APPENDIX 3.9-A

Baseline
Wildlife Report

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POWERTECH URANIUM CORPORATION
DEWEY-BURDOCK PROJECT
BASELINE WILDLIFE REPORT

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INTRODUCTION

Powertech Uranium Corporation (PUC) has proposed to develop in situ recovery (ISR) operations for uranium resources in southwestern South Dakota (SD) known as the Dewey-Burdock Project. ISR operations vary from typical open pit mining by using less intrusive extraction methods that are more efficient and, thus, have less physical impact on the surrounding area. These recovery methods use a series of injection and extraction wells that mix oxygen and carbon dioxide with native groundwater to extract the uranium from the ore bodies. The recovery area then becomes a series of wells within a systematic pattern (well field) connected to one or more processing facilities to remove the uranium from the extract. No underground or open pit mining would occur as part of this project.

The Dewey-Burdock Project area encompasses approximately 10,926 contiguous acres. Because ISR mining has a much smaller impact footprint than conventional surface mining, topsoil stripping and habitat impacts are reduced to relatively small areas needed for the injection and extraction wells, processing facilities, access roads, and other supporting infrastructure. Well fields are distributed in a systematic pattern over the ore body. It is expected to take up to three years to construct the entire well field, and not all wells would be operational in a given year. Only about 2,488 acres (23%) of the entire project area will be directly affected by these activities. In addition to the well fields and two processing areas, the project will include approximately 7.5 miles of new and/or improved roads, 11.5 miles of new underground pipeline, 9.7 miles of overhead power lines (transmission and distribution lines), and a new electrical substation (about 1 acre). The permanent working staff is anticipated to be approximately 20 individuals. Powertech may also construct a series of center-pivot irrigation systems distributed around the two plant sites to make constructive use of excess processing water.

Ecological baseline studies for flora and fauna were conducted in accordance with applicable SD Department of Environment and Natural Resources (SDDENR), SD Game, Fish and Parks (SDGFP), and U.S. Fish and Wildlife Service (USFWS) guidelines. These agencies were consulted prior to initiating field surveys to ensure that adequate objectives, survey methodologies, and data collection techniques were employed.

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ICF Jones & Stokes conducted the baseline wildlife inventories for this project. The objectives of the study were to: describe wildlife habitats within the proposed permit area; collect data on faunal diversity, abundance, and habitat affinity; and determine the potential impacts of ISR operations on terrestrial and aquatic wildlife. Baseline information was collected for the project from July 2007 through early August 2008. The survey area included the entire proposed permit area (current as of September 2008), with additional surveys conducted on adjacent lands and in nearby riparian areas for certain species of concern. Specific surveys were conducted for threatened and endangered species, upland game birds, raptors (including bald eagle winter roosts), breeding birds, waterfowl, small mammals, lagomorphs, fish, and aquatic macro-invertebrates, with less intense surveys for amphibians and bats. Stream characterizations were also performed at the aquatic sampling points. Information on other animal groups (big game, predators, furbearers, and reptiles) was obtained primarily through opportunistic observation in and near the project area.

Survey methods and results are presented by animal group, below. G. McKee supervised all terrestrial surveys for the Dewey-Burdock baseline inventory and A. Wones supervised the aquatics work. Both work for ICF Jones & Stokes; their resumes are provided as an attachment to this report.

PERMIT AREA DESCRIPTION

The proposed Dewey-Burdock Permit Area (permit area) is located approximately 12 miles north-northwest of Edgemont, South Dakota, and spans the boundary between northern Fall River County and southern Custer County. The northwestern edge of the permit boundary extends to the state border. The permit area includes approximately 10,926 acres of private surface and encompasses all or portions of T7S, R1E, Sections 1-5, 10-12, and 14-15, and T6S, R1E, Sections 20-21 and 27-35 (Map 1). Based on the results of exploratory drilling completed to date, PUC has divided the Dewey-Burdock permit area into six development areas covering about 2,488 non-contiguous acres (23% of the total permit acreage) concentrated in the northwestern and east-central portions of the area.

The permit area is located near the southwestern extension of the Black Hills. The elevation within the area ranges from approximately 3,600 feet to 3,900 feet above mean sea level, with the highest elevations along the pine breaks that overlap the eastern boundary. Topography in the general area is primarily gently rolling in the western quarter, with more varied terrain in the pine breaks and dissected hills that comprise the rest of the area. The region is characterized as semi-arid continental or steppe with a dry winter season. The area commonly experiences low precipitation levels, high evaporation rates, low relative humidity, and plentiful sunshine. Yearly precipitation totals average about 14 inches. Approximately one-half of the annual precipitation falls during the months of May, June, and July. As expected, most of the winter precipitation occurs as snow, with an annual average of 37 inches. Thunderstorms are relatively frequent in the project area during the summer months, averaging 40-45 days per year. Much of the annual rainfall is associated with these events.

Temperatures are moderate, with large diurnal and annual variations, and extremes ranging from approximately -37 degrees F in the winter to 114 degrees F in the summer. The first freeze typically occurs in mid- to late September, with the last freeze often recorded during late May. Windy conditions are fairly common in the project area and generally average about 10 miles per hour (mph). Prevailing winds come from the west-northwest during much of the year, though east-southeast winds are also common.

The permit area is comprised of a mosaic of five main vegetative communities: Upland Grassland, Ponderosa Pine Woodland, Big Sagebrush Shrubland, Greasewood Shrubland, and Cottonwood Gallery. Those primary habitat types were defined during the baseline vegetation assessment conducted by BKS Environmental Associates, Inc. (BKS). That assessment is included as a separate report in the permit application package for the Dewey-Burdock Project. Despite the overall ranking, Upland Grassland was present in the largest individual parcels. Interspersed among those primary habitats are smaller inclusions of Silver Sagebrush Shrubland, Agricultural Land, creek channels, and numerous ephemeral draws. One occupied black-tailed prairie dog (*Cynomys ludovicianus*) colony is located in the northwestern corner of the Dewey-Burdock permit area, and two others are present in the southwestern portion of the one-mile

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perimeter (Map 2). Local ranchers use shooting and other control methods to reduce and/or eradicate prairie dogs from the permit area and surrounding private lands.

The Dewey-Burdock survey area (permit area and surrounding one-mile perimeter) is located within the Cheyenne River watershed. Two main stream channels pass through the area: Beaver Creek (perennial) and Pass Creek (intermittent). Both flow south into the Cheyenne River, which runs from west to east approximately 2.5 miles south of the permit boundary. A few small stock reservoirs are scattered throughout the area, though they do not typically retain water year-round.

Trees are present along the riparian corridors of both primary creeks, and on the higher elevation hilltops in the permit area. The plains cottonwood (*Populus deltoides*) was the only tree present along the creek channels, and was more prevalent in the Pass Creek corridor. Ponderosa pine (*Pinus ponderosa*) dominates the higher elevation hilltops and breaks in the central and eastern portions of the permit area, with Rocky Mountain juniper (*Juniperus scopulorum*) present as individual trees or small inclusions in some of the dry drainages.

The permit area is comprised entirely of private lands, but is adjacent to the Black Hills National Forest in the north and small parcels managed by the Bureau of Land Management (BLM) in the southwest. Land use in the area includes ranch lands managed primarily for livestock (cattle) grazing, with limited efforts toward cultivated crops. Several unimproved (two-track) roads pass through the permit area and surrounding perimeter. One improved gravel county road currently runs through the western half of the permit area from northwest to southeast. The road parallels the Burlington Northern Railroad.

The delineation of the proposed permit boundary was revised during the baseline survey period, and was eventually enlarged to the north in September 2008, after all wildlife field studies had been completed. However, because the baseline wildlife surveys included a one-mile perimeter around the permit area, the entire new configuration was encompassed during the entire baseline study period. Only a small portion of the northern-most tier of the new one-mile perimeter was

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not included in those baseline inventories (Map 2). Because all surveys were conducted in representative habitats throughout the permit area and surrounding lands, and no new habitat types were included in the expanded area, it is the professional opinion of ICF Jones & Stokes that no information was lost for any unique or critical data by not having conducted certain surveys in the limited excluded portion of the expanded one-mile perimeter.

METHODS

Wildlife and aquatics sampling were conducted by ICF Jones & Stokes (formerly Thunderbird Wildlife Consulting), of Gillette, Wyoming. Background information on terrestrial vertebrate wildlife species, and aquatic vertebrates and invertebrates in the vicinity of the Dewey-Burdock Project was obtained from several sources, including records from SDGFP, BLM, USFWS, U.S. Forest Service (USFS), and the original Draft Environmental Impact Statement (DES) prepared by the Tennessee Valley Authority (TVA) in 1979. Previous site-specific data for the Dewey-Burdock Project and surrounding perimeter were obtained from those same sources.

Current baseline wildlife information was collected for the project from July 2007 through early August 2008 to meet agency requirements for one year of baseline data, and to accommodate changes to the permit area boundary during that period. The survey area included the entire proposed permit area (current as of September 2008), with additional surveys conducted on adjacent lands and in nearby riparian areas for certain species of concern. Survey protocols and timing were developed collaboratively with SDGFP to meet species-specific requirements. The survey area included the permit area and one-mile perimeter for threatened and endangered (T&E) species, bald eagle winter roosts, all nesting raptors, upland game bird leks, and big game. Surveys and documentation of occurrence conducted only in the permit area included other vertebrate species of concern tracked by the South Dakota Natural Heritage Program (SDNHP), as well as bats, small mammals, lagomorphs, prairie dog (*Cynomys* spp.) colonies, breeding birds, predators, and herptiles (reptiles and amphibians). Aquatic sampling occurred at water gauge stations located in Beaver Creek upstream (BVC 04) of the permit area, and in Beaver Creek (BVC 01) and the Cheyenne River (CHR05) downstream of the area (Map 3). Those sites were selected specifically to coincide with data collected from water gauge stations at those

locations. In addition to these targeted efforts, incidental observations of all vertebrate wildlife species seen within the permit area were recorded during each site visit during the year-long baseline survey period. Surveys for black-footed ferrets (*Mustela nigripes*) were not required for this project due to a block clearance issued by the USFWS that includes the entire Dewey-Burdock Project area and vicinity.

All surveys were conducted by qualified biologists using standard field equipment and appropriate field guides. Most terrestrial data were collected from vantage points during pedestrian or vehicular surveys to avoid disturbing wildlife; exceptions included breeding bird surveys, small mammal trapping, and aquatic species sampling. Raptor nests, prairie dog colonies, and other features or points of special interest were mapped in the field using a hand-held Global Positioning System (GPS) receiver to record the Universal Transverse Mercator (UTM, NAD27) coordinates. Species were identified with the aid of field guides and other literature including, but not limited, to Robbins et al. (1966), Burt and Grossenheider (1976), Jones et al. (1983), Clark and Stromberg (1987), Peterson 1990, South Dakota Ornithological Union (1991), Baxter and Stone (1995), Stokes and Stokes (1996), and Kiesow (2006).

HABITAT MAPPING

General wildlife habitats within the proposed Permit Area were outlined in the field with the aid of topographic maps. Habitats were described in terms of physical and vegetative characteristics, in keeping with classifications identified by BKS staff during their baseline vegetation assessment. Special emphasis was placed on documenting any high value, unusual, or critical wildlife habitats.

MAMMALS

Big Game

SDGFP did not require big game surveys for the Dewey-Burdock project. Therefore, big game use of the permit area and one-mile perimeter was largely determined through biologists recording all observations made during site visits from July 2007 to August 2008. Data recorded

typically included the species and number of animals seen, as well as their location. Personnel also noted herd activity, and sex and age composition, when possible.

Small Mammals

Small mammal trapping was conducted during fall 2007. Rodents were trapped in eight transects spread among the five primary habitats: Upland Grassland, Ponderosa Pine Woodland, Greasewood Shrubland, Cottonwood Gallery, and the edge between Big Sagebrush Shrubland and Ponderosa Pine. Although sagebrush is present in the area, it does not occur in sufficiently large stands to accommodate its own transect. Four trap lines were established in grassland, with one line in each of the remaining habitats (Map 1). The extra trapping effort in the grassland habitat was due to the prevalence of that habitat type in the project area. Per a request from SDGFP, one additional transect was also placed in Clay Breaks habitat just beyond the southern edge of the permit boundary.

Each trap line consisted of 20 stations spaced at 15-meter intervals, and included a total of 35 traps: 20 Sherman live traps (7.6 X 8.9 X 22.9 centimeters [cm], 1 per station), 10 Museum Special snap traps (1 at even-numbered stations), and 5 pitfall traps (stations 1, 5, 10, 15, and 20). Live traps were baited with a mixture of bird seed, rolled oats, peanut butter, and bacon grease; peanut butter and bird seed was used for snap traps. Three jumbo cotton balls were placed in all live and pitfall traps to provide overnight nesting material. Recent small mammal trapping efforts at other project sites in South Dakota have included specially modified pitfall traps that focused upon the Merriam's shrew (*Sorex merriami*). Due to a lack of suitable habitat within the Dewey-Burdock permit area, no such efforts were undertaken during those baseline trapping activities.

Each trap line was maintained for three consecutive days and nights, per SDGFP. That level of effort was consistent with recent baseline and long-term studies conducted for other surface mine operations in northwestern South Dakota and northeastern Wyoming, respectively. Traps were set out in the morning on September 11, 2007. Each line was checked for three subsequent evenings and mornings, beginning with the evening of the first day. Traps were re-baited as

necessary; they were run for the last time and picked up on the morning of September 14. The grassland habitats generated 420 trap nights (35 traps/line x 4 lines/habitat x 3 nights), whereas all other habitat types generated 105 trap nights each (35 traps/line x 1 line x 3 nights), for a total of 945 trap nights.

All animals captured were identified to species, aged, and sexed. The physical condition of live-trapped animals was noted. To allow for identification of recaptures, individuals from live traps were marked following the first capture by clipping a toe (for smaller species) or using a permanent marker under the larger species' chins prior to release.

Lagomorphs

Vehicular spotlight surveys for lagomorphs (hares and rabbits) were conducted on September 12 and 13, 2007. The survey route covered approximately 8.2 miles and included all habitats within the permit area (Map 1). Each night, two biologists began driving the route at least 30 minutes after sunset. One observer drove at approximately 5 mph while the other continuously swept a spotlight back and forth across the path. Data collected included the number and species of animals observed, general location, and habitat. Local landowners, sheriffs, and game wardens were contacted prior to conducting all spotlight surveys.

Other Mammals

The occurrence of mammals such as predators and furbearers within the Dewey-Burdock project area was documented through incidental observation and periodic searches for sign during site visits. Personnel also used spotlights to watch for bats over water bodies as opportunities arose in spring and summer.

AVIFAUNA

Game Birds

Three grouse species could potentially occur in the Dewey-Burdock project area (permit area and one-mile perimeter): the greater sage-grouse (*Centrocercus urophasianus*), sharp-tailed grouse (*Tympanuchus phasianellus*), and ruffed grouse (*Bonasa umbellus*). The greater sage-grouse is a

species of great concern throughout the west, and is considered a "landscape species" due to its use of wide expanses of sagebrush as primary habitat during each phase of its life cycle. Searches for grouse leks and drumming logs were completed on three mornings between April 7 and May 12, 2008. Surveys were conducted between first light and approximately one hour after sunrise each day. Biologists searched for displaying grouse by driving through the permit area and one-mile perimeter, and making frequent stops at vantage points to scan and listen for displaying birds. All searches were conducted during favorable weather conditions (i.e., no precipitation, calm to light winds).

Game bird use of the Dewey-Burdock survey area during other seasons was tracked through opportunistic observations of birds and their sign while conducting other surveys. All upland game bird sightings were recorded, including the number of birds, sex and age (when possible), location (UTM and quarter-quarter section), habitat, and activity.

Raptors

Raptor use within the permit area and one-mile perimeter was documented through both specific searches and opportunistic observation throughout the year-long baseline survey period. Initial surveys for early-nesting raptor species such as bald eagles, golden eagles (*Aquila chrysaetos*), and great horned owls (*Bubo virginianus*) were conducted in February, concurrent with surveys for winter bald eagle roosts. Additional surveys for those species and other nesting raptors were conducted periodically from late March through early June. Guidelines recommended by Grier and Fyfe (1987) were followed to prevent nest abandonment, damage to eggs, or injury to young. Nests were not approached until April for eagles and owls, and June for other species. All known nests were monitored to determine their nesting status (active/inactive) and production for the year.

New nests were located by slowly driving throughout the study area and stopping frequently to examine typical nesting habitat. Rough breaks and riparian corridors were searched on foot. Biologists also watched for breeding behavior (territory defense, courtship flights, prey

deliveries, etc.) during all site visits within the breeding season. Additional nest searches were conducted concurrent with other surveys completed during the non-breeding season. Areas where individuals or pairs were repeatedly seen were thoroughly searched for nests. All active nests were monitored until the pair's breeding attempt failed or young fledged.

Breeding Birds

Surveys for breeding birds, primarily passerines, were conducted using belt transects in the five main habitat types within the permit area. The Clay Breaks habitat just beyond the permit boundary was also surveyed, as for small mammals. The number of transects in each habitat and their locations were the same as for the small mammal trapping (Map 1): four transects were placed in Upland Grassland, with one each in the remaining habitat types. Each transect measured 100 meters wide by 1,000 meters long. Some transects were broken into two halves to accommodate the configuration of the habitat blocks (Map 1). Transects were surveyed by slowly walking through the center of each line and stopping every 50 meters to watch and listen for birds. Individuals observed while walking were also recorded, with efforts made to avoid double counting birds.

Each transect was surveyed on three consecutive mornings from June 18 through 20, 2008. To reduce bias, surveys started in a different habitat type each morning. Surveys began between dawn and sunrise, and were completed within four hours. All birds were identified to species. Flyovers and birds seen and heard beyond the transect boundaries were recorded as incidentals, but were not included in the analysis. Surveys were not conducted during inclement weather (precipitation, moderate to heavy winds, etc.).

Other Avian Observations

Sightings of all avian species were recorded during each site visit throughout the Dewey-Burdock project area, and occurred in all seasons. Extra efforts were made to include areas with special features such as stock reservoirs and prairie dog colonies that might attract specific species (e.g., waterfowl, shorebirds, etc.). A species list was maintained for the duration of the

baseline study. Information gathered in this manner was used to supplement knowledge of avian communities and habitat associations in and near the proposed permit area.

AMPHIBIANS AND REPTILES

Reptile and amphibian occurrence was documented through habitat-specific searches and opportunistic observation. Nocturnal surveys for amphibians were conducted along pond perimeters and creek banks in July 2007 and June 2008. Those search efforts entailed spotlighting select water bodies and listening for anuran calls in the evening and early morning hours. Biologists also inspected larger ponds, creeks, and rocky outcrops for reptiles during warm weather. All observations of those species were recorded throughout the baseline study period.

SPECIES OF CONCERN

Throughout the course of all field studies, biologists watched for all state and federally listed species (endangered, threatened, candidate, petitioned, proposed), as well as species listed by the SDNHP. Data collected included notes on species, number of individuals, location, habitat use, sex/age (when possible), and activity.

Black-footed Ferret

One black-tailed prairie dog colony is present within the permit area; approximately one-third of the colony was occupied during the baseline survey period (Map 2). Prairie dog colonies provide habitat for several species of concern, including the endangered black-footed ferret (*Mustela nigripes*) and the mountain plover (*Charadrius montanus*), a species of concern for the SDNHP. The USFWS office in Pierre, South Dakota issued a block clearance from the need to conduct surveys for black-footed ferrets in black-tailed prairie dog colonies in the state prior to 2007, when baseline wildlife surveys began for the Dewey-Burdock project (S. Larson, USFWS, personal communication to G. McKee, ICF Jones & Stokes, August 25, 2007). Consequently, no surveys for ferrets were required or conducted for this project.

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Bald Eagle

Searches for bald eagle winter roosts were conducted during winter 2007-2008, and encompassed the permit area and a one-mile perimeter. Weather conditions on all survey days consisted of clear to partly cloudy skies and light winds. Ground surveys for winter roosts were conducted between December 20 and 25, 2007. A biologist conducted the surveys by slowly driving through the survey area and stopping often to scan the trees along Beaver Creek and Pass Creek using binoculars and a spotting scope. Due to unreliable travel conditions due to drifting snow, the remaining two surveys were conducted from the air on January 25 and February 26, 2008. Biologists observed all possible roosting habitats within the permit area and one-mile perimeter from a fixed wing aircraft (Cessna 182). Flight speed was 80 to 85 mph, and survey height was 300 to 350 feet above ground level. All surveys were conducted from one-half-hour before to one hour after sunrise, or from one hour before to one-half-hour after sunset. Survey efforts included a mix of morning and evening searches to maximize the opportunity for observing eagles. In addition to these specific searches, all incidental bald eagle sightings within the survey area were recorded throughout the year-long baseline inventory period.

AQUATIC RESOURCES

Because Beaver Creek is the only perennial stream in the Dewey-Burdock project area, and is the receiving water for drainage from the portions of the permit area identified for proposed future ISR activities, it was the focus of aquatic habitat monitoring efforts conducted for this project. Some sampling was also conducted in the Cheyenne River downstream of the permit area to obtain additional site data. Beaver Creek is listed as impaired under Section 303(d) of the federal Clean Water Act for the following constituents: oil, specific conductivity, temperature, total dissolved solids, and total suspended solids (EPA 2008).

Baseline aquatics monitoring was conducted at sites that were previously established as water quality monitoring stations on Beaver Creek and the Cheyenne River. Using these sites allowed for comparisons with past and ongoing water quality records. One site on Beaver Creek was located upstream (BVC04) of the proposed ISR activities and the other was downstream (BVC01, Map 3). Fish sampling for species, abundance, and radiological testing was conducted

at both Beaver Creek sites, and at one site on the Cheyenne River downstream of the Beaver Creek confluence (CHR05, Map 3).

Baseline sampling of aquatic habitat, benthic macro-invertebrates, and fish was conducted according to protocols developed by the SDDENR (2002), EPA (2004), and the SDGFP (S. Michals, personal communication 2008). Aquatic data collected at the two Beaver Creek sites during the baseline sampling included: stream habitat description; aquatic benthic macro-invertebrate community composition; the variety, condition, and relative abundance of fish species; and radiological analysis of fish collected. As indicated, fish sampling also occurred at CHR05, though SDGFP did not require the other aquatic sampling efforts to be conducted at that location.

Habitat, invertebrate, and fish sampling was conducted during spring (April) and summer (July) conditions in 2008 to provide a baseline for semi-annual monitoring described in NRC Guide 4.14 (NRC 1990). This timing was selected to capture seasonal differences, including high and base flow conditions. However, the late spring and early summer of 2008 were unusually wet and, as a result, the flow during both seasonal events was similar. Consequently, neither sampling effort fully represented the low summer flow conditions that have typically occurred at these sites in recent years (M. Hollenbeck, personal communication 2008).

The habitat description and invertebrate collection efforts followed the SDDENR protocol (SDDENR 2002). Eleven cross-section transects were established at equidistant intervals from the downstream end of each sample site. The longitudinal distance of each survey reach was established as the distance equal to 30 average channel widths as determined by 10 preliminary width measurements.

Fish sampling was conducted according to SDGFP guidelines by blocking and seining a 100-meter survey reach downstream of each sample site (S. Michals, personal communication 2008). Due to obstacles in the stream, it was not feasible to seine an entire reach in one sweep, so three separate sweeps were made at a given sample site and fish were collected on shore at three

locations within each 100-meter reach. All fish captured were identified, counted, measured, and weighed. Individuals that were less than 100 millimeters (mm) in length were combined for a composite weight by species.

Numerous fish were collected for radiological testing during each of the spring and summer flow sampling events. The initial target at each sample site was six individual fish, preferably from six different species (i.e., 6 fish per sample site, 18 total fish), though fewer fish were retained if the target was not achieved. Many of the specimens collected in April 2008 contained no detectable Uranium. In an effort to improve the protocol to better represent conditions in sampled fish populations, up to five individuals of each of six species (i.e., 30 fish per sample site, 90 total fish) were collected in July 2008 (when available in the catch) and processed for radiology. Live fish were bagged, frozen, and kept frozen until they were analyzed for the following: Uranium (mg/kg), Uranium (µCi/kg), Thorium-230 (µCi/kg), Radium-226 (µCi/kg), Lead-210 (µCi/kg), Polonium-210 (µCi/kg). These analytes are specified in NRC Guide 4.14. Analysis was conducted by Energy Laboratories Inc., in Casper, Wyoming.

Benthic macro-invertebrates were sampled using SDDENR protocols (SDDENR 2002) and those outlined in the Wadeable Stream Assessment: Field Operations Manual (EPA 2004). Samples were collected using a modified D-frame kick net, with sample sites located 1 meter downstream of each of the 11 cross-section transects at an assigned sampling point (Left, Center, or Right). Habitat conditions (riffle/run, pool/glide, substrate type, etc.) were also recorded at each sample site. Benthic samples were strained using a 500 : m sieve and a 5-gallon bucket to cull the sample before preserving and packing it. Samples were sent to a private laboratory operated by Mr. Larry DeBrey in Laramie, Wyoming, where they were sorted, classified, and counted.

RESULTS

Appendix I lists all species that could potentially reside in the vicinity of the Dewey-Burdock permit area or pass through during migration. Species actually observed in or adjacent to the property are noted. Appendix II includes various tables listing sightings of targeted wildlife species, including those tracked by the SDNHP, recorded in the vicinity of the Dewey-Burdock

area from July 2007 through August 2008. Appendix III provides representative photographs of the project area and wildlife species observed there during the baseline survey period. Appendix IV includes a full resume for G. McKee, with ICF Jones & Stokes, including contact information. Ms. McKee was the Project Manager for the baseline wildlife project, supervised and/or conducted all wildlife surveys for the project, and wrote the baseline report. An abbreviated resume is also provided for A. Wones, who conducted the aquatics portion of the baseline inventory and drafted that section of the baseline report.

HABITAT MAPPING

Vegetation specialists with BKS classified five primary vegetative communities within the Dewey-Burdock Project Area: Upland Grassland, Ponderosa Pine Woodland, Big Sagebrush Shrubland, Greasewood Shrubland, and Cottonwood Gallery. Detailed descriptions of each habitat type, including mapped acreages, are provided in the Baseline Vegetation Assessment prepared by BKS. A general description of the location, extent, and characteristics of each habitat type is described below. The Clay Breaks area was just beyond the permit boundary, and was included in some wildlife sampling efforts at the request of SDGFP. Because that habitat type was not sampled by BKS, it is not included in the following descriptions or the baseline vegetation report. Representative photographs of the permit area during the yearlong survey period are presented in Appendix III; that appendix does include the Clay Breaks habitat.

Upland Grassland

Upland grassland covers approximately 18 percent of the total acreage of the permit area. Grassland areas are characterized by moderately dense cover (46 percent) with little (11 percent) bare ground. As expected, grass height varied with precipitation levels, with spring rains in 2008 enhancing plant growth that year. Various native short- to mid-grass species dominate this habitat type, with numerous forbs scattered throughout the area. Grass species commonly encountered during field surveys included: blue grama (*Bouteloua gracilis*), western wheatgrass (*Elymus smitthii*), threadleaf sedge (*Carex filifolia*), needle-and-thread (*Hesperostipa comata*), and buffalograss (*Buchloe dactyloides*). The only sub-shrub present was fringed sagewort

(*Artemisia frigid*). Patches of plains prickly pear (*Opuntia* spp.) were also present in some portions of the project area.

Ponderosa Pine Woodland

Approximately 19 percent of the permit area is comprised of Ponderosa Pine woodland habitat. As expected, trees represent 52 percent of the total vegetation cover in this habitat type. Ponderosa pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*) are the dominant tree species in this habitat type, and the permit area overall.

Big Sagebrush Shrubland

Sagebrush shrubland habitat covers approximately 25 percent of the total acreage within the permit area, but occurs as a scattered mosaic throughout the area rather than isolated stands. This habitat type is comprised of various woody plants, but is dominated by big sagebrush. Other common shrubs present in the area include rubber rabbitbrush (*Chrysothamnus* spp.) and *Eriogonum*, with species such as fringed sagewort, snakeweed (*Gutierrezia sarothrae*), and others observed less often. The understory in shrubland areas is comprised of a variety of common native grasses and forbs.

Greasewood Shrubland

Approximately 24 percent of the permit area is comprised of greasewood shrubland habitat. This habitat type includes various woody plants, but is dominated by greasewood (*Sarcobatus vermiculatus*). Grass species commonly encountered during field surveys included blue grama, western wheatgrass, and threadleaf sedge.

Cottonwood Gallery

Cottonwood Gallery habitat occurs along the primary drainages of Beaver Creek and Pass Creek, and covers approximately 2 percent of the total acreage within the permit area. This habitat type is comprised of perennial grasses (52 percent) and trees (21 percent). Perennial grasses consist mainly of smooth brome (*Bromus inermis*) and western wheatgrass. The plains cottonwood (*Populus deltoidies*) is the only tree species present.

MAMMALS

Big Game

No crucial big game habitats or migration corridors are recognized by the SDGFP in the Dewey-Burdock permit area or surrounding one-mile perimeter. Crucial range is defined as any particular seasonal range or habitat component that has been documented as the determining factor in a population's ability to maintain and reproduce itself at a certain level.

Pronghorn (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*) are the only two big game species that regularly occur in the Dewey-Burdock project area, and both are considered year-round residents. Elk (*Cervus elaphus*) and white-tailed deer (*Odocoileus virginianus*) are also present in the survey area, but only in small herds. The latter two species can also be seen in the survey area year-round, but may be more common during certain seasons.

The pronghorn is the most common big game species in the Dewey-Burdock survey area, though no species is prevalent. The pronghorn is a browse species and sagebrush-obligate, using shrubs for both forage and cover (Fitzgerald et al. 1994). Pronghorn herds were most often observed in sagebrush stands just beyond the north-central permit boundary during winter 2007-2008. Conversely, herds were widely distributed throughout grassland habitats in the northwestern and southeastern portions of the survey area during spring, summer, and early fall 2008. In June, after the ground and water pools had dried up, water availability became a limiting factor and pronghorn began to move to, and concentrate around, more dependable water sources such as Beaver Creek and livestock tanks, and to draws with more succulent forage.

Mule deer use nearly all habitats, but prefer sagebrush-grassland, rough breaks, and riparian bottomland (Jones et al. 1983). Browse is an important component of the mule deer's diet throughout the year, comprising as much as 60 percent of total intake during autumn, while forbs and grasses typically make up the rest of their diet (Fitzgerald et al. 1994). In the Dewey-Burdock survey area, mule deer were observed as individuals or in small herds in ponderosa pine and cottonwood riparian habitats along Beaver and Pass Creeks, and in the pine breaks along the eastern edge of the License area. They are considered year-round residents in the survey area.

By nature, elk are shy animals that are less accepting of human disturbance than pronghorn (Fitzgerald et al. 1994) or deer. Elk in the Dewey-Burdock survey area share their range with pronghorn and domestic cattle from spring through fall. A herd of six bull elk was observed in the survey area in ponderosa pine habitat on one occasion (June 2008) during the baseline survey period, but local residents report that elk are frequently seen in the pine stands, especially during fall and winter.

White-tailed deer are typically associated with forests, woodlands, and treed galleries along streams (Fitzgerald et al. 1994). Small numbers of white-tailed deer were observed in the Dewey-Burdock survey area during the baseline survey period, predominantly in the cottonwood corridor along Pass Creek in the central portion of the permit area. Most sightings of white-tailed deer were actually in the cottonwood corridor along the Cheyenne River, approximately 2-2.5 miles south of the permit boundary. This species is considered an uncommon year-round resident in the survey area itself.

Small Mammals

Four species of small mammals were captured in September 2007 (Appendix II, Table 1): the deer mouse (*Peromyscus maniculatus*), olive-backed pocket mouse (*Perognathus fasciatus*), western harvest mouse (*Reithrodontomys megalotis*), and northern grasshopper mouse (*Onychomys leucogaster*).

Excluding recaptures, 115 animals were trapped in the Dewey-Burdock project area, for an overall frequency of 12.0 captures/100 trap-nights (Appendix II, Table 1). That capture rate was comparable to or greater than those recorded during two baseline studies conducted in the same general habitat types in northwestern South Dakota in recent years. The capture rate for the American Colloid Company's (ACC) Dobesh expansion in 1998 was approximately 13.9 animals/100 trap nights, whereas the rate (7.9 animals/100 trap nights) for ACC's Kudlock permitting project was considerably lower in 2001. Given the cyclic nature of small mammal populations, it is possible that results from 2001 coincided with a low point in the overall population level.

The deer mouse was by far the most ubiquitous and abundant small mammal captured during the Dewey-Burdock baseline study, representing approximately 95 percent of the total (Appendix II, Table 1). Each of the three other species captured accounted for less than 3 percent of the remaining captures. The deer mouse was the only species trapped in all habitats. These sampling results were similar to results from the previous Dobesh and Kudlock trapping efforts in northwestern South Dakota. In all three studies, the deer mouse was the most ubiquitous and abundant small mammal captured. It was the only species trapped in all habitats during all sampling efforts, and accounted for greater than 83 percent of total captures in all studies.

Upland grassland was the only habitat that produced captures of all four species. However, overall small mammal abundance in the Dewey-Burdock area was highest in the ponderosa pine transect (Appendix II, Table 1). That transect offered the greatest structural diversity and/or vegetative density. Similar results were reported from previous studies elsewhere in the general region. Small mammal abundance for the Dewey-Burdock Project was lowest in the greasewood transect. Although that habitat type did provide structural diversity, the understory provided somewhat less cover during the fall 2007 sampling session than other habitat types.

Lagomorphs

Two lagomorph species were observed within the Dewey-Burdock permit area during spotlight surveys conducted in 2007: the white-tailed jackrabbit (*Lepus townsendii*) and cottontail (*Sylvilagus* spp.). Cottontail abundance was twice that of jackrabbits, though neither count was especially high (Appendix II, Table 2). Results from lagomorph surveys conducted in northeast Wyoming annually since 1984, and periodic surveys in northwestern South Dakota in recent years, indicate that the regional lagomorph population recently experienced a downward trend in its regular cyclic pattern. Although no data is available from the Dewey-Burdock project area prior to 2007, its proximity to other regional survey areas and the low counts recorded during the baseline survey period suggest that the Dewey-Burdock lagomorph population was in a similar low cycle at that time. Declines in the Wyoming population have been attributed to Tularemia, a disease known to infect lagomorph populations once they reach a certain threshold. It is possible that a similar disease event occurred recently in western South Dakota.

Other Mammals

A variety of small and medium-sized mammalian species have the potential to occur in the Dewey-Burdock survey area, although not all were observed in the permit area itself during the baseline wildlife surveys. These potential species include a variety of common predators and furbearers such as the coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), badger (*Taxidea taxus*), beaver (*Castor canadensis*), and muskrat (*Ondatra zibethicus*). A complete list of the mammalian species that were observed during surveys in and near the Dewey-Burdock property during the year-long baseline survey period can be found in Appendix 1. Numerous prey species, including rodents (e.g., mice, rats, voles, gophers, ground squirrels, chipmunks, prairie dogs, etc.), can also be found in the Dewey-Burdock survey area. These species are cyclically common and widespread throughout the region, and are important food sources for raptors and other predators. Each of these prey species, with the exception of chipmunks and rats, were either directly observed during the field surveys, or were known to exist through burrow formation or scat. Observations of small mammals occurred most often near Beaver Creek and Pass Creek, in the northwestern and central portions of the survey area, respectively.

One black-tailed prairie dog colony overlaps the northwestern corner of the Dewey-Burdock permit area, and two others are present in the southwestern portion of the one-mile perimeter (Map 2). Portions of all three colonies were unoccupied during the baseline survey period. Local ranchers use shooting and other control methods to reduce and/or eradicate prairie dogs from private surface in the permit area and on surrounding lands. Other mammalian species such as the striped skunk (*Mephitis mephitis*), porcupine (*Erethizon dorsatum*), and various weasels (*Mustela* spp.) could inhabit the survey area, but no sightings or confirmed scat were recorded for those species during the baseline surveys. Infrequent, incidental bat sightings (species unknown) occurred during nocturnal amphibian surveys and spotlighting efforts conducted at targeted ponds in the permit area during the baseline period.

AVIFAUNA

Game Birds

The wild turkey (*Meleagris gallopavo*) and mourning dove (*Zenaida macroura*) were the only upland game bird species observed in the Dewey-Burdock survey area during baseline inventories conducted from July 2007 to August 2008. Both species are relatively common and occur in a variety of woodland and open habitats in the project area.

Although sage-grouse were historically recorded in the general vicinity (TVA DES 1979), no leks have been documented by agency biologists within 6 miles of the Dewey-Burdock permit area in recent years. No grouse were observed during the entire yearlong baseline survey period for this project. Limited potential habitat for this species is present in the general survey area, but only in small stands of sage surrounded by less suitable grasslands and pine breaks.

Raptors

Raptor species observed during the Dewey-Burdock baseline wildlife surveys included the bald eagle, red-tailed hawk (*Buteo jamaicensis*), golden eagle, northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), Cooper's hawk (*Accipiter cooperii*), rough-legged hawk (*Buteo lagopus*), merlin (*Falco columbarius*), great horned owl, and long-eared owl (*Asio otus*). Other raptor species could also occur in the survey area, particularly as seasonal migrants, but were not seen during the 2007 and 2008 inventories.

Raptor sightings were recorded most often in ponderosa pine, cottonwood riparian, and grassland habitats. Observations were most concentrated in proximity to Beaver Creek and Pass Creek, perhaps because of prey availability due to the presence of water and better vegetative cover along those drainages, and to the ample presence of perch sites. A variety of behavior was recorded, including: hunting, perching in trees, on power poles, and on other topographic features; tending nests, incubating eggs, and exhibiting nest defense behavior. The bald eagle, red-tailed hawk, American kestrel, and northern harrier were the most commonly seen raptor species in the area. Raptor sightings for those species were recorded with regularity during all

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four seasons throughout the baseline survey period, though some of those species may leave the area under harsh winter conditions.

Five confirmed, intact (i.e., material present) raptor nests and one potential nest site were located in the Dewey-Burdock permit area during the 2007-2008 baseline survey period (Map 2). Two additional nest sites (one confirmed and one potential) were recorded in the one-mile survey perimeter. All eight nests are listed in Table 3 (Appendix II), including their locations, and their status and productivity in 2008. Three raptor species tracked by the SDNHP nested in the Dewey-Burdock project area. The bald eagle and long-eared owl successfully nested within the permit area. A merlin was recorded at a potential nest site in the pine breaks east of the permit boundary. The bird exhibited defensive behavior near the nest site, but no young or signs of active use (e.g., droppings, prey remains, egg shells, etc.) were recorded there.

Breeding Birds

Data from belt transects were used to calculate species richness and abundance for each of the -six habitats sampled within the Dewey-Burdock permit area (Appendix II, Table 4). Species richness was, simply, the number of species recorded in each habitat over the sampling period. Relative abundance was defined as the number of birds observed per survey. Weather conditions during all surveys were mostly calm and clear, with a light breeze and approximately 25% high, thin cloud cover.

Thirty-four species were identified within the breeding bird transects during spring 2008. Two additional unknown species were logged during the surveys, with two other species recorded only while flying over the transects; those observations were not included in data analyses (Appendix II, Table 4). The western meadowlark (*Sturnella neglecta*) was the most common species, followed by the mourning dove. The dove was the only species recorded in all -six habitat types. The long-billed curlew (*Numenius americanus*) was the only observed species that is tracked by the SDNHP. Defensive behavior recorded during the transect surveys indicated that up to three pairs may have nested near the south-central edge of the proposed permit area.

As expected, several species were associated with specific habitat types. For example, the curlew was only seen in the grassland transects (Appendix II, Table 4). Likewise, several species typically associated with trees were only observed in or immediately adjacent to the Cottonwood Gallery or Ponderosa Pine transects: the chipping sparrow (*Spizella passerina*), mountain bluebird (*Sialia currucoides*), black-capped chickadee (*Poecile atricapillus*), and yellow-rumped warbler (*Dendroica coronata*), among others. Similar associations were noted between other species and habitats.

Other Avian Observations

Specific surveys for waterfowl and shorebirds were not required for the Dewey-Burdock Project. Nevertheless, biologists recorded all birds seen during the year-long survey period. Eight species associated specifically with water, wetlands, or other mesic habitats were observed during the baseline inventories: the American white pelican (*Pelecanus erythrorhynchos*), great blue heron (*Ardea herodias*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), American wigeon (*Anas americana*), killdeer (*Charadrius vociferus*), long-billed curlew, and upland sandpiper (*Bartramia longicauda*). The pelican, heron, and curlew are tracked by the SDNHP. Three additional avian species tracked by the SDNHP were observed while conducting other surveys during the baseline inventory period: the Cooper's hawk, golden eagle, and Clark's nutcracker (*Nucifraga columbiana*). All three species were briefly observed flying over the permit area, but no known nesting or other targeted use was recorded by these species.

AMPHIBIANS AND REPTILES

Three aquatic or semi-aquatic amphibian species and one aquatic reptile were recorded during the 2007 and 2008 surveys conducted in the Dewey-Burdock permit area: the boreal chorus frog (*Pseudacris triseriata*), Woodhouse's toad (*Bufo woodhousei*), great-plains toad (*B. cognatus*), and western painted turtle (*Chrysemys picta*). All four species were heard and/or seen in Beaver Creek as it flows through the western portion of the permit area or near stock reservoirs. All four species are common to the project area, and the region as a whole.

Lizards (species unknown) were often observed sunning themselves on rocks and on sandy soil in the summer months during all except the early morning hours. These sightings were widespread throughout the survey area, with observations increasing as the summer progressed and the days got hotter. The shed remains of a snakeskin were found in the north central portion of the survey perimeter in early May 2007. The skin was at the base of a rock outcrop and looked as though it may have belonged to a bullsnake (*Pituophis cantenifer*).

SPECIES OF CONCERN

Black-footed Ferret

The USFWS issued a block-clearance for ferrets throughout most of South Dakota in recent years, including the Dewey-Burdock survey area in extreme southwestern Custer County and northwestern Fall River County. The only exception to that clearance is in Custer State Park in northern Custer County. Although surveys were not required for the Dewey-Burdock project, they were conducted in the general vicinity of the permit area during monitoring performed for the TVA DES in fall 1977 (TVA DES 1979). No ferrets or evidence of their presence (e.g., trenching, tracks, or scat) were observed during those historic surveys, or during the recent Dewey-Burdock survey period.

Bald Eagle

The USFWS removed (delisted) the bald eagle from protection under the ESA in July 2007 (Federal Register, July 9, 2007), and the ruling became effective that August. However, this species is still considered as a state-listed threatened species in South Dakota. In addition, bald eagles continue to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, as well as any applicable state regulations.

Bald eagles were repeatedly observed along Beaver Creek in the western portion of the proposed permit area and perimeter during winter roost surveys conducted in late 2007 and early 2008. One active bald eagle nest was confirmed in a cottonwood tree along Beaver Creek in the northwestern portion of the permit area in mid-SW¼ Section 30, T6S, R1E. The nest fledged one young in 2008.

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SDNHP Rare, Threatened, or Endangered Animals

Prior to initiating field surveys, biologists reviewed the list of rare, threatened, or endangered (T&E) vertebrate species tracked by the SDNHP that could occur as permanent or seasonal residents on or within 1 mile of the Dewey-Burdock property, based on each species' range and the habitats present in that area. As expected, the SDNHP database includes State- and Federally-listed threatened and endangered species. However, many SDNHP species are not actually rare; some are merely at the edge of their natural range. A listing by the SDNHP is often an indication of possible concern, and the need for more information on a species' range and habitat requirements within the state of South Dakota. The specific codes associated with species on the SDNHP list are clearly explained in that document and, thus, are not repeated here.

Appendix II, Table 5 presents a summary of vertebrate SDNHP (2008 web-site confirmation of the current listed) species that were recorded in or within 1 mile of the Dewey-Burdock permit area during the yearlong baseline survey period. That table includes the legal descriptions for all observations, as well as notations regarding habitat associations and activity. All species that could potentially occur in the area, including those on the SDNHP list, were included in Appendix I; species of concern that were actually observed in the project area were identified with bold text in that appendix. Those species were also highlighted in other tables (e.g., the raptor nesting and breeding bird tables) in that appendix, as applicable.

Seven vertebrate sensitive species or species of local concern other than the bald eagle were documented within the Dewey-Burdock permit area during the baseline survey period: the long-billed curlew, great blue heron, golden eagle, Cooper's hawk, merlin, American white pelican, and long-eared owl. The long-eared owl and curlew are known or are suspected to have nested in the permit area, based on evidence (young present) or persistent defensive behavior, respectively. The remaining five species were observed perched in or flying over the permit area only once or twice each. These seven species of special interest are considered as secure populations within their respective overall ranges, though one or more could be less common in parts of a given range, especially in the periphery. Likewise, all seven are considered to be either

rare and local throughout their statewide ranges, or locally abundant in restricted portions of those ranges.

Two additional vertebrate species of concern were documented at least once each in the one-mile survey perimeter: the Clark's nutcracker and plains topminnow (*Fundulus sciadicus*). The nutcracker was described in the preceding *Other Avian Observations* section of this document. The topminnow was captured during fisheries sampling efforts in the Cheyenne River in April 2008 and the downstream sample site along Beaver Creek in July that year; both sites are beyond the Dewey-Burdock permit area.

One northern river otter (*Lontra canadensis*) carcass was unexpectedly discovered at the upstream fisheries sampling point (BVC04) on Beaver Creek in April 2008. That sampling station was located approximately 11 stream miles (3.5 linear miles) northwest of the permit area boundary and across the state line. The cause of death was not apparent, and the carcass was gone by the July 2008 sampling period; it was presumably washed downstream with the next flood event. Otters are listed as a threatened species by the State of South Dakota, and are tracked by the SDNHP.

Aquatic Resources

Benthic Invertebrates

Benthic invertebrates can be useful indicators of habitat quality, providing an index of quality that is integrated over time. Different taxa of aquatic invertebrates (primarily insects, crustaceans, and mollusks) exhibit different habitat requirements, feeding strategies, and tolerances to environmental perturbation. Therefore, several metrics of benthic invertebrate community composition can be indicative of aquatic habitat quality.

The invertebrate communities sampled indicate poor habitat conditions in Beaver Creek. The counts of each taxa are shown in Table 6 of Appendix II, and a synopsis of the community composition metrics is shown in Table 7. The total number of invertebrates and the taxonomic

richness (number of species) were extremely low at both Beaver Creek sites. Ephemeroptera (mayflies) and plecoptera (stoneflies) were absent from both sites, indicating an impaired condition. Most taxa collected were moderately tolerant taxa. One individual of a sensitive taxa, *Lepidostoma*, and one individual of a highly tolerant taxa, *Culiciodes*, were collected at the downstream site (BVC01) in April. All other taxa collected are considered moderately tolerant. High pH, conductivity, and temperatures and a high volume of fine sediment all may contribute to the low invertebrate communities observed in Beaver Creek during the 2008 sampling.

Fish

A total of 12 fish species were collected from the three sampling locations: BVC04 – Beaver Creek upstream of the project area; BVC01 – Beaver Creek downstream of the project area; and CHR05 – Cheyenne River downstream of the confluence with Beaver Creek. The species, trophic category, and habitat notes are summarized in Appendix II, Table 8. The abundance (presented as catch per unit effort or fish per meter of stream length), and average sizes of fish are shown in Table 9. The fathead minnow (*Pimephales promelas*) was the most abundant species at both Beaver Creek sites during April and July 2008. The creek chub (*Semotilus atromaculatus*) was the most abundant species at the Cheyenne River site in April, and the sand shiner (*Notropis stramineus*) was the most common fish caught there in July.

The channel catfish was the only species collected in April that contained detectable levels of Uranium (0.05 mg/kg, and 3 X 10^{-5}μCi/kg) (Appendix II Table 10). The catfish is also the only species collected in the Dewey-Burdock project area that is typically caught for human consumption.

Uranium was detected in all of the fish collected in July 2008 due, in large part, to increased sample sizes (Appendix II, Table 10). Uranium concentrations and uranium radioactivity were generally low and similar across sample sites when compared by species. Radioactivity from Polonium-210, Thorium-230, and Radium-226 was detectable, but low in most samples. Lead-210 was only detected in one specimen (plains killifish [*Fundulus zebrinus*]) collected in April at the downstream Beaver Creek site (BVC01). Lead-210 was not detected in any of the other

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samples. For further detailed information regarding aquatic resources surveyed on the Dewey-Burdock project area refer to the 2008 ICF Jones & Stokes Wildlife Environmental Report.

CONCLUSIONS

The Dewey-Burdock Project area encompasses approximately 10,926 contiguous acres. Because ISR mining has a much smaller impact footprint than conventional surface mining, topsoil stripping and habitat impacts are reduced to relatively small areas needed for the injection and extraction wells, processing facilities, access roads, and other supporting infrastructure. Despite the relatively limited surface disturbance associated with ISR uranium mining, operations can have direct and indirect impacts on local wildlife populations. These impacts are both short-term (until successful reclamation is achieved) and long-term (persisting beyond successful completion of reclamation). However, the latter category is not expected to be substantial due to the relatively limited habitat disturbance associated with this industry.

The direct impacts of ISR mining on wildlife include: injuries and mortalities caused by collisions with project-related traffic or habitat removal actions such as topsoil stripping, particularly for smaller species with limited mobility such as some rodents and herptiles; and restrictions on wildlife movement due to construction of fences. The likelihood for the impacts resulting in injury or mortality is greatest during the construction phase due to increased levels of traffic and physical disturbance during that period. Overall traffic will increase from current levels and will persist during production, but should occur at a reduced, and possibly more predictable level than during the construction phase. Speed limits would be enforced during all construction and maintenance operations to reduce impacts to wildlife throughout the year, but particularly during the breeding season.

As indicated, most of the habitat disturbance associated with the ISR process itself will consist of scattered, confined drill sites for well heads that will not result in large expanses of habitat being dramatically transformed from its original character, as is the case with other surface mining operations. Therefore, most indirect impacts would relate to the displacement of wildlife due to increased noise, traffic, or other disturbances associated with the development and operation of

the Dewey-Burdock Project, as well as from small reductions in existing or potential cover and forage due to habitat alteration, fragmentation, or loss. Indirect impacts typically persist longer than direct impacts. However, because ISR mining results in fewer large-scale habitat alterations, the need for reclamation actions that can also result in dramatic differences between pre-construction and post-construction vegetative communities is also reduced.

No significant impacts to wildlife are anticipated from the construction of infrastructure, mining, and reclamation of these lands. The habitats on the proposed permit area are typical of the region, and no unique or unusual wildlife features are present. The site currently is not subject to regular human activity beyond normal ranching operations, though occasional vehicular traffic and cattle do occur in the area. Multiple site visits and targeted surveys conducted over the last year, combined with existing agency databases that encompass the project area and input from local residents, indicate that the Dewey-Burdock permit area and surrounding vicinity is occupied by a wide variety of common wildlife and fish species, with only a few species of particular concern occurring in the area.

The most notable species of interest is the bald eagle, which is still considered threatened at the state level. Bald eagle winter roost sites and a successful nest site were documented within the permit area during surveys conducted in 2007 and 2008. Two other species tracked by the SDNHP were confirmed or suspected to have nested in that area in 2008, the long-eared owl and long-billed curlew. Seven additional SDNHP species were documented in or within one-mile of the permit area during baseline surveys. However, most of those observations consisted of limited observations of birds foraging in or flying over the permit area, or sightings made in the surrounding perimeter. No grouse leks have been recorded within 6 miles of the permit area during agency or project-specific surveys completed in recent years.

As indicated, suitable nesting habitat (trees and native uplands) for some SDNHP species is present in the permit area. However, the nature of ISR mining and the presence of apparently suitable alternate nesting habitat (due to low density of other nesting individuals) throughout the permit area and perimeter combine to minimize the potential for both direct and indirect impacts

for species of concern, and others that require similar habitats. One of those species, the long-eared owl, nested within 75 meters, but largely beyond view of, an existing gravel county road, suggesting the pair has at least some level of tolerance for vehicular traffic near active nest sites.

Other wildlife species of concern, such as other nesting raptors, that occur in the area may also experience direct and/or indirect impacts from increased travel and noise in the area during project construction and operation. However, the presence of potential alternate nesting and foraging habitat in the immediate vicinity, the mobility of those species, and the location of most nest sites relative to planned disturbance combine to reduce impacts to most nesting SDNHP birds as well as other species of interest.

Some vegetative communities currently present in the project area can be difficult to reestablish through artificial plantings, and natural re-seeding of those species would likely take many years. However, the current habitat of greatest regional concern (Big Sagebrush Shrublands) occurs only in scattered stands that are relatively small and widely spread across the permit area. Results from lek searches, breeding bird surveys, and small mammal trapping, as well as regular site visits in all seasons over the baseline survey period, strongly suggest that sage obligates, including pronghorn, occur in limited numbers in the permit area, if at all.

The vegetative communities (Cottonwood Gallery and Ponderosa Pine) with the greatest species richness and abundance during baseline surveys would not be physically impacted by construction or operation of the proposed Dewey-Burdock Project. It is possible that the potential implementation of center-pivot irrigation using excess processing water may enhance nesting, brood-rearing, and/or foraging habitat for some species. Consequently, although individual animals associated with some specific habitats could be impacted by the proposed ISR operations, the small percentage (approximately 23%) of gradual, non-contiguous surface disturbance within the permit area relative to its overall size, and the low density of nesting efforts relative to habitat presence in that area, suggest that their populations as a whole will experience minimal negative impacts from the Dewey-Burdock project. Advanced planning of

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construction sites and activities in concert with continued monitoring can further reduce impacts and assist with the development of mitigation options, if necessary.

Big game could be displaced from portions of the Dewey-Burdock Project area to adjacent habitats, particularly during construction of the well field and facilities, when disturbance activities would be greatest. Disturbance levels would decrease during actual extraction operations, and would consist primarily of vehicular traffic on new and existing improved and unimproved (two-track) roads throughout the project area. Similar disturbance is already present in the area due to existing ISR exploration, ranching, and railroad operations. Pronghorn would be most affected, as they are more prevalent in the area. However, no areas classified as crucial pronghorn habitat occur on or within several miles of the Dewey-Burdock permit area, and this species is not as common in the general area as elsewhere within the region due to the limited presence of sagebrush in the area. Mule deer would not be substantially impacted given their somewhat limited use of these lands, the paucity of winter forage and security cover, and the availability of suitable habitat in adjacent areas. The SDGFP does not consider the project area to be within the crucial habitat range of mule deer or any other big game species. Sightings of other species in that vicinity are often seasonal and less common.

Medium-sized mammals (such as lagomorphs, canids, and badgers) may be temporarily displaced to other habitats during the initial ISR mining activities. Direct losses of some small mammal species (e.g., voles, ground squirrels, mice) may be higher than for other wildlife due to their more limited mobility and likelihood that they would retreat into burrows when disturbed, and thus be potentially impacted by topsoil scraping or staging activities. However, given the incremental disturbance pattern and relatively limited area of impact from the Dewey-Burdock Project, such effects would not be expected to result in major changes or reductions in mammalian populations for small or medium-sized animals. Few bats were recorded in the permit area despite targeted efforts to observe them during the baseline surveys. Individuals seen were near water bodies and treed habitats, which are not currently scheduled for disturbance. The mammalian species known to be, or potentially, present in the project area have shown an ability to adapt to human disturbance in varying degrees, as evidenced by their

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continued presence in other mining and residential areas of similar, or greater, disturbance levels elsewhere in the region. Additionally, small mammal species in the area have a high reproductive potential and tend to re-occupy and adapt to altered and/or reclaimed areas quickly.

ISR mining in the Dewey-Burdock project area would not impact regional raptor populations, though individual birds or pairs may be affected. Mining activity could cause raptors to abandon nest sites proximate to disturbance, particularly if activities encroach on active nests during a given breeding season. Other potential direct impacts would be injury or mortality due to collisions with mine-related vehicular traffic. Construction activities that occur within or near active raptor territories could also cause indirect impacts such as reduction or avoidance of foraging habitats for nesting birds. However, surface disturbance will only occur in a small percentage of the overall permit area at any given time, and the low density of nesting raptors relative to the apparent availability of suitable habitat suggests that alternate nesting habitat is available for all known nesting raptor species in the Dewey-Burdock area.

ISR mining in the Dewey-Burdock project area would also affect non-contiguous acres of potential foraging and nesting habitat for mourning doves, though such disturbance is not expected to have any marked impacts on this species. No woody corridors will be disturbed by the proposed activities, and additional trees are present in the cottonwood gallery along the Cheyenne River, located approximately 2 miles south of the permit area, where mining is not projected to occur in the near future. Additionally, doves are not restricted to treed habitats, nor are they subject to any special mitigation measures for habitat loss.

Annual monitoring surveys conducted by agency biologists and a year-round baseline study for the Dewey-Burdock Project have demonstrated that sage-grouse do not currently inhabit that area, and have not for many years. As described previously, those surveys encompassed the entire permit area (including the September 2008 configuration) and the vast majority of its one-mile perimeter, particularly as part of this baseline project. The nearest known sage-grouse lek is approximately 6.0 miles north of the Dewey-Burdock permit area (SDGFP records). The majority of the disturbance will occur in grassland habitats that do not provide adequate shrub

cover to attract nesting sage-grouse (Gregg et al. 1994). Given the lack of sage-grouse observations in the area, and the scattered stands of marginal quality sage-grouse habitat, licensing of the Dewey-Burdock Project will not result in negative impacts to existing or potential sage-grouse leks, or important sagebrush habitats.

Construction and operation of the Dewey-Burdock Project would have a negligible effect on migrating and breeding waterfowl and shorebirds. Existing habitat is limited and seasonally available in the project area, so it does not currently support large groups or populations of these species. New sedimentation ponds created during mining would be adequately covered, if necessary, to prevent birds from accessing any hazardous water bodies. Any new treated water sources would enhance current habitat conditions for these species, though such effects may be ephemeral and temporary in nature. Habitat disturbance in drainages or other potential water sources would be reclaimed once productive operations have ceased. Replacement of any impacted jurisdictional wetlands would be required in accordance with Section 404 of the Clean Water Act.

As with waterfowl, potential habitat for aquatic and semi-aquatic amphibians and reptiles, is limited within the proposed Dewey-Burdock permit area, and occurs primarily along Beaver Creek in the western portion of the area. Other water bodies are ephemeral, and thus offer only short-term habitat. Activities associated with the Dewey-Burdock Project are not expected to disturb existing surface water or alter the topography in the area. Those species residing in rocky outcrops located in potential disturbance area could be impacted by construction and maintenance operations. However, few non-aquatic herptile species were observed in the permit area and surrounding perimeter. Any impacts that might occur would affect individuals, but would not likely impact the population as a whole.

As described in the preceding sections of this document, no federally listed vertebrate species were documented in the Dewey-Burdock survey area (permit area and one-mile perimeter) during the yearlong survey period, or during previous targeted surveys conducted for the original claims (TVA 1979). Additionally, the USFWS has issued a block clearance for black-footed

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ferrets in all black-tailed prairie dog colonies in South Dakota (except northern Custer County) and in the entire neighboring state of Wyoming. That clearance indicates that ferrets do not currently, and are not expected to occupy the Dewey-Burdock project area. Only one partially occupied black-tailed prairie dog colony was present within the permit area itself during the 2007-2008 baseline surveys, and local landowners are actively working to remove the animals from their lands. Consequently, licensing the Dewey-Burdock Project will have no direct, indirect, or cumulative effects on black-footed ferrets.

ISR mining within the Dewey-Burdock Project may affect, but is not likely to adversely affect bald eagles, the only state listed species known to inhabit the project area. Bald eagles were documented at winter roosts and an active nest within the proposed permit area for this project. However, most roost sites and the lone nest site are at least 1.0 mile from the nearest planned facility associated with this project. Additionally, no more than two or three bald eagles were observed during any given winter survey, despite the numerous available (and unoccupied) mature trees along Beaver Creek, Pass Creek, and the pine breaks located in and near the permit area, as well as the Cheyenne River corridor approximately 2 to 2.5 miles south of the permit area. Three proposed land application sites (center pivot irrigation systems) would fall within the one-mile buffer of the bald eagle nest. However, those systems are typically automated, and the minimal disturbance associated with potential maintenance of those systems should not be significant enough to impact nesting or roosting bald eagles along Beaver Creek.

Direct impacts to bald eagles would include the potential for injury or mortality to individual birds foraging in the project area due to collisions with mine-related equipment during construction or operation of the Dewey-Burdock Project, or due to electrocutions on new overhead power lines. The most likely opportunity for collisions would be during construction of the proposed new access road; a small segment of that road would be located approximately 0.75 mile from the eagle nest under the current proposed alignment.

Although not expected, disturbance activities near an active nest could result in abandonment of the nest and, thus, the loss of eggs or young. However, the nearest potential disturbance would

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be construction of a new access road approximately 0.75 mile from the bald eagle nest site; that site is currently less than 0.25 mile from an existing ranch two-track and an occupied residence. The increased human presence and noise associated with construction activities, if conducted while eagles are wintering within the area, could displace individual eagles from using the area during that period.

Given the low number of wintering and nesting bald eagles in the project area, potential negative direct impacts of the proposed project would be limited to individuals rather than a large segment of the population. The use of existing or overlapping right-of-way corridors, along with current Avian Power Line Interaction Committee (APLIC 2006) recommendations for new power line construction, would help minimize potential direct impacts associated with overhead power lines. If necessary, the majority of other potential direct impacts could be mitigated if construction activities were conducted outside the breeding season and/or winter roosting months, or outside the daily roosting period, should eagles be present within one mile of construction. Any bald eagles that might roost or nest in the area once the mine is operational would be doing so in spite of continuous and on-going human disturbance, indicating a tolerance for such activities. Annual monitoring of nesting and wintering bald eagles would generate valuable information that could be used to further reduce potential impacts and to help develop mitigation measures that would benefit this species while allowing ISR mining to proceed or continue.

Indirect impacts such as area avoidance could result from increased noise and human presence associated with mine related operations. Potential winter foraging habitat could be further fragmented by linear disturbances such as overhead power lines and new roads associated with the project. Given the size of the proposed project, those disturbances would occur within narrow corridors over relatively short distances. Nevertheless, the use of common right-of-way corridors to consolidate new infrastructure would help reduce these potential indirect impacts.

Ten terrestrial species tracked by the SDNHP were recorded during baseline surveys for the Dewey-Burdock Project, including the bald eagle. Eight of the 10 were observed in or flying

over the permit area, and 2 were seen in the one-mile perimeter. One additional species, the river otter, was observed in the Wyoming reach of Beaver Creek, at least 3.0 miles upstream of the permit area. Three SDNHP species are known or suspected to have nested in the permit area in 2008. However, two of the three nest sites are at least 1.0 mile from the nearest planned new facility, and all three were closer to existing disturbances in 2008 than they would be to new activities outside those existing areas.

The remaining SDNHP species recorded in the Dewey-Burdock permit area could potentially experience the same type of direct and/or indirect impacts from construction and operation of the proposed mining operation as those described previously for other species: e.g., injury, mortality, avoidance, displacement and increased competition for resources, etc. Those potential impacts would be minimized by the timing, extent, and duration of the proposed drilling operations. Enforced speed limits during all phases of the project would further reduce potential impacts to wildlife throughout the year, particularly during the breeding season. Once facilities and infrastructure are in place, animals remaining in the project area would be demonstrating an acclimation to those disturbances.

Ground disturbing construction activities have the potential to affect aquatic species through the direct physical displacement of aquatic habitat, and through secondary effects of impaired water quality on aquatic species. However, as the planned locations for new facilities and infrastructure do not overlap any perennial aquatic features, no loss of aquatic habitat would occur as the result of their construction. The risk of impaired water quality could be further reduced or avoided through project siting, and implementation of standard construction erosion and sediment control measures. The proposed locations of mine-related facilities (processing plants, pipelines, new roads, and power lines), as well as proposed land application sites (center pivot irrigation sites) would preclude direct impacts to perennial streams.

Due to the arid climate and the proposed location of new mine facilities, operation of the Dewey-Burdock mine is not expected to alter aquatic habitat or water quality in perennial streams. No surface water would be diverted for use in the operation, and no process water would be

discharged into aquatic habitat. Recreational anglers do fish Beaver Creek, although the Cheyenne River and Angostura Reservoir provide greater fishing opportunities in the area.

Land application of process water is a potential opportunity through the use of a series of center pivot irrigation systems located near the central processing plant and satellite plant sites. Process water applied to the land surface would evaporate, be taken up by plants, or infiltrate into the groundwater. Small intermittent tributaries to Pass Creek drain three of the proposed land application sites northwest and southwest of the proposed central processing plant. The effect of this potential increased flow on aquatic species would depend on the timing of land application and the quality of process water that is discharged. This watershed provides only seasonal drainage and does not support fish or significant amphibian habitat.

Two of the three potential land application sites located west of the proposed satellite processing plan are in close proximity to Beaver Creek, the primary aquatic habitat in the project vicinity. Beaver Creek would not be directly affected by the mine facilities or land application sites. However, groundwater that originates from land application of process water would contribute to the flow of Beaver Creek. Therefore maintenance of existing conditions in Beaver Creek would depend on the quality of process water discharged at the land application sites. Since process water would be tested for radionuclides and other potentially harmful substances prior to land application, and only discharged when in compliance with permitted levels, no adverse effect on the aquatic biota of Beaver Creek is anticipated.

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MAPS

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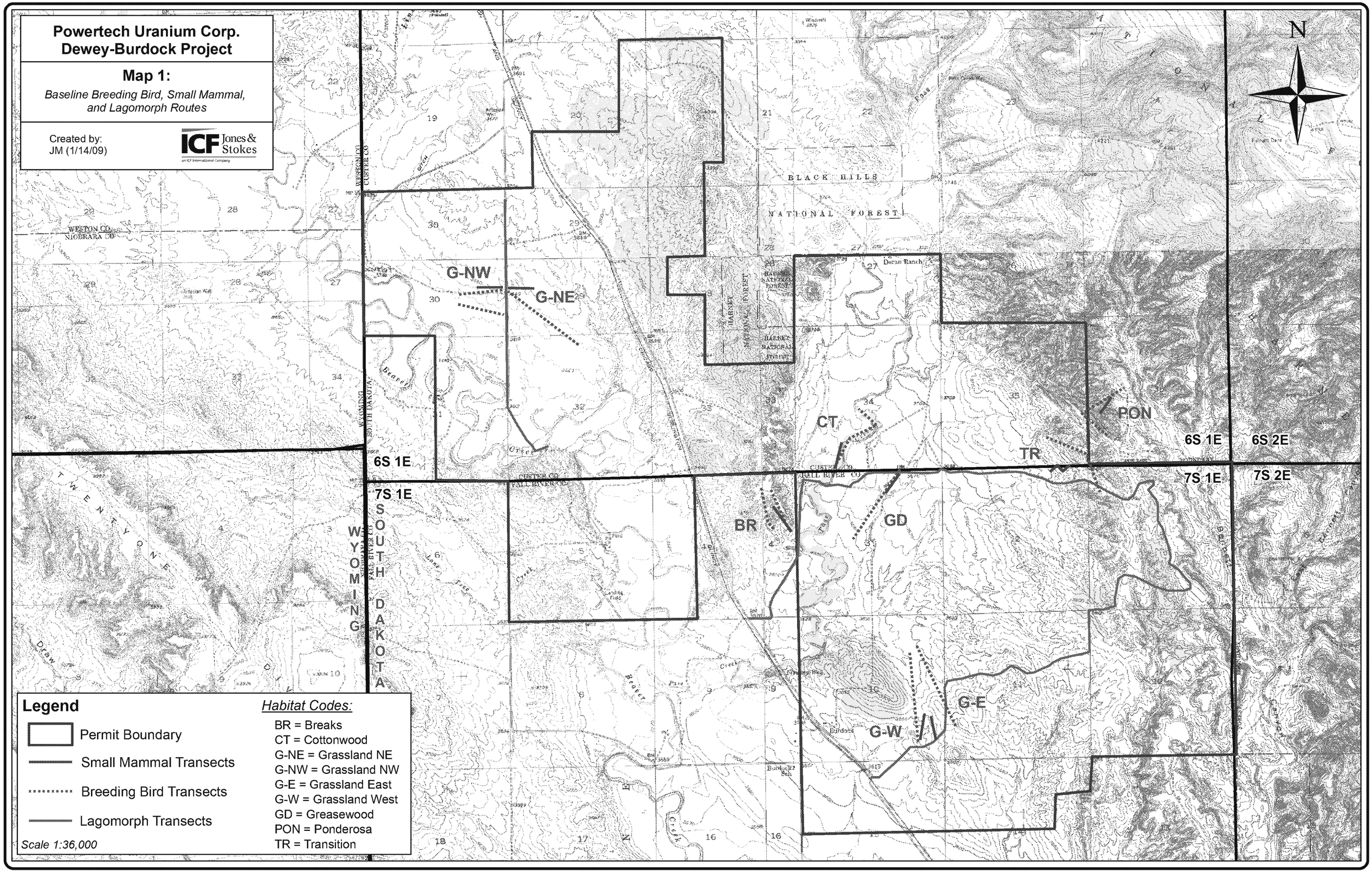
Powertech Uranium Corp.
Dewey-Burdock Project

Map 1:

Baseline Breeding Bird, Small Mammal, and Lagomorph Routes

Created by:
JM (1/14/09)

ICF Jones & Stokes
an ICF International Company

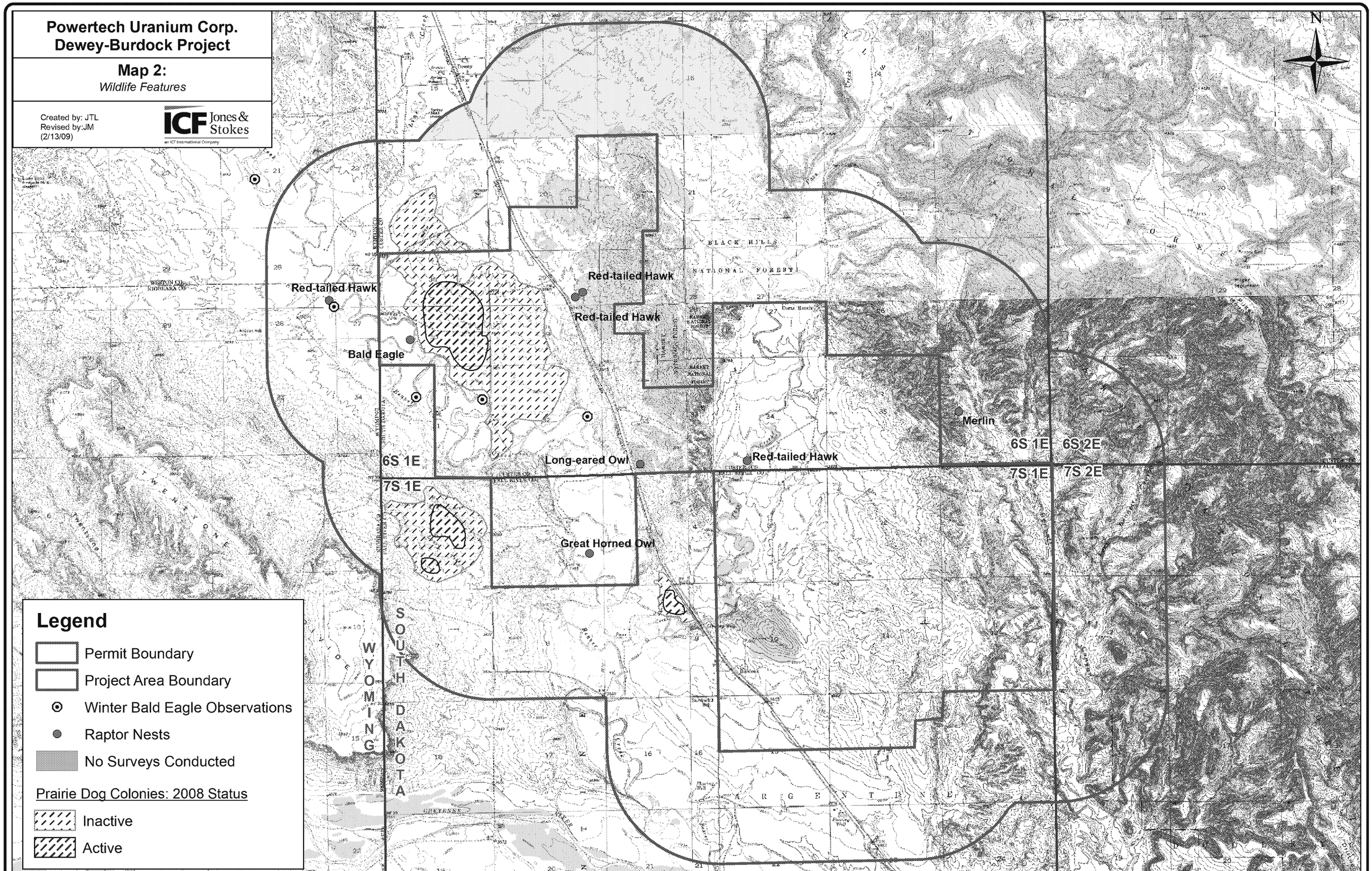


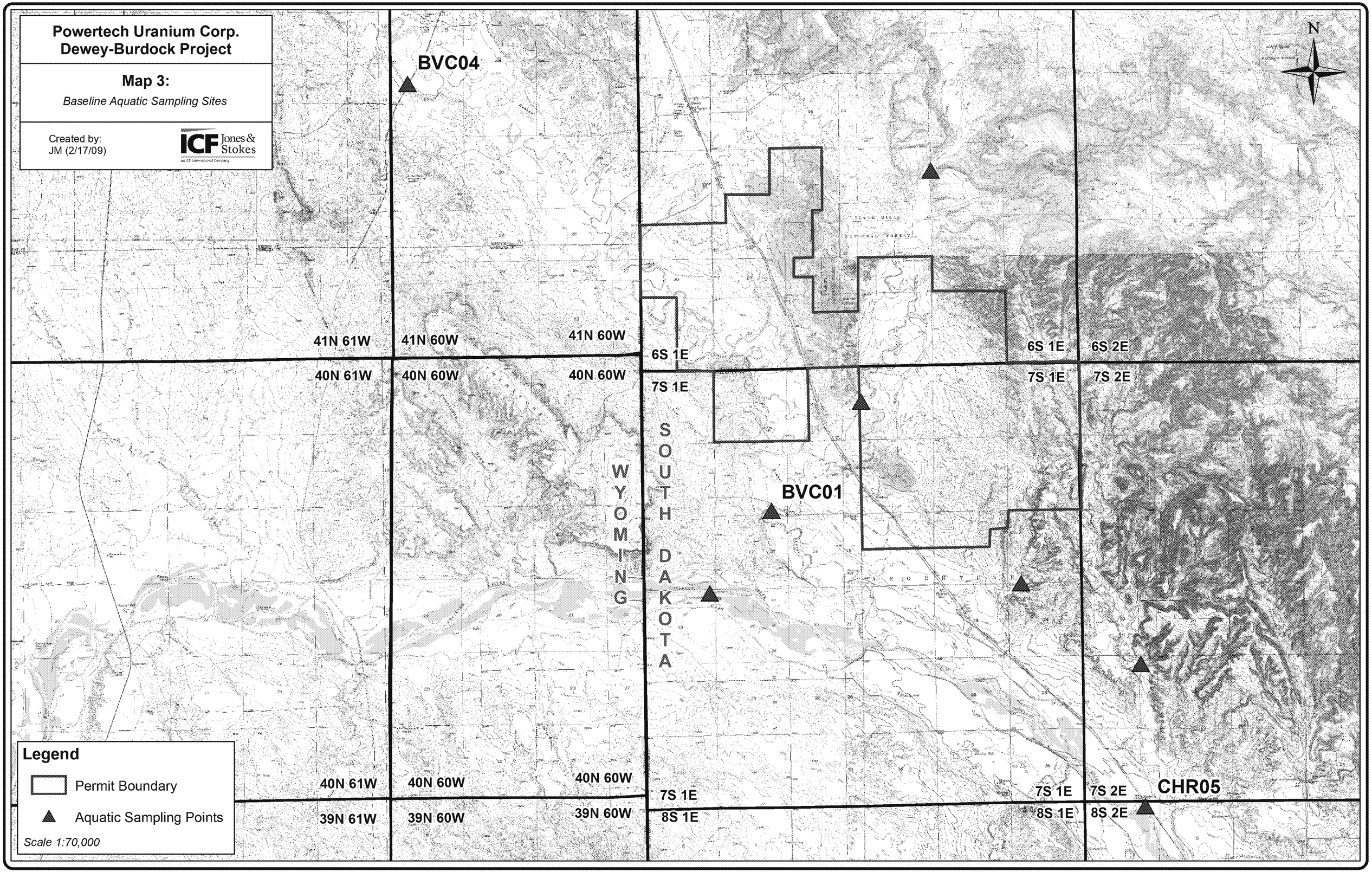
Powertech Uranium Corp.
Dewey-Burdock Project

Map 2:
Wildlife Features

Created by: JTL
Revised by:JM
(2/13/09)

ICF Jones & Stokes
an ICF International Company




Powertech Uranium Corp.
Dewey-Burdock Project
Map 3:
Baseline Aquatic Sampling Sites
Created by:
JM (2/17/09)
ICF Jones & Stokes
BVC04
BVC01
CHR05
N
41N 61W
41N 60W
41N 60W
6S 1E
6S 1E
6S 2E
40N 61W
40N 60W
40N 60W
7S 1E
7S 1E
7S 2E
WYOMING
SOUTH DAKOTA
40N 61W
40N 60W
40N 60W
7S 1E
7S 1E
7S 2E
39N 61W
39N 60W
39N 60W
8S 1E
8S 1E
8S 2E
Legend
Permit Boundary
Aquatic Sampling Points
Scale 1:70,000

POWERTECH URANIUM CORPORATION
DEWEY-BURDOCK PROJECT

2007-2008 BASELINE WILDLIFE REPORT

APPENDIX I

Potential and Observed Terrestrial Species List in the Dewey-Burdock Wildlife Baseline Study Area

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DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED MAMMALIAN SPECIES LIST

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
INSECTIVORES			
Masked shrew	*Sorex cinereus*	---	---
Merriam's shrew	***Sorex merriami***	---	---
Vagrant shrew	*Sorex vagrans*	---	---
Dwarf shrew	***Sorex nanus***	---	---
BATS			
Unknown bat species		X	X
Small-footed myotis	*Myotis ciliolabrum*	---	---
Long-eared myotis	***Myotis evotis***	---	---
Fringe-tailed myotis	***Myotis thysanodes pahasapensis***	---	---
Northern myotis	***Myotis septentrionalis***	---	---
Little brown myotis	*Myotis lucifugus*	---	---
Long-legged myotis	*Myotis volans*	---	---
Hoary bat	*Lasiurus cinereus*	---	---
Red bat	*Lasiurus borealis*	---	---
Silver-haired bat	***Lasionycteris noctivagans***	---	---
Big brown bat	*Eptesicus fuscus*	---	---
Townsend's big-eared bat	***Plecotus townsendi***	---	---
HARES AND RABBITS			
Desert cottontail	*Sylvilagus audubonii*	---	---
Mountain cottontail	*Sylvilagus nuttallii*	---	---
Cottontail species	*Sylvilagus* spp.	X	X
Eastern cottontail	*Sylvilagus floridanus*	---	---
Black-tailed jackrabbit	*Lepus californicus*	---	---
White-tailed jackrabbit	*Lepus townsendii*	X	X
RODENTS			
Least chipmunk	*Tamias minimus*	---	---
Thirteen-lined ground squirrel	*Spermophilus tridecemlineatus*	X	X
Northern flying squirrel	***Glaucomys sabrinus***	---	---
Black-tailed prairie dog	*Cynomys ludovicianus*	X	X
Yellow-bellied marmot	*Marmota flaviventris*	---	---
Northern pocket gopher	*Thomomys talpoides*	X	X
Plains pocket gopher	*Geomys bursarius*	---	---
Olive-backed pocket mouse	*Perognathus fasciatus*	X	---
Silky pocket mouse	*Perognathus flavus*	---	---
Hispid pocket mouse	*Perognathus hispidus*	---	---
Plains pocket mouse	*Perognathus flavescens*	---	---
Ord's kangaroo rat	*Dipodomys ordii*	---	---
Western harvest mouse	*Reithrodontomys megalotis*	X	---
Plains harvest mouse	*Reithrodontomys montanus*	---	---
Deer mouse	*Peromyscus maniculatus*	X	---
White-footed mouse	*Peromyscus leucopus*	---	---
Northern grasshopper mouse	*Onychomys leucogaster*	X	---
Bushy-tailed woodrat	*Neotoma cinerea*	---	---

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED MAMMALIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
RODENTS, cont.			
Long-tailed vole	*Microtus longicaudus*	---	---
Prairie vole	*Microtus ochrogaster*	---	---
Meadow vole	*Microtus pennsylvanicus*	---	---
Muskrat	*Ondatra zibethicus*	---	---
Northern river otter	***Lontra canadensis***	---	**X**
Norway rat	*Rattus norvegicus*	---	---
House mouse	*Mus musculus*	---	---
Meadow jumping mouse	***Zapus hudsonius***	---	---
Western jumping mouse	*Zapus princeps*	---	---
Porcupine	*Erethizon dorsatum*	---	X
Beaver	*Castor canadensis*	---	X
CARNIVORES			
Coyote	*Canis latrans*	X	X
Swift fox	***Vulpes velox***	---	---
Raccoon	*Procyon lotor*	---	X
Ermine	*Mustela erminea*	---	---
Long-tailed weasel	*Mustela frenata*	---	---
Black-footed ferret	***Mustela nigripes***	---	---
Least weasel	*Mustela nivalis*	---	---
Mink	*Mustela vison*	---	---
Badger	*Taxidea taxus*	---	X
Eastern spotted skunk	***Spilogale putorius interrupta***	---	---
Striped skunk	*Mephitis mephitis*	X	---
Mountain lion	***Felis concolor***	---	---
Bobcat	*Felis rufus*	---	---
UNGULATES			
Elk	*Cervus elaphus*	X	X
Mule deer	*Odocoileus hemionus*	X	X
White-tailed deer	*Odocoileus virginianus*	X	X
Pronghorn	*Antilocapra americana*	X	X

1 POTENTIAL OCCURRENCE--list derived from ra nge and habitat information in Burt and Grossenheider (1976), Jones et al. (1983), and Clark and Stromberg (1987), and Cerovski et al. (2004).

2 OBSERVED IN DEWEY-BURDOCK PERMIT AREA—animal or sign observed in the proposed permitting project area by Jones & Stokes biologists or other project personnel at least on ce from 2007-2008.

3 RECORDED IN VICINITY—animal or sign observed within 1 mile of the proposed permitting project area by Jones & Stokes biologists or other project personnel at least once from 2007-2008.

Bold species are tracked by the South Dakota Natural Heritage Program – South Dakota Department of Game, Fish and Parks (SDGFP web page, last updated September 2, 2008).

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
LOONS			
Common loon	***Gavia immer***	---	---
GREBES			
Horned grebe	***Podiceps auritus***	---	---
Eared grebe	*Podiceps nigricollis*	---	---
Western grebe	*Aechmorphorus occidentalis*	---	---
Pied-billed grebe	*Podilymbus podiceps*	---	---
PELICANS			
American white pelican	***Pelecanus erythrorhynchos***	**X**	**X**
CORMORANTS			
Double-crested cormorant	*Phalacrocorax auritus*	---	---
HERONS			
Great blue heron	***Ardea herodias***	**X**	---
Black-crowned night heron	***Nycticorax nycticorax***	---	---
American bittern	*Botaurus lentiginosus*	---	---
Green-backed heron	***Butorides virescens***	---	---
White-faced ibis	***Plegadis chihi***	---	---
SWANS, GEESE, AND DUCKS			
Canada goose	*Branta canadensis*	---	X
Snow goose	*Chen caerulescens*	---	---
Ross's goose	*Chen rossii*	---	---
Mallard	*Anas platyrhynchos*	X	---
Gadwall	*Anas strepera*	---	---
Northern pintail	*Anas acuta*	---	---
Green-winged teal	*Anas crecca*	---	---
Blue-winged teal	*Anas discors*	---	---
Cinnamon teal	*Anas cyanoptera*	---	---
American wigeon	*Anas americana*	---	X
Northern shoveler	*Anas clypeata*	---	---
Wood duck	*Aix sponsa*	---	---
Redhead	*Aythya americana*	---	---
Ring-necked duck	*Aythya collaris*	---	---
Canvasback	*Aythya valisineria*	---	---
Lesser scaup	*Aythya affinis*	---	---
Greater scaup	*Aythya marila*	---	---
Bufflehead	***Bucephala albeola***	---	---
Common goldeneye	*Bucephala clangula*	---	---
Barrow's goldeneye	*Bucephala islandica*	---	---
Ruddy duck	*Oxyura jamaicensis*	---	---
Hooded merganser	***Lophodytes cucullatus***	---	---
Common merganser	***Mergus merganser***	---	---
Red-breasted merganser	*Mergus serrator*	---	---

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
SWANS, GEESE, AND DUCKS, cont.			
Tundra swan	*Cygnus columbianus*	---	---
DIURNAL RAPTORS			
Turkey vulture	*Cathartes aura*	X	X
Osprey	***Pandion haliaetus***	---	---
Bald eagle	***Haliaeetus leucocephalus***	**X**	**X**
Northern harrier	*Circus cyaneus*	---	X
Sharp-shinned hawk	***Accipiter striatus***	---	---
Cooper's hawk	***Accipiter cooperii***	**X**	**X**
Northern goshawk	***Accipiter gentilis***	---	---
Broad-winged hawk	***Buteo platypterus***	---	---
Red-tailed hawk	*Buteo jamaicensis*	X	X
Swainson's hawk	***Buteo swainsoni***	---	---
Ferruginous hawk	***Buteo regalis***	---	---
Rough-legged hawk	*Buteo lagopus*	X	X
Golden eagle	***Aquila chrysaetos***	**X**	**X**
American kestrel	*Falco sparverius*	X	X
Merlin	***Falco columbarius***	---	**X**
Peregrine falcon	***Falco peregrinus***	---	---
Gyrfalcon	*Falco rusticolus*	---	---
Prairie falcon	***Falco mexicanus***	---	---
GALLINACEOUS BIRDS			
Sharp-tailed grouse	*Pedioecetus phasianellus*	---	---
Sage-grouse	*Centrocercus urophasianus*	---	---
Ring-necked pheasant	*Phasianus colchicus*	---	---
Gray partridge	*Perdix perdix*	---	---
Wild turkey	*Meleagris gallopavo*	X	X
CRANES, RAILS, AND COOTS			
Whooping crane	***Grus americana***	---	---
Sandhill crane	*Grus canadensis*	---	---
Sora	*Porzana carolina*	---	---
American coot	*Fulica americana*	---	---
Virginia rail	*Rallus limicola*	---	---
SHOREBIRDS, GULLS, AND TERNS			
American avocet	*Recurvirostra americana*	---	---
Semipalmated plover	*Charadrius semipalmatus*	---	---
Killdeer	*Charadrius vociferus*	X	X
Mountain plover	***Charadrius montanus***	---	---
Piping plover	***Charadrius melodus***	---	---
Lesser golden plover	*Pluvialis dominica*	---	---
Black-bellied plover	*Pluvialis squatarola*	---	---
Marbled godwit	*Limosa fedoa*	---	---
Hudsonian godwit	*Limosa haemastica*	---	---
Long-billed curlew	***Numenius americanus***	**X**	---

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
SHOREBIRDS, GULLS, AND TERNS, cont.			
Upland sandpiper	*Bartramia longicauda*	X	X
Greater yellowlegs	*Tringa melanoleuca*	---	---
Lesser yellowlegs	*Tringa flavipes*	---	---
Solitary sandpiper	*Tringa solitaria*	---	---
Buff-breasted sandpiper	*Tryngites subruficollis*	---	---
Willet	*Catoptrophorus semipalmatus*	---	---
Spotted sandpiper	*Actitis macularia*	---	---
Wilson's phalarope	*Phalaropus tricolor*	---	---
Red-necked phalarope	*Phalaropus lobatus*	---	---
Common snipe	*Gallinago gallinago*	---	---
Short-billed dowitcher	*Limnodromus griseus*	---	---
Long-billed dowitcher	*Limnodromus scolopaceus*	---	---
Red knot	*Calidris canutus*	---	---
Semipalmated sandpiper	*Calidris pusilla*	---	---
Western sandpiper	*Calidris mauri*	---	---
Least sandpiper	*Calidris minutilla*	---	---
Baird's sandpiper	*Calidris bairdii*	---	---
Pectoral sandpiper	*Calidris melanotos*	---	---
Sanderling	*Calidris alba*	---	---
White-rumped sandpiper	*Calidris fuscicollis*	---	---
Stilt sandpiper	*Micropalama himantopus*	---	---
Herring gull	*Larus argentatus*	---	---
California gull	***Larus californicus***	---	---
Ring-billed gull	*Larus delawarensis*	---	---
Franklin's gull	*Larus pipixcan*	---	---
Bonaparte's gull	*Larus philadelphia*	---	---
Forster's tern	*Sterna forsteri*	---	---
Caspian tern	*Sterna caspia*	---	---
Common tern	***Sterna hurundo***	---	---
Black tern	***Childonias niger***	---	---
Interior least tern	***Sterna antillarum athalassos***	---	---
PIGEONS AND DOVES			
Rock dove	*Columba livia*	X	---
Mourning dove	*Zenaida macroura*	X	X
CUCKOOS			
Yellow-billed cuckoo	*Coccyzus americanus*	---	---
Black-billed cuckoo	*Coccyzus erythropthalmus*	---	---
OWLS			
Barn owl	***Tyto alba***	---	---
Northern saw-whet owl	***Aegolius acadicus***	---	---
Long-eared owl	***Asio otus***	**X**	---
Short-eared owl	*Asio flammeus*	---	---
Great horned owl	*Bubo virginianus*	X	X

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
OWLS, cont.			
Burrowing owl	***Athene cunicularia***	---	---
Snowy owl	*Nyctea scandiaca*	---	---
Eastern screech-owl	*Otus asio*	---	---
Western screech-owl	*Otus kennicottii*	---	---
GOATSUCKERS			
Common nighthawk	*Chordeiles minor*	X	X
Common poorwill	***Phalaenoptilus nuttallii***	---	---
KINGFISHERS			
Belted kingfisher	*Megaceryle alcyon*	---	X
WOODPECKERS			
Red-headed woodpecker	*Melanerpes erythrocephalus*	X	---
Hairy woodpecker	*Picoides villosus*	X	---
Downy woodpecker	*Picoides pubescens*	---	---
Lewis' woodpecker	***Melanerpes lewis***	---	---
Three-toed woodpecker	***Picoides tridactylus***	---	---
Black-backed woodpecker	***Picoides arcticus***	---	---
Northern flicker	*Colaptes auratus*	X	X
FLYCATCHERS			
Western wood-pewee	*Contopus sordidulus*	X	---
Western flycatcher	*Empidonax difficilis*	---	---
Least flycatcher	*Empidonax minimus*	---	---
Dusky flycatcher	*Empidonax oberholseri*	---	---
Cordilleran flycatcher	*Empidonax occidentalis*	---	---
Willow flycatcher	*Empidonax traillii*	---	---
Olive-sided flycatcher	***Contopus borealis***	---	---
Eastern phoebe	*Sayornis phoebe*	---	---
Say's phoebe	*Sayornis saya*	X	X
Western kingbird	*Tyrannus verticalis*	X	X
Eastern kingbird	*Tyrannus tyrannus*	X	---
Cassin's kingbird	***Tyrannus vociferans***	---	---
LARKS			
Horned lark	*Eremophila alpestris*	X	X
SWALLOWS			
Violet-green swallow	*Tachycineta thalassina*	---	---
Tree swallow	*Tachycineta bicolor*	---	---
Purple martin	*Progne subis*	---	---
Bank swallow	*Riparia riparia*	---	---
Northern rough-winged swallow	*Stelgidopteryx serripennis*	---	---
Cliff swallow	*Hirundo pyrrhonota*	X	---
Barn swallow	*Hirundo rustica*	X	---

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
JAYS, MAGPIES, AND CROWS			
Blue jay	*Cyanocitta cristata*	---	---
Pinyon jay	*Gymnorhinus cyanocephalus*	X	X
Clark's nutcracker	***Nucifraga columbiana***	---	**X**
Black-billed magpie	*Pica pica*	---	---
American crow	*Corvus brachyrhynchos*	X	X
CHICKADEE			
Black-capped chickadee	*Parus atricapillus*	X	X
CREEPERS			
Brown creeper	***Certhia americana***	---	---
NUTHATCHES			
Red-breasted nuthatch	*Sitta canadensis*	---	X
White-breasted nuthatch	*Sitta carolinensis*	X	---
Pygmy nuthatch	***Sitta pygmaea***	---	---
WRENS			
Rock wren	*Salpinctes obsoletus*	X	---
House wren	*Troglodytes aedon*	X	---
Marsh wren	*Cistothorus palustris*	---	---
THRUSHES			
Veery	***Catharus fuscescens***	---	---
Hermit thrush	*Catharus guttatus*	---	---
Swainson's thrush	*Catharus ustulatus*	---	---
Ruby-crowned kinglet	*Regulus calendula*	---	---
Golden-crowned kinglet	*Regulus satrapa*	---	---
Mountain bluebird	*Sialia currucoides*	X	X
Western bluebird	*Sialia mexicana*	---	---
Townsend's solitaire	*Myadestes townsendi*	---	---
American robin	*Turdus migratorius*	X	X
MIMIC THRUSHES			
Northern mockingbird	***Mimus polyglottos***	---	---
Gray catbird	*Dumetella carolinensis*	---	---
Brown thrasher	*Toxostoma rufum*	---	---
Sage thrasher	***Oreoscoptes montanus***	---	---
PIPITS			
American pipit	*Anthus rubescens*	---	---
Sprague's pipit	***Anthus spragueii***	---	---
WAXWINGS			
Cedar waxwing	*Bombycilla cedrorum*	---	---
Bohemian waxwing	*Bombycilla garrulus*	---	---

SHEAR/CLARKSON BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
SHRIKES			
Northern shrike	*Lanius excubitor*	---	---
Loggerhead shrike	*Lanius ludovicianus*	---	X
STARLINGS			
European starling	*Sturnus vulgaris*	X	X
VIREOS			
Solitary vireo	*Vireo solitarius*	---	---
Warbling vireo	*Vireo gilvus*	---	---
Red-eyed vireo	*Vireo olivaceus*	---	---
WARBLERS			
Tennessee warbler	*Vermivora peregrina*	---	---
Orange-crowned warbler	*Vermivora celata*	---	---
Chestnut-sided warbler	*Dendroica pensylvanica*	---	---
Black-throated warbler	*Dendroica caerulescens*	---	---
Yellow warbler	*Dendroica petechia*	X	---
Yellow-rumped warbler	*Dendroica coronata*	X	---
Yellow-throated warbler	*Dendroica dominica*	---	---
Blackpoll warbler	*Dendroica striata*	---	---
Black-and-white warbler	***Mniotilta varia***	---	---
Virginia's warbler	***Vermivora virginiae***	---	---
American redstart	*Setophaga ruticilla*	---	---
Ovenbird	*Seiurus aurocapillus*	---	---
Northern waterthrush	*Seiurus noveboracensis*	---	---
MacGillivray's warbler	*Oporornis tolmiei*	---	---
Common yellowthroat	*Geothlypis trichas*	---	---
Wilson's warbler	*Wilsonia pusilla*	---	---
Yellow-breasted chat	*Icteria virens*	X	---
TANAGERS			
Western tanager	*Piranga ludoviciana*	---	---
GROSBEAKS AND BUNTINGS			
Black-headed grosbeak	*Pheucticus melanocephalus*	---	---
Rose-breasted grosbeak	*Pheucticus ludovicianus*	---	---
Blue grosbeak	*Guiraca caerulea*	X	---
Lazuli bunting	*Passerina amoena*	X	---
Indigo bunting	*Passerina cyanea*	X	---
Dickcissel	*Spiza americana*	---	---
TOWHEES, SPARROWS, JUNCOS, AND LONGSPURS			
Spotted towhee	*Pipilo maculatus*	X	---
Green-tailed towhee	*Pipilo chlorurus*	---	---
American tree sparrow	*Spizella arborea*	---	---
Chipping sparrow	*Spizella passerina*	X	---
Clay-colored sparrow	*Spizella pallida*	---	---
Brewer's sparrow	***Spizella breweri***	---	---

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
TOWHEES, SPARROWS, JUNCOS, AND LONGSPURS, cont.			
Field sparrow	*Spizella pusilla*	---	---
Vesper sparrow	*Pooecetes gramineus*	X	X
Lark sparrow	*Chondestes grammacus*	X	---
Sage sparrow	*Amphispiza belli*	---	---
Lark bunting	*Calamospiza melanocorys*	X	---
Savannah sparrow	*Passerculus sandwichensis*	---	---
Baird's sparrow	***Ammodramus bairdii***	---	---
Grasshopper sparrow	*Ammodramus savannarum*	X	---
Fox sparrow	*Passerella ilicac*	---	---
Song sparrow	*Melospiza melodia*	---	---
Lincoln's sparrow	*Melospiza lincolnii*	---	---
White-throated sparrow	*Zonotrichia albicollis*	---	---
White-crowned sparrow	*Zonotrichia leucophrys*	---	---
Harris' sparrow	*Zonotrichia querula*	---	---
Dark-eyed junco	*Junco hyemalis*	---	---
McCown's longspur	***Calcarius mccownii***	---	---
Lapland longspur	*Calcarius lapponicus*	---	---
Chestnut-collared longspur	*Calcarius ornatus*	---	---
Snow bunting	*Plectrophenax nivalis*	---	---
Bobolink	*Dolichonyx oryzivorus*	---	---
BLACKBIRDS, MEADOWLARKS, AND ORIOLES			
Red-winged blackbird	*Agelaius phoeniceus*	X	---
Western meadowlark	*Sturnella neglecta*	X	X
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	X	---
Brewer's blackbird	*Euphagus cyanocephalus*	X	---
Common grackle	*Quiscalus quiscula*	---	---
Brown-headed cowbird	*Molothrus ater*	X	---
Orchard oriole	*Icterus spurious*	---	---
Bullock's oriole	*Icterus bullockii*	X	---
Baltimore oriole	*Icterus galbula*	---	---
FINCHES			
Gray-crowned rosy finch	*Leucosticte tephrocotis*	---	---
Pine grosbeak	*Pinicola enucleator*	---	---
Purple finch	*Carpodacus purpureus*	---	---
Cassin's finch	***Carpodacus cassinii***	---	---
House finch	*Carpodacus mexicanus*	---	---
Red crossbill	*Loxia curvirostra*	X	X
White-winged crossbill	*Loxia leucoptera*	---	---
Common redpoll	*Carduelis flammea*	---	---
Hoary redpoll	*Carduelis hornemanni*	---	---
Pine siskin	*Carduelis pinus*	---	---
American goldfinch	*Carduelis tristis*	---	---
Evening grosbeak	*Coccothraustes vespertinus*	---	---

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AVIAN SPECIES LIST (continued)

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
WEAVER FINCHES			
House sparrow	*Passer domesticus*	---	---

1 POTENTIAL OCCURRENCE—list derived from range and habitat information in Robbins et al. (1966), Petersen (1990), Stokes and Stokes (1996), and Cerovski et al. (2 004). The species listed includes those that might pass through the Dewey-Burdock permitting project area, or vicinity, during migration.

2 OBSERVED IN DEWEY -BURDOCK PERMIT AREA—bird or s ign observed in the proposed permitting project area by Jones & Stokes biologists or other project personnel at least on ce from 2007-2008.

3 RECORDED IN VICINITY—bird or sign observed within one mile of the proposed permitting project area by Jones & Stokes biologists or other project personnel at least once from 2007-2008.

Bold species are tracked by the S.D. Natural Heritage Program – South Dakota Department of Game, Fish and Parks (SDGFP web page, last updated September 2, 2008).

DEWEY-BURDOCK BASELINE WILDLIFE REPORT

POTENTIAL[1] AND OBSERVED AMPHIBIAN AND REPTILE SPECIES LIST

Common Name	Scientific Name	Observed In Permit Area[2]	Recorded In Vicinity[3]
SALAMANDERS			
Tiger salamander	*Ambystoma tigrinum*	---	---
FROGS AND TOADS			
Plains spadefoot	*Scaphiopus bombifrons*	---	---
Woodhouse's toad	*Bufo woodhousei*	X	---
Great plains toad	*Bufo cognatus*	X	---
Boreal chorus frog	*Pseudacris triseriata*	X	X
Northern leopard frog	*Rana pipiens*	---	---
TURTLES			
Western painted turtle	*Chrysemys picta*	X	---
Western spiny softshell	*Trionyx spiniferus*	---	---
Common snapping turtle	*Chelydra serpentina*	---	---
LIZARDS			
Northern sagebrush lizard	***Sceloporus graciosus***	---	---
Eastern short-horned lizard	*Phrynosoma douglassi*	---	---
SNAKES			
Plains hognose snake	*Heterodon nasicus*	---	---
Eastern yellowbelly racer	*Coluber constrictor*	---	---
Bullsnake	*Pituophis melanoleucas*	---	---
Pale milk snake	*Lampropeltis triangulum*	---	---
Wandering garter snake	*Thamnophis elegans*	---	---
Western plains garter snake	*Thamnophis radix*	---	---
Common garter snake	*Thamnophis sirtalis*	---	---
Prairie rattlesnake	*Crotalus viridis*	---	---
Smooth green snake	***Opheodrys vernalis***	---	---
Brown snake	***Storeria dekayi***	---	---

1 POTENTIAL OCCURRENCE--list derived from range and habitat information in Baxter and Stone (1985), Stebbins (1966), and Kiesow (2006).

2 OBSERVED IN DEWEY-BURDOCK PERMIT AREA—animal or sign observed in the proposed permitting project area by Jones & Stokes biologists or other project personnel at least once from 2007-2008.

3 RECORDED IN VICINITY—animal or sign observed within one mile of the proposed permitting project area by Jones & Stokes biologists or other project personnel at least once from 2007-2008.

Bold species are tracked by the S.D. Natural Heritage Program – South Dakota Department of Game, Fish and Parks (SDGFP web page, last updated September 2, 2008).

DEWEY-BURDOCK BASELINE WILDLIFE REPORT
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POWERTECH URANIUM CORPORATION
DEWEY-BURDOCK PROJECT

2007-2008 BASELINE WILDLIFE REPORT

APPENDIX II

Vertebrate Wildlife Species
Observed Within the Dewey-Burdock Project Survey Area

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Table 1. Small mammal abundance[1] by habitat during trapping within the Dewey-Burdock Project permit area in September 2007.

	Habitat Types (Captures/100 Trap Nights)						
Species	**G**	**PP**	**PS**	**GW**	**CG**	**CB**	**Captures/100 trap nights**
Deer mouse (*Peromyscus maniculatus*)	6.7	22.9	15.2	5.7	16.2	17.1	11.4
Olive-backed pocket mouse (*Perognathus fasciatus*)	0.7	--	--	--	--	--	0.3
Western harvest mouse (*Reithrodontomys megalotis*)	0.2	--	--	0.9	--	--	0.2
Northern grasshopper mouse (*Onychomys leucogaster*)	0.2	--	--	--	--	--	0.1
Totals	**7.8**	**22.9**	**15.2**	**6.6**	**16.2**	**17.1**	**12.0**

[1] Abundance = animals per 100 trap nights (excluding recaptures).

CB = Clay Breaks
CG = Cottonwood Gallery
G = Upland Grassland
GW = Greasewood
PP = Ponderosa Pine
PS = Pine/Sagebrush Edge

Table 2. Total lagomorphs observed during spotlight surveys and abundance indices within the Dewey-Burdock Project permit area in September 2007.

	Species		
	White-tailed Jackrabbit	Cottontail	Totals
Lagomorph Count	12	28	40
Lagomorphs/Survey Mile[2]	1.5	3.4	4.9

[1] Number given is highest count per species from two survey nights.
[2] Survey route totaled 8.2 miles.

Table 3. Raptor nest locations and activity in the Dewey-Burdock Project permit area and one-mile perimeter during baseline wildlife surveys from July 2007 through August 2008.

Species[1,2]	¼ ¼ Section	Township/Range	Habitat	2008 Status	Location
LEOW	**SESW 35**	**6 South/1 East**	**Ponderosa Pine**	**1+ young fledged**	**Permit area**
RTHA (2 nests)	SENE 29	6 South/1 East	Ponderosa Pine	1 young fledged	Permit area
RTHA	SESW34	6 South/1 East	Cottonwood-riparian	2 young fledged	Permit area
BAEA	**Mid-SW 30**	**6 South/1 East**	**Cottonwood-riparian**	**1 young fledged**	**Permit area**
MERL	**NWSW 36**	**6 South/1 East**	**Ponderosa Pine**	**Nest defense but no confirmed young**	**1-mile perimeter**
Potential GHOW[3]	NESE 5	7 South/1 East	Lone, live cottonwood tree	Status unknown	Permit area
Potential RTHA	NESE 28	41 North/60 West (Wyoming)	Lone, dead cottonwood tree	Inactive	1-mile perimeter

[1] **Bold** species are tracked by the South Dakota Natural Heritage Program – South Dakota Department of Game, Fish and Parks (SDGFP web page, last updated September 2, 2008).

[2] Species Codes:

BAEA = Bald eagle

GHOW = Great horned owl

LEOW = Long-eared owl

MERL = Merlin

RTHA = Red-tailed hawk

[3] One adult GHOW was observed in the nest tree, but no chicks, feathers, droppings, or prey items were observed in or on the nest, or on the ground under the nest.

Table 4. Breeding bird species richness and relative abundance in six habitat types within the Dewey-Burdock Project permit area in June 2008.

	Average number of birds per habitat type[1]						
Species[2]	**CB**	**CG**	**G**	**GW**	**PS**	**PP**	**Avg #/ Plot**
Western meadowlark (*Sturnella neglecta*)	3.0	1.7	2.9	7.0	2.0	---	2.8
Mourning dove (*Zenaida macroura*)	5.0	1.7	1.9	0.7	0.3	2.0	1.9
Long-billed curlew (*Numenius americanus*)	---	---	**1.9**	---	---	---	**0.9**
Chipping sparrow (*Spizella passerina*)	---	---	---	0.3	4.0	1.6	0.6
Lark sparrow (*Chondestes grammacus*)	3.7	---	---	---	1.7	---	0.6
Grasshopper sparrow (*Ammodramus savannarum*)	---	---	0.1	4.3	---	---	0.5
Northern flicker (*Colaptes auratus*)	---	4.3	---	0.3	---	---	0.5
Mountain bluebird (*Sialia currucoides*)	---	---	---	---	2.3	2.0	0.5
Brewer's blackbird (*Euphagus cyanocephalus*)	---	3.7	---	---	---	---	0.4
Spotted towhee (*Pipilo maculatus*)	---	1.3	---	0.3	0.7	1.0	0.4
American kestrel (*Falco sparverius*)	0.3	2.3	0.2	---	---	---	0.4
Brown-headed cowbird (*Molothrus ater*)	---	0.3	---	---	2.0	1.0	0.4
House wren (*Troglodytes aedon*)	---	2.7	---	---	---	---	0.3
Yellow warbler (*Dendroica petechia*)	---	2.0	---	---	---	---	0.2
Say's phoebe (*Sayornis saya*)	---	0.3	---	---	1.3	---	0.2
Bullock's oriole (*Icterus bullockii*)	---	1.7	---	---	---	---	0.2
Unknown flycatcher	---	---	---	---	---	1.7	0.2
Eastern kingbird (*Tyrannus tyrannus*)	---	1.3	---	---	---	---	0.1
Red-tailed hawk (*Buteo jamaicensis*)	---	0.3	0.1	0.3	---	---	0.1
Black-capped chickadee (*Poecile atricapillus*)	---	0.3	---	---	---	0.7	0.1
Yellow-rumped warbler (*Dendroica coronata*)	---	0.3	---	---	---	0.7	0.1

Table 4. Continued.

Species[2]	Average number of birds per habitat type[1]						
	CB	CG	G	GW	PS	PP	Avg #/ Plot
Unknown passerine	0.3	---	0.2	---	---	---	0.1
European starling (*Sturnus vulgaris*)	---	1.0	---	---	---	---	0.1
Great horned owl (*Bubo virginianus*)	---	1.0	---	---	---	---	0.1
Vesper sparrow (*Pooecetes gramineus*)	---	---	0.3	---	---	---	0.1
American crow (*Corvus brachyrhynchos*)	---	---	0.1	---	---	0.3	0.1
Red-headed woodpecker (*Melanerpes erythrocephalus*)	---	0.7	---	---	---	---	0.1
Rock wren (*Salpinctes obsoletus*)	---	---	---	---	0.7	---	0.1
Western kingbird (*Tyrannus verticalis*)	I	0.7	---	---	---	---	0.1
American robin (*Turdus migratorius*)	---	0.3	---	---	---	---	<0.1
Common nighthawk (*Chordeiles minor*)	---	I	---	---	---	0.3	<0.1
Indigo bunting (*Passerina cyanea*)	---	0.3	---	---	---	---	<0.1
Killdeer (*Charadrius vociferous*)	---	---	0.1	---	---	---	<0.1
Lazuli bunting (*Passerina amoena*)	---	0.3	---	---	---	---	<0.1
Western wood peewee (*Contopus sordidulus*)	---	---	---	---	0.3	---	<0.1
Yellow-breasted chat (*Icteria virens*)	---	0.3	---	---	---	---	<0.1
Red-winged blackbird (*Agelaius phoeniceus*)	---	---	I	---	---	---	I
Turkey vulture (*Carthartes aura*)	I	I	---	---	---	---	I
Average # Birds/Transect	**12.3**	**29.0**	**7.7**	**13.3**	**15.3**	**10.7**	**12.4**
Total Species	**5**	**23**	**10**	**7**	**10**	**10**	**36**

[1]Table acronyms defined:
CB = Clay breaks
CG = Cottonwood Gallery
G = Grassland
GW = Greasewood
PS = Pine-Sagebrush Edge
PP = Ponderosa pine
I = Incidental flyover during breeding bird survey (not counted in totals)

[2] **Bold** species are tracked by the South Dakota Natural Heritage Program – South Dakota Department of Game, Fish and Parks (SDGFP web page, last updated September 2, 2008).

Table 5. Rare, threatened, and endangered animal species tracked by the South Dakota Natural Heritage Program and observed[1] in the Dewey-Burdock Project permit area or one-mile perimeter during baseline wildlife surveys from July 2007 through August 2008.

Date	No. & Species	¼ ¼ Section, T, R	Habitat	Activity	Permit Area
9/13/07	2 merlins	SWSW 12, 7S 1E	sagebrush	perched	Yes
12/20/07	1 bald eagle	SENE 31, 6S 1E	riparian	perched	Yes
12/21/07	1 bald eagle	SESE 27, 6S 1E	pine breaks	flying	Yes
12/27/07	1 golden eagle	SWSW 3, 7S 1E	riparian	perched	Yes
1/25/08	2 bald eagles	mid-NW 31, 6S 1E	riparian	perched	No
1/25/08	1 bald eagle	NENE 36, 6S 1E	ponderosa pine	flying	No
2/26/08	1 bald eagle	NENE 31, 6S 1E	riparian	flying	Yes
4/2008	1 river otter*	SWNW 18, 41N, 60W (WY)	Beaver Creek	carcass	No
4/15/08	plains topminnow	SESW 8, 7S, 1E	Beaver Creek	swimming	No
4/15/08	1 long-billed curlew	SWNE 15, 7S 1E	grassland	foraging	Yes
5/19/08	1 great blue heron	NENE 15, 7S 1E	open water	foraging	Yes
5/19/08	18 American white pelicans	NWSW 32, 6S 1E	riparian	flying	Yes
5/19/08	1 bald eagle	SESW 30, 6S 1E	riparian	perched	Yes
6/17/08	4 long-billed curlews	SWNW 15, 7S 1E	grassland	flying	Yes
6/17/08	1 golden eagle	SWSW 36, 6S 1E	ponderosa pine	flying	No
6/18/08	1 merlin (nest)	NESW 36, 6S 1E	ponderosa pine	perched	No
6/19/08	1 Cooper's hawk	NESW 10, 7S 1E	ponderosa pine	foraging	Yes
6/19/08	6 long-billed curlews	NENW 15, 7S 1E	grassland	flying	Yes
6/19/08	Clark's nutcracker	SWNW 36, 6S 1E	ponderosa pine	flying	No
6/20/08	1 American white pelican	NESE 30, 6S 1E	riparian	flying	Yes
6/20/08	1 long-eared owl (nest)	SESW 33, 6S 1E	ponderosa pine	perched	Yes
6/20/08	1 bald eagle	NESE 30, 6S 1E	riparian	perched	Yes
7/10/08	plains topminnow	NENE 6, 8S, 2E	Cheyenne River	swimming	No

[1] All observations made by Jones & Stokes personnel.

* The otter was in the Wyoming reach of Beaver Creek, approximately 3.5 linear miles and 11 stream miles upstream of the Dewey-Burdock permit area.

Table 6. Benthic macro-invertebrate counts for composite samples collected in April and July 2008.

	Site and Date			
	BVC01	BVC04	BVC01	BVC04
Taxa	14-Apr-08	14-Apr-08	9-Jul-08	9-Jul-08
Phylum:Mollusca				
Class:Gastropoda				
Order: Bassommatophora				
Family: Physidae	2		2	1
Phylum: Arthropoda				
Class: Insecta				
Order: Diptera				
Family: Ceratopogonidae				
Genus: *Culiciodes*	1			
Family: Chironomidae				
Subfamily: Orthocladiinae	14	33		2
Subfamily: Chironomnae		11		1
Subfamily: Tanypodinae			4	23
Family: Siluliidae				
Genus: *Simulium*	2			1
Order: Trichoptera				
Family: Hydropsychidae				
Genus: *Cheumatopsyche*				76
Family: Lepidostomadtidae				
Genus: *Lepidostoma*	1			
Family: Limnephilidae				
Genus: *Limnephilus*	3	2		
Order: Coleoptera				
Family: Elmidae			1	3

Table 7. Community composition metrics for benthic macro-invertebrates collected at the Beaver Creek sites.

			Functional Feeding Group		Habitat/ Behavior		Abundance			
							BVC01	BVC04	BVC01	BVC04
Measures	**Taxa**	**Tolerance**	**Primary**	**Secondary**	**Primary**	**Secondary**	**April**	**April**	**July**	**July**
Taxa	Physidae	8	SC				2		2	1
	Culicoides	10	PR	GC	bu		1			
	Orthocladiinae	5	GC		bu		14	33		2
	Chironominae	6	GC					11		1
	Tanypodinae	7	PR		bu				4	23
	Simulium	6	FC				2			1
	Cheumatopsyche	5	FC							76
	Lepidostoma	1	SH				1			
	Limnephilus	5	SH		sp		3	2		
	Elmidae (early instar)	4	GC		cn	bu			1	3
Abundance							23	46	7	107
Richness	Total Taxa						6	3	3	7
	EPT Taxa						3	1	0	1
	Ephemeroptera Taxa						0	0	0	0
	Plecoptera Taxa						0	0	0	0
	Trichoptera Taxa						3	1	0	1
Composition	% EPT Taxa						17.4%	4.3%	0.0%	71.0%
	% Ephemeroptera						0%	0%	0%	0%
Tolerance	Number of Intolerant Taxa						1	0	0	0
	% Tolerant Macrobenthos						13.0%	0.0%	28.6%	0.9%
	% Dominant Taxa						60.9%	71.7%	0.0%	1.9%
Feeding	% Filterers						8.7%	0.0%	0.0%	72.0%
	% Grazers & Scrapers						69.6%	95.7%	42.9%	6.5%
Habitat	Number of Clinger Taxa						0	0	0	0
	% Clingers						0%	0%	20%	3%

Table 7. Continued.

Notes: SC=Scraper, PR = Predator, GC = Gatherer collector, FC = Filterer/collector, SH = Shredder.
bu = burrower, sp = sprawler, cn = clinger.
Tolerance scores on scale of 1-10 with 1 being most sensitive, and 10 most tolerant of environmental stressors.

Table 8. Fish species and trophic categories.

Species Code	Common Name	Latin Name	Trophic Category	Notes
SAS	Sand shiner	*Notropis stramineus*	Omnivore	
CRC	Creek chub	*Semotilus atromaculatus*	Primarily carnivorous omnivore	
PLM	Plains Minnow	*Hybognathus placitus*	Primarily herbiverous	Generally in slower water and side channels of turbid streams. Eats benthic algae & other plant material.
CAP	Common carp	*Cyprinus carpio*	Omnivore	Introduced species. Bottom feeder.
LND	Longnosed dace	*Rhynichthys cataractae*	Primarily carnivorous omnivore	Primarily in riffles
FHM	Fathead minnow	*Pimephales promelas*	Primarily herbiverous	Widely cultivated for bait, and extensively used in toxicological studies
RIC	River Carpsucker	*Carpoides carpio*	Bottom feeding omnivore	
SHR	Shorthead Redhorse Sucker	*Moxostoma macrolepidotum*	Bottom feeding carnivore	
CHC	Channel Catfish	*Ictalurus punctatus*	Bottom feeding omnivore	Species most likely to be eaten by humans.
PLT	**Plains topminnow**	***Fundulus sciadicus***	**Surface feeding carnivore**	
PLK	Plains Killifish	*Fundulus zebrinus*	Surface feeding carnivore	
GRS	Green sunfish	*Lepomis cyanellus*	Carnivore	Palatable but generally too small for human consumption

Bold species are tracked by the South Dakota Natural Heritage Program – South Dakota Department of Game, Fish and Parks (SDGFP web page, last updated September 2, 2008).

Table 9. Summary of fish size and abundance.

Location	Date	Common Name	CPUE (fish/m)	Average total length (mm)	Average weight (g)
CHR05 – Cheyenne River at Marietta	4/15/08	Green sunfish	0.01	98	20
		Sand shiner	0.53	48	4.6
		Creek chub	1.00	47	0.9
		River Carpsucker	0.01	97	13
		Shorthead Redhorse Sucker	0.14	145	115
		Plains topminnow	**0.01**	**51**	**<1**
		Plains killifish	0.48	49	1.5
CHR05 – Cheyenne River at Marietta	7/09/08	Common carp	0.01	135	31
		Longnosed dace	0.01	74	4
		Fathead minnow	0.10	47	0.7
		Sand Shiner	0.45	49	1.5
		Shorthead Redhorse Sucker	0.14	153	39
		River Carpsucker	0.04	407	1,038
		Channel catfish	0.03	222	88
		Plains killifish	0.07	58	1.9
BVC01 – Beaver Creek at Argentine Road	4/16/08	Fathead minnow	0.64	48	1.3
		Plains killifish	0.02	45	4
		Longnosed dace	0.01	48	<1
		Green sunfish	0.01	120	25
BVC01 – Beaver Creek at Argentine Road	7/10/08	Common carp	0.01	171	73
		Sand Shiner	0.10	50	1.1
		Fathead minnow	0.33	50	1.5
		Longnosed dace	0.01	59	2
		Plains minnow	0.01	73	1
		Plains topminnow	**0.06**	**56**	**2**
		Plains killifish		60	1.8

Table 9. Continued.

Location	Date	Common Name	CPUE (fish/m)	Average total length (mm)	Average weight (g)
BVC04 – Beaver Creek at old Hwy 85 Bridge	4/16/08	Common carp	0.03	75	9.3
		Fathead minnow	0.84	45	1.1
		Channel catfish	0.01	215	72
		Plains killifish	0.10	44	1.4
		Green sunfish	0.04	66	7.5
BVC04 – Beaver Creek at old Hwy 85 Bridge	7/10/08	Common carp	0.01	260	230
		Sand Shiner	0.26	52	1.3
		Fathead minnow	0.47	50	1.4
		Longnosed dace	0.02	63.5	2.5
		Shorthead redhorse sucker	0.01	136	130
		Plains killifish	0.09	55	1.4

Notes: 1CPUE = Catch per unit effort.

Bold species are tracked by the South Dakota Natural Heritage Program – South Dakota Department of Game, Fish and Parks (SDGFP web page, last updated September 2, 2008).

Table 10. Baseline Radiological Analysis of Whole Fish from Beaver Creek.

Site	Species	No.	Length[a] mm	Sample Weight[b] g	U mg/kg	U uCi/Kg	Po 210 uCi/Kg	Pb 210 uCi/Kg	Th 230 uCi/Kg	Ra 226 uCi/Kg
BVC01 - April	GRS	1	120	22.96	ND	ND	u	u	u	0.0003
	PLK	1	48	1.77	ND	ND	u	0.02[c]	0.0002	u
	LND	1	48	0.64	ND	ND	0.002	u	0.0001	u
	FHM	1	30-60	4	ND	ND	0.0004	u	u	u
BVC04-April	PLK	1	40-60	0.72	ND	ND	u	u	u	u
	RIC	1	111	18.79	ND	ND	0.0004	u	0.00002	u
	FHM	1	30-70	~1.2	ND	ND	u	u	0.00001	0.0004
	CHC	1	215	72	0.05	30	0.0009	u	0.00002	u
CHR05-April	RIC	1	97	13.73	ND	ND	0.0008	u	u	u
	GRS	1	98	13.67	ND	ND	0.00008	u	0.00001	u
	SRS	1	169	55.05	ND	ND	0.0002	u	0.00002	u
	CRC	1	30-70	2.92	ND	ND	u	u	u	u
	PLK	1	32-74	1.51	ND	ND	u	u	0.0001	u
	SAS	1	30-60	1.51	ND	ND	u	u	0.001	u
BVC01-July	FHM	5	42-67	~8	0.026	0.000018	0.0004	u	u	u
	CAP	1	171	73	0.0098	0.0000067	0.00078	u	u	u
	SAS	5	46-62	7	0.031	0.000021	0.00023	u	0.000098	u
	PLK	5	57-71	9	0.035	0.000024	0.00047	u	u	u
	PLT	5	48-71	12	0.021	0.000014	0.00035	u	0.0001	u
BVC04-July	SAS	5	45-58	~6.7	0.024	0.000016	0.00054	u	0.000027	u
	FHM	5	42-61	~3.7	0.031	0.000021	0.00018	u	u	u
	CAP	1	260	237	0.014	0.0000094	0.00015	u	0.0000023	u
	PLK	5	48-68	~7.2	0.019	0.000013	u	u	0.000094	u
	SRS	1	136	130	0.0072	0.0000049	0.00017	u	u	u
CHR05-July	FHM	5	38-60	~0.7	0.024	0.000016	0.00042	u	u	u
	SAS	5	42-60	~1.5	0.04	0.000027	0.00049	u	0.00014	u
	CAP	1	135	31	0.01	0.0000069	0.00074	u	0.000017	u
	RIC	4	381-415	5150	0.031	0.000021	u	u	u	0.000008
	SRS	2	146-160	78	0.0066	0.0000044	0.00005	u	0.0000032	u
	PLK	4	46-68	~7.4	0.017	0.000012	0.00047	u	u	u
	CHC	3	181-290	265	0.017	0.000012	0.00016	u	0.000009	u

Table 10. Continued.

Notes: GRS = Green Sunfish, PLK = Plains Killifish; LND = Longnosed Dace; RIC = River Carpsucker; FHM = Fathead Minnow; CHC = Channel Catfish; SRS = Shorthead Redhorse Sucker; CRC = Creek Chub; SAS = Sand Shiner.

U = Uranium; Po = Polonium; Pb = Lead; Th = Thorium; RA = Radium.

ND = Not detected at the reporting limit, u = Not detected at minimum detectable concentration.

[a]Lengths reported as a range when multiple specimens were combined as a composite sample, or when the individual processed for radiology was not recorded separately.

[b] Approximate sample weights from field average weights for the species measured in the field.

[c]Due to matrix interference, the precision of this measurement was equal to the detected concentration (i.e. 0.02 µCi ± 0.02 µCi).

POWERTECH URANIUM CORPORATION
DEWEY-BURDOCK PROJECT

2007-2008 BASELINE WILDLIFE REPORT

APPENDIX III

Representative Photographs from the
Dewey-Burdock Project Area

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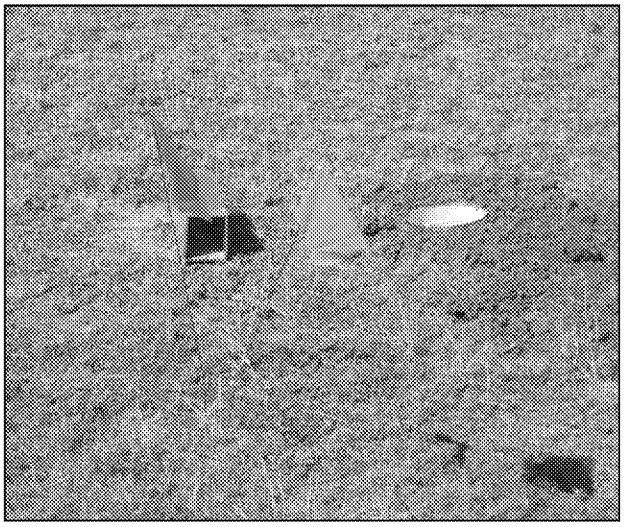
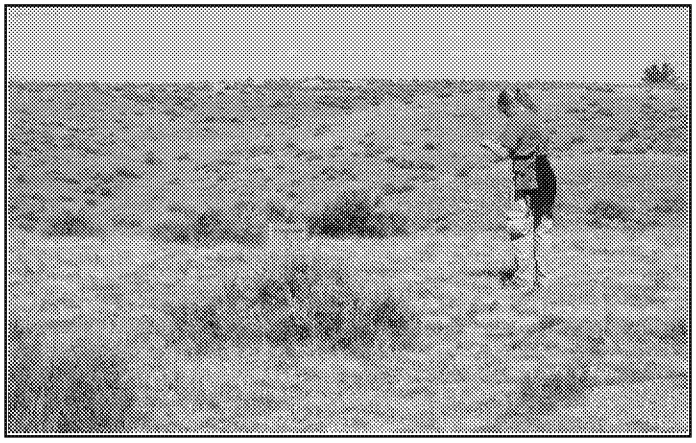
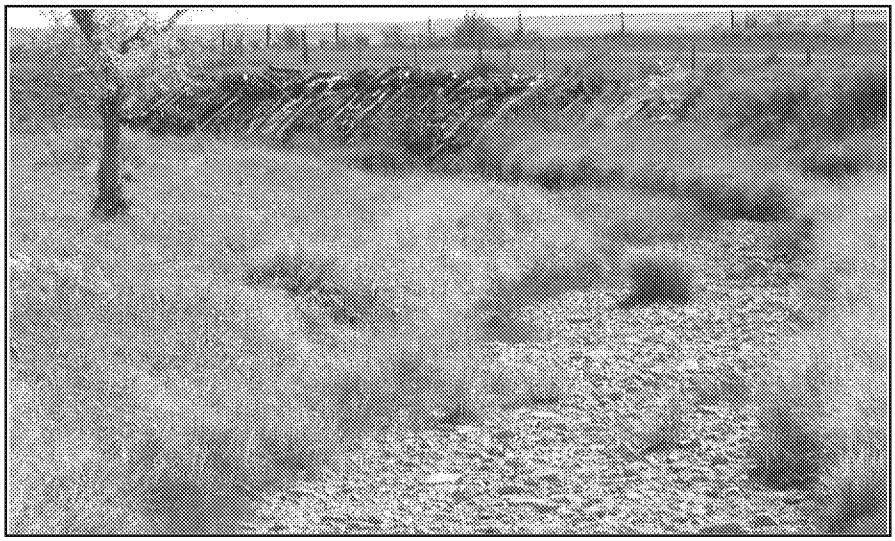
Exhibit 1. Representative photographs of habitats in and near the Dewey-Burdock permit area during baseline wildlife studies from June 2007 through August 2008.

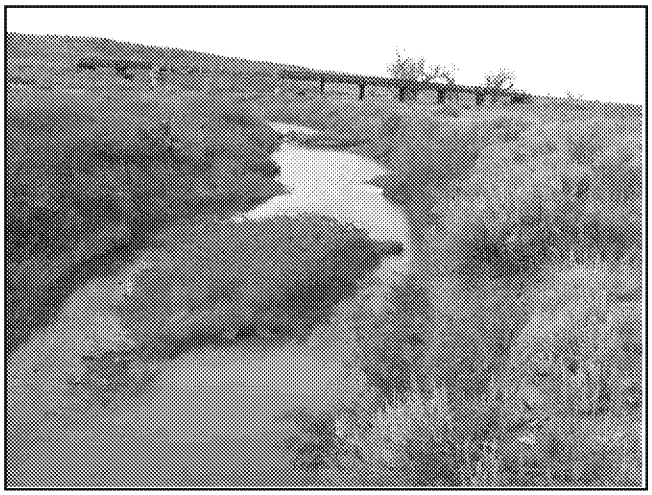
Upland Grassland – Initial site visit in June 2007





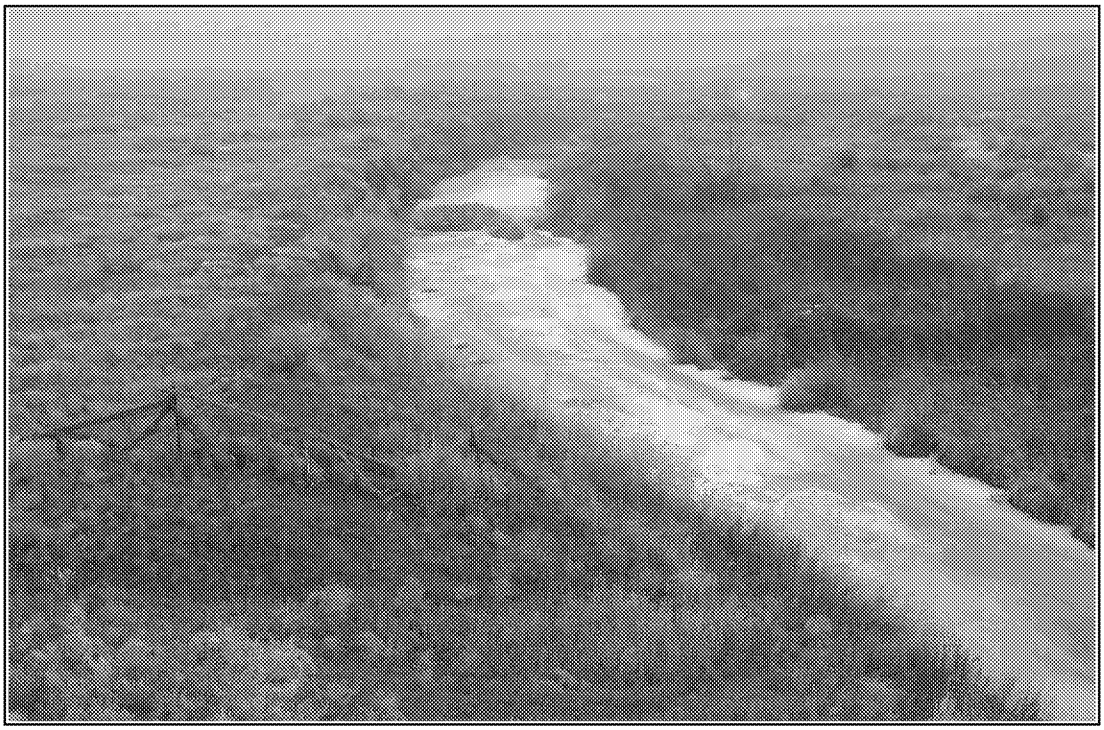
Small mammal trapping in Greasewood Shrubland, Upland Grassland, and Big Sagebrush Shrubland Habitats (clockwise, from left) – September 2007





Beaver Creek, upstream and downstream of proposed Dewey-Burdock permit area – September 2007
(October 2007 in lower right)

Proposed Dewey-Burdock permit area – December 2007



Beaver Creek – December 2007

Beaver Creek – April 2008

Ponderosa Pine Woodland breeding bird transect – June 2008

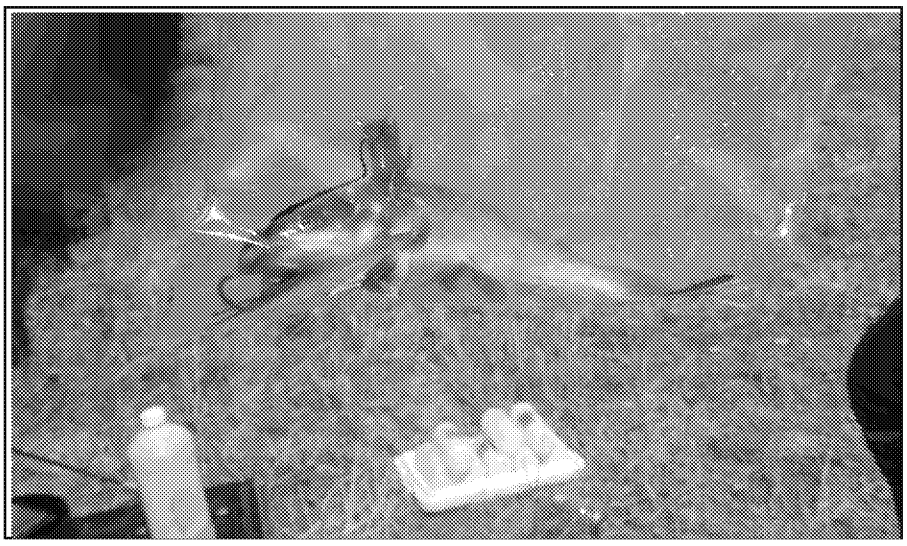
Upland Grassland breeding bird transect – June 2008

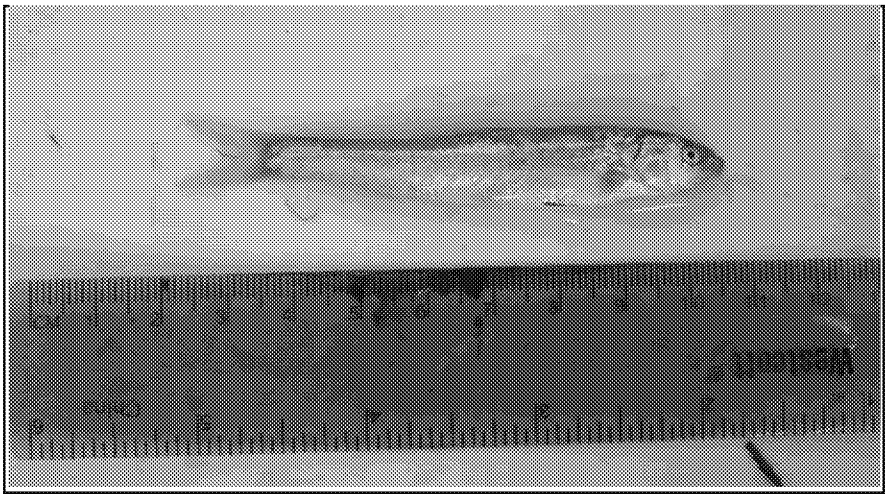
Beaver Creek – July 2008

Cheyenne River – July 2008

Exhibit 2. Representative fish sampling in Beaver Creek and the Cheyenne River within the Dewey-Burdock project area during baseline wildlife studies in July 2008.

Seining in Beaver Creek – July 2008





Fish samples from Beaver Creek and the Cheyenne River – July 2008

Exhibit 3. Representative wildlife species observed within the Dewey-Burdock permit area during baseline wildlife studies from July 2007 through August 2008.

Long-eared owl near nest site in Ponderosa Pine Woodland

Long-billed curlew in Upland Grassland

Elk

Pronghorn buck

Black-tailed prairie dog.

Northern grasshopper mouse

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POWERTECH URANIUM CORPORATION
DEWEY-BURDOCK PROJECT

2007-2008 BASELINE WILDLIFE REPORT

APPENDIX IV

Resumes for Gwyn McKee and Andrew Wones
Jones & Stokes

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Gwyn McKee

Technical Director/Senior Wildlife Biologist

Education

M.S. Wildlife Management/Ecology, University of Missouri-Columbia, 1995

B.S. Wildlife Management, University of Missouri-Columbia, 1982

Professional Memberships

The Wildlife Society

Raptor Research Foundation

Certifications

Black-footed ferret surveys (USFWS)

MSHA (surface coal, metal, non-metal)

Site-specific Hazard Training

Current Permits

Eagle Take (USFWS)

Depredation (USFWS)

Special Purpose Salvage (USFWS)

Special Use-Biological/Research (USFS)

Chapter 10 (WGFD-Wyoming)

Chapter 33 (WGFD-Wyoming)

Scientific Collector (SDGFP-S. Dakota)

Gwyn McKee is a Technical Director and Senior Wildlife Biologist. She has served as a primary contact for the energy industry and regulators (local, state, federal) regarding project requirements and design, impact assessment, and mitigation strategies for surface mines and electric utility projects in the Northern Great Plains since 1994. Gwyn manages a staff of resource specialists that provide wildlife inventory and monitoring, cultural resource, and other consulting services to existing, expanding, and new surface coal, uranium, bentonite, and gold mines, and utility projects. Efforts range from small, single-day site assessments to large, multi-year monitoring programs. Her management area has included up to 20 surface mines across more than 700 mi^2 in Wyoming, South Dakota, and Montana. Gwyn also prepares technical and NEPA support (BAs, BABEs, EA/EIS text) documents for submittal to the Department of Environmental Quality, Bureau of Land Management, Forest Service, Fish and Wildlife Service, and Nuclear Regulatory Commission as part of the permitting process. She obtains and administers all necessary state and federal permits for monitoring and mitigation activities, and crafts or revises Wildlife Monitoring, Mitigation, and Reclamation Plans for surface coal and uranium mine permits. Gwyn is highly regarded among colleagues, energy industry professionals, and agency regulators throughout the region for the high quality of her work, and for her integrity and balanced approach to problem solving and conflict resolution among diverse landowner, industry, and government agency stakeholders. Her service as a Director on numerous local and statewide boards has further enhanced her knowledge and expertise regarding impact analysis and mitigation options for terrestrial and aquatic habitats and species.

Project Experience

Surface Mine Wildlife Monitoring and Mitigation---Wyoming, South Dakota, Montana

Manages and conducts annual monitoring programs, designs and conducts baseline inventories for new mines and expansions of existing properties, develops and implements mitigation strategies for surface coal, uranium, bentonite, and gold mines. Coverage area has included 20 mines across more than 700 mi^2 in Wyoming, South Dakota, and Montana. Surveys encompass a variety of taxa, including T&E species, big game, lagomorphs, small mammal trapping, raptors, upland game birds, waterfowl, shorebirds, songbirds, herptiles, fish, and aquatic invertebrates. Prepares technical reports and maps, and NEPA support

documents (BAs, BABEs, EA/EIS text) for submittal with annual and baseline reports to the Department of Environmental Quality, Bureau of Land Management (BLM), U.S. Forest Service (USFS), and U.S. Fish and Wildlife Service (USFWS). Designs and implements mitigation programs at surface coal mines, including USFWS approved Avian Mitigation Plans and periodic relocation of active and inactive raptor nests. Obtains and administers all necessary state and federal permits for mitigation activities. Crafts or revises Wildlife Monitoring, Wildlife Mitigation, and Wildlife Reclamation Plans for surface coal mine permits. Conducts salvage activities as needed.

Electric Transmission and Distribution Projects---Powder River Basin, Wyoming

Manages and conducts biological inventories, habitat assessments, monitoring, and mitigation projects for T&E species and other vertebrates of concern for various transmission and distribution line projects for two electric coops operating in northeast Wyoming. Project size has ranged from 0.5-75 miles. Develops and implements mitigation strategies for active and inactive raptor nests during and post construction. Prepares technical reports and mitigation plans, obtains and manages necessary state and federal permits. Salvages birds as needed.

Biological Assessments, Biological Evaluations, Management Indicator Species analyses---Powder River Basin, Wyoming

Supervises and conducts all required wildlife surveys and habitat assessments for vertebrate T&E species, Sensitive Species, Management Indicator Species, and other faunal species of concern for several electric and surface coal mine projects on federally owned lands within the BLM Buffalo Field Office region and USFS Douglas Ranger District in northeast Wyoming. Prepares the Biological Assessments, Biological Evaluations, and MIS analyses for those projects. Coordinates closely with BLM and USFS personnel for each project.

Sage-grouse Research---Campbell and Weston Counties, Wyoming

Captures, radio-collars, and tracks greater sage-grouse in southern Campbell County and western Weston County, Wyoming. This project provides current data regarding the home range, survival, nesting success, and general habitat use of grouse in a landscape that is heavily impacted by coal mining and oil and gas development. Efforts were expanded onto nearby private lands in recent years to assist ranchers with proactive management practices for this species. Results are summarized annually in a technical report that is provided to all interested entities (corporate, government) in the region.

Black-tailed Prairie Dog Translocations for Mountain Plover Habitat Mitigation---Antelope Coal Mine, Converse County, Wyoming

Initiated and implemented a project to create mountain plover habitat in reclamation to mitigate the loss of habitat during surface coal mining. Constructed 70 burrow chambers in four artificial prairie dog colonies over two years, covering approximately 10 non-contiguous acres. Translocated 103 prairie dogs (males, females, juveniles) into the colonies during that period. Monitored presence, reproduction, and expansion in the colonies during subsequent years, surveyed for mountain plovers. This project garnered three state and one national award for the Antelope Coal Mine, including the Excellence in Surface Coal Mining & Reclamation National Award from the Office of Surface Mining in 2003.

Black-footed Ferret Surveys---Wyoming, Montana

Certified by USFWS to supervise and conduct snow tracking and spot-light surveys for black-footed ferrets prior to potential habitat disturbance. Projects have included surface coal and bentonite mines, natural gas pipelines, CO_2 pipelines, a railroad, and a coal-fired power plant in Wyoming and southeastern Montana. Related survey work includes mapping prairie dog colonies and determining burrow density, coordinating with federal regulating agencies, and report preparation.

Road and Utility (Water/Sewer) Projects and Water Treatment Plant---Northeast Wyoming

Supervised and conducted all required wildlife surveys and habitat assessments for vertebrate T&E species and other wildlife species of concern prior to construction of various water, sewer (collection and trunk lines), road, and water treatment plant projects in the cities of Gillette and Pine Haven in northeast Wyoming. Prepared summary reports and maps for submittal to state and federal regulators.

Previous Experience

Various organizations over a 20-year span: trapped >150 migrating and resident raptors of 7 species using 5 different methods; banded 300+ raptors; radio-collared/tracked 50+ raptors: reintroduced 100+ raptors; identified/counted > 1,350 migrating raptors of 17 species over 5 volunteer days; raptor rehabilitation, rearing, reintroduction, flight training, handling (eagles, vultures, hawks, falcons, accipiters, owls); trapped, banded, collared, radio-tracked 75+ prairie grouse of 2 species; time-budget observations of nesting bald and golden eagles; vegetation sampling using various techniques.

Selected Publications and Presentations

McKee, G. June 2007. *Wildlife Mitigation Techniques at Surface Coal Mines in Northeast Wyoming.* Presentation for the 2007 National Meeting of the American Society of Mining and Reclamation. Gillette, WY.

McKee, G. February 2007 and October 2006. *Nesting Issues and Solutions.* Invited presentation for the 6th Avian Electrocution and Collision Prevention workshop and APLIC short course, and for the 11th International ESMO Symposium. Both in Albuquerque, NM.

McKee, G. March 2006. *Raptor Identification, Mitigation, and Regulation in Northeast Wyoming.* Presentation at the Avian Protection Plan Public Forum hosted by Powder River Energy Corporation. Gillette, WY.

McKee, G. February 2006. *Wildlife Issues in Reclamation.* Presentation for a course on Reclamation Basics in the State of Wyoming at the Gillette Campus of the Sheridan Community College. Gillette, WY.

McKee, G., K.M. Clayton, H.R. Postovit, and B.C. Postovit. August 2001. *Long-term trends of wildlife use in native and reclaimed habitats in the Powder River Basin of northeastern Wyoming.* Paper presented at the Interactive forum on surface-mining reclamation approaches to bond release: wildlife habitat construction and wildlife use of reclaimed lands in the arid and semi-arid west. Gillette, WY.

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Andrew Wones

Aquatic Ecologist

Mr. Wones is an aquatic ecologist and project manager with over 21 years of experience. Andrew manages teams of biologists in conducting field studies of fish, water quality, amphibian, invertebrates, and wetlands. He prepares biological assessments, SEPA and NEPA documents (environmental checklist, EIS, EA, and EIR), monitoring studies, environmental permit applications (JARPA, HPA, NPDES), and other technical reports on aquatic resources. Andrew has conducted studies in a variety of aquatic environments in Washington, Oregon, California, Alaska, Virginia, West Virginia, and Antarctica.

Key Skills

Project Management. Andrew manages teams of field biologists and permitting experts for construction permitting projects, biological field investigations, and mitigation planning and monitoring. He writes scopes of work and project work plans, manages project budgets, coordinates with clients and regulatory agencies, and oversees preparation of documents.

ESA Compliance. Since the listing of several Pacific salmonid species under the federal Endangered Species Act (ESA), Andrew has prepared BAs for a variety of projects including road repair and expansion, sewer line installation, and stream levee repairs.

Bull Trout Surveys. Andrew has managed teams of biologists conducting bull trout surveys in the upper Yakima and upper Wynoochee watersheds in Washington State using night snorkel methods and USFS/USFWS/WDFW protocols.

Aquatic Invertebrate Studies. Andrew conducts marine and freshwater benthic invertebrate studies for mitigation monitoring and biotic integrity assessment.

Water Quality and NPDES Permitting. Andrew prepares stormwater pollution prevention plans (SWPPP) for industrial and construction sites, and conducts water quality monitoring studies for permit compliance, model support, and other special studies.

Marine Biology. Andrew is certified to conduct geoduck clam and eelgrass surveys by WDFW, and has been a certified SCUBA diver since 1983. Andrew also conducts underwater surveys of nearshore habitat and assesses marine projects for potential impacts.

Mitigation Monitoring. Andrew designs and conducts monitoring studies for stream, wetland, and marine intertidal mitigation projects to determine ecological function and permit compliance. Mr. Wones also manages and participates in construction monitoring for environmental permit compliance.

Education

- MS, Biological Sciences, Oregon State University, Corvallis
- BS, Biology, Virginia Polytechnic Institute and State University, Blacksburg

Project Experience

- Dewey-Burdock Uranium Mine Aquatic Species Baseline Conditions Report – Knight- Piesold
- SR167 Stream Habitat Surveys – Perteet/WSDOT
- Klamath River Benthic Macro-invertebrate Study – CH2MHill/Pacificorp
- San Pedro Waterfront Redevelopment Project—Port of Los Angeles
- Big Hanaford Creek Construction Observation and Monitoring—TransAlta Centralia Mining, LLC
- I-90 Snoqualmie Pass East Aquatic Species Technical Report and Biological Assessment—US Army Corps of Engineers, Seattle District, and WSDOT
- San Juan Islands Submarine Cable Replacement Environmental Permitting and Monitoring—Bonneville Power Administration
- Wynoochee River Bull Trout Surveys—Corps, Seattle District
- Cedar River Salmon Spawning Survey—Corps, Seattle District
- 2005 Benthic Analysis of the Federal Navigation Channel—Corps, Seattle District
- Dredge Water Quality Monitoring – Budd Inlet, Grays Harbor, Snohomish Estuary, Duwamish Waterway, WA – US Army Corps of Engineers, Seattle District
- Mount Rainier Alpine Lakes Study – Oregon State University/Mount Rainier National Park, WA
- Goat Lake, AK Aquatic Studies – FERC Hydroelectric License Application – RW Beck

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APPENDIX 3.9-B

SDGF&P Approval of Wildlife Consultant

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DEPARTMENT OF GAME, FISH AND PARKS
Outdoor Campus West
4130 Adventure Trail
Rapid City, South Dakota 57702-4804

May 15, 2012

Mr. Mark Hollenbeck
Project Manager
Dewey-Burdock Project Office
Powertech (USA) Inc.
P.O. Box 812
Edgemont, SD 57735

Dear Mr. Hollenbeck:

ICF Jones & Stokes (now ICF International) of Gillette, Wyoming conducted baseline ecological studies for flora and fauna at the proposed Dewey-Burdock In-Situ Uranium Recovery project between July 2007 and August 2008. South Dakota Game, Fish and Parks is writing to confirm it was consulted prior to study initiation to ensure that adequate objectives, survey methodologies and data collection techniques were employed. Per SDCL 45-6B-7(4), South Dakota Game, Fish and Parks approves ICF Jones and Stokes as the wildlife consultant on the Dewey-Burdock In-Situ Uranium Recovery Project near Edgemont, South Dakota.

Sincerely,

Stan Michals -Energy and Minerals Coordinator

Office (605)394-2589 Fax (605)394-1793 Stan.Michals@state.sd.us

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