

**Technical Report on the  
Aladdin Uranium Project  
Crook County, Wyoming**



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## 1.0 SUMMARY

Powertech (USA) Inc. (Powertech) engaged Jerry D. Bush, C.P.G., a geologist with an abundance of uranium exploration and development experience, to write a National Instrument (NI) 43-101 compliant technical report on its Aladdin Project in order to categorize its resource base under current standards of review. The author has first-hand field and data review experience on these and adjacent properties. Mr. Bush has over twenty years of experience in uranium exploration within the Western U.S. and Australia. He is experienced in all aspects of uranium sampling and analyses, as well as uranium resource estimation techniques. While employed by Homestake Mining Company, Mr. Bush gained specific experience conducting uranium exploration activities within Inyan Kara sediments in the Black Hills Uplift area.

The Aladdin Project is located in northeast Wyoming, within Crook County. The project is more specifically located in Townships 54 and 55 North, Ranges 60 and 61 West of the 6<sup>th</sup> Principal Meridian. At the present time, the project described in this technical report consists of 10,831 acres of mineral rights and 11,711 acres of surface rights, all derived from private and state mining leases under lease to Powertech (USA), Inc.

This area is on the northern flank of the Black Hills Uplift, where uranium was discovered in the 1950s. Uranium mining in Crook County took place from the early 1950's through 1966. The uranium mineralization occurs within sandstones of the Lakota and Fall River Formations of the Inyan Kara Group of lower Cretaceous age. Uranium deposits occur in roll fronts, consisting of several stacked horizons of continuous mineralization occurring at the oxidation/reduction "(O/R)" boundary of downward migrating oxidizing solutions which entered the host sandstones at the outcrop. The configuration of these roll front deposits is typical of shallow, sedimentary uranium deposits that occur within the western United States and are characterized as "C" shaped rolls, convex down gradient, with the highest grade mineralization occurring immediately on the reduced side of the O/R boundary.

The Aladdin Project area was explored by several companies through the mid 1970s. In excess of 1,800 historic exploratory drill holes have been drilled by Teton Exploration on the project and Powertech has acquired a considerable portion of this data. In addition to this historic drilling, Powertech completed a 60-hole drilling program on the project in 2007. This drilling confirmed the geochemical setting (oxidation/reduction) and roll front configuration of the uranium mineralization within thirteen intervals (mineralized trends) within sandstones of the Fall River and Lakota Formations. In the process of evaluating and delineating these mineralized trends, the 2007 drilling program also confirmed the

presence of high-grade roll front uranium mineralization in the historic resource areas.

Through evaluation of Teton's historic close-spaced drilling data, along with its confirmation drilling results, Powertech developed a resource base for the project. These resources include both Indicated and Inferred Resources, and were based on a GT contouring method of resource estimation. Project resources were determined using both a 0.20 GT cut-off and a 0.40 GT cut-off. Resource classification was determined by applying project-specific evaluation criteria based on Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves to each GT-contoured resource area.

Using a 0.20 GT and 0.02% grade cut-off, Powertech has identified 1,038,023 pounds of Indicated Resources, contained in 466,232 tons averaging 0.111 %  $U_3O_8$  and 101,255 pounds of Inferred Resources, contained in 42,611 tons averaging 0.119 %  $U_3O_8$ . At a 0.40 GT cut-off, Powertech delineated 554,195 pounds of Indicated Resources, contained in 169,558 tons averaging 0.163 %  $U_3O_8$  and 42,620 pounds of Inferred Resources, contained in 11,455 tons averaging 0.186 %  $U_3O_8$ .

In addition to these classified resources, project-specific geologic criteria from historic and confirmation drilling indicates there is a potential of discovering a significant number of additional pounds of uranium within the project area. This potential is estimated to range from 5 million to 11 million pounds  $U_3O_8$  with an average grade of 0.11 %-0.12 %  $U_3O_8$ . The grade and quantity of this potential is conceptual in nature. There has been insufficient exploration within the portions of the Aladdin Project that contain this potential to define a mineral resource. It is uncertain if further exploration in the areas of this potential will result in the delineation of mineral resources.

Based on these classified resources and the large size of the project's potential, a two-phase exploration/evaluation program is recommended. The objective of the first phase will be to evaluate the areas containing the large potential and the second phase will be an exploration drilling program directed toward elevating a designated portion of the potential to a classified resource status (inferred or indicated).

## **2.0 INTRODUCTION**

### **2.1 Purpose of Report**

This technical report has been prepared for Powertech in compliance with the revised National Instrument 43-101 – Standards of Disclosure for Mineral Projects, dated June 30,

2011. The purpose of this report is to disclose certain scientific and technical information developed historically and by Powertech on the Aladdin Project.

## 2.2 Terms of Reference

Units of measurement unless otherwise indicated, are feet (ft), miles, acres, pounds (lbs) and short tons (2,000 lbs). Uranium content is expressed as %U<sub>3</sub>O<sub>8</sub> the industry standard unit for describing in place uranium intercepts. Values reported for historical resources are %<sub>e</sub>U<sub>3</sub>O<sub>8</sub> (equivalent U<sub>3</sub>O<sub>8</sub> by calibrated geophysical logging unit). Unless otherwise indicated, all references to dollars (\$) refer to the currency of the United States. Additional units of measurement are tabulated as follows:

Unit	Metric Equivalent
1 foot	0.3048 meters
1 inch	2.54 centimeters
1 pound (avdp.)	0.4536 kilograms
1 acre	0.4047 hectare

## 2.3 Sources of Information and Data

All of the detailed and factual data were obtained directly from the staff of Powertech. These data included drill hole data, electric logs, drill hole location maps, land maps and uranium resource calculations.

## 2.4 Extent of Author's Field Involvement

The author of this technical report for the Aladdin Project is Jerry D. Bush. The report is based on Mr. Bush's personal experience on the project and his knowledge of the geology of the area. He was a staff exploration geologist for Teton Exploration and Homestake Mining Company, and conducted field activities in the northern Black Hills area in the 1970's. In 2007, he supervised Powertech's exploration drilling program, reviewed the logging of subsurface drill cuttings and was present as geophysical logs were run on all drill holes. In addition, he has inspected copies of historic electric logs and assay maps for the project. This historic drill hole data was collected by the Teton Exploration Company in 1970 - 1976. Teton Exploration operated in the uranium business for many years and was a well-qualified operator.

The author has been involved in the extractive mineral industry (uranium, petroleum, coal-bed methane) and water resources since 1969. The author's qualifications, as required by NI 43-101, are submitted with this report. This experience includes over twenty years experience in the uranium industry, involving extensive uranium exploratory drilling,

property evaluation and resource calculation work. His last site visit to the project area was April, 2012.

### **3.0 RELIANCE ON OTHER EXPERTS**

The author has reviewed data and certain geologic reports prepared by Powertech personnel and contractors in the preparation of this report. Documents reviewed included:

Geostatistical resource evaluation  
R.B. Smith & Associates  
April 2007

Aladdin Project Exploration Report  
James A. Bonner, Powertech  
July 2010

GT Contour Resource Analyses  
Frank Lichnovsky, Powertech  
February 2012

Because of the author's geologic experience in this area, he had prior knowledge concerning geological and historical exploration information on the Aladdin Project and surrounding areas. With respect to actual drill hole data and resource calculations, the author verified existing field data and evaluation techniques used in determining resource estimates. Based on his experience in this area, as well as a thorough audit of data and techniques employed by the Powertech team, the author found the approach taken by Powertech for the resource estimates provided in **Section 14.0** to be acceptable and reliable.

## **4.0 PROPERTY DESCRIPTION AND LOCATION**

### **4.1 Location of Project Area**

The Aladdin Project is located in the northeastern corner of Wyoming, immediately northwest of the Black Hills Uplift. As shown in **Figure 1**, the project is situated adjacent to the Wyoming/South Dakota border, approximately 75 northeast of Gillette, Wyoming. It lies within portions of Townships 54 and 55 North, Ranges 60 and 61 West. The small town of Aladdin, Wyoming is approximately 7 miles south of the project area.



Not To Scale



**Figure 1**  
 Location Map  
 Aladdin Project  
 Crook County, Wyoming

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DATE	11-Jun-2012
FILENAME	40101 Resources Location Map





#### 4.2 Nature of Land Position

At the present time, the project consists of 10,831 acres of mineral rights and 11,711 acres of surface rights, all derived from 25 private and state mining leases (**Table 1**). 3,792 acres of other state mining leases are north of the project area and are not included in this Technical Report. All mining leases also grant Powertech the right to access surface lands for the purposes of exploring, developing, mining and processing.

**Table 1: Aladdin Project Leases**

Lease No.	Net Acres Minerals	Net Acres Surface
WY-11010	0	288
WY-11010-A	144	0
WY-11010-B	144	0
WY-11012	400	400
WY-11013	80	80
WY-11014-A	30	0
WY-11014-B	30	0
WY-11014-C	122	0
WY-11014-D	110	484
WY-11014-E	30	0
WY-11014-F	30	0
WY-11014-G	12	35
WY-11015	728	728
WY-11016-A	380	407
WY-11016-B	380	407
WY-11016-C	380	407
WY-11016-D	380	407
WY-11016-E	380	750
WY-11016-F	46	0
WY-11020	5027	5190
WY-11021	1031	1031
WY-11023-A	0	383
WY-11023-B	93	0
STATE 0-41313	234	74
STATE 0-41314	<u>640</u>	<u>640</u>
	<b>10,831</b>	<b>11,711</b>

The project property position is illustrated in **Figure 2**. Also shown on this figure is a large portion of the 1800 exploratory drill holes completed by Teton Exploration in the early 1970's.

All private mineral leases provide royalty payments to landowners ranging from 2%-7% of the gross value of uranium produced. There are no other royalties due to individuals or entities on these private leases. State mining leases provide for a royalty of 5% of the gross value of uranium produced. One state section, Section 36, T55N, R61W, was assigned to Powertech by Bayswater Uranium and carries an additional 1% royalty to Bayswater. All private mining leases are valid through 2017-18 and state leases are valid through 2016-17.

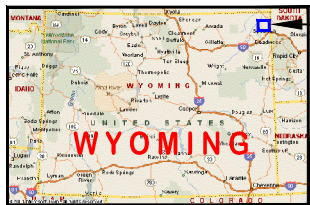
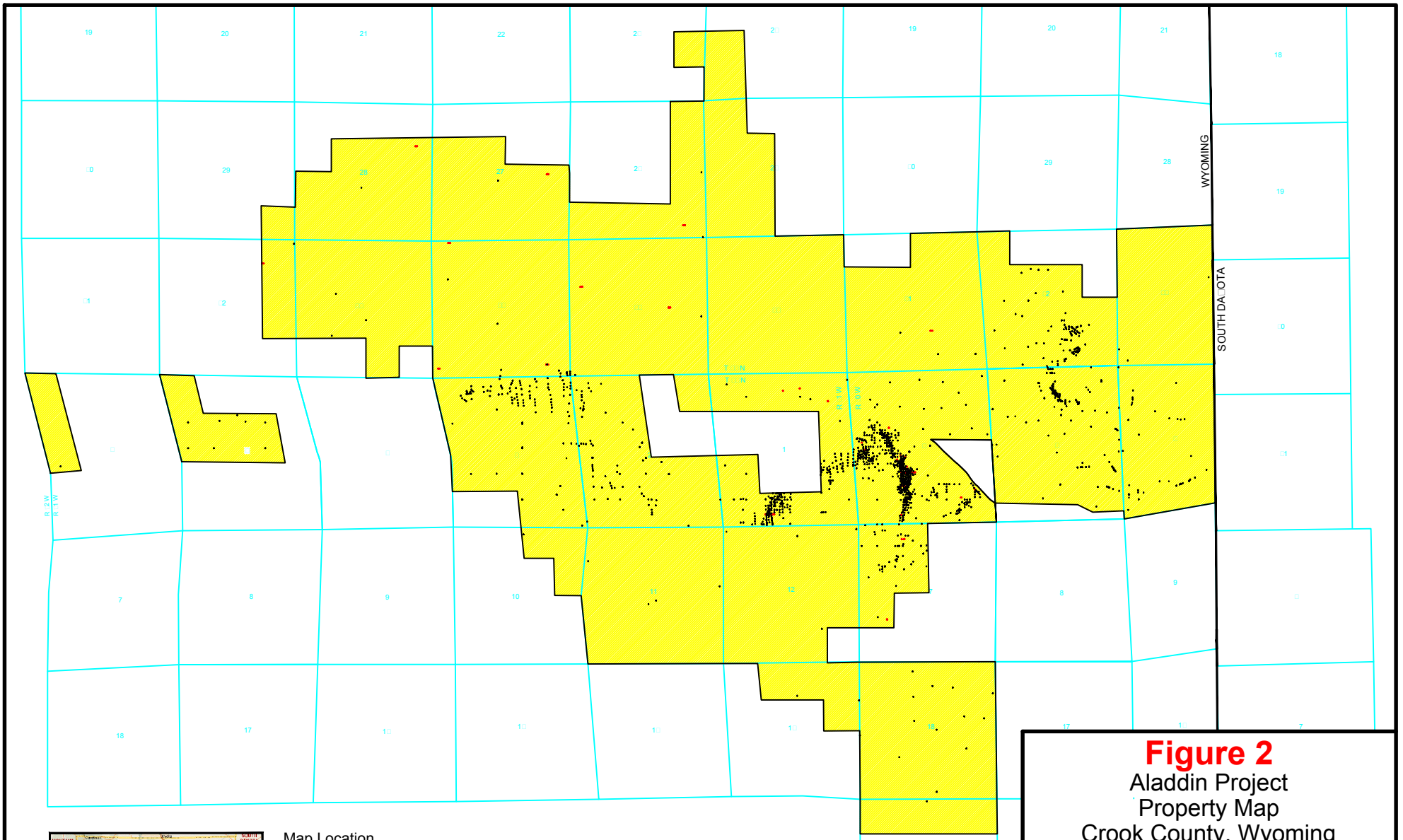
### **4.3 Surface Disturbance, Environmental Liability**

There has been no attempt made to extract uranium from the project area. Accordingly, there is no surface or subsurface disturbance of area due to uranium mining operations. There was considerable exploratory drilling in the project area in the 1970s and all surface disturbances from those activities have been satisfactorily reclaimed. Powertech conducted a 60-hole drilling program on the project in 2007. This drilling was permitted and monitored by the Wyoming Department of Environmental Quality (WDEQ). All hole plugging and surface reclamation work was approved by the WDEQ and a regulatory sign-off was obtained for this exploration work.

There are a few historic, shallow surface bentonite mines within the Aladdin Project area, These mines were developed within marine shales of the Graneros Group and have surface expressions similar to small gravel pits. There are some small, historical uranium prospect pits in the southeastern portion of the property (Sec 18, T54N, R60W). These prospects were developed on a ridge where mineralized sandstones were exposed and the associated surface disturbance is minimal. The project land is used for ranching purposes and there are no identified environmental liabilities associated with the surface or subsurface.



### **4.4 Required Permits**

The Aladdin Project is in an exploration phase and all surface lands within the project area are privately-owned or state-owned. Accordingly, the only permit required to operate on the project will be a "Notification of Intent to Explore for Minerals by Drilling". This notification is submitted to and administered by the WDEQ. The notification describes the proposed exploration program, the number of exploratory holes to be drilled, the proposed hole plugging procedures, site reclamation activities and establishes a reclamation bond to be posted to assure performance of all identified work activities. This notification will be submitted prior to conducting the next exploration program on the project.



Map Location

LEGEND

-  Powertech Leases
-  Historic Exploration Drill Holes



**Figure 2**  
Aladdin Project  
Property Map  
Crook County, Wyoming

State Plane-NAD 27

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DATE	11-Jun-2012
FILENAME	□ 101 Resources with exhibits



Should the project progress to an advanced stage, because of the number of active and developing in-situ recovery (ISR) mines in Wyoming, a well-defined regulatory framework for mine planning has been established. This future permitting will involve the Nuclear Regulatory Commission (NRC), who has the responsibility for issuing licenses under the Atomic Energy Act, such as the Source Materials Handling. WDEQ will be responsible for issuing the State Permit to Mine, while the Environmental Protection Agency (EPA) has responsibility under the Safe Drinking Water Act (SDWA) to administer permits concerning the injection of fluids into subsurface aquifers. In Wyoming, the WDEQ has primacy for administering the body of regulation meeting the requirements of the SDWA (Underground Injection Control Program). WDEQ is also responsible for issuing air quality, water discharge and storm water permits.

## **5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY**

### **5.1 Topography, Elevation, Vegetation**

The Aladdin Project is located on the northern flank of the Black Hills Uplift. Terrain is, in part, undulating to moderately incised at the south and east portion of the project. Significant drainages on the project are few, only four or five on the whole project area. These canyons are cut less than 1,000 feet 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 feet in height that will extend for only a few hundreds of feet in length. The Aladdin Project topography ranges from low lying grass lands in the center of the project, along small stream drainage systems to dissected, forested sandstone ridges in the eastern and southern portions of the project.

There is about 500 feet of elevation change across the project area. The lower elevation of 3,300 feet above mean sea level (amsl) is around the north and east side of the project area. The highest elevation at near 3,800 feet amsl is in the western and southwestern portion of the area.

Two major vegetation regions are noted within the Aladdin Project area: grassland and ponderosa pine. Grassland vegetation is dominated by buffalo grass, blue gramma and western wheatgrass. Ponderosa pine occurs with Rocky Mountain juniper. Cultivated crops are limited to and consist of dryland hay crops. 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 Aladdin Project.

## **5.2 Access**

Access is provided from major U.S. Highways by numerous state and county roads. Primary access is provided by Interstate Highway 90 (I-90) between Gillette, Wyoming and Rapid City, South Dakota. I-90 is fifteen miles south of the project. A county road named the Mona Road is present throughout the center of the project area and is connected to I-90 by federal highways Hwy 111 and Hwy 24.

## **5.3 Local Resources**

Belle Fourche, SD, 20 miles east, Hulett, WY, 30 miles west, and Sundance, WY, 35 miles southwest are nearby towns where food, lodging, fuel and other basic necessities can be obtained. The closest city to provide travel services, manpower, communications and exploration/mining support services is Gillette, Wyoming, 75 miles to the southwest. Rapid City, South Dakota is 70 miles to the southeast.

## **5.4 Climate**

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 considered to be semi-arid continental or steppe with a dry winter season. The Black Hills to the south of the project, because of its significantly higher elevation, has greater temperature extremes- especially during winter months. The annual mean temperature in this area is 46°F. The mean low temperature of 20°F occurs in January. The mean high temperature of 74° occurs in July. The Aladdin Project area averages 198 days per year of below freezing temperatures. Below freezing temperatures generally do not occur after mid-May or before late September.

The average precipitation in the Aladdin Project area is 16 inches. The wettest month is June when rainfall amounts to 2.6 inches and the driest months are January and December yielding 0.3 inches each month, usually as snow. The average annual snowfall is expected to be 37 inches.

## **5.5 Infrastructure**

The Aladdin Project area is well supported by nearby towns and services. Power lines are located across the project and can be accessed for electrical service for future development and mining operations. Water is readily available within the formations that contain the uranium and can be used for exploration drilling, as well as future mining operations. It should be noted that the aquifers containing the uranium are slightly artesian to the surface or near surface.

## **6.0 HISTORY**

### **6.1 Ownership History of the Property**

In 1969, Teton Exploration Company obtained private and state mining leases within the Aladdin Project area. They were active in the area for six years before relinquishing all leases due to a world-wide downturn in uranium prices. There was no uranium activity in the project area for the next thirty years.

In the summer of 2006, Powertech began acquiring uranium leases in the Aladdin area. Many local ranchers were pleased to see interest in mining return to this region. At the present time Powertech controls 14,623 acres of mineral rights in the region and 10,831 acres of mineral rights in the project area. The project acreage consists of 19 mining leases with private mineral owners and two State of Wyoming mining leases. **Figure 2** shows Powertech's land position and the location of Teton historic drill holes.

### **6.2 Exploration and Development Work Undertaken**

Soon after the initial discovery of uranium in the Black Hills in 1951, extensive exploration activities were conducted throughout the northern Black Hills region of Crook County, Wyoming. This initial exploration consisted primarily of airborne radiometric surveys, which were successful in locating numerous areas where mineralized Inyan Kara sandstones were exposed at the surface. Homestake Mining was the most active company and found a large mineralized area in western Crook County, approximately 40 miles west of the Aladdin Project. This discovery resulted in the development the New Haven open pit mine within sandstones of the Fall River Formation, which was the first of several mines to be developed in that portion of the County. Exploration drilling in this New Haven area by Homestake resulted in the discovery of high-grade uranium in sandstones of the underlying Chilson Member of the Lakota Formation. The Hauber Mine, an underground uranium mine, was developed within this deeper ore horizon in 1957. Production continued at the Hauber Mine until 1966, resulting in the recovery of over 2.6 million pounds of uranium, averaging 0.22% U<sub>3</sub>O<sub>8</sub>. Uranium ore from this mine was shipped by truck and rail to a regional mill that was built at Edgemont, South Dakota.

In the 1960's, uranium exploration companies initiated renewed exploration programs along the northwestern flank of the Black Hills Uplift which targeted deeper uranium deposits, located down-gradient of the surface occurrences. In the Aladdin area, Homestake Mining and Union Carbide conducted limited exploratory drilling during this period of time. Teton Exploration, Inc. began a major exploration program in 1969. From 1974-76, Teton Exploration Company completed over 1800 exploratory drill holes on the Aladdin Project and delineated a small, open ended resource area. All exploration activity in this region ceased in the late 1970's due to the world-wide decline in uranium prices.

### **6.3 Historic Mineral Resource Estimates**

Although there were discussions of Aladdin resources in internal communications, no historic Teton Exploration resource maps or calculations were obtained. In April 2007, R.B. Smith & Associates, a geological consulting firm, used drill hole data from Teton Exploration's 1800-hole historic exploratory drilling program on the Aladdin Project to prepare a historical resource. A 0.02%  $U_3O_8$  grade cut-off and a GT (Grade X Thickness) cut-off of 0.10 were applied to all mineralized intercepts. Resources were estimated by applying this GT information to a 100-foot square grid system that was superimposed over the historic drilling areas. If more than one drill hole fell within a grid, the resource was calculated for each intercept in each hole and then divided by the total number of drill holes within the grid. A total resource number for the project was determined by totaling the net resources of each grid. For the Aladdin Project, at a 0.1 GT cut-off, the total resource estimate was 1.2 million pounds of  $U_3O_8$ . This global estimate is considered to be relevant, reliable and suitable for public disclosure. However, the grid system evaluation technique provided no categorization of uranium resources and is not compliant with National Instrument 43-101. A qualified person has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves and the Company is not treating the historical estimate as current mineral resources or mineral reserves.

### **6.4 Production History**

In the early 1950's, during the initial stages of northern Black Hills uranium exploration, many high-grade occurrences of uranium were found on Inyan Kara sandstone outcrops. Numerous small mining operations or prospects were developed on these features. Ore mined from these small operations was hauled to Edgemont, South Dakota, where the AEC had established a buying station. Two of these small mining operations were developed on property adjacent to the Aladdin Project. 146 tons of uranium ore averaging 0.21%  $U_3O_8$  was mined from one of these prospects while the other prospect yielded 151 tons of uranium ore averaging 0.10%  $U_3O_8$ . There has been no uranium production from within the Aladdin Project boundary.

## **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 by 60 miles wide located in southwestern South Dakota and northeastern Wyoming. The uplift has deformed all sedimentary rocks in age from Cambrian to latest Cretaceous. Subsequent erosion has exposed these rock units dipping outward in successive elliptical outcrops surrounding the central core of Precambrian metamorphic and granite rocks. 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 rocks in the Black Hills region are sandstones of the Lakota and Fall River Formations within the Inyan Kara Group of earliest Cretaceous Age. The Early Cretaceous sediments of the Inyan Kara Group are transitional units, exhibiting a change from terrestrial to marine deposition. The basal Lakota Formation (Chilson Member, Fahrenbach, 2007) is a fluvial sequence, which grades upward into marginal marine sediments as the Cretaceous Seaway inundated a stable land surface. Basal units of the Lakota Formation scour into clays of the underlying Morrison Formation and display the depositional nature of a large braided stream system, crossing a broad, flat coastal plain and flowing toward the northwest. Younger fluvial sand units of the Lakota become progressively thinner and less continuous and are separated by thin deposits of overbank and flood plain silts and clays. At the top of the Lakota is the Fuson Shale. The Fuson consists of shale with minor beds of fine grained sandstone and siltstone. The Fuson separates the underlying Lakota Formation from the overlying Fall River Formation. The Fall River consists of thick, widespread fluvial sands in the lower portion, grading to thinner, less continuous, marginal-marine sands in the upper part. There is some debate as to whether the Fuson Shale extends from the southern Black Hills to the northern Black Hills (Wagge, 1959). Historically, Homestake Mining and Teton Exploration used this terminology in the northern Black Hills and to avoid confusion this is the convention followed by Powertech.

Following deposition of the Fall River, this region was covered by the North American Cretaceous Seaway, which resulted in the accumulation of vast thicknesses of marine sediments. From 3000-5000 feet of these marine sediments are represented by the Skull Creek Shale, Newcastle Sandstone, Mowry Shale, Belle Fourche Shale, Greenhorn Formation, Carlisle Shale, Niobrara Formation and Pierre Shale. In Late Cretaceous time, the modern Rocky Mountain Uplift began, forcing the retreat of the Cretaceous seaway.

Unconformably overlying the Cretaceous sediments in the Black Hills region is the Tertiary-age (Oligocene) tuffaceous White River Formation. This thick, tuffaceous sequence was the result of volcanic eruptions to the west and was rich in volcanic fragments. The White River sediments have primarily been removed by erosion and can be found only as erosional remnants. This unit is thought to be the source of the uranium deposits found in the Black Hills region and the Powder River Basin of Wyoming. The most recent sediments in the region are Quaternary-age deposits consisting of local material derived as a result of post-Laramide-uplift erosion. Recent deposits include alluvium and floodplain terrace deposits (**Figure 3**).



PERIOD	FORMATION	Sym- bol	COLUMN	LITHOLOGIC DESCRIPTION	Thickness	CORRELATION
<b>Tertiary</b>	White River Fm.	Twr		Volcanic Ash	0-500 ft	
<b>Cretaceous</b>	Pierre Fm.	Kp		Dark Gray Shale, weather brown, fossiliferous	0-1000 ft	
	Niobrara Fm.	Kn		Gray calcareous shale weathers yellow	0-225 ft	
	Carlile Fm.	Kcr		Gray shale w/ thin ss beds	0-540 ft	
	Greenhorn LS	Kg		Thin bed hard limestone, fossiliferous	0-50 ft	
	Belle Fourche Fm. Mowry Shale	Kgs		Lt gy shale, bentonite w/concretions	0-670 ft	
	Newcastle SS			Thin brn -yellow ss		
	Skull Creek Sh			Black carbonaceous sh		
	Fall River Fm.	Kfr		Interbed red-brn massive ss and carbonaceous shale	30-165 ft	Uranium Zone
	Fuson Sh.			Gy-purple sh, bentonite concretions	0-160 ft	
	Lakota Fm.	Klk		Coarse massive ss, buff-gray coal near base	130-230 ft	Uranium Zone
<b>Jurassic</b>	Morrison Fm.	Jm		Green maroon sh	0-125 ft	
Sundance Fm	Jsd		red ss interbeds and red to green marine sh	250-450 ft		

**Figure 3**

Regional Stratigraphic Column  
Aladdin Project

Crook County, Wyoming  
Jim Bonner

DRAWN BY	RC
DATE	13-Jun-2012
FILENAME	Regional Stratigraphic Column



## 7.2 Local and Property Geology

The Aladdin Project is located on the northern flank of the Black Hills Uplift, approximately 40 miles east of the eastern edge of Wyoming's Powder River Basin. Locally, sediments are gently dipping to the north and northeast. The surface geology of the Aladdin Project area is shown in **Figure 4**.

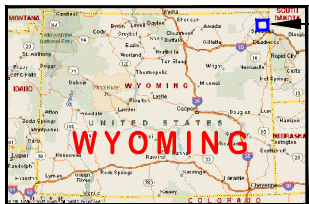
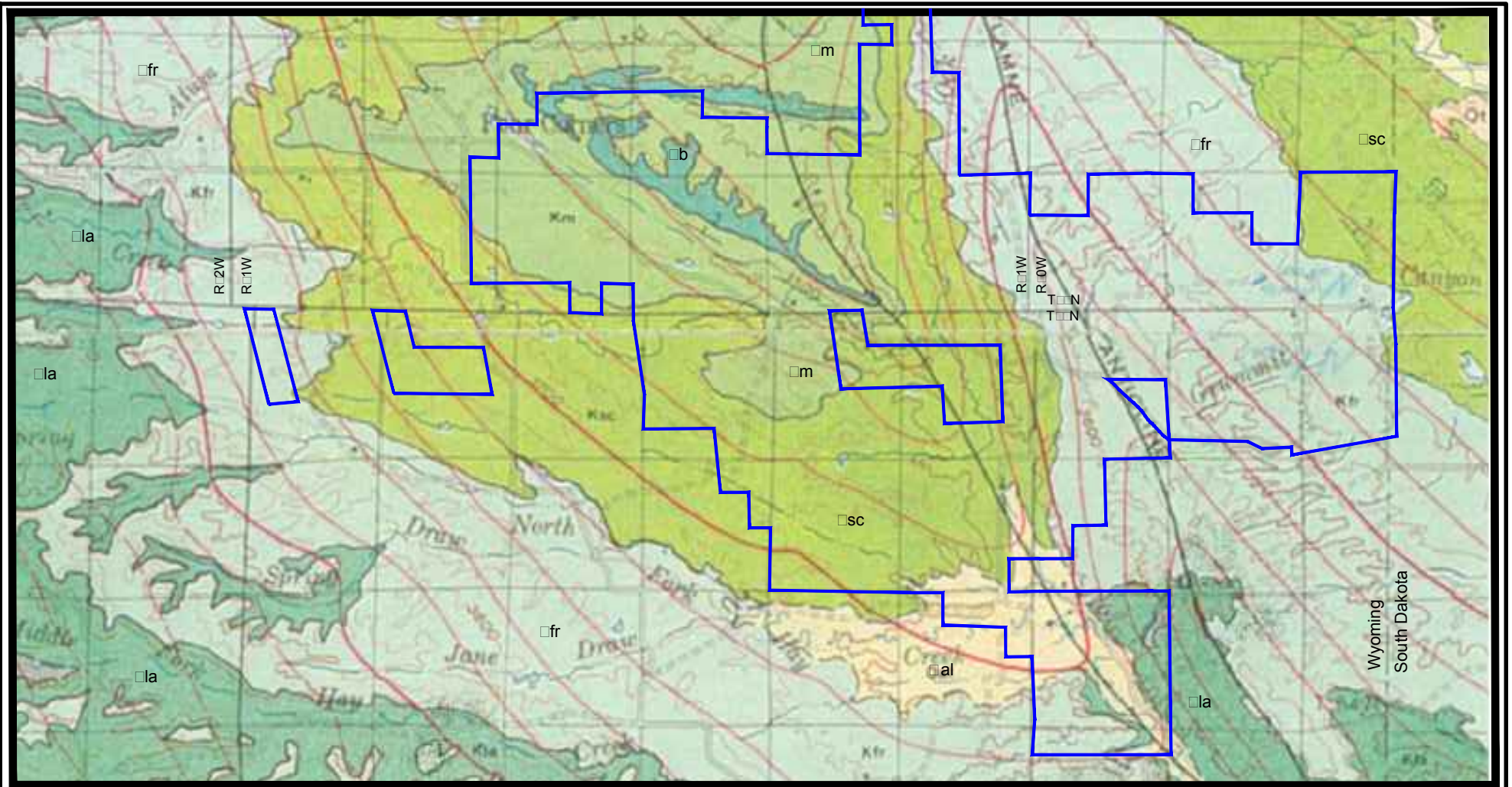
As shown on the geologic map, the lowermost Cretaceous-age Inyan Kara Group consists of the Lakota and overlying Fall River Formations. The Chilson Member of the Lakota Formation in the Aladdin Project consists of fluvial sandstones deposited by a northwesterly flowing stream system. Sediments consist of point bar and transverse bar deposition. The stream channel systems are typical of meandering fluvial deposition. Sandstone units fine upward and numerous cut and fill sandstones are indicative of channel migration depositing silt and clay upon older sandstone and additional channel sandstones overlay older silts and clays. This Chilson stream system deposited sediments across a depositional channel width of four or five miles. The thickness of Chilson sandstones in the Aladdin Project area varies from 80-150 feet. The sandstones are very fine to medium-grained and well sorted and were deposited by a northwest flowing river system.

Underlying the Chilson Member is the Morrison Formation. The Upper Jurassic Morrison Formation was deposited as flood plain deposits. It is composed of waxy, unctuous, calcareous, noncarbonaceous massive shale with numerous limestone lenses. This 60-80 foot thick clay unit is an excellent lower confining unit for mineralized Chilson sandstones.

Overlying the Chilson Member is the Fuson Shale. This low-permeability clay unit is indicative of a period of quiescence and separates the Chilson member from the overlying Fall River Formation. The Fuson Shale ranges from 40 to 60 feet thick and represents an excellent confining unit between Chilson and Fall River sandstones.








The top of the Inyan Kara Group is the Fall River Formation consists of thick, widespread fluvial sands. These sands are indicative of regional uplift to the far southeast and broad stream deposition toward the advancing sea. The units are composed of carbonaceous interbedded siltstone and sandstone, channel sandstones, and sequences of interbedded sandstone and shale. Channels were deposited by northwest flowing rivers. The sandstones are cross-bedded to massive, fine to medium-grained, and well-sorted. The thickness of the Fall River Formation varies from 125-180 feet.

The Inyan Kara Group is a major aquifer along the northwestern flank of the Black Hills. Water in this aquifer is under artesian pressure and there are several flowing wells in and around the project area.



Map Location

LEGEND

-  Powertech Leases
-  Alluvium
-  Bell Fourche
-  Mowry Shale
-  Skull Creek Shale
-  Fall River Formation
-  Lakota Formation

SCALE 0 2000 4000 6000 Feet



**Figure 4**  
Geologic Map of  
Aladdin Project  
Crook County, Wyoming

Geologist: J. Bonner

DRAWN BY RC

DATE 11-Jun-2012

FILENAME Aladdin Geology 1-2010



**POWERTECH (USA) INC.**

Overlying the Inyan Kara Group is the Graneros Group, which consists of the Skull Creek Shale, Mowry Shale and Belle Fourche Shale. These shale units represent the lower portion of the overall Graneros Group and act as an upper confining unit to the mineralized Fall River sandstones.

There is some folding within these sedimentary units, as evidenced by the La Flamme Anticline shown in **Figure 4** in the eastern portion of the project area. The mineralized Fall River sandstones are quite shallow on the crest of this anticline, ranging from 0-200 feet below surface. Toward the west, away from the anticline, the host sands dip gently to the northwest, are buried by overlying shale units and reach depths of 600 feet below surface.

**Figure 5** is a typical log of Inyan Kara Group sediments at the Aladdin Project. The Fall River Formation is approximately 125 feet thick and contains up to three fluvial sandstone sequences. Underlying the Fall River Formation is the Lakota Formation, which is subdivided into the Fuson Shale and the Chilson Member. The Fuson Shale is a 40-foot thick low-permeability clay unit, while the Chilson Member is a 140-foot thick sequence of fluvial sandstones. These sandstones are typically referred to as “Lakota Sands”. Below the Lakota Formation is the Morrison Formation.

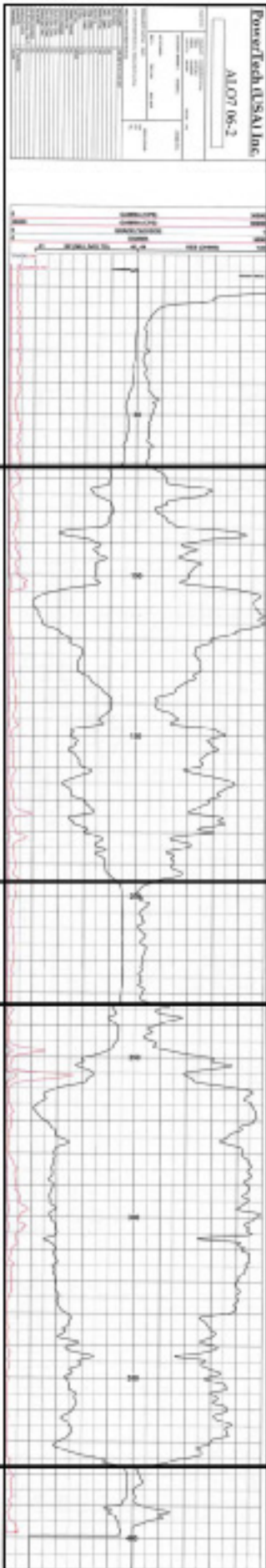
### **7.3 Mineralization**

The uranium deposits in the Aladdin Project are classic roll front type deposits occurring in subsurface sandstones deposited in shallow fluvial sandstone channel sequences within the Inyan Kara Group of early-Cretaceous age. Uranium deposits are concentrated along the flanks of sandstone channels and are larger in size on the down dip channel flanks. Alteration, depicting the oxidation reduction contact can occur in several channel units and may be several miles in length. Significant concentrations of uranium occur discontinuously along the oxidation/reduction boundary with individual deposits ranging from several hundred to a few thousand feet in length. The width of the concentrated uranium is dependent upon lithology and position within the channel and averages approximately 50 to 75 feet. Thickness of high concentration uranium mineral varies with respect to its position within the roll front - from one or two feet in limbs to eight or ten feet in the rolls. Tenor of uranium mineralization may vary from nil to a few percent at any point within the ore body.

The uranium roll fronts in the Aladdin area are associated with oxidation/reduction interfaces (mineralized trends). These trends are known to cover a linear distance of nearly 100 miles, extending northward into Carter County, Montana and returning back to the Hauber Mine area of western Crook County. Historic data describes multiple



AL07-06-2



SKULL CREEK  
SHALE

FALL RIVER FORMATION

FUSON  
MEMBER

LAKOTA FORMATION

CHILSON  
MEMBER

MORRISON  
FORMATION

Scale Feet  
0 25 50

Vertical Scale

**Figure 5**  
Typical Log  
Aladdin Project  
Crook County, Wyoming

Geologist: J. Bonner

DRAWN BY R Patton  
DATE 12-Jun-2012  
FILENAME Typical Log AL07-06-2



discontinuous uranium deposits concentrated at these oxidation/reduction interfaces, along the entire length of the mineralized trend. In the Aladdin area, there may be as many as 13 stacked uranium roll fronts within Inyan Kara sandstones along this portion of the mineralized system.

The primary ore control of uranium mineralization in the Aladdin Project is the presence of permeable sandstone within a major sandstone channel system that is also a groundwater aquifer. Such conditions exist in both the Lakota and Fall River Formations. A source rock with uranium in juxtaposition to the aquifer is necessary to provide mineral to the system. As described above the uranium-rich White River formation originally overlay the subcropping 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. A common source of reductant is the carbon and carbon trash in siltstones and shales that does occur in varying quantities throughout the Inyan Kara Group. Another possible source of reductant is available from hydrocarbon source units in the deeper portions of the basin to the north, which could migrate updip within the Inyan Kara sandstone units during maturation of marine source rocks. The migration and presence of hydrocarbons within uranium host rocks are well known for their propensity to create reducing/uranium precipitating conditions.

## **8.0 DEPOSIT TYPES**

Uranium deposits in the Aladdin Project are sandstone, “roll front” type, typical of those in Wyoming, South Dakota and Texas, as well as some in Australia and Kazakhstan. These types of deposits derive their name from the configuration associated with their deposition. They are normally “C” shaped in cross section, a few tens of feet-to-100 or more-feet wide and often thousands of feet long. Uranium minerals are typically deposited at the down dip interface of oxidizing solutions penetrating into reduced sandstone host rocks with the uranium being precipitated at the boundary between oxidation and reduction “redox boundary”. Typical alteration associated with this redox boundary consists of iron oxidation yielding limonitic and hematitic staining of the sandstones toward the up-gradient or oxidized side of the roll front. On outcrop, most of the sandstones of the Inyan Kara Group exhibit trace to pervasive limonite staining of various shades of yellow and orange. Red hematite staining is less common and occurs as scattered streaks in most outcrops. Generally, the more porous and thicker the sandstone, the more pronounced the alteration.

As the uranium minerals precipitate, they coat sand grains and fill the interstices between grains. As long as oxidizing groundwater movement is constant, minerals will be solubilized at the interior, oxidized portion of the “C” shape, and precipitated in the down

gradient exterior reduced portion of the “C” shape, increasing the tenor of the ore body by multiple migration and accretion. Thickness of the ore body is generally a factor of the thickness of the sandstone host unit. Mineralization may be up to 10 feet thick within the roll front and gradually thins to a few feet thick behind the front, in what is considered to be the trailing “limbs” portion of the deposit. **Figure 6** is a cross section illustrating the classical roll front configuration. Deposit configuration determines the location of well field drill holes and is a major economic factor in ISR mining.

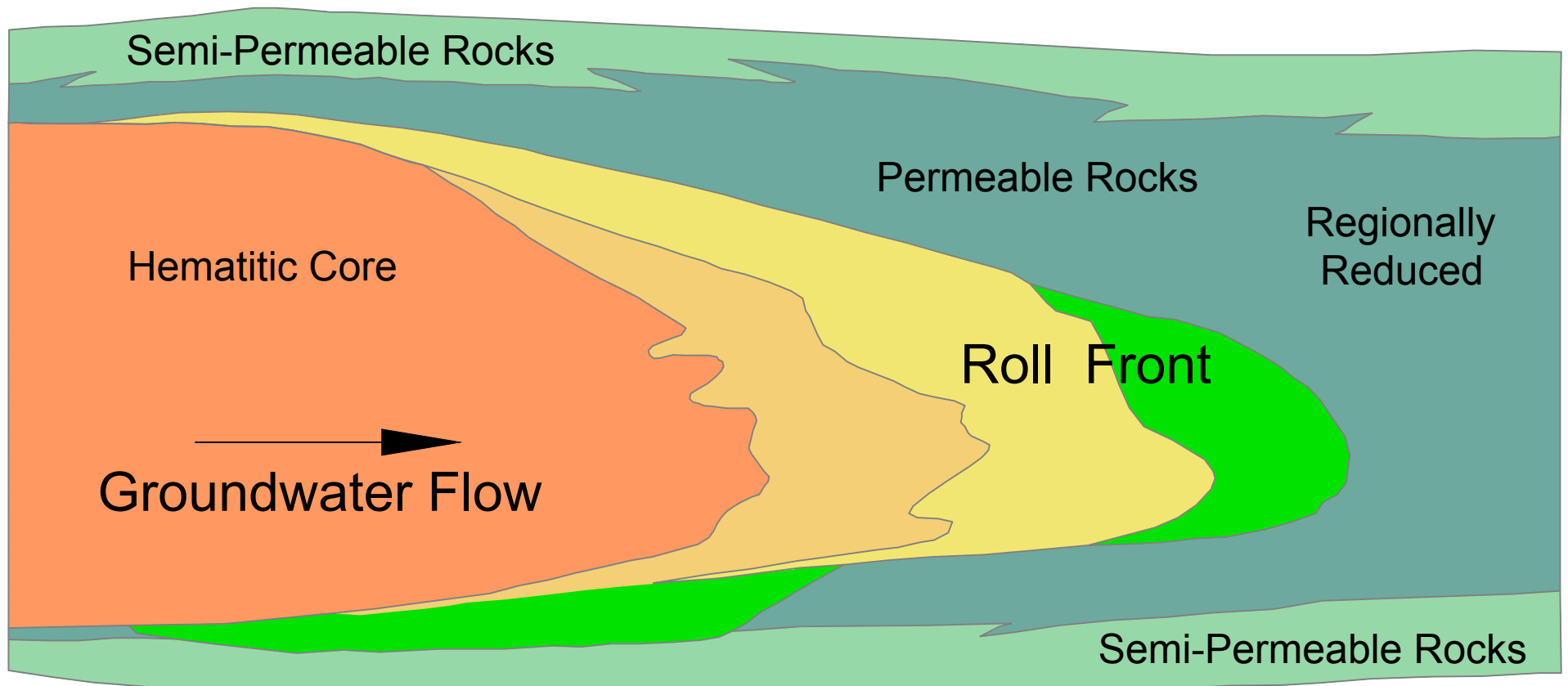
Uranium deposits are concentrated along the down-dip flank of sand deposits. Alteration depicting the oxidation/reduction contact can occur in several sand units and may be several miles in length. Uranium deposition in significant deposits occurs discontinuously along the redox boundary with individual deposits ranging from several hundred-to a few thousand feet in length. Width of concentration is dependent upon lithology and position within the sand unit. Width of roll front mineralization on the Aladdin Project appears to average 25 to 75 feet. Thickness of highly concentrated uranium mineral varies from one or two feet in limbs to up to ten feet in rolls. Tenor of uranium mineralization may vary from minimal to a few percent at any point within the ore body. However, the method of deposition by solubilization, migration and precipitation within permeable sandstone units creates gradational mineralization that readily yields to contouring of grade times thickness (GT) products.






Multi-element analyses of mineralized core indicate that there are various amounts of associated minerals such as iron, vanadium, selenium arsenic and molybdenum, occurring with the uranium. These associated minerals are usually found only as trace amounts and therefore are generally not of economic value or of concern in any ISR mining or restoration of ground water. However, vanadium can occur in sufficient quantity to become a production byproduct. Vanadium has not been quantified within the uranium deposits at Aladdin.

## **9.0 EXPLORATION**

Between August 2007 and November 2007, Powertech completed a 60-hole exploration drilling program on the Aladdin Project. All holes were drilled vertically and this program, which totaled 26,680 feet, was designed to meet two primary objectives.

37 drill holes, or approximately 60% of Powertech's 2007 drilling program, were directed toward the objective of evaluating portions of the project area on which Teton Exploration had performed close-spaced historic drilling. In these areas, Teton had encountered multiple mineralized intervals (mineralized trends) within Chilson sandstones. Prior to commencing this drilling program, Powertech had reviewed historic drill hole logs and



<b>Hematite</b>	<b>Alteration Envelope</b>	<b>Ore Stage Uranium</b>	<b>Ore-Stage Pyrite</b>	<b>Reduced Sandstone</b>
				
Hematite Magnitite	Siderite Sulfur-S Ferroselite Goethite	Uraninite Pyrite FeS Selenium Ilsemanite	Molybdenite Pyrite Jordisite Calcite	Pyrite Jordisite Calcite

**Figure 6**

Conceptual Model of  
Uranium Roll Front Deposit

Aladdin Project

DRAWN BY  
Lichnovsky, Bonner

DATE  
20-Jun-2012

FILENAME  
DeVotoRollFrontConcept.dwg



Source: Uranium Geology and Exploration, 1978, Richard H. DeVoto



maps from Teton Exploration and observed over 100 drill holes with high-grade intercepts, ranging from 0.10% U<sub>3</sub>O<sub>8</sub> to over 1.0% U<sub>3</sub>O<sub>8</sub>. The objective of this phase of Powertech's drilling program was to examine these mineralized areas and confirm that the uranium encountered by Teton met the parameters of the accepted uranium roll front deposit model. By doing so, the grade, width and extent of the subsurface uranium mineralization could be mapped for both exploration and resource evaluation purposes. **Figure 7** is a cross section of Teton Exploration holes, in the area of close-spaced historic drilling that shows well-developed roll fronts within Chilson sandstones.

This drilling confirmed the geochemical setting (oxidation/reduction) and roll front configuration of the uranium mineralization within thirteen intervals (mineralized trends) within sandstones of the Fall River and Lakota Formations. In the process of evaluating and delineating these mineralized trends, 24 of the drill holes intersected uranium mineralization with grades ranging from 0.02% up to and exceeding 1.00% eU<sub>3</sub>O<sub>8</sub>. The 2007 drilling program confirmed the presence of high-grade roll front uranium mineralization in the historic resource areas. The three highest mineralized intercepts as indicated by down-hole radiometric logging were:

Hole No.	Thickness	Grade	Depth	GT
AL 07-1-5	6.0 ft	0.451% eU308	497 feet	2.71
AL 07-1-4	7.5 ft	0.332% eU308	496 feet	2.49
AL 07-1-10	12.5 ft	0.333% eU308	474.5 feet	4.16

The balance of 23 drill holes (40% of the drilling program) was directed toward the second objective of evaluating previously unexplored property adjacent to the area of extensive historical drilling. These wide-spaced exploratory drill holes identified and mapped oxidation/reduction boundaries within Fall River and Lakota sandstones. This mapping confirmed that mineralized trends along oxidation/reduction boundaries extend up to several miles west and east from the historical drilling.

## 10.0 DRILLING

From August 2007 to November 2007, Powertech completed a 60-hole exploration drilling program, totaling 26,680 feet on the Aladdin Project. This program was authorized under an exploration drilling notification (No. 356 DN) from the WDEQ. The depth of these holes ranged from 270 to 715 below ground surface. All drill holes were plugged and abandoned in accordance with State of Wyoming regulations. The latest WDEQ guidelines describe filling the drill hole, from the bottom upward, with a sodium bentonite plugging gel. The viscosity of this plugging gel is measured to be, at a minimum, 20

A

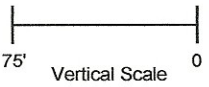
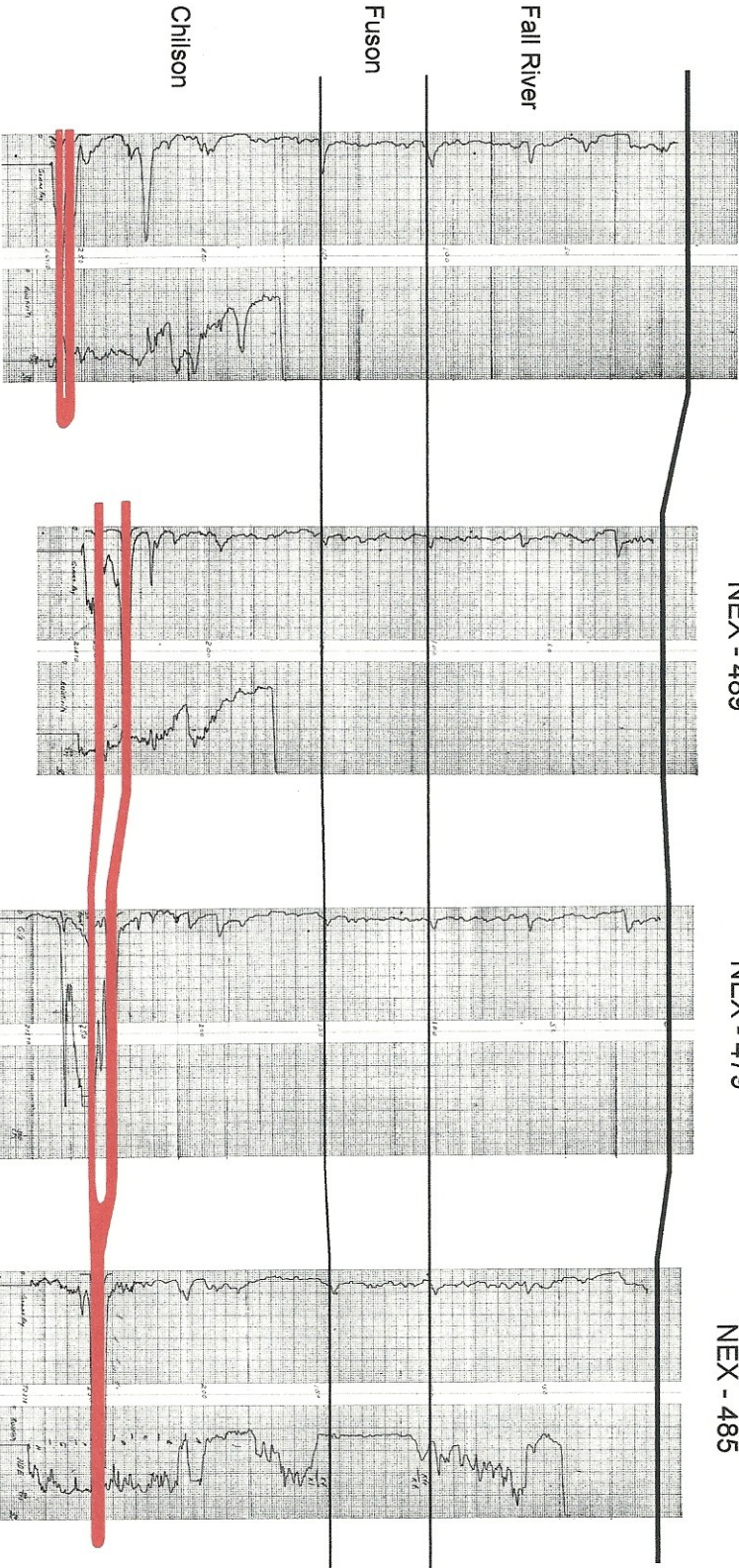
NEX - 481

NEX - 489

NEX - 479

NEX - 485

A'



Horizontal not to scale

**Figure 7**

Cross Section A-A'  
of Chilison Roll Front  
Aladdin Project

Crook County, Wyoming

DRAWN BY

F. Lichnovsky

DATE

13-Jun-2012

FILENAME

Aladdin A-A' Cross Section



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seconds higher than the viscosity of the bottom-hole drilling fluid. (This method of measuring mud viscosity is standard in rotary drilling business and is derived from standards developed by oil and gas drilling techniques where a specifically designed cone for containing drilling mud is filled to the prescribed level and the time to empty is measured with a stop watch. If the time to empty is greater than 20 seconds slower than the normal drilling fluid used to drill the exploration hole, the abandonment mud is deemed sufficiently dense to seal water bearing formations.) 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 drill hole 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), the sealing procedure is completed by filling the remaining portion of the open hole with bentonite chips to within three feet of the surface. The final three feet of the hole is filled with soil.

After the completion of the drilling program, in compliance with the exploration drilling notification (No. 356 DN), Powertech submitted a report to the WDEQ confirming the hole plugging and site reclamation procedures used on the drilling program. The WDEQ sent a representative to visit the drilling sites and examine the results of the reclamation. The WDEQ has approved of all reclamation work on the project and released all bonding held on the project.

### **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 1970's. A 6.25-inch hole was drilled and rotary cutting samples were collected at 5-foot intervals. A description of these cuttings are made by the on-site geologist and compiled into a lithology log for each drill hole. This rotary drilling was used to confirm several critical issues regarding previously identified uranium resources at the Aladdin Project.

These drill hole results confirmed the presence and tenor of multiple, mineralized intervals in sandstones of both the Fall River and Lakota Formations. This drilling also examined the geologic setting of the project and the nature of the Inyan Kara Group, by demonstrating that the depositional environments and lithologies of the host sandstones were found to be consistent with descriptions presented by previous operators on the project site. Electric logs and lithology logs from each drill hole 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, as well as to demonstrating continuity within known resource areas. This drilling demonstrated that originally hypothesized “roll-front” deposit model is appropriately applied to this project.

## **11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY**

Powertech has completed no core holes on the Aladdin Project, and accordingly, there have been no samples for preparation and analyses. Teton Exploration completed many historic core holes on the project. Powertech does not have analytical data related to this historic coring and no discussion of this work is included in this report.

## **12.0 DATA VERIFICATION**

### **12.1 Review of Historical Records**

After acquiring its Aladdin property position, Powertech purchased a portion of Teton’s Aladdin exploration database. This data acquisition included 1 inch = 50 foot drill hole maps of all 1800 exploration drill holes, with plots of all mineralized intercepts from all drill holes. Copies of the electric logs of 581 of the 1800 drill holes were also obtained. This data has been extremely useful in gaining an understanding of the geology and uranium potential of the project area.

The author, through his previous work experience with Teton Exploration, was familiar with the geophysical logging equipment used on the project and personally knew some of the geologists who worked on the project. He believes information to be relevant and accurate.

### **12.2 Data Verification Procedures**

The use of geophysical logs is extremely important in a uranium exploration program. 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 perform hole-to-hole correlation of 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 U238, which is not a major gamma emitter. However, many of uranium's daughter products are gamma emitters. It is well known in the uranium industry that it takes approximately one million years for uranium daughter products to reach equilibrium. At this point, as much gamma emitting uranium daughters are being created as are being destroyed through radioactive decay. Down hole gamma probes are calibrated at this equilibrium point and the gamma readings yield an equivalent  $U_3O_8$ .

It is clear that the age of sedimentary uranium mineralization, within the high plains region of North America, is of Tertiary age which makes it several million years old. However, constant groundwater movement can mobilize the soluble uranium and displace it down dip from the daughters present in the host formation. Typically this displacement occurs in shallow, unsaturated sandstones. These conditions are well known to uranium geologists and when the hydrologic regime is conducive to these conditions; much more scrutiny is undertaken toward the issue of equilibrium. In the case of the Aladdin Project, there are no such conditions that would make knowledgeable uranium geologists believe that significant differences of uranium versus daughter gamma equivalency could occur. Because the company geologists were well schooled in the issues associated with displacement of uranium from daughter products, the author believes that all the gamma data is a reliable technique for calculating in-place uranium resources.

On the Aladdin Project, Powertech used its own geophysical logging truck, manufactured by Geoinstruments Logging. This unit produced continuous, down-hole electric logs, consisting of resistivity, self-potential and gamma ray curves. This geophysical unit was used to log approximately 80% (47 holes) of Powertech's exploratory drill holes. Century Wireline Services, a contract logging service, was used to log approximately 20% of the drill holes (13 holes). A comparative review of electric logs from both logging units showed consistent and uniform logging results from both units. Both Century and Powertech logging units are regularly calibrated at U.S. Department of Energy assay stations located in Casper Wyoming in order to achieve consistency in gamma readings.

### **12.3 Data Confirmation**

The author was on site during the logging of most Powertech exploratory holes and was of the opinion that this work was performed professionally and that the work products were complete and accurate. The electric logs that were run on all 60 drill holes across the Aladdin Project area in 2007 were similar in character and tenor to Teton's historic drill hole logs for the same project. Powertech also drilled confirmation holes within the area that was densely drilled by Teton and the character and tenor of the adjacent drill hole records was readily confirmed.

### **13.0 MINERAL PROCESSING AND METALLURGICAL TESTING**

Powertech has completed no core holes on the Aladdin Project and has performed no mineralogical or metallurgical testing. Teton Exploration completed many historic core holes on the project, however, Powertech does not have analytical data related to this historic coring and no discussion of this work is included in this report. All identified uranium resource areas were located below the water table in saturated sediments and disequilibrium issues are not expected. Future recommendations on the project include coring and analytical programs.

### **14.0 MINERAL RESOURCE ESTIMATES**

A primary purpose of this technical report is to calculate and categorize the total resource base within the Aladdin Project. In late 2011 and early 2012, Powertech performed an internal uranium resource study using all historic and Powertech-generated drill hole information on the project. This resource evaluation was completed in April 2012. The evaluation consisted of two phases: 1) indentifying, correlating and mapping individual roll fronts within the Inyan Kara Group sandstones and 2) completing GT contouring of all uranium mineralization encountered in each roll front.

This first phase of this effort identified six roll fronts (mineralized trends) within sandstones of the Fall River Formation and seven fronts within sandstones of the Lakota Formation within the project area. The next step in this evaluation process was the GT contouring of all identified resources. Finally, the categorization of these identified resources was performed through a strict application of criteria and definitions presented in the **CIM Definition Standards for Mineral Resources and Mineral Reserves**, dated November 22, 2005. At the present time, there are no known legal, political or environmental risks in the Aladdin area that would affect the potential development of these mineral resources.

#### **14.1 GT Contouring**

For the ISR industry, GT contour mapping is the accepted method of resource calculation, as well as for well field mining design and injection well and extraction well lay-out. This mapping method has been proven accurate and reliable from the actual recovery of uranium from the numerous projects that have completed mining with the ISR technique. A grade cutoff is dependent on the uranium price. The higher the price of the commodity, the lower the grade that can be economically extracted. In the case of ISR, the minimum grade that is normally considered for economic recovery is 0.02% U<sub>3</sub>O<sub>8</sub>. GT is a summary of mineralization, based on the grade multiplied by the thickness of a mineralized intercept. After extensive subsurface correlation of mineralized sandstone units to

determine geologic continuity, a listing of all mineralized intercepts for individual sandstone units was developed

Mineralized intercepts that met or exceeded a GT of 0.2 (an established industry-wide economic cutoff) were placed on drill hole maps. Hand-drawn contouring of the GT values was then performed. Standard extrapolation techniques were used in the contouring process, along with the incorporation of some geologic interpretation. This interpretation took the physical characteristics of a roll-front uranium deposit into consideration, allowing for the projection of contour lines along the trend of the observed oxidation/reduction boundary. Individual contour lines were drawn for GTs of 0.20, 0.40, 0.60, etc. The resulting GT contour map provides an excellent representation of the distribution of uranium grades and delineates the roll-front within each resource area.

For each resource area, the first step in estimating resources was to calculate areas (in square feet) between each GT contour line. AutoCAD® mapping software was used for this purpose. Resources were calculated by multiplying the area of each interval enclosed by the GT contours by the average GT of that interval and a tonnage factor and dividing by the density factor of 16 cu ft/ton ( $\text{Avg. GT} \times \text{Area in Sq ft} \times 20 / 16 \text{ cu ft/ton} = \text{lbs U}_3\text{O}_8$ ). All individual interval resources were summed to determine a total for each resource area. Spreadsheets for these calculations were maintained.

#### **14.2 CIM Definition Standards**

To categorize these GT contoured-resources, criteria from the CIM Definition Standards were applied to each resource area. The GT contour maps (and the drill hole data from which they were prepared) were the primary focus of the resource classification effort. The CIM Definition Standards state that a mineral resource is known, estimated or interpreted from specific geological evidence and knowledge. A resource is further sub-divided into categories based on increasing geological confidence, such that inferred resources have a lower level of confidence than that applied to an indicated resource. An indicated resource has a higher level of confidence than inferred resources but has a lower level of confidence than a measured resource. CIM resource definitions are as follows:

**Inferred Mineral Resource** - An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

**Indicated Mineral Resource** - An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

**Measured Mineral Resource** - A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

### **14.3 Key Assumptions**

To complete the categorization process, the results of the historic and confirmation drilling were examined to demonstrate that the uranium mineralization at Aladdin was consistent with the CIM resource definitions. As previously discussed in **Section 8.0 - Deposit Types**, uranium mineralization within the project area fits a sandstone roll-front uranium model and the host sandstone were deposited within a fluvial depositional system. Based on industry knowledge of this roll front deposit model, key assumptions can be made concerning the predictability of uranium resources along mineralized trends. At Aladdin, the GT contoured-resources exhibited excellent geological and grade continuity and established a level of confidence for the resource areas.

**Geologic Continuity** – Specific geologic data were reviewed for each resource area (GT contour map) to confirm that the mineralization is consistent with a sandstone roll-front deposit model within fluvial channel sandstones. Sufficient drill hole electric and geologic lithology logs were reviewed for each area to determine the presence of a consistent mineralized oxidation/reduction (redox) boundary in the subsurface. At the same time, drill hole data within the project were reviewed to gain an understanding of the identification and correlation of stratigraphic units in the subsurface. Cross sections were developed and reviewed, along with a review of existing isopach maps, to demonstrate the



presence of individual, mappable continuous host sandstones. The character of the electric logs (specifically the resistivity and self potential curves) were reviewed and found to demonstrate sufficient permeability and porosity of host sandstones to allow movement of mineralized solutions. In addition, these electric logs also indicated the presence of low permeability clay beds above and below the host sandstones to act as confining units. All this data confirmed the presence of uranium mineralization within a geologic environment that is continuous throughout the project area.

**Grade Continuity** – Again, the confirmation that Aladdin mineralization is associated with sandstone roll front deposits is an important factor in establishing grade continuity of the resources. In a roll front deposit, the continuity of the grade of a deposit or resource area is directly related to the mineralized redox boundary. Uranium mineralization in a roll front deposit has a readily identifiable elongated, crescent-shaped configuration. The “points” of the crescent are within the oxidized portion behind the redox boundary. The highest grade portion of the mineralization is found in the center of the crescent at the redox boundary or the “front”. The length of a deposit or resource area is roughly parallel to the redox boundary and can have a length of a few hundreds of feet to a few thousands of feet. The width of a resource is at a right-angle to the redox boundary and will measure from a few tens of feet to a few hundreds of feet. Cross sections drawn or reviewed by the author within all resource areas illustrated the presence of roll front uranium and the continuity of uranium mineralization along redox boundaries within sandstone units. Drill hole data gathered on the Aladdin Project demonstrates that the grades of uranium mineralization within these roll front deposits are both continuous and predictable.

**Drill Hole Density** – As discussed previously, the width of the concentrated uranium along roll fronts within the Aladdin Project averages approximately 50-75 feet. This width of mineralization is important in determining if drill holes that are spaced closely enough to confirm both geological and grade continuity - assuring that resource classifications meet CIM definition standards. In considering the nature of roll front mineralization on the Aladdin Project, drill hole spacing within an Indicated Resource area must be at a density such that each mineralized drill hole has an area of influence ranging from 5,000 to 22,500 sq. ft. The area of influence of mineralized drill holes for an Inferred Resource area increases to a range of 22,500 to 60,000 sq. ft. Although there are currently no resources on the project that can be classified as Measured Resources, the area of influence of mineralized drill holes for this classification would be 5,000 sq ft or less.

#### **14.4 Mineral Resource Estimates**

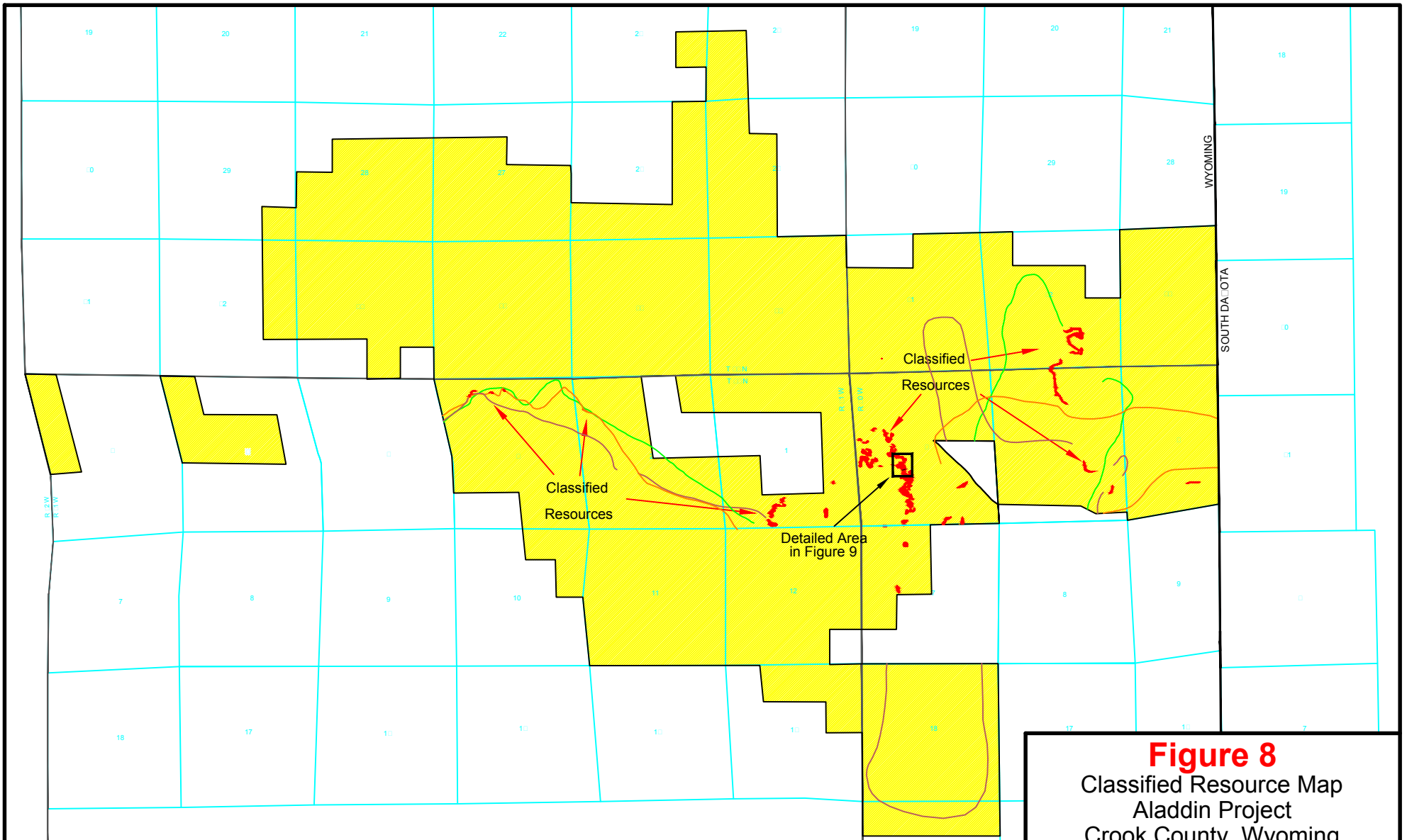
Uranium resources have been calculated for multiple, stacked mineralized sandstone units throughout the Aladdin Project. To date, subsurface mapping has identified six individual sandstones in the Fall River Formation and seven sandstones in the Chilson Member of the

Lakota Formation. All thirteen sand units contain oxidation/reduction boundaries and are mineralized. For the purpose of this report, resources have been delineated for the mineralized trends within each of these sand units.

Resources have been classified as Indicated or Inferred by incorporating the drill hole density definitions described above. Separate classified resource totals were calculated for all Fall River Formation and underlying Lakota Formation fronts at a 0.20 GT cut-off and a 0.40 GT cut-off. A 0.20 GT cut-off was used to present appropriate resources consistent with industry standards and current ISR operations. Resources using this cut-off are recommended for reporting purposes. A 0.40 GT cut-off was used to highlight areas of higher mineralization, to be used in lower cost economic analyses. Radiometric intercepts that met or exceeded 0.02%  $U_3O_8$  and were of sufficient thickness to yield a minimum GT of 0.2 were included in the calculations. For a 0.20 GT cut-off, resources were calculated by multiplying the areas enclosed by the 0.20 GT contour (in square feet) by the average GT times 20 (tonnage factor) and dividing by the density factor of 16 cu ft/ton - (Avg. GT x Area in Sq ft x 20)/16 cu ft/ton = lbs  $U_3O_8$ ). For a 0.40 GT cut-off, the area enclosed by the 0.40 contour (in square feet) was incorporated into the same formula as described above.

Close-spaced exploratory drilling, sufficient to outline classified resources, has been completed along approximately only 20% of the project area. **Figure 8** shows the locations of these classified resources along mineralized trends at various locations throughout the project area. Only three of the project's thirteen mineralized trends are illustrated on this figure in order to highlight the classified resource areas. **Figure 9** is an example GT contour mapping of the L3U front in Section 6, T54N, R60W.

As summarized in **Table 2**, this resource mapping effort resulted in identifying Powertech's Inferred and Indicated uranium resource total at a 0.20 GT cut-off within the Aladdin Project area. The depth to the top of these resources ranged from 100 to 530 feet below ground surface (bgs). These are excellent depths for the development of In-situ Recovery (ISR) of uranium – deep enough to have a good column of water over the mining interval, yet shallow enough to keep the cost of well development low.



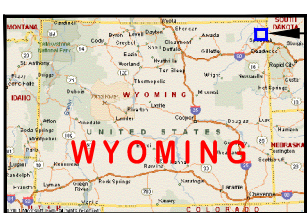
**Figure 8**  
 Classified Resource Map  
 Aladdin Project  
 Crook County, Wyoming

State Plane-NAD 27

DRAWN BY F. Lichnovsky

DATE 11-Jun-2012

FILENAME □ 101 Resources

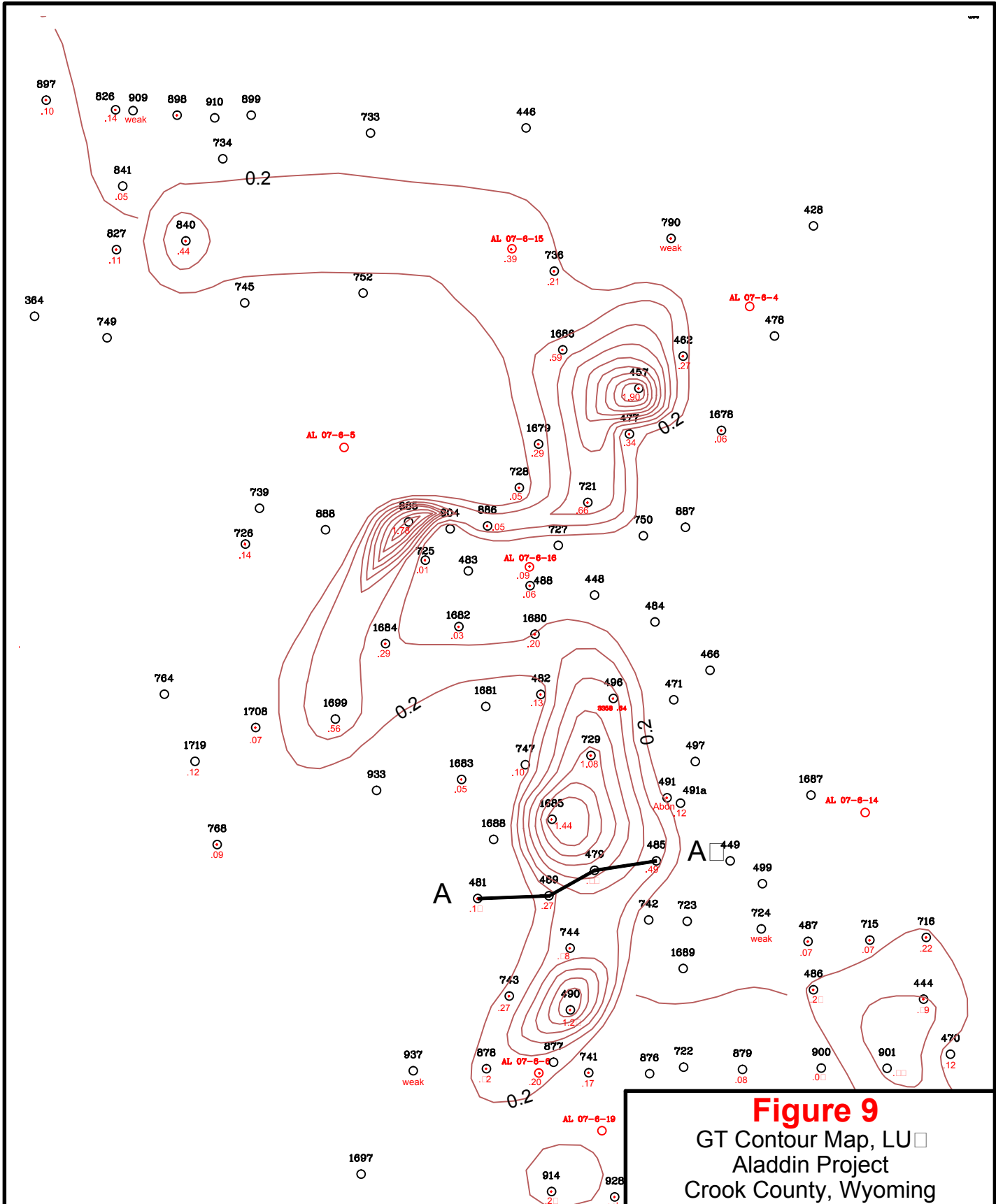


Map Location

LEGEND

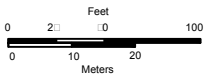
- Powertech Leases
- L1U
- L2L
- LCU





Map Location

Contour Interval 0.2 GT



**Figure 9**  
 GT Contour Map, LU □  
 Aladdin Project  
 Crook County, Wyoming

State Plane NAD 27	
DRAWN BY	F. Lichnovsky
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**Table 2: Total Indicated and Inferred Resources at 0.20 GT Cut-Off**

<b>TOTAL INDICATED RESOURCES AT 0.20 GT CUT-OFF</b>			
	Tons	Average Grade	Pounds (U <sub>3</sub> O <sub>8</sub> )
Fall River	61,575	0.12 %	147,778
Lakota	404,657	0.11 %	890,245
<b>Total Project</b>	<b>466,232</b>	<b>0.111 %</b>	<b>1,038,023</b>

<b>TOTAL INFERRED RESOURCES AT 0.20 GT CUT-OFF</b>			
	Tons	Average Grade	Pounds (U <sub>3</sub> O <sub>8</sub> )
Fall River	37,557	0.12 %	90,136
Lakota	5,064	0.11 %	11,119
<b>Total Project</b>	<b>42,611</b>	<b>0.119 %</b>	<b>101,255</b>

As summarized in **Table 3**, this resource mapping effort also resulted in identifying Powertech's Inferred and Indicated uranium resource total at a higher 0.40 GT cut-off within the Aladdin Project area.

**Table 3: Total Indicated and Inferred Resources at 0.40 GT Cut-Off**

<b>TOTAL INDICATED RESOURCES AT 0.40 GT CUT-OFF</b>			
	Tons	Average Grade	Pounds (U <sub>3</sub> O <sub>8</sub> )
Fall River	19,349	0.19 %	73,527
Lakota	150,209	0.16 %	480,668
<b>Total Project</b>	<b>169,558</b>	<b>0.163 %</b>	<b>554,195</b>

<b>TOTAL INFERRED RESOURCES AT 0.40 GT CUT-OFF</b>			
	Tons	Average Grade	Pounds (U <sub>3</sub> O <sub>8</sub> )
Fall River	9,938	0.19 %	37,766
Lakota	1,517	0.16 %	4,854
<b>Total Project</b>	<b>11,455</b>	<b>0.186 %</b>	<b>42,620</b>

In addition to the Inferred and Indicated resources listed above, Powertech's comprehensive geologic evaluation has identified favorable areas where significant additional potential pounds of uranium maybe discovered within the project area. This potential is based on the application of roll front deposit model characteristics to the mineralized trends identified throughout the Aladdin Project. As previously discussed,

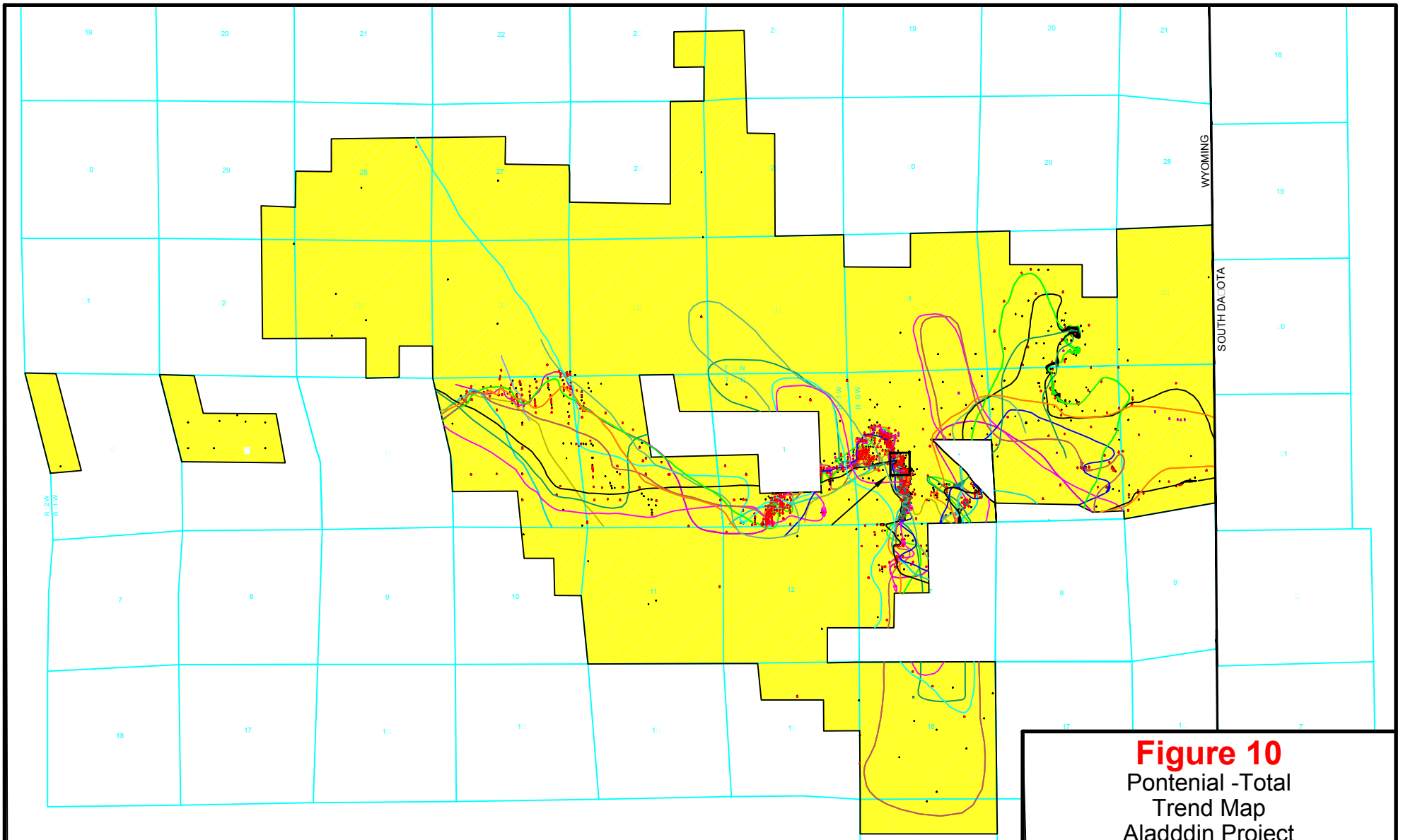
subsurface mapping delineated thirteen mineralized trends within sandstone units of the Fall River Formation and the Chilson Member of the Lakota Formation. This potential may be developed within the project area where drilling has identified mineralized trends but it is of insufficient density to delineate classified resources.

Resource-grade uranium mineralization is never found to be present continuously along the entire length of a roll front (mineralized trend). An examination of closely-spaced drilling areas at Aladdin indicates that resource-grade uranium, at a 0.20 GT cut-off, occurs along approximately 60% of the mineralized trend. Therefore, in the estimation of potential, a range of lengths of mineralized trends outside of densely drilled areas were assumed to vary from 50% to 70% of the total trend length. As shown in **Figure 10**, the thirteen mineralized trends are mapped throughout the Aladdin project area. The total length of these trends is approximately 400,000 linear feet. The average grade thickness (GT) of the classified uranium resources at Aladdin, using a 0.20 GT cut-off, ranged from 0.37-0.41. For this reason, in the estimation of potential for the project area, an average GT of 0.40 was used. Also used in this estimation was a range of widths of resource-grade mineralization of 50-75 feet and a tonnage factor of 16 cu. ft./ton.

These variables were input into the previously described formula used for the calculation of the classified resources. Using a GT cut-off of 0.20, a range of potential was determined to be 5.0 to 11.0 million pounds of uranium, averaging 0.11% - 0.12%  $U_3O_8$ . The grade and quantity of this potential is conceptual in nature. There has been insufficient exploration within the portions of the Aladdin Project that contain this potential to define a mineral resource. It is uncertain if further exploration in the areas of this potential will result in the delineation of mineral resources.

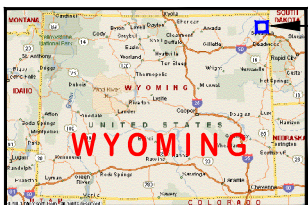
## **15.0 ADJACENT PROPERTIES**

There are no active uranium projects or operating uranium mines near the Aladdin Project area. In the 1970s, there was exploratory drilling on adjacent properties, but there has been no further activity in the past thirty years. The nearest active uranium project is the Busfield Project located approximately 35 miles to the west in western Crook County, WY. Bayswater Uranium Corp. operates this exploration project. An in situ recovery (ISR) mine is presently operating near Crawford, Nebraska and other ISR mines are operating at the Smith Ranch Project and Willow Creek Project in the Powder River Basin of Wyoming.



**Figure 10**  
 Pontenial -Total  
 Trend Map  
 Aladdin Project

Crook County ,Wyoming  
 State Plane NAD 27



Map Location

LEGEND

- |     |  |     |  |
|-----|--|-----|--|
| F1U |  | L1L |  |
| F2L |  | L1U |  |
| F2U |  | L2L |  |
| F1L |  | L2U |  |
| F1U |  | L1L |  |
| F1L |  | L1U |  |
| F1U |  | L1U |  |



DRAWN BY F. Lichnovsky

DATE 12-Jun-2012

FILENAME  
 101 Resources with exhibits



## **16.0 OTHER RELEVANT DATA AND INFORMATION**

Pertinent data concerning the uranium deposits in the Aladdin Project are bound to exist in other data storage. Over the years, several uranium exploration companies and numerous individuals were involved in the ongoing project in the area. Any additional data would have increased the confidence level of existing geologic interpretations but it is not likely that any data could be in existence that could detract from the conclusions presented.

## **17.0 INTERPRETATION AND CONCLUSIONS**

After a careful review of all historical data obtained from Teton Exploration and all newly-generated data by Powertech used to evaluate the uranium resources of the Aladdin Project, it is concluded that the data and reporting were sufficient and accurate. Additional drilling will be necessary to establish the entire potential of undiscovered uranium resources within the regional project area.

As the project progresses, more geologic data, along with environmental background data collection will be completed for the site. This information, along with hydrological characteristics and proposed operational plans for the project area must be assembled into required permit applications and submitted to the appropriate regulatory authorities for review.

## **18.0 RECOMMENDATIONS**

A two-phased exploration program is recommended for the Aladdin Project.

### **18.1 Phase 1**

Because of the 5-11 million pound potential associated with this project, it is important to evaluate and assess the areas containing this potential. A recommended first phase exploration program would be directed toward drilling fences of drill holes across the mapped mineralized trends in areas with no close-spaced drilling. These drill hole fences would be drilled normal to the mineralized trends and have drill hole spacing as close as 50-feet. This is necessary due to the fact that the expected width of resource-grade uranium mineralization is 50-75 feet.



It is estimated that 16 drill hole fences would provide an excellent sampling of these trends at approximately ½ mile intervals across the project area. 250 drill holes would be required to complete this assessment. Assuming an average drill hole depth of 400 feet, the total drill footage for this program would be 100,000 feet. This program will help to quantify the validity of the potential estimate for the project and identify areas for more detailed exploration. Based on the results of this program, a second phase exploration program would be recommended.

A summary breakdown of costs for this program would be:

Drilling	\$500,000
Logging	\$ 80,000
Geology	<u>\$ 40,000</u>
	<b>\$620,000</b>

## 18.2 Phase 2

A second phase follow-up detailed exploration drilling program is recommended for a portion of the potential area found to contain resource-grade uranium mineralization in the initial drilling phase. This detailed drilling program would be directed toward a statistical evaluation of resources. It is a well-recognized evaluation technique used in sedimentary uranium resource estimation that statistically estimated resources provide a boundary for a global estimate upon which scoping economics can be determined. It is estimated that 60 drill holes will be required to complete a delineation program for a specified resource area. Assuming an average depth of 400 feet, the total drill footage for this phase would be 24,000 feet. It is also recommended to complete a minimum of four core holes, in order to obtain chemical uranium values for the resource areas. Based on the results of this exploration phase, an overall exploration program for the project could be designed to delineate total classified mineral resources and estimate production economics.

A summary breakdown of costs for this program would be:

Drilling	\$120,000
Coring	\$ 10,000
Logging	\$ 20,000
Analyses	\$ 6,000
Geology	<u>\$ 20,000</u>
	<b>\$176,000</b>

## 19.0 REFERENCES

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## 20.0 SIGNATURE PAGE

The accompanying report titled “**Technical Report on the Aladdin Uranium Project, Crook County, Wyoming**” and dated effective June 22, 2012 (the “Report”) was prepared by Jerry D. Bush, Certified Professional Geologist. Mr. Bush supervised the preparation of the report and is responsible for all of the information in the Report.

The effective date of this technical report is June 21, 2012.

Signed and dated this 22<sup>nd</sup> day of June, 2012.



Jerry D. Bush Certified Professional Geologist – No. 03574

