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NI 43-101 Technical Report
Resource Estimate
Dewey-Burdock Uranium ISR Project
South Dakota, USA

Effective date: November 12, 2018
Report date: December 21, 2018

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1.0 EXECUTIVE SUMMARY

1.1 Background

Roughstock Mining Services (Roughstock) was retained by Azarga Uranium Corp. (Azarga Uranium) and their wholly owned subsidiary Powertech USA Inc. (Powertech), to prepare this independent Resource Estimate for the Dewey-Burdock ISR Project (Project) located in Custer and Fall River Counties in South Dakota, USA. The project location is shown on Figure 1.1. This Resource Estimate has been prepared for Azarga Uranium and Powertech (collectively referred to as "Azarga") in accordance with the guidelines set forth under National Instrument (NI) 43-101 and NI 43-101F1 for the submission of technical reports on mining properties.

A NI 43-101 Technical Report - Preliminary Economic Assessment for the Dewey-Burdock Project was prepared by TREC, Inc. and Roughstock effective January 29, 2015 ("2015 PEA") (ref., TREC, 2015). The mineral resource estimate presented in the 2015 PEA was reviewed and updated with new resource information completed by Roughstock. The entire resource estimate for the project was reviewed and audited for this report resulting in an updated resource estimate as summarized in Table 1.1 below.

Table 1.1: Comparison of 2015 PEA ISR Mineral Resource Estimate with Current ISR Mineral Resource Estimate

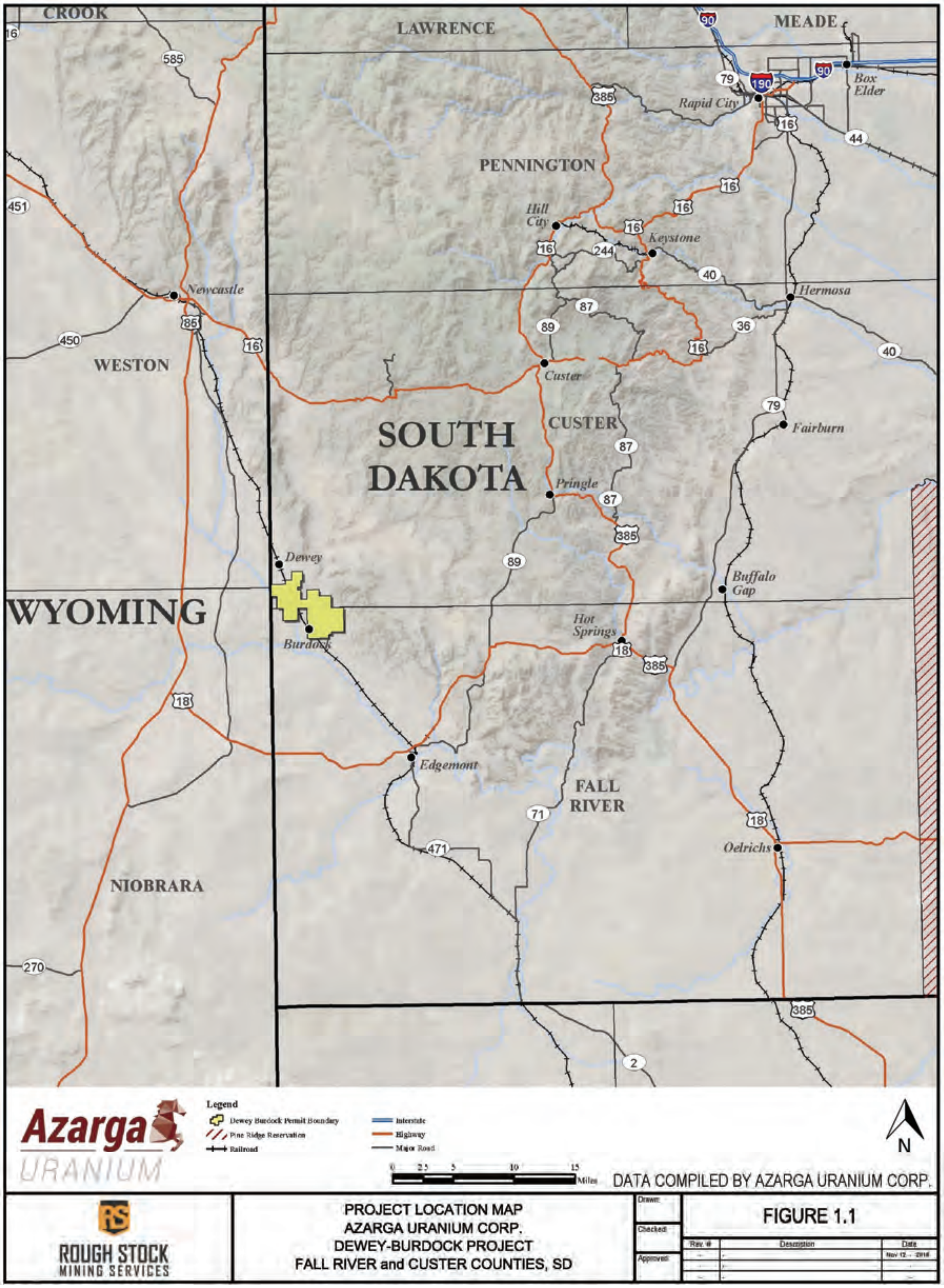
	2015 PEA	Grade	Current	Grade	% Change Pounds
Estimated Measured Resource (lb)	4,122,000	0.330%	13,779,000	0.132%	
Estimated Indicated Resource (lb)	4,460,000	0.210%	3,160,000	0.068%	
Estimated M&I Resource (lb)	8,582,000	0.250%	16,939,000	0.113%	97%
Estimated Inferred Resource (lb)	3,528,000	0.050%	818,000	0.056%	-77%

Cautionary Statement: Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Subsequent to the 2015 PEA resource calculation, Azarga has added additional mineralized intercepts and redefined the cutoff grade for resource estimation based on uranium recovery from production operations using ISR methods. Azarga is now following industry standard using the redefined cutoff of GT $\geq$ 0.20 rather than the previously used GT $\geq$ 0.50.

As shown in Table 1.1 above, during the process of re-contouring and recalculation of the drillhole data, Measured ISR resources increased to 13.78M pounds U_3O_8 from 4.12M pounds, representing a 234% increase. Measured and Indicated (M&I) ISR resources have increased to 16.94 million pounds U_3O_8 from 8.58M pounds, representing a 97% increase. These resources are categorized as defined by CIM and discussed in Section 14 of this resource estimate.

Figure 1.1: Project Location Map



The Dewey-Burdock Project is an advanced-stage uranium exploration project located in South Dakota and is solely controlled by Powertech. The Project is located in southwest South Dakota (Figure 1.1) and forms part of the northwestern extension of the Edgemont Uranium Mining District. The project is divided into two Resource Areas, Dewey and Burdock.

The project is within an area of low population density characterized by an agriculture-based economy with little other types of commercial and industrial activity. The project is expected to bring a significant economic benefit to the local area in terms of tax revenue, new jobs, and commercial activity supporting the project. Previously, a uranium mill was located at the town of Edgemont, and a renewal of uranium production is expected to be a locally favorable form of economic development. Regionally, there are individual and other organizations that oppose the project though typically not in the immediate Edgemont area.

The three most significant permits/licenses are (1) the Source and Byproduct Materials License, which was issued by the U.S. Nuclear Regulatory Agency NRC in April 2014; (2) the Large Scale Mine Permit (LSMP), to be issued by the South Dakota Department of Environment and Natural Resources (DENR); and (3) Underground Injection Control (UIC) Class III and V permits (for ISR injection and deep disposal, respectively), which draft permits were issued from the U.S. Environmental Protection Agency Region 8 (EPA) in March 2017. Permit requirements and status are discussed in Sections 4 and 20. Public interest in the project has extended regulatory efforts and logistics for accommodating public involvement, but at the time of this report, the NRC license has been issued, the State of South Dakota LSMP has been recommended for approval by DENR, and draft UIC Class III and Class V permits have been issued by EPA.

1.2 Resources

Cautionary Statement: Mineral resources that are not mineral reserves do not have demonstrated economic viability.

As further discussed in Section 14, the deposits within the project area contain Measured ISR resources of 5,200,000 tons at an average grade of 0.132% U_3O_8, Indicated ISR resources of 2,328,000 tons at a grade of 0.068% U_3O_8 for a total M&I ISR resource of 16.94M pounds U_3O_8 at a 0.2 GT cutoff, and Inferred resource of 732,000 tons at a grade of 0.056% U_3O_8 for a total of 0.82M pounds U_3O_8 at a 0.2 GT cutoff. See Table 1.2 for a summary of the mineral resource estimate.

The Dewey-Burdock uranium mineralization is comprised of “roll-front” type uranium mineralization hosted in several sandstone stratigraphic horizons that are hydro-geologically isolated and therefore amenable to ISR technology. Uranium deposits in the Dewey-Burdock Project are sandstone, roll-front type. This type of deposit is usually “C”-shaped in cross section, with the down gradient center of the “C” having the greatest thickness and highest tenor. These “roll fronts” are typically a few tens of feet wide and often can be thousands of feet long. Uranium minerals are deposited at the interface of oxidizing solutions and reducing solutions. As the uranium minerals precipitate, they coat sand grains and partially fill the interstices between grains. Thickness of the deposits is generally a factor of the thickness of the sandstone host unit. Mineralization may be 5 to 12 ft thick within the roll front while being 1 to 2 ft thick in the trailing tail portions.

Table 1.2: Mineral Resource Estimate (Effective - November 12, 2018)

ISR Resources	Measured	Indicated	M & I	Inferred
Pounds	13,779,000	3,160,000	16,939,000	818,000
Tons	5,200,000	2,328,000	7,528,000	732,000
Avg. GT	0.730	0.396	0.640	0.333
Avg. Grade (%U_3O_8)	0.132%	0.068%	0.113%	0.056%
Avg. Thickness (feet)	5.51	5.83	5.69	5.95

Non-ISR Resources	Measured	Indicated	M & I	Inferred
Pounds	1,060,000	0	1,060,000	0
Tons	926,000	0	926,000	0
Avg. GT	0.374	0.000	0.374	0.000
Avg. Grade (%U_3O_8)	0.057%	0.000%	0.057%	0.000%
Avg. Thickness (feet)	6.54	0.00	6.54	0.00

Note: Resources are rounded to the nearest thousandth. Resource pounds and grades of U_3O_8 were calculated by individual grade-thickness contours. Tonnages were estimated using average thickness of resource zones multiplied by the total area of those zones. Non-ISR Resources are located above the water table.

Deposit configuration determines the geometry of the well field and is a major economic factor in ISR mining.

The Dewey-Burdock mineralization is located at depths of 184 – 927 ft below surface at Dewey and from surface to 782 ft below surface at Burdock, as several stacked horizons, which are sinuous and narrow but extend over several miles along trend of mineralization. The deposits are planned for ISR mining by development of individual well fields for each mineralized horizon. A well field will be developed as a series of injection and recovery wells, with a pattern to fit the mineralized horizon, typically a five spot well pattern on 50 to 150 ft drillhole spacing.

Historic exploration drilling for the project area was extensive and is discussed in Section 6. In 2007 and 2008, Azarga conducted confirmatory exploration drilling of 91 holes including 20 monitoring wells. In addition, Azarga installed water wells for water quality testing and for hydro-stratigraphic unit testing. This work confirmed and replicated the historic drill data and provided some in-fill definition of uranium roll fronts. In addition, the hydrogeologic investigations defined the pre-mining water quality and determined the capacity for the uranium-bearing hydro-stratigraphic units to allow for circulation of ISR recovery fluid, and confinement of the fluids to the hydro-stratigraphic unit.

1.3 Project

As reported in the 2015 PEA, the Project has been previously designed with well fields where mineral extraction will occur. The 2015 PEA envisioned a central processing plant (CPP) facility for the Project that will be located at the Burdock Resource Area and a satellite facility will be constructed in the Dewey Resource Area. The Dewey Resource Area contains a separate group of well fields where mineral extraction will occur.

The Project area is well supported by nearby towns and services. Major power lines are located near the Project and can be accessed and upgraded for electrical service for the mining operation. A major rail line (Burlington Northern Santa Fe) cuts diagonally across the project area. A major railroad siding is located at Edgemont and could be used for shipment of materials and equipment for development of the producing facilities.

1.4 Risks

The Project is located in a region where ISR projects have been and are operated successfully. The ISR mining method has been proven effective in geologic formations near the Project in Wyoming and Nebraska as described herein. Six Wyoming ISR facilities are currently in operation (Smith Ranch, North Butte, Willow Creek, Lost Creek, Ross, and Nichols Ranch) and one operating facility is in Nebraska (Crow Butte).

As with any pre-development mining property, there are risks and opportunity attached to the project that need further assessment as the project moves forward. The author deems those risks, listed below, on the whole, as identifiable and manageable.

- Risk associated with uranium recovery and processing,
- Risk associated with delays in permitting,
- Risk associated with social and/or political issues, and
- Risk associated with the uranium market and sales contracts.

This report does not undertake any discussion of economic factors and as such the effects of such risks are not evaluated in this report.

2.0 INTRODUCTION

Roughstock Mining Services (Roughstock) was retained by Azarga Uranium Corp (Azarga Uranium) and their wholly owned subsidiary Powertech (USA) Inc. (Powertech), to prepare this independent Resource Estimate for the Dewey-Burdock ISR Project (Project) located in Custer and Fall River Counties in South Dakota, USA. The project location is shown on Figure 1.1. This Resource Estimate has been prepared for Azarga Uranium and Powertech (collectively referred to as "Azarga") in accordance with the guidelines set forth under National Instrument (NI) 43-101 and NI 43-101F1 for the submission of technical reports on mining properties.

The corporate address of Azarga Uranium is 15782 Marine Drive, Unit 1, White Rock, British Columbia, V4B 1E6 and the address of its subsidiary Powertech is 5575 DTC Parkway, Suite 140, Greenwood Village Colorado, with a project field office located in Edgemont, South Dakota. Azarga Uranium is a publicly traded company listed on the Toronto Stock Exchange (TSX) under the symbol "AZZ".

The Dewey-Burdock project is an advanced-stage exploration project with established uranium resources and project conceptual designs for In Situ Recovery (ISR) of uranium. Azarga controls approximately 16,690 acres of mineral rights and 12,613 acres of surface rights that cover the project areas of uranium mineralization. The permit area, as shown on Figures 4.1, 4.2 and 4.3, is 10,580 acres.

2.1 Purpose of the Report

The purpose of this Resource Estimate is to update the mineral resource. An updated resource estimate is summarized in Table 14.1.

2.2 Terms of Reference

Units of measurement unless otherwise indicated are feet (ft), miles, acres, pounds avoirdupois (pounds), and short tons (2,000 pounds). Uranium production is expressed as pounds U_3O_8, the standard market unit. Grades reported for historical resources and the mineral resources reported and used herein are percent equivalent U_3O_8 (eU_3O_8) by calibrated geophysical logging unit. ISR refers to "in situ recovery", sometimes also termed "in situ leach" or ISL. Unless otherwise indicated, all references to dollars ($) refer to the United States currency.

2.3 Sources of Information

This Resource Estimate was prepared by Roughstock and is based on information provided by Azarga, other professional consultants, and generally accepted uranium ISR practices. A previously published NI 43-101 Technical Report - Preliminary Economic Assessment for the Dewey-Burdock Project was prepared by TREC, Inc. and Roughstock effective January 29, 2015 ("2015 PEA") (ref., TREC, 2015).

2.4 Site Visits

Steve Cutler, P.G. (Roughstock) conducted a Project site visit on July 24, 2014. The purposes of the visit was to observe the geography and geology of the Project site, verify work done at the site by Azarga, observe the potential locations of Project components, current site activities, and location of exploration activities and gain knowledge on existing site infrastructure.

3.0 RELIANCE ON OTHER EXPERTS

3.1 Source of Information Relied Upon

The information, conclusions, opinions, and estimates contained herein are based on:

- Information, data, and reports supplied by Azarga and third party sources (to the extent identified and as referenced herein);
- Assumptions, conditions, and qualifications as set forth in this technical report; and
- The Author relied on property ownership information provided by Azarga and has not independently researched property title or mineral rights for the Project properties. The Author expresses no legal opinion as to the ownership status of the Project properties controlled by Azarga.

Sections 7 through 13 are extracted in-part from Azarga's Technical Report titled "NI 43-101 Technical Report; Preliminary Economic Assessment, Dewey-Burdock Project, with an effective date of January 29, 2015 ("2015 PEA") (ref., TREC, 2015). Changes to standardizations, sub-titles, and organization have been made to suit the format of this Technical Report. Roughstock comments and opinions, where present, contain "Roughstock" or "Author" in the pertinent sentences and paragraphs. The authors have reviewed the information contained in these sections for use in this Resource Estimate and are in agreement with it.

This resource estimate was prepared by Roughstock with reliance on reports and information from others as well as internal Roughstock experts. The experts and their contributions/responsibilities in the development of this resource estimate are identified below. All work was supervised by the Author.

Steve Cutler, P.G. (Q.P), Roughstock Mining Services

- Primary Author
- Review and audit of geology
- Review and audit of resource estimates
- Responsible for all sections

John Mays, P.E., Azarga

- Permitting requirements
- Project ownership details

Len Eakin, Azarga

- Provide updated resource database
- Develop GT contour maps

Jennifer Evans, P.G., Roughstock Mining Services

- Audit of resource mapping and drillhole data
- Calculation of resource calculations

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 Project Location

The Dewey-Burdock Project is located in southwest South Dakota and forms part of the northwestern extension of the Edgemont Uranium Mining District. The project area is located in Townships 6 and 7 South, Range 1 East of the Black Hills Prime Meridian. The county line dividing Custer and Fall River counties in South Dakota lies at the confluence of Townships 6 and 7 South (Figure 4.1).

4.2 Property Description

The project is divided into two Resource Areas, Dewey and Burdock, as shown on Figure 4.2. The Burdock Resource Area, which resides primarily in Fall River County with resources over an approximate area of 413 acres. The project currently envisions a central processing facility located at the Burdock Resource Area. A satellite facility is envisioned for construction at the Dewey Resource Area with resources over an area of approximately 148 acres residing entirely within Custer County.

4.3 Mineral Titles

The Project includes federal claims, private mineral rights and private surface rights covering the entire Project area within the licensed project permit boundary as well as surrounding areas. Since 2005, Azarga has consolidated its land position by staking an additional 61 mining claims and acquiring surrounding property with resource potential. At the time of this report, Azarga controls approximately 16,960 acres of mineral rights in the project area (Figure 4.3). The project permit area is 10,580 acres.

Access and mineral rights are currently held by a combination of 53 private surface use, access and mining leases agreements, two purchase agreements and 370 federal mineral claims in and surrounding the project area.

Azarga acquired leases from the various landowners with several levels of payments and obligations. In the portions of the project area where Azarga seeks to develop the uranium, both surface and minerals are leased or controlled by unpatented mineral claims. Furthermore, Azarga controls all surface and mineral rights within the project permit boundary. Most leases and purchase agreements for the Project are maintained through annual payments. Several leases are subject to an annual payment that is based on the uranium spot price at the time payment is due. Claims are held by annual payments to the Bureau of Land Management (BLM). Annualized surface and mineral payments for the Project including leases, claims and purchase agreements are approximately $278,700 at the current uranium price of approximately $29 per pound at the time of this report.

Azarga granted the mineral owners an overriding royalty payment out of sales of the product. The surface owners will be paid an overriding royalty as incentive to support the development of uranium under their lands. In addition, surface owners are paid an annual rental to cover the cost of surface damage and to additionally compensate for reduction of husbandry grazing during field operations. Royalties are zero for mineral rights subject to a purchase agreement and for some claims whereas some mineral leases can have royalty rates up to a maximum mineral royalty of 10%, depending on the sales price of uranium.

Figure 4.1: Project Location Map

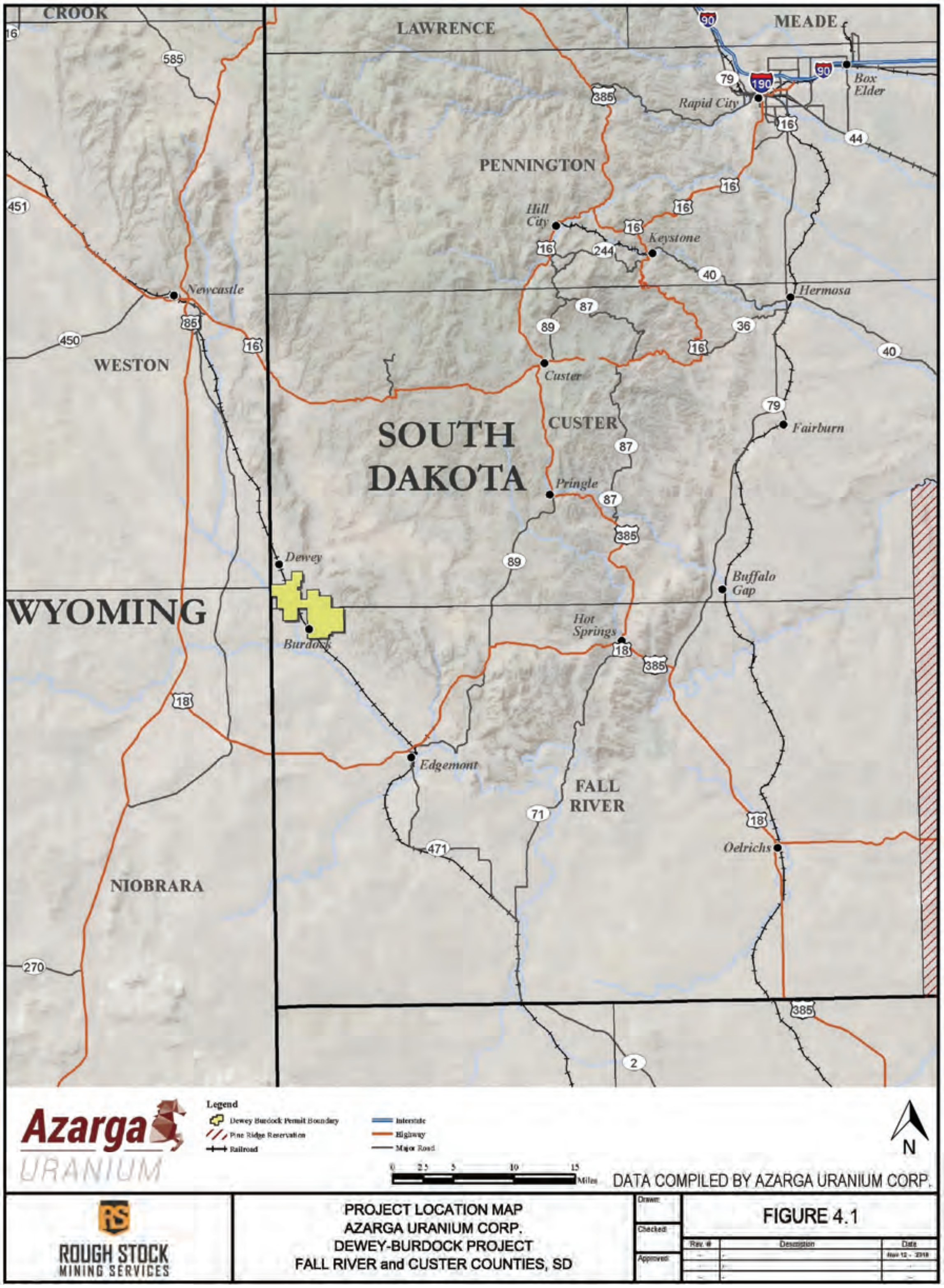


Figure 4.2: Surface Ownership Map

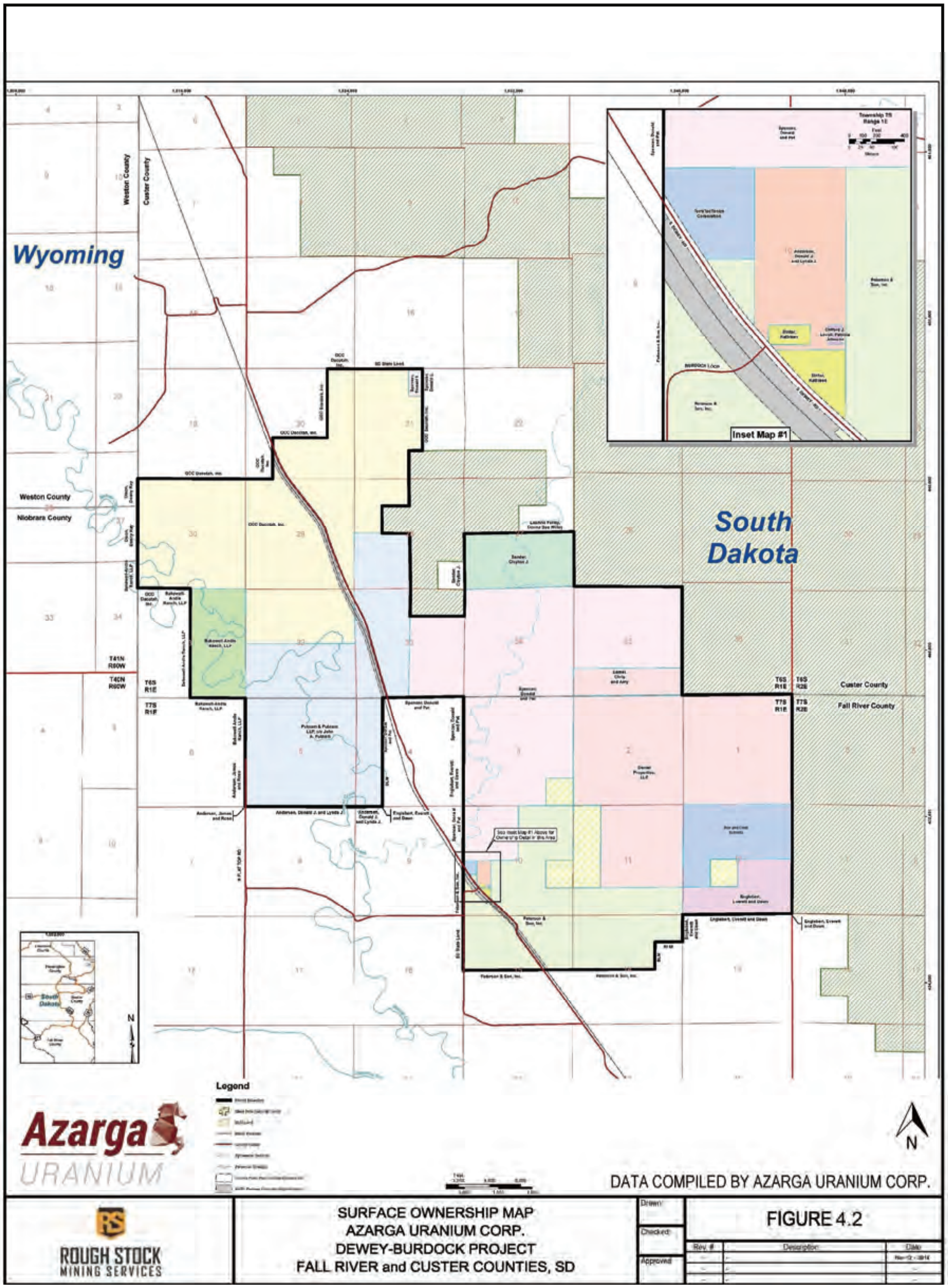
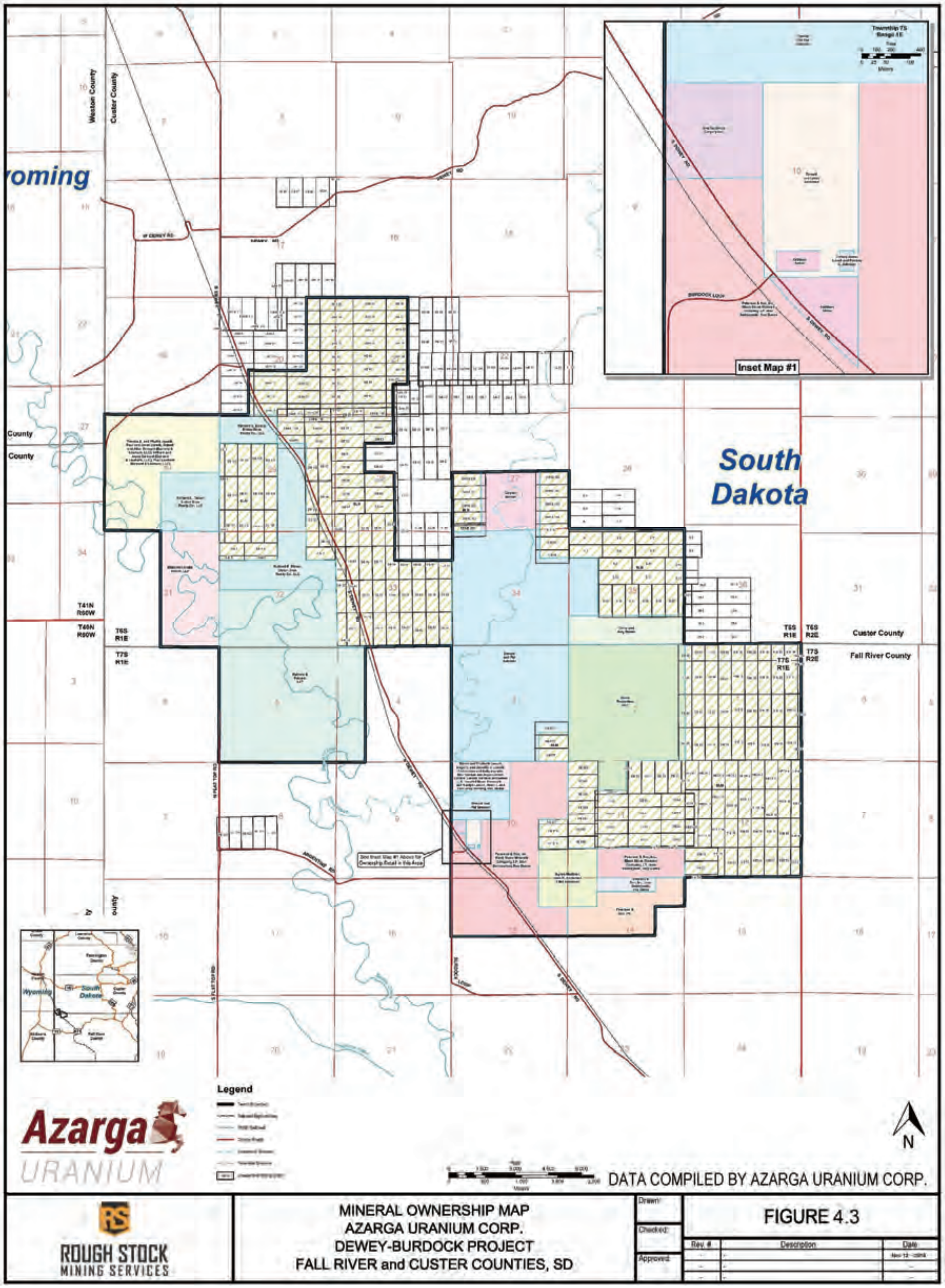


Figure 4.3: Mineral Ownership Map



In December 2008, Azarga purchased a large block of properties in South Dakota and Wyoming from Bayswater Uranium Corporation (Bayswater). There were 37 mining claims (740 acres) located adjacent to Azarga properties within the Dewey-Burdock Project.

In January 2009, Azarga entered into an agreement with Neutron Energy Inc. (NEI) to exchange some of Azarga's noncore properties in New Mexico and Wyoming for acreage located within and adjacent to Azarga's Dewey-Burdock Project in South Dakota. The acreage acquired from NEI by Azarga consists of approximately 6,000 acres of prospective claims and leases.

4.4 Location of Mineralization

The uranium deposits in the Dewey-Burdock Project are classic roll front type deposits occurring in subsurface sandstone channels within the Lakota and Fall River formations of early-Cretaceous age (see stratigraphic column Figure 4.4). These fronts are known to extend throughout an area covering more than 16 square miles and having a total length of over 24 miles. A map prepared by Silver King Mines (SKM) in 1985, and acquired by Azarga, indicates the regional oxidation-reduction boundaries (redox) that control the deposition of uranium mineralization. In addition to the densely (100 ft spacing or less) drilled portions of the redox interfaces where SKM had estimated uranium resources, less densely drilled extensions of these boundaries total 114 miles.

4.5 Environmental Liabilities and Permitting

The Dewey-Burdock project is well advanced in terms of environmental permits, and is positioned to receive the necessary licenses and permits for design and construction of an ISR operation, see Table 4.1.

4.5.1 Residual Environmental Liabilities

The eastern portion of the Burdock project area contains the remnants of uranium mining operations dating from the late 1950s and 1960s. Approximately 200,000 pounds of uranium were extracted via open pit and shallow underground mining methods from the outcropping Fall River Formation. Surface disturbance related to some of these operations, including open pit workings and waste rock piles, have not been reclaimed. At this time, Azarga does not propose operations in the Fall River Formation in this area. There are no known liabilities associated with the unreclaimed workings that are the responsibility of Azarga.

4.5.2 Required Permits and Status

South Dakota has a long history of underground and open pit mining. The South Dakota Department of Environment and Natural Resources recently tolled certain regulations related to in situ uranium development due to duplicative requirements from federal agencies. However, the authority to mine in South Dakota still resides with DENR and South Dakota still requires several permits for the Project. There are a number of permits and licenses required by federal and state agencies. See Table 4.1 for a summary of the licenses and permits and their status. Section 20 also presents the required permits, and

Figure 4.4: Stratigraphic Column

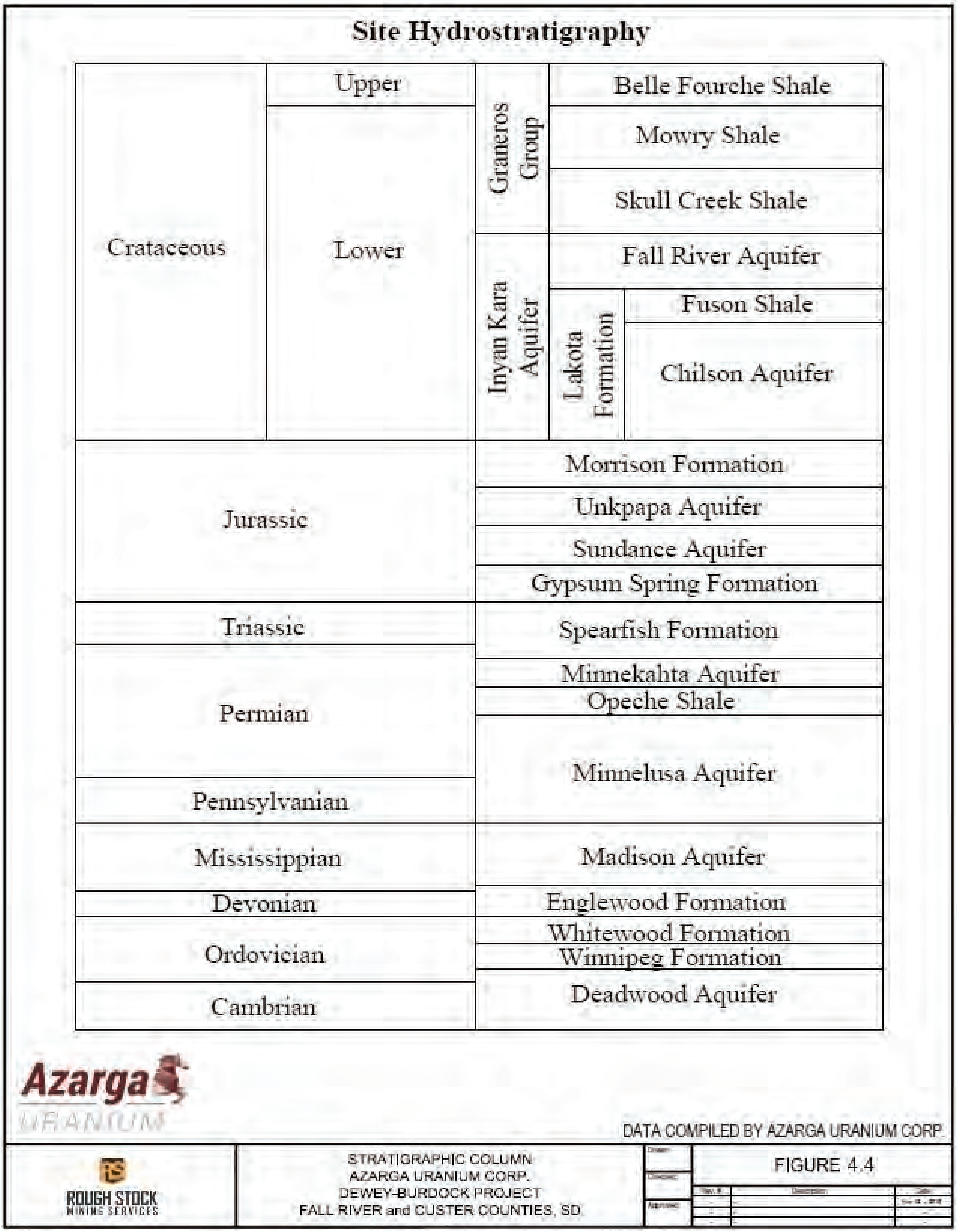


Table 4.1: Permit Status

Permit, License, or Approval Name	Agency	Status
Uranium Exploration Permit	DENR	Submitted - July, 2006 Approved - January, 2007
Special, Exceptional, Critical, or Unique Lands Designation Permit	DENR	Submitted - August, 2008 Approved - February, 2009
UIC Class III Permit	EPA	Submitted - December, 2008 Draft Permit Received – March 2017 Approval pending
Source and Byproduct Materials License	NRC	Submitted - August, 2009 Approved - April, 2014
Plan of Operations (POO)	BLM	Submitted - October, 2009 Approval pending
UIC Class V Permit	EPA	Submitted - March, 2010 Draft Permit Received -March 2017 Approval pending
Groundwater Discharge Plan (GDP)	DENR/WMB	Submitted - March, 2012 DENR Recommended Approval - December, 2012 Approval pending
Water Rights Permit (WR)	DENR/WMB	Submitted - June, 2012 DENR Recommended Approval - November, 2012 Approval pending
Large Scale Mine Permit (LSMP)	DENR/BME	Submitted - September, 2012 DENR Recommended Approval - April, 2013 Approval pending
Minor Permits		
Air Permit	DENR	Deemed Unnecessary - February, 2013
Avian Management Plan	GFP/USFWS	Submitted - September, 2013
Non-Purposeful Eagle Take Permit	USFWS	Submitted - January, 2014
NPDES Construction Permit	DENR	To Be Submitted
NPDES Industrial Stormwater Permit	DENR	To Be Submitted
Septic System Permit	DENR	To Be Submitted
EPA Subpart W Pond Construction Permit	EPA	To Be Submitted
County Building Permits	Custer and Fall River Counties	To Be Submitted

their current status for the Dewey-Burdock project along with additional discussion regarding environmental studies and community interaction.

4.6 Other Significant Factors and Risks

There are no other known factors or risks that would limit Azarga's ability to access the Dewey-Burdock properties to conduct exploration and/or ISR mining and recovery operations on the property that have not already been addressed elsewhere in this report.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Access

The nearest population center to the Dewey-Burdock Project is Edgemont, South Dakota (population 900) located on US Highway 18, 14 miles east from the Wyoming-South Dakota state line. Fall River County Road 6463 extends northwestward from Edgemont to the abandoned community of Burdock located in the southern portion of the Dewey-Burdock project, about 16 miles from Edgemont. This road is a two lane, all weather gravel road. Fall River County Road 6463 continues north from Burdock to the Fall River-Custer county line where it becomes Custer County Road 769 and continues on to the hamlet of Dewey, a total distance of about 23 miles from Edgemont. This county road closely follows the tracks of the BNSF (Burlington Northern Santa Fe) railroad between Edgemont and Newcastle, Wyoming. Dewey is about 2 miles from the northwest corner of the Dewey- Burdock project.

An unnamed unimproved public access road into the Black Hills National Forest intersects Fall River County Road 6463 4.3 miles southeast of Burdock and extends northward about 4mi, allowing access to the east side of the Dewey-Burdock project. About 0.9 miles northwest from Burdock, an unimproved public access road to the west from Fall River County Road 6463 allows access to the western portion of the Dewey-Burdock project. Private ranch roads intersecting Fall River County Road 6463 and Custer County Road 769 allow access to all other portions of the Dewey-Burdock Project.

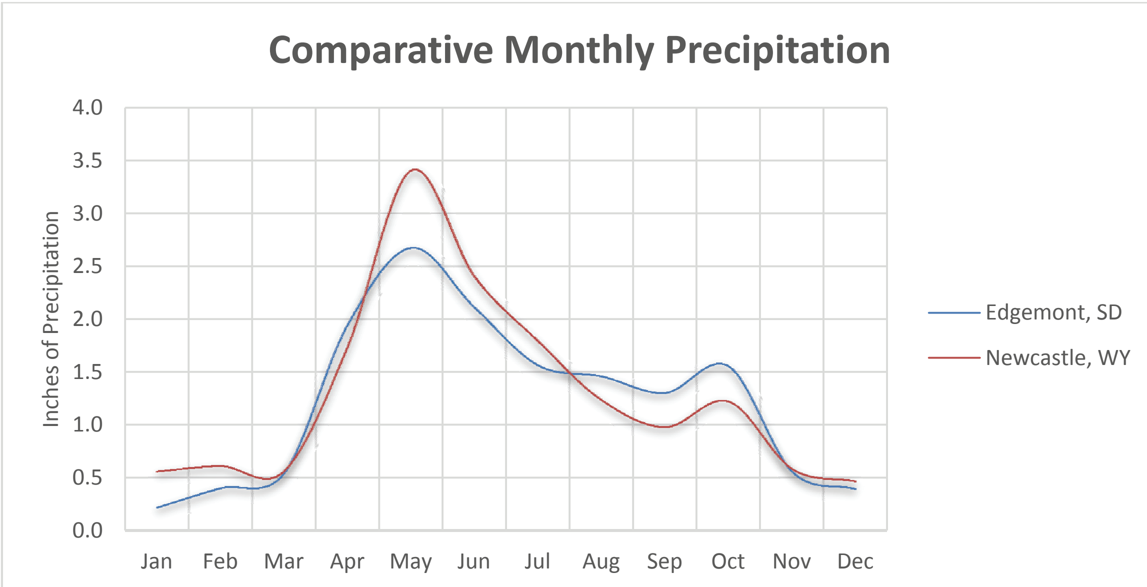
5.2 Climate and Vegetation

The Dewey-Burdock Project topography ranges from low-lying grass lands on the project's west side to dissected up-warped flanks of the Black Hills Uplift in the eastern portion of the Project. Low precipitation, high evaporation rates, low relative humidity and moderate mean temperatures with significant diurnal and seasonal variations characterize the area. The general climate of the project area is semi-arid continental or steppe with a dry winter season. The higher Black Hills to the northeast of the project seem to generally moderate temperature extremes especially during winter months. The local climate is not expected to have any adverse impacts to construction or operation of the Project. Similar projects have been constructed and operated for decades in the neighboring States of Nebraska and Wyoming. Blizzards and extreme cold during the winter months can cause temporary access restrictions but are typically short lived and have rarely been a significant impedance to operations on ISR facilities as evidenced at nearby locations in Nebraska and Wyoming.

The annual mean temperature in this area of South Dakota is 46°F. The mean low temperature of 20°F occurs in January. The mean high temperature of 74°F occurs in July. Dewey-Burdock averages 198 day/year of below freezing temperatures. Below freezing temperatures generally do not occur after mid-May or before late September.

The average precipitation in the Dewey-Burdock Project area is 15 inches. The wettest month is May when rainfall amounts to 3 inches and the driest months are January and December yielding 0.5 inch each month, usually as snow. The average annual snowfall is 37 inches. See Figure 5.1 below:

Figure 5.1: Average Monthly Precipitation (2009 - 2014)



Three major vegetation regions are noted within the Dewey-Burdock Project area: grassland, ponderosa pine and desert shrub. Grassland vegetation is dominated by buffalo grass, blue gamma grass and western wheatgrass. Ponderosa pine occurs with Rocky Mountain juniper. Shrubs are composed of big sagebrush and black greasewood.

Cultivated crops are limited to and consist of flood irrigated hay land. Less than 5% of the project area includes cultivated farming. Most of the vegetation is given over to cattle. A minor portion of the project area covered by stands of ponderosa pine has been selectively logged for pulpwood. Timber is not a significant industry in the Dewey-Burdock Project.

5.3 Topography and Elevation

The Dewey-Burdock Project is located at the extreme southwest corner of the Black Hills Uplift. Terrain is thus, in part, undulating to moderately incised at the south and west portion of the project. The eastern and northern area is further into the Uplift and is cut by narrow canyons draining the higher hills. Significant drainages on the project are few, with only four or five canyons on the whole project area. These canyons are cut less than 1,000 ft in width between the ridges. Slopes may be gentle or steep depending upon the underlying rock type. Sandstones may form cliffs up to 30 to 45 ft in height that will extend for only hundreds of feet in length.

There is only about 300 ft of elevation change across the project area. The lower elevation of 3,600 ft above mean sea level is accurate around the south and west side of the project area. The highest elevation at near 3,900 ft above mean sea level is at the northeast portion of the area.

5.4 Infrastructure

The Dewey-Burdock area is well supported by nearby towns and services. Major power lines are located across the project and can be accessed for electrical service for the mining operation. A major rail line (Burlington Northern Santa Fe) cuts diagonally across the project area. A major railroad siding occurs at Edgemont and could be used for shipment of materials and equipment for development of the producing facilities. Confined groundwater hydro-stratigraphic units containing the uranium are locally artesian to the surface or near surface. This characteristic is highly favorable for ISR and will aid in the dissolution of oxygen in the lixiviant that is utilized in the recovery process.

Nearby population centers indicate there will be no difficulty in finding housing for the relatively small staffing level that is typical of an ISR operation. Skills that are employed in ISR mining are typically found in regional population centers. The local communities of Edgemont, Custer and Hot Springs offer sources for labor, housing, offices and basic supplies.

All leases are designed to have maximum flexibility for emplacement of tanks, out buildings, storage area and pipelines. The topography is relatively low lying and undulating and is conducive for the development of ISR operations.

The project site has no current mining related facilities or buildings. The only site facilities related to mining include an Azarga installed weather monitoring station, radiological monitoring stations, and monitor wells (capped wellheads), all accessible by dirt access roads.

5.5 Sufficiency of Surface Rights

Azarga's land rights are composed of mining claims on BLM land, and private surface and minerals. The access to these lands, as stated in Section 4.3 – Mineral Titles is controlled by surface rights held by Azarga, or by public access on federal lands. There are no significant limitations to surface access and usage rights that might affect Azarga's ability to drill and conduct ISR mining and uranium recovery operations on the Dewey-Burdock properties. As this Project is an ISR operation, waste rock and tailings will not be generated. Thus, there is no requirement for mine waste disposal and no requirement for acquiring surface rights for on-site disposal.

6.0 HISTORY

6.1 Ownership

The surface and minerals rights of properties within the Dewey-Burdock Project may not be owned by the same entity. In years past, when the surface real estate was sold, the owner retained ownership of the minerals. Other properties were homesteaded under the 1916 Homestead Act and the U.S. Government reserved the mineral rights. Uranium minerals were discovered in the vicinity of the Dewey-Burdock Project area as early as 1952 and were soon developed by open pit, adit, or decline shallow underground methods. Production came from small mining companies leasing the mineral rights from either the surface/mineral owner or the surface/mining claim owner. By the late 1950's, these surface uranium deposits came under the control of Susquehanna Western Corp. (SW) who had purchased the process mill located in Edgemont. SW mined out most of the known, shallow uranium deposits before closure of the mill in 1972.

During the uranium boom of the 1970s, several companies returned to the Dewey-Burdock area, acquired leases and began further exploration for deeper deposits. During this period, exploration groups such as Wyoming Mineral (Westinghouse), Homestake Mining Co., Federal Resources and SW discovered much larger, roll-front type uranium mineralization. In 1978, TVA bought out SW's interest in the Edgemont Uranium Mining District, including the closed processing mill in Edgemont. TVA made the Dewey-Burdock area its main exploration target and developed reserves adequate to warrant an underground shaft mine at both the Burdock site and the Dewey site. TVA's plans included a new uranium mill to be located near Burdock.

These plans ended when the price of uranium dropped in the early 1980's. Eventually, TVA dropped their leases and mining claims in the area and the original land/claim owners took over their old mining claims or retained their mineral rights. In 1994, Energy Fuels Nuclear (EFN) acquired the properties covering the uranium roll-front mineralized resource bodies within the Dewey-Burdock Project. By 2000, EFN relinquished their land position in the Dewey-Burdock project.

In 2005, Denver Uranium Company, LLC (DU) acquired leases of federal claims, private mineral rights covering 11,180 acres and private surface rights covering 11,520 acres in the Dewey-Burdock area. This acreage position consisted of contiguous blocks of both surface and mineral rights covering the majority of the discovered and delineated uranium in this district. The basic terms of the lease are a five-year initial term, renewable two times every five years.

On February 21, 2006, Azarga and DU entered into a binding Agreement of Purchase and Sale. Pursuant to the terms of the agreement, Azarga agreed to purchase the assets of DU in exchange for the issuance of eight million common shares of Azarga and the assumption of the liabilities of DU, including a bridge loan, but excluding liabilities related to tax and to DU's officers and members. Further to its initiative to consolidate the Dewey-Burdock uranium resource, Azarga also entered into a binding property purchase agreement with Energy Metals Corp. (EMC) on November 18, 2005 whereby Azarga acquired a 100% interest in 119 mineral claims covering approximately 2,300 acres in the Dewey-Burdock area. EMC retained a production royalty based upon the price of uranium. Azarga issued

1 million shares and 1.25 million share purchase warrants as consideration for the mineral claims.

Since that time, Azarga consolidated its land position by staking an additional 61 mining claims and acquiring surrounding property with resource potential.

In December 2008, Azarga purchased a large block of properties in South Dakota and Wyoming from Bayswater Uranium Corporation (Bayswater). There were 37 mining claims (740 acres) located adjacent to Azarga properties within the Dewey-Burdock Project.

In January 2009, Azarga entered into an agreement with NEI to exchange some of Azarga's non-core properties in New Mexico and Wyoming for acreage located within and adjacent to Azarga's Dewey-Burdock Project in South Dakota. The acreage acquired from NEI by Azarga consists of approximately 6,000 acres of prospective claims and leases.

At the time of this report, Azarga controls approximately 16,960 acres of mineral rights and 12,613 acres of surface rights in the project area (Figures 4.2 and 4.3).

6.2 Past Exploration and Development

Exploration in the vicinity of the Dewey-Burdock area began in 1952 following discovery of uranium minerals in Craven Canyon in the Edgemont District. Early efforts by the US Atomic Energy Commission and the USGS determined the Lakota and Fall River formations were potential uranium host formations.

Early rancher/prospectors made the first uranium discovery in outcrops of the Fall River formation on the Dewey-Burdock Project. The prospectors leased their holdings to local uranium mining companies who first drilled shallow exploration holes with wagon drills and hand-held Geiger probes. Sufficient uranium was discovered to warrant mine development by adit and shallow decline. Susquehanna Western Corp. drilled the first deep holes (600 ft) to discover unoxidized uranium roll front ore deposits in the Lakota formation.

After acquisition of the Dewey-Burdock Project by TVA in 1978, its contractor, SKM, evaluated previous exploration efforts and began its own exploration program. Exploration and development drilling continued on the Dewey-Burdock Project until 1986. TVA then allowed its leases to expire. By that time, over 4,000 exploration holes to depths of 500 to 800 ft were drilled on the project. The majority of this drilling was done with rotary drills using 4.5 to 5.3 inch drill bits and drilling mud recovery fluids. Cutting samples were collected at 10 ft intervals and were recorded in geologic sample logs.

The completed open hole was probed for uranium intersection by down hole instruments to log the hole for gamma, self-potential (SP) and resistivity. Because of caving ground and swelling clays, some holes were logged through the drill stem, which limited the borehole log to gamma response. TVA studied logging holes both open hole and behind pipe in the same hole to estimate a factor to evaluate uranium content when the hole was logged only behind pipe.

TVA completed at least 64 core hole tests on the Burdock portion of the project to calculate equilibrium of gamma response for uranium equivalent measurement versus actual chemical assay. The records do not specify the laboratory used but the results show that the mineralized trends are in equilibrium and that gamma logging will give an accurate measurement of the in place uranium content.

TVA completed an extensive development drilling program as well as a hydrologic study and in 1981 completed an underground mine feasibility study on the uranium deposits within the Dewey-Burdock Project. This study designed an underground mine that proposed five shafts, three on the Burdock deposit and two on the Dewey deposit. Projected mine production was to be 750 tons/day that would produce 5M pounds U_3O_8 using underground mining cutoff grade of 6.0 ft of 0.20%. Later studies considered a processing mill to be built on the Burdock deposit that would also process Dewey ores as well as other ores to be mined in the Edgemont District.

All TVA efforts between 1982 and 1986 were expended on exploration drilling assessment work required to hold their lode mining claims. This effort ended in 1988 when the claims and leases were allowed to expire.

In 1992, EFN acquired leases and drillhole information on the Dewey-Burdock Project. Their intention was to mine the uranium deposits by ISR methods. EFN retained RBS&A as an independent consultant to evaluate available data and to identify the location, host formation and uranium resource that might be exploited by ISR methods. EFN did no additional exploration or development drilling on the project. In 2000, International Uranium Corporation, the successor to EFN, dropped their holdings in the Dewey-Burdock Project.

6.3 Historic Mineral Resource Estimates

Historically, the district has had numerous operators exploring for uranium. The historic project extents have changed considerably over the years, yet the core area of the Project, particularly relative to historic estimates is believed to remain within the boundaries of the current Project. In 1978, TVA acquired all the mineral interests along the known mineralized trend and looked to develop underground mines to feed ore to a planned expanded mill at Edgemont. TVA drilled the mineralized trends in the Dewey-Burdock area on various spacings. TVA utilized a qualified operator, SKM for resource/reserve estimation and mine planning. SKM was known as a careful and qualified operating company with knowledgeable geologists and engineers who had a reputation for accurate and meticulous methods of reserve/resource estimation.

The first uranium resource estimate for the Dewey-Burdock Project was completed for TVA by SKM in 1981 as part of an underground mine feasibility study. This study used a minimum thickness of 6 ft with a minimum average grade of 0.20% U_3O_8. The feasibility study concluded that 5M pounds could be mined by underground methods from a total calculated resource of about 8M pounds. Because of the specific underground mining parameters used in this calculation, this historical resource did not use categories contained in the CIM Definition Standards on Mineral Resources and Reserves. This resource was calculated from assay maps that showed hole location, collar elevation, gamma intercept depth, intercept thickness and, average intercept grade estimated by conventional gamma log grade calculation methods. Azarga does not consider this historical estimate to be equivalent to current mineral resources or mineral reserves as defined in NI 43-101; therefore, the historical estimates should not be relied upon.

SKM calculated in place “identified resources” for the Project (July 1985) of 10M pounds

(SKM terminology, average grade and tonnage not specified). In addition, within these in-place pounds, SKM estimated underground "mineable reserves" of approximately 5M pounds U_3O_8. This estimate was based on a run of mine total of 1,250,000 tons averaging 0.20% U_3O_8. This historical estimate by SKM is not compliant with NI 43-101 and the categorizations "identified resources" and "mineable reserves" are not categories contained in the CIM Definition Standards. These U.S. historical resource categories were based primarily on drillhole density within the Resource Areas. Azarga does not consider this historical estimate to be equivalent to current mineral resources or mineral reserves as defined in NI 43-101; therefore, the historical estimates should not be relied upon.

As part of the historic pre-mine feasibility study, TVA and SKM conducted several leach studies that were designed for a conventional milling circuit. The uranium recovery averaged over 99% and indicated that there is no known portion of the mineralization that can be considered refractory. Copies of the same drillhole assay maps were available to RBS&A in 1991 (ref., Smith, 1993 and 1994). RBS&A evaluated the data for a U.S. uranium company in the expectation that the uranium deposit would be mined by ISR methods. RBS&A considered only those assay map intercepts that had an average grade of 0.05% U_3O_8 or greater and were of sufficient thickness to yield a grade-thickness (GT) product of 0.50. Over 2,000 electric drillhole logs from the known mineralized areas on the Dewey-Burdock Project were selected for audit in order to correlate and categorize each intercept to a designated sand host unit and to determine an intercept position within a geochemical roll front system. The drillhole electric log data in association with lithologic data determined roll front intervals or horizons within each of 12 lithologic units within the Lakota and Fall River formations. Nine lithologic units were assigned to the Lakota Formation and three lithologic units were assigned to the Fall River Formation.

The assay intervals greater than 0.5 GT and roll front location were transferred to drillhole location maps. The GT values were then hand contoured. The area inside the 0.5 GT contour was measured with a planimeter to estimate the square footage within the area. The arithmetic mean GT intercept within the 0.5 GT contour was calculated. Pounds of U_3O_8 within any 0.5 GT contour were estimated using the equation:

$$(20 \times A \times GT)/16 = \text{pounds } U_3O_8$$

Where "A" is equal to the planimeter area, GT is mean grade-thickness product, and 16 ft^3/ton is rock density. Uranium resources were estimated for each 0.5 GT contour closure and these resources were summed for each lithologic unit. All lithologic units were summed to obtain the total uranium resource. This resource estimate was prepared for a U.S. client and did not conform to CIM Standards on Mineral Resources and Reserves. This evaluation by RBS&A indicated a global uranium resource that met economic parameters for ISR mining in the Dewey-Burdock project area totaled 8.1M pounds U_3O_8, contained in 1,928,000 tons and averaging 0.21% U_3O_8. Azarga does not consider this historical estimate to be equivalent to current mineral resources or mineral reserves as defined in NI 43-101; therefore, the historical estimates should not be relied upon.

Azarga purchased all of RBS&A data in 2006. These records and maps document the method of calculation and interpretation of the TVA data. The maps were adjusted to fit Azarga's land position in 2006 and, in accordance to the CIM Standards on Mineral Resources and Reserves; a second resource evaluation was undertaken. These calculations are documented in the original Dewey-Burdock technical report prepared by RBS&A,

showing total Azarga inferred resources to be 7.6M pounds U_3O_8, contained in 1,807,000 tons and averaging 0.21% U_3O_8. Azarga's in-house experts in ISR mining corroborate the RBS&A calculations.

The historical resources/reserves stated in this Section 6.3 are not reliable or relevant; they are historically reported information only. Key assumptions and estimation parameters used in the above estimates are not completely known to the authors of this report, it is therefore not possible to determine what additional work is required to upgrade or verify the historical estimated as current mineral resources or mineral reserves. The above tonnage and grade figures are not CIM complaint resources, as no Azarga or Roughstock Qualified Persons have evaluated the data used to derive the estimates of tonnage and grade; therefore the estimates should not be relied upon. A qualified person has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves and Azarga is not treating the historical estimate as current mineral resources or mineral reserves. The estimates of tons and grade or pounds of uranium are presented here only as documentation of what was historically reported for the property.

Azarga presents current and CIM compliant resources for Dewey-Burdock in Section 14 of this report.

6.4 Historic Production

Uranium was first produced in the Dewey-Burdock Project probably as early as 1954 by a local group known as Triangle Mining Co., a subsidiary of Edgemont Mining Co. Early commercial production consisted of a single, shallow open pit. This same group reportedly drove an adit from both sides of an exposed ridge mining a narrow orebody. This mining was within the Burdock portion of the Dewey-Burdock Project area.

SWI acquired the same area in about 1960 and discovered by shallow drilling sufficient resources in the Fall River formation to warrant open pit mining in five or six pits less than 100ft deep. SWI controlled the mill in Edgemont, which allowed some tolerances in mining low-grade ores that other mining companies could not afford. SWI also had a milling contract with Homestake Mining Co. to buy ore from the Hauber Mine in northeast Wyoming. As long as SWI had the Hauber ore to run through their Edgemont mill they could afford to mine low-grade ores from the Burdock surface mines. When the Hauber Mine was mined out and Homestake ceased ore shipments to Edgemont, SWI closed their mining operations at Burdock and elsewhere in the Black Hills. No actual production records are known from the Burdock mines, which are located in the east portion of the current project area, but production is estimated to have been approximately 200,000 pounds U_3O_8. No subsequent operator in the Dewey-Burdock area produced uranium.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Black Hills Uplift is a Laramide Age structure forming a northwest trending dome about 125 miles long x 60 miles wide located in southwestern South Dakota and northeastern Wyoming. The uplift has deformed all rocks in age from Cambrian to latest Cretaceous. Subsequent erosion has exposed these rock units dipping outward in successive elliptical outcrops surrounding the central Precambrian granite core. Differential weathering has resulted in present day topography of concentric ellipsoids of valleys under softer rocks and ridges held up by more competent units.

The uranium host units in the Dewey-Burdock area are the marginal marine Lakota and Fall River sandstone units within the Inyan Kara Group of earliest Cretaceous Age. These sandstones are equivalent to the Cloverly formation in western Wyoming, the Lakota formation in western Minnesota, and the Dakota formation in the Colorado Plateau. The entire Inyan Kara Group consists of basal fluvial sediments grading into near marine sandstones, silts and clays deposited along the ancestral Black Hills Uplift. The sandstones are fairly continuous along the western flank of the Uplift. The Inyan Kara Group unconformably overlies the Jurassic Morrison formation, here a flood plain deposit and terrestrial clay unit. Overlying the Inyan Kara are later early Cretaceous marine shales composed of the Skull Creek, Mowry, and Belle Fourche formations (referred to as the Graneros Group). Post uplift, the entire truncated set of formations was unconformably overlain by the Tertiary White River formation. The White River consisted of several thousand feet of volcanic ash laden sediments that have since been eroded.

The Inyan Kara is typical of units formed as first incursion of a transgressive sea. The basal fluvial units grade into marine units as the ocean inundates a stable land surface. The basal units of the Lakota rest in scours cut into the underlying Morrison shale and display the depositional nature associated with mega-channel systems crossing a broad, flat coastal plain. Between channel sands are thin deposits of overbank and flood plain silts and clays.

Crevasse splays are common and abruptly terminate into inter-channel clays. The uppermost unit of the Lakota formation is a widespread clay unit generally easily identified on electric logs by a characteristic “shoulder” on the resistivity curve. This unit is known as the Fuson member. The basal unit of the Fall River formation is a widespread, fairly thick channel sand deposited in a middle deltaic environment that is evidenced by low-grade coals in its upper portion. Younger Fall River sand units are progressively thinner, less widespread; contain more silt and contain considerably more carbon, denoting a lower deltaic environment of deposition. There is little or no evidence of scouring of the contact between Fall River and the overlying marine Skull Creek. Inundation must have been rapid since within less than 20 ft of sedimentation, rock character goes from middle deltaic, marginal marine to deep marine environment with no evidence of beach deposits or offshore bar systems.

The overall structure of the Black Hills Uplift is fairly simple in that the structure is domal and rock units dip outward away from the central core. Regionally across the Black Hills, subsequent and attendant local doming caused by local intrusions disrupts the general dip of the units. Tensional stress creates fault zones with considerable displacement from one side of the zone to the other. This is often a distance of three or four miles. The Dewey fault zone, a few miles to the north is a zone of major displacement. The faulting drops the uranium host units several hundred feet and truncates the oxidation-reduction contact that formed the Dewey-Burdock mineralization. However, detailed geologic and hydrogeologic investigations indicate no evidence of faulting within the project permit area.

7.2 Local and Project Geology

The Lakota formation in the Dewey-Burdock Project area was deposited by a northward flowing stream system. Sediments consist of point bar and transverse bar deposition. The stream channel systems are typical of meandering fluvial deposition. Sand units fine upward and numerous cut-and-fill sandstones are indicative of channel migration depositing silt and clay upon older sand and additional channel sands overlay older silts and clays. Uranium minerals were deposited in several stratigraphically different sands within the Lakota. Because uranium deposits have formed in separate stratigraphic units, these units were identified and named for their stratigraphic position.

Similar channel deposition occurred during Fall River time but the channel sands are noticeably thinner with marine sediments immediately superimposed on the fluvial sands. The knowledge of detailed stratigraphy is critical in ISR mining due to the importance of solution contact with the uranium mineralization. Where uranium is located in low permeability horizons, solution mining is not as efficient as it would be in more uniform sandstones with relatively equal permeability. During the evaluation of uranium resources made by RBS&A, the sands of the Lakota Formation were divided into nine sandstone units, generally about 20 ft thick and usually separated by a consistent claystones or shales. The major sand unit in the basal Fall River Formation was divided into three sand subunits, each of which are mineralized and contain roll fronts on the Dewey portion of the area. All of the Fall River uranium mineralization on the Burdock portion of the Project is at or above the water table. Mining of these resources is presumed to require other mining methods rather than ISR such as open pit or underground mining.

The lithologic units of the Lakota and Fall River Formations now dip gently, about 3° to the southwest off the flank of the Black Hills Uplift. This structure controls present groundwater migration. Since the uranium roll front orebodies below the water table are dynamic, their deposition and tenor is factored by groundwater migration. No faults were observed during the correlation of exploration drillholes in the project area. Fault systems have been mapped away from the Project and only the major sandstone channel systems affect local groundwater migration and thus uranium deposition.

7.3 Significant Mineralized Zones

7.3.1 Mineralized Zones

Previous reports by TVA indicate that uranium minerals in the Dewey-Burdock Project are all of +4 valence state and thus considered to be deposited from epigenetic solutions. Permeability often has an effect on the mineralized resource body locations. More permeable portions of mineralized resource zone of the sand frequently contain larger portions of the deposit particularly along oxidation/reduction boundaries. Zones of lower permeability are often characterized by generally thinner and less continuous deposits in comparison. Alteration, depicting the oxidation-reduction contact can occur in several channel units and may be several miles in length. Uranium deposition in significant deposits occurs discontinuously along the oxidation/reduction boundary with individual deposits ranging from several hundred to a few thousand feet in length. Width of concentration is dependent upon lithology and position within the channel. Widths are seldom less than 50 ft and are often over 100 ft. Thickness of high concentration uranium mineralization varies from 1 or 2 ft in limbs, to 5 or 12 ft in the rolls. Tenor of uranium mineralization may vary from nil to a few percent at any point within the orebody.

7.3.2 Relevant Geologic Controls

The primary mineralized resource control of uranium mineralization in the Dewey-Burdock project is the presence of permeable sandstone within a major sand channel system that is also a groundwater hydro-stratigraphic unit. Such conditions exist in both the Lakota and Fall River formations. A source rock for uranium in juxtaposition to the hydro-stratigraphic unit is necessary to provide mineral to the system. As described above, the uranium-rich White River formation originally overlay the sub-cropping sandstone units of the Lakota and Fall River formations. The last control is the need for a source of reductant to precipitate dissolved uranium from groundwater solutions. RBS&A observed that such reductant is available from deeper hydrocarbon deposits discovered down dip only a few miles west of the Dewey-Burdock Project as well as hydrocarbon occurrences in deeper formations just east of the Project area. Previous writers as early as 1952 postulated the source of reductant to be carbon and carbonaceous material that does occur in varying quantities throughout the Inyan Kara group sedimentary rocks, including the Fall River and Lakota formations.

7.4 Hydrogeological Setting

CIM adopted Best Practice Guidelines for the Estimation of Mineral Resources and Mineral Reserves on November 23, 2003 (ref., CIM Council, 2003); within which are recommended guidelines with respect to uranium. To support the use of ISR methods, hydrogeologic data are required to show:

- Permeability of the mineralized horizon;
- Hydrologic confinement of the mineralized horizon; and
- Ability to return groundwater within the mined area to its original baseline quality and usage.

Azarga completed significant work to characterize the groundwater system at the Dewey-Burdock project to demonstrate favorable hydrogeologic conditions for ISR methods, as well as mine planning and permitting purposes. Work completed by Azarga and their consultants includes monitor and pumping well construction, hydro-stratigraphic unit testing, groundwater sampling, and completion of regional and well field scale groundwater models.

7.4.1 Project Hydrogeology

Within the Dewey-Burdock project area the uppermost hydro-stratigraphic unit and the production hydro-stratigraphic unit are both the Inyan Kara, the underlying hydro-stratigraphic unit is the Unkpapa Formation (or Sundance if the Unkpapa is not present). There is no overlying hydro-stratigraphic unit within the project area other than minor localized alluvial hydro-stratigraphic units.

The information presented is based upon the results of work completed by Azarga and their consultants, as well as TVA. Azarga completed groundwater sampling, piezometric surface mapping, and individual hydro-stratigraphic unit tests within both the Dewey project area and the Burdock project area in 2007-2009, in addition to resource drilling activities that collected core samples for measurement of hydrogeologic parameters. TVA completed three hydro-stratigraphic unit tests, one just north of the Dewey project area in 1982, and two within the Burdock project area in 1979 (ref., Powertech, 2013a and 2013b).

7.4.2 Hydraulic Properties of the Inyan Kara

The following section discusses the results of hydro-stratigraphic unit tests and geotechnical testing completed in the project area to estimate the hydraulic properties of the production hydro-stratigraphic unit and confining units, as well as water level data and confining pressures for the individual project areas.

Dewey

Two hydro-stratigraphic unit test programs were completed within or just outside of the Dewey project area: Tennessee Valley Authority (TVA) in 1982 (ref., Powertech, 2013a) and Azarga in 2008 (ref., Powertech, 2013c).

The 1982 test completed by TVA consisted of pumping in the Lakota Formation for 11 days at an average rate of 495 gpm from a screened interval 75 ft in length. The results of the hydro-stratigraphic unit test yielded the following data:

- Transmissivity of the Lakota averaged 590 ft^2/day; and
- Storativity of the Lakota was approximately 0.0001 (dimensionless).

TVA recorded a hydraulic response in the Fall River through the intervening Fuson Member late in the hydro-stratigraphic unit test (3,000 to 10,000 minutes). TVA calculated the vertical hydraulic conductivity of the Fuson Member to be 0.0002 ft/day using the Neuman-Witherspoon ratio method (ref., Neuman and Witherspoon, 1972).

TVA observed a barrier boundary, or a decrease in transmissivity due to lithologic changes with distance from the site, or both. A possible geologic feature corresponding to a barrier was noted to be the Dewey Fault Zone, located approximately 1.5 miles north of the test site, where the Lakota and Fall River Formations are structurally offset.

The 2008 test completed by Azarga consisted of pumping in the Fall River Formation for 74 hours at an average rate of 30.2 gpm from a screened interval 15 ft in length. The results of the hydro-stratigraphic unit test yielded the following data:

- Ten determinations of transmissivity ranged from 180 to 330 ft^2/day, with the median value of 255 ft^2/day; and
- Five determinations of storativity ranged from 0.000023 to 0.0002 with a median value of 0.000046.

Azarga recorded a delayed response in the upper Fall River Formation, which indicates lateral and vertical anisotropy due to interbedded shales in the formation. No flow was observed through the Fuson Member between the Fall River and the underlying Lakota hydro-stratigraphic units.

In addition to the 2008 hydro-stratigraphic unit test, Azarga collected and submitted Fall River sandstone core samples, equivalent to that tested by the hydro-stratigraphic unit test, for laboratory measurements of horizontal and vertical hydraulic conductivity with the following results:

- Measured horizontal hydraulic conductivity was 6.1 ft/day; and
- Horizontal to vertical hydraulic conductivity ratio of 4.5:1.

Laboratory measurements of horizontal and vertical hydraulic conductivity on core from the confining units overlying (above the Fall River hydro-stratigraphic unit) and underlying (between the Fall River and Lakota hydro-stratigraphic units) the hydro-stratigraphic unit test area include:

- Skull Creek shale: average vertical hydraulic conductivity of 0.000015 ft/day; and
- Fuson shale: average vertical hydraulic conductivity of 0.000018 ft/day.

Water level data collected by Azarga from a vertical well nest at the Dewey project area indicate that the Unkpapa, Lakota, and Fall River hydro-stratigraphic units are confined and are locally hydraulically isolated. Generalized water level data for the Lower Fall River Sandstone that hosts uranium mineralization in the Dewey project area are detailed in Table 7.1.

Table 7.1: Dewey Production Area Water Level Data

Hydro-Stratigraphic Unit	Top Elevation (feet)	Bottom Elevation (feet)	Static Water Elevation (feet)	Available Drawdown (feet)
Lower Fall River	3,151	3,011	3,642	491

Burdock

Three hydro-stratigraphic unit tests were completed within the Burdock project area: two completed by TVA in 1979 (ref., Powertech, 2013b), and a third completed by Azarga in 2008 (ref., Powertech, 2013c).

The 1979 tests completed by TVA consisted of pumping in the Lakota Formation for 73 hours at an average rate of 200 gpm, and pumping in the Fall River for 49 hours at an average rate of 8.5 gpm. A single pumping well was utilized for these tests, with a pneumatic packer separating the screened intervals within the Lakota and Fall River. The screen length in the Lakota was approximately 75 ft, and in the Fall River 55 ft. The results of the hydro-stratigraphic unit tests yielded the following data:

- Interpreted transmissivity of the Lakota was based on analysis of late time data and inferred decreasing transmissivity with distance from the test site due to changes in lithology; overall transmissivity averaged approximately 190 ft^2/day and storativity was 0.00018. The maximum transmissivity determined from early time was approximately 310 ft^2/day;
- Transmissivity of the Fall River averaged approximately 54 ft^2/day and storativity of 0.000014;
- Communication was observed between the Fall River and Lakota Formations through the intervening Fuson shale; and leaky behavior was observed in the Fall River Formation; and
- The vertical hydraulic conductivity of the Fuson shale determined with the Neuman-Witherspoon ratio method (ref., Neuman and Witherspoon, 1972) was estimated to be 0.001 to 0.0001 ft/day.

The 2008 test completed by Azarga consisted of pumping in the Lakota Formation for 72 hours at an average rate of 30.2 gpm from a screened interval 10 ft in length. The results of the hydro-stratigraphic unit test yielded the following data:

- Nine determinations of transmissivity ranged from 120 to 223 ft^2/day with a median value of 150 ft^2/day; and
- Four storativity determinations ranged from 0.000068 to 0.00019 with a median value of 0.00012.

In addition to the 2008 pump test, Azarga collected and submitted Lakota sandstone core samples, representative of the formations tested during the hydro-stratigraphic unit test, for laboratory measurements of horizontal and vertical hydraulic conductivity with the following results:

- Measured horizontal hydraulic conductivity ranged from 5.9 to 9.1 ft/day, and a mean value of 7.4 ft/day; and
- Horizontal to vertical hydraulic conductivity ratio of 2.47:1.

Laboratory measurements of horizontal and vertical hydraulic conductivity on core from the confining units overlying (above the Lakota hydro-stratigraphic unit) and underlying (below the Lakota hydro-stratigraphic unit) the hydro-stratigraphic unit test area include:

- Fuson shale: average vertical hydraulic conductivity of 0.00027 ft/day; and
- Morrison shale: average vertical hydraulic conductivity of 0.00006 ft/day.

Water level data collected by Azarga from vertical well nest at the Burdock project area indicate that the Unkpapa, Lakota, and Fall River hydro-stratigraphic units are confined and are locally hydraulically isolated. Generalized water level data for the Lower Lakota Sandstone that hosts uranium mineralization in the Burdock project area are detailed in Table 7.2.

Table 7.2: Burdock Production Area Water Level Data

Hydro-Stratigraphic Unit	Top Elevation (feet)	Bottom Elevation (feet)	Static Water Elevation (feet)	Available Drawdown (feet)
Lower Lakota	3,290	3,245	3,660	370

The data collected by Azarga, and previous operator TVA, is sufficient to characterize the hydrogeologic regimes of the production hydro-stratigraphic units at the Dewey-Burdock Project. Table 7.3 summarizes groundwater flow parameters determined for the project.

Table 7.3: Hydro-Stratigraphic Unit Property Summary for Dewey-Burdock Project

Geologic Unit	Pump Transmissivity (ft^2/day)		Horizontal Hydraulic Conductivity* (ft/day)	Vertical Hydraulic Conductivity* (ft/day)	
	TVA	Azarga	Azarga	TVA	Azarga
Dewey					
Skull Creek	-	-	-	-	1.5×10^{-5}
Fall River	-	255 (15' Screen)	6.1	-	-
Fuson	-	-	-	2.0×10^{-4}	1.8×10^{-5}
Lakota	590 (75' Screen)	-	-	-	-
Morrison	-	-	-	-	-
Burdock					
Skull Creek	-	-	-	-	-
Fall River	54 (55' Screen)	-	-	-	-
Fuson	-	-	-	10^{-3} to 10^{-4}	2.7×10^{-4}
Lakota	190 (75' Screen)	150 (10' Screen)	7.4	-	-
Morrison	-	-	-	-	6.0×10^{-5}

* Core Material

7.4.3 Hydrogeologic Considerations for ISR Mining Performance

The primary hydro-stratigraphic unit parameter to consider in the design of an ISR well field is hydraulic conductivity/transmissivity of the mineral deposit. This parameter influences hydro-stratigraphic unit drawdown, and build up, due to pumping and injection, as well as groundwater velocity and residence time for the ISR mining lixiviant. The second important hydro-stratigraphic unit parameter for ISR well field design is the amount of hydraulic head above an upper confining unit (or available drawdown). A greater hydraulic head allows for higher concentrations of dissolved oxygen within the lixiviant, more aggressive pumping and injection, and reduced risk for gas lock in the producing formation.

Analysis of the Fall River and Lakota hydro-stratigraphic unit suggests that a range of ISR well pumping rates is suitable within the hydro-stratigraphic unit's potential. The combination of local artesian conditions (relatively high hydraulic head above an upper confining unit and available drawdown) in the Fall River and Lakota hydro-stratigraphic units transmissivity provide favorable conditions for ISR mining techniques. The existing hydro-stratigraphic unit parameters will allow significant dissolved oxygen to be introduced into the groundwater for uranium oxidation and extraction.

7.4.4 Hydrogeologic Considerations for ISR Mining Impact to Groundwater System

In February 2012, Petrotek Engineering Corporation of Littleton, Colorado completed a three-dimensional numerical model to evaluate the response of the Fall River and Chilson hydro-stratigraphic units to operation of the Dewey-Burdock ISR project (ref., Powertech, 2013d). The model was developed using site-specific data regarding top and bottom hydro-stratigraphic unit elevations, saturated thicknesses, potentiometric surfaces, hydraulic gradients, hydraulic conductivities, specific yields, storativities, and porosities. The model was calibrated to existing conditions and to three pumping tests.

Once calibrated, the model was used to simulate the complete operational cycle of the Dewey-Burdock ISR project, from production through post-restoration recovery. Simulations were run using production rates of 4,000 and 8,000 gallons per minute (gpm), a restoration rate of up to 500 gpm, and net bleeds ranging from 0.5 to 1.0%. Modeling results indicate the following:

- Simulated production at rates of 4,000 and 8,000 gpm with 0.5 to 1.0% bleeds for a period of 8.5 years did not result in hydro-stratigraphic unit dewatering;
- The maximum drawdown simulated outside the project area was less than 12 feet;
- Restoration using reverse osmosis at a rate of up to 500 gpm per wellfield with a 1.0% bleed was simulated to be sustainable throughout a restoration cycle of 6 pore volumes;
- Groundwater sweep simulated at rates to remove one pore volume every 6 to 18 months per wellfield did not result in localized dewatering of the hydro-stratigraphic unit;
- Wellfield interference was shown to be manageable for the simulated production, restoration and net bleed rates through sequencing of wellfields to maximize distances between concurrently operating units;
- Model simulations indicate limited drawdown will occur within the Fall River as a result of ISR operations within the Chilson; and
- Simulated water levels were shown to recover to near pre-operational elevations within one year of ISR cessation.

7.4.5 Groundwater Chemistry

NRC ISR licensing regulations and guidance specify that site characterization pre-mining groundwater chemistry data be collected from the production hydro-stratigraphic unit, underlying hydro-stratigraphic unit, overlying hydro-stratigraphic unit, and the uppermost hydro-stratigraphic unit. Within the Dewey-Burdock project area, the uppermost hydro-stratigraphic unit and the production hydro-stratigraphic unit are both the Inyan Kara, the underlying hydro-stratigraphic unit is the Unkpapa Formation. There is no overlying hydro-stratigraphic unit within the project area other than minor localized alluvial hydro-stratigraphic units.

Across the Black Hills region, the groundwater of the Inyan Kara ranges from soft to very hard and fresh to slightly saline. Compared to other regional hydro-stratigraphic units, the Inyan Kara has relatively high concentrations of sulfate, sodium, and magnesium. These concentrations, along with chloride, are generally higher in the southern Black Hills. The exact source of the sulfate is uncertain but could be the result of oxidation of sulfide minerals such as pyrite within the Inyan Kara (ref., RESPEC, 2008).

Chemical composition and pH within the Inyan Kara varies based upon distance from the outcrop. Previous studies indicate the groundwater pH increases down dip, as well as a change from calcium sulfate type water near outcrop to sodium sulfate type down gradient.

The Inyan Kara is a principal uranium-bearing rock unit in the southwestern Black Hills. As such, the hydro-stratigraphic unit typically has measurable amounts of dissolved uranium, radium-226, radon-222, and other byproducts of radioactive decay. In addition to the radionuclides, high concentrations of sulfate and dissolved solids deter use of the Inyan Kara as a source of drinking water (ref., RESPEC, 2008).

Groundwater chemistry data for the Fall River Formation and Lakota Formation of the Inyan Kara are shown in Table 7.4. Minimum, maximum, and mean concentrations are based upon background data collected for the Dewey-Burdock NRC source and byproduct materials license. In general, the water of the Inyan Kara within the project area is characterized by high concentrations of dissolved solids, sulfate, and radionuclides. Mean concentrations of sulfate, dissolved solids, manganese, and radionuclides (gross alpha, Radon-222) exceed drinking water quality standards (EPA maximum contaminant levels (MCL), secondary MCLs, and proposed MCLs) in over half of the samples collected.

The present poor water quality of the Inyan Kara within the Dewey-Burdock project area, naturally containing both radionuclide and TDS concentrations above EPA drinking water standards, suggests that reclamation of the production hydro-stratigraphic unit to background or alternate concentration limits will be required.

7.4.6 Assessment of Dewey-Burdock Project Hydrogeology

The data confidence level is typical of a uranium ISR project at this stage in development. Prior to the development of each individual well field, Azarga will complete specific testing including coring and hydro-stratigraphic unit testing that will increase confidence and understanding.

Table 7.4: Groundwater Chemistry for the Fall River and Chilson Formations

Analyte	Units	Fall River Hydro ID Means			Chilson Hydro ID Means		
		Min	Max	Mean[1]	Min	Max	Mean[1]
Physical Properties							
pH, Laboratory	s.u.	7.10	8.45	7.92	7.10	8.05	7.64
Total Dissolved Solids	mg/L	773.85	2250.00	1275.01	708.33	2358.33	1263.38
Major Ions							
Bicarbonate as HCO_3	mg/L	142.92	239.67	195.92	86.75	318.25	206.27
Calcium, Dissolved	mg/L	30.10	368.00	110.93	34.74	385.50	145.84
Carbonate as CO_3	mg/L	<5	7.85	2.95	<5	3.125	2.54
Chloride	mg/L	9.50	47.00	15.62	5.00	17.50	10.06
Magnesium, Dissolved	mg/L	10.51	133.75	38.56	11.80	124.14	51.34
Potassium, Dissolved	mg/L	7.08	15.98	11.20	7.18	21.65	13.57
Sodium, Dissolved	mg/L	86.60	502.50	236.23	47.42	283.00	168.00
Sulfate	mg/L	425.38	1442.50	743.25	388.77	1509.17	733.54
Metals, Total							
Arsenic	mg/L	0.00075	0.00379	0.00205	0.001	0.02	0.005
Chromium	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	0.0425	0.008
Iron	mg/L	0.04167	4.76417	0.82336	0.08	15.30	3.33
Lead	mg/L	<0.001	0.002	0.001	<0.001	0.026	0.0032
Manganese	mg/L	0.03000	2.48500	0.32747	0.04	1.74	0.36
Mercury	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	<0.01	0.03	0.04	<0.01	0.075	0.05
Selenium	mg/L	<0.001	0.001	0.001	<0.001	0.0019	0.001
Strontium	mg/L	0.65	6.20	2.18	0.70	7.45	3.04
Uranium	mg/L	<0.0003	0.11	0.01	<0.0003	0.02	0.0046
Zinc	mg/L	<0.01	0.01	0.01	<0.01	0.13	0.03
Radionuclides							
Gross Alpha, Dissolved	pCi/L	5.58	1504.69	272.70	3.56	4990.71	418.43
Radium 226, Dissolved	pCi/L	1.18	388.17	67.71	1.15	1289.29	103.18
Radon 222, Total	pCi/L	276.83	278029.73	27107.39	196.67	180750.00	21158.38

Note 1: ½ x reporting limit used to calculate mean where non-detect results occurred

Analyte concentration exceeds standard for:

- (red) Federal MCL
- (green) Secondary Standard
- (yellow) Proposed MCL

(ref., Powertech, 2013e)

8.0 DEPOSIT TYPE

Uranium deposits in the Dewey-Burdock Project are sandstone, roll front type. This type of deposit is usually “C” shaped in cross-section, with the down gradient center of the “C” having the greatest thickness and highest tenor. The “tails” of the “C” are usually much thinner and essentially trail the “roll front” being within the top and bottom of the sandstone unit that is slightly less permeable.

These “roll fronts” are typically a few tens of feet wide and often can be thousands of feet long. Uranium minerals are deposited at the interface of oxidizing solutions and reducing solutions. As the uranium minerals precipitate, they coat sand grains and partially fill the interstices between grains. As long as oxidizing groundwater movement is constant, minerals will be solubilized at the interior portion of the “C” shape and precipitated in the exterior portion of the “C” shape, increasing the tenor of the orebody by multiple migration and accretion. Thickness of the orebody is generally a factor of the thickness of the sandstone host unit. Mineralization may be 5 to 12 ft thick within the roll front while being 1 to 2 ft thick in the trailing tail portions. Deposit configuration determines the location of well field drillholes and is a major economic factor in ISR mining.

The uranium deposits in the southern Black Hills region are characteristic of the Rocky Mountain and Intermontane Basin uranium province, United States (ref., Finch, 1996). The uranium province is essentially defined by the extent of the Laramide uplifts and basins.

Roll-front sandstone uranium deposits formed in the continental fluvial basins developed between uplifts. These uranium deposits were formed by oxidizing uranium-bearing groundwater that entered the host sandstone from the edges of the basins. Two possible sources of the uranium were (1) uraniferous Precambrian granite that provided sediment for the host sandstone and (2) overlying Tertiary age (Oligocene) volcanic ash sediments. Major uranium deposits occur as sandstone deposits in Cretaceous and Tertiary age basin sediments. Cluster size and grades for the sandstone deposits range from 500 to 20,000 tons U_3O_8, at typical grades of 0.04 to 0.23% U_3O_8.

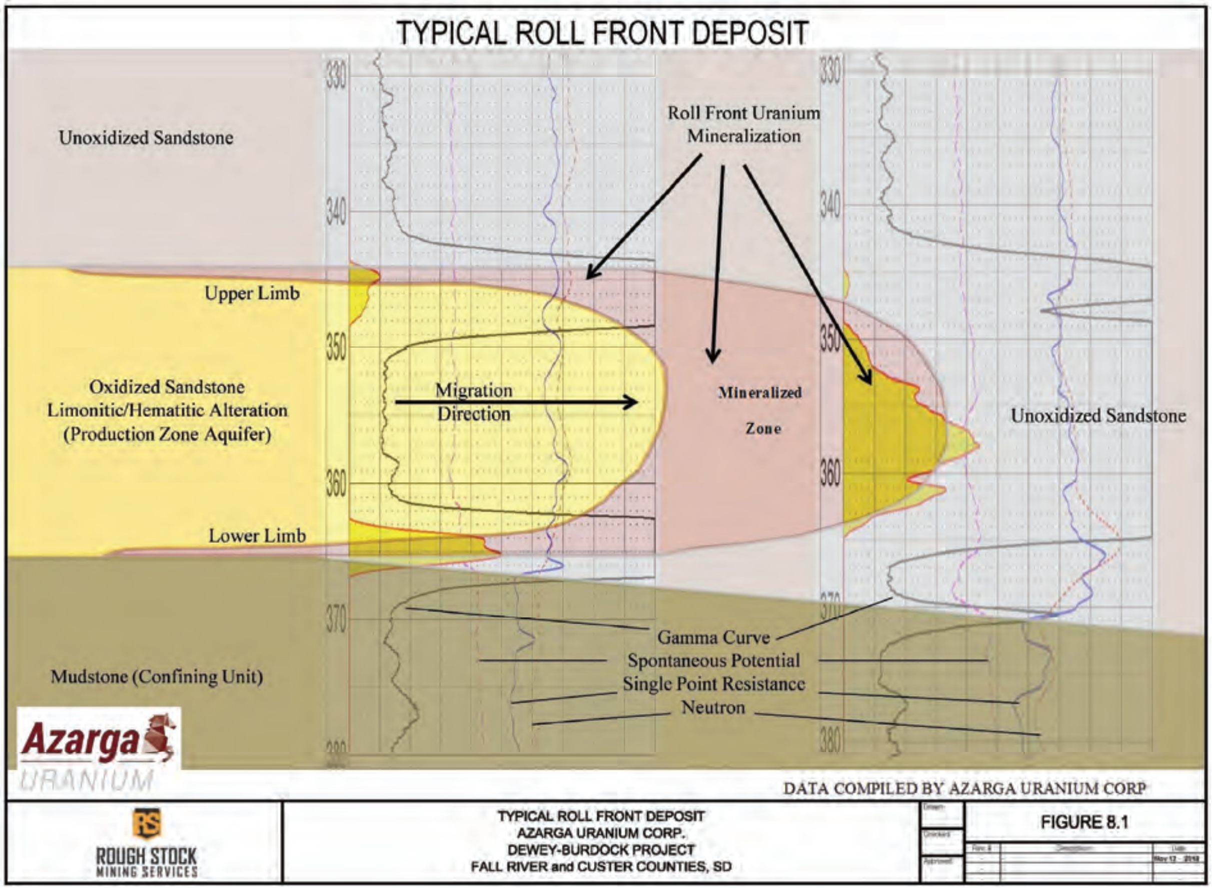
The tectono-stratigraphic setting for roll-front uranium ores is in arkosic and fluvial sandstone formations deposited in small basins. Host rocks are continental fluvial and near-shore sandstone. The principal ages of the host rocks are Early Cretaceous (144–97 Ma), Eocene (52–36 Ma), and Oligocene (36–24 Ma), with epochs of mineralization at 70 Ma, 35–26 Ma, and 3 Ma.

Ore mineralogy consists of uraninite, pitchblende and coffinite with associated vanadium in some deposits. Typical alteration in the roll-front sandstone deposit includes oxidation of iron minerals up-dip from the front and reduction of iron minerals down-dip along advancing redox interface boundaries (Figure 8.1).

Probable sources of uranium in the sandstone deposits are Oligocene volcanic ash and/or Precambrian granite (2,900–2,600 Ma). Mineralizing solutions in the sandstone are oxygen-bearing groundwater. Uranium mineralization of the sandstone deposits began with inception of Laramide uplift (approximately 70 Ma) and peaked in Oligocene.

Size and shape of individual deposits can vary from small pod-like replacement bodies to elongate lobes of mineralization along the regional redox boundary.

Figure 8.1: Typical Roll Front Deposit



Historical drillhole data (electric and lithology logs), along with Azarga's confirmatory drilling results confirm that the mineralization at Dewey-Burdock is a roll front type uranium deposit. This is determined by the position of the uranium mineralization within sandstone units in the subsurface, the configuration of the mineralization and the spatial relationship between the mineralization and the oxidation/reduction boundary within the host sandstone units.

9.0 EXPLORATION

Historical exploration drilling for the project area was extensive and is discussed in Section 6 (History). In January 2007, Azarga received an exploration permit for its Dewey-Burdock project from the South Dakota DENR. The purpose of this drilling was to examine the geologic setting of the Inyan Kara Group sandstones in the subsurface, to confirm the uranium mineralogy within these sands, to collect core samples on which assay, metallurgical and leach testing could be performed. In addition, the drilling program was to install groundwater wells for groundwater quality samples, and for two 72-hour pump tests to estimate the permeability and flow rates for the host formations. Drilling associated with this permit began in May 2007, continued through April 2008 and will be discussed in the following section.

Azarga received their second exploration permit in November 2008. The purpose of this 30-hole permit was to investigate the uranium potential of known host sandstones, below planned production facilities, to ensure that no surface construction would take place over uranium resources. As of the date of this report, no drilling has taken place under this permit.

No additional mineral detection exploration surveys or investigations, other than drilling, were conducted on the Dewey-Burdock project.

Roughstock's opinion is that the historical drilling, for which Azarga has most, but not all the drillhole geophysical logs, was typically drilled and logged in a manner that would produce acceptable data for resource estimation purposes today. In addition, Azarga's confirmatory drilling has verified historically determined geology, mineralization, and shapes of the defined roll fronts. The exploration methods used historically and by Azarga are appropriate for the style of mineralization, and provide industry standard results that are applicable to current methods of resource estimation.

10.0 DRILLING

From May 2007 to April 2008, Azarga completed 91 drillholes on the Dewey- Burdock Project for a total footage of 55,302 ft. The depths of these holes ranged from 185 to 761 ft below surface. While geologic information was collected from all drillholes, they were used for multiple purposes. Selective coring took place in ten holes and 12 holes were completed as water wells. With the exception of the holes converted to wells, all other drillholes were plugged and abandoned in accordance with State of South Dakota regulations. This involved filling the drillhole, from the bottom upward, with a sodium bentonite plugging gel. The viscosity of this plugging gel was measured to be, at a minimum, 20 seconds higher than the viscosity of the bottom-hole drilling fluid. After a 24-hour settling period, this method of hole sealing emplaces a solid plug in the abandoned hole that has a high degree of elasticity. This type of plug conforms to any irregularity within the drillhole and is considered to provide a more effective seal than a rigid cement plug. Once the plugging gel has been allowed to settle (24-hour period), filling the remainder of the hole with bentonite chips to the surface completes the sealing procedure. If artesian water flow was encountered in the drillhole, it was filled from the bottom upward with portland cement. A representative of the South Dakota DENR was on site to observe all hole plugging activities.

10.1 Mud Rotary Drilling

Exploratory drilling was performed using a truck-mounted, rotary drill rig using mud recovery fluids. This style of drilling is consistent with historical drilling programs from the 1970s and 1980s. A 6.5 in hole was drilled and rotary cutting samples were collected at 5 ft intervals. The on-site geologist prepared a description of these cuttings and compiled a lithology log for each drillhole. This rotary drilling was used to confirm several critical issues regarding uranium resources at the Dewey- Burdock project.

Wide-spaced exploration holes were drilled across the project area to examine the geologic setting and the nature of the host sands within the Fall River and Lakota Formations. This drilling showed that the depositional environments and lithologies of the Fall River and Lakota sands were found to be consistent with descriptions presented by previous operators on the project site. It also confirmed the presence of multiple, stacked mineralized sand units in the area. Electric logs and lithology logs from each drillhole were used in these evaluations.

Most importantly, the observation that geochemical oxidation cells within the host sands in the subsurface were directly related to uranium mineralization, establishes well-known geologic controls to uranium resources on this project. Encountering mineralized trends associated with “oxidized” and “reduced” sands within multiple sand units, provides reliable guides to the identification of resource potential in relatively unexplored areas, as well as to demonstrating continuity within known Resource Areas.

Fences of drillholes were completed in areas away from known resources but within areas of identified oxidation-reduction boundaries in the subsurface. Due to the narrow average width of the higher-grade uranium mineralization along these trends, between four and six close-spaced drillholes are required in each fence. A total 56 holes were drilled in 15 fences. In the completion of this drilling program, seven fences encountered mineralization in excess of 0.05 % eU_3O_8. The remaining eight fences will require additional drilling to delineate the higher-grade mineralization.

This drilling demonstrated that the originally hypothesized roll-front deposit model is appropriately applied to this project. While high-grade uranium mineralization was not encountered in all fences due to the sparse nature of reconnaissance drilling, the concentration and configuration of mineralization was sufficiently encouraging to warrant additional close-spaced drilling in the fences that did not encounter high-grade mineralization.

10.2 Core Drilling

Ten core holes were included in the 91 drillholes completed. Rotary drilling was used to reach core point, at which time, a 10 ft-long, 4 inch diameter core barrel (with core bit) was lowered into the drillhole. A total of 407 ft of 3 inch core was recovered from the mineralized sands in four separate Resource Areas. The coring was planned to intercept various parts of these uranium roll front deposits and to obtain samples of mineralized sandstone for chemical analyses and for metallurgical testing. Six holes were cored in the Fall River Formation and four holes were cored in the Lakota Formation. Table 10.1 and Table 10.2 present a listing of the uranium values in these core holes, as determined by down-hole radiometric logging for the Fall River and Lakota Formations, respectively.

Table 10.1: Results for Fall River Formation Core Holes

Core Hole Number	Depth (feet)	Total Mineralized Intercept	GT	Highest ½-Foot Interval
DB 07-29-1C	579.5	12.5’ of 0.150% eU_3O_8	1.88	0.944% eU_3O_8
DB 07-32-1C	589.5	5.0’ of 0.208% eU_3O_8	1.04	0.774% eU_3O_8
DB 07-32-2C	582.5	16.0’ of 0.159% eU_3O_8	2.54	0.902% eU_3O_8
DB 07-32-3C	No mineralized sand recovered			
DB 07-32-4C	559.0	13.0’ of 0.367% eU_3O_8	4.77	1.331% eU_3O_8
DB 07-32-9C	585.5	10.5’ of 0.045% eU_3O_8	0.47	0.076% eU_3O_8

Table 10.2: Results of Lakota Formation Core Holes

Core Hole Number	Depth (feet)	Total Mineralized Intercept	GT	Highest ½-Foot Interval
DB 07-11-4C	432.5	6.0’ of 0.037% eU_3O_8	0.22	0.056% eU_3O_8
DB 07-11-11C	429.5	7.0’ of 0.056% eU_3O_8	0.40	0.061% eU_3O_8
DB 07-11-14C	415.0	9.0’ of 0.052% eU_3O_8	0.47	0.126% eU_3O_8
DB 07-11-16C	409.0	3.5’ of 0.031% eU_3O_8	0.17	0.041% eU_3O_8

Overall core recovery, despite poor hole conditions in DB 07-32-3C, was greater than 90% on this coring program.

Laboratory analyses were performed on selected core samples to determine the physical parameters for permeability and porosity of the mineralized sands, as well as overlying and underlying clays. These analyses on seven core samples of mineralized sandstones showed favorable high, horizontal permeabilities - ranging from 449 to 3207 millidarcies. These horizontal permeabilities within the mineralized zones allow for favorable solution flow rates for ISR production. Analyses on confining units, above and below the sands, showed very low, vertical permeabilities - ranging from 0.007 to 0.697 millidarcies. Low vertical permeabilities in the confining units help to isolate solutions within the mineralized sand during ISR mining and restoration operations.

10.3 Groundwater Wells

During the 2007 and 2008 drilling campaign, Azarga converted 12 of the 91 rotary holes to groundwater wells in both Fall River and Lakota. These wells were used along with previously existing wells for the collection of groundwater quality samples and in pump tests to determine the hydrologic characteristics of the mineralized sands. Results of the pump tests demonstrated a sustained pumping rate of 25 to 30 gpm and showed that groundwater flow characteristics within the mineralized sands were sufficient to support ISR mining operations. All data relating to groundwater quality and hydrology are available for public review in the permit applications submitted to the NRC, EPA and the State of South Dakota.

10.4 Results

Roughstock concludes the drilling practices were conducted in accordance with industry-standard procedures. The drilling conducted by Azarga confirms historical drilling in terms of thickness and grade of uranium mineralization and provides confirmatory geological controls to that mineralization – conformation of the redox roll-front model.

Core drilling provided the verification of the mineralization as being largely in equilibrium for those deposits that are below the current water table. Water wells provide the means for groundwater characterization, and preliminary information to support potential ISR production.

11.0 SAMPLE PREPARATION, ANALYSIS AND SECURITY

11.1 Sample Methods

11.1.1 Electrical Logs

A geophysical logging truck, manufactured by Geo-Instruments Logging was used for the borehole logging. This unit produces continuous, down-hole electric logs, consisting of resistivity, self-potential and gamma ray curves. This suite of logs is ideal for defining lithologic units in the subsurface. The resistivity and self-potential curves provide qualitative measurements of water conductivities and indicate permeability, which are used to identify sandstones, clays and other lithologic units in the subsurface. These geophysical techniques enable geologists to interpret and correlate geologic units and perform detailed subsurface geologic mapping.

The gamma ray curves are extremely important as they provide an indirect measurement of uranium in the subsurface. Uranium in nature primarily consists of the isotope Uranium-238, which is not a major gamma emitter. However, many of the daughter products of uranium are gamma emitters and when the uranium is in equilibrium with its daughter products, gamma logging is a reliable technique for calculating in-place uranium resources.

These electric logs were run on all 91 drillholes completed across the Dewey-Burdock project site. They are similar in nature to TVA's historic drillhole logs for the project.

11.1.2 Drill Cuttings

Mud rotary drilling relies upon drilling fluids to prevent the drill bit from overheating and to evacuate drill cuttings from the hole. Drill cuttings (samples) are collected at five-foot intervals by the drill rig hands at the time of drilling. The samples are displayed on the ground in order to illustrate the lithology of the material being drilled and so that depth can be estimated. After the hole is completed, a geologist will record the cuttings piles into a geologist's lithology log of the hole. This log will describe the entire hole, but detailed attention will be directed toward prospective sands and any alteration (oxidation or reduction) associated with these sands. Chemical assaying of drillhole cuttings is not practical since dilution is so great by the mud column in the drillhole and sample selection is not completely accurate to depth.

11.1.3 Core Samples

Core samples allow accurate chemical analyses and metallurgical testing, as well as testing of physical parameters of mineralized sands and confining units. The mud rotary drill rig had the capability to selectively core portions of any drillhole, using a 10 ft barrel.

A portable core table was set up at the drilling site. Core was taken directly from the inner core barrel and laid out on the table. The core was measured to estimate the percentage of core recovery, then washed, photographed and logged by the site geologist. The core was then wrapped in plastic, in order to maintain moisture content and prevent oxidation, and cut to fit into core boxes for later sample preparation. Overall core recovery was approximately 90%.

11.2 Review

Gamma logs historically were the standard “sampling” tool by which to determine in-situ uranium grades. Current uranium exploration methods use a combination of gamma logging and core samples, as Azarga has, to determine in situ uranium grades, and the nature and extent of uranium equilibrium/disequilibrium. The methods employed by Azarga are appropriate for the mineralization at Dewey-Burdock and are standard industry methods for uranium exploration and resource development.

11.3 Laboratory Analysis

Analyses of core samples are included in this report. The down-hole electric log was used in conjunction with the geologist’s log of the core to select intervals for testing. Azarga selected 6 inch intervals of whole core (3 inch diameter) for physical parameter testing (permeability, porosity, density). Mineralized sands selected for chemical analyses were cut into ½ ft intervals and then split in half. One of the splits was used for chemical analyses and the other split was set aside for metallurgical testing. Azarga geologic staff performed the sample identification and selection process. Chain-of-custody (COC), sample tags were filled out for each sample and samples were packed into ice chests for transportation to the analytical laboratory.

Azarga sent samples to Energy Laboratories, Inc.’s (ELI’s) Casper, WY facility for analyses. Upon receipt at the laboratory, the COC forms were completed and maintained, with the lab staff taking responsibility for the samples. The first step in the sample preparation process involved drying and crushing the selected samples. The pulp is then subject to an EPA 3050 strong acid extraction technique. Digestion fluids were then run through an Inductively Coupled Argon Plasma Emission Spectrometer (ICPMS) according to strict EPA analytical procedures. Multi-element chemical analyses included values for uranium (chemical), vanadium, selenium, molybdenum, iron, calcium and organic carbon. Whole rock geochemistry provides valuable information for the design of ISR well field operations.

11.3.1 Sample Preparation and Assaying Methods

ELI is certified through the National Environmental Laboratory Accreditation Program (NELAP). NELAP establishes and promotes mutually acceptable performance standards for the operation of environmental laboratories. The standards address analytical testing, with State and Federal agencies serve as accrediting authorities with coordination facilitated by the EPA to assure uniformity. Maintaining high quality control measures is a prerequisite for obtaining NELAP certification. As an example, nearly 30% of the individual samples run through ICPMS are control or blank samples to assure accurate analyses. In Roughstock’s opinion, ELI has demonstrated professional and consistent procedures in the areas of sample preparation and sample security, resulting in reliable analytical results.

11.3.2 Gamma Logging

The basic analysis that supports the uranium grade reported in most uranium deposits is the down-hole gamma log created by the down-hole radiometric probe. The down-hole gamma log data are gathered as digital data on approximately 1.0 inch intervals as the radiometric probe is inserted or extracted from a drillhole.

The down-hole radiometric probe measures total gamma radiation from all natural sources, including potassium (K) and thorium (Th) in addition to uranium (U) from uranium-bearing minerals. In most uranium deposits, K and Th provide a minimal component to the total radioactivity, measured by the instrument as counts per second (CPS). At the Dewey-Burdock Project, the uranium content is high enough that the component of natural radiation that is contributed by K from feldspars in sandstone and minor Th minerals is expected to be negligible. The conversion of CPS to equivalent uranium concentrations is therefore considered a reasonable representation of the in-situ uranium grade. Thus, determined equivalent uranium analyses are typically expressed as ppm eU_3O_8 (“e” for equivalent) and should not be confused with U_3O_8 determination by standard XRF or ICP analytical procedures (commonly referred to as chemical uranium determinations). Radiometric probing (gamma logs) and the conversion to eU_3O_8 data have been industry-standard practices used for in- situ uranium determinations since the 1960’s. The conversion process can involve one or more data corrections; therefore, the process is described here.

The typical gamma probe is about 2 inches in diameter and about 3 ft in length. The probe has a standard sodium iodide (NaI) crystal that is common to both hand-held and down-hole gamma scintillation counters. The logging system consists of the winch mechanism, which controls the movement of the probe in and out of the hole, and the digital data collection device, which interfaces with a portable computer and collects the radiometric data as CPS at defined intervals in the hole.

Raw data is typically plotted by WellCAD software to provide a graphic down-hole plot of CPS. The CPS radiometric data may need corrections prior to conversion to eU_3O_8 data. Those corrections account for water in the hole (water factor) which depresses the gamma response, the instrumentation lag time in counting (dead time factor), and corrections for reduced signatures when the readings are taken inside casing (casing factor). The water factor and casing factor account for the reduction in CPS that the probe reads while in water or inside casing, as the probes are typically calibrated for use in air-filled drillholes without casing. Water factor and casing factor corrections are made where necessary, but Azarga drillholes were logged primarily in open, mud-filled drillholes.

Conversion of CPS to %-eU_3O_8 is done by calibration of the probe against a source of known uranium (and thorium) concentration. This was done for the Azarga gamma probe initially at the U.S. Department of Energy (DOE) uranium test pits in George West, Texas. Throughout Azarga’s field projects the probe was then regularly calibrated at the DOE uranium test pits in Casper, Wyoming. The calibration calculation results in a “K-factor” specific to the probe; the K-factor is 6.12331-6 for Azarga’s gamma probe. The following can be stated for thick (+60 cm) radiometric sources detected by the gamma probe:

$$10{,}000 \text{ CPS x K} = 0.612\% \ U_3O_8$$

The total CPS at the Dewey-Burdock Uranium Project is dominantly from uraninite/pitchblende uranium mineralization therefore, the conversion K factor is used to estimate uranium grade, as potassium and thorium are not relevant in this geological environment. The calibration constants are only applicable to source thickness in excess of 2.0 ft. When the calibration constant is applied to source thickness of less than 2.0 ft, thickness of mineralization will be over-stated and radiometric determined grades will be understated.

The industry standard approach to estimating grade for a graphical plot is referred to as the half-amplitude method and was used for this estimate. The half-amplitude method follows the formula:

GT = K x A

Where: GT is the grade-thickness product,

K is the probe calibration constant, and

A is the area under the curve (ft-CPS units).

The area under the curve is estimated by the summation of the 6 inch (grade-thickness) intervals between E1 and E2 plus the tail factor adjustment to the CPS reading of E1 and E2, according to the following formula:

$A = [\sum N + (1.38 \times (E1 + E2))]$

Where: A is the area under the curve,

N is the CPS per unit of thickness (6in), and

E1 and E2 are the half-amplitude picks on the curve.

This process is used in reverse for known grade to determine the K factor constant.

The procedure used at the Dewey-Burdock Project is to convert CPS per anomalous interval by means of the half-amplitude method; this results in an intercept thickness and eU_3O_8 grade. This process can be done in a spreadsheet with digital data, or by making picks off the analog plot of the graphical curve plot of down-hole CPS.

11.4 Results and QC Procedures

Geophysical logging during confirmatory drilling programs at Dewey-Burdock utilized multiple geophysical logging trucks. A Century Geophysical provided initial logging services, and later logging was completed by the Geoinstruments logging unit. No discrepancies were seen in results between either service provider. Historical logs, and those completed by Azarga during confirmatory drilling, were interpreted on 0.5 ft intervals following standard industry practice.

No drillholes completed by Azarga were truly co-located with historical drillholes; however, several drilled within 10 ft of historical drillholes displayed similar results for eU_3O_8 values.

11.5 Opinion on Adequacy

Roughstock concludes that Azarga's sample preparation, methods of analysis, and sample and data security are acceptable industry standard procedures, and are applicable to the uranium deposits at the Dewey-Burdock Uranium project.

12.0 DATA VERIFICATION

The records of the Dewey-Burdock Project are substantial. In 1991, RBS&A conducted an evaluation of the resource deposits using copies of electric logs and various drillhole location and assay maps. In 1993, additional data became available that included reports by previous owners, additional assay data and even aerial photographs of the project. Diligent searches of university libraries and government records were made. Contacts were made to interview people who had been active on the project at different times. All of this data was evaluated during 1993 and 1994 and summarized in several reports presented to EFN, the owner and operator of the project at that time (ref., Smith, 1993 and 1994).

RBS&A had a long career in evaluating numerous uranium ore reserves throughout the United States and in Mexico. With this experience comes the knowledge to recognize reliable data. RBS&A stated that "knowing the parties involved in the project area and knowing several of the workers personally gives confidence to the veracity of the data obtained and reviewed to develop the estimate of uranium resources. The limitation of all these data is that their origin is so diverse. Different companies produced electric logs across a long period of time. Data is so abundant that it is difficult to accumulate all the data into one sensible document. Up to a point in time, these data were being used to establish an underground uranium mine. The present interest is to develop an ISR mine that requires slightly different parameters than does conventional mining." Azarga's Chief Geologist, Len Eakin has also reviewed this extensive database and believes the information to be relevant and accurate.

12.1 Procedures

As previously described, TVA performed an equilibrium study on core samples from mineralized sandstones to demonstrate gamma response for uranium equivalent measurements versus actual chemical assays of the core. Figure 12.1 is the equilibrium plot from the original technical report showing the relationship between chemical and gamma responses from TVA's historic coring program. The results show that the mineralized trends are in equilibrium and that gamma logging will give an accurate measurement of the in place uranium content.

Azarga's 10-hole coring program completed in 2007 and 2008 provided samples for a similar verification analysis of the uranium mineralization at Dewey-Burdock. Half-foot samples of mineralized sandstones were sent to Energy Labs, Inc. in Casper, WY for analyses. Each sample was assayed for UGamma and UChemical. As shown in the equilibrium plot in Figure 12.1, a trend line on the plot of these values for each core interval shows an excellent correlation between radiometric and chemical values. The trend lines (or the chemical uranium: gamma uranium ratios) for these two plots are very similar. This indicates that the confirmation drilling encountered the same chemical uranium mineralization in the subsurface and this chemical uranium is in equilibrium with its gamma response. For resource estimation purposes, conventional gamma ray logging will provide a valid representation of in-place uranium resources.

Figure 12.2 shows the location of Azarga's confirmation drilling within the Dewey portion of the project area. The drillholes on this map targeted the F11 mineralized trend and are a good example of how confirmation drilling (shown in blue text) verified the results of historic drilling and in many cases, expanded known high-grade mineralization. This

Figure 12.1: Equilibrium Plot

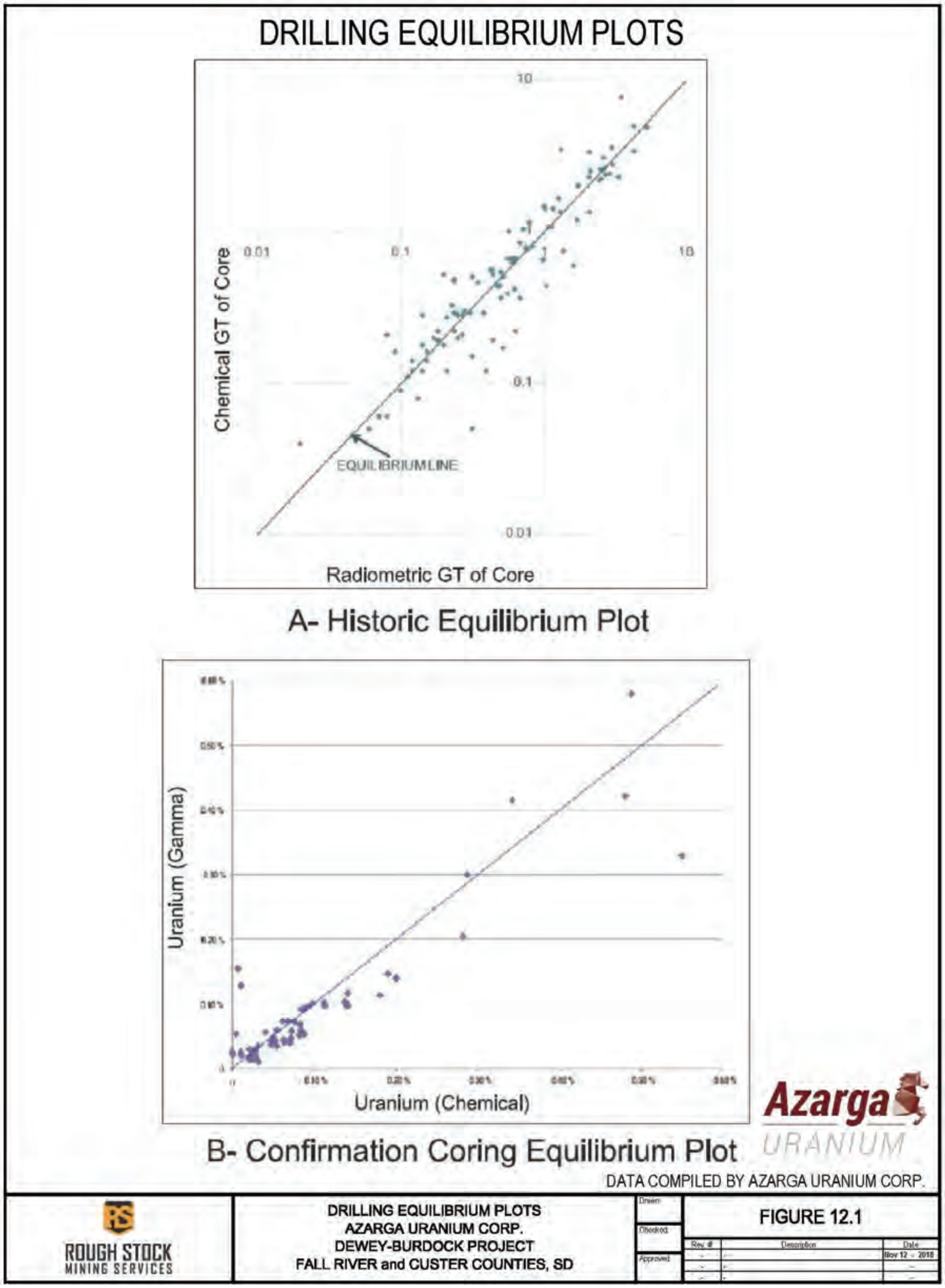
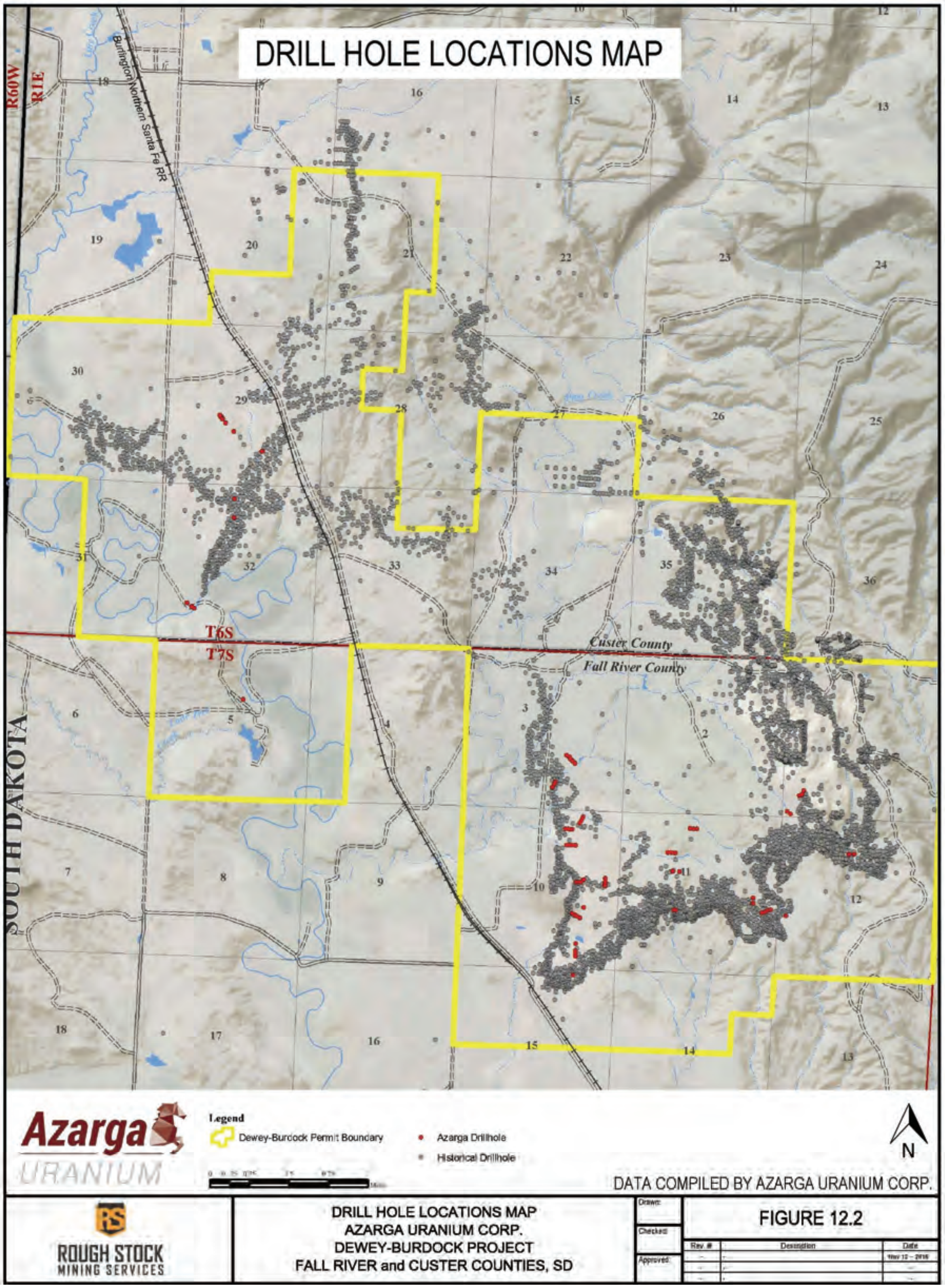


Figure 12.2: Drill Location Map



confirmation drilling successfully demonstrated geological and grade continuity within identified Resource Areas throughout the Dewey-Burdock project.

12.2 Data Confirmation

An overall assessment of the data used for the classification of resources into various categories is required by the CIM Definition Standards. This assessment showed that historical data gathering and interpretation of the data was conducted by a well-respected major uranium exploration company with high-quality uranium exploration staff. It also showed that at key points, professional geologic consultants reviewed and verified the results of the historic explorations programs. Numerous academic reports have also been published on geologic settings and uranium mineralization of the Project. Current interpretive work has been completed under the direction of Azarga's senior geologic staff. Azarga's Chief Geologist, Len Eakin has 12 years of uranium experience, including well field development assignments at Nebraska and Wyoming ISR facilities. All these factors provide a high level of confidence in the geological information available on the mineral deposit and that historic drillhole data on the Dewey-Burdock Project is accurate and useable for continued evaluation of the project.

Mr. Steve Cutler, the Qualified Person responsible for auditing Azarga's resources, visited the Dewey-Burdock site and office, and reviewed the data used in this resource evaluation. He examined geologic data, and performed quality assurance checks of gamma logging data contained in resource databases/maps. These audit techniques are described in section 14.5 below.

12.3 Quality Control Measures and Procedures

With respect to all data used in the verification analysis, Mr. Steve Cutler (QP for Mineral Resources) inspected the drill sites during a site visit, reviewed analytical data, and received copies of the analytical results and directed the interpretation of the data.

12.4 Limitations

Roughstock concludes the work done by Azarga to verify the historical records has validated the project information. Data are available for over 7,500 locations that include the thickness, grade, and depth of mineralization from previous companies exploring the deposit. Azarga does not have the actual geophysical logs for approximately 24% of the exploratory drill holes.

Mr. Cutler visited the site and noted the historic location of Azarga drillhole sites and water wells and monitor wells above-ground casings. There are limitations in defining the historical drilling in that most, if not all, historical drillholes are no longer identifiable as to collar location. This is due in part because the holes were collared in soil/alluvium/shale, which would not visibly retain evidence of the drillhole collars unless the holes were abandoned with steel casing protruding from the ground surface.

12.5 Data Adequacy

Roughstock notes that the drilling by Azarga has verified the location and grade of uranium mineralization. There are no known discrepancies in locations, depths, thicknesses, or grades that would render the project data questionable in any way. It is Roughstock's opinion that Azarga and Qualified Person Mr. Steve Cutler (responsible for the resource estimate in Section 14) have adequately verified the historical data for the Dewey-Burdock project. Roughstock has reviewed the data confirmation procedures and concludes that the drillhole database has been sufficiently verified and is adequate for use in resource estimation.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

The following evaluation was presented in the 2015 PEA for the Project (ref., TREC, 2015). The authors have reviewed the evaluation for use in this Resource Estimate and are in agreement with it. The evaluation is in regards to combined bottle roll tests conducted by Energy Labs Inc. (ELI).

13.1 Procedures

Azarga conducted leach amenability studies on uranium core samples obtained in the previously described coring program. Azarga conducted the tests at ELI's Casper facility between July 27 and August 3, 2007. Leach amenability studies are intended to demonstrate that the uranium mineralization is capable of being leached using conventional ISR chemistry. The leach solution is prepared using sodium bicarbonate as the source of the carbonate complexing agent (formation of uranyldicarbonate (UDC) or uranyltricarbonate ion (UTC). Hydrogen peroxide is added as the uranium-oxidizing agent as the tests are conducted at ambient pressure. Sequential leach "bottle roll" tests were conducted on the four core intervals selected by Azarga personnel. The tests are not designed to approximate in-situ conditions (permeability, porosity, pressure) but are an indication of an ore's reaction rate and the potential uranium recovery.

13.2 Evaluation

The following evaluation was presented in the 2015 PEA for the Project (ref., TREC, 2015), which referenced the previous work performed as a part of Azarga's 2012 Preliminary Economic Assessment (ref., SRK, 2012). The authors have reviewed the evaluation for use in this Resource Estimate and are in agreement with it. The evaluation is in regards to combined bottle roll tests conducted by Energy Labs Inc. (ELI).

13.2.1 Ambient Bottle Roll Tests

ELI reported that acid producing reactions were occurring during the initial leaching cycles and this is consistent with the core samples having been exposed to air during unsealed storage. This may have influenced uranium leaching kinetics and final uranium extraction, but two other aspects of the work deserve emphasis: (1) the coarsest grain size in two of the four leach residues had very high uranium assays; and (2) all four composites contained leachable vanadium.

The 615.5-616.5 ft interval of Hole # DB07-32-2C produced a 30-PV (pore volume) leach residue assaying 2.95% U_3O_8 in the +20-mesh fraction, and the same coarse fraction from the 616.5-617.3 ft interval of that hole assayed 5.02% U_3O_8. The weight fractions were small, 0.7% and 1.8%, but the respective uranium distributions were 28% and 30% of total uranium retained in the residues. Possibly, these losses in the coarsest grain fraction were due simply to calcite encapsulation or another post-mineralization event. In any case, a QEMSCAN characterization of the uranium could shed light on the likelihood of increased uranium dissolution by reagent diffusion during longer retention times in a commercial well field. If this interpretation is supported by new evidence, there is a potential for ultimate uranium extractions (not overall recoveries) well over 90% from higher-grade intervals. Table 13.1 includes calculated uranium extractions based on the ELI leach tests without accounting for possible improvements at longer retention times.

Table 13.1: Uranium and Vanadium Dissolutions Based on Solids Assays

Sample	Core Assays (mg/kg)		Residue Assays (mg/kg)		Dissolutions (%)	
	Uranium	Vanadium	Uranium	Vanadium	Uranium	Vanadium
DB 07-11-4C #1	670	59	70	35	90.3	45.0
DB 07-32-2C #2	2,020	678	625	175	71.0	74.7
DB 07-32-2C #3	7,370	378	2,336	358	71.0	5.9
DB 07-32-2C #4	1,370	79	103	31	92.8	61.4

(ref., SRK, 2012)

The leach tests were conducted on four core intervals recovered from two holes. One interval represented low-grade resource at 0.067% U_3O_8 and the other three intervals represented resource ranging from 0.14% U_3O_8 to 0.74% U_3O_8. Based on the known volume of core in the selected intervals and the apparent wet density, wet masses of sample representing a 100mL pore volume (PV), assuming 30% porosity, were delivered to the reaction vessels. 5PV lixiviant charges (500mL of 2g/L $NaHCO_3$, 0.5 g/L H_2O_2) were mixed with the resource samples and vessel rotation was started. Over a six-day period, 30 PV of lixiviant was delivered to and extracted from the vessels.

13.3 Results

As shown in Table 13.1, the four composites contained variable concentrations of vanadium, but most of it, at least by one method of calculation, was dissolved by the oxygenated bicarbonate lixiviant. The uranium and vanadium dissolutions in Table 13.1 were calculated from worksheets describing individual ELI leaching cycles and are based on assays of heads and residues. There are analytical uncertainties, however, so Tables 13.2 and 13.3 summarize results obtained by different approaches. The uranium dissolutions in Table 13.2 are based on dividing the uranium mass in the leachates by the sum of the masses of uranium in leachates and residues. The vanadium dissolutions in Table 13.3 are based on dividing the sum of the vanadium masses in the leachates by the vanadium mass in the sample prior to leaching. Thus, the vanadium dissolutions given in Table 13.3 are lower than those in Table 13.1, while the uranium dissolutions in Tables 13.1 and 13.2 are comparable (ref., SRK, 2012). Available data do not allow a rigorous determination of the amount of vanadium that will dissolve during commercial leaching, but it is clear that vanadium will be present in the pregnant leach solutions.

Analyses of the resulting leach solution indicated leach efficiencies of 71% to 92.8% as shown in Table 13.1. Peak recovery solution grades ranged from 414mg/L to 1,654mg/L. Tails analysis indicated efficiencies of 75.8% to 97% see Table 13.2. The differences between the two calculations are likely to involve the difficulty in obtaining truly representative 1g subsamples of the feed and tails solids. The solution assays are believed to be more accurate and representative than the feed/tails results and they typically showed a less conservative estimate of uranium leachability.

Table 13.2: Uranium Dissolutions Based on Leachate and Residue Assays

Sample	Uranium in Leachates (mg)	Uranium in Residues (mg)	Total Uranium (mg)	Uranium Dissolution (%)
DB 07-11-4C #1	324	10.0	334	97.0
DB 07-32-2C #2	722	229.5	952	75.8
DB 07-32-2C #3	3,235	386.5	3,621	89.3
DB 07-32-2C #4	775	73.7	849	91.3

(ref., SRK, 2012)

Table 13.3: Vanadium Dissolutions Based on Head and Leachate Assays

Sample	Head: Pre-Test		Leachate		
	Dry Head Mass (g)	Vanadium (mg/kg)	Vanadium (mg)	Vanadium Extracted (mg)	Vanadium Dissolution (%)
DB 07-11-4C #1	631	59	37	6.5	17.4
DB 07-32-2C #2	610	648	395	194.9	49.3
DB 07-32-2C #3	597	348	208	24.1	11.6
DB 07-32-2C #4	629	79	50	17.5	35.0

(ref., SRK, 2012)

These preliminary leach tests indicate that the uranium deposits at Dewey-Burdock appear to be readily mobilized in oxidizing solutions and potentially well suited for ISR mining. The results presented in this section provide an indication of the leachability of uranium from the host formation.

The ELI report states “Vanadium mobilization occurred in all intervals; however, uranium appeared to leach first and preferentially.” This conclusion is generally supported by the test results. There are potentially important consequences of high vanadium dissolution. Vanadium in the VO-3 and VO4-2 valence states will exchange onto and elute from a strong-base anionic resin along with uranium. However, the resin’s affinity for uranium is stronger, so vanadium can be “crowded off” the resin with higher uranium loadings. Based upon present data, vanadium ratios are variable and may require additional attention within the processing facility. There are several options for removal of vanadium, including elution and separation by IX or solvent extraction. Should further testing or initial operations prove that vanadium is inhibiting uranium recovery, the addition of a vanadium removal system to the processing plant may be necessary.

Further testing to determine the U/V ratios in leach solutions and the favored approach to handling U and V separation is recommended.

14.0 MINERAL RESOURCE ESTIMATE

The mineral resources for the Project reported here have been estimated utilizing the grade-thickness (GT) contour method. The GT contour method is well accepted within the uranium ISR industry and is suited to guide detailed mine planning and estimates of recoverable resources for roll front type deposits such as the Dewey-Burdock Property. A discussion of the methodology is presented below in Section 14.4.

Resource estimation for the Dewey-Burdock Project includes mineralization above the static water table, but as such mineralization is not amenable to in-situ recovery it is categorized separately as non-ISR.

14.1 Assumptions

Resources within the Dewey-Burdock Project are identified recognizing that roll front mineralization occurs in long, narrow, sinuous bodies which are found adjacent and parallel to alteration (redox) fronts. These commonly occur in multiple, vertically stacked horizons, each of which represents a unique resource entity. Resource classification requires horizontal continuity within individual horizons. Accumulation of resources in a vertical sense (i.e., accumulating multiple intercepts per drill hole) is not valid in ISR applications. Individual roll front mineral horizons are assumed to be 50 ft. wide (based on project experience) unless sufficient information is available to establish otherwise.

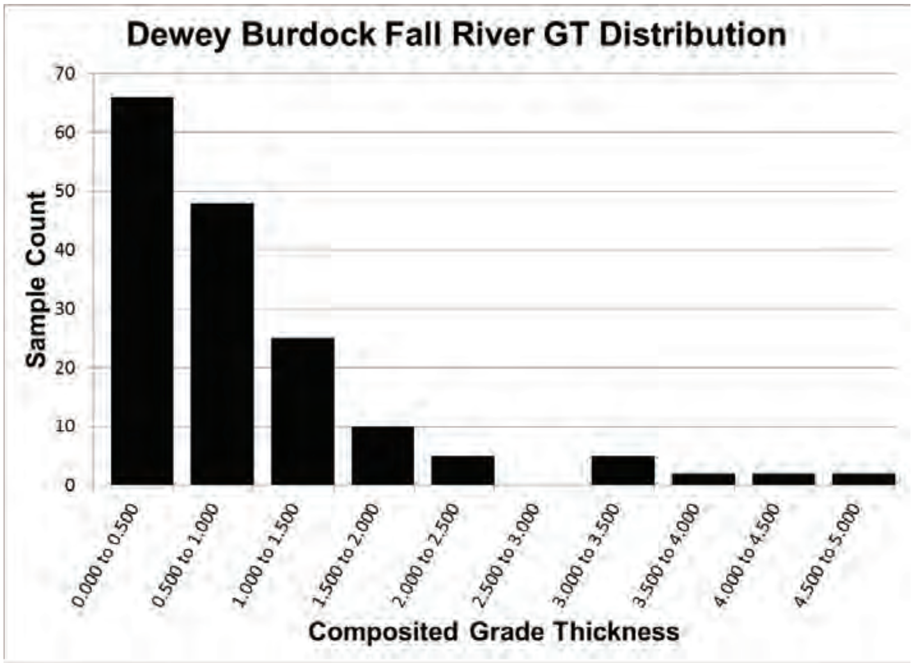
In addition, certain assumptions were incorporated throughout all calculations:

1. No disequilibrium. Therefore, the radiometric equilibrium multiplier (DEF) is 1.0.
2. The unit density of mineralized rock is 16 cubic ft. per ton based on numerous core density measurement results.
3. All geophysical logs are assumed to be calibrated per normal accepted protocols, and grade calculations are accurate.
4. All mineral classified as a resource occurs below the static water table for ISR Resources.

14.1.1 Statistical Analysis

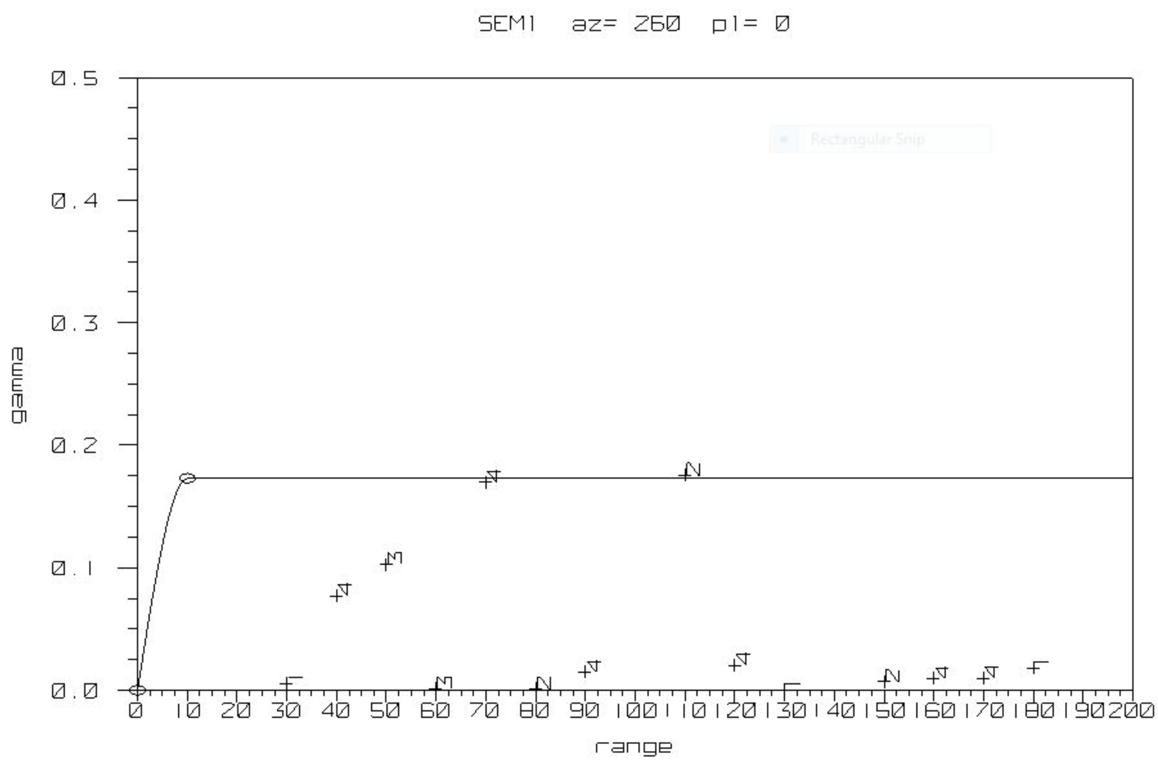
A small dataset of 166 holes from the Fall River area were evaluated individually for statistical information. This dataset consisted of only mineral grade zones used in the contouring of Fall River pods. A separate drillhole database was created in Vulcan and from this database a composite database was created. The composite database held a single record for each drillhole with the location and total grade thickness of all mineral grade intervals flagged for a single Fall River zone. The minimum grade thickness was 0.13, maximum was 5.04, and average was 0.94. Using this data, a 99% clip grade is 4.63. Figure 14.1 is a graph showing the distribution of composited grade thickness for the Fall River holes.

Figure 14.1: Dewey-Burdock Fall River GT Distribution



Geostatistics were run on this dataset to determine the optimum drillhole spacing. The semivariogram in Figure 14.2 below shows two groups of drillholes; both indicate that a drillhole spacing of about 75 feet is ideal.

Figure 14.2: Drilling Semivariogram



14.2 Cutoff Selection

In the 2015 PEA, the resource estimate used a 0.050% cutoff. However, in this Resource Estimate a 0.020% cutoff was used as this cutoff is typical of ISR industry practice and represents appropriate values relative to current ISR operations. Experience at other ISR operations has demonstrated that grades below 0.020% can technologically be successfully leached and recovered, given supporting economics. Due to the nature of roll front deposits and production well designs, the incremental cost of addressing low grades is minimal (given the presence of higher grades). Note, however, that the above cutoffs were selected without direct relation to any associated commodity price.

Resource estimation also used a 0.20 GT cut-off for all drilling.

In summary, minerals reportable as resources must meet the following cut-off criteria (see also Section 14.4):

Minimum Grade: 0.020% eU_3O_8
Grade measured below this cut-off is considered as zero value.

Minimum GT (Grade x Thickness): 0.20 GT
Intercepts with GT values below this cut-off are mapped exterior to the GT contours employed for resource estimation, given zero resource value and therefore are excluded from reported resources.

Minimum Thickness: No minimum thickness is applied, but is inherent within the definition of GT (Grade Thickness).

14.3 Resource Classification

Resource estimates were prepared using parameters relevant to the proposed mining of the deposit by ISR methods. The methodology relies on detailed mapping of mineral occurrences to establish continuity of intercepts within individual sandstone host units. This method is more regimented and results in a more detailed analysis than methods utilized during earlier stages of property evaluation (RBS&A, 2006 and prior).

Dewey-Burdock resources were classified as measured, indicated and inferred based on drill spacing. Audited polygons were correctly classified based on drill spacing.

The most recent and all relevant data was used in the calculation of this mineral resource estimate. The preparation of this resource report was supervised by a qualified person. The mineral resource estimates in this report were reviewed and accepted by the Qualified Person, Mr. Steve Cutler.

Azarga employs a conservative resource classification system which is consistent with standards established by the CIM. Mineral resources are identified as Measured, Indicated and Inferred based ultimately on the density of drill hole spacing, both historical and recent; and continuity of mineralization within the same mineral horizon (roll front).

In simplest terms, to conform to each classification, resources determined using the GT contour method (see Section 14.4) must now meet the following criteria:

1. Meet the 0.02% grade cut-off
2. Occur within a contiguous mineral horizon (roll front)

3. Fall within the mapped GT contour and
4. Extend no farther from the drill hole than the radius of influence specified below for each category.

Employing these considerations, mineralization which meets the above criteria is classified as a resource and assigned a level of confidence via the following drill spacing guidelines:

Measured: ≤ 100 ft (i.e., mineral on trend, within the 0.20 GT contour, and which does not extend beyond 100 ft. from any given "ore-quality" drill hole)

Indicated: 100 - 250 ft (i.e., mineral on trend, within the 0.20 GT contour, and which extends from 100 ft. to 250 ft. from any given "ore-quality" drill hole)

Inferred: 250 - 500 ft (i.e., mineral on trend, within the 0.20 GT contour, and which extends from 250 ft. to 500 ft. from any given "ore-quality" drill hole)

Mineralization occurring more than 500 feet beyond any given "ore-quality" drill hole is given no resource value.

Isolated occurrences of mineralization meeting the GT and grade cutoff criteria (i.e., single isolated "ore-quality" drill holes) are classified as Inferred and are defined as mineralization which occurs within the GT contour for the given mineral horizon and extending no more than 500 ft beyond the sample point (drill hole). See Section 14.4 Methodology for additional discussion.

14.4 Methodology

The Project resources are defined by utilizing both historical and recent drilling information. The basic unit of mineral identity is the "Mineral Intercept" and the basic unit of a mineral resource is the "Mineral Horizon", which is generally synonymous to a roll front. Mineral intercepts are assigned to named mineral horizons based on geological interpretation by Azarga geologists founded on knowledge of stratigraphy, redox, and roll front geometry and zonation characteristics. Resources are derived and reported per mineral horizon (i.e., per roll front).

Mineral intercepts are derived from drill hole gamma logs and represent where the drill hole has intersected a mineralized zone. Calculation of uranium content detected by gamma logs is traditionally reported in terms of mineral grade as eU_3O_8% (equivalent uranium) on one-half foot depth increments. A mineral intercept is defined as a continuous thickness interval in which mineral concentration meets or exceeds the grade cutoff value, which is 0.02% for the Dewey-Burdock Project. Mineral below the cutoff grade is treated as zero value with regard to resource estimation. A mineral intercept is defined in terms of:

- Thickness of the mineralized interval that meets cutoff criteria
- Average Grade of mineralization within that interval
- Depth to the top of that interval

In addition, a GT value is assigned to each mineral intercept, defined as the average grade of the intercept times the thickness of the intercept. GT is a convenient and functional single term used to represent the overall quality of the mineral intercept. It is employed as the basic criterion to characterize "ore-quality", which at the Dewey-Burdock Project was historically defined as GT ≥ 0.50 for M&I resources and GT ≥ 0.20 for Inferred Resources. Based on uranium recoveries from production operations currently using ISR methods, Azarga is following industry standard by redefining this as GT ≥ 0.20 for both M&I and Inferred resources in this Resource Estimate. Intercepts that do not make the "ore–quality" GT cutoff are excluded from the resource calculation, but may be taken into consideration when drawing GT contours. As noted above, use of the term "ore-quality" by Azarga is applied in a generic sense and has no direct relation to any associated commodity price.

Each intercept is assigned to a stratigraphic and mineral horizon by means of geological evaluation. The primary criterion employed in assignment of mineral intercepts to mineral horizons is roll front correlation. Depth and elevation of intercepts are secondary criteria which support correlation. The evaluation also involves interpretation of roll front zonation (position within the roll front) by means of gamma curve signature, redox state, lithology and relative mineral quality. Mineral intercept data and associated interpretations are stored in a drill hole database inventoried per drill hole and mineralized horizon. Using AutoCAD software, this database is employed to generate map plots displaying GT values and interpretive data for each mineral horizon of interest. These maps become the basis for GT contouring as described below.

For the map plots of GT values mentioned above, the GT contour lines are drafted honoring all GT values. Contours may be carefully modified by Azarga geologists where justified to reflect knowledge of roll front geology and geometry. The GT contour maps thus generated for each mineral horizon form the foundation for resource calculation. Figure 14.3 shows contours drawn to honor GT values both on drillholes above cutoff which have GT values labeled in pink as well as below cutoff which do not have GT value labels.

In terms of geometry, the final product of a GT contoured mineral horizon typically represents a mineral body that is fairly long, narrow, sinuous, and which closely parallels the redox front boundary. Parameters employed to characterize the mineral body are:

Thickness: Average thickness of intercepts assigned to the mineral horizon (inherent in GT values)

Grade: Average grade of mineral intercepts assigned to the mineral horizon (inherent in GT values)

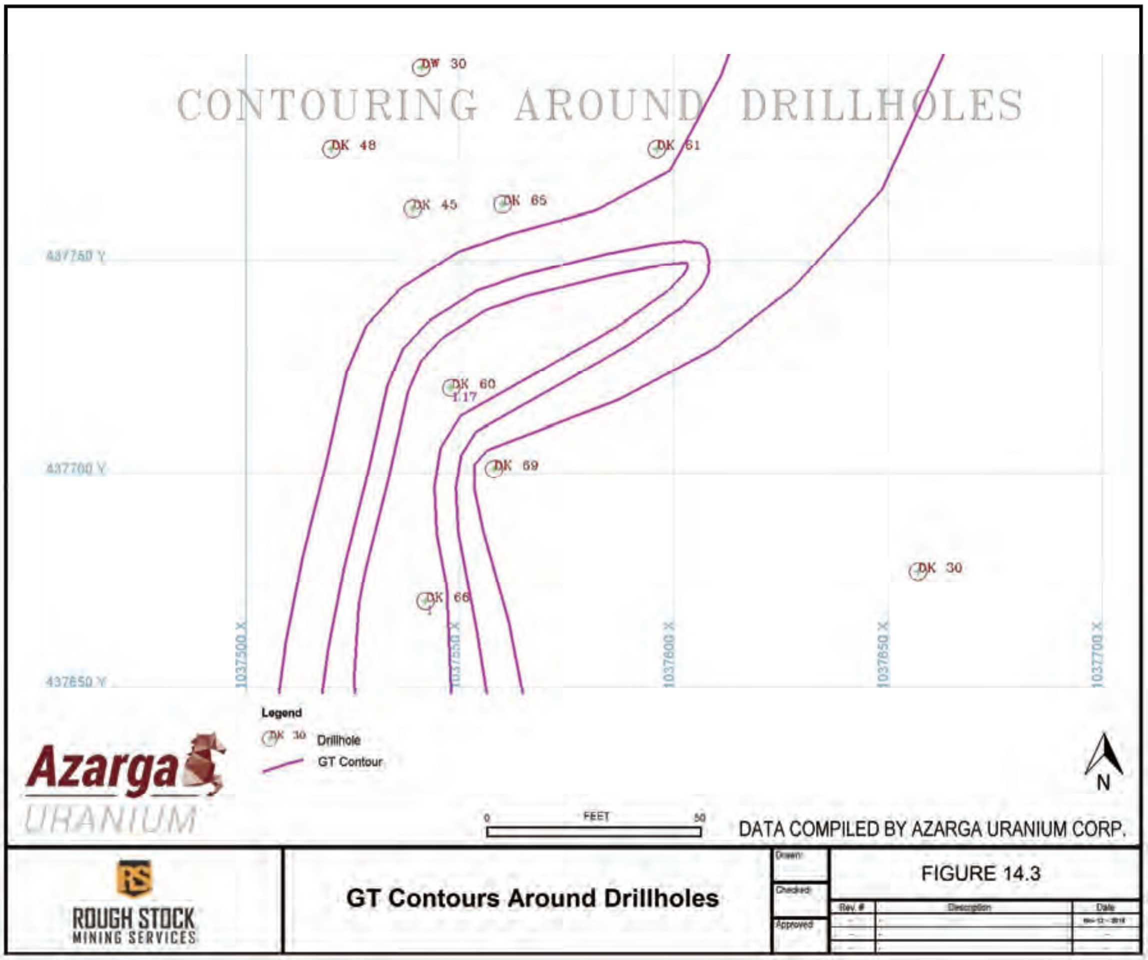
Depth: Average depth of mineral intercepts assigned to the mineral horizon

Area: Defined as the area interior to the 0.20 GT contour lines, more specifically:

Width: Defined by the breadth of the 0.20 GT contour boundaries. Where sufficient data are unavailable, (i.e., wide-spaced drilling), the width is assumed to be no greater than 50 feet

Length: Defined by the endpoints of the 0.20 GT contour boundaries. Where sufficient data is unavailable, length is limited to 1000 feet (i.e., 500 feet on either side of an isolated drill hole – Inferred resource category).

Figure 14.3: GT Contours Around Drillholes



For resource estimation the area of a mineral horizon is further partitioned into banded intervals between GT contours, to which the mean GT of the given contour interval is applied. Area for each contour interval is determined by importing AutoCAD drawing files into Vulcan software and the use of area calculation tools. Once areas are derived and mean GT values are established for each contour interval, resources are then calculated for each contour interval employing the following equation. Resources per contour interval are then compiled per mineral horizon and per mineral 'pod' as discussed below.

$$\textbf{POUNDS} = \frac{\textbf{AREA x T x 20 x DEF}}{\textbf{TF}}$$

Where:

POUNDS = Resources (pounds)

AREA = Area measured within any given GT contour interval (ft^2)

T = Average thickness of Horizon

20 = Conversion constant: grade-% and tons to unit pounds (1% of a ton)

DEF = Disequilibrium factor (=1.0, no disequilibrium)

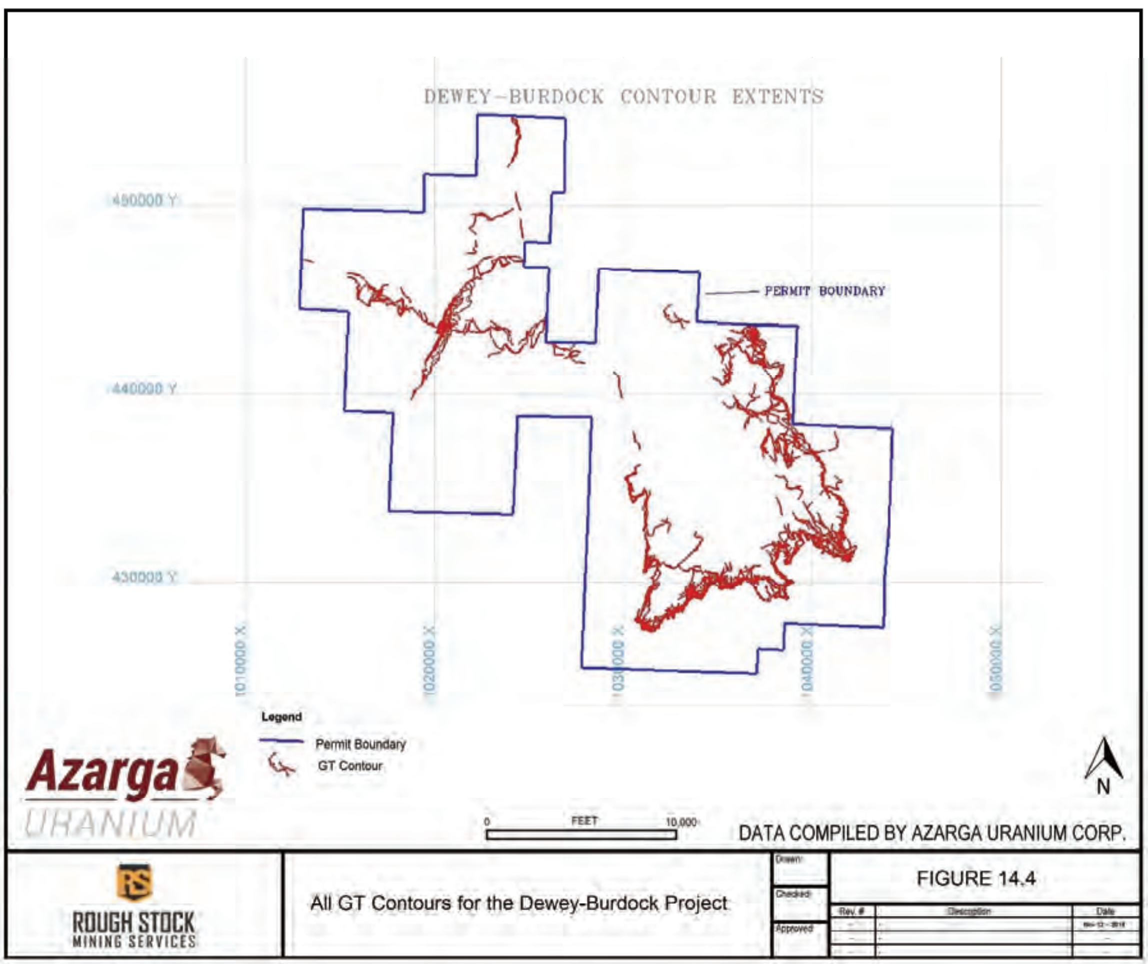
TF = Tonnage Factor: Rock density, a constant (=16 ft^3/ton) (Enables conversion from volume to weight)

In map-view resources for any given mineral horizon often occur in multiple ‘pods’ rather than a single continuous body. Individual pods are then compiled per mineral horizon, summed and categorized by level of confidence (Measured, Indicated, or Inferred) using the criteria discussed in Section 14.3. The resource calculation process is streamlined using the same Vulcan software in which the mapping and GT contouring took place.

As is evident, the GT contour method for resource estimation is dependent on competent roll front geologists for accurate correlation and accurate contour depiction of the mineral body. Nonetheless, uranium industry experience has shown that the GT contour method remains the most dependable for reliable estimation of resources for roll front uranium deposits.

Figure 14.4 illustrates the outlines of mineral occurrences in the Dewey-Burdock Property defined by the red 0.20 contours.

Figure 14.4: All GT Contours for the Dewey-Burdock Project



14.5 Resource Estimation Auditing

As an additional audit of resource modeling methods for the Dewey-Burdock Project, all of the data for this Project was loaded into Vulcan software by Ms. Jennifer Evans. The resource shapes were originally AutoCAD .dxf files and the drill hole data was stored in an Excel database. The resource shapes were directly imported into Vulcan. Data from the Excel database was also directly imported into Vulcan using the .csv format.

14.5.1 Resource Contour Checking

A total of 20 resource contours were audited for this project. Ten contours were evaluated from the Burdock area, which has a total of 100 contours, resulting in 10% of the contours being audited. Ten contours from the Dewey area were also evaluated. The Dewey area has a total of 46 contours, so 22% were audited for this area. The contours were selected to represent a variety of complexity and all areas of the deposit.

14.6 Results and Recommendations

Every pod used for Dewey-Burdock resource calculations has been reviewed and all errors corrected. Very few errors were encountered, but all corrections were recorded in a spreadsheet that documented the solution as well as a checked final product.

The method for contouring around drill holes was correct. Data errors, typos, and flagging changes were caught and corrected.

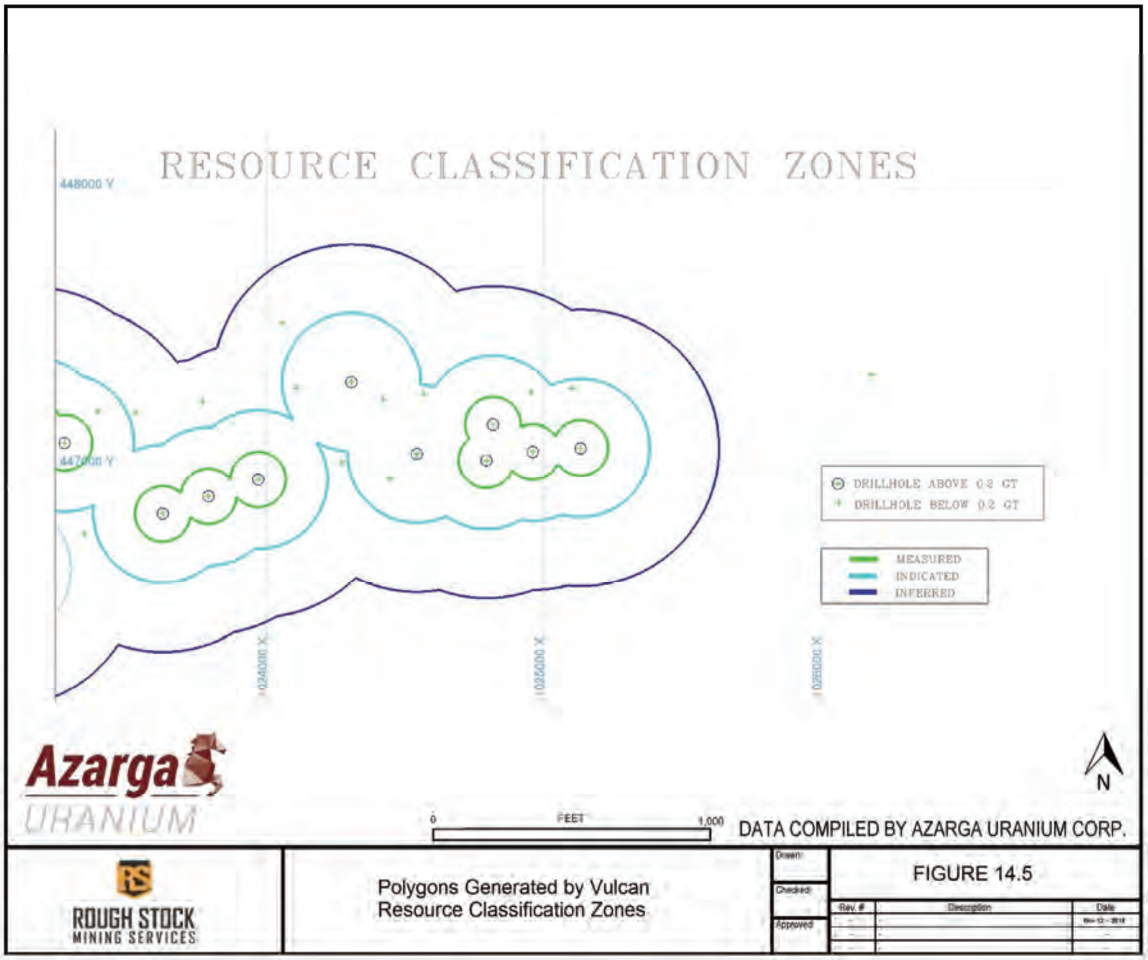
The method of calculating resources was also correct and very few errors were found in this stage of the process. Resources were recalculated for all pods where errors required either data or shape changes.

Using Vulcan, each drill hole influencing the shape of the selected contour was located and labeled with its Hole ID. These holes were identified using the Resource Polygons tool in Vulcan which creates color coded polygons drawn at specified radius from each drillhole. In Figure 14.5 below, the pink resource polygons are overlain with the resource classification polygons generated by Vulcan, green represents Measured with a 100 foot radius, turquoise represents Indicated with a 250 foot radius, and dark blue represents Inferred with a 500 foot radius.

Each contour was verified to be within the limits of the Inferred boundary. Next, it was verified that intercepts used to draw each GT contour contained the appropriate GT values for that contour. Each hole was reviewed to ensure that only resource grade material was included in the contour and that the shape of the contour corresponded with the drill hole collar locations.

For each contour, the pounds reported as resource were also checked. This was achieved by calculating the square footage for each contour in Vulcan. If the shape was more complex, with several grade contours, the square footage within each contour was calculated and used to find a contour net area. The contour net area from Vulcan was then cross-referenced to that used by Azarga in their resource calculation to ensure that all areas were correct. The pounds per contour were then calculated using the average GT for each contour provided by Azarga. For one contour in each the Dewey and Burdock areas, the calculation of the average GT was checked by using zone picks in original drill hole

Figure 14.5: Polygons Generated by Vulcan Resource Classification Zones



database. The resultant GT calculations and resource values for the polygons match those derived by Azarga.

14.6.1 Quality Control/Quality Assurance Review

Drilling for the Dewey-Burdock Project both historical and recent is interpreted on 0.5 ft intervals following standard industry practice.

There are no sets of twinned drill holes, however there are many instances of drill holes within 10 ft of each other demonstrating similar mineralized depth and values.

14.6.2 CIM Compliance

Dewey-Burdock resources were classified as Measured, Indicated, and Inferred based on drill spacing. Audited contours were correctly classified based on drill spacing. Only areas with mineralized drill holes within 100 ft of each other and on the same horizon were classified as Measured, those within 250 ft of each other were classified as Indicated and those within 500 ft were classified as Inferred.

The most recent and all relevant data was used in the calculation of this mineral resource.

14.7 Summary of Mineral Resources

The deposits within the Project area contain Measured ISR resources of 13.78M pounds U_3O_8 with 5,200,000 tons at an average grade of 0.132% U_3O_8, Indicated ISR resources of 3.16M pounds U_3O_8 with 2,328,000 tons at a grade of 0.068% U_3O_8 for a total M&I resource of 16.94M pounds U_3O_8 at a 0.2GT cutoff. The Inferred ISR resource of 732,000 tons at a grade of 0.056% U_3O_8 totals 818,000 pounds U_3O_8, at a 0.2GT cutoff. Mineral resources are summarized in Table 14.1.

Table 14.1: Mineral Resource Estimate (Effective - November 12, 2018)

ISR Resources	Measured	Indicated	M & I	Inferred
Pounds	13,779,000	3,160,000	16,939,000	818,000
Tons	5,200,000	2,328,000	7,528,000	732,000
Avg. GT	0.730	0.396	0.640	0.333
Avg. Grade (%U_3O_8)	0.132%	0.068%	0.113%	0.056%
Avg. Thickness (feet)	5.51	5.83	5.69	5.95

Non-ISR Resources	Measured	Indicated	M & I	Inferred
Pounds	1,060,000	0	1,060,000	0
Tons	926,000	0	926,000	0
Avg. GT	0.374	0.000	0.374	0.000
Avg. Grade (%U_3O_8)	0.057%	0.000%	0.057%	0.000%
Avg. Thickness (feet)	6.54	0.00	6.54	0.00

Note: Resources are rounded to the nearest thousandth. Resource pounds and grades of U_3O_8 were calculated by individual grade-thickness contours. Tonnages were estimated using average thickness of resource zones multiplied by the total area of those zones. Non-ISR Resources are located above the water table.

Cautionary Statement: Mineral resources that are not mineral reserves do not have demonstrated economic viability.

As shown in Table 14.2 below, during the process of re-contouring and recalculation of the drillhole data, which included additional mineralized intercepts and used the new 0.20 GT cutoff, the calculated resource has changed from the 2015 PEA.

Table 14.2: Comparison of 2015 PEA ISR Mineral Resource Estimate with Current ISR Mineral Resource Estimate

	2015 PEA	Grade	Current	Grade	% Change Pounds
Estimated Measured Resource (lb)	4,122,000	0.330%	13,779,000	0.132%	
Estimated Indicated Resource (lb)	4,460,000	0.210%	3,160,000	0.068%	
Estimated M&I Resource (lb)	8,582,000	0.250%	16,939,000	0.113%	97%
Estimated Inferred Resource (lb)	3,528,000	0.050%	818,000	0.056%	-77%

15.0 MINERAL RESERVE ESTIMATES

Mineral reserves were not estimated for this report. There are no mineral reserve estimates for the Dewey-Burdock Project, which would have economic viability.

16.0 MINING METHODS

Azarga plans to recover uranium at the Project Area using the In-Situ Recovery (ISR) method. The ISR method has successfully been used for over four decades elsewhere in the United States as well as in other countries such as Kazakhstan and Australia. ISR mining was developed independently in the 1970s in the former USSR and the United States for extracting uranium from sandstone type uranium deposits that were not suitable for open cut or underground mining. Many sandstone deposits are amenable to uranium extraction by ISR mining, which is now a well-established mining method that accounted for approximately 48% of the world's uranium production today (ref., WNA, 2017). The bottle roll tests (see Section 13) demonstrate the potential feasibility of both mobilizing and recovering uranium with an oxygenated carbonate lixiviant.

Mining dilution (rock that is removed along with the ore during the mining process) is not a factor with the ISR method as only minerals that can be mobilized with the lixiviant are recovered. There are some metals, such as vanadium, that can be mobilized with the lixiviant and can potentially dilute the final product if not separated before packaging. If vanadium occurs in high enough concentration, it can be economically separated and sold as a separate product.

Many impacts typically associated with conventional uranium mining and milling processes can be avoided by employing uranium ISR mining techniques. The ISR benefits are substantial in that no tailings are generated, surface disturbance is minimal in the well fields, and restoration, reseeding, and reclamation can begin during operations. As a particular well field is depleted, groundwater restoration will begin immediately after, significantly reducing both the time period of post-production restoration, and the cumulative area not restored at any point in time. At the end of the project life, affected lands and groundwater will be restored as dictated by permit and regulatory requirements.

This report represents a Resource Estimate update and does not include any further details on mining methods nor any economic analysis.

17.0 RECOVERY METHODS

17.1 Recovery

Previous PEA's noted that, and Azarga continues to expect that, the Dewey-Burdock uranium resources are potentially mineable by ISR mining methods. This report represents a Resource Estimate update and does not include any further details on recovery methods nor any economic analysis.

18.0 PROJECT INFRASTRUCTURE

The basic infrastructure necessary to support an ISR mining operation at the proposed Project is located within reasonable proximity of the Project as further described below.

18.1 Utilities

18.1.1 Electrical Power

The Black Hills Electric Cooperative is anticipated to be the power provider for the Project. It has been established that the most cost effective power source for the project is from a substation located in Edgemont, South Dakota. Approximately 15 miles of new 69 kV power line is necessary to provide power to the plant. Main power for the Dewey-Burdock project will be distributed from a new substation located at the County road 6463 tie in point along highway 18. From the substation, overhead distribution lines will carry power to medium voltage transformers located near the CPP and Satellite sites and for distribution within the project.

18.2 Transportation

18.2.1 Railway

The Burlington Northern Santa Fe Railroad runs parallel to County Road 6463 along the length of the Project, and extends southeast to the town of Edgemont. Rail access may be negotiated to facilitate transport and delivery of construction equipment and supplies.

18.2.2 Roads

The nearest population center to the Dewey-Burdock Project is Edgemont, South Dakota (population 900) located on US Highway 18, 14 mi east from the Wyoming-South Dakota state line. Fall River County Road 6463 extends northwestward from Edgemont to the abandoned community of Burdock located in the southern portion of the Dewey-Burdock project, about 16 mi from Edgemont. This road is a two lane, all weather gravel road. Fall River County Road 6463 continues northwest from Burdock to the Fall River-Custer county line where it becomes Custer County Road 769 and continues on to the hamlet of Dewey, a total distance of about 23 mi from Edgemont. This county highway closely follows the tracks of the Burlington Northern Santa Fe railroad between Edgemont and Newcastle, Wyoming. Dewey is about 2 mi from the northwest corner of the Dewey-Burdock project.

An unnamed unimproved public access road into the Black Hills National Forest intersects Fall River County Road 6463 4.3 mi southeast of Burdock and extends northward about 4 mi, allowing access to the east side of the Dewey-Burdock project. About 0.9 mi northwest from Burdock, an unimproved public access road to the west from Fall River County Road 6463 allows access to the western portion of the Dewey-Burdock project. Private ranch roads intersecting Fall River County Road 6463 and Custer County Road 769 allow access to all other portions of the Dewey-Burdock Project.

Secondary access roads will be improved with added structural support and properly graded to reduce maintenance costs.

19.0 MARKET STUDIES

This report represents a Resource Estimate update and does not include any further details on market studies.

20.0 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Studies

Azarga conducted an environmental baseline data collection program on the Dewey-Burdock Project from July 2007 to September 2008. An independent, third-party contractor directed sampling and analysis activities to characterize pre-mining conditions related to water, soils, air, vegetation, and wildlife of the site and surrounding areas.

In addition to the baseline environmental data collected by the third-party contractor, U.S. Nuclear Regulatory Commission (NRC) staff prepared a Generic Environmental Impact Statement (GEIS) (ref., USNRC, 2009) for western-area license applicants that addressed common environmental issues associated with the construction, operation, and decommissioning of ISR facilities, as well as ground water restoration at such facilities. The GEIS served as a starting point for the site-specific environmental review of the Dewey-Burdock license application. Findings of the site-specific assessment are presented in NRC's Final Supplemental Environmental Impact Statement (FSEIS) for the Dewey-Burdock Project (ref., USNRC, 2014).

Results of the baseline studies, GEIS and FSEIS indicate that environmental concerns are unlikely for the Dewey-Burdock Resource Areas.

20.1.1 Potential Well Field Impacts

The injection of treated groundwater as part of uranium recovery or as part of restoration of the production zone is unlikely to cause changes in the underground environment except to restore the water quality consistent with baseline or other NRC approved limits and to reduce mobility of any residual radionuclides. Further, industry standard operating procedures, which are accepted by NRC and other regulating agencies for ISR operations, include a regional pump test prior to licensing, followed by more detailed pump tests after licensing for each individual area where uranium will be recovered prior to its production.

During ISR operations, potential environmental impacts of well field operations include consumptive use, horizontal fluid excursions, vertical fluid excursions, and changes to groundwater quality in production zones (ref., USNRC, 2009). Through analyses in the GEIS and continued in the FSEIS, NRC staff concluded that impacts of well field operations on the environment will be small. That is, well field operations will have environmental effects that are either not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the area's groundwater resources (ref., USNRC, 2014).

NRC staff concluded the potential environmental impact of consumptive groundwater use during well field operation will be small at the Dewey-Burdock Project because such consumptive use will result in limited drawdown near the project area, water levels will recover relatively rapidly after groundwater withdrawals cease and it is dependent upon a State water appropriation permit. The State has recommended approval of the permit after considering important site-specific conditions such as the proximity of water users' wells to well fields, the total volume of water in the production hydro-stratigraphic units, the natural recharge rate of the production hydro-stratigraphic units, the transmissivities and storage coefficients of the production hydro-stratigraphic units, and the degree of isolation of the production hydro-stratigraphic units from overlying and underlying hydro-stratigraphic units.

NRC staff also concluded the potential environmental impact from horizontal excursions at the proposed Dewey-Burdock ISR Project will be “small”. This is because i) EPA will exempt a portion of the uranium-bearing aquifer from USDW classification according to the criteria under 40 CFR 146.4, ii) Powertech is required to submit well field operational plans for NRC and EPA approval, iii) inward hydraulic gradients will be maintained to ensure groundwater flow is toward the production zone, and iv) Azarga’s NRC-mandated groundwater monitoring plan will ensure that excursions, if they occur, are detected and corrected.

Similarly, NRC staff concluded potential impacts from vertical excursions to be “small”. The reasons given for the conclusion included i) uranium-bearing production zones in the Fall River Formation and Chilson member of the Lakota Formation and are hydrologically isolated from adjacent aquifers by thick, low permeability layers (i.e., the overlying Graneros Group and underlying Morrison Formation), ii) there is a prevailing upward hydraulic gradient across the major hydro-stratigraphic units, iii) Azarga’s required mechanical integrity testing program will mitigate the impacts of potential vertical excursions resulting from borehole failure, and iv) Azarga has committed to properly plugging and abandoning or mitigating any previously drilled wells and exploration holes that may potentially impact the control and containment of well field solutions within the proposed project area.

Lastly, potential impacts of well field operations on groundwater quality in production zones were concluded by NRC staff to be “small” because Azarga must initiate groundwater restoration in the production zone to return groundwater to Commission-approved background levels, EPA MCL’s or to NRC-approved alternative water quality levels at the end of ISR operations.

20.1.2 Potential Soil Impacts

NRC staff have concluded that potential impacts to soil during all phases of construction, operation, hydro-stratigraphic unit, and decommissioning of the Dewey-Burdock Project will be “small” (ref., USNRC, 2014).

During construction, earthmoving activities associated with the construction of the Burdock central plant and Dewey satellite plant facilities, access roads, well fields, pipelines, and surface impoundments will include topsoil clearing and land grading. Topsoil removed during these activities will be stored and reused later to restore disturbed areas. The limited areal extent of the construction area, the soil stockpiling procedures, the implementation of best management practices, the short duration of the construction phase, and mitigative measures such as reestablishment of native vegetation will further minimize the potential impact on soils.

During operations, the occurrence of potential spills during transfer of uranium-bearing lixiviant to and from the Burdock central plant and Dewey satellite facility will be mitigated by implementing onsite standard procedures and by complying with NRC requirements for spill response and reporting of surface releases and cleanup of any contaminated soils.

During groundwater restoration, the potential impact to soils from spills and leaks of treated wastewater will be comparable to those described for the operations phase.

During decommissioning, disruption or displacement of soils will occur during facility dismantling and surface reclamation; however, disturbed lands will be restored to their pre-ISR land use. Topsoil will be reclaimed and the surface will be graded to the original topography.

The following proposed measures will be used to minimize the potential impacts to soil resources:

- Salvage and stockpile soil from disturbed areas.
- Reestablish temporary or permanent native vegetation as soon as possible after disturbance utilizing the latest technologies in reseeding and sprigging, such as hydroseeding.
- Decrease runoff from disturbed areas by using structures to temporarily divert and/or dissipate surface runoff from undisturbed areas.
- Retain sediment within the disturbed areas by using silt fencing, retention ponds, and hay bales.
- Fill pipeline and cable trenches with appropriate material and re-grade surface soon after completion.
- Drainage design will minimize potential for erosion by creating slopes less than 4 to 1 and/or provide rip-rap or other soil stabilization controls.
- Construct roads using techniques that will minimize erosion, such as surfacing with a gravel road base, constructing stream crossings at right angles with adequate embankment protection and culvert installation.
- Use a spill prevention and cleanup plan to minimize soil contamination from vehicle accidents and/or wellfield spills or leaks.

20.1.3 Potential Impacts from Shipping Resin, Yellowcake and 11e.(2) Materials

The Project operations will require truck shipment of resin, yellowcake and 11e.(2) materials.

<u>Ion Exchange Resin Shipment</u>

Ion exchange resin requires transportation of loaded ion exchange resins by tanker trucks to a central processing facility. The radiological impacts of these shipments are typically lower than estimated risks associated with finished yellowcake shipments because i) ion exchange resins are less concentrated (about 0.009 ounces uranium per gallon) than yellowcake and therefore will contain less uranium per shipment than a yellowcake (about 85% uranium by weight) shipment, ii) uranium in ion exchange resins is chemically bound to resin beads; therefore, it is less likely to spread and easier to remediate in the event of a spill, and iii) the total annual distance traveled by ion-exchange shipments will be less than the same for yellowcake shipments. The NRC regulations at 10 CFR Part 71 and the incorporated U.S. Department of Transportation regulations for shipping ion exchange resins, which are enforced by NRC onsite inspections, also provide confidence that safety is maintained and the potential for environmental impacts with regard to resin shipments remains “small” (ref. USNRC, 2009 and 2014).

Yellowcake Shipment

After yellowcake is produced at an ISR processing facility, it is transported to a conversion plant to produce uranium hexafluoride (UF6) for use in the production of nuclear reactor fuel. NRC and others have previously analyzed the hazards associated with transporting yellowcake and have determined potential impacts are “small”. Previously reported accidents involving yellowcake releases indicate that in all cases spills were contained and cleaned up quickly (by the shipper with state involvement) without significant health or safety impacts to workers or the public. Safety controls and compliance with existing transportation regulations in 10 CFR Part 71 add confidence that yellowcake can be shipped safely with a low potential for adversely affecting the environment. Transport drums, for example, must meet specifications of 49 CFR Part 173, which is incorporated in NRC regulations at 10 CFR Part 71. To further minimize transportation-related yellowcake releases, delivery trucks are recommended to meet safety certifications and drivers hold appropriate licenses (ref., USNRC, 2009 and 2014).

11e.(2) Shipment

Operational 11e.(2) byproduct materials (as defined in the Atomic Energy Act of 1954, as amended) will be shipped from the Dewey-Burdock Project by truck for disposal at a licensed disposal site. All shipments will be completed in accordance with applicable NRC requirements in 10 CFR Part 71 and U.S. Department of Transportation requirements in 49 CFR Parts 171–189. Risks associated with transporting yellowcake were determined by NRC to bound the risks expected from byproduct material shipments, owing to the more concentrated nature of shipped yellowcake, the longer distance yellowcake is shipped relative to byproduct material destined for a licensed disposal facility, and the relative number of shipments of each material type. Therefore, potential environmental impacts from transporting byproduct material are considered “small” (ref., USNRC, 2009 and 2014).

20.2 Socioeconomic Studies and Issues

A Socioeconomic Assessment for the Project was performed by Knight Piesold and Co. in 2008 and updated by WWC Engineering August 2013. The Assessment’s summary of the economic impact was as follows (ref., WWC, 2013):

> *According to the economic impact analysis, the most significant benefits are the potential to create jobs, which will have direct and indirect effects on the local economies. Additional significant benefits include capital expenditures and tax benefits to the State of South Dakota, Custer County and Fall River County.*
>
> *Impacts to the regional housing market should be minimal because of the large percentage of local workers. Impacts to schools and public facilities should be negligible because of their present ability to absorb any associated regional influx.*
>
> *This economic impact analysis indicates that the construction and operation costs including capital costs of this project will result in positive economic*

benefits to the local and regional economy by the creation of hundreds of jobs and millions of dollars in tax revenue over the life of the project.

The development of the ISR project should present Custer and Fall River counties with net positive gain.

20.3 Permitting Requirements and Status

The three most significant permits/licenses are (1) the Source and Byproduct Materials License, which was issued by NRC April of 2014; (2) the Large Scale Mine Permit (LSMP), to be issued by the South Dakota DENR; and (3) UIC Class III and V well permits (injection and/or deep disposal), which draft permits were issued by the EPA in March 2017. In regards to the issued NRC license, a formal post-licensing hearing with the Atomic Safety Licensing Board was first conducted in August 2014 and proceedings have been ongoing since that time. There currently remains one contention outstanding pertaining to the identification and protection of historic and cultural resources that the NRC staff has developed an approach for completing.

The land within the Project boundary includes mining claims on mostly private but does include a minor amount of federal, BLM-managed lands. Access to these lands, as stated in Section 4, is controlled under surface rights held by Azarga, or by public access on federal surface. Thus, a BLM Plan of Operations and associated evaluation will be completed in the form of an Environmental Assessment that will reference the already completed Environmental Impact Statement previously finalized by NRC with BLM as a cooperating agency.

Permit/license amendments will be required for expanded well field areas.

The status of the various federal and state permits and licenses that are needed for the Project are summarized in Table 20.1. Prior to the start of mining (the injection of lixiviant), Azarga will obtain all the following necessary permits, licenses, and approvals required by the NRC, DENR and EPA. Some permits are only applicable later in the project life prior to construction of the Dewey satellite plant.

Azarga has an ongoing community affairs program and maintains routine contacts with landowners, local communities and businesses, and the general public. Once the Project commences, the senior project operational managers and environmental manager will be onsite at the facility.

The Project is within an area of low population density characterized by an agriculture-based economy with little other types of commercial and industrial activity. The project is expected to bring a significant economic benefit to the local area in terms of tax revenue, new jobs, and commercial activity supporting the project. Previously, a uranium mill was located at the town of Edgemont, and a renewal of uranium production is expected to be a locally favorable form of economic development. Regionally, there exists individual and other organizations that oppose the project though typically not in the immediate Edgemont area. Public interest in the project has extended regulatory efforts and logistics for accommodating public involvement, but at the time of this report, the NRC license has been issued, the State of South Dakota large scale mine permit has been recommended for approval, and UIC draft Class III and Class V permits have been received from EPA.

There has already been extensive public involvement including both public hearings and public comment on the project.

Table 20.1: Permitting Status

Permit, License, or Approval Name	Agency	Status
Uranium Exploration Permit	DENR	Submitted - July, 2006 Approved - January, 2007
Special, Exceptional, Critical, or Unique Lands Designation Permit	DENR	Submitted - August, 2008 Approved - February, 2009
UIC Class III Permit	EPA	Submitted - December, 2008 Draft Permit Received – March 2017 Approval pending
Source and Byproduct Materials License	NRC	Submitted - August, 2009 Approved - April, 2014
Plan of Operations (POO)	BLM	Submitted - October, 2009 Approval pending
UIC Class V Permit	EPA	Submitted - March, 2010 Draft Permit Received -March 2017 Approval pending
Groundwater Discharge Plan (GDP)	DENR/WMB	Submitted - March, 2012 DENR Recommended Approval - December, 2012 Approval pending
Water Rights Permit (WR)	DENR/WMB	Submitted - June, 2012 DENR Recommended Approval - November, 2012 Approval pending
Large Scale Mine Permit (LSMP)	DENR/BME	Submitted - September, 2012 DENR Recommended Approval - April, 2013 Approval pending
Minor Permits		
Air Permit	DENR	Deemed Unnecessary - February, 2013
Avian Management Plan	GFP/USFWS	Submitted - September, 2013
Non-Purposeful Eagle Take Permit	USFWS	Submitted - January, 2014
NPDES Construction Permit	DENR	To Be Submitted
NPDES Industrial Stormwater Permit	DENR	To Be Submitted
Septic System Permit	DENR	To Be Submitted
EPA Subpart W Pond Construction Permit	EPA	To Be Submitted
County Building Permits	Custer and Fall River Counties	To Be Submitted

21.0 CAPITAL AND OPERATING COSTS

This report represents an update to the Resource Estimate and no updated analysis of capital and operating costs has been performed.

22.0 ECONOMIC ANALYSIS

This report represents an update to the Resource Estimate and no updated economic analysis has been performed.

23.0 ADJACENT PROPERTIES

There are no operating uranium mines near the Dewey-Burdock project at this time. In the past, several open pit and underground uranium mines were located in the Edgemont District within and near the northeast portion of the current project location, and in northeastern Wyoming. An ISR uranium mine is presently operating near Crawford, Nebraska, approximately 70 miles straight line distance to the south of Dewey-Burdock and another ISR uranium mine is operating in Converse County, Wyoming approximately 90 miles to the west of Dewey-Burdock.

24.0 OTHER RELEVANT DATA AND INFORMATION

The existing open pit mines located in the east part of the Project are not planned for any mining by Azarga. These pits remain the responsibility of previous operators and existing landowners. Potential ISR resources have been identified under the existing pits below the underlying Fuson shale and at some depth within the Chilson Member of the Lakota.

There are several projects controlled by Azarga which could potentially be a satellite to the project once a CPP is constructed. This could potentially include Azarga's Aladdin, Gas Hills and Centennial projects. These projects are located approximately 80 miles, 260 miles and 250 miles from the Dewey-Burdock site, respectively.

Azarga presently owns the Dewey Terrace property in Wyoming which is a western extension of Dewey Burdock and is anticipated to potentially provide additional resources to Dewey Burdock. The project is directly adjacent with the Wyoming state line which is part and directly adjacent to the permit boundary for Dewey-Burdock.

There are extensive unexplored oxidation and reduction boundaries or "trends" within the project area which have yet to have been sufficiently drilled to determine the presence of mineralization. Further assessment of these trends has the potential to demonstrate additional resources within the project area. Historical record estimates indicate approximately 170 miles of these trends within the project area with a large portion (estimated at over 100 miles) that is sparsely drilled or unexplored. In particular, the potential exists for further discovery to the south, north, and west of existing Dewey resources.

Potentially recoverable vanadium mineralization within the project area is expected based upon historic operation of the mill in Edgemont, which produced vanadium along with uranium. As well, existing core analyses indicates vanadium deposition. However, previous drilling programs were designed to determine uranium primarily through gamma logging and not widespread coring. Therefore, the quantity of vanadium mineralization currently cannot be estimated. It is recommended that a drilling plan to evaluate the vanadium mineralization be completed including additional core drilling and testing. Should suitable mineralization be identified, an additional economic evaluation to determine a cost-benefit analysis for the production of vanadium is recommended.

25.0 INTERPRETATION AND CONCLUSIONS

After reviewing the available information, the QP feels that the resource estimate presented here is a reasonable assessment of the mineral resources and is representative of the geologic setting and data available for the Project.

The sandstone hosted roll-front uranium deposits in the Project area are shown to be amenable to ISR extraction from Project site-specific bench-scale core leach testing results (ref., SRK 2012) as well as the 2015 PEA (ref., TREC, 2015). The QP feels that the use of ISR methods would remain applicable to the updated resources provided in the report.

As with any pre-development mining property, there are risks and opportunity attached to the project that need further assessment as the project moves forward. The author deems those risks, listed below, on the whole, as identifiable and manageable:

- Risk associated with uranium recovery and processing,
- Risk associated with delays in permitting,
- Risk associated with social and/or political issues, and
- Risk associated with the uranium market and sales contracts.

26.0 RECOMMENDATIONS

The first priority should be the development of an updated preliminary economic assessment based on the updated resource estimate provided in this NI 43-101 Technical Report. The updated resource estimate should allow for further refinement of the Project design in the updated economic analysis. Though the 2015 PEA continues to provide a reasonable production alternative, this alternative may be further expanded upon with the updated resource estimate in this NI 43-101 Technical Report. The approximate cost is estimated to be up to $100,000 and completion is expected in 2019.

In addition to the above, the following activities are recommended for the Project:

- Complete all activities required to obtain all necessary licenses and permits required to operate an in situ uranium mine in the State of South Dakota. Approximate potential cost up to $800,000.
- Additional exploration – the extensive underexplored mineralized trends have the potential to lead to further resource expansion within the Dewey-Burdock license area. The QP recommends additional exploration be undertaken when feasible. Initially exploration would target Fall River trends in the Dewey area of the Project and could consist of 16 fences with each fence consisting of 13 drillholes. Approximate potential cost up to $1,600,000. Dependent on the results of this initial program, further exploration and drilling programs would be expected to be developed.
- The occurrence of vanadium should be further explored. Core data and historic information on recovery of vanadium in the area point to the potential for commercial vanadium production, potentially as a by-product of ISR operations. Data indicates similar deposition of vanadium and uranium and a more extensive vanadium exploration program should be considered to determine subsurface vanadium concentrations when feasible. An initial exploration program would target areas of the Project within existing uranium resources and could consist of 80 core holes to provide further data on vanadium concentrations. Approximate potential cost up to $1,200,000. Dependent on the results of this initial program, it will need to be determined if the vanadium mineralization can be quantified or if further exploration is needed.

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28.0 DATE, SIGNATURE AND CERTIFICATION

This NI 43-101 technical report entitled "NI 43-101 Technical Report Resource Estimate Dewey-Burdock Uranium ISR Project South Dakota, USA" has been prepared and signed by the following author.

Dated this 12th day of November, 2018 (Effective date)
Signed this 21st day of December, 2018 (Report date)

/s/ Steve E. Cutler
Steve E. Cutler, P.G.

CERTIFICATE OF QUALIFIED PERSON

I, Steven E. Cutler. P.G., of 4671 Shandalyn Lane, Bozeman, Montana 59718 do hereby certify that:

- I have been retained by Azarga Uranium Corp., to manage, coordinate, develop and write *certain sections of the documentation for the Dewey Burdock Property, Resource Estimate* for the Dewey-Burdock Uranium ISR Project, South Dakota, USA, dated December 21, 2018 (report date), (the "**Technical Report**").
- I am a Consulting Geologist, affiliated with Roughstock Mining Services, LLC at 4671 Shandalyn Lane, Bozeman, Montana 59718, USA. I am Professional Geologist, AIPG #11103, in good standing.
- I was awarded a B.S. in Geology from Montana State University, Bozeman, Montana in 1984, and an M.S. Degree in Economic Geology from the University of Alaska-Fairbanks, Fairbanks, Alaska in 1992.
- Since 1984 I have practiced continuously as a Geologist, Supervisor, Chief Mine Engineer, Technical Services Manager, and Consultant for mining firms, and other mining consulting firms. My previous experience encompassed a wide variety of mining and metals types, resource and reserve estimation evaluations, mining planning, equipment selection, and cost analyses. I am the author of several publications on subjects relating to the mining industry.
- I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- I am responsible for the preparation of all sections of the Technical Report.
- I visited the Dewey-Burdock Property on July 24, 2014 and was there for approximately eight hours.
- As defined in Section 1.5 of National Instrument 43-101, I am independent of the issuer, Azarga Uranium.
- I have not been involved with permitting activities for the subject property.
- To the best of my knowledge, information and belief, at November 12th, 2018, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
- I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that Instrument and Form.

Dated this 21stth day of December, 2018

Signed: **/s/ Steve E. Cutler**

Steve E. Cutler

Steve E. Cutler, C.P.G.