

Because there are no residents in close proximity to the Site, no people will be affected by the noise or visual impacts of proposed activities. There would be a minor positive impact on the local communities due to additional employee hiring and equipment rentals.

#### 4.8 Historical and Cultural Resources

The proposed activities at the Site are similar to those discussed in the 1999 EA (NRC, 1999). In addition, KUC is required by license condition to perform an archeological survey and obtain approval before disturbing any previously unsurveyed areas. Work must cease if buried cultural deposits are unearthed, until approval to proceed is granted by the NRC and SHPO. Because the proposed activities will occur in an existing industrial area, no historical or cultural resource impacts are expected.

#### 4.9 Public and Occupational Health

Current radiological impacts, as discussed in the semi-annual effluent monitoring report and annual ALARA Audit Report, indicate that the licensee has maintained potential radiation exposure levels to a reasonable level below the regulatory limits.

The ground-water contamination resulting from the tailings pond leakage in 1984, has not migrated off-site and the plume is maintained within 213.4 m (700 feet) of the impoundment and in the upper 80 cm (50 feet) of the aquifer by pumping the water to the tailings impoundment. Air monitoring samples for radionuclides indicate levels at a small fraction of the regulatory limits. The air sample location is on site; therefore, it is anticipated that radiation levels at the Site boundary approach background. During the proposed reclamation, potential off-site radiation doses will be monitored and action would be taken if any radiation levels approach the regulatory limits.

No guidelines concerning acceptable limits of radiation exposure have been established for the protection of species other than humans. Because facility effluents will be monitored and maintained within safe radiological protection limits for humans, no adverse radiological impact is expected for animals residing on or near the Site.

An on-site Radiation Safety Officer (RSO) is part of the facility staff. The office building contains a first aid treatment room, and an ambulance is maintained on-site at all times. The NRC, through 10 CFR Part 20 and license conditions, requires a radiological safety program that contains the elements needed to assure that exposures are kept ALARA.

#### 4.10 Transportation

No residents are located near the Site; therefore, no impacts are expected as a result of the temporary increase in vehicle traffic near the Site while implementing the remedial activities. No contaminated materials will be transported offsite during the activities associated with the proposed action. An onsite vehicle accident could occur spilling contaminated materials; however, public exposure would not be expected due to the lack of residences near the Site. Employee exposure would be mitigated through dust control measures, as discussed in Section 4.6 and through the use of personal protective equipment. Excavation and earth moving

equipment will be properly released by decontaminating and surveying before demobilizing from the Site.

## 5.0 RESTORATION AND DECOMMISSIONING

Ground-water restoration will continue to be conducted under the Corrective Action Program, as authorized by the NRC license. Mill decommissioning and tailings area reclamation are governed by NRC regulations and the impacts from the planned decommissioning of land have been addressed in the 1999 EA. Significant or long-term impacts should not occur off-site. On-site restoration will be performed to include regrading and seeding disturbed areas.

## 6.0 FINANCIAL SURETY

Under 10 CFR Part 40, Appendix A, Criterion 9, licensees are required to establish a financial surety adequate to cover the estimated cost for: (1) decommissioning and decontamination of the mill and mill site; (2) reclamation of any tailings or waste disposal area; (3) ground-water restoration, as warranted; and (4) the long term surveillance fee. The surety is based on an estimate which must account for the total cost that would be incurred if an independent contractor were contracted to perform the reclamation and decommissioning work.

The proposed 2004 surety amount for the Sweetwater mill was provided as Appendix 4 of the license renewal application dated May 25, 2004, and reviewed by NRC staff. In response to comments, KUC provided a revised surety document dated July 22, 2004. The NRC approved surety amount included adequate funds for the work proposed under this amendment request.

## 7.0 PROPOSED LICENSE CONDITION CHANGES

Proposed changes in **BOLD**.

- 9.10 Decommissioning of the facility shall be performed as presented in the Final Design, Volume VI, Part 2 - "Mill Decommissioning Addendum to the Existing Impoundment Reclamation Plan", submitted May 28, 1998, as supplemented by the response to comments submitted February 3, 1999, **and the catchment basin remediation plan dated May 12, 2004, as revised July 22, 2004, December 15, 2004, and January 18, 2005. The verification results of this remediation are to be submitted to NRC for approval, as soon as reasonably possible.** The NRC shall be notified and detailed SOPs for decommissioning (land and buildings) shall be available for review at least three (3) months before decommissioning begins.
- 11.3 The licensee shall conduct a corrective action program (CAP) with the objective of returning the **ground-water** concentrations of chromium, natural uranium, and combined radium-226/228 to the levels referenced in "Addendum to the Revised Environmental Report, Background Ground Water Quality and Detection Standards," January 1996, as revised by page changes January 8, 1998 (approved by the NRC letter of May 28, 1998), **and the catchment basin ground-water corrective action plan dated May 12, 2004, as revised July 22, 2004, December 15, 2004, and January 18, 2005.**

The ground-water protection standards at point of compliance (POC) wells TMW-15, 16,

17, and 18, with background being recognized in well TMW-5, are: arsenic = 0.05 mg/l, beryllium = 0.01 mg/l, cadmium = 0.01 mg/l, chromium = 0.05 mg/l, lead-210 = 8.9 pCi/l, nickel = 0.01 mg/l, combined radium-226/228 = 5.8 pCi/l, selenium = 0.01 mg/l, thorium-230 = 7.0 pCi/l, natural uranium = 36.0 pCi/l, gross alpha = 15.0 pCi/l, **manganese = 0.2 mg/l, aluminum =1.8 mg/l, and iron = 0.6 mg/l.**

Pump-back wells may be added or removed from service with the goal of improving the performance of the CAP. POC, monitoring, and pump-back wells shall be sampled at the locations, at the frequency, and for the parameters provided in Table 5-1 (for existing impoundment) of the Final Design Volume VII, submitted (page change) June 21, 1999. Reporting limits for sampled constituents shall be as provided in Table 5-11 of the Final Design Volume VII, submitted April 13, 1998.

**The catchment basin pump-back wells and monitoring wells TMW-92, 93, 94, 95, 97, 98, 99, 100, 101, 104, 111, 112, 113, and 115 will be sampled quarterly for diesel range and gasoline range organics and volatile organic compounds, in addition to the above constituents. The ground-water protection standards to be used to assess data from these wells are as follows: 1,1-dichloroethane = 3.0 mg/l, 1,1-dichloroethene = 0.007 mg/l, DRO = 10 mg/l, GRO = 10 mg/l, naphthalene = 1.5 mg/l, toluene = 1 mg/l, 1,1,1-trichloroethane = 0.20 mg/l, 1,2,4-trimethylbenzene = 0.012 mg/l, 1,3,5-trimethylbenzene = 0.012 mg/l, m+p xylenes = 10 mg/l, manganese = 0.2 mg/l, aluminum =1.8 mg/l, and iron = 0.6 mg/l.**

- 11.5 During any period of mill standby, the licensee shall conduct an environmental monitoring program in accordance with on-file SOPs for environmental monitoring, and in accordance with Table 5-1 of the Final Design Volume VII, submitted (page change) June 21, 1999, **as revised January 18, 2005.**

## **8.0 CONSULTATION WITH AFFECTED FEDERAL AND STATE AGENCIES**

As documented in the 1999 EA, the NRC staff contacted representatives of the USEPA, USBLM, USFWS, the Wyoming Fish and Game Department, SHPO, and the Wyoming DEQ regarding the proposed restart of the mill and eventual reclamation of the site. The proposed catchment basin reclamation has been discussed with staff of the Wyoming DEQ Water Quality Division. As previously stated, NRC contacted FWS in September 2004 to obtain updated information regarding rare, threatened, and endangered species (FWS, 2004). Results of this coordination are discussed in Section 3.4. Furthermore, the Wyoming SHPO, Wyoming DEQ, FWS, BLM, and the Environmental Protection Agency were forwarded copies of the draft environmental assessment. Comments were received from Wyoming DEQ and USFWS. Appendix A presents the comments and the manner in which the USNRC addressed these comments.

## **9.0 CONCLUSION**

The NRC staff has concluded that the proposed action is an appropriate response to soil and ground-water contamination discovered at the Site per 10 CFR 40, Appendix A. Environmental impacts associated with the proposed action do not warrant denial of the license amendment request. It is the staff's conclusion that the impacts associated with the request are within the



realm of impacts anticipated in the FES (NRC, 1978) and 1999 license renewal EA. Furthermore, denying the license amendment request would perpetuate a condition of ground-water contamination that does not serve to protect public health and safety and the environment.

The NRC staff has prepared this EA in support of the proposed action to amend materials license SUA-1350. On the basis of this EA, NRC has concluded that there are no significant environmental impacts and the license amendment does not warrant the preparation of an EIS. Accordingly, it has been determined that a FONSI is appropriate.

## **10.0 LIST OF PREPARERS**

Elaine S. Brummet, Ph.D.  
Project Manager, Division of Fuel Cycle Safety and Safeguards

Stephen J. Cohen, PG  
Hydrogeologist, Division of Fuel Cycle Safety and Safeguards

## **11.0 REFERENCES and SUBMITTALS**

Kennecott Uranium Company (KUC), letters and submittals to NRC:  
---Revised Radiation Safety Program, March 13, 1994  
---Revised Environmental Monitoring Manual (for mill operation), June 7, 1994  
---Revised Environmental Report, August 15, 1994  
---Addendum to the Revised Environmental Report - Geologic Cross Sections and Aquifer Information, August 10, 1995  
---Addendum to the Revised Environmental Report - Background Ground Water Quality and Detection Standards, February 2, 1996  
---Final Design Volume IV, Liner Design Report, July 23, 1997  
---Final Design Volume V, New Impoundment Reclamation Plan, August 1, 1997  
---Final Design Volume VI, Existing Impoundment Reclamation Plan, August 20, 1997  
---Final Design Volume VII, Operations Plan, September 18, 1997  
---Final Design Volume I, Executive Summary Report, October 7, 1997  
---Page changes, Background Groundwater Study, January 8, 1998  
---Final Design Volume VI, Part 2 (Mill Decommissioning Plan) includes proposed expanded NRC-licensed area, May 28, 1998  
---Page changes to Vol. I, V, VI, VII, and IX on channel design, revised cost estimate, and deletion of references to SOPs and license conditions, June 21, 1999  
---Annual Review 2003 - Corrective Action Program, Semiannual 10 CFR 40.65 Report (Airborne Effluents), Land Use Survey, and ALARA Report, February 24, 2004.  
---Request for license amendment to address catchment basin contamination, May 12, 2004 (ADAMS accession no. ML041450424)  
--- Response to comments with additional information, July 22, 2004 (ML042110148).  
---Response to comments, December 15, 2004 (ML043520255).  
---Page changes, January 18, 2005 (ML050350266).

Hansen, E.M., Fenn, D.D., Schreiner, L.C., Stodt, R.W., Miller, J.F., Hydrometeorological Report No. 55-A, National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, June 1998.

Letter to U.S. Bureau of Land Management Requesting Consultation on Eligibility of Sweetwater Site for Listing on National Register of Historic Places, March 5, 1998.

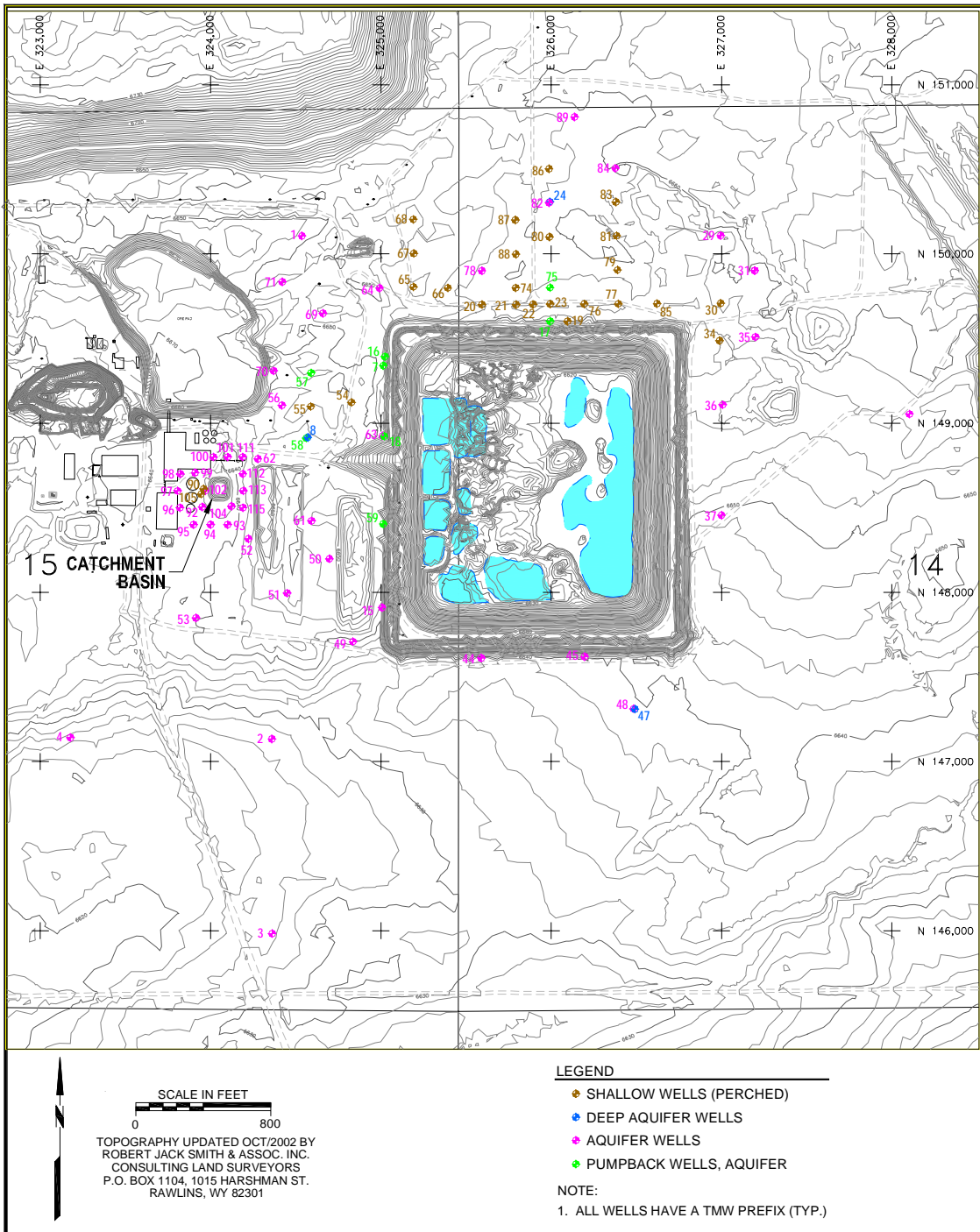
U.S. Fish and Wildlife Service, Telefax Transmittal of Updated Rare, Threatened, and Endangered Species List in Sweetwater County, Wyoming, September 21, 2004 (ML pending).

U.S. Nuclear Regulatory Commission, Final Environmental Statement Related to Operation of Sweetwater Uranium Project, Mineral Exploration Company, December 1978.

U.S. Nuclear Regulatory Commission, Environmental Assessment for Source Materials License SUA-1350, Renewal for Operations and Amendment for Reclamation Plan, July 1999.

U.S. Nuclear Regulatory Commission staff comments, June 24, 2004 (ML041800207).  
---request for additional information, October 28, 2004 (ML043070658)

# FIGURE 1



MFG, Inc.  
consulting scientists and engineers

SWEETWATER URANIUM FACILITY  
CATCHMENT BASIN LOCATION MAP

Date: APRIL 2004  
Project: 06-442\REP2004\1  
File: GW-MAP.dwg

FIGURE 2

