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2.2 Uses of Adjacent Lands and Waters

The study area for land and water use is comprised of the Permit Area plus the area within two miles of the Permit Area, except for information on nuclear fuel cycle facilities for which the study area is expanded to 50 miles from the Permit Area. The land and water uses within the study area are described below to provide the background information necessary to assess the potential impacts of the Project. Land and water use data support evaluation of the potential impacts from all aspects of the ISR operation, including radiation exposure calculations, cost-benefit analyses, and determination of air emissions.

2.2.1 Land Use

The land within the Permit Area is entirely publicly owned. Three-thousand-five-hundred-eighty acres (85 percent) are federal land, managed by BLM through the Rawlins and Lander Field Offices. Six-hundred-forty acres (15 percent) are state lands managed by the Wyoming Office of State Lands and Investments. Within the two-mile perimeter study area, 27,486 acres (96 percent) are federally owned; 983 acres (three percent) are state owned; and 307 acres (one percent) are privately owned (**Figure 2.2-1**). The current primary land use in the study area is rangeland for cattle and sheep, but the area is also used for dispersed recreation, such as hunting, off-highway vehicle (OHV) use, and antler collecting. There are no population centers within two miles of the Permit Area; the closest residence is in Bairoil, about 15 miles from the Project. There are no maintained roads within the study area, but a power line is present.

Rangeland and Agriculture

There is no crop production within the Permit Area or within two miles of the Permit Area; the only agricultural production is related to grazing. The study area includes portions of three grazing allotments: Stewart Creek, Cyclone Rim, and Green Mountain (**Figure 2.2-2**). These allotments provide forage for cattle that are generally sold as food sources, as well as a small number of horses and sheep. Grazing rights are assigned by section, so all sections that are at least partly within two miles of the Permit Area are included in the grazing allotment study area.

The Stewart Creek and Cyclone Rim allotments are managed by the BLM Rawlins Field Office, and cover 22,101 acres within the study area. Together, these two allotments provide 3,027 animal unit months (AUMs) of summer and winter grazing (Calton, M. Range Specialist. BLM Rawlins Field Office. Personal communication. July, 2007.). The Green Mountain allotment is managed by the BLM Lander Field Office, and includes 9,339 acres within the study area. This acreage provides 635 AUMs of summer grazing.

An AUM is an animal unit month, the common unit of measure defined as “the amount of forage to sustain one mature cow or the equivalent, based on an average daily forage consumption of 26 pounds of dry matter per day” (BLM, 2004a). The total AUMs for the study area is 3,662, which would provide year-round forage for the equivalent of 305 cows. For a 1,000-pound cow, the average meat yield is 550 pounds (National Sustainable Agriculture Information Service, 2007). Therefore, the annual potential total meat production associated with the Permit Area is roughly 168,000 pounds if all the cattle are slaughtered. However, because the cattle generally include cow-calf pairs, some of the cows and calves are generally kept for breeding.

In 2000, one AUM for cattle was worth \$33.27. At these values, the BLM calculated that cattle production would produce \$65.07 per AUM of total economic impact, which includes both direct and secondary returns (BLM, 2004a). Using these figures, livestock production on rangeland within the grazing allotments of the Permit Area has a potential value of about \$238,000 per year based on the current AUMs of the study area.

Hunting

WGFD hunting areas for antelope, deer, elk, and mountain lion include the Permit Area. Hunting seasons run from September through December, but hunting occurs primarily in October and November. Hunter days for the hunt areas in the general region of the Project are shown in **Table 2.2-1**; these hunt areas are primarily not within two miles of the Permit Area.

Infrastructure

Currently, the only transportation corridors within the study area proper are two-track roads (**Figure 1.3-1**). These are accessible year-round by four-wheel-drive vehicles. Most are indistinct, difficult to delineate, or do not have obvious end points. These tracks are not maintained, have no drainage, and are sometimes impassible during the winter months. County Road 23 North (Wamsutter-Crooks Gap Road) is about five miles west of the Permit Area, and the BLM 3215 (Sooner Road) is about five miles east. A power transmission line runs in a north-south direction near the western boundary of the Permit Area.

Nuclear Fuel Cycle Facilities, Uranium Mills, Mines, and ISR Projects

There are no nuclear fuel cycle facilities within 50 miles of the Lost Creek Permit Area (NRC, 2007). However, there are several conventional uranium mills and mines and ISR projects within 50 miles of the Permit Area; the locations are shown on **Figure 2.2-3**. Other than Kennecott Uranium Company’s Sweetwater Mill (NRC License No. SUA-1350; WDEQ Permit No. 481), which is currently on stand-by, and the PRI Gas Hills

Project (NRC License No. SUA-1511-Amendment; WDEQ Permit No. 603), which is a new ISR project not yet in operation, all of the operations shown in **Figure 2.2-3** are in decommissioning or reclamation or have been reclaimed by the operator or the WDEQ Abandoned Mine Lands Division. The closest facility to the Project is the Sweetwater Mill, which is located about five miles south-southwest of the center of the Project, with about two miles separating the permit boundaries.

2.2.1.1 Planned Land Uses and Developments

Both Carbon and Sweetwater Counties are experiencing considerable natural resource development, much of which is related to oil and gas exploration and production. Based on publicly available information, no projects are currently planned within the study area (Simons, D. Planning and Environmental Coordinator, BLM Rawlins Field Office. Personal communication. 2007; Murray, C. Planning and Environmental Coordinator, BLM Lander Field Office. Personal communication. 2007). Although specific locations and plans have generally not been publicly disclosed, uranium exploration in the general vicinity has recently increased in response to the current uranium market.

2.2.2 Water Use

Water-use permits with legal descriptions inside and within two miles of the Permit Area were queried in 2007 using the Wyoming State Engineer's Office (WSEO) Water Rights Database (WSEO, 2006). In this vicinity, water is used for livestock and wildlife watering as well as for purposes related to mining (monitoring, pump testing, and dewatering). Currently, water is not used for domestic or irrigation purposes within two miles of the Permit Area.

2.2.2.1 Surface Water

The WSEO Database query results indicate that surface-water-use permits do not exist inside or within two miles of the Permit Area. As noted in the following section, there are four BLM stock ponds within two miles of the Permit Area (**Figure 2.2-4**). The water-use permits for these ponds are associated with the wells that supply the ponds, i.e., they are not associated with any surface-water-use permits. Also, as noted in **Section 2.7.1.1**, the Crooked Well Reservoir is located in the Permit Area. However, it is a small off-channel detention pond, less than one-quarter acre in size, and there is no water-use permit associated with it.

2.2.2.2 Groundwater

Water-use permits with legal descriptions inside and within two miles of the Permit Area were queried using the WSEO Water Rights Database (WSEO, 2006). The majority of the groundwater-use permits filed in the vicinity of the Permit Area are for monitoring or miscellaneous mining-related purposes, and do not represent consumptive use of groundwater. Many of those permits are associated with the Kennecott Sweetwater Mine, which is in reclamation. Because this mine was an open-pit operation, the dewatering and monitoring associated with it were at much shallower depths than those proposed for ISR at Lost Creek. Dewatering in advance of mining at the Sweetwater Mine was completed in 1983.

All non-mining and mining groundwater-use permits inside and within two miles of the Permit Area are presented in **Table 2.2-2**. Descriptions of the groundwater-use permits include, but are not limited to, location, uses, priority dates, status, yield, total depth, and static water depth.

The water-use permits unrelated to mining are those of the BLM. In 1968 and 1980, the BLM Rawlins District was granted three permits (13834, 55112, and 55113). Each of these permits is associated with a well that supplies a stock pond (or tank). These wells and associated stock ponds are located outside of the Permit Area, but within the study area (**Figure 2.2-4**). In addition, there is a fourth BLM well, supplying a stock pond, for which no water-use permit was found.

Permit 13834 is for Battle Spring Draw Well No. 4451, which pumps water into a stock tank east of the Permit Area (Township 25 North, Range 92 West, Section 21, Northwest Quarter, Northeast Quarter, Northeast Quarter). In 1968, a uranium exploration hole was drilled at this location; when water was encountered, plastic casing was installed and the well was developed. The well depth is 900 feet, with a static water level of 104 feet. A yield of 19 gpm is permitted. The screened interval is unknown, but given the well depth, it may be significantly deeper than the sands targeted by LC ISR, LLC under this permit. In November 2007, this well did not appear to have been used in some time and the associated pond consisted of an in-channel berm designed to pond natural runoff during spring snowmelt or rare summer flow events. However, in April 2009, the well had apparently been recently put back into use, with a solar-powered pump feeding a stock tank, with overflow routed to the in-channel stock pond (**Figure 2.2-5a**).

Boundary Well No. 4775 (Permit 55112) and Battle Spring Well No. 4777 (Permit 55113) were drilled as stock wells in 1981 to a depth of approximately 280 feet and 220 feet, respectively. These wells are shallower than the sands targeted by LC ISR, LLC under this permit. A water use of 25 gpm is permitted at each of these wells. According to aerial photographs, Boundary Well No. 4775 is located northeast of the Permit Area, in

Township 25 North, Range 92 West, Section 10, Southeast Quarter, Northeast Quarter, Southwest Quarter. Battle Spring Well No. 4777 is situated southeast of the Permit Area, in Township 25 North, Range 92 West, Section 30, Southeast Quarter, Northwest Quarter. The condition of the windmill on Boundary Well No. 4775 is not known, and the windmill on the Battle Spring Well No. 4777 was not in working order in June 2007 (**Figure 2.2-5b**).

In June and July of 2007, LC ISR, LLC contacted BLM to identify the status of these groundwater-use permits. These groundwater-use permits are still considered active (BLM, 2007). In addition to these wells, BLM identified another active stock well, the East Eagle Nest Draw Well.

The East Eagle Nest Draw Well is located north of the Permit Area, in the Northwest Quarter of the Northwest Quarter of the Northwest Quarter of Section 13, Township 25 North and Range 93 West. From mid-May through mid-September, an electric submersible pump in the well is used to pump water into a livestock watering pond at an average rate of five gpm for six to eight hours each day (**Figure 2.2-5c**). This total depth of this well is 370 feet, with a static water level of 269 feet.

Throughout the phases of the Project, LC ISR, LLC will correspond with BLM to ensure that the stock reservoirs and wells are not impacted in a manner that restricts their intended use.

At this time, LC ISR, LLC has several water supply wells and over 100 monitor wells permitted and bonded by the State Engineer and WDEQ to LC ISR, LLC and its affiliates (Ur-E and NFU Wyoming, LLC). Installation of these wells is on-going. Currently, the Project consumes a negligible amount of groundwater for well development, monitoring, testing, and miscellaneous purposes related to uranium exploration. Projected water use once ISR begins is discussed in **Sections 3.1.1** (water supply) and **3.2.7.3** (ISR water balance), and the impacts of that use are discussed in **Section 7.1.5.2**.

A list and description of the queried cancelled and abandoned drill holes and wells within a two-mile radius of the Permit Area are displayed in **Table 2.2-3**. Abandonment information for historic drill holes is included in **Section 2.6**. Drill hole abandonment is discussed in detail in **Section 3.2.2** of this report. Well abandonment is discussed in **Section 6.3.2** of this report.

In November 2008, NRC requested a list of the domestic and stock wells within five miles of the Permit Area (Request for Additional Information (RAI) 2.7.2 #4). In response to that RAI in December 2008, LC ISR, LLC provided the map and list of those wells (**Figure 2.2-6** and **Table 2.2-4**). Of these fifteen wells, all are stock wells except for the supply well for Kennecott Uranium Company's Sweetwater Mill.