

**JUNIPER RIDGE URANIUM PROJECT**  
**CARBON COUNTY, WYOMING,**  
**USA**

**AMENDED and RESTATED**  
**NI 43-101 MINERAL RESOURCE AND**  
**PRELIMINARY ECONOMIC**  
**ASSESSMENT**  
**TECHNICAL REPORT**

**PREPARED FOR:**

**URZ Energy Corp.**

**AUTHORED BY:**

**BRS Inc.**

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**Principal Engineer**

**AND**

**Terence P. (Terry) McNulty, P.E., D. Sc.**

**T. P. McNulty and Associates Inc.**

**Effective Date: June 9, 2017**

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# SIGNATURE PAGE AND CERTIFICATE OF QUALIFIED PERSON

DOUGLAS L. BEAHM

I, Douglas L. Beahm, P.E., P.G., do hereby certify that:

1. I am the Principal Engineer and President of BRS, Inc., 1130 Major Avenue, Riverton, Wyoming 82501.
2. I am the author of the report titled "JUNIPER RIDGE URANIUM PROJECT, CARBON COUNTY, WYOMING, USA – AMENDED and RESTATED NI 43-101 MINERAL RESOURCE TECHNICAL REPORT AND PRELIMINARY ECONOMIC ASSESSMENT" and dated June 9, 2017 (The Technical Report).
3. I graduated with a Bachelor of Science degree in Geological Engineering from the Colorado School of Mines in 1974. I am a licensed Professional Engineer in Wyoming, Colorado, Utah, and Oregon; a licensed Professional Geologist in Wyoming; and Registered Member of the SME.
4. I have worked as an engineer and a geologist for over 40 years. My relevant work experience includes: uranium exploration, mineral resource estimation, mine production, and mine/mill decommissioning and reclamation. Specifically, I have worked with uranium projects hosted in sandstone environments in Wyoming intermittently since 1975 including direct work experience at Juniper Ridge from 1982-1986, and in 1988.
5. I was last present at the site on December 14, 2016 and was also present during the confirmation drilling program on August 16, 2011.
6. I am responsible for all sections of the Technical Report with the exception of Sections 13 and 17.
7. I am independent of the issuer as described in Section 1.5 of National Instrument 43-101 Standard of Disclosure for Mineral Reports (NI 43-101).
8. I have prior working experience on the property as stated in the report. Specifically, I have completed drilling, mine planning and economic studies for three past operators and was the project manager of the project for four years from 1982-1986.
9. I have read the definition of “qualified person” set out in NI 43-101 and certify that for those sections of the Technical Report that I am responsible for preparing, I am a “qualified person” for the purposes of NI 43-101.
10. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with same.
11. As of the date of this report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9 June, 2017

*Signed and Sealed*

Douglas L. Beahm, P.E.

## SIGNATURE PAGE AND CERTIFICATE OF QUALIFIED PERSON

TERENCE P. McNULTY

I, Terence P McNulty, D. Sc., P.E., do hereby certify that:

1. I am the co-owner and President of T. P. McNulty and Associates, Inc. located at 4550 North Territory Place, Tucson, AZ 58750-1855
2. I am co-author of the report titled "JUNIPER RIDGE URANIUM PROJECT, CARBON COUNTY, WYOMING, USA – AMENDED and RESTATED NI 43-101 MINERAL RESOURCE TECHNICAL REPORT AND PRELIMINARY ECONOMIC ASSESSMENT" and dated June 9, 2017 (The Technical Report).
3. I obtained with a Bachelor of Science degree in Chemical Engineering from Stanford University in 1961, a Master of Science degree in Metallurgical Engineering from Montana School of Mines in 1963, and a Doctor of Science degree from Colorado School of Mines in 1966. I am a Registered Professional Engineer in the State of Colorado (License # 24789) and a Registered Member (# 2,152,450RM) of the Society of Mining, Metallurgy, and Exploration, Inc.
4. I have worked as a metallurgical engineer for a total of 51 years, including years worked between degrees. My relevant experience for the purpose of the Technical Report is as follows:
  - a. I have worked as a consultant on 27 uranium projects during the last 8 years and have contributed to NI 43-101 compliant studies for many of those;
  - b. I was Manager of Corporate R&D and Technical Services for a large diversified mining firm, The Anaconda Company, which was a major uranium producer.
5. I have not visited the site.
6. I am responsible for all of Sections 13 and 17 and relevant portions of Sections 1, 25 and 26 of this Technical Report.
7. I am independent of the issuer as described in Section 1.5 of National Instrument 43-101 Standard of Disclosure for Mineral Reports (NI 43-101).
8. My prior involvement on this property is limited to the 2014 PEA referenced in the report.
9. I have read the definition of "Qualified Person" set out in NI 43-101 and certify that for those sections of the Technical Report that I am responsible for preparing, that I am a "Qualified Person" for the purposes of NI 43-101.
10. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with same.
11. As of the date of this report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9 June, 2017

***Signed and Sealed***

Terence P. McNulty, D Sc., P.E.

## Section 1 - Summary

This Technical Report was prepared by BRS Inc. (BRS) and T. P. McNulty and Associates for URZ Energy Corp. and provides an updated mineral resource and preliminary economic assessment (PEA) for the Juniper Ridge Uranium Project (Juniper Ridge or Project). The report was prepared by Douglas L Beahm, P.E, P.G. and Dr. Terence McNulty, P.E.: who are independent “Qualified Persons” as defined by National Instrument 43-101, Standards of Disclosure for Mineral Projects (NI 43-101).

The Project is located in the southwest portion of the state of Wyoming, USA, located 6 to 10 miles west of the town of Baggs, Wyoming, within a small enclosed subsidiary basin on the southeast flank of the Washakie Basin at approximately 41° 02' 30" North Latitude, 107° 46' West Longitude. The Project is accessible via 2-wheel drive on existing county and two-track roads.

The mineral property on which the Project is located is owned by UCOLO Exploration Corp. (UCOLO), a Utah corporation, and a wholly-owned subsidiary of URZ Energy Corp. (URZ), collectively “URZ”. As of the date of this Report, URZ is undertaking its initial public offering to become a public company whose shares will be traded on the TSX Venture Exchange.

The mineral rights associated with the property include 130 unpatented lode mining claims and one Wyoming State Mineral Lease. In total, these holdings comprise approximately 3,326 acres. Surface land ownership consists of federal lands administered by the United States Bureau of Land Management (BLM) and private lands (the Property).

Uranium was first discovered in this area in 1951, and commercial uranium mining occurred intermittently from 1954 until 1966. Seven companies mined uranium from twelve open pits and two shallow underground mines. During this time a total of 156,000 tons of material with an average grade of 0.172%  $U_3O_8$  were mined resulting in production of 536,000 pounds of uranium (Pincock, Allen, & Holt, 1978).

Uranium mineralization in the Browns Park Formation within the project and surrounding area is described as Wyoming sandstone roll-type mineralization (Austin and D'Andrea, 1978). Uranium mineralization occurs within an eolian stratigraphic unit of the Miocene Browns Park Formation. Depth of mineralization averages slightly over 100 feet but ranges from near surface to a maximum of 292.5 feet, depending on location within the basin and local topography. Two general areas of mineralization occur within the Project, separated by less than 2 miles, which are herein referred to as Juniper Ridge East and Juniper Ridge West.

The deposit is relatively flat lying with formation dip less than 5 degrees. The dip of the formation is highest at the margins of the basin and flatter near the center of the basin. The average thickness of mineralization above a 0.02%  $eU_3O_8$  cutoff grade is slightly in excess of 10 feet.

Currently, available drill data consists of radiometric equivalent data (eU<sub>3</sub>O<sub>8</sub>) for 2,167 drill holes and USAT assay data for 400 drill holes completed during the 2011 drilling program. For the 2012 drilling program, radiometric equivalent data was collected for all drill holes. In addition, for drill holes with significant mineralization Prompt Fission Neutron (PFN) assay data was collected (40 of 149 drill holes). Thus, the current database consists of 2,716 drill holes.

The primary resource estimation method utilized in this report is the Grade Thickness (GT) contour method. This method is appropriate for this type of deposit. Evaluation of radiometric equilibrium was based on 258 drill holes, with natural gamma and USAT data, completed in 2011 which met the cut-off criteria utilized in the mineral resource estimation. For the purposes of assessing the overall mineral resources for the Project, it is considered appropriate that no correction for radiometric equilibrium be applied.

Based on drill density and verification drilling completed in 2011 and 2012, which demonstrates the continuity and quality of the mineralization as reflected by the GT contour model of the mineralization, and additional data verification procedures performed by the authors, as explained in Section 12 of this Technical Report, the mineral resource estimate meets the criteria for either Indicated Mineral Resources, as shown in Table 1.1, or Inferred Mineral Resources, as shown on Table 1.2, in accordance with the Canadian Institute of Mining, Metallurgy, and Petroleum (“CIM”) Definition Standards for Mineral Resources and Mineral Reserves, dated May 10, 2014, (“CIM Definition Standards 2014”) and as further discussed in Section 14 of this Technical Report.

**Table 1.1 Indicated Mineral Resource Summary**

Indicated Resource	Juniper Ridge West		
GT Cut-off (ft x wt%)	(base case) 0.1	0.25	0.5
Pounds eU <sub>3</sub> O <sub>8</sub>	800,000	718,000	561,000
Tons	605,000	461,000	317,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.066	0.078	0.088
Indicated Resource	Juniper Ridge East		
GT Cut-off (ft x wt%)	0.1	0.25	0.5
Pounds eU <sub>3</sub> O <sub>8</sub>	5,206,000	4,583,000	3,321,000
Tons	4,534,000	3,559,000	2,339,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.057	0.064	0.071
Indicated Resource	<b>PROJECT TOTAL</b>		
GT Cut-off (ft x wt%)	(base case) 0.1	0.25	0.5
<b>Pounds eU<sub>3</sub>O<sub>8</sub></b>	<b>6,006,000</b>	<b>5,301,000</b>	<b>3,882,000</b>
Tons	5,139,000	4,020,000	2,656,000
Average Grade% eU <sub>3</sub> O <sub>8</sub>	0.058	0.066	0.073

**Table 1.2 Inferred Mineral Resource Summary**

Inferred Mineral Resource	Juniper Ridge West
GT Cut-off (ft x wt%)	0.1
Pounds eU <sub>3</sub> O <sub>8</sub>	117,000
Tons	83,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.071
Inferred Mineral Resource	Juniper Ridge East
GT Cut-off (ft x wt%)	0.1
Pounds % eU <sub>3</sub> O <sub>8</sub>	65,000
Tons	24,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.133
<b>Inferred Mineral Resource</b>	<b>PROJECT TOTAL</b>
GT Cut-off (ft x wt%)	0.1
<b>Pounds eU<sub>3</sub>O<sub>8</sub></b>	<b>182,000</b>
Tons	107,000
Average Grade eU <sub>3</sub> O <sub>8</sub>	0.085

Mineral resources were estimated using a cut-off grade of 0.02 % eU<sub>3</sub>O<sub>8</sub> for the base case (Refer to Section 14 for discussion of cut-off grade). The effective date of the mineral resource estimate is June 9, 2017. The last date for which sample data was collected was January 18, 2012. The base case for estimated mineral resources as highlighted in Table 1.1 and Table 1.2 is the 0.1 GT cutoff as discussed on Section 14 of this Technical Report.

The Preliminary Economic Assessment (PEA) in this Technical Report considers open pit mining in conjunction with on-site heap leach recovery, producing an intermediate uranium concentrate in the form of loaded resin which would be shipped to a third party Central Processing Plant (CPP). The 2014 PEA (Beahm and McNulty, 2014) presumed shipment of resin to EFR's White Mesa Mill, Blanding, Utah facility for final processing which still could provide this service, however, other facilities such as Cameco's Smith Ranch uranium recovery facility in Wyoming are also receiving resin for final processing (Beahm and Goranson, 2015). Given the assumptions described herein, the PEA demonstrates a positive return on investment. Further studies may also consider alternatives of on-site upgrading with off-site processing. The author does not consider In Situ Recovery (ISR) practical for this project due to geohydrological conditions.

PEA highlights are summarized in Table 1.3.



**Table 1.3 PEA Highlights**

Life of Mine	10 years
Capex	\$36.7 M
Total Direct Cost per lb U produced	\$39.77
Assumed Uranium price	\$65.00/lb
Pre-tax IRR	26%
Post-tax IRR	22%
Pre-tax NPV @8% discount rate (x1000)	\$27,349
Post-tax NPV @8% discount rate (x1000)	\$19,908
Payback period	3 years after start of construction
<b>Tons Included in PEA Mine Plan</b>	
Indicated	3,978 ktons @ 0.064% eU <sub>3</sub> O <sub>8</sub> grade
Inferred	25 ktons @ 0.133% eU <sub>3</sub> O <sub>8</sub> grade
Average Process Recovery	84.5%
Strip Ratio (Tons waste:Tons processed)	15.4 : 1

The results of the PEA represents forward-looking information and actual results may vary from what is presented. The PEA is based on open pit mining and heap leach extraction of uranium, utilizing methodologies, equipment, and a conceptual mine design that was employed at the site in the past and on similar sites. The material factors used to develop the forward-looking information are discussed in the relevant sections of the Technical Report and the risk factors that could cause actual results to differ from the forward-looking information are identified in Section 26 of the Technical Report. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. The PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the PEA will be realized.

The Project is located in an area which has been mined in the past. In addition, the most similar known uranium deposit, the Maybell project, was also mined in the past producing over 5 million pounds of uranium (Albretsen and McGinley 1982). It is the author's opinion that the Project is best suited to conventional open pit mining, heap leach recovery, in concert with either on-site beneficiation or upgrading with off-site processing of a concentrate. To the author's knowledge, there are no conditions of a political or environmental nature that would preclude the development of the Project provided that all applicable state and federal regulations are met.

Mine development would require a number of permits depending on the type and extent of development. The major permits being the mining permit issued by the State of Wyoming Department of Environmental Quality, Land Quality Division, and the Plan of Operations approved by the BLM. Mineral processing for uranium would require a source materials license from the US Nuclear Regulatory Commission. These environmental permits have not been applied for. It is likely that an Environmental Impact Statement (EIS) would be required to obtain these permits.

## ***Recommendations***

Recommendations are broadly divided into the following categories: drilling, metallurgical studies, preliminary feasibility studies, and baseline studies necessary to bring the project to allow a feasibility study to be completed. The recommended work should proceed in phases and Phase 2 recommendations may be amended based on results.

The recommendations reflect the Authors' opinion as to the approximate costs for preliminary feasibility study work. It is the Author's recommendation that Phase 1 in the advancement of the project would be delineation and exploration drilling according to the drilling plan, as discussed in Section 26. The estimated cost of this program including reporting, and an update of the Mineral Resource estimates for this area, is US\$620,000, as summarized in Tables 1.4 and 1.5.

**Table 1.4 Recommendations, Delineation Drilling**

<b>Expense Category</b>	<b>Scope of Services</b>	<b>Estimated Cost</b>
Delineation Drilling	Confirmation and delineation Juniper Ridge West 25 holes; 4,000 feet	\$40,000
Delineation Drilling	Main Resource Area - 200 holes; 32,000 feet.	\$320,000
Resource Update	Update existing resource estimate	\$40,000
Total Estimated Cost		\$400,000

**Table 1.5 Recommendations, Exploration Drilling**

<b>Expense Category</b>	<b>Scope of Services</b>	<b>Estimated Cost</b>
Exploration Drilling	North Trend - 100 holes; 16,000 feet.	\$160,000
	North East Trend - 25 holes; 4,000 feet	\$40,000
Interpretations and Report	Summary Report	\$20,000
Total Estimated Cost		\$220,000

Depending on the results of the drilling program and market conditions, Phase 2, pre-feasibility work items as summarized in Table 1.6, for the Project would include:

**Table 1.6 Pre-Feasibility Work Items**

<b>Expense Category</b>	<b>Estimated Cost</b>
Drilling	\$560,000
Metallurgical Studies	\$316,000
Preliminary Feasibility Study	\$600,000
Baseline Studies	\$500,000
Total Estimated Cost	\$1,976,000

## Section 2 – Introduction

### Terms of Reference

This Technical Report was prepared for URZ. The purpose of this Technical Report is to support a current Mineral Resource estimate within the Juniper Ridge Project and to summarize a PEA based on those Mineral Resources. URZ intends to file this Technical Report in support of an Initial Public Offering with Canadian Securities Regulatory authorities, and to support a listing application with the TSX Venture Exchange.

This Technical Report is an update and revision of a previous NI 43-101 Technical Report, Juniper Ridge Uranium Project, Carbon County, Wyoming, USA dated January 27, 2014 which was prepared for Energy Fuels Inc. by BRS Inc. and T.P. McNulty and Associates Inc.

### Sources of Information

Specific reference material and Project data available to the author includes:

- Drill data acquired by URZ as part of the Project.
  - a) Pre-2011 data
  - b) 2011 drill data collected by Crosshair January 18, 2012.
  - c) 2012 drill data collected by Strathmore Resources August 8, 2013.
- Copies of reports and technical studies completed by former owners of the Project were used as general references. Specific data in these reports, including metallurgical recovery and lixiviant consumption, were considered by the Authors in the development of the parameters used in the PEA.
  - a) Pincock, Allen, & Holt, 1978
  - b) Pincock, Allen, & Holt 1986
  - c) Beahm, DL, 1982
  - d) Anctil, 1987

The assumptions stated in the PEA are based on a combination of publically available reference material cited herein, and the author's specific knowledge of the Project, US sandstone-type uranium mineralization in general, industry accepted practices for these types of deposits that are amenable to open pit mining and heap leach extraction. The basis for the assumptions are considered reasonable for a conceptual level of study.

Uranium mineralization in the Browns Park Formation within the Project and surrounding area is described as Wyoming sandstone roll-type mineralization (Austin and D'Andrea, 1978). The Mineral Resource estimation method utilized in this report is the GT contour method which is considered appropriate for this type of deposit.

Data for the project area consists of radiometric sampling (geophysical logging) from 5,423 drill holes in the vicinity of the property comprising 868,000 feet and more than 200 core holes with chemical analysis. Of this total, 4,871 holes were located on the previous mineral owner's land

holdings, the Agency General of International Petroleum (AGIP), an Italian State company (Pincock, Allen, & Holt, 1986). The drill data was stored on electronic media from which significant portions of the relevant data have been recovered.

Currently available drill data consists of radiometric equivalent data used in the mineral resource estimate (eU<sub>3</sub>O<sub>8</sub>) for 2,167 historical drill holes and radiometric equivalent data (eU<sub>3</sub>O<sub>8</sub>), USAT assay data for 400 drill holes completed during the 2011 drilling program, and radiometric equivalent data from 149 holes drilled in 2012 of which PFN assay data was collected for 40 of the holes with significant mineralization..

The database for the mineral resource estimate thus consists of drill data from 2,716 holes with radiometric equivalent data. . With respect to the drill data, the radiometric equivalent uranium grade data by ½ foot increments was provided by Century Geophysical on reel-to-reel magnetic tapes for 1,917 of the 2,167 drill holes (88%). All 2011 and 2012 radiometric equivalent uranium grade data was provided on-site in hard copy and electronically. Radiometric equivalent uranium grade data for the remaining 250 drill holes (9% of the total database) is in the form of mineralized intercept data from manual log interpretation. Of these 250 drill holes, 138 (55%) were above minimum cutoff. As shown on Table 10.1, 1,376 of the total drill holes or 51% were above cutoff and therefore within the mineral resource GT model. The barren and mineralized holes below cutoff were used to define the limits of the mineral resource.

The following is a brief list of terms and abbreviations used in this report:

Cy	cubic yard
eU <sub>3</sub> O <sub>8</sub>	radiometric equivalent U <sub>3</sub> O <sub>8</sub>
Ft	foot or feet
ft <sup>2</sup>	square foot
Wt%	weight percent
GT	grade thickness product
Lb	pound or pounds
Ton	short ton (2,000 lbs.)
tpd	tons per day

Douglas Beahm P.E, P.G. is the independent qualified person responsible for this preparation of this Technical Report and the mineral resource estimate herein. Mr. Beahm is a Qualified Person (QP) under National Instrument 43-101 (NI43-101), a Professional Engineer, a Professional Geologist, and a Registered Member of the Society of Mining, Metallurgy and Exploration Inc. (SME) with more than 40 years of professional and managerial experience. Mr. Beahm’s experience in US uranium dates from 1974 and includes exploration, mine development, mine production, and mine and mill sites reclamation.

## Personal Inspection of the Property

Mr. Beahm was present on site on August 16, 2011 when verification drilling was being conducted and last present on the site December 14, 2016. During the August 16, 2011 site visit the author reviewed drilling activities including, sampling of rotary cuttings, lithologic logging, geophysical logging, downhole deviation surveys, and surveying of drill hole locations using a sub-meter GPS. During the December 14, 2016 site visit Mr. Beahm confirmed that no material change in site conditions had occurred. At that time there were no active site activities. The county road accessing the site was well maintained and accessible. Mining claim monuments and reclaimed drill holes sites were observed. The only change in conditions was the partial reclamation of shallow historical open pit mines in the northern portion of the project by the Wyoming Abandoned Mine Lands Program (AML). The AML reclamation was funded through a tax on current coal mine production in Wyoming and does not impart any cost or liability to URZ. Mr. Beahm has past work experience on the project during the 1970's and 1980's while employed, directly and/or as a consultant, by Union Carbide Mining and Metals Division, AGIP Mining, and CoCa Mining. Mr. Beahm's past work on the project included the planning and execution of exploratory and delineation drilling programs, mineral resource estimation, mine planning, economic analysis, and project management.

Dr. McNulty did not make a recent visit to the site. Dr. McNulty's responsibilities in the preparation of this report were limited to Section 17, Recovery Methods. Dr. McNulty's recent experience with the extractive metallurgy of uranium includes providing services as a metallurgical consultant for 27 uranium projects in the past 8 years. Beginning in the 1960's, Dr. McNulty was involved in laboratory testing and process development for uranium resources being evaluated by Anaconda's exploration department, as well as providing technical services to the uranium operations. In the late-1970s, he had overall technical responsibilities for expansion of the Bluewater acid leaching plant in New Mexico from 3,000 tons per day to 7,000 and conversion from resin-in-pulp uranium recovery to counter current decantation and solvent extraction. Dr. McNulty is very familiar with the extractive metallurgy of sandstone hosted uranium deposits and is well qualified to address the requirements related to Section 17 of this report.

### Effective Dates:

- The effective date of this report is June 9, 2017.
- The effective date of the cost estimates and economic analysis is January 2, 2017.
- The effective date of the mineral resource estimation is June 9, 2017.
- The last date for which drill hole or other sample data was collected is January 18, 2012.

The initial mineral resource estimation for the Project was initially completed by the author on January 27, 2014 using the GT contour method an industry accepted method for this type of deposit. Subsequently, on May 10, 2014, CIM revised the CIM Definition Standards for Mineral

Resources and Mineral Reserves. The author has reviewed the revised CIM document and concludes the mineral resource estimates meet those revised definitions, are current, and are appropriate for use in PEA as further discussed in Section 14 of this Technical Report. All material information for the Project has been used in the current mineral resource estimate and therefore the effective date of the mineral resource is now considered to be June 9, 2017.

### **Section 3 – Reliance on Other Experts**

The Technical Report was prepared by BRS and T.P. McNulty and Associates Inc. and written under the direction of Douglas I. Beahm, P.E., P.G. and Dr. Terrence McNulty, P.E., D.Sc., both independent “qualified persons” for the purposes of NI 43-101.

BRS relied on the following information provided by URZ.

- Mineral ownership mapping showing the location of mineral leases and claims was provided by URZ January 3, 2017 along with a summary of the property acquisition included in Section 4. Mining claim status was checked on BLM LR2000 database and shown to be consistent with the information provided by URZ. BRS relied on the mineral ownership mapping and relevant details of the property acquisition.
- Property holding costs of \$22,070 per year provided by URZ. The holding costs consist of 130 mining claims at \$155/each per year, and the one state lease at \$3/acre (640 acres) per year. These cost were subsequently verified by BRS.

The qualified persons have fully relied upon, and disclaim responsibility for, information of the political, social and environmental risk of the Project by using information from the “Fraser Institute Annual Survey of Mining Companies 2016 (Feb. 2017). This information is used in Section 25 of the report.

The qualified persons have fully relied upon, and disclaim responsibility for, information of the status of and the vestment of record title to certain unpatented mining claims (collectively the “Claims”) and a State of Wyoming mineral lease of lands situated in Carbon County, Wyoming by using information from a letter on this subject matter dated May 12, 2017 from Ervin & Thompson LLP (Ervin & Thompson, 2017) to URZ energy Corp. Inc. This information is used in Section 4 of the report.

## **Section 4 – Property Description and Location**

### Location

The Property is located in southwest Wyoming, 6 to 10 miles west of the town of Baggs, within a small enclosed subsidiary basin on the southeast flank of the Washakie Basin, located at approximately 41° 02' 30" North Latitude, 107° 46' West Longitude.

### Mineral Rights

Mineral rights associated with the Property include 130 unpatented mining lode claims and one Wyoming State Mineral Lease. In total, these holdings comprise approximately 3,326 acres. Surface land ownership consists of federal lands administered by the BLM and private lands. Mineral ownership consists of federal minerals administered by the BLM and Wyoming State Lands. Parcels within the Project with private surface lands are a split estate, i.e., the mineral rights are federal while the surface rights are private. The state lease is for minerals only. The land surface within the state lease is federal.

Mining claims and mineral leases locations utilized in the development of the Property Map, Figure 4.1, are representative of the approximate location of the mineral holdings. A listing of the mining claims was obtained from the Wyoming BLM. Legal surveys of unpatented claims are not required and, to the author's knowledge, have not been completed.

Based on the BLM LR2000 online database, the Claims are active and in good standing until September 1, 2017. The owner of the Claims must pay the federal annual mining claim maintenance fees to BLM on or before September 1, 2017 (Ervin & Thompson, 2017).

Mineral leases and claims establish mineral rights for uranium and other valuable minerals. The location of the individual mining claims was not re-surveyed. Mineral lease 0-41095 (State of Wyoming) is valid through the 1st day of April, 2025 and is renewable.

The online records of the Office of State Lands and Investments of the State of Wyoming show that Ucolo Exploration Corp. is the lessee of Minerals Lease 0-41095 by assignment. The State of Wyoming Lease is subject to a two percent (2%) overriding royalty reserved by Strathmore Resources (US) Ltd. (Ervin & Thompson, 2017).

A portion of the mining claims were originally located by Miller and Associates in 2004 and transferred to Strathmore Resources (US) Ltd. in 2007; additional claims were also staked by Strathmore in 2007. The claims were subsequently conveyed to Crosshair Energy Corporation (Crosshair) in 2010. Details of that purchase agreement are provided in the Crosshair November 1st, 2010 News Release. Crosshair failed to complete the purchase arrangement and the property reverted to Strathmore in December of 2012. The previous agreement between Strathmore and Crosshair included a production royalty which is now null and void. Through its purchase of Strathmore in 2013, EFR controlled 100% of the Project prior to its sale of the Property to URZ



in October 2016. To the author's knowledge, no other royalties, agreements, or encumbrances exist on the Property other than the 2% royalty on the State of Wyoming mineral lease.

### Terms of Acquisition

On September 9, 2016, UCOLO, on behalf of URZ, entered into an Asset Purchase and Sale Agreement with Strathmore Resources (US) Ltd.(Strathmore), a wholly-owned subsidiary of Energy Fuels Inc., whereby the Company Purchased all of Strathmore's interests in the Juniper Ridge Property. The aggregate consideration, payable under the Asset Purchase and Sale Agreement, for the purchased assets purchased from Strathmore, including the Property, is as follows:

- (i) Pay to Strathmore US\$200,000 on closing (completed);
- (ii) Reimburse Strathmore for the BLM claim maintenance fees for 884 total claims in the amount of US\$137,020 due September 1, 2016 (completed);
- (iii) Replace all existing permit bonds of US\$63,000; and
- (iv) Pay to Strathmore US\$200,000 on the first anniversary of the closing date.

This transaction closed on October 31, 2016.

### Environmental Liabilities

Uranium was first discovered in this area in 1951 and commercial production of uranium took place from 1954 until 1966. Seven companies mined uranium from twelve open pits and two shallow underground mines, as is further discussed in Section 6, History.

In addition, one operator, the Shawano Development Corporation, attempted various methods of on-site mineral processing including mechanical upgrading and vat leaching with both acid and alkaline lixivants (Anctil, 1987). The historical mineral processing wastes associated with this operation were investigated under the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 and assigned a low priority (Albretsen and McGinley, 1982). In the late 1980's the Wyoming Department of Environmental Quality, Abandoned Mine Lands Division (AML) covered and reclaimed the Shawano mineral processing site in place.

Mining, both surface and underground, pre-dated the passage of the Wyoming Environmental Quality Act in 1973 and the Surface Mine Control and Remediation Act (SMCRA), August 3, 1977. In addition to reclaiming the Shawano mineral processing site, AML has conducted mine reclamation efforts within the Project area.

URZ has not completed an assessment of potential environmental liabilities on the Project. The State of Wyoming Department of Environmental Quality, Land Quality Division (WDEQ/LQD) does not hold a reclamation bond on the Property.

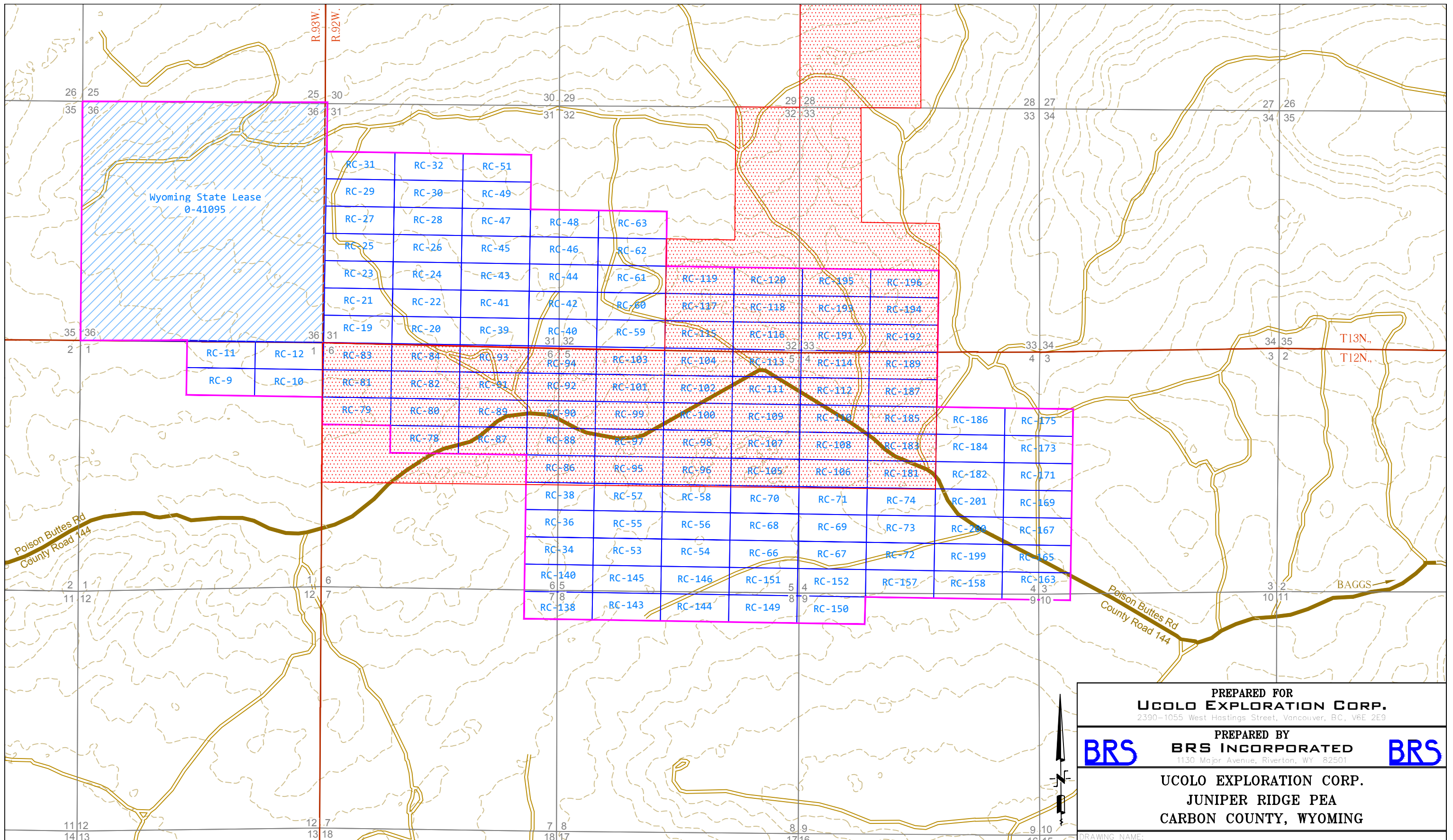
In order to conduct exploratory drilling of the property, a Drilling Notification (DN) from the State of Wyoming Department of Environmental Quality and the BLM will be required. These permits have been obtained successfully in the past and no issue is expected with obtaining new permits for the recommended drilling.

#### Other Factors

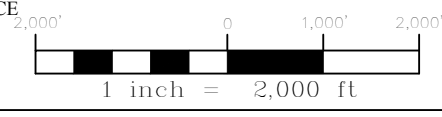
Within the general Project area and vicinity oil and gas wells and infrastructure exist. Currently the oil and gas wells and infrastructure are not in conflict with the known mineral resource areas. As federal lands are subject to multiple uses, there is a risk that future oil and gas development and/or related infrastructure could be in conflict with mineral development.

The mineral tenure of the Project is based on unpatented mining lode claims established through the US Mining Law of 1872. Changes in US mining law could affect mineral tenure. State Mineral Lease 0-41095 establishes the rights and requirements to mine that portion of the Property located on Section 36, T13N, R93W.

To the author's knowledge, there are no other significant factors that may affect access, title, or the right to perform the recommended work on the Property.



LEGEND		MINERAL OWNERSHIP		SURFACE OWNERSHIP	
	SECTION LINE		COUNT ROAD		PRIVATE SURFACE
	TOWNSHIP RANGE LINE		ACCESS ROAD		ALL OTHER LAND IS OIL AND GAS SURFACE
	EXISTING GROUND CONTOURS		MINING CLAIM		
	PROJECT AREA		STATE MINING LEASE		



PREPARED FOR <b>UCOLO EXPLORATION CORP.</b> <small>2390-1055 West Hastings Street, Vancouver, BC, V6E 2E9</small>				
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<b>UCOLO EXPLORATION CORP.</b> <b>JUNIPER RIDGE PEA</b> <b>CARBON COUNTY, WYOMING</b>				
DRAWING NAME: <b>PROPERTY MAP</b>				
DRAWN BY: CDS	REVISION NO. 1	DATE 12/15/16	BY CDS	DRAWING SCALE: 1"=2,000'
DATE DRAWN: 1/18/12	2	6/7/17	CDS	DRAWING NUMBER: <b>4.1</b>
CHECKED BY: DLB				
DATE ISSUED: 6/7/17				
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## Section 5 – Accessibility, Climate, Local Resources, Infrastructure and Physiography

### Accessibility

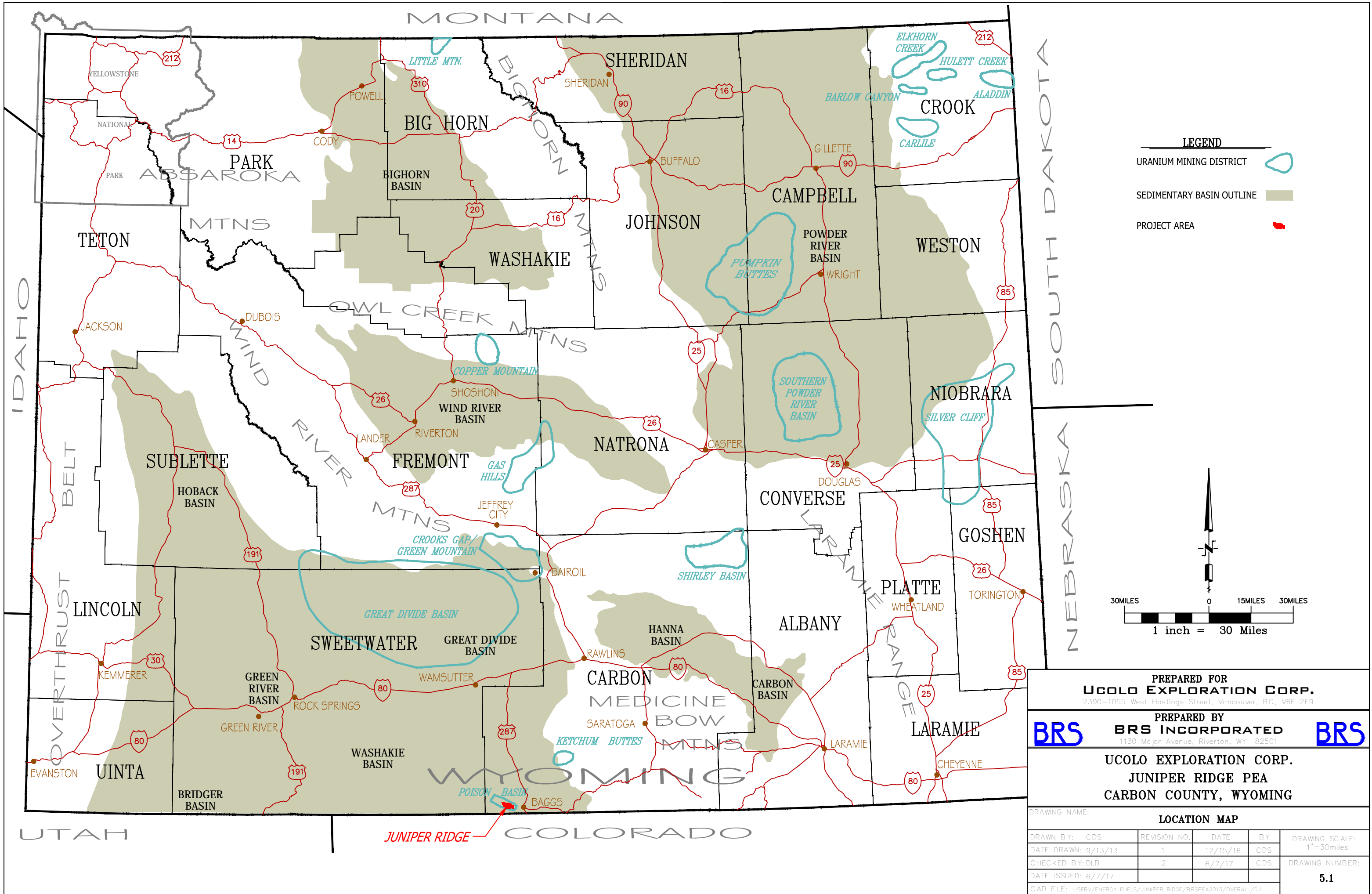
The Property is located 6 to 10 miles west of Baggs, Wyoming and approximately 3 miles north of the Colorado-Wyoming border (Refer to Figure 5.1 – Location and Access Map). The Property is accessible via two-wheel drive on existing county and two-track roads by proceeding one mile north of Baggs, Wyoming on Highway 789, then west on Carbon County Road 144 (Poison Buttes Road), towards Poison Buttes approximately 6 miles where the road crosses the Property for the next 4 miles. The principal access roads to the site are maintained year-round.

### Climate

The Property falls within the intermountain semi-desert weather province within the Green and Bear River Drainages. Winter conditions can be severe, and can include sub-zero temperatures and ground blizzards. Summer conditions are hot and arid with high temperatures at times exceeding 100°F. Although this is the case, year round mining operations have been conducted in the past and can be expected in this climate. The following table provides summary of the climatic conditions for Baggs, Wyoming, approximately 12 miles from the Project.

Annual average high temperature:	58°F
Annual average low temperature:	27.9°F
Annual average temperature:	42.95°F
Average annual precipitation - rainfall:	10.48 inch
Average annual snowfall:	41 inch

(:<http://www.usclimatedata.com/climate/baggs/wyoming/united-states/uswy0011>)



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**BRS** **BRS**

**UCOLO EXPLORATION CORP.**  
**JUNIPER RIDGE PEA**  
**CARBON COUNTY, WYOMING**

DRAWING NAME: **LOCATION MAP**

DRAWN BY: CDS	REVISION NO. 1	DATE 12/15/16	BY CDS	DRAWING SCALE: 1"=30miles
DATE DRAWN: 9/13/13	2	6/7/17	CDS	
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DATE ISSUED: 6/7/17				
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## Physiography

The Property is located within the Wyoming Basin physiographic province within a small enclosed subsidiary basin on the southeast flank of the greater Washakie Basin. The elevation of the Project site is between 6,000 and 7,000 feet above mean sea level. The topography is characterized by gently rolling hills which are cut by some ephemeral streams draining into the Little Snake River, approximately 3 miles south of the Property. The dominant vegetation consists of juniper trees, native grasses, sagebrush, and other shrubs typical of the continental, arid climate in the Western United States.

## Infrastructure

In addition to site access, mine development will require utilities and water supply. The nature and scope of the mine operations will greatly influence utility and water supply demands. Utility services, including natural gas, electricity, and communications, are located in Baggs, Wyoming which is 6 miles from the eastern boundary of the Property. Water supply could be obtained from locally permitted and constructed wells or from surface water sources including the Little Snake River approximately 3 miles south of the Property. Water rights for both surface and ground water are administered by the Wyoming State Engineer's Office and are subject to prior water rights. Options for on-site power demands would include extension of existing service to the Project or the generation of power on site. For the purpose of the PEA connection to grid power was assumed.

## Local Population

The nearest community is the town of Baggs, Wyoming. The 2010 census shows a population of 348, (refer to [www.townofbaggs.com](http://www.townofbaggs.com)). The nearest population center is Craig, Colorado located approximately 41 miles south of Baggs, Wyoming. According to the Chamber of Commerce, Craig's population was 9,251 as of the 2010 US census ([www.craig-chamber.com/profile.html](http://www.craig-chamber.com/profile.html)).

Wyoming is a state with active mining operations and a skilled workforce. It is not anticipated that it would be difficult to obtain necessary skilled personnel for the mining operation. Service companies and suppliers of mining equipment are available in Casper and Rock Springs, Wyoming and Craig, Colorado.

## Surface Rights

The 1872 Mining Law grants certain surface rights along with the right to mine provided the surface use is incident to the mine operations. In order to exercise those rights the operator must comply with a variety of State and Federal regulations (refer to section 20). The Code of Federal Regulations 43 CFR 3715 governs the use and occupancy under the mining laws for Federal Lands. Under these regulations, 3715.05, states "*Mining operations* means all functions, work, facilities, and activities reasonably incident to mining or processing of mineral deposits."

Thus, for the mine operations, as described in Section 16, URZ has and/or can obtain, through permitting and licensing of site activities, sufficient surface rights for the planned operations, including potential waste disposal areas, heap leach pads, and potential plant sites.

For areas of private surface ownership appropriate surface-owner agreements would be required.

## Section 6 – History

### Past Production

Uranium was first discovered in this area in 1951, and commercial uranium mining occurred intermittently from 1954 until 1966. Seven companies mined uranium from twelve open pits and two shallow underground mines. During this time, a total of 156,000 tons of uranium material with an average grade of 0.172% U<sub>3</sub>O<sub>8</sub> were mined resulting in production of 536,000 pounds of uranium (Pincock, Allen, & Holt, 1978). Some of the operators included: the Shawano Development Corporation, Trace Elements (later acquired by Union Carbide Corporation), Teton Minerals, Parker-Thomas, and Leckenby. Underground mining was conducted by Basin Engineering Company under contract to Teton Minerals. Mined ores were shipped to a variety of mills including: Union Carbide's mills located in Rifle and Maybell, Colorado, Western Nuclear's Split Rock mill near Jeffrey City, Wyoming, and Atomic Energy Commission (AEC) ore buying stations (Anctil, 1987). Shawano Development Corporation attempted various methods of on-site processing including: mechanical upgrading using a spiral classifier to separate sand and slimes with the uranium values expected to report to the slimes, acid vat leach with ion exchange recovery, and carbonate-bicarbonate vat leach which produced a sodium diuranate concentrate. The concentrate was subsequently purchased by the (AEC) (Anctil, 1987).

### Ownership and Control

Site activities were limited during what is referred to as the "Stretch Out" period beginning in the mid 1960's and continuing into the early 1970's. During this period, AEC supply contracts were being phased out and private utilities began to enter the uranium market. In 1973, Homestead Mineral Corporation (HMC) controlled most of the mining claims and leases in the area, with the exception of those held by Union Carbide Corporation (UCC). In that same year, Minerals Exploration Company (MECO) in joint venture with Urangesellschaft (UG) acquired the property from HMC. In 1975, UG purchased MECO's portion of the joint venture acquiring 100% interest in the property (Pincock, Allen, & Holt, 1978). However, UCC maintained its mineral claims in the area. In 1981, AGIP acquired the Project from UG (Pincock, Allen, & Holt, 1986) and in 1982 CoCa Mines acquired the UCC portion of the Project (Anctil, 1987). Subsequently, mineral leases and claims were allowed to expire during the extended lull in the uranium market which began in the late 1980s.

Beginning in 2004, Strathmore Resources, through Miller and Associates, acquired Wyoming State Mineral Lease 0-41095 (April, 2005) and located the unpatented mining lode claims that comprise the current Project. On January 30, 2007, Strathmore entered into a joint venture agreement with Yellowcake Mining Inc. to develop the Property. The JV was dissolved in December 2008. On November 1, 2010, Crosshair entered into a purchase agreement with Strathmore for the Property. Crosshair failed to complete the terms of the purchase agreement



and so in December 2012 the Property reverted back to Strathmore. In 2013, Strathmore was acquired by Energy Fuels Inc. Recently, with the acquisition of the claims and state lease, URZ now controls the Project. The Property now encompasses portions of both the former AGIP and CoCa Mines mineral holdings.

### Exploration History

The most recent of the technical studies (Pincock, Allen, & Holt, 1986) state that the study was based on radiometric sampling (geophysical logging) from 5,423 drill holes in the vicinity of the property comprising 868,000 feet, of which 4,871 of these drill holes were located on the AGIP Mining USA (AGIP) mineral properties. A previous historical feasibility study (Pincock, Allen, & Holt, 1978) states that their mineral resources/reserve estimates were based on radiometric assays from 3,935 drill holes.

The earlier technical studies and reports also address radiometric equilibrium. The data available over time for evaluation of radiometric equilibrium also varied. In 1982, an internal project summary report (Beahm, 1982), radiometric equilibrium was evaluated based on data from 200 core holes. For that study, only core holes with greater than 80% sample recovery were included and only samples with uranium grades greater than 0.04%  $U_3O_8$  were used. This study reported a positive disequilibrium factor of 1.017:1 (chemical to radiometric). The subsequent feasibility study (Pincock, Allen, & Holt, 1986) evaluated individual core samples representing a total of 321.5 feet of core, but does not specify the number of core holes from which the samples were taken. Independent sampling and assaying of core and independent radiometric log determinations were completed by the authors of the 1986 report. They concluded that while there was some bias in the estimation of mineralized thickness based on radiometric interpretation, there was no bias in grade. The older feasibility study by Urangesellschaft (UG) (Pincock, Allen, & Holt, 1978) evaluated radiometric equilibrium based on 125 mineralized intervals from three separate geographical areas at a 0.02% minimum grade  $U_3O_8$ . This study recommended an adjustment of grade by an overall negative disequilibrium factor of 0.90.

### Historical Estimates

Historical mineral resource estimates are available for the Property from at least three sources. Both UG and AGIP completed technical studies on the Property as described in Pincock, Allen, & Holt (1978, 1986). These reports were for the same mineral holdings but excluded the adjacent mineral holdings of UCC. CoCa Mines, following their acquisition of the UCC mining claims, stated historical mineral resource estimates for the UCC mineral holding (Anctil, 1987). These historical estimates are not relevant as there is a current mineral resource estimate on the Property that is described in Section 14 of this Technical Report.

## Section 7 – Geological Setting and Mineralization

### Regional Geology

The Property is located within the southeastern portion of the Washakie Basin. The Washakie Basin and the Great Divide Basin in the southwest together comprise the greater Green River Basin. These basins contain up to 25,000 ft. of Cretaceous to Recent sedimentary rocks.

The Property is located within a small subsidiary basin, referred to as the Poison Basin, on the southeast flank of the Washakie Basin. The Property encompasses the majority of the outcropping of the Browns Park Formation which hosts the uranium mineralization. The Browns Park Formation is present in the basin over an area of approximately 10 square miles (Pincock, Allen, & Holt, 1986).

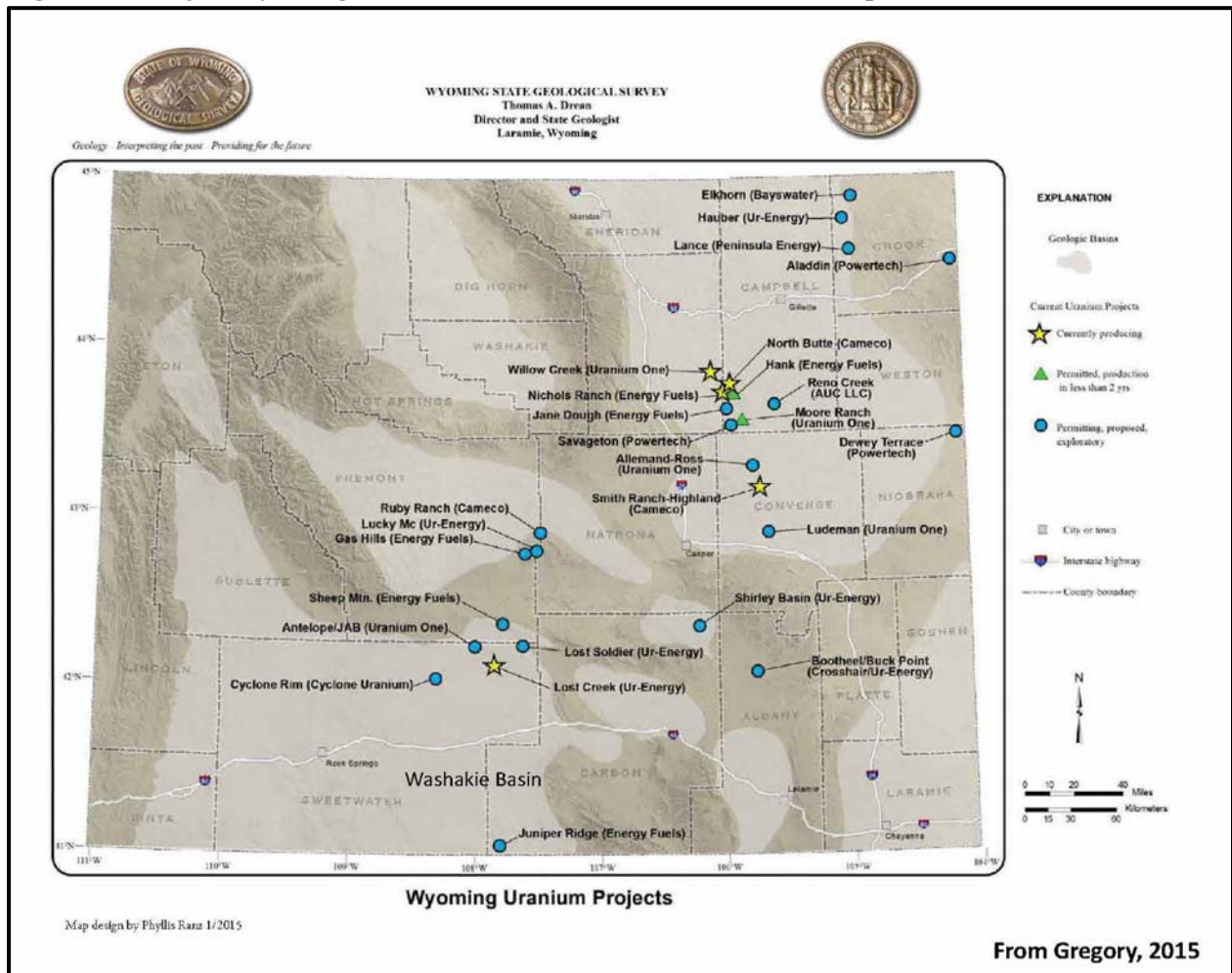
During the end of the Cretaceous, the Laramide Orogeny divided the Wyoming Basin Province into a series of downwarped basins (Refer to Figure 5.1). As these basins were created, uplift created the Granite and Seminoe Mountains, and older formations were altered during the same time. In the northern regions of the basin swamps, alluvial plains, and fluvial fans were present at the margins of the uplifted Granite Mountains. To the southwest, the basin is occupied by the lacustrine Eocene Green River Formation and by the lower energy Wasatch Formation (Dribus and Hanna, 1982).

Most of Wyoming's uranium deposits are found in medium to coarse grained sandstone deposits within or on the margins of sedimentary basins. Figure 7.1 from Gregory, 2015, shows the major Wyoming Basin in relationship to known areas of uranium mineralization both historical and current. These host rocks are about 40 million to 55 million years old, but the uranium ore deposits contained in them are much younger.

The uranium minerals found in the ore deposits were leached from their original source rock and precipitated out of solution in the host rock. The solvent, as well as the transport mechanism, was oxygen-rich surface and groundwater. One proposed source for uranium ore deposits in Wyoming is Precambrian granitic rocks such as those in the Granite Mountains in the central part of the state. Uranium occurs as a minor element in minerals within these igneous rocks. Erosion has removed such substantial amounts of igneous material from the Granite Mountains that many geologists believe enough uranium has been removed from those mountains to account for the ore deposits in the nearby basins.

Another potential source for uranium in Wyoming is Eocene, Oligocene, and younger tuffs (volcanic ash-rich material). The tuffaceous beds were deposited beginning about 50 million years ago, forming such rock units as the Wagon Bed and White River Formations and their equivalents. Volcanism, resulting from molten rock or magma near the surface of the earth, was widespread throughout much of the western United States as well as northwestern Wyoming, and occurred periodically for some 40 million years.

**Figure 7.1 Major Wyoming Basins in Relation to Known Uranium Deposits**



### *Stratigraphy*

While formations ranging in age from Cretaceous to Quaternary are exposed at the surface within the vicinity, only the Eocene and Miocene formations play a significant role in the location and tenure of uranium mineralization. Upper Eocene and Miocene age sediments fill the Poison Basin. Oligocene rocks are absent, having been completely eroded away before Miocene deposition; Miocene rocks lie unconformably on upper Eocene rocks in the basin and host the known uranium mineralization within the Project area (Pincock, Allen, & Holt, 1986).

The Eocene series in the basin are represented by the Wasatch and Green River Formations. The aggregate thickness of these formations in the region ranges from 2,000 to 4,000 feet. The Wasatch Formation in the area is composed of variegated mudstones, claystones, siltstones, sandstones, and conglomerates. Deposition is considered to have occurred largely in lacustrine, piedmont, and plaudal environments, but eolian and fluvial environments are represented as well.

The Green River Formation consists of shales, mudstones, sandstones, and marlstones largely deposited in the lacustrine environments. The Tipton Tongue member of the Green River Formation has limited exposure in the area cropping out along the northern rim of the basin, where it is predominately a claystone with interbeds of marlstone and sandstone.

The Browns Park Formation is the only stratigraphic unit of Miocene age found within the Project and immediately surrounding area. The Browns Park is a sedimentary formation which was deposited unconformably on a highly irregular erosion surface which truncates upper Cretaceous through Eocene strata. The base of the Browns Park is conglomerate overlying the Wasatch Formation which consists mainly of quartzite and igneous pebbles in a sandstone matrix. Crossbedding, irregular bedding surfaces, and clay lenses suggest that this conglomerate is of fluvial origin. However, some authors have suggested that this lower conglomeratic unit may represent pediment gravels (e.g. Vine and Prichard, 1954). Thickness of the unit ranges from 5 to 75 feet.

Overlying the basal conglomerate is the Upper Browns Park, consisting of a tuffaceous, feldspathic sandstone. The Upper Browns Park is fine grained, moderately to poorly sorted, friable sandstones in which the grain size is bimodal, i.e., larger grains – quartz, chert, and clastic volcanic fragments – are set in a fine to very fine-grained tuffaceous sandstone containing quartz and feldspar. The dominant sedimentary structures within the unit are small to large scale festoon and planar cross-bed sets ranging up to several feet in thickness. Based on the roundness of quartz grains, the frosted nature of quartz grains, and the character of the cross-beds, the upper portion of the Browns Park is interpreted to be of eolian origin. The thickness of the upper portion of the Browns Park Formation within the Project area varies due to erosion reaching a maximum thickness of approximately 300 feet.

Although the Wasatch Formation is known to host uranium mineralization in other areas of Wyoming, all known uranium mineralization within the Project area is hosted within the upper Browns Park Formation.

### *Structural Geology*

The dominant structures of the area, directly related to the grabens, are the east-west trending, high angle, normal faults. These faults are mapped as bounding the north side of the basins, but in all probability they bound the south side as well. Although these east-west faults trend into the Poison Basin, they do not appear to affect the Miocene rocks and, thus, are dated as being pre-Miocene. In addition to these faults, northeast and northwest-trending, high angle normal faults have been noted cutting the Browns Park into the Poison Basin. These faults are said to show only minor displacements. Minor folds trending east to west cut through the basin, but the effects on the Browns Park are not significant (Pincock, Allen, & Holt, 1986).

### Local and Property Geology

The geological setting and mineralization within the Project area and the vicinity is well documented in the professional literature as well as internal reports from past mineral owners. The earliest published report for the area is by Vine and Prichard (1954), AEC geologists. They discovered anomalous radioactivity in the Browns Park Formation in the vicinity of the Property on October 15, 1953 as a result of a reconnaissance with a car-mounted recording scintillation detector (Vine and Prichard, 1954). More recent reports include the “National Uranium Resource Evaluation (NURE); Rawlins Quadrangle, Wyoming and Colorado” (Dribus and Nanna, 1982) which designated the Property area as Area B, refer to pages 25 through 36. Also in 1982, the Property is described in the “Ore Deposits of Wyoming”, (Hansel, 1982). Internal Property summary and technical studies include: UG, 1978, AGIP Mining 1982 and 1986, and CoCa Mines (Anctil, 1987). The Author is not aware of any more recent publications with respect to the local geology of the Property and as such considers the information cited as the most currently available.

The following description of the mineralization in what was termed Area 15 in their report, which corresponds to the Property, is taken from Dribus and Nanna, 1982, pp. 31-33:

*Vine and Prichard (1954) reported that most of the mineralized sands in Poison Basin are brown to reddish brown, contain from 0.004% to 0.39% uranium, and are characterized by radiochemical disequilibrium in favor of equivalent uranium, relative to actual uranium present. Samples of black sandstone collected by Vine and Prichard show roughly equal values of equivalent and chemical uranium content. These samples were from unaltered sands and probably contained the uranium oxide uraninite, which is reported as an ore mineral in the “primary zone” of the Poison Basin district by the U. S. Atomic Energy Commission (1959). Unaltered sands have not been leached of their uranium content by weathering processes; hence, radiochemical equilibrium is maintained.*

*A sample of mineralized, altered sandstone collected by Vine and Prichard (1954) contains 3.21% uranium and shows pronounced radiochemical disequilibrium in favor of actual uranium relative to equivalent uranium. This type of disequilibrium, in favor of actual uranium, characterizes uranium ores in the Browns Park Formation of the Maybell-Lay area in Colorado. Grutt and Whalen (1955) suggested “the tendency of unoxidized ore to contain more uranium than is indicated by radiometric assay, may indicate youthful formation of the deposits.” An unaltered sand (MFA 005) from uranium occurrence 82 and an altered sand (MFA 240) from uranium occurrence 91 also reflect higher uranium values than indicated by equivalent results .... These values suggest that uranium concentration mechanisms in the Browns Park Formation have been operative in recent times and that some of the uranium has not had sufficient time to decay and produce radiogenic daughters.*

The general geological setting of the Project is shown in plan on Figure 7.2, Geologic Map, and in profile on Figure 7.3, Geologic Cross Sections.

### Mineralization

Most of Wyoming's uranium deposits are found in medium- to coarse-grained sandstone formations of Paleocene and Eocene age within or along the margins of sedimentary basins. These host rocks are about 40-55 million years old, but the uranium ore deposits within them are much younger (Gregory, 2016).

Uranium mineralization occurs within an eolian stratigraphic unit of the Miocene Browns Park Formation. The host unit consists of tuffaceous, feldspathic sandstone which exhibits small to large scale festoon and planar cross-bed sets ranging up to several feet in thickness. Generally, uranium mineralization is the roll-front type mineralization, common to the uranium basins in Wyoming (refer to Section 8). Localization of uranium appears to relate to permeability and the presence of pyrite or hydrogen sulphide (Pincock, Allen, & Holt, 1986). The depth of mineralization averages slightly over 100 feet, but ranges from near surface to a maximum of 292.5 feet depending on location within the basin and local topography. Two general areas of mineralization occur within the Property, separated by less than two miles, which are herein referred to as Juniper Ridge East and Juniper Ridge West.

Uranium mineralization occurs as interstitial filling and coatings on the sand grains within the host rock. The most common uranium minerals are uraninite, uranophane, and autunite (Dribus and Hanna, 1982).

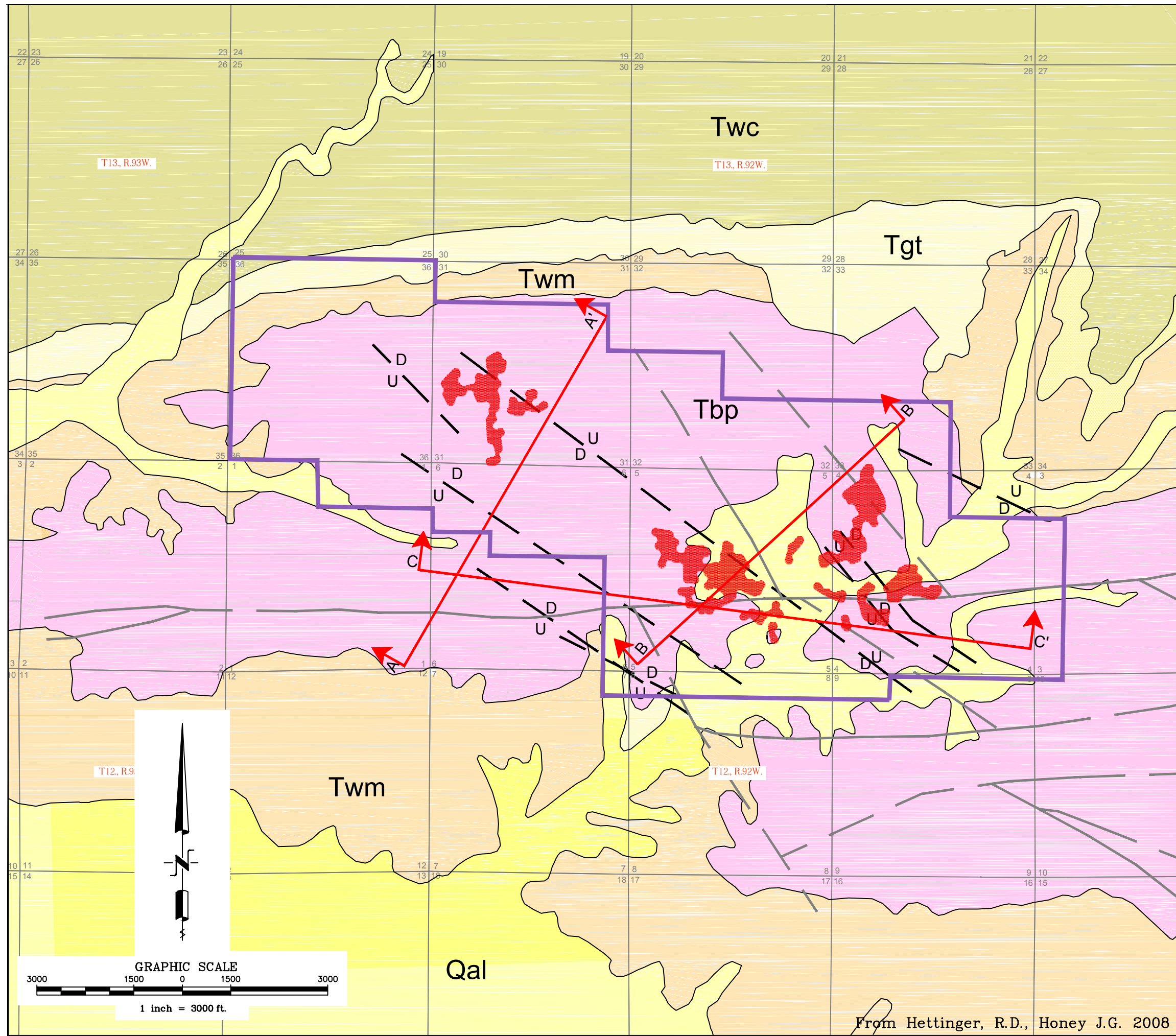
The deposit is relatively flat lying with formation dip less than 5°. The dip of the formation is highest at the margins of the basin and flatter near the center of the basin. The average thickness of mineralization above a 0.02% eU<sub>3</sub>O<sub>8</sub> cutoff grade is slightly in excess of 10 feet.

The distribution of the mineralization is shown in plan view on Figure 14.1 and 14.2 for Juniper Ridge East and West, respectively. More than 80% of the known mineralization occurs within the Juniper Ridge East portion of the Property.

Historical feasibility reports, AGIP, 1986 and UG, 1978, discuss the continuity of mineralization. These reports express some concerns relative to the continuity of mineralization especially with respect to grades necessary to support mining. AGIP, 1986 states that continuity at very low grades, i.e., a cutoff of about 80 ppm, is excellent and mineralization appears nearly continuous for several thousand feet throughout much of the main property area. However, the degree of continuity decreases with increasing grade. At grades above 500 ppm U<sub>3</sub>O<sub>8</sub>, continuity of mineralization may range between tens of feet to several hundred feet. Continuity of grade for most mineralized zones is generally less than 50 feet horizontally.

Figure 7.4, Core Hole Series JR 233, provides a graphical representation of the variability of the mineralization. This series of core holes was completed in 2011 to obtain samples for metallurgical testing. The five core holes in this series represent 10 foot offsets or the variability over a span of 50 feet. In each hole, an interval of 15 to 16 feet was cored at approximately the same depth. For these five holes, the average grade ranged from 0.012% to 0.055%  $U_3O_8$ ; the average thickness of mineralization above 0.02%  $U_3O_8$  ranged from 3 to 12 feet; and the GT 0.02%  $U_3O_8$  ranged from 0.081 to 0.729.

It is the author's opinion, based on personal knowledge of the site, having managed the exploration and development drilling for the project for AGIP, and through mine production experience at a very similar Browns Park hosted deposit located near Maybell, Colorado, that the forgoing statement relative to the continuity of the deposit is largely correct. Portions of the uranium deposits at Juniper Ridge and at its sister deposits near Maybell, Colorado have been mined successfully in the past. Past operations have compensated for the variability in grade by delineating areas to be mined by open pit methods, by drilling on 50 foot centers and instituting rigorous in-pit grade control programs.



### Generalized Local Stratigraphy

Series	Formation	Lithology	Description
Tertiary	PLEISTOCENE	Unnamed	Glacial deposits including drift, and outwash
	MIO-PLIOCENE	North Park	White to greenish-gray tuffaceous sandstone, siltstone, and claystone; locally conglomeratic
		Tertiary Volcanics	Black basalt and scoria flows
		Browns Park	Tan fluvial and sandstone with freshwater limestone basal conglomerates includes Bishop Conglomerate
	EOCENE	Washakie	Gray tuffaceous claystones and brown fluvial sandstone Sandy limestone with sandstone and some brown shale
		Green River Laney Shale Member	Light brown to light gray marlstone. Brown to light-gray sandstone, where light brown tuffaceous sandstone thin gravel beds and oil shale benches.
		Wasatch Cathedral Bluffs Tongue	Red mudstone and sandstone
		Green River Tipton Shale	Lightly colored fissile shale and minor limestone

From Dribus and Hanna, 1982

#### LEGEND

- Qal-Alluvium of the Little Snake River and Muddy Creek
- Tbp-Browns Park Formation
- Twc-Wasatch Formation Cathedral Bluffs Tongue
- Tgt-Green River Formation Tipton Tongue
- Twm-Upper Wasatch Formation Main Body
- Resource Area
- Cross Section Line
- Regional Fault
- Fault
- Juniper Ridge Claims Outline

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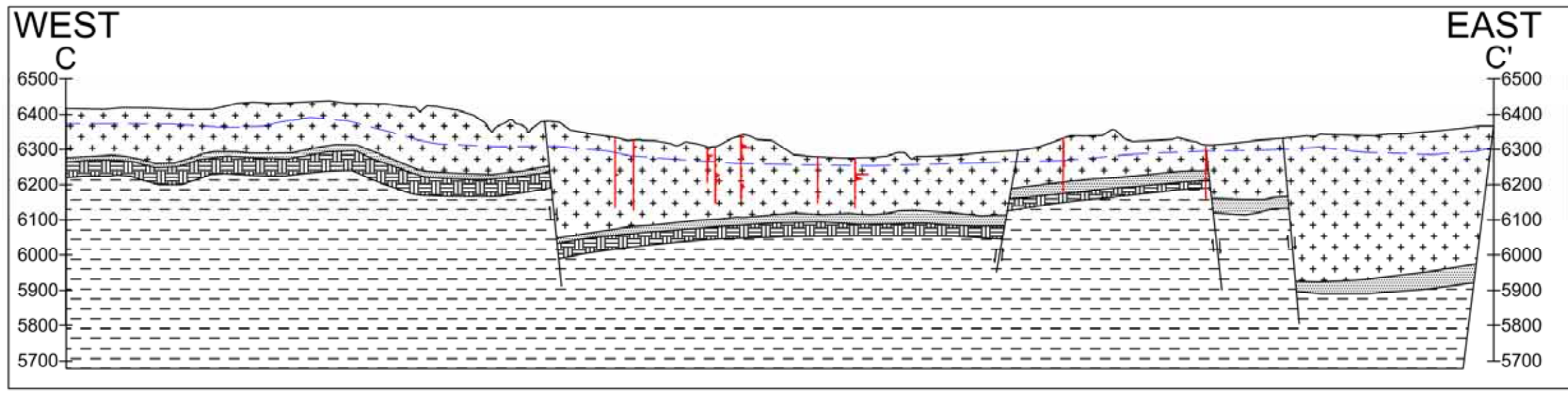
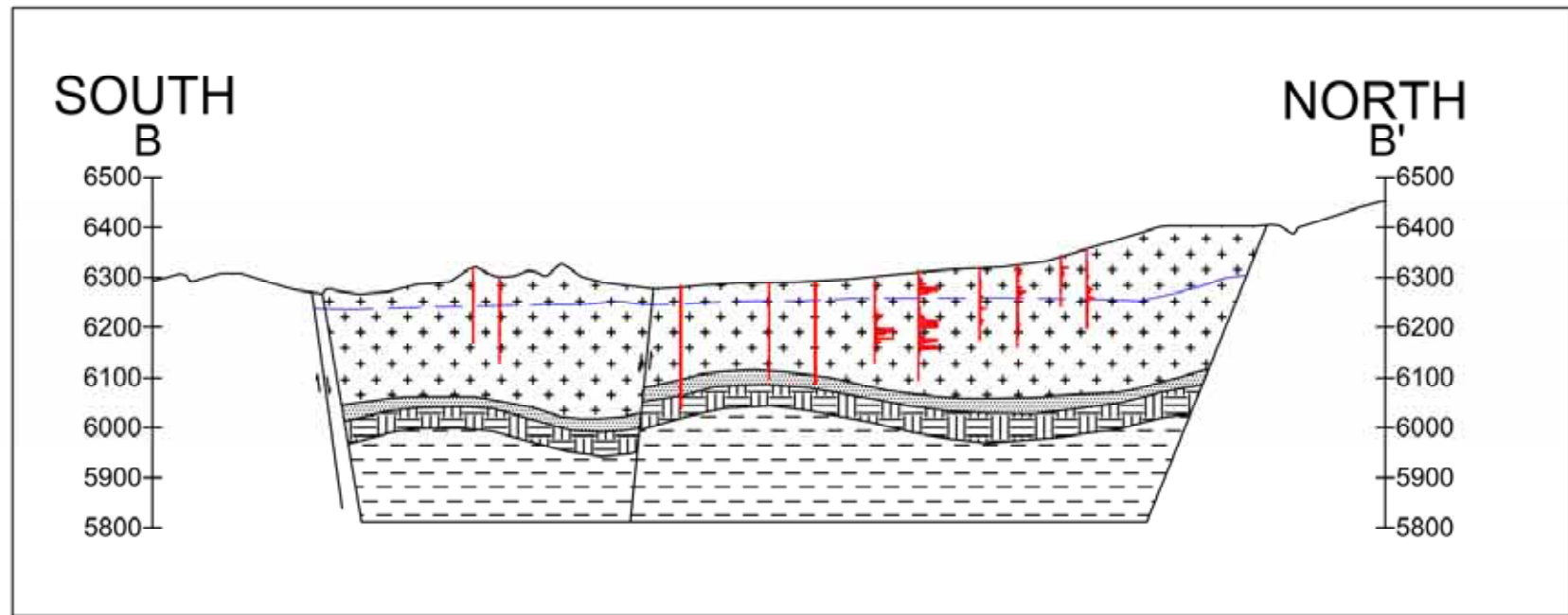
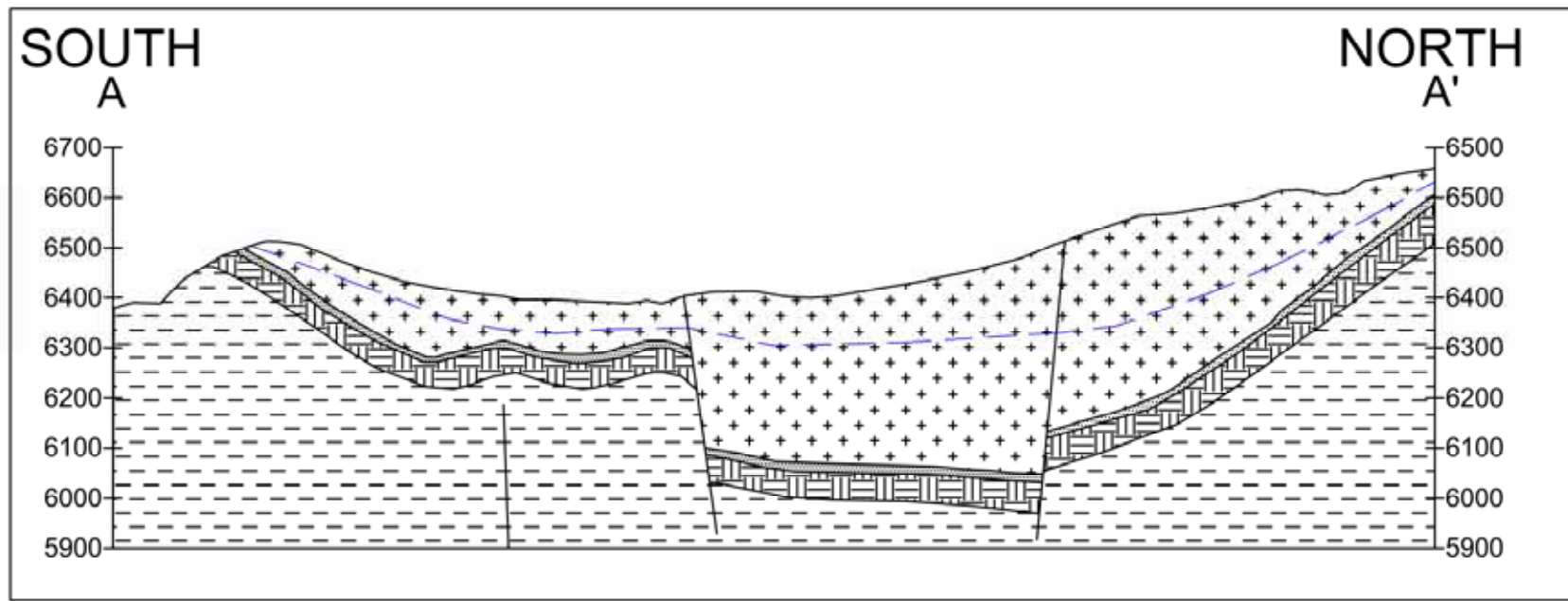
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DATE ISSUED: 6/7/17			
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CAD FILE: USERV/ENERGY FUELS/JUNIPER RIDGE/BRSPEA2013/OVERALL/18.1			

From Hettinger, R.D., Honey J.G. 2008





**LEGEND**

-  UPPER BROWNS PARK FORMATION
-  LOWER BROWNS PARK FORMATION
-  GREEN RIVER FORMATION
-  WASATCH FORMATION
-  Approximate Water Table
-  Gamma Counts Per Second (CPS) 2011 Drilling

GRAPHIC SCALE  
400 200 0 200 400  
1 inch = 400 ft.

Note: 4x Vertical Exaggeration  
From: URANGESHELLSHAFT, 1978

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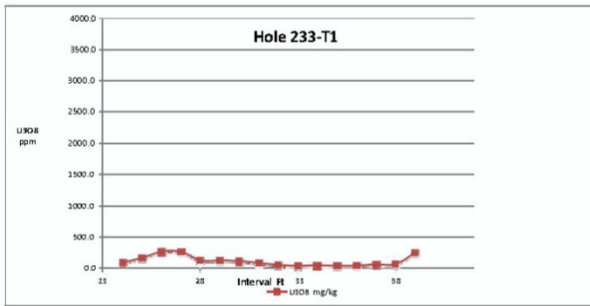
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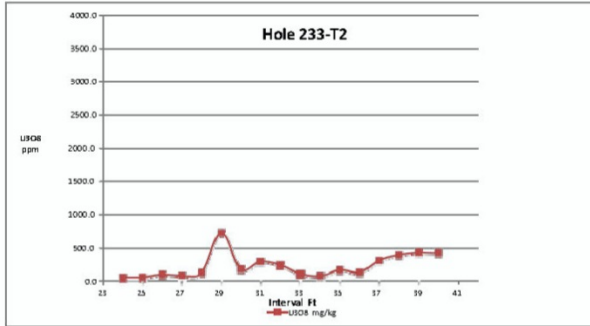
CAD FILE: UCOLO\ENERGY\PEAS\JUNIPER RIDGE\BROWNS PARK\OVERALL.PG 1.2 GEOLOGIC CROSS SECTIONS

**Figure 7.4 Core Hole Series JR 233**



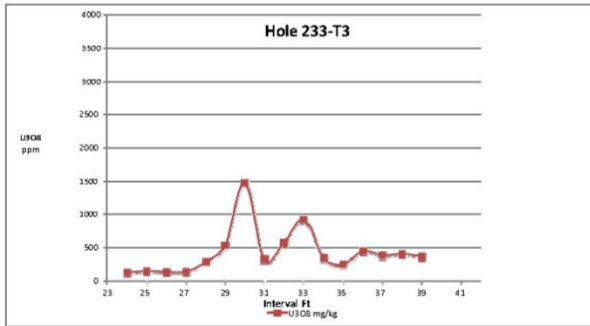
Hole 233-T1

Average Grade 0.012 % eU<sub>3</sub>O<sub>8</sub>  
 Intervals > 0.02 % eU<sub>3</sub>O<sub>8</sub>  
 3 Feet @ 0.027 % eU<sub>3</sub>O<sub>8</sub>  
 GT 0.081



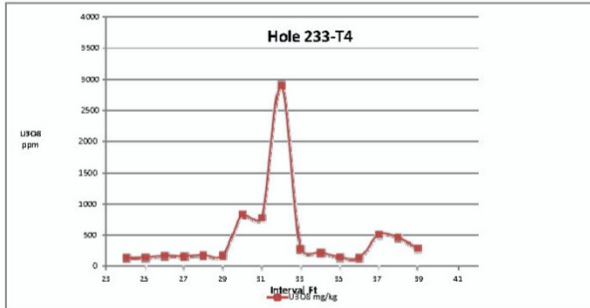
Hole 233-T2

Average Grade 0.023 % eU<sub>3</sub>O<sub>8</sub>  
 Intervals > 0.02 % eU<sub>3</sub>O<sub>8</sub>  
 7 Feet @ 0.041 % eU<sub>3</sub>O<sub>8</sub>  
 GT 0.287



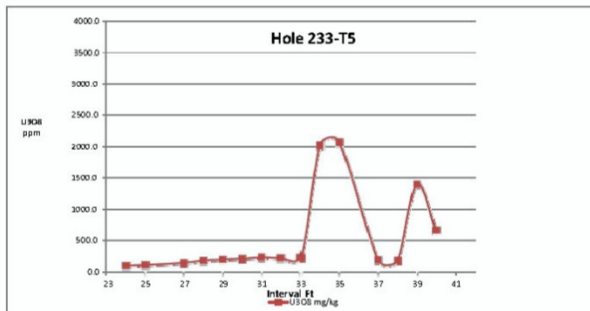
Hole 233-T3

Average Grade 0.043 % eU<sub>3</sub>O<sub>8</sub>  
 Intervals > 0.02 % eU<sub>3</sub>O<sub>8</sub>  
 12 Feet @ 0.053 % eU<sub>3</sub>O<sub>8</sub>  
 GT 0.636



Hole 233-T4

Average Grade 0.047% eU<sub>3</sub>O<sub>8</sub>  
 Intervals > 0.02 % eU<sub>3</sub>O<sub>8</sub>  
 8 Feet @ 0.078 % eU<sub>3</sub>O<sub>8</sub>  
 GT 0.624



Hole 233-T5

Average Grade 0.055 % eU<sub>3</sub>O<sub>8</sub>  
 Intervals > 0.02 % eU<sub>3</sub>O<sub>8</sub>  
 9 Feet @ 0.081 % eU<sub>3</sub>O<sub>8</sub>  
 GT 0.729

## Section 8 – Deposit Types

Uranium mineralization in the Browns Park Formation within the Project and surrounding area is described as Wyoming sandstone roll-type mineralization (Austin and D’Andrea, 1978).

While local mineralization displays some of the characteristics of known uranium deposits in the Gas Hills and Southern Powder River Basin of Wyoming, the mineralization is not necessarily typical of Wyoming roll-front deposits. The uranium mineralization within the Project is sandstone hosted and was deposited along a geochemical solution front, as is typical of roll-front mineralization and similar to other Wyoming sandstone hosted uranium deposits, refer to Figure 8.1. The features which distinguish mineralization within the Browns Park Formation harken to its eolian origin and include the absence of carbonaceous trash and lack of stratigraphic controls, i.e., the lack of distinct vertical variations in grain size and the lack of intervening finer grained units (Rackley, 1972). This affects the continuity of mineralization and was considered in the mineral resource estimation by limiting the area of influence of drill data discussed in Section 14.

The source of uranium is described as syngenetic, alteration of the tuffaceous volcanic materials within the Browns Park Formation and/or the immediately overlying North Park Formation liberated uranium which was transported by ground water and concentrated along oxidation/reduction interfaces within the formation (Dribus and Nanna, 1982).

The localization of uranium appears to relate to local variations in permeability and the presence of pyrite and/or hydrogen sulphide. Uranium mineralization, in general, appears to be of the roll-front type mineralization common to the uranium basins in Wyoming, cutting across sedimentary structures (Pincock, Allen, & Holt, 1986).

**Figure 8.1 – Roll-Front Mineralization**

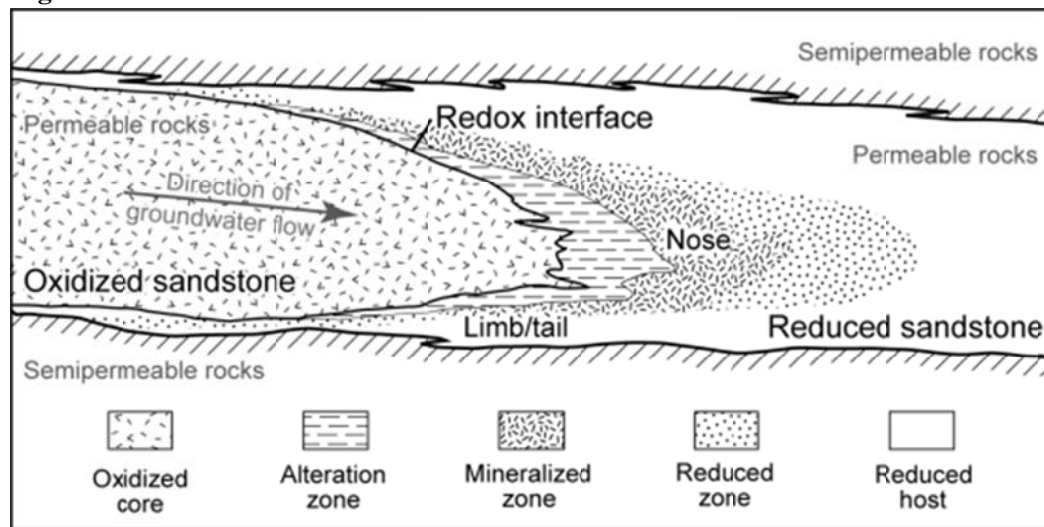


Figure 8.1 - Idealized cross-section of a sandstone-hosted roll front uranium deposit.

Modified from Granger and Warren (1974) and De Voto (1978).

## **Section 9 – Exploration**

The initial discovery was based on ground radiometric surveys reported in 1953 but since that time exploratory work has been primarily drilling. Sampling procedures associated with the drilling programs is described in Sections 10 and 11 of this Report. Crosshair completed a soil sampling program analyzing the samples for Radium 226, however, this program did not define additional exploration targets. The ownership of the recent drilling and other data passed from Crosshair to Strathmore and then from Strathmore to EFR and ultimately to URZ.

The Project is located within a brownfield site which has experienced past mine production, extensive exploration, and development drilling.

## Section 10– Drilling

Drilling and down-hole geophysical logging methods for roll-front, sandstone hosted uranium deposits have been well established for uranium exploration, resource estimation and mining over the past several decades in Wyoming. Industry accepted practices were employed during the various drilling campaigns on the Juniper Ridge property. The author personally observed on site the drilling and sampling practices during the period of 1982 through 1986 and later in 2011, and was involved in inspection and interpretation of data from the 2012 drilling program. The author was active in uranium exploration and mining in Wyoming in the 1970's when earlier drilling programs were undertaken on the Juniper Ridge property, participated in quality control and industry practice workshops, and observed that industry accepted practices were well understood by industry and followed at the time.

### Drilling Methods:

- The majority of the drilling was conducted by air and/or mud rotary drilling with limited core drilling for evaluation of the radiometric equilibrium conditions.
- The locations of drill holes are shown on Figure 10.1 and are available in state plane coordinates. The holes were drilled vertically and typically to less than 300 feet in depth. Downhole drift surveys are available only for the 2011 and 2012 drilling. These surveys show hole deviation from vertical of less than 2° over the length of the hole, which would have no influence on the interpretation of the relatively flat lying mineralization (see discussion below).
- With respect to high grade intervals the area of influence was limited in the development of the GT contour model.
- Core recovery is not an issue as radiometric equivalent uranium grade determination is obtained from geophysical logging of open drill holes.

Currently, available drill data consists of radiometric equivalent data ( $eU_3O_8$ ) for all 2,167 drill holes and USAT assay data for 400 drill holes completed during the 2011 drilling program. For the 2012 drilling program, radiometric equivalent data was collected for all drill holes. In addition, for drill holes with significant mineralization Prompt Fission Neutron (PFN) assay data was collected (40 of 149 drill holes).

Thus, the current database consists of 2,716 drill holes.

With respect to the pre-2011 and 2012 drill holes, the radiometric equivalent uranium grade data by ½ foot increments was provided by Century Geophysical on reel-to-reel magnetic tapes for 1,917 of the 2,167 drill holes (88%). All 2011 and 2012 radiometric equivalent uranium grade data was provided on-site in hard copy and electronically. Radiometric equivalent uranium grade data for the remaining 250 drill holes (9% of the total database) is in the form of interpreted data from manual logs. Of these 250 drill holes that do not have the original

electronic copies of the geophysical data, 138 were above minimum cutoff used for the mineral resource estimate. As shown on Table 10.1, 1,376 of the total drill holes or 51% were above cutoff and therefore within the mineral resource GT model. The barren and mineralized holes below cutoff were used to define the limits of the mineral resource.

Verification of drilling data is discussed in Section 12, Data Verification.

Drill data available for this estimate is summarized in Table 10.1.

**Table 10.1: Drillhole Data**

	<b>Total</b>	<b>Barren</b>	<b>Mineralized</b>	<b>&gt;0.10 GT &lt;0.5GT</b>	<b>&gt;0.50 GT &lt;1.0 GT</b>	<b>&gt;1.0 GT</b>
<b>Pre-2011 Drill Holes</b>	2,167	683	405	677	230	172
<b>2011 Drill Holes</b>	400	76	71	151	41	61
<b>2012 Drill Holes</b>	149	103	2	22	12	10
<b>Total</b>	2,716	862	478	850	283	243

All drill holes were shallow (less than 300 feet) and drilled vertically. The surface location of the drill holes is shown on Figure 10.1, Drill Hole Location Map. This figure distinguishes between the pre-2011 and recent drill holes and shows the general outline of mineralization which meets a minimum grade of 0.02% eU<sub>3</sub>O<sub>8</sub> and a minimum GT of 0.10.

Both grade and GT distribution are log normal. However, the range was not extreme with grade above cutoff ranging from 0.02% eU<sub>3</sub>O<sub>8</sub> to a maximum of approximately 1% eU<sub>3</sub>O<sub>8</sub> and GT above cutoff ranging from 0.10 to just over 5. Restrictions were put on the high grade (and/or GT holes) used in the resource estimate.

Drift (down hole deviation) surveys of the drill holes were generally not completed because the drilling was shallow and the dip of the formation reasonably flat. Even at a maximum dip of 5° and given the average mineralized thickness of approximately 10 feet, the difference between the measured vertical thickness and the true thickness measured perpendicular to dip would be less than 0.04 feet, i.e., 9.96 feet as compared to 10 feet. The author concludes that this possible variation is well within the accuracy of the resource estimate.

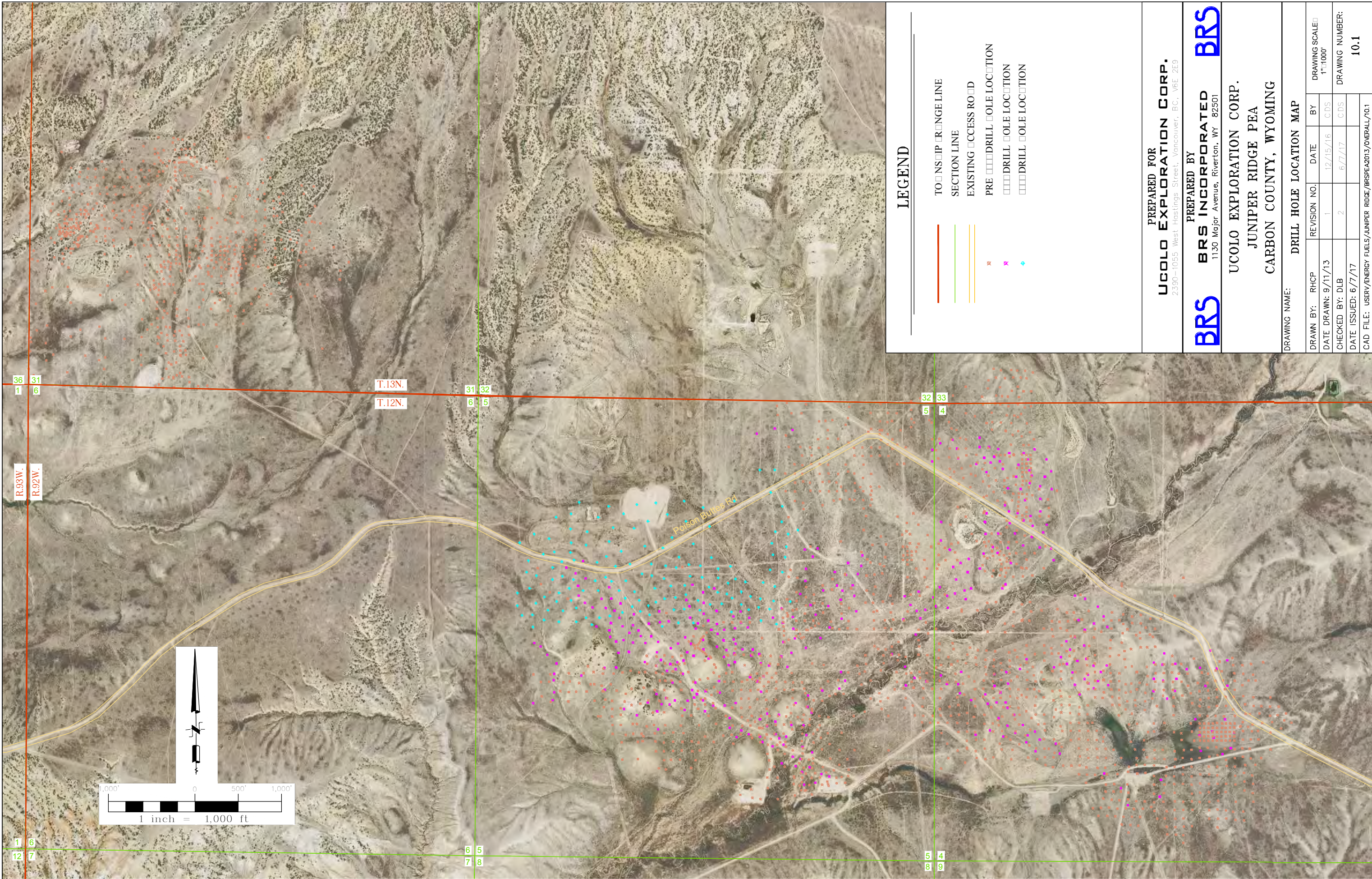
## Typical Cross Sections

Typical cross sections are shown for the most significant areas of mineralization within the Property located in the southwestern portion of the Juniper Ridge East mineral resource area. The location of the cross sections is shown on Figure 10.2. Detailed cross sections are shown on Figure 10.3, Radiometric Cross Sections. All data presented in the cross sections is from the 2011 drill program.

The cross sections are located along and transverse to the general trend of mineralization, spanning 1,200 feet along trend and 1,000 feet across trend. The cross sections show:

- Anomalous Radioactivity is continuous horizontally along and across the mineralized trend for more than 1,000 feet in either direction.
- Individual drill holes have vertically continuous zones of anomalous radioactivity over a thickness of approximately 150 feet.
- There is no discernible lithological difference within the vertically continuous zone of anomalous radioactivity. Thus, treating the mineralization as a single horizon is justified.
- There are distinct variations in the thickness and grade of higher grade mineralized intercepts.

These cross sections support the conclusions of previous studies relative to the continuity of mineralization as discussed in Section 7, Geological Setting and Mineralization.



**LEGEND**

- TO NS TIP RANGE LINE
- SECTION LINE
- EXISTING ACCESS ROAD
- PRE DRILL HOLE LOCATION
- DRILL HOLE LOCATION
- DRILL HOLE LOCATION

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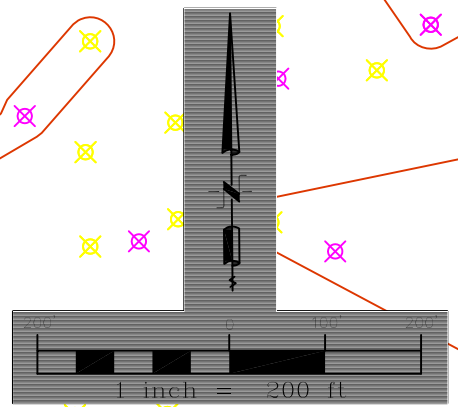
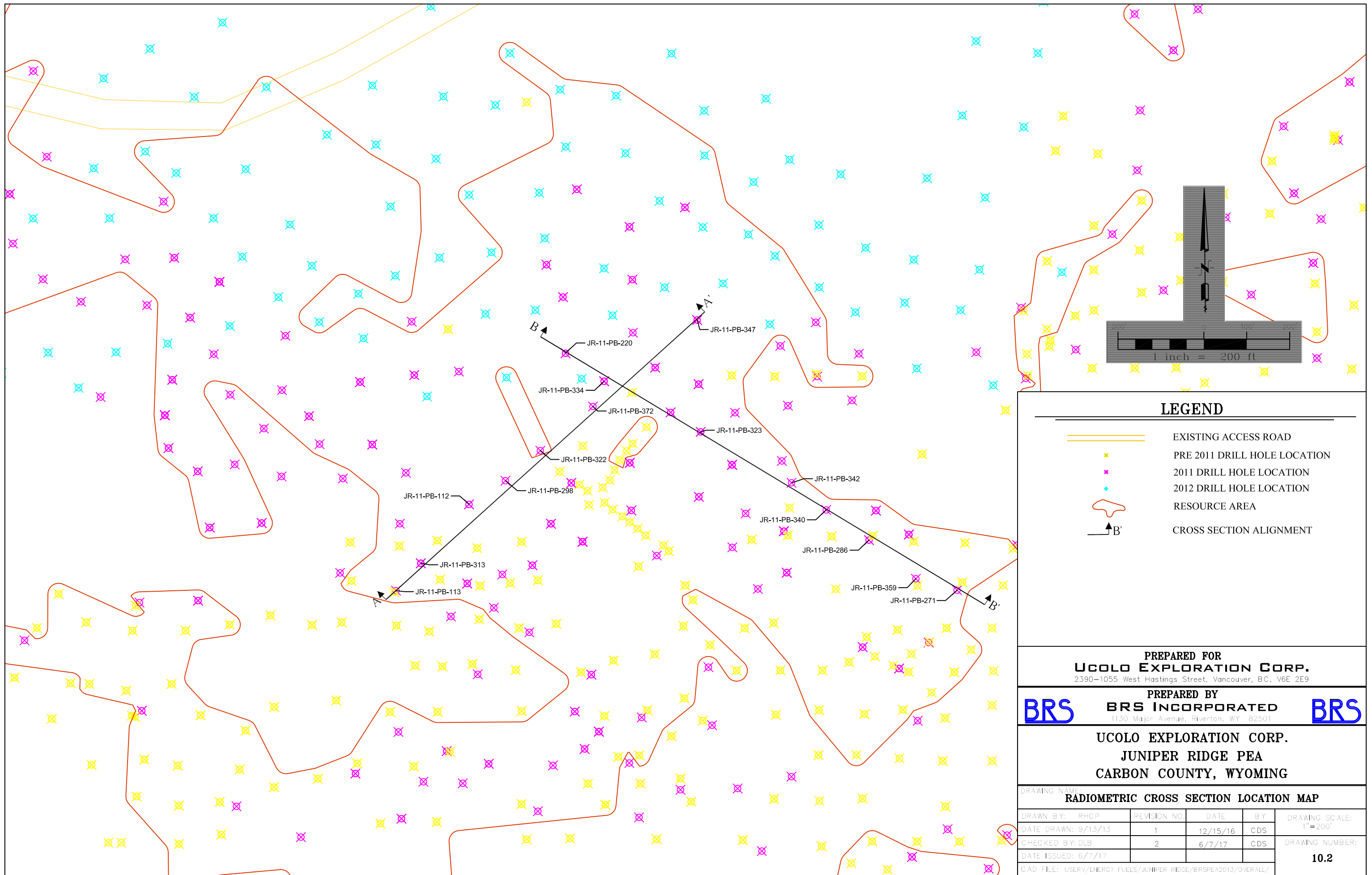
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DRAWING NAME: DRILL HOLE LOCATION MAP







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**LEGEND**

-  EXISTING ACCESS ROAD
-  PRE 2011 DRILL HOLE LOCATION
-  2011 DRILL HOLE LOCATION
-  2012 DRILL HOLE LOCATION
-  RESOURCE AREA
-  CROSS SECTION ALIGNMENT

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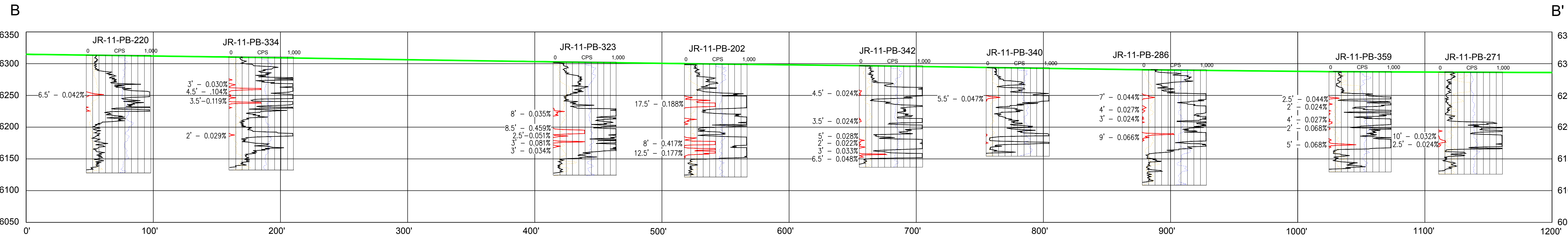
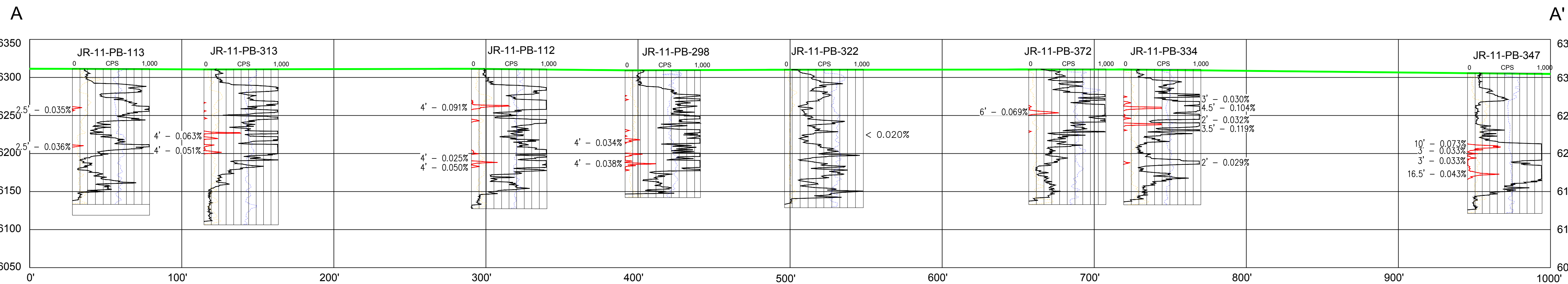
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DRAWING NAME:  
**RADIOMETRIC CROSS SECTION LOCATION MAP**

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**EXPLANATION**

— EXISTING GROUND

**DRILL HOLE I.D.**

**GRAPHIC SCALE**

(IN FEET)

Horizontal 1 inch = 40 ft.

Note: 2:1 Horizontal Exaggeration

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6/2/14	2	6/2/14		

**RADIOMETRIC CROSS SECTIONS**

DRAWING NUMBER: 10.3

## Section 11 – Sample Preparation, Analyses, and Security

For the 2011 and 2012 drilling program, the primary data collected for this Project is the downhole radiometric equivalent data, USAT and PFN geophysical log data, and the lithological descriptions of the drill cuttings. For the 2011 and 2012 drilling programs, downhole geophysical logging of the drill holes was provided by recognized commercial vendors, Century and GAA, respectively, and consists of both hard copy and electronic data provided directly by the vendors. Lithologic descriptions, along with drill hole number and survey coordinates, were recorded on-site with a data recorder. For the 2011 and 2012 drilling programs, QA/QC of the data consisted of verifying the radiometric assays and their entry into the drill hole database, which was completed by the on-site personnel and the electronic data transferred to company's data server with weekly back up. The electronic data included the drill hole database and the original electronic geophysical logs and data. The author used the original electronic geophysical log data to determine appropriate composite mineralized zones for inclusion in the current Mineral Resource estimates that are included in this Technical Report and is further described in Section 12.

The PFN is a specialized logging tool with neutron activation to determine the uranium concentrations in drilled holes. The PFN logging utilizes two different tools used one after the other; a standard gamma tool followed by the PFN tool.

The PFN tool creates neutron-induced fission reactions with  $U^{235}$  atoms present in the host rocks. The  $U^{235}$  atoms emit delayed neutrons which reactivate and are counted by the probe's detector. This delay cycle is repeated a number of times to accumulate a statistically acceptable number of delayed neutron counts. If uranium is present, the "decay" times of the delayed neutrons is proportional to the uranium content and is independent of disequilibrium or changes in density. This method can therefore be used to determine the direct content of uranium in the host rocks.

Seventeen core holes were completed during the 2011 drilling program primarily to provide samples for metallurgical testing. Following field lithologic description, the core was placed into plastic sleeves which were sealed to prevent oxidation. The core was then placed into standard core boxes and stored in a secure facility leased from Grieve Enterprises in Baggs, Wyoming.

The author observed the core storage and examined some of the core which had been collected. The core samples were sealed in plastic bags to prevent oxidation and stored in core boxes which were labeled as to the hole number and footage interval. The database for the mineral resource estimate is based on radiometric equivalent data with the 2011 USAT data utilized to evaluate radiometric equilibrium. This is standard industry practice for these types of deposits.

The 2012 drilling program consisted of rotary drilling and geophysical logging of the drill holes. No core holes were completed as part of the 2012 drilling program.

With respect to drilling prior to 2011 which is discussed in Section 10 of the Technical Report, the author obtained electronic copies of the radiometric equivalent uranium grade data by ½ foot increments from Century Geophysical for 1,917 of the 2,167 holes drilled (88%). Radiometric equivalent uranium grade data for the remaining 250 drill holes (9% of the total database) is in the form of mineralized intercept data from manual log interpretations. Original ½ foot radiometric equivalent data for the 1,917 drill holes has been preserved electronically.

In the 1970's digital geophysical logging gradually replaced analog geophysical logging. The AEC published information of gamma log interpretation methods (Dodd and Drouillard, 1967). The standard manual log interpretation method was the half-amplitude method (Century, 1975). The AEC and its successor agency the Energy Research and Development Administration (ERDA) conducted workshops on gamma-ray logging techniques and interpretation as did private companies including Century Geophysical. The author and peers in the uranium industry at the time attended the geophysical log interpretation workshop conducted by Century Geophysical. On November 19, 1976 the author received certification in geophysical log interpretation from Century after attending their short course.

In summary, the data used in the mineral resource estimates provided herein was collected and preserved to generally accepted industry standards and in the author's opinion is appropriate for the stated purpose of this Technical Report.

## Section 12 – Data Verification

Data sources for the estimation of current uranium mineral resources for the Project include radiometric equivalent data (eU<sub>3</sub>O<sub>8</sub>) for 2,167 drill holes, radiometric equivalent data (eU<sub>3</sub>O<sub>8</sub>) and USAT assay data for 400 drill holes completed during the 2011 drilling program, and radiometric data for 149 drill holes completed in 2012. The 2011 drilling program was intended to verify pre-2011 drilling and to generate new electronic geophysical data (offset drilling) for drill holes where only interpreted eU<sub>3</sub>O<sub>8</sub> data was available, and where original electronic copies of the radiometric data could not be recovered. The 2012 drilling was intended to better define and expand the mineral resource. The author was on site on August 16, 2011 and observed the offset drilling being completed at that time as well as reviewed the overall drilling and logging procedures. The author was not onsite during the 2012 drilling program but has reviewed the original data collected during that program. The 2012 data collection is consistent with that of 2011.

For the 2011 and 2012 drilling programs, downhole geophysical logging of the drill holes was provided by recognized commercial vendors, Century Wireline Services of Tulsa, Oklahoma, formerly Century Geophysical Corporation (Century) and GAA Wireline Services of Casper, Wyoming, respectively. The majority of the pre-2011 geophysical drill hole logging was also provided by Century Geophysical Corporation.

All of the drill data from the 2011 and 2012 drilling programs, including lithologic and geophysical logs and electronic radiometric equivalent data in ½ foot increments, is available in original form.

### Radiometric Equivalent Geophysical Log Calibration

DOE supports the development, standardization, and maintenance of calibration facilities for environmental radiation sensors. Radiation standards at the facilities are primarily used to calibrate portable surface gamma-ray survey meters and borehole logging instruments used for uranium and other mineral exploration and remedial action measurements.

Calibration facilities are located at the DOE Site and Grand Junction Regional Airport in Grand Junction, Colorado; Grants, New Mexico; Casper, Wyoming; and George West, Texas. <https://energy.gov/lm/services/calibration-facilities>

These calibration facilities were first established by the US Atomic Energy commission (AEC) in the 1950's to support the domestic uranium exploration and development programs of that era. Early geophysical logs were analog which required manual interpretation. The standard method for estimation of the grade and thickness of uranium was the half-amplitude method. In the late 1960's this method was gradually replaced with computer processing. Dodd and Drouillard, 1967, state that borehole logging is the geophysical method most extensively used in the US for the exploration and evaluation of uranium deposits and that gamma-ray logging at that time

supplied 80 percent of the basic data for ore reserve calculations and much of the subsurface geologic information. At that time calibration and correction factors were established for each logging unit and probe in the full scale model holes established by the AEC. GAMLOG and RHOLOG computer programs (Fortran II) were used to quantitatively analyze gamma-ray logs to obtain radiometric equivalent grade and thickness of mineralized intercepts (Dodd and Drollard, 1967).

In 1942 Century Geophysical Corporation, now Century Wireline Services (Century) began research and development of geophysical logging techniques in the US and introduced analog geophysical logging equipment for the uranium industry by 1960. In the late 1970's Century pioneered digital logging and continues to provide these services (Century, 2017). Century's geophysical logging equipment is and has been calibrated at US facilities (AEC/ERDA/DOE). Tools used for uranium logging are calibrated and assigned deadtimes and K-factor values at government provided uranium calibration pits. At the same time Century logs field calibration test sleeves which may then be used for daily tool calibration checks to verify that K-factor and deadtimes have not changed (Century, 2017 and Century, 1975).

Calibration procedures and standards for the geophysical logging equipment used in the determination of radiometric equivalent uranium grade has been consistent through the various drilling campaigns and has relied on calibration facilities maintain by the US government. It is standard practice for Century and other geophysical logging companies to rely on these calibration facilities. Century calibrates to the primary standards located at ERDA facilities in Grand Junction, Colorado where a family of calibration models are maintained. These models consist of a barren zone bored in concrete and a mineralized zone constructed of a homogenous concentration of uranium at a known grade followed by and underlying barren zone. There a different grade models to reflect the range on uranium concentrations typically found in the US. In addition, the models can be flooded to determine a water factor and there are models which are cased for the determination of a casing factor. Each of the models are approximately 9 feet deep consisting a 3 foot mineralized zone with 3 foot barren zones above and below. The facilities are secure. Logging unit operators logs the holes, provide the geophysical log data in counts per second (CPS) to the facility which in turn processes the data and provides the company with standard calibration values including; dead time, K Factor, and water and casing factors (Century, 1975).

#### Verification of Radiometric Equivalent Database:

During the preparation of the database to support the Mineral Resource estimates that are included in this Technical Report, the available ½ foot electronic data from both pre-2011 and 2011 and 2012 drilling was reviewed and verified by the author. This process included:

- Screening the drill hole data and preparing a subset of the data containing mineralized intercepts meeting grade, thickness and GT cutoff criteria.

- Correlating the mineralized intercept data such that mineral resource estimates reflected only continuous horizons.
- Excluding any spurious mineralized horizons (laterally or by depth) from the mineral resource database which reflected mineralization outside the continuous mineralized horizon.
- Examining any mineralized intercepts which were either substantially higher or lower than the surrounding values to insure the data was valid.

#### Verification of Pre-2011 Drill Data by Offset Drilling:

During the preparation of the database supporting the Mineral Resource estimate presented in this Technical Report, the author compared information on all drill holes completed during the 2011 drilling program located within 25 feet of pre-2011 drill holes. This comparison process included:

- Comparison of the pre-2011 and 2011 drill hole coordinate locations and selecting all pairs of pre-2011 and 2011 drill holes within 25 feet horizontally.
- Of the 400 drill holes completed in 2011, sixty-nine were completed within 25 feet of a drill hole with pre-2011 radiometric data.
- Ten of the 69 2011 holes varied by less than 0.1 GT as compared to pre-2011 data.
- Twenty-three 69 2011 drill holes had a GT that was lower than the pre-2011 drill data by more than 0.1 GT but less than 1.0 GT.
- Eighteen of the 69 2011 drill holes had a GT that was higher than pre-2011 drill data by more than 0.1 GT but less than 1.0 GT.
- Twelve of the 69 2011 drill holes had a GT that was lower than pre-2011 drill data by more than 1.0 GT.
- Six of the 69 2011 drill holes had a GT that was higher than pre-2011 data by more than 1.0 GT.
- Overall the GT from the 2011 drill holes were slightly lower than the comparative pre-2011 data.

It is the author's opinion that the variances in the comparison of the pre-2011 drilling results to the 2011 results are related to natural variability in grade and mineralization rather than variations or biases induced by analytical methods or equipment.

#### Limitations of Available Data

The Juniper Ridge West area was not part of the 2011 – 2012 drilling campaign that was performed on the Juniper Ridge East area. The author was on site and supervised the Juniper Ridge West drilling during the period of 1982-1986. The database for this area consists of the same radiometric equivalent data and was collected concurrently with that for Juniper Ridge East. Thus, it is the opinion of the author that the pre-2011 drilling databases for both Juniper Ridge West and East are equally reliable and suitable for use in Mineral Resource estimation.

## Radiometric Equilibrium

The author was involved in interpreting the original data, and evaluation of radiometric equilibrium using the 1982 to 1986 drill data (Beahm 1982). The current data for evaluation of radiometric equilibrium is available from the 400 drill holes completed in 2011 for which there is both radiometric equivalent data and USAT data available. USAT logging is a commercially available product. Calibration of the USAT tool followed industry standard methods. The author reviewed and verified these calibration procedures for the 2011 drilling.

It is the author's opinion that the method of assessing radiometric equilibrium follows industry accepted practices, is appropriate and reliable for this Project and that the volume of data is sufficient to reasonably determine radiometric equilibrium conditions for the purposes of estimating Mineral Resources. The evaluation of radiometric equilibrium is provided in Section 14, Mineral Resource Estimates.

## Drill Collar Surveys

Drill hole location maps are available which show the locations of the great majority of all drill holes as are the surveyed drill hole collar locations. During the period of 1982-1986 the author contracted a licensed surveyor, John Krishel, Arrow Surveying, Denver, Colorado, to re-survey a representative portion of the UG drill holes and convert all records to NAD 83 coordinate systems. All surveys of the drill holes completed during the period of 1982-1986 were surveyed in the same manner. For the 2011 and 2012 drilling the operator utilized sub-meter GPS units and recorded the drill hole coordinate's in the NAD 83 coordinate system. The drill holes were plotted by the author from the collar coordinates and compared directly to the drill maps prepared during the period of 1982-1986.

The initial plane surveying system was established using standard plane surveying techniques by UG and maintained by AGIP. The survey control system was created prior to the advent of current GPS technology. All surveying of drill holes, mining claims, and control for aerial mapping was completed by an independent Professional Licensed Surveyor and all surveying was completed within accepted mapping standards. Initial drill hole locations were staked out by the surveyor and the final locations of all drill holes were surveyed following drilling. The surveyor utilized total station survey equipment which provided a digital record of coordinates and elevation accurate to a few tenths of a foot.

Recent drill hole surveys were completed using a Trimble pro XH with a pole mounted tornado antenna. Field data was post-processed with Trimble Pathfinder Office software and referenced to three fixed public reference stations. Recent drill hole surveys were not tied into the on-site control net although both surveys report coordinates and elevations in the NAD 83 Wyoming State Plane system. The recent survey methodology yields sub meter accuracy with respect to both coordinates and elevation.



## Density Determination

The density of mineralized material used in the historical technical studies, Pincock, Allen, & Holt (1986) and Pincock, Allen, & Holt (1978) was 16.3 and 17 cubic feet per ton, respectively. Although there was some test data available for the determination of density factors, the original data is not specifically provided in the reports nor was it available for this study. The previous studies both recommended further testing to increase the number of density determinations in the database. For the purposes of this report the author recommends a density factor of 16 cubic feet per ton based on direct personal experience with mining operations in similar sandstone hosted deposits in Gas Hills, Wyoming and Maybell, Colorado that have a more extensive density database.

The maximum variance in the estimation of mineral resources based on density in the range of 16 to 17 cubic feet per ton is approximately 6%.

## Conclusion

It is the author's opinion that the current radiometric database is reliable for the purpose of estimating mineral resources for the following reasons:

- The pre-2011 and 2011 radiometric data were generated and interpreted by an experienced and industry recognized commercial geophysical logging company. The same commercial logging company, Century, was employed for both the pre-2011 and 2011 drilling programs and is one of the principal companies providing such logging services for the uranium industry in the US.
- The radiometric equivalent data was provided directly from the geophysical logging company (Century) to the companies electronically on reel-to-reel magnetic tapes.
- The radiometric equivalent data was combined with the surveyed collar coordinates using commercial software available at that time. The data for the drill holes used in the estimate has been electronically preserved and converted in format only.
- The companies which previously controlled the Project area were involved in uranium exploration in the US and abroad. These companies followed generally accepted industry practices.
- The pre-2011 radiometric data was vetted and verified by independent consultants Pincock, Allen, & Holt, 1978 and Kilborn Engineering, 1986, for two separate technical studies commissioned by the previous owners of the Project.
- The procedures employed during the 2011 verification drilling program were directly observed and reviewed by the author and followed generally accepted industry practices.
- The author personally observed on-site data collection including drilling, geophysical logging, sample collection, and surveying during the period of 1982-1986.

## Section 13 – Mineral Processing and Metallurgical Testing

Uranium has been mined from the project area and the product from that mining shipped to conventional mills and recovered. As documented in Section 6-History, commercial uranium mining occurred intermittently from 1954 until 1966. Mined product was shipped to a variety of mills including: Union Carbide’s mills located in Rifle and Maybell, Colorado, Western Nuclear’s Split Rock mill near Jeffrey City, Wyoming, and AEC ore buying stations (Anctil, 1987). These uranium mills were acid leach facilities.

This past production from the project demonstrates that uranium is recoverable from the mineralized material using conventional mineral process and recovery methods which are well established for these types of uranium deposits. In 2012 Crosshair completed limited bottle-roll leach test using acid lixiviant on fresh drill core. Five samples were tested with head grades ranging from 0.032 to 0.344 %U<sub>3</sub>O<sub>8</sub>. Recoveries ranged from 61.2 to 93.4% and averaged 78%. One sample exhibited high acid consumption of 300 lbs H<sub>2</sub>SO<sub>4</sub>/ton while the other 4 samples ranged from 20 to 106 lbs/ton.

Previous owners of the project completed extensive metallurgical studies and incorporated the findings of those studies in technical studies, as summarized in Table 13.1, (Pincock, Allen, & Holt, 1978) and (Pincock, Allen, & Holt, 1986). Table 13.1 is a summary of the findings as provided in the technical studies.

**Table 13.1: Mineral Recovery Estimates**

Feasibility Study	Lixiviant	Capacity Tons/Day	Mill Feed Grade	Mill recovery
UG 1978	Acid	2,000	0.06% U <sub>3</sub> O <sub>8</sub>	90.15 %
UG 1978	Alkaline	2,000	0.06% U <sub>3</sub> O <sub>8</sub>	84 %
AGIP 1986	Alkaline	540 maximum	0.06-0.12% U <sub>3</sub> O <sub>8</sub>	88.3 – 92.9 %

Molybdenum is known to be associated with the uranium mineralization at Juniper Ridge. Earlier studies (Pincock, Allen, & Holt, 1978) included recovery of molybdenum as a co-product, whereas later studies (Pincock, Allen, & Holt, 1986) did not. Whether molybdenum is recovered as a co-product or not, due consideration should be given to its presence, with respect to process design, as it may affect uranium recovery under certain circumstances. It is recommended that whenever physical samples are analyzed for uranium, analysis for other constituents including molybdenum, selenium, arsenic, and carbonates be completed. The presence or absence of these constituents may have implications for process design and waste management.

Factors which will affect mineral processing recoveries and costs include;

- The grade of the mined material. The solid loss due to the refractory nature of the mineralized material is relatively constant. Thus, the higher the feed grade the higher the percentage recovery.
- The calcium carbonate concentrations, which in some areas are in the range of 6 to 8% would affect acid consumption and hence operating costs (AGIP, 1982).
- If alkaline lixiviant is used, recoveries are expected to be lower than an acid lixiviant and alkaline lixiviants will have a tendency to cause the clay fraction in the leach material to swell which may not be desirable depending on the methodologies chosen for mineral processing and tailings disposal.
- In-situ recovery would generally not be favorable due to relatively low permeability, lack of confining units, and a substantial portion of the mineralization occurring above the water table.

After reviewing the information available for the Project with respect to the past metallurgical programs, and considering results from similar uranium deposits mined in Wyoming and Colorado, the author considers heap leaching to be appropriate for process recovery for the Juniper Ridge Project and support the assumptions used in the mineral resource estimate and the PEA mine design. Additional metallurgical test are recommended to support more advanced mining studies as specified in Section 26.

## Section 14 – Mineral Resource Estimates

The Juniper Ridge Project is supported by drill hole data with a nominal spacing of 50 feet which provides a good basis for establishing geological and grade continuity within the area of the mineral resource estimate. The geometry, mineralization controls, and continuity of mineralization for roll-front uranium deposits such as Juniper Ridge are well understood.

The selected method of mineral resource estimation is the use of a GT contour model. The author used the CIM Definition Standards for Mineral Resources and Mineral Reserves (May 10, 2014) for the definition of Mineral Resource and the confidence categories.

### Cut-off Criteria

To meet the definition of a Mineral Resource the mineralization must have reasonable prospects of eventual economic extraction. This is determined by having sufficient grade and thickness in a minable unit that would meet the mining, processing, and G&A costs and factoring metallurgical recoveries and uranium price. Using open pit mining methods and the scale of equipment for this size and type of deposit including the relatively continuous and flat lying mineralization the following assumptions were made:

- minimum radiometric equivalent grade of 0.02% eU<sub>3</sub>O<sub>8</sub>, as a marginal cut-off
- minimum mining width of 2 feet to account for the selectivity of the mining equipment and
- minimum GT of 0.10, as the mine cutoff
- open pit limits established using a maximum of 20:1 stripping ratio (waste tons:resource tons).

Note 1: Marginal cutoff is defined as the minimum grade of mineralized material that would pay back the cost of process and recovery of material which has already been mined from the pit. Therefore mining costs are not included in the marginal cost.

Note 2: The mine cutoff is based on open pit mining costs. The host formation for both waste and mineralization is weakly cemented and rippable, thus allowing removal of overburden by wheel scrapers supported by dozers.

Cost Center	Estimated Unit Cost
Stripping (\$1.50/ton * 20:1 SR)	\$30.00 per Ton Processed
Direct Mining	\$5.00 per Ton Processed
Mineral Processing	\$17.00 per Ton Processed
Average Taxes and Royalties	~\$3.50 per Ton Processed
Total Estimated Cost	\$55.50 per Ton Processed

Assuming \$65.00 per/lb uranium price and 85% metallurgical recovery, results in a breakeven cutoff 0.05% eU<sub>3</sub>O<sub>8</sub>. Assuming a minimum mining width of 2 feet at 0.05% eU<sub>3</sub>O<sub>8</sub>, the minimum GT cut-off of 0.10 is appropriate.

Using the criteria described above, the cut-off realistically reflects the location, deposit scale, continuity, assumed mining method, metallurgical processes, costs and reasonable long term metal prices appropriate for the deposit, and the mineral resources have reasonable prospects for eventual economic extraction.

The assessment of reasonable prospects of eventual economic extraction and the appropriate cut-off criteria applied to the resource estimate is based on the assumption of open pit mining methods and heap leach extraction for the recovery of uranium as discussed in Sections 16, Mining Methods and Section 17, Recovery Methods. GT Contour maps Figures 14.1 and 14.2, Juniper Ridge East and West, respectively, provide a graphical representation or model of the mineralization reflecting the location, quality as represented by the GT, and continuity of the mineralization.

The drill hole spacing for Indicated Mineral Resources is 50 feet or less (25 foot maximum projection). Inferred Mineral Resources were estimated in areas where the drill holes spacing exceeded 50 feet but were less than 200 feet (100 foot maximum projection). The drill hole spacing is based on the observed variability of the mineralization in the drill hole database as represented by the GT contours, operational experience of past mining on the Juniper Ridge property, and the Author's experience of roll front uranium deposits in this facies of host rock.

#### Mineral Resource Estimation Methodology:

The primary resource estimation method utilized in this report is the GT contour method which is considered appropriate for this type of deposit. The mineral resource estimate represents a two dimensional estimate based on the total GT, by horizon, by hole, meeting cut-off criteria. For sandstone-type uranium deposits the GT cut-off is by far the governing factor as the combination of grade and thickness relates directly to contained pounds and minability of the mineralized horizon. The minimum or marginal cut-off grade is typically the grade of material which can support mineral processing costs. In the case of open pit mining, designs and economic evaluations are based on material meeting the GT cutoff. During mining typically at least two grade cut-offs are employed; a higher grade cut-off for short-term plant feed, and a lower grade cut-off or marginal cutoff for material to be stockpiled for future mineral processing when economic conditions allow.

Drill data reflecting the thickness (T), grade (% eU<sub>3</sub>O<sub>8</sub>), and GT was summed for all intercepts meeting cut-off criteria by hole. GT and T were then contoured using standard algorithms based upon the geological interpretation of the deposit. From the contoured GT ranges, the contained pounds of uranium were calculated by multiplying the incremental areas of the GT ranges by GT and density. Similarly, the total tonnage was calculated by contouring thickness and multiplying

by area to obtain cubic feet, then converting to tonnage by applying the density factor. A density factor of 16 cubic feet per ton was utilized in the mineral resource estimation. Tonnage by GT range was estimated based on the ratio of GT areas to total tonnage and the results summed.

**Table 14.1 Indicated Mineral Resource Summary**

Indicated Resource	Juniper Ridge West		
GT Cut-off (ft x wt%)	(base case) 0.1	0.25	0.5
Pounds eU <sub>3</sub> O <sub>8</sub>	800,000	718,000	561,000
Tons	605,000	461,000	317,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.066	0.078	0.088
Indicated Resource	Juniper Ridge East		
GT Cut-off (ft x wt%)	0.1	0.25	0.5
Pounds eU <sub>3</sub> O <sub>8</sub>	5,206,000	4,583,000	3,321,000
Tons	4,534,000	3,559,000	2,339,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.057	0.064	0.071
Indicated Resource	<b>PROJECT TOTAL</b>		
GT Cut-off (ft x wt%)	(base case) 0.1	0.25	0.5
<b>Pounds eU<sub>3</sub>O<sub>8</sub></b>	<b>6,006,000</b>	<b>5,301,000</b>	<b>3,882,000</b>
Tons	5,139,000	4,020,000	2,656,000
Average Grade% eU <sub>3</sub> O <sub>8</sub>	0.058	0.066	0.073

**Table 14.2 Inferred Mineral Resource Summary**

Inferred Resource	Juniper Ridge West
GT Cut-off (ft x wt%)	0.1
Pounds eU <sub>3</sub> O <sub>8</sub>	117,000
Tons	83,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.071
Inferred Resource	Juniper Ridge East
GT Cut-off (ft x wt%)	0.1
Pounds eU <sub>3</sub> O <sub>8</sub>	65,000
Tons	24,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.133
Inferred Resource	<b>PROJECT TOTAL</b>
GT Cut-off (ft x wt%)	0.1
<b>Pounds eU<sub>3</sub>O<sub>8</sub></b>	<b>182,000</b>
Tons	107,000
Average Grade % eU <sub>3</sub> O <sub>8</sub>	0.085

The base case for estimated mineral resources, as highlighted in the forgoing tabulation, is the 0.1 GT cut-off.

Grade thickness contour plans were generated in the areas of mineralization using the radiometric equivalent data (eU<sub>3</sub>O<sub>8</sub>) for 2,167 drill holes completed pre-2011, radiometric equivalent data (eU<sub>3</sub>O<sub>8</sub>) and USAT assay data for 400 drill holes completed in 2011, and radiometric equivalent data (eU<sub>3</sub>O<sub>8</sub>) for 149 drill holes (includes 40 holes using PFN assay) completed in 2012.

GT contour maps for Juniper Ridge East and West are provided as Figures 14.1 and 14.2, respectively. Due to the observed variability of grade, as previously discussed, the projection of mineralization for Indicated Mineral Resources was limited to a maximum of 25 feet. Inferred Mineral Resources were projected up to 100 feet along interpreted mineralized trends. The spacing of drill holes within the areas for which GT contour maps were prepared is generally 100 feet or less. Based on the density of drill data and interpretation of geological continuity, the mineral resources were considered to meet either Indicated or Inferred Mineral Resources using the definitions of CIM Definition Standards. The projection of Inferred Mineral Resources was limited and it is reasonably expected that the majority of the Inferred could be upgraded to Indicated Mineral Resources with continued exploration. The estimated Inferred Mineral

Resources have a lower level of confidence as compared to the estimated Indicated Mineral Resources, however, the Inferred Mineral Resources are interpreted to be in the same geological horizon and to have a similar depth, thickness, and grade, and thus, reasonable prospects of eventual extraction.

### Disequilibrium

Evaluation of radiometric equilibrium was based on 258 drill holes, with natural gamma and USAT data, completed in 2011, which met the cut-off criteria utilized in the mineral resource estimation. While the average disequilibrium factor was slightly less than 1 (0.94), the disequilibrium factor varies by area, ranging from 0.84 to 1.04 with the higher factors corresponding to the more highly mineralized areas of the deposit. The author also prepared a study of radiometric equilibrium using pre-2011 drilling results in a study supporting an advanced mining study in 1988 and the results were consistent with the 2011 study. Based on these results, the author determined that no correction for radiometric equilibrium be applied to the resource estimate.

Figure 14.3 shows the general distribution of disequilibrium conditions with respect to the areas of project mineralization.

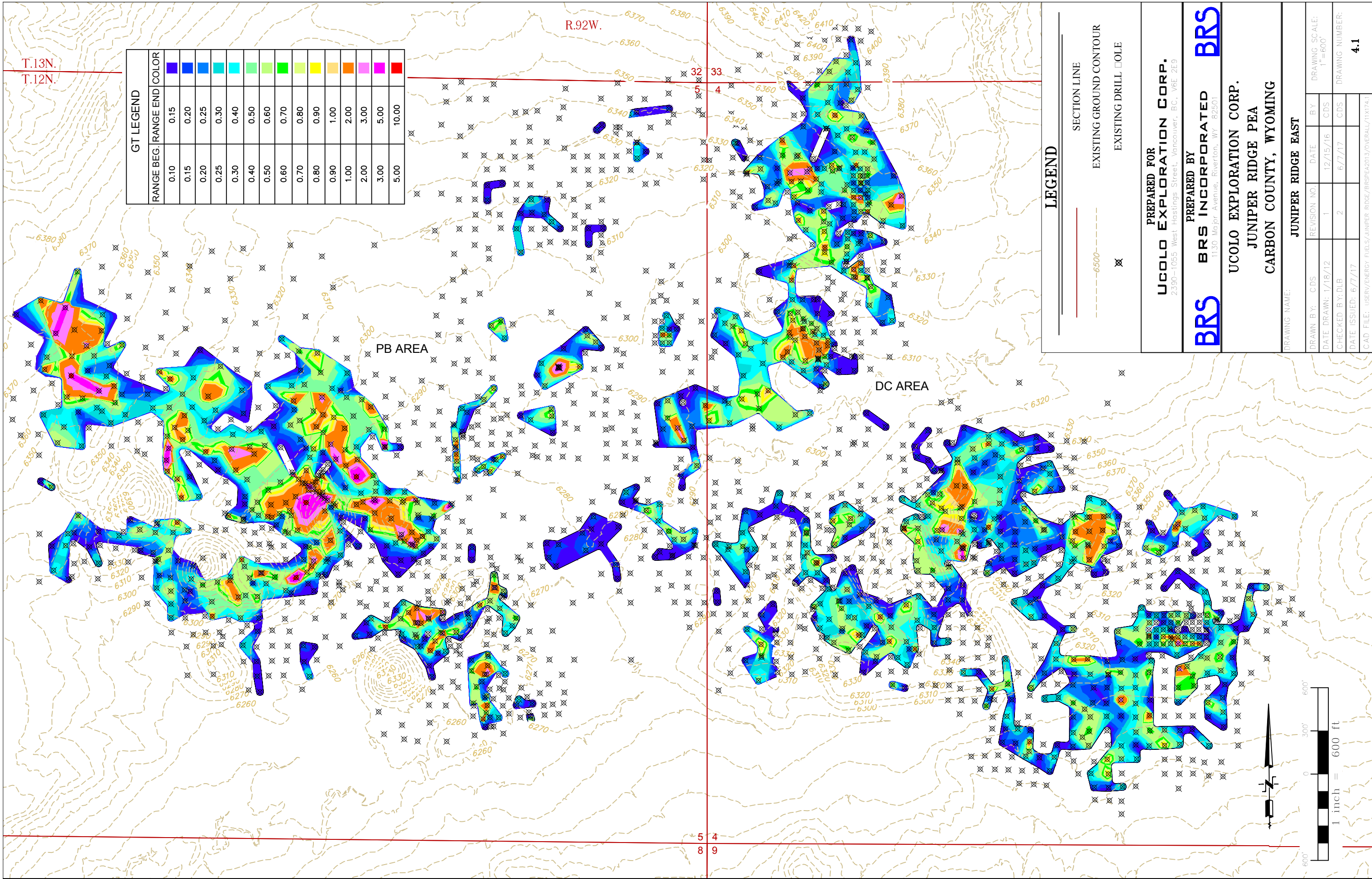
### Environmental Permitting and Other Relevant Factors

With regard to the socioeconomic and political environment, Wyoming mines have produced over 200 million pounds of uranium from both conventional mine and mill operations and ISR. Production began in the early 1950's and continues to the present. The State has ranked as the number one US producer of uranium since 1994. Wyoming is generally favorable to mine development provided established environmental regulations are met (refer to "Wyoming Politicians, Regulators Embrace Uranium Miners With Open Arms", Finch, 2006). An assessment by the Fraser Institute published in February 2017, ranks Wyoming as 7<sup>th</sup> out of 104 jurisdictions using a Policy Perception Index, which indicates a very favorable perception by the mining industry towards Wyoming mining policies.

Within the general Project area and vicinity, oil and gas wells and infrastructure exist. Currently the oil and gas wells and infrastructure are not in conflict with the known mineral resource areas. As federal lands are subject to multiple uses, there is a risk that future oil and gas development and/or related infrastructure could be in conflict with mineral development.

To the author's knowledge, there are no other significant environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the mineral resource estimates.





T.13N.  
T.12N.

R.92W.

GT LEGEND	
RANGE BEG.	RANGE END COLOR
0.10	0.15
0.15	0.20
0.20	0.25
0.25	0.30
0.30	0.40
0.40	0.50
0.50	0.60
0.60	0.70
0.70	0.80
0.80	0.90
0.90	1.00
1.00	2.00
2.00	3.00
3.00	5.00
5.00	10.00

**LEGEND**

- SECTION LINE
- - - - - EXISTING GROUND CONTOUR
- ⊗ EXISTING DRILL HOLE

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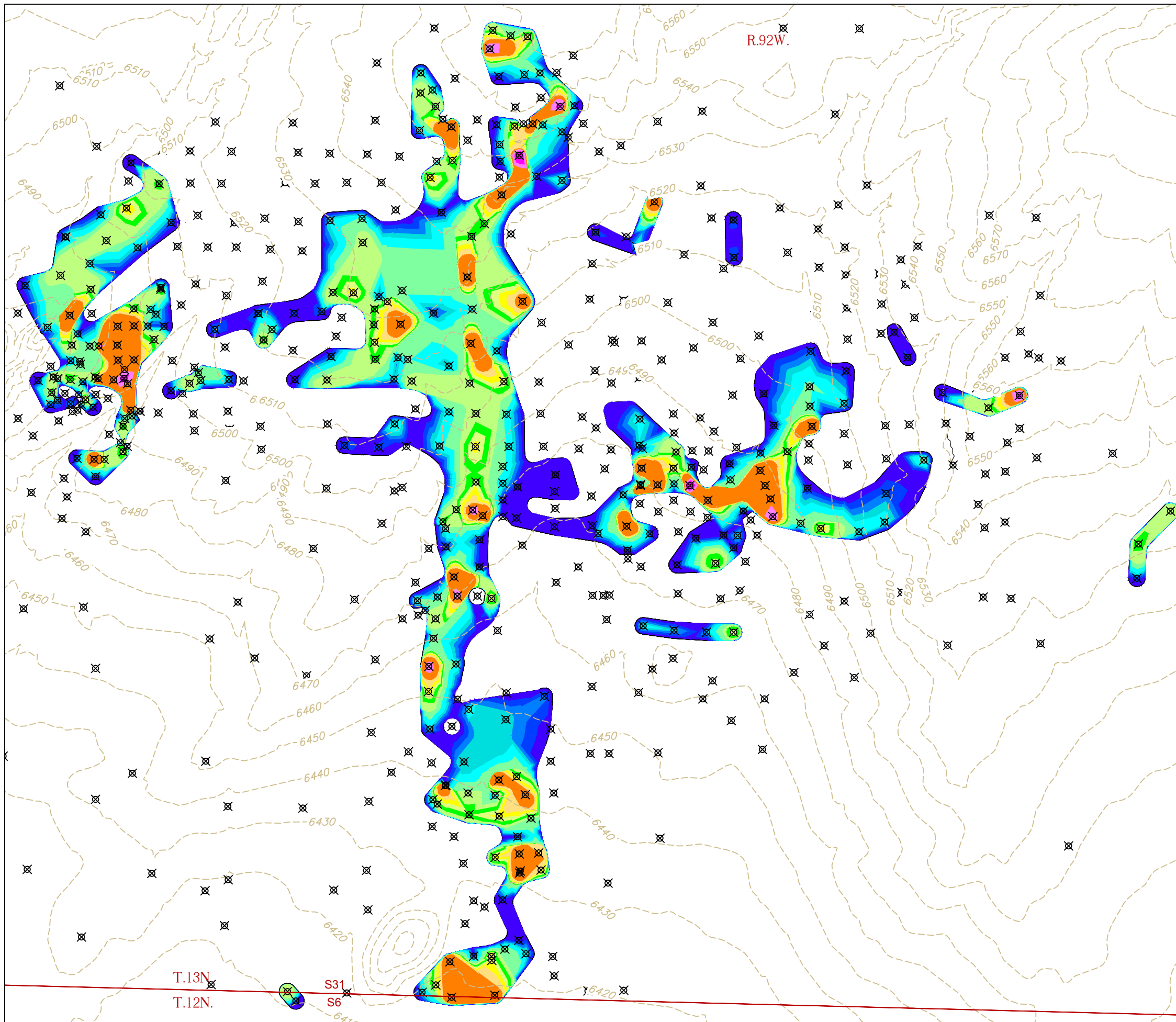


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**JUNIPER RIDGE PEA**  
**CARBON COUNTY, WYOMING**


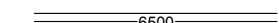

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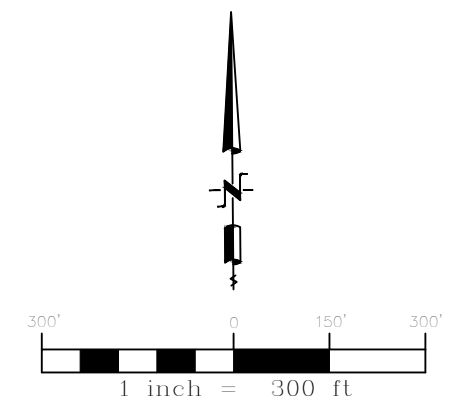




**LEGEND**

-  SECTION LINE
-  EXISTING GROUND CONTOUR
-  DESIGN PIT CONTOUR
-  PIT LIMITS

GT LEGEND		
RANGE BEG.	RANGE END	COLOR
0.10	0.15	Blue
0.15	0.20	Dark Blue
0.20	0.25	Light Blue
0.25	0.30	Cyan
0.30	0.40	Light Cyan
0.40	0.50	Light Green
0.50	0.60	Green
0.60	0.70	Yellow-Green
0.70	0.80	Yellow
0.80	0.90	Orange
0.90	1.00	Light Orange
1.00	2.00	Pink
2.00	3.00	Magenta
3.00	5.00	Red
5.00	6.00	Dark Red

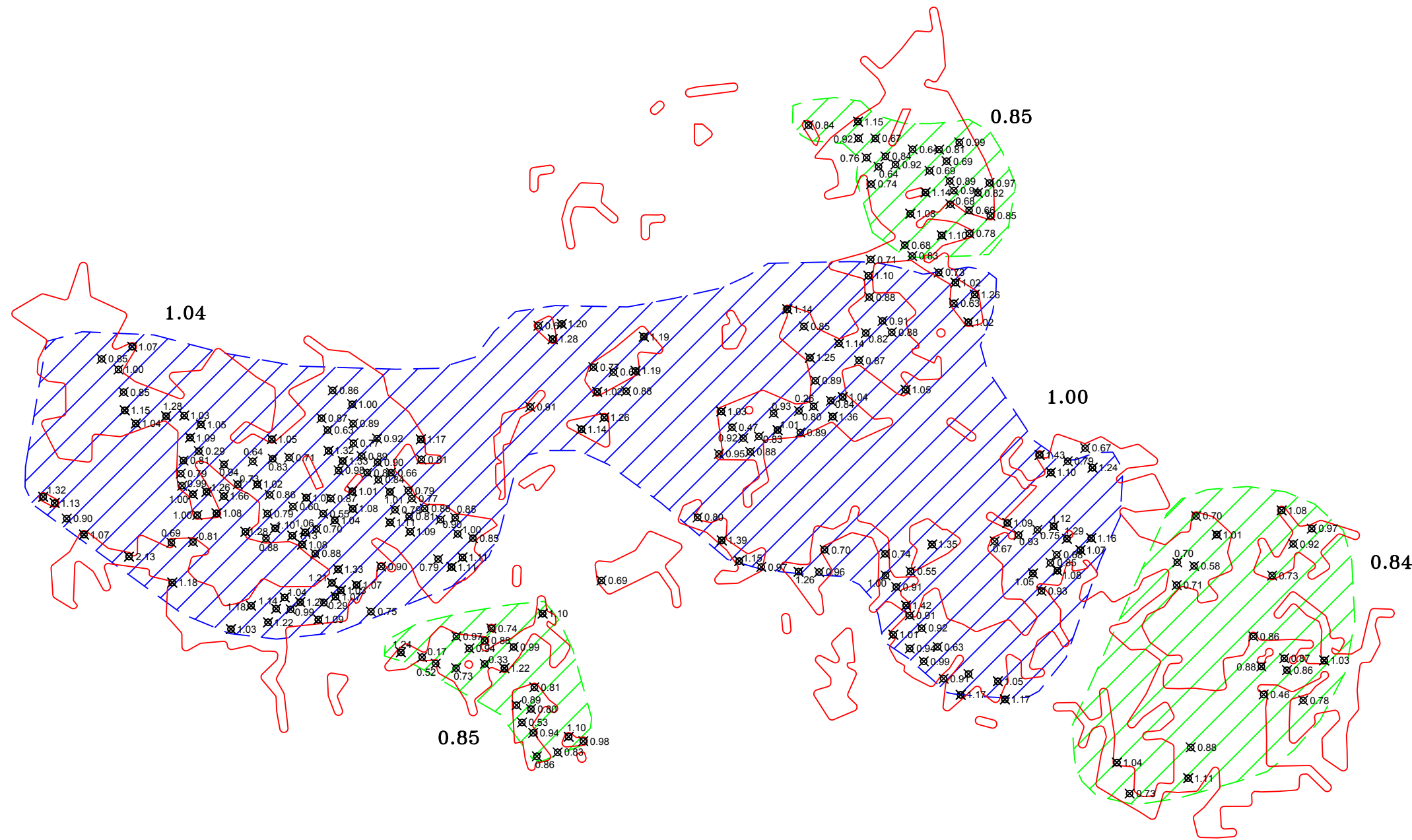


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**CARBON COUNTY, WYOMING**

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





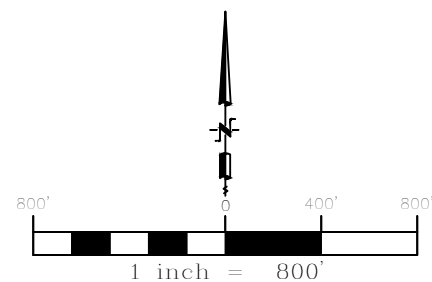
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DATE ISSUED: 6/17/17				<b>14.3</b>
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**LEGEND**

-  DISEQUILIBRIUM FACTOR DEVIATION
-  DISEQUILIBRIUM FACTOR DEVIATION
-  DRILL HOLE LOCATION
-  RESOURCE AREA



## **Section 15 – Mineral Reserve Estimates**

Mineral Reserves are not estimated herein.

## Section 16– Mining Methods

### 16.1 Introduction

The PEA is based on open pit mining utilizing methodologies, equipment, and generalized design criteria which have been employed at the Jupiter Ridge site and similar sites in the past. Figure 16.1 depicts the overall conceptual mine layout. Conceptual mine designs were developed for three main areas. The primary parameter for determining the open pit limits is the ratio (Mining Ratio) of mined overburden, expressed in cubic (CY), as compared to the pounds of uranium contained in the mineralization that is delivered to the heap leach pad. Mineral resources within the Juniper Ridge West area were incorporated in the MU pits. Mineral resources within the Juniper Ridge East area were incorporated in the PB or DC pits. Conceptual pit designs for the MU, PB, and DC areas are depicted in Figures 16.2 through 16.5, respectively.

### 16.2 Mineral Resources Used for PEA

The Indicated and Inferred Mineral Resources used in the PEA, Table 16.1, are that portion of the mineral resources which meet minimum cut-off criteria and are incorporated within conceptual mine designs, as further discussed herein. For conceptual mine design, mineral resources were subdivided into three main areas: PB, MU, and DC. The MU area corresponds with the Juniper Ridge West and the PB and DC areas correspond with the Juniper Ridge East.

**Table 16.1 Mineral Resources Used in the PEA**

Indicated Mineral Resources	Total CY (x1,000)	Mining Ratio (CY:Pounds)	Total Tons (x1,000)	Total Pounds (x1,000)	Average Grade (% eU <sub>3</sub> O <sub>8</sub> )
PB Area	14,837	5.6	1,791	2,603	0.073
MU Area	7,440	8.2	675	907	0.067
DC Area	14,295	9.1	1,512	1,577	0.052
Total Indicated Mineral Resources in PEA	36,572	7.1	3,978	5,087	0.064
Total Inferred Mineral Resources in PEA			25	65	0.133

Note 1: The conceptual open pit designs developed for the purposes of the PEA were not optimized. Mineral Resources which fall outside the conceptual open pit designs do have reasonable prospects for eventual economic extraction albeit at a lower rate of return.

Note 2: The total Inferred Mineral Resource included in the PEA was 24.5 ktons (less than 1% of the total tons) at an estimated grade of 0.13 % eU<sub>3</sub>O<sub>8</sub>.

### 16.3 Determination of Mine Cut-off Grade

Conceptual mine designs focused on the areas with the most extensive mineralization and sought to identify areas with mining ratios less than 15:1, and an average diluted grade of 0.05% eU<sub>3</sub>O<sub>8</sub> or greater over a minimum mining width of 2 feet. Note this is an elevated cutoff above what was used in the mineral resource estimates in order to achieve a reasonable return.

The PEA shows total direct operating costs of approximately \$42 per ton processed and capital costs of approximately \$10 per ton processed. Mineralized material encountered below the mine GT cutoff, which has to be excavated as part of the mine plan and would otherwise be disposed of as mine waste, could be salvaged at grades as low as 0.02 % U<sub>3</sub>O<sub>8</sub> considering only mineral processing costs. This grade is slightly more than the minimum grade criteria.

### 16.4 Selection of Mining Method

The PEA is based on open pit mining utilizing methodologies, equipment, and a generalized design criteria which have been employed at the site and similar sites in the past. Open pit mining has two major facets: (1) primary stripping or the removal of overburden and (2) the mining of the mineralized material as it is exposed by the stripping. Primary stripping would operate a single 10 hour shift per day on a continuous basis with each operator working approximately 240 of 260 available days per year or 2,400 hours. Mining would be accomplished on a similar single daylight shift. If it were necessary to increase production, it is recommended that the mining remain a daylight operation for grade control purposes but the days and shifts be extended during the late spring to late fall when weather conditions are more favorable.

Grade control during both stripping and mining operations will be a critical aspect of the Project. This type of sandstone hosted uranium deposit may exhibit local variability in grade and thickness, and potentially variable radiometric equilibrium conditions. Cost allowances have been made in the PEA for 4 fulltime grade control persons under direction of the mine geologist, along with the requisite field radiometric scanning and rapid assay equipment.

### 16.5 Conceptual Mine Design

The conceptual mine designs utilized a 0.6:1 (horizontal to vertical) slope. This allows for a highwall cut at a 0.5:1 slope with 10 foot wide safety benches incorporated at 50 foot vertical intervals. Highwall heights range from less than 40 to slightly more than 200 feet. The open pit design employs similar design parameters and mining equipment configurations to those used successfully in past Wyoming conventional mine operations. Ramps were not specifically incorporated in the designs at this conceptual level of study because the pits are quite shallow on

the northern or up dip side and will not add significantly to the estimated excavation volumes. Minimum turn radii and travel widths were held to 100 feet.

## 16.6 Geotechnical Considerations

Specific geotechnical studies relating to highwall stability were completed for past studies. There are remnant highwalls at the site from past mining which have stood at a 0.5:1 slope aspect for more than 50 years. At the relatively shallow depths planned, the author considers highwall design criteria utilized for the PEA to be adequate for the level of investigation.

## 16.7 Pre-Production Mine Development

Pre-production expenses relate primarily to project design and permitting and include:

- Project Development and Design
  - Drilling and Reserve Definition
  - Mine Planning
  - Metallurgical Testing
  - Plant and Heap Design
  - Property Holding Costs
- Project Permitting and Licensing
  - Environmental Baseline
  - State and BLM Mine Plan and Plan of Operations
  - NRC Source Materials License

In the PEA, an allowance of approximately 5.2 million \$US was included over a four year period leading up to the year of capital construction prior to initial production. This was based on the author's recent experience with similar projects.

## 16.8 Mine Equipment

Mining equipment is summarized in Table 16.2 and includes: the stripping and mining equipment, support equipment, facilities, and a 15% contingency.

The primary stripping equipment includes two 637 and two 631 scrapers which will work in pairs. The 637 scrapers being a twin engine push-pull scrapers and the 631 single engine scrapers. In the paired configuration, the scrapers will predominantly self-load but may at times be assisted by dozers.

Mining will be accomplished in a selective manner utilizing a 3 CY excavator and articulated mine haul trucks. This equipment would be capable of working in tight areas and selectively excavating mineralized material in lifts of 2 feet or less, as necessary. A 6 CY wheel loader is also included for handling of mined material at the stockpile and as a backup for the excavator.

The mining and stripping crews will be supported by dozers, a motor grader, and water trucks. While this configuration would be adequate for the Project, alternative equipment configurations could be considered.

**Table 16.2 Mine Equipment and Facilities**

Capital Costs	units	unit cost (x 1,000)	total costs (x 1,000)
330 LX Linkbelt	1	\$136	\$136
16M Motor Grader-	1	\$744	\$744
140 Grader	1	\$304	\$304
D-8TDozer-	2	\$658	\$1,316
A30D Volvo Artic Truck	4	\$225	\$902
980 Wheel Loader-	1	\$462,000	\$462
637G Scraper -	2	\$1,400,000	\$2,800
631G Scraper	2	\$1,000,000	\$2,000
Water truck 3000 gal	1	\$100,000	\$100
Water truck	1	\$356	\$359
Subtotal Major Equipment			\$9,123
Mine Support vehicles			
Fuel/lube truck	1	\$155	\$155
Mechanical service truck	1	\$112	\$112
Rubber tire backhoe Cat 414e	1	\$60	\$60
Pickup trucks, 4WD, ¾-ton	8	\$29	\$232
Shop equipment	1	\$400	\$400
Subtotal			\$959
Facilities			
Shop/Warehouse	1	\$453	\$453
Lab Trailer	1	\$50	\$50
XRF	3	\$50	\$150
Subtotal			\$ 653
Total Capital			\$ 10,735
Contingency 15%			\$ 1,610
Escalation 2014-2016			\$ 247
<b>TOTAL OPEN PIT</b>			<b>\$ 12,592</b>



## 16.9 Mine Productivity and Reclamation

Mine designs, haulage profiles, and cycle times were developed at a conceptual level. Given the shallow nature and proximity of the pits, cycle times in the range of 6 to 8 minutes (load, haul, dump, and return) are considered reasonable. The annual production schedule and profile requires approximately 4 million CY of primary stripping annually. At cycle times of 6 to 8 minutes and allowing for 90% utilization, between 2.9 and 3.8 scrapers, respectively, would be required. The PEA conservatively assumed 4 scrapers on an annual basis providing some additional excavation capacity.

The mining configuration including the excavator (with the loader as backup) and 4 haul trucks has sufficient capacity to mine over 400 thousand tons per year, handle up to the same volume of internal waste, and haul the mined product to the heap facility.

The stripping equipment would also be utilized for mine reclamation and closure during cessation of operations. The PEA allows that the entire volume of the first pit in each area would be temporarily stockpiled at the beginning of the operation in each area. Subsequent pits would then sequentially backfill previous pits and the stockpiled mine waste from the first pits would be utilized to reclaim the final pits in each area.

Although it would be possible for the on-site equipment to also reclaim the heap and mineral processing facility, this was estimated as a contracted operation in the PEA. Reclamation of the heap and mineral processing facility would include dismantling of the facilities, on-site disposal, cover, and sloping of the reclaimed heap and plant site to a geomorphically stable configuration. A cost allowance of some 6.8 million \$ US has been included in the estimate for an approximate 70 acre site.

## 16.10 Labor and Personnel Requirements

Labor requirements for staff and mine operations are summarized in Table 16.3. The total mine labor force is estimated at 35 including staff positions. Where positions are shown as halftime in the table, it was assumed that one individual would serve dual roles and/or be shared with other operating facilities. Costs in the PEA allow for a year-round operation 5 days per week or 260 days per year. However, to account for lost days due to factors such as weather conditions, operating productivity was based on 240 days.

**Table 16. 3 Labor Requirements**

STAFF	
General Project Manager	0.5
Mine Manager OP	1.0
Mine Leadman OP	1.0
Maintenance Leadman	1.0
Warehouse/clerk	1.0
Safety/personnel Manager	0.5
Environmental Engineer	0.5
Chief Mine Engineer	0.5
Chief Mine Geologist	0.5
RSO	1.0
Radiation Safety Technician	1.0
Surveyor	1.0
Engineering Technician	1.0
Secretary/Clerk	1.0
Accountant	0.5
TOTAL STAFF	12
LABOR	
Equipment Operators	15
Mechanics	4
Grade Control	4
TOTAL LABOR	23
GRAND TOTAL PERSONNEL	35

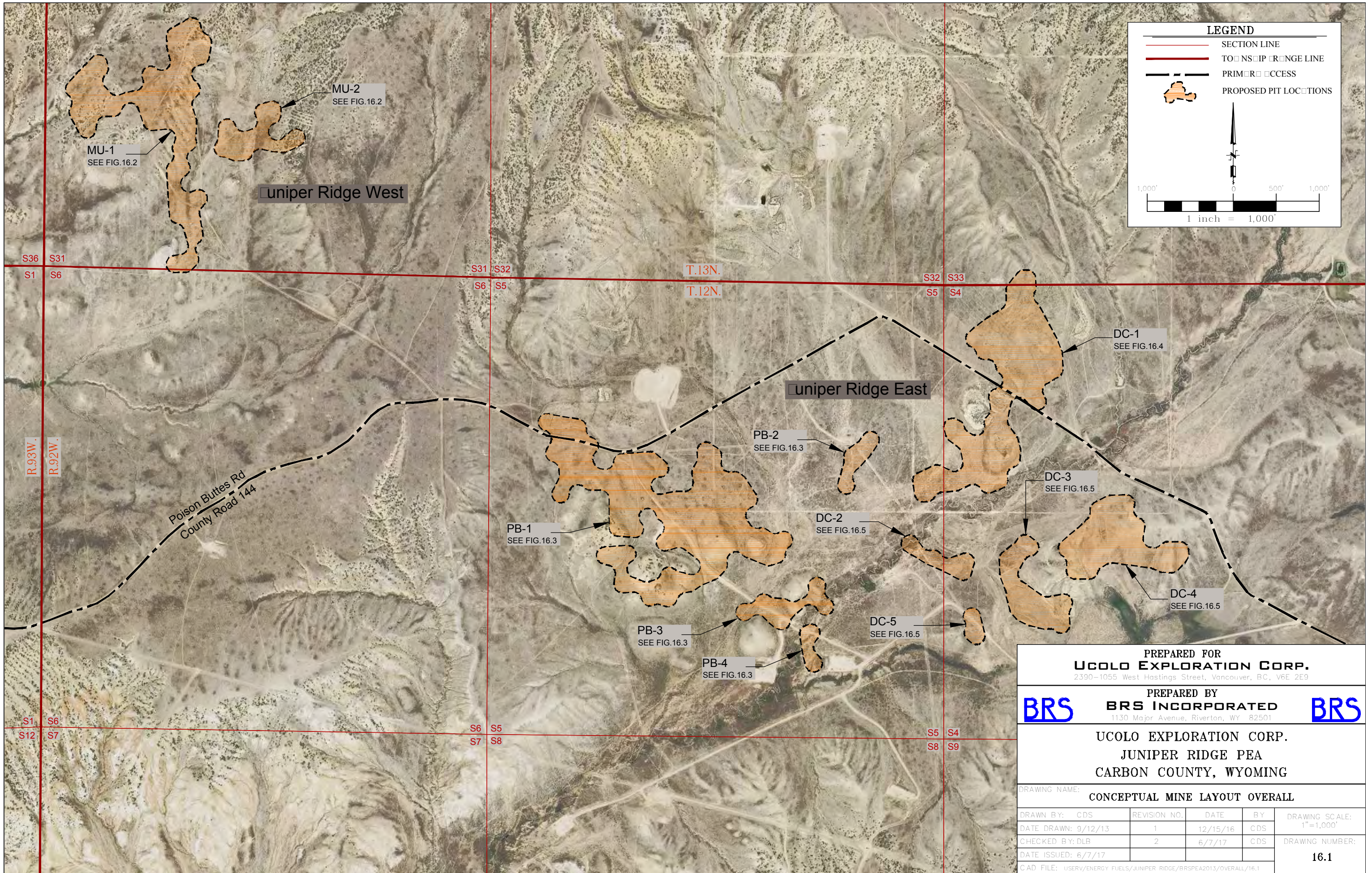
### 16.11 Production Profile

Table 16.4 displays the production profile for a 10 year mine operation with a nominal production of approximately 400,000 tons per year loaded onto the heaps, containing in excess of 500,000 pounds of uranium per year. To achieve this level of mine production, the annual stripping requirement averages 3.6 million cubic yards per year with a peak requirement of 4.3 million cubic yards.

**Table 16.4 Production Profile**

(Tons and Lbs x 1,000)

Pit	pits	yr 1	yr 2	yr 3	yr 4	yr 5	yr 6	yr 7	yr 8	yr 9	yr 10	TOTAL
PB 1C, MU 1B&C, MU 2	CY	2,505			400			1,186	1,186			
	TONS	193	193			193	83	47	47			
	LBS	312	312			257	110	85	85			
	Grade	0.081	0.081			0.066	0.066	0.091	0.091			
PB 1D, MU 1A	CY	1,000				600	2,312					
	TONS		226	226			305					
	LBS	-	336	336			369					
	Grade		0.074	0.074			0.061					
PB 3&4, DC 3, DC 1A&B, DC4C	CY			924	244		1,533	2,930	2,966	330	2,007	
	TONS			86	25		182	519	321	36	147	
	LBS			154	59		185	494	345	38	130	
	Grade			0.090	0.118		0.051	0.048	0.054	0.054	0.044	
PB 1E, DC 4A, DC 2	CY			1,535						4,012	517	
	TONS			128	128					275	34	
	LBS			173	173					341	42	
	Grade			0.067	0.067					0.062		
PB 1F	CY			1,000	2,303							
	TONS				255	170						
	LBS				336	224						
	Grade				0.066	0.066						
PB 2	CY				628							
	TONS				42							
	LBS				81							
	Grade				0.096							
PB 1B	CY											
	TONS					142						
	LBS					174						
	Grade					0.061						
TOTALS	CY	3,505		3,459	3,576		3,845	4,116	4,152	4,342	2,524	36,572
	TONS	193	420	441	451	505	570	566	368	310	181	4,003
	LBS	312	647	663	649	654	665	580	430	379	173	5,152
	Grade	0.081	0.077	0.075	0.072	0.065	0.058	0.051	0.059	0.061	0.048	0.064



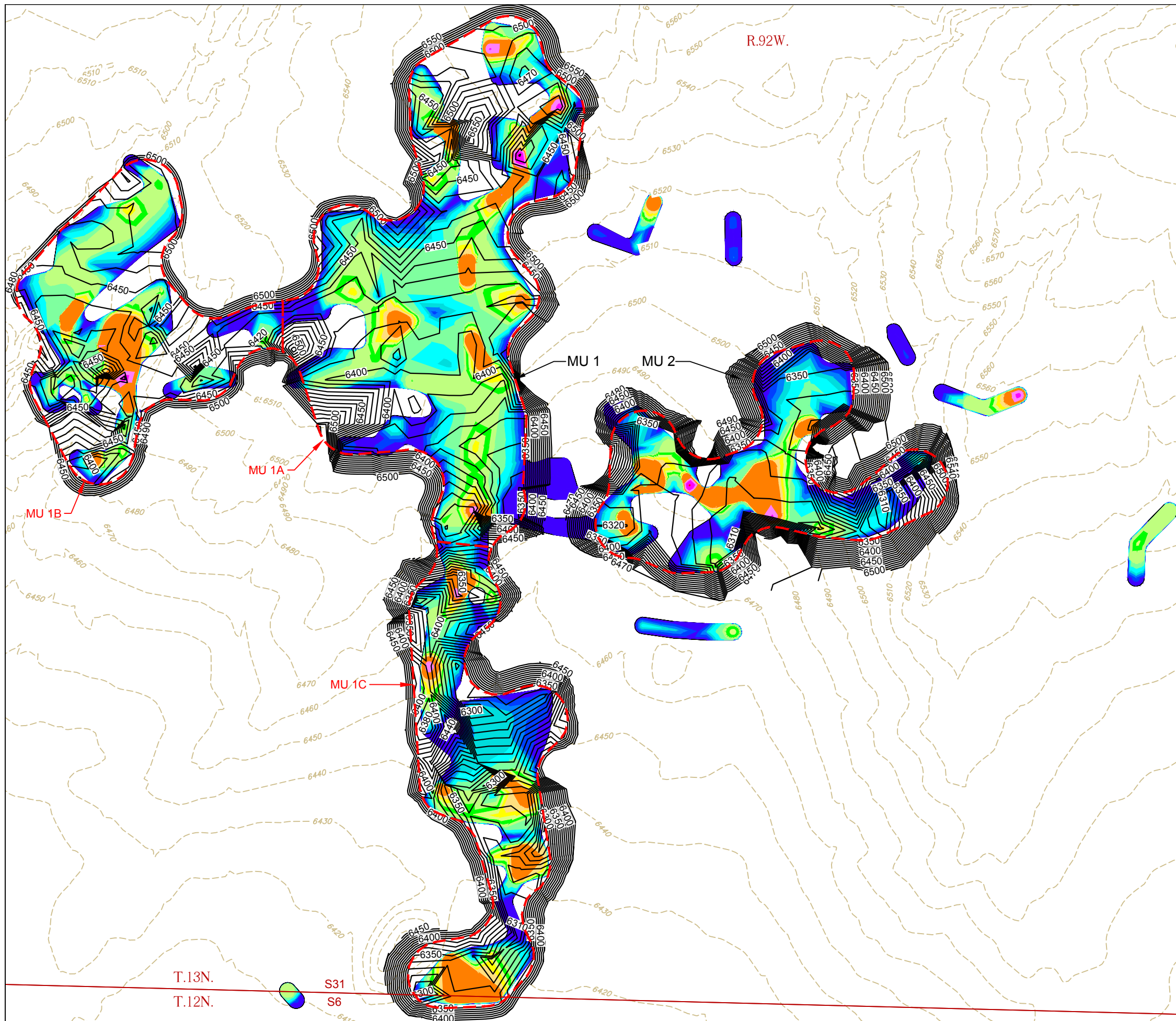
**LEGEND**

- SECTION LINE
- TOWNSHIP RANGE LINE
- PRIMARY ACCESS
- PROPOSED PIT LOCATIONS



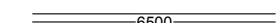

1,000' 0 500' 1,000'

1 inch = 1,000'

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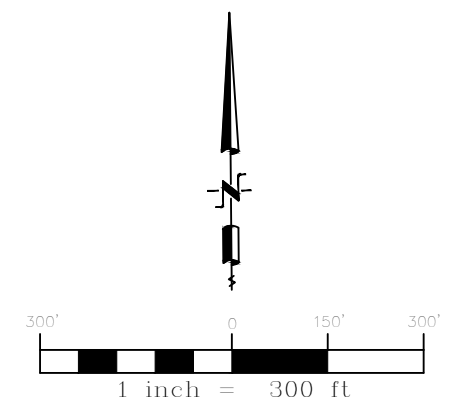


### LEGEND

-  SECTION LINE
-  EXISTING GROUND CONTOUR
-  DESIGN PIT CONTOUR
-  PIT LIMITS

### GT LEGEND

RANGE BEG.	RANGE END	COLOR
0.10	0.15	Blue
0.15	0.20	Dark Blue
0.20	0.25	Light Blue
0.25	0.30	Cyan
0.30	0.40	Light Cyan
0.40	0.50	Light Green
0.50	0.60	Green
0.60	0.70	Yellow-Green
0.70	0.80	Yellow
0.80	0.90	Orange
0.90	1.00	Light Orange
1.00	2.00	Pink
2.00	3.00	Magenta
3.00	5.00	Red
5.00	6.00	Dark Red

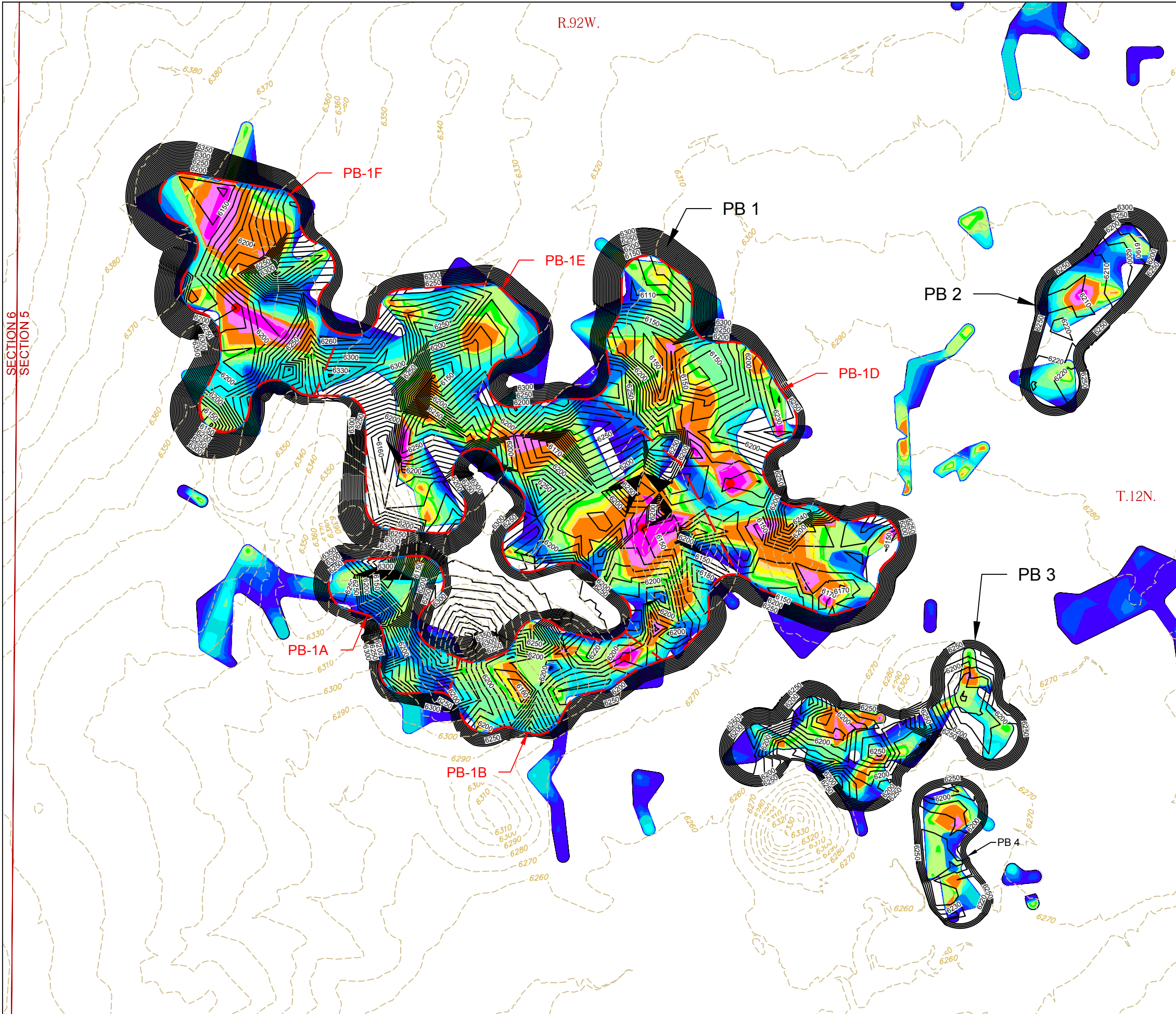


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**CARBON COUNTY, WYOMING**

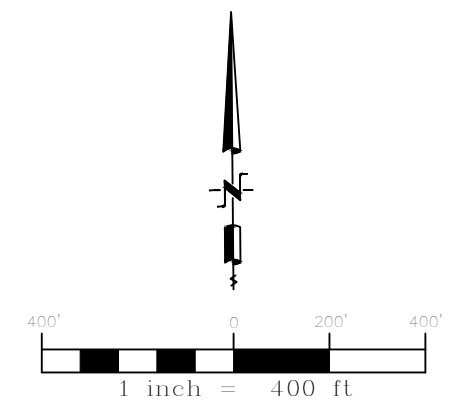
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**LEGEND**

- SECTION LINE
- EXISTING GROUND CONTOUR
- DESIGN PIT CONTOUR
- PIT LIMITS

GT LEGEND		
RANGE BEG.	RANGE END	COLOR
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0.15	0.20	Light Blue
0.20	0.25	Light Cyan
0.25	0.30	Cyan
0.30	0.40	Light Green
0.40	0.50	Green
0.50	0.60	Light Yellow
0.60	0.70	Yellow
0.70	0.80	Light Orange
0.80	0.90	Orange
0.90	1.00	Light Red
1.00	2.00	Red
2.00	3.00	Light Purple
3.00	5.00	Purple
5.00	10.00	Dark Purple

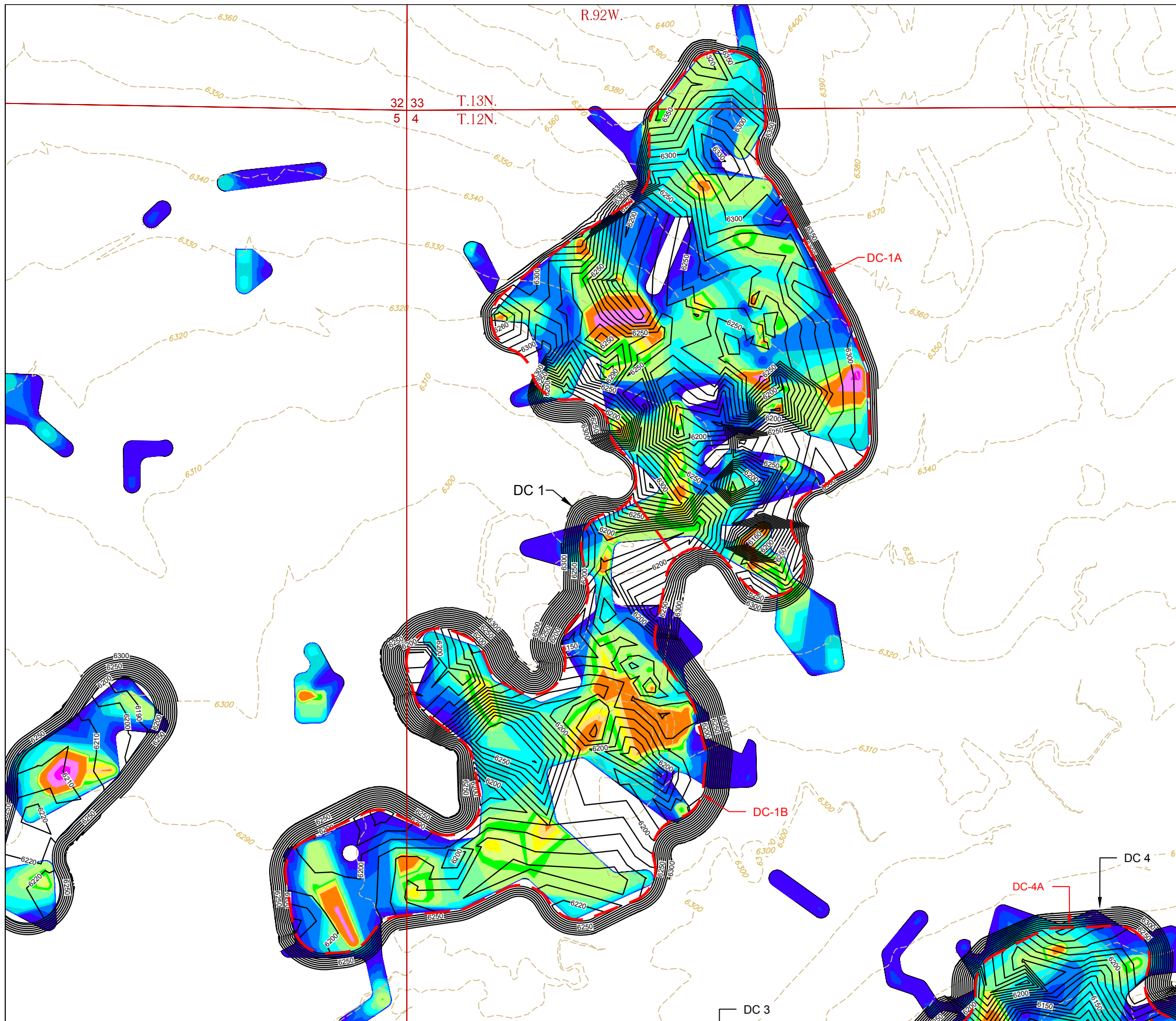


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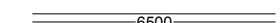

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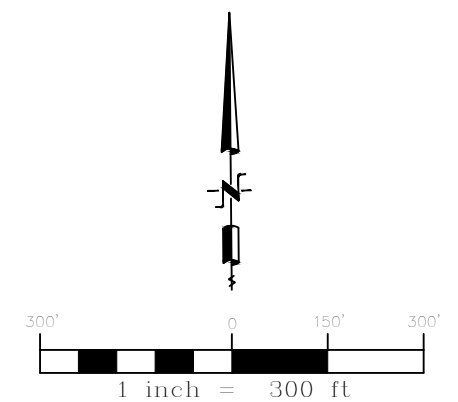
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**LEGEND**

-  SECTION LINE
-  EXISTING GROUND CONTOUR
-  DESIGN PIT CONTOUR
-  PIT LIMITS

GT LEGEND		
RANGE BEG.	RANGE END	COLOR
0.10	0.15	Blue
0.15	0.20	Light Blue
0.20	0.25	Light Cyan
0.25	0.30	Cyan
0.30	0.40	Light Green
0.40	0.50	Green
0.50	0.60	Light Yellow
0.60	0.70	Yellow
0.70	0.80	Light Orange
0.80	0.90	Orange
0.90	1.00	Light Red
1.00	2.00	Red
2.00	3.00	Light Purple
3.00	5.00	Purple
5.00	10.00	Dark Purple



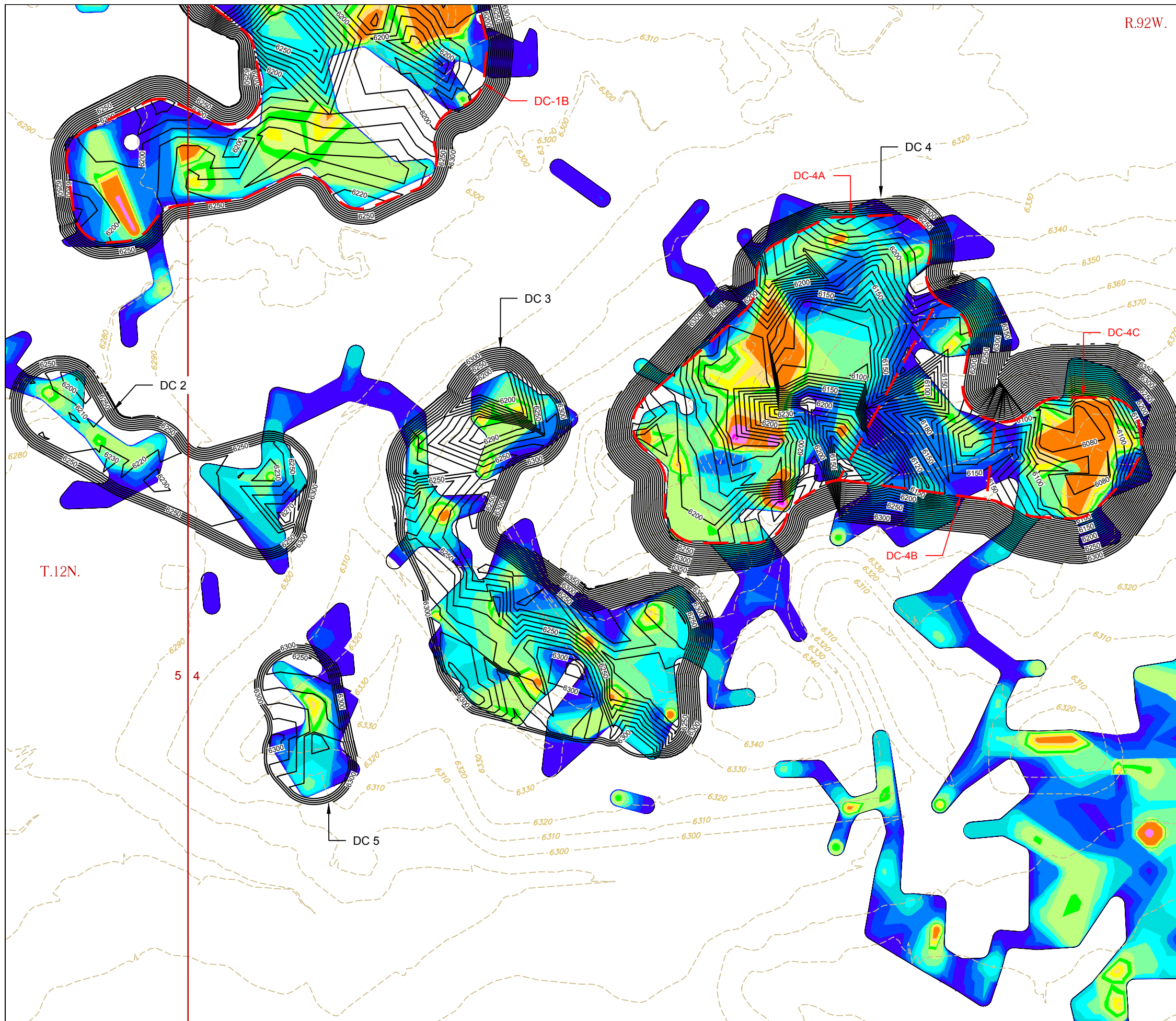
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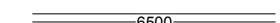

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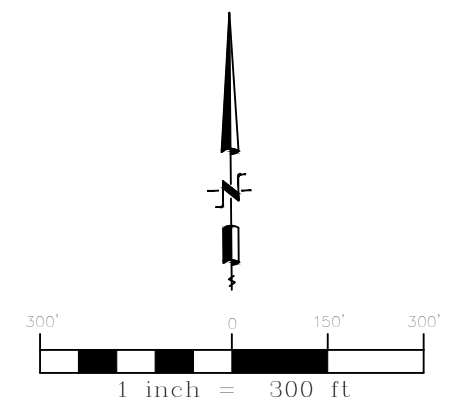
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**LEGEND**

-  SECTION LINE
-  6500 EXISTING GROUND CONTOUR
-  6500 DESIGN PIT CONTOUR
-  PIT LIMITS

GT LEGEND		
RANGE BEG.	RANGE END	COLOR
0.10	0.15	Dark Blue
0.15	0.20	Blue
0.20	0.25	Light Blue
0.25	0.30	Cyan
0.30	0.40	Light Cyan
0.40	0.50	Light Green
0.50	0.60	Green
0.60	0.70	Yellow-Green
0.70	0.80	Yellow
0.80	0.90	Orange
0.90	1.00	Light Orange
1.00	2.00	Orange
2.00	3.00	Pink
3.00	5.00	Magenta
5.00	10.00	Red



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## Section 17 - Recovery Methods

### 17.1 Summary

The planned uranium recovery method at the Juniper Ridge Project is conventional heap leaching which includes: mobilization of uranium into solution from the mined material stacked on the heap pad via acid leaching, delivery of uranium-rich solutions to a recovery plant, and concentration of the uranium via Ion Exchange (IX).

Uranium recovery at Juniper Ridge will include the following unit operations:

- stacking of mined material on the heap leach pad;
- application of leach solution;
- collection of pregnant leach solution (PLS);
- filtering of sand and fine particles from the PLS;
- IX to transfer uranium from solution onto resin; and
- shipment of the loaded resin to a third party's CPP for stripping, precipitation, washing, drying, packaging, storage, and loading as yellowcake.

The uranium recovery process equipment will be housed in a single building within the proposed plant boundary. Loaded resin will be produced on-site. Yellowcake processing, including precipitation, washing, drying, packaging, storage, and loading, will be completed off-site. Reagent storage and distribution systems will be located within or next to the process buildings.

Processing begins as run-of-mine product that is crushed and then stacked on the double-lined heap leach pad using covered belt conveyors and a covered radial arm stacking (RAS) belt. The stacked mined material is leveled with low ground pressure equipment forming a "lift". A protective layer of gravel is placed on top of the lift to mitigate fugitive dust and transport of radioactive particulates from the heap. A drip irrigation system using conventional plastic piping is then installed on top of the completed lift, and the heap is ready for the application of leach solutions.

The general flow of solutions and uranium within the heap and recovery plant is as follows:

- The process begins with the pumping of the refortified leach solution from the Barren Pond to the top of the heap where it is applied using drip emitters.
- The leach solution consists of water; an oxidizing agent (sodium chlorate to convert tetravalent uranium to the soluble hexavalent state), and a complexing agent (sulfuric acid) to complex and solubilize the uranium.
- The product of the heap leach process is a pregnant leach solution (PLS) containing a mixture of uranyltrisulfate (UTS) and uranyldisulfate (UDS). PLS percolates through the stacked mined material via gravity drainage and is intercepted by the heap leach pad liner system and then gathered into collection pipes, which drain by gravity into the collection pond.
- The PLS is then pumped from the collection pond into the IX plant where the PLS is filtered to remove suspended solids, and the uranium is loaded onto IX resin beads.

- The resulting uranium-depleted solution, called barren leach solution, flows by gravity from the IX plant to the barren pond. This barren solution is refortified with additional acid, oxidant, and make-up water. It is then pumped back to the heap in a continuous cycle.
- Resin is shipped from the plant to a third party's central processing plant (CPP) for final processing to yellowcake.

## 17.2 Heap Leaching and Plant Capital Requirements

Given the conceptual level of the PEA, specific heap leach pad and plant designs have not been completed. Equipment requirements, types, and sizes have been estimated based on typical design parameters tailored to the production profile of the Project. The PEA presumes that the heap would be constructed in a single lift of approximately 15-25 feet in height over an approximate area of 69 acres.

As summarized in Table 17.1, capital costs related to heap leaching include crushing, conveying, stacking, and lined leach pads and ponds estimated at 10.68 million \$US (M\$US). Capital requirements for plant and equipment are estimated at 8.19 M\$US. Thus, total capital cost for the plant and heap are estimated at \$18.88 M\$US.

**Table 17.1 – Heap, Plant and Equipment Capital Requirements**

<b>Heap Pad and Ponds</b>	<b>Cost (x 1,000)</b>
Site clearing and grubbing	\$ 250
Subgrade	\$ 198
Grading for perimeter and cell berms	\$ 400
Fine-crushed waste liner bedding, per CY	\$ 76
Crushed ore drainage aggregate, per CY	\$ 130
Rip-Rap on runoff diversion channel	\$ 115
Double 60 mil HDPE liner, full pad	\$ 5,720
Double 60 mil HDPE liner, submerged PLS pond	\$ 765
Perforated drainage pipe, per LF	\$ 160
External ditches and piping	\$ 145
Security fence	\$ 108
Monitor wells	\$ 23
Septic system w/leach field	\$ 24
QA/QC	\$ 55
Subtotal Directs	\$ 8,169
EPCM @ 9%	\$ 735
Contingency @ 20%	\$ 1,780
<b>TOTALS</b>	<b>\$ 10,684</b>

**Table 17.1 Continued**

<b>Processing Facility</b>	<b>Cost (x 1,000)</b>
Powerline, 6 miles, 35Kv	\$ 612
Water wells, 300 GPM	\$ 38
Submersible pump	\$ 71
Process water tank, steel, 24'D x 21'H	\$ 82
Front-end loader, 5 cy	\$ 350
Coarse ore bin with 12" x 12" bar grizzly, conv. pkg.	\$ 69
Jaw crusher plant with vibrating screen and conveyor pkg.	\$ 536
Secondary cone crusher with vibrating screen pkg.	\$ 795
Transfer conveyor pkg. w/3 folding units	\$ 129
Transfer conveyor pkg. w/2 folding units	\$ 81
Radial stacker system, portable	\$ 103
Belt scale	\$ 17
Crushing plant control van	\$ 328
Lime silo, 1,500 CF	\$ 51
Lime feeder	\$ 40
PLS sump pump	\$ 11
IX resin adsorption columns, 3, code welded, dished heads	\$ 510
Loaded resin transport containers, SS 316, 300 cubic foot	\$ 102
Barren pond, 1 acre x 3' deep, lined	\$ 75
Bleed cell, 1 acre x 3' deep, double-lined	\$ 150
Heap feed pump, 100 Hp, VS, 200-800 GPM @ 100' TDH	\$ 55
Sulfuric acid mix tank w/mixer	\$ 14
Reagent metering pumps	\$ 14
Miscellaneous tools, sets	\$ 2
Safety supplies, kit	\$ 2
Shower and eyewash station	\$ 3
Office trailer, furnished	\$ 18
Auxiliary diesel generator, 100 Hp	\$ 39
Area lighting	\$ 21
<b>SUBTOTAL</b>	<b>\$ 4,318</b>
EPCM @ 9% of installed cost	\$ 389
Owner's costs, including resin fill	\$ 775
Working capital @ 60 days' operating expense	\$ 1,292
Freight	\$ 55
Contingency @ 20%	\$ 1,366
<b>TOTALS</b>	<b>\$ 8,193</b>
<b>TOTAL CAPEX PROCESSING FACILITY</b>	<b>\$ 18,877</b>

### 17.3 – Labor and Operating Expenses

Labor and personnel requirements are summarized on Table 17.2 and are in addition to the staff and mine workforce requirements summarized in Section 16.

**Table 17.2 Labor and Personnel Requirements**

POSITION	NUMBER	ANNUAL	TOTAL	Daily Cost
Operations				
Supt./metallurgist	1	\$150,000	\$150,000	
Plant foreman	3	93,000	279,000	
Assayer	<u>1</u>	98,000	<u>98,000</u>	
<b>Total salaried personnel</b>	<b>5</b>		<b>\$527,000</b>	
Crusher operator	3	68,000	\$204,000	
Stacker operator	3	64,000	192,000	
Pad operator	3	61,000	183,000	
Pad helper	4	54,000	216,000	
Loader operator	1	68,000	68,000	
Plant mechanic	1	70,000	70,000	
IX operator	<u>2</u>	77,000	154,000	
<b>Total hourly personnel</b>	<b>18</b>		<b>\$1,087,000</b>	
<b>TOTAL PAYROLL</b>			<b>\$1,614,000</b>	<b>\$4,480</b>

Operating requirements and expenses are summarized in in Table 17.3.

**Table 17.3 – Operating Expenses**

ITEM	DAILY CONSUMPTION	PRICE	Cost/Day
Electrical energy, kWh	8,568	0.06	\$510
Sulfuric acid, lb, @ 100 lb/ton	138,600	0.075	10,400
Sodium chlorate	1,800	0.40	720
Lime, lb, in bulk truck	20,000	0.12	2,400
DOWEX 21-K resin, cubic feet	1	900	900
Lubricants, US gal	10	7.00	70
Diesel fuel, US gal	200	3.00	600
Laboratory reagents, supplies	1	650	650
Maintenance and repair parts	1	800	<u>800</u>
<b>TOTAL Daily</b>			<b>\$17,050</b>

**In summary, total OPEX including labor is estimated at 21,530 \$US per day.**

## **Section 18 - Project Infrastructure**

### **Access**

The Project is located 6 to 10 miles west of Baggs, Wyoming and approximately 3 miles north of the Colorado-Wyoming border (Refer to Figure 5.1 – Location and Access Map). The Project is accessible via two-wheel drive on existing county and two-track roads by proceeding one mile north of Baggs, Wyoming on Highway 789, then west on Carbon County Road 144 (Poison Buttes Road) towards Poison Buttes approximately 6 miles where the road crosses the Project for the next 4 miles. The site is generally accessible year-round.

### **Power and Utilities**

Utility services including natural gas, electricity, and communications are located in Baggs, Wyoming 6 miles from the eastern boundary of the Project. Gas pipelines crossing the Project area are shown on the base map. Provisions in the PEA include the extension of line power to the Project.

### **Process Water**

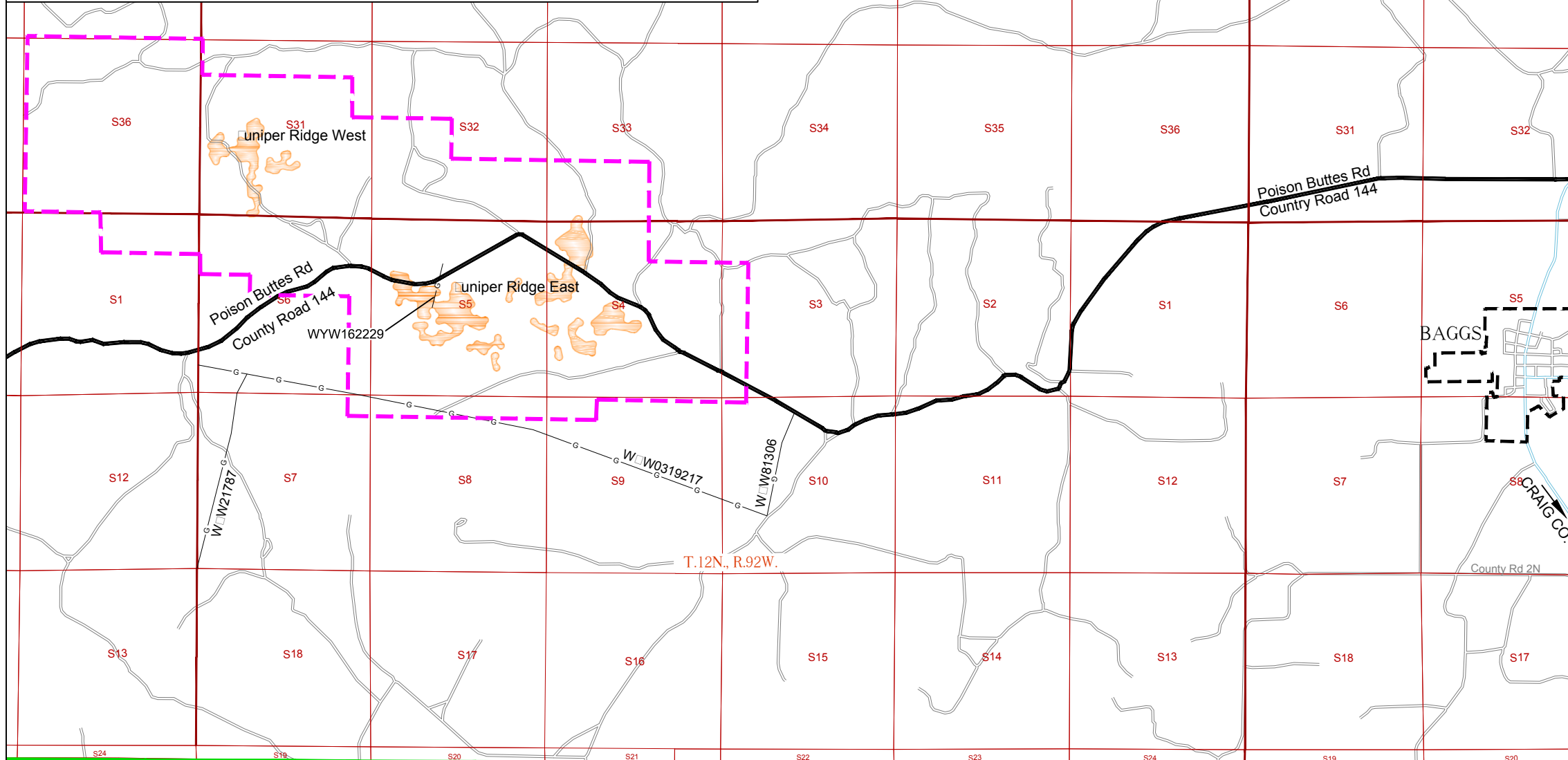
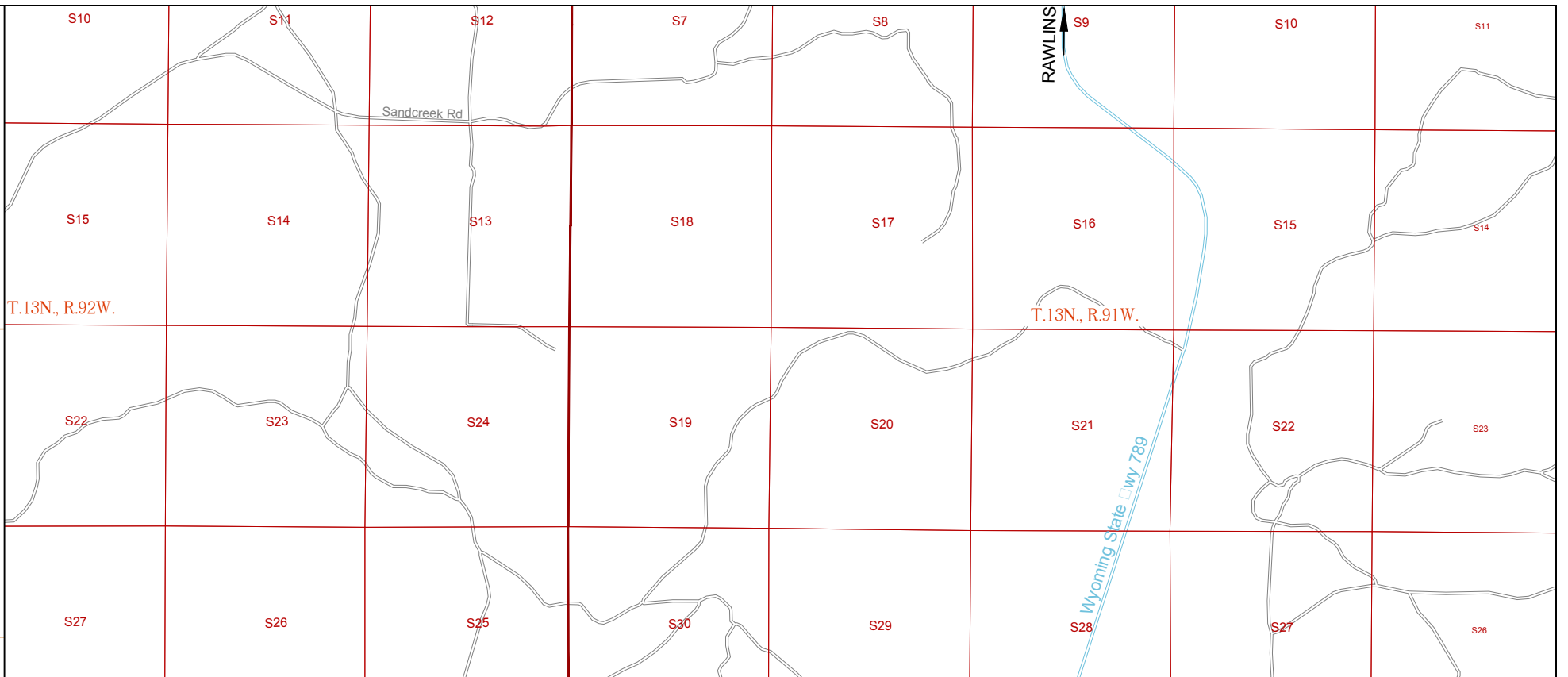
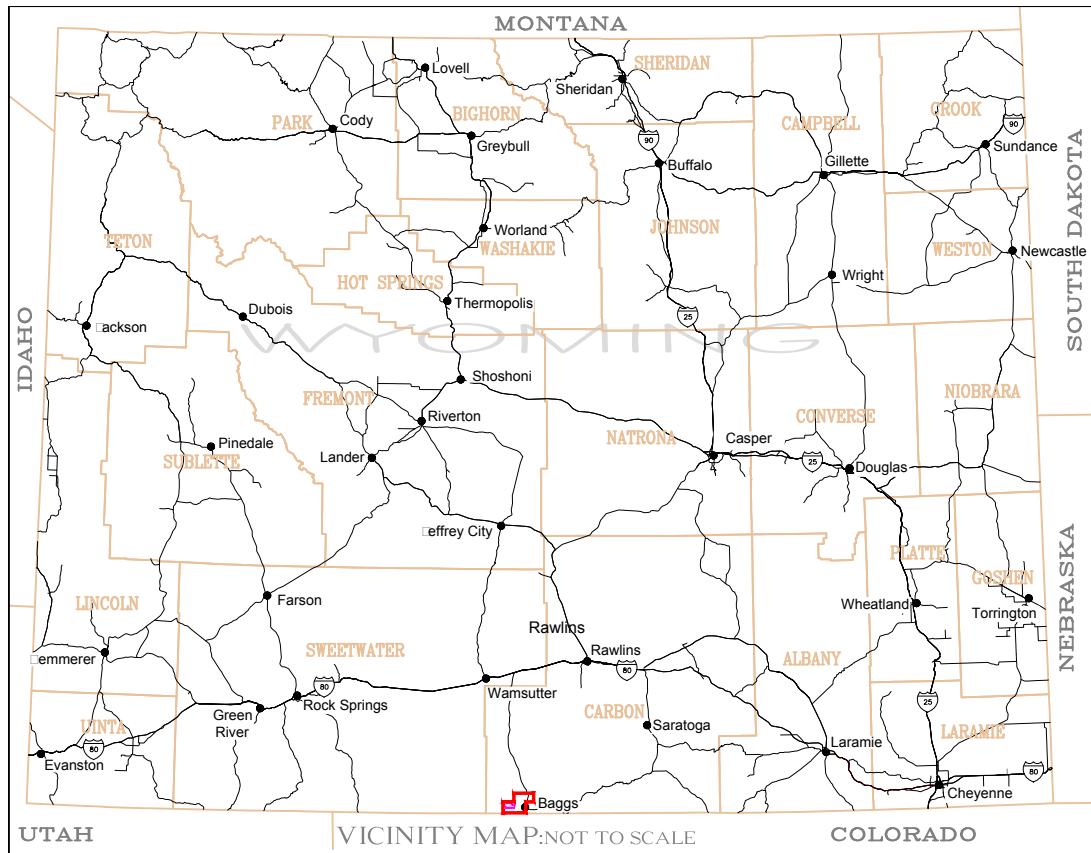
Detailed investigation of potential water sources has not been completed. Water supply could be obtained from locally permitted and constructed wells or from surface water sources including the Little Snake River approximately 3 miles south of the project area. Water rights for both surface and ground water are administered by the Wyoming State Engineer's Office and are subject to prior water rights.

### **Mine Support Facilities**

Mine support facilities will consist of an office, mine shop, and warehouse. In consideration of the remoteness of the site and the potential for hazardous winter driving conditions, emergency stores of non-perishable food and water will be kept on-site along with portable cots, should it be necessary for personnel to remain on-site during such conditions.

### **Public Safety and Facility Maintenance**

Access to the site will be controlled where appropriate. The mine facility will be regulated by the US Mine Safety and Health Administration (MSHA). Any persons wishing to enter the facility will be required to complete safety training as required by regulations and be equipped with appropriate Personal Protective Equipment (PPE) depending on which areas they wish to enter. Access to the mineral processing facility and heap leach will be restricted in accordance with NRC regulations and license conditions. Once leaching is fully completed the spent material will be considered waste and will be reclaimed in place in accordance with NRC regulations and license conditions.



**LEGEND**

- SECTION LINE
- TOPOGRAPHIC RANGE LINE
- PRIMARY ACCESS
- ROAD OTHER STRUCTURE
- PROPOSED PIT LOCATIONS
- PROJECT BOUNDARY
- EXISTING GRASS

1 inch = 4,000'

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**UCOLO EXPLORATION CORP.**  
**JUNIPER RIDGE PEA**  
**CARBON COUNTY, WYOMING**

DRAWING NAME: **SITE ACCESS AND UTILITIES**

DRAWN BY: CDS	REVISION NO. 1	DATE 12/15/16	BY CDS	DRAWING SCALE: 1"=4000'
DATE DRAWN: 9/10/13	2	6/7/17	CDS	
CHECKED BY: DLB				
DATE ISSUED: 6/7/17				DRAWING NUMBER: <b>18.1</b>

CAD FILE: USER\ENERGY FUELS\JUNIPER RIDGE\BRSPEA2013\OVERALL\18.1

## Section 19 - Market Studies and Contracts

Uranium does not trade on the open market and many of the private sales contracts are not publically disclosed. Monthly long term industry average uranium prices based on the month-end prices are published by Ux Consulting, LLC, and Trade Tech, LLC. The PEA is based on long term uranium prices rather than spot uranium prices.

CIM Guidance of Commodity Pricing, November 28, 2015, recommends methods for determining ‘reasonable prospects of eventual economic extraction’ which includes "Consensus Prices" obtained by collating the prices used by peers or as provided by industry observers, such as analysts. Table 19.1 provides a summary of seven analyst price forecasts made public in the last 6 months.

**Table 19.1 – Analyst Price Forecasts**

		2017	2018	2019	2020	2021	Long Term
Cantor Fitzgerald	4/27/2017	\$ 28.32	\$ 45.00	\$ 66.25	\$ 80.00	\$ 80.00	\$ 80.00
Hayward	1/25/2017	\$ 25.75	\$ 38.25	\$ 46.50	\$ 54.50	\$ 63.75	\$ 70.00
Macquarie	12/22/2016	\$ 21.00	\$ 24.00	\$ 27.00	\$ 30.00	\$ 33.00	\$ 33.00
RBC	3/15/2017	\$ 25.00	\$ 30.00	\$ 35.00	\$ 40.00	\$ 45.00	\$ 65.00
Scotia	4/17/2017	\$ 25.00	\$ 30.00	\$ 35.00	\$ 45.00	\$ 50.00	\$ 65.00
TD	4/19/2017	\$ 26.74	\$ 29.00	\$ 31.00	\$ 33.00	\$ 37.00	\$ 55.00

References cited in Table 19.1:

- Cantor Fitzgerald, February 6, 2017, Quarterly Commodity Outlook, page 1 of 54.
- Scotiabank, April 17, 2017, Mining & Metals Research Daily.
- RBC Capital Markets, March 15, 2017, global Metals & Mining Q2/17 Outlook, Exhibit 1: Commodity Price Revisions.
- Macquarie Research, December 19, 2016, Commodities Comment.
- Haywood Securities Inc. January 25, 2017, Target & Commodity Price Revisions.
- TD Securities, March 8, 2017, Industry Note, Equity Research.

For an undeveloped mining project the use of long-term commodity price forecasts is reasonable. While the analysts’ forecasts vary the median value of \$US65/lb is assumed by the author and for use in the mineral resource estimates, cut-offs for mine design, and the cash flow analysis of the PEA.

The economic analysis includes a sensitivity to uranium price evaluated over a range of \$US55/lb to \$US75/lb.

## **Section 20 - Environmental Studies, Permitting, and Social or Community Impact**

Uranium mining at Juniper Ridge occurred from the mid-1950s through 1964 prior to the passage of either the Wyoming 1969 Open Cut Reclamation Act or the 1973 Wyoming Environmental Quality Act. A substantial amount of reclamation has since been performed at the property by mining companies and by the WDEQ/AML. WDEQ/AML can remediate hazards and reclaim mined lands which were disturbed prior to the passage of the federal Surface Mining Control and Reclamation Act of 1977.

The Juniper Ridge Project is situated on a mixture of private fee land with federal mineral rights, federal land and minerals administered by the BLM, and State Trust lands with state-owned minerals administered by the State of Wyoming.

Because of this mixture of land and mineral ownership and because the proposed mineral processing facility is licensed by NRC, a number of state and federal agencies are involved in the permitting and licensing of this Project. WDEQ/LQD is the lead agency for the State of Wyoming, though other state agency approvals are necessary. The primary federal agencies involved include: the BLM, NRC and U.S. Environmental Protection Agency (EPA). In addition, County approvals for construction are also required.

BLM and Wyoming have established a Memorandum of Understanding (MOU) that allows WDEQ/LQD to issue the Mine Permit for both state and BLM lands while the BLM administers the National Environmental Policy Act (NEPA) for activities and impacts to the federal lands based on a Plan of Operations (POO) prepared by the permittee. The BLM also comments on the mining, milling, and reclamation activities proposed in the Mine Permit.

No potential social or community related requirements, negotiations, and/or agreements are known to exist with local communities and/or agencies other than those discussed herein.

The permitting and licensing requirements for mine development are substantial as they are for any similar project in the US. To the author's knowledge there are no identified environmental issues that would materially affect the development of the Project.

### Environmental Studies

Only limited environmental studies, relating primarily to drilling permits, have been completed recently on the Project.

Substantial data was once developed with respect to ground water conditions. Currently available data and reports have very little information in this regard. Based on the author's personal work experience on the Project, the water table is relatively shallow, less than 100 feet from the surface. The Browns Park Formation is a single unconfined aquifer with low permeability and transmissivity due to the interstitial clay content. Water quality generally meets



Wyoming standards for livestock but does not meet drinking water standards. Additional and current data relative to ground water conditions, water levels, water quality, and flow rates is needed for project design and ultimate environmental permitting. To the extent possible, a zero discharge facility should be considered in the design process.

#### Carbon County

Construction permits for buildings and septic systems will be required. The County permits are not anticipated to present technical or time critical issues in the development of the Project.

#### Wyoming Land Quality Division

A Mine Permit will be required by WDEQ/LQD. Under the MOU with BLM, WDEQ will formally approve the Mine Permit update after formal concurrence by the BLM. No mine permit application has been submitted. Once the mine permit is granted bonding for the reclamation of the first year's activities will be required. The bond is then updated annually to reflect reclamation requirements.

#### Wyoming Abandoned Mine Land Division

The WDEQ/AML program does not administer any licenses or permits directly related to the mining or milling activities. However, the AML program has completed mine land reclamation at the site in the past and has a current project to investigate remaining mine disturbance for possible future AML action.

#### Wyoming Air Quality Division

The Wyoming Air Quality Division (WAQD) administers the provisions of the Clean Air Act as delegated to the state by EPA Region VIII. No permit application has been submitted.

#### Wyoming Water Quality Division

Discharges to surface water, if needed as part of the mine dewatering and mine water management program, are permitted by the State of Wyoming under authority delegated by EPA Region VIII for the National Pollution Discharge Elimination System (NPDES) program. Currently, water produced from mine dewatering is expected to be 100-percent consumed for mineral processing and dust suppression. A WPDES permit application may be developed at a later date should the dewatering of the deeper underground levels produce more water than can be consumed by the mining and processing operations.

#### Wyoming State Engineers Office

The Wyoming State Engineers Office (SEO) is responsible for permitting of wells and impoundments, and issuance and modification to water rights. No permit applications relative to water rights have been submitted.

### U.S. Bureau of Land Management

The BLM will require a Plan of Operations for mining in coordination with WDQ/LQD. BLM will likely require an EIS, separate from the NRC's EIS and NEPA process. No applications have been submitted.

### U.S. Nuclear Regulatory Commission

The NRC regulates source material within Wyoming and will require a Source Material License for the processing of uranium at the site. No application has been submitted. The NRC will require bonding for the estimated closure and reclamation of that portion of the site associated with the processing of uranium as defined in the Source Materials License.

### U.S. Environmental Protection Agency

The EPA oversees compliance with 40 CFR Part 61 subpart W, radon emissions from tailings. No applications have been filed.

### Social and Community Relations

Carbon County has a substantial mineral resource industry including coal mining and other minerals. Oil and Gas development is also prevalent in Carbon County and in the vicinity of the Project with wells and a gas pipeline within the general Project area. The author is not aware of any specific social or community relations issues which would adversely affect the Project.

### Closure and Reclamation Plans

The land encompassing the Project area is currently used for livestock grazing, wildlife habitat, and recreation (primarily hunting). The reclamation plan will return the areas disturbed by the Project to the same pre-mining uses. Reclamation bonds will be in place prior to startup for both the mining and processing areas of the Project, in accordance with state and federal requirements.

Solid and liquid wastes from the processing of uranium will be managed on site. Upon closure, liquid wastes will either be a) stabilized and placed in the spent heap leach pad or b) evaporated on the heap leach pad surface prior to closure. Process buildings and equipment that cannot be released from the site will be decommissioned, sized, and then placed in the spent heap, according to NRC guidance. The heap leach pad and associated ponds will then be encapsulated within an engineered cover that is designed to minimize radon emissions and water infiltration. The disposal cell will then be monitored until the site meets DOE's requirements for long-term stewardship.

## Section 21 - Capital and Operating Costs

Project cost estimates are based on a conventional open pit mine operation with on-site heap leach extraction. It is anticipated that the Project will not produce a final product, i.e. dried yellowcake, but will operate as a satellite facility for shipping loaded resin to another facility. For the PEA it was assumed that resin would be shipped to a third party CPP (EFR White Mesa) for final processing. Resin could be shipped for final processing to other CPP's located in Wyoming.

All costs are estimated in constant 2016 US Dollars with an expected accuracy range appropriate for a PEA level of study (+40% -35%). Operating (OPEX) and Capital (CAPEX) costs reflect a full and complete operating cost going forward including all pre-production costs, permitting costs, mine costs, and complete reclamation and closure costs for the mine. CAPEX does not include sunk costs or acquisition costs. Mining and mineral recovery methods are described in Sections 16 and 17, respectively. The mine production profile is discussed in Section 16.11. Table 21.1 provides a summary of CAPEX.

**Table 21.1: Capital Cost Summary**  
(\$ x 1,000)

<b>Capital Expenditures:</b>	YEAR -4	YEAR -3	YEAR -2	YEAR -1	STARTUP	TOTAL
Baseline and Permitting		\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 4,000
Pre-Development Project Design	\$ 83	\$ 250	\$ 250	\$ 500		\$ 1,083
Annual Holding Costs	\$ 32	\$ 32	\$ 32	\$ 32		\$ 127
OP Mine Equipment					\$ 10,702	\$ 10,702
Office, Shop					\$ 1,890	\$ 1,890
Mineral Processing					\$ 18,877	\$ 18,877
<b>TOTAL</b>	<b>\$ 115</b>	<b>\$ 1,282</b>	<b>\$ 1,282</b>	<b>\$ 1,532</b>	<b>\$ 32,469</b>	<b>\$ 36,678</b>

Operating cost estimates are based on a conventional open pit mine with heap leach processing. Operating cost estimates were based upon vendor quotations, published mine costing data, and contractor quotations. Such estimates were generally provided for budgetary purposes and considered valid at the time the quotations were provided. In all cases, appropriate suppliers, manufacturers, tax authorities, and transportation companies should be consulted before substantial investments or commitments are made.

Operating costs were estimated for the following major items and are summarized on Table 21.2 for life of mine:

- Mine Operating Expenses
- Reclamation and Closure
- Reclamation Bond
- Taxes and Royalties
- Transport of Loaded Resin to the White Mesa Uranium Mill Facility, Utah
- Allocated Costs for Final Processing at White Mesa

**Table 21.2 – Operating Cost Summary**  
(\$ x 1,000)

Surface Mine				Total Cost	\$/lb U
Strip	\$ 1,734	per yr		\$ 18,211	\$ 4.19
Support Equipment	\$ 803	per yr		\$ 8,434	\$ 1.94
Mining	\$ 867	per yr		\$ 8,236	\$ 1.89
Staff	\$ 996	per yr		\$ 10,460	\$ 2.40
Total Surface Mine	\$ 4,578	per yr		\$ 45,341	\$ 10.42
Reclamation and Closure					
NRC Annual Inspection Fees				\$ 520	\$ 0.12
Mine Reclamation	Included with Stripping			\$ 4,032	\$ 0.93
Final Grading and Revegetation	per acre	1000		\$ 3,788	\$ 0.87
Plant Decommissioning and Reclamation				\$ 6,808	\$ 1.56
Total Reclamation and Closure				\$ 15,148	\$ 3.48
Heap Leach					
Average Costs per year	\$ 7,822	per yr		\$ 74,652	\$ 17.16
Total Heap Leach				\$ 74,652	\$ 17.16
Reclamation Bond Mine and Heap					
	\$ 15,000	bond, 2% fee		\$ 3,900	\$ 0.90
Taxes & Royalties					
Gross Products tax per/lb U	by price	per pound	\$ 2.12	\$ 9,225	\$ 2.12
Severance Tax per/lb U	by price	per pound	\$ 1.09	\$ 4,752	\$ 1.09
Claim royalties (expunged)	rec. lbs. x price		0	\$ 0.00	\$ 0.00
Total Taxes and Royalties				\$ 13,977	\$ 3.21
Resin Transport and Final Product Finishing					
Transport Resin up to 400 Miles				\$ 3,046	\$ 0.70
CPP Resin/Packaging Cost*				\$ 16,970	\$ 3.90
Total Product Finishing					\$ 4.60
<b>TOTAL DIRECT COSTS</b>				<b>\$ 173,033</b>	<b>\$ 39.77</b>

\*Unit cost Juniper Ridge PEA 2014 (Beahm and McNulty, 2014) was \$2.60 per pound at EFR's White Mesa mill. The Author escalated this unit cost by 50% to account for EFR handling costs and profit.

## Section 22 – Economic Analysis

Financial evaluations that follow represent constant US dollars and a commodity price of \$65.00 per pound of uranium as discussed in Section 19. As previously stated, all costs are forward looking and do not include any previous project expenditures or sunk costs.

### Tax Considerations

Operating costs include all direct taxes, as discussed in Section 21. The economic analysis includes a before and after US corporate income tax analysis. Estimation of US corporate income tax is difficult as income tax relates to the overall income and expenses of the reporting entity, not a specific project. However, to evaluate the economics of the Juniper Ridge Project, post corporate taxes, it was treated as a stand-alone project. This analysis reflects the most amount of taxes that would be due if the project alone were subject to U.S. income tax. Due to the favorable regular tax depletion deduction, most mining companies' effective tax rate is the Alternative Minimum Tax (AMT) rate. The regular tax percentage depletion deduction for uranium is equal to the lesser of 22% of gross revenue or 50% of taxable income after loss carry-forwards. In most cases, 50% of taxable income is less than 22% of gross revenue. Thus, the percentage depletion deduction is equal to 50% of taxable income which reduces the effective regular federal tax rate from 35% to 17.5%. As the AMT rate is 20% and a taxpayer is subject to the larger of AMT or Regular tax, the AMT rate of 20% becomes the effective rate. The Juniper Ridge property is located in Wyoming which has no state income tax so the combined Federal and state rate remains at 20% (Beck, 2014).

However that the actual amount of cash taxes paid as a result of this project could be significantly less than the 20% AMT rate due to loss carry-forward relating to acquisition, head office and administrative costs, and other non-direct project costs.

Net Present Value (NPV) is calculated at a range of discount rates as shown both pre and post US corporate federal income tax. Table 22.1 summarizes the pre and post corporate income tax estimated internal rate of return (IRR) and net present value (NPV) for a uranium price of \$65 per pound. Subsequent sensitivity analysis is provided for uranium price is shown on Table 22.2 and includes pre and post US income tax. Sensitivity to other factors and was completed as a pre-tax analysis as shown on Table 22.3. The relative sensitivity these factors would be similar for post-tax. Detailed Cash Flow analysis is provided in Table 22.4 at the end of this section.

**Table 22.1: Economic Criterion**

Juniper Ridge Project	PRE US INCOME TAX	POST US INCOME TAX
IRR	26%	22%
NPV 5%	\$ 39,927	\$ 30,245
NPV 8%	\$ 27,349	\$ 19,908
NPV 10%	\$ 21,022	\$ 14,753
NPV 12%	\$ 15,955	\$ 10,656

#### Overview of Cash Flow Model Parameters

- No allowance has been made for inflation or escalation.
- No allowance has been made for corporate overhead or profit.
- Capital and operating costs are provided in Section 21.
- Capital costs include a 15% contingency for mine capital and a 20% contingency for capital associated with mineral recovery facilities.
- Mine design parameters and relevant assumptions are provided in Section 16.
- Mineral recovery design parameters and relevant assumptions are provided in Section 17.
- Infrastructure requirements are provided in Section 18.
- The capital structure is assumed to be 100% equity, with no debt or interest payments.
- Working capital is included in the estimates.
- No residual or salvage value for equipment was included.
- Replacement capital was included in the operating cost estimates.

#### Economic Criteria

- Long term price of uranium of US\$65 per pound U<sub>3</sub>O<sub>8</sub> was used based on analysts' forecast as discussed in Section 19.
- 100% of the uranium produced was assumed sold at the long term price.
- Life of mine 10 years at an average production rate of 400,000 pounds U<sub>3</sub>O<sub>8</sub> per year.
- Direct operating costs approximately \$US\$40 per pound U<sub>3</sub>O<sub>8</sub>.
- Sensitivity analyses of the Project are included for uranium price, mine recovery, mineral processing recovery, OPEX, and CAPEX.
- Project costs estimates include reclamation and closure, taxes, and transportation and product finishing costs.

### Sensitivity to Price

Sensitivity to uranium prices is shown in Table 22.2. The breakeven price based on this analysis is approximately \$47 per pound of uranium. As no income is generated at the breakeven price the before and after tax analyses are the same.

**Table 22.2: Sensitivity to Price**

Juniper Ridge Project	Pre US Income Tax (\$ x 1,000)		
U Price	\$55/lb	\$65/lb	\$75/lb
Discount Rate			
NPV 5% (\$ x1,000)	\$ 14,356	\$ 39,927	\$ 65,498
NPV 8% (\$ x1,000)	\$ 7,854	\$ 27,349	\$ 46,845
NPV 10% (\$ x1,000)	\$ 4,644	\$ 21,022	\$ 37,400
NPV 12% (\$ x1,000)	\$ 2,126	\$ 15,955	\$ 29,783
IRR	14%	26%	35%
Juniper Ridge Project	Post US Income Tax (\$ x 1,000)		
U Price	\$55/lb	\$65/lb	\$75/lb
Discount Rate			
NPV 5% (\$ x1,000)	\$ 4,568	\$ 30,245	\$ 55,710
NPV 8% (\$ x1,000)	\$ 331	\$ 19,908	\$ 39,322
NPV 10% (\$ x1,000)	\$ -1,694	\$ 14,753	\$ 31,322
NPV 12% (\$ x1,000)	\$ -3,230	\$ 10,656	\$ 24,426
IRR	8%	22%	32%

### Sensitivity to Other Factors

Sensitivity of the projected IRR and NPV, with respect to key parameters other than price as previously shown, is summarized in Table 22.3. The sensitivity analysis shows that the Project is not highly sensitive to minor changes in OPEX and/or CAPEX. With respect to mine recovery and process recovery, the sensitivity is similar to that of uranium price in that much of the same costs are incurred and any variance in mine recovery affects gross revenues either positively or negatively. The Project is roughly twice as sensitive to variances in mine recovery and/or process recovery as it is to variance in OPEX or CAPEX.

Mine recovery is highly dependent upon grade control and mining selectivity. The mine plan, equipment selection, and personnel allocations included in the cost estimate provide for selective mining and tight grade control in recognition of this factor.

Process Recovery is based on a loss of 0.01 % U<sub>3</sub>O<sub>8</sub> (including solid and liquid losses). This yields an average percent recovery of 84.5% which is conservative in comparison to historical data as summarized in Section 13.

**Table 22.3: Sensitivity Summary**

Parameter	Change from Base Case	Change in IRR	Change in NPV at 8% discount
Mine Recovery	10 %	7 %	\$ 12.0 million
Process Recovery	10 %	6 %	\$ 11.8 million
CAPEX	10 %	2%	\$ 2.6 million
OPEX	10 %	4%	\$ 7.9 million

Payback Period

Capital investment was assumed to begin three years prior to startup to include such items as: exploratory drilling, environmental baseline studies, engineering and design related studies, and permitting and licensing. Once in operation the Project has a positive cumulative cash flow three years after the Project start of construction, in constant dollars, refer to Table 22.4, Cash Flow.

Cautionary Note:

The results of the PEA represents forward-looking information and actual results may vary from what is presented. The PEA is based on open pit mining and heap leach extraction of uranium, utilizing methodologies, equipment, and a conceptual mine design that was employed at the site in the past and on similar sites. The material factors used to develop the forward-looking information are discussed in the relevant sections of the Technical Report and the risk factors that could cause actual results to differ from the forward-looking information are identified in Section 26 of the Technical Report. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. The PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the PEA will be realized.



TABLE 22.4 - CASH FLOW		YR-4	YR-3	YR-2	YR-1	YR 0	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR 11	YR 12	total	\$/lb rec	
Production		Totals																			
Strip Ratio																					
Juniper Ridge Open Pit																					
Tons of resource mined	4,003					-	193	420	441	451	505	570	566	368	310	181				4,003	
Pounds Contained	5,152					0	312	647	663	649	654	665	580	430	379	173				5,152	
Mined Grade % U3O8	0.064						0.081	0.077	0.075	0.072	0.065	0.058	0.051	0.059	0.061	0.048				0.064	
Cubic Yards stripped	36,572	7				0	3,505	3,522	3,459	3,576	3,531	3,845	4,116	4,152	4,342	2,524				36,572	
Reclamation CY	6,195	17%														1,858	4,336			6,195	
Tons Ore Processed	4,003						193	420	441	451	505	570	566	368	310	181				4,003	
Pounds Contained	5,152						312	647	663	649	654	665	580	430	379	173				5,152	
Plant feed, % U3O8	0.064						0.081	0.077	0.075	0.072	0.065	0.058	0.051	0.059	0.061	0.048				0.064	
Recovery U3O8 0.01 loss	0.845	0.010	loss			0	0.876	0.870	0.867	0.861	0.846	0.829	0.805	0.829	0.836	0.791				0.845	
Pounds U3O8 recovered	4,351						273	563	575	559	554	551	467	357	317	136				4,351	
U3O8 price/pound Input price to recalculate revenue	\$ 65.00						65	65	65	65	65	65	65	65	65	65	65				
<b>GROSS REVENUES</b>							\$ 17,745	\$ 36,609	\$ 37,349	\$ 36,328	\$ 35,979	\$ 35,812	\$ 30,331	\$ 23,200	\$ 20,617	\$ 8,867	\$ -			282,838	
<b>Direct Costs:</b>																					
<b>Surface Mine</b>		added contingency																			
Strip - Company	\$ 1,734	0%				\$ 867	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	\$ 1,734	19,945	\$ 4.58
Support Equipment	\$ 803	0%				\$ 402	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	\$ 803	9,238	\$ 2.12
Mining	\$ 867	0%				\$ -	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	\$ 867	8,236	\$ 1.89
Staff	\$ 996	0%				\$ 498	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	\$ 996	11,955	\$ 2.75
<b>Total Surface Mine</b>	\$ 4,401					\$ 1,767	\$ 4,401	\$ 4,401	\$ 4,401	\$ 4,401	\$ 4,401	\$ 4,401	\$ 4,401	\$ 4,401	\$ 4,401	\$ 4,401	\$ 3,967	\$ 3,534	\$ 498	49,373	\$ 11.35
<b>Reclamation and Closure</b>		Mine reclamation Year 11 and 12																			
NRC Annual Inspection Fees						\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	520	\$ 0.12
Mine Reclamation	Included with Stripping					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -
Final Grading and Revegetation	per acre	\$1,000								\$ 200			\$ 200		\$ 200	\$ 2,787.63	\$ 200	\$ 200	3,788	\$ 0.87	
Plant Decommissioning and Reclamation																		\$ 6,808		6,808	\$ 1.56
<b>Total Reclamation and Closure</b>						\$ 40	\$ 40	\$ 40	\$ 40	\$ 240	\$ 40	\$ 40	\$ 240	\$ 40	\$ 240	\$ 2,828	\$ 240	\$ 7,048		11,116	\$ 2.55
<b>Heap Leach</b>																					
Variable costs per ton	\$0.00					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -
Fixed Costs per year	\$ 7,858	per yr				\$ -	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 3,929				74,652	\$ 17.16
<b>Total Heap Leach</b>						\$ -	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 7,858	\$ 3,929	\$ -	\$ -		74,652	\$ 17.16
<b>Reclamation Bond with 40% collateral</b>		\$ 15,000 bond, 2% fee																			
	\$					\$ 6,300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	(5,700)	3,900 \$ 0.90
<b>Taxes &amp; Royalties</b>																					
Gross Products tax per/lb	by price	per pound	\$ 2.12			\$ -	\$ 579	\$ 1,194	\$ 1,218	\$ 1,185	\$ 1,173	\$ 1,168	\$ 989	\$ 757	\$ 672	\$ 289	\$ -	\$ -		9,225	\$ 2.12
Severance Tax per/lb	by price	per pound	\$ 1.09			\$ -	\$ 298	\$ 615	\$ 627	\$ 610	\$ 604	\$ 602	\$ 510	\$ 390	\$ 346	\$ 149	\$ -	\$ -		4,752	\$ 1.09
Claim royalties (UG)	rec. lbs. x price	\$ -				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -
<b>Total Taxes and Royalties</b>						\$ -	\$ 877	\$ 1,809	\$ 1,846	\$ 1,795	\$ 1,778	\$ 1,770	\$ 1,499	\$ 1,146	\$ 1,019	\$ 438	\$ -	\$ -		13,977	\$ 3.21
Transport Resin to White Mesa Mill	per pound	\$ 0.70				\$ 191	\$ 394	\$ 402	\$ 391	\$ 387	\$ 386	\$ 327	\$ 250	\$ 222	\$ 95	\$ -	\$ -			3,046	\$ 0.70
White Mesa Resin/Packaging Cost	per pound	\$ 3.90				\$ 1,065	\$ 2,197	\$ 2,241	\$ 2,180	\$ 2,159	\$ 2,149	\$ 1,820	\$ 1,392	\$ 1,237	\$ 532	\$ -	\$ -			16,970	\$ 3.90
<b>TOTAL DIRECT COSTS</b>						\$ 8,107	\$ 14,732	\$ 16,999	\$ 17,088	\$ 17,165	\$ 16,923	\$ 16,903	\$ 16,444	\$ 15,387	\$ 15,277	\$ 12,090	\$ 4,074	\$ 1,846		173,033	\$ 39.77
<b>Cash Flow</b>						\$ (8,107)	\$ 3,014	\$ 19,611	\$ 20,261	\$ 19,163	\$ 19,056	\$ 18,909	\$ 13,887	\$ 7,813	\$ 5,340	\$ (3,222)	\$ (4,074)	\$ (1,846)		109,805	
<b>Capital Expenditures:</b>																					
Permitting (NRC, BLM, and WDEQ)		\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000															4,000	\$ 0.92
Pre-Development Mine Design	\$ 83	\$ 250	\$ 250	\$ 500																1,083	\$ 0.25
Holding Costs	\$ 32	\$ 32	\$ 32	\$ 32																127	\$ 0.03
OP Mine Equipment					\$ 10,702															10,702	\$ 2.46
Office, Shop, Dry, and support					\$ 1,890															1,890	\$ 0.43
Mineral Processing					\$ 18,877															18,877	\$ 4.34
<b>TOTAL CAPITAL EXPENDITURES</b>	\$ 115	\$ 1,282	\$ 1,282	\$ 1,532	\$ 32,469	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	36,678	\$ 8.43
<b>NET CASH FLOW PRE TAX</b>	\$ (115)	\$ (1,282)	\$ (1,282)	\$ (1,532)	\$ (40,576)	\$ 3,014	\$ 19,611	\$ 20,261	\$ 19,163	\$ 19,056	\$ 18,909	\$ 13,887	\$ 7,813	\$ 5,340	\$ (3,222)	\$ (4,074)	\$ (1,846)			73,126	
<b>CUMULATIVE NET CASH FLOW:</b>	\$ (115)	\$ (1,397)	\$ (2,678)	\$ (2,928)	\$ (41,972)	\$ (38,959)	\$ (19,348)	\$ 913	\$ 20,076	\$ 39,132	\$ 58,041	\$ 71,928	\$ 79,741	\$ 85,081	\$ 81,859	\$ 77,785	\$ 75,939				

## **Section 23 – Adjacent Properties**

Not applicable

## **Section 24 – Other Relevant Data and Information**

There is no other additional information or explanation necessary to make the technical report understandable and not misleading.

## **Section 25 – Interpretation and Conclusions**

Based on the deposit type, confidence in the geological interpretation, quantity and reliability of supporting testwork, density of drilling and verification drilling completed in 2011 and 2012, and the author's data verification of project data, the author considers the mineral resource estimates meet the confidence category for either Indicated Mineral Resources, as shown in Table 1.1, or Inferred Mineral Resources, as shown on Table 1.2, in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (May 10, 2014). The Project is at a PEA level of study thus, no current Mineral Reserves can be declared.

The base case for the PEA considers open pit mining in conjunction with on-site heap leach processing, producing an intermediate uranium concentrate in the form of loaded resin which would be shipped to a third party Central Processing Plant (CPP). Given the assumptions described herein, the PEA indicates, at a conceptual level, a positive return on investment. Further studies may also consider alternatives of on-site upgrading with off-site processing.

The PEA is based on open pit mining and heap leach extraction of uranium, utilizing known technologies and methodologies, equipment, and a generalized mine design which has been employed at the site and/or similar sites in the past. The Mineral Resource estimates and mine designs are subject to risks typical of uranium mines that have successfully operated in the state of Wyoming. The Project risks are considered reasonably well understood and can be mitigated during Preliminary Feasibility and Feasibility Studies. Mineral resources are not mineral reserves and do not have demonstrated economic viability. The PEA is preliminary in nature and includes Inferred Mineral Resources (less than 1% of the total Mineral Resources included in the PEA mine plan). Inferred mineral resources are too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA will be realized.

The State of Wyoming has a long history of uranium mining and was a major source of U for the US. The Juniper Property was a past uranium producer. In the "Fraser Institute Annual Survey of Mining Companies 2016 (Feb. 2017), Wyoming is rated highly favorably by the mining industry, 7th out of 104 jurisdictions rated, in the Policy Perception Index, which is an assessment of the attractiveness of mining policies. The Policy Perception Index is a composite index that captures the opinions of managers and executives on the effects of policies in jurisdictions with which they are familiar. All survey policy questions (i.e., uncertainty concerning the administration, interpretation, and enforcement of existing regulations; environmental regulations; regulatory duplication and inconsistencies; taxation; uncertainty concerning disputed land claims and protected areas; infrastructure; socioeconomic agreements; political stability; labor issues; geological database; and security) are included in its calculation.

Within and adjacent to the Project, there is oil and gas development. Oil and gas are leasable commodities whose rights are independent of the uranium mineral rights, which are locatable under US laws and regulations. While neither mineral should preclude the development of the other, the presence of the oil and gas development may limit access and/or impact activities such as ground water monitoring. It is recommended that the oil and gas lessees be contacted as to potential conflicts and to gain a full understanding of their processes, as they may affect environmental baseline and monitoring programs. Oil and gas development in the vicinity of the Project is at depths in excess of 2,500 feet in geologic formations separate from the Browns Park. Search of the Wyoming Oil and Gas Commission website (<http://wogcc.state.wy.us/>) shows one well with log data located in the SESW of Section 28, Township 13 North, Range 92 West. This well, North Gamblers Fed 30-28, was completed to a depth of 8,700 feet and targeted potential oil and gas in the Fort Union, Lance, Fox Hills, and Lewis Shale formations. Other shallower wells are located in the vicinity, but depth of completion is not known.

To the author's knowledge, there are no conditions of a political or environmental nature that would preclude the development of the Project, provided that all applicable state and federal regulations are met.

Any estimation or reference to costs and uranium prices within the context of this report over the potential life of mine are by their nature forward-looking and subject to various risks and uncertainties. The author is not aware of any other specific risks or uncertainties that might significantly affect the mineral resource estimates or the projected economic outcomes of the PEA.

## Section 26 - Recommendations

Recommendations to prepare for, and complete a Preliminary Feasibility Study are broadly divided into the following major categories: drilling, metallurgical studies, geotechnical and groundwater studies, preliminary feasibility studies, and baseline studies. The major categories are generally listed in order of importance although some studies need to be completed, all or in part, before the Preliminary Feasibility Study can proceed.

### Drilling

Drilling costs are estimated at \$10 per foot based rates to include: drilling, geophysical logging, supervision, and overhead. The recommended delineation and exploration drilling is summarized in Table 26.1 and 26.2 and illustrated in figure 26.1.

**Table 26.1 Recommendations, Delineation Drilling**

<b>Expense Category</b>	<b>Scope of Services</b>	<b>Estimated Cost</b>
Delineation Drilling	Confirmation and delineation Juniper Ridge West 25 holes; 4,000 feet	\$40,000
Delineation Drilling	Main Resource Area - 200 holes; 32,000 feet.	\$320,000
Resource Update	Update existing resource estimate	\$40,000
Total Estimated Cost		<b>\$400,000</b>

**Table 26.2 Recommendations, Exploratory Drilling**

<b>Expense Category</b>	<b>Scope of Services</b>	<b>Estimated Cost</b>
Exploratory Drilling	North Trend - 100 holes; 16,000 feet.	\$160,000
Exploratory Drilling	North East Trend - 25 holes; 4,000 feet	\$40,000
Interpretations and Report	Summary Report	\$20,000
Total Estimated Cost		<b>\$220,000</b>

### Metallurgical Studies

Metallurgical studies utilizing representative core samples from the 2011 drilling program should evaluate both acid and alkaline lixivants. The studies should not be limited only to resource recovery, but should characterize both liquid and solid waste streams. The disposal/containment costs and environmental sensitivities of spent heap tailings are such that it is critical to characterize the potential waste streams as to their physical and chemical characteristics. Studies should also evaluate alternatives for stabilizing the waste streams physically and/or chemically. In addition, the nature of the mineralized material is such that the uranium values primarily occur as interstitial filling around the sand grains. As such, various techniques for mechanically upgrading the material may be considered. For all methods tested for the upgrading of the mineralized material, mass balances for uranium, associated metals, and carbonates should be determined.

Expense Category	Scope of Services	Estimated Cost
<b>Leaching Studies</b>		
	Complete a range of leach conditions beginning with data from previous work. Six tests each alkaline and acid, including analytical work.	\$17,000
Column Leach Testing	A minimum of four columns based on selected conditions from the leach studies should be run to assess uranium extractions and to evaluate optimum heap feed top-size and lift height.	\$66,000
<b>Upgrading Studies</b>		
Size Fraction Testing	Standard sieve analyses; minus- $\frac{1}{4}$ inch to 400 mesh screening. Mass balances for uranium, associated metals, and carbonates.	\$5,000
Attrition Scrubbing	Four conventional attrition tests and analyses.	\$10,000
Ablation	Four tests at a range of liquid/solid ratios.	\$20,000
Gravity Separation	Four tests with mass balances for uranium, associated metals, and carbonates.	\$4,000
Flotation	Four test with mass balances for uranium, associated metals, and carbonates.	\$4,000
Waste Characterization	Determine general engineering and chemical properties of waste products. Develop samples for diffusion testing.	\$12,000
Waste Diffusion Testing	ASTM C 1308 testing of tailings samples to determine long term diffusion rates of potential contaminants. Four tests should suffice.	\$28,000
Subtotal Metallurgical Testing		<b>\$166,000</b>
Met Core Drilling	Provision for fresh core if the 2011 core has degraded and is no longer suitable for metallurgical testwork.	<b>\$150,000</b>
<b>Total Estimated Cost</b>		<b>\$316,000</b>

### Work to Support Preliminary Feasibility Studies

A summary of major tasks for completion of a preliminary feasibility study follows. We recommend that the preferred development option should be an open pit mine operation in conjunction with an on-site heap leaching and solution treatment facility.

Expense Category	Scope of Services	Estimated Cost
Open Pit Mine Conceptual Design and Sequence	Prepare conceptual open pit designs and mine sequence. Evaluate production options of 250 to 500 thousand pounds of U per year.	\$100,000
Geotechnical Studies	Evaluate highwall stability and engineering properties of mine overburden and mineralized material.	\$100,000
Geohydrology Studies	Evaluate ground water conditions with respect to de-watering requirements and water treatment requirements.	\$100,000
Mine CAPEX and OPEX	Estimate capital and operating costs based on similar project experience, vendor quotes and published mine cost data.	\$50,000
Mineral Processing Facility Preliminary Design and Consideration of Alternatives	Conduct confirmatory leach testing for alkaline and acid lixiviant. Prepare conceptual design for on-site heap leach. Address conventional milling and off-site processing as alternatives.	\$100,000
Mineral Processing CAPEX and OPEX	Estimate capital and operating costs based on similar project experience, vendor quotes and published mine cost data.	\$50,000
Annual Cash Flow and Cost Model	Complete annual cash flow based on average production rates. Estimate IRR, DCFROR, and NPV.	\$50,000
Technical Report	Complete preliminary feasibility study report and summary technical report.	\$50,000
Total Estimated Cost		<b>\$600,000</b>

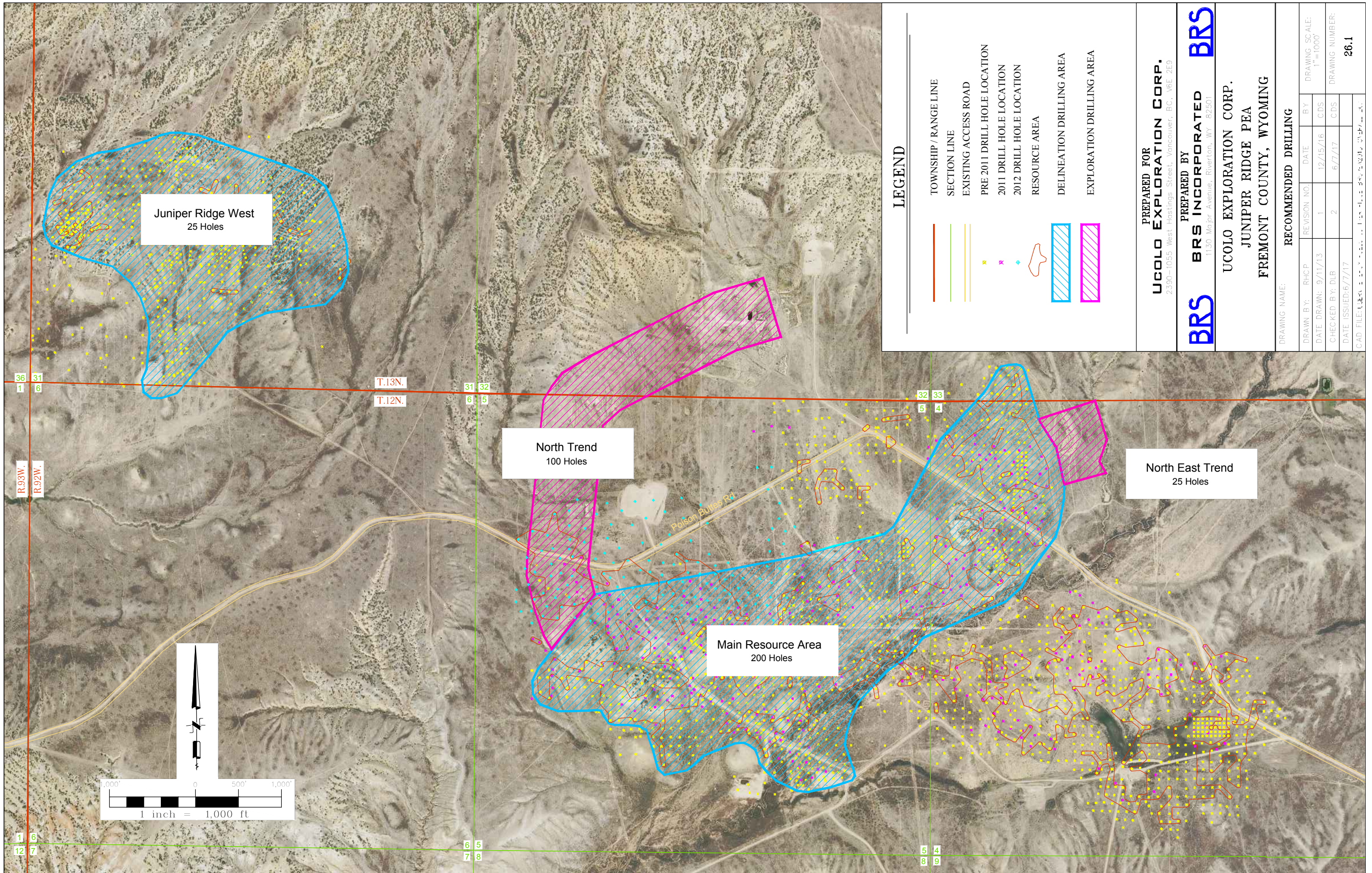


### Baseline Studies

Completion of environmental and socio-economic studies in support of the pre-feasibility study including an assessment of any potential existing environmental liabilities. Estimated cost \$500,000.

### Summary of Work to Support Preliminary Feasibility Studies

Expense Category	Estimated Cost
Drilling	\$560,000
Metallurgical Studies	\$316,000
Preliminary Feasibility Study	\$600,000
Baseline Studies	\$500,000
<b>Total Estimated Cost</b>	<b>\$1,976,000</b>



**Juniper Ridge West**  
25 Holes

**North Trend**  
100 Holes

**Main Resource Area**  
200 Holes

**North East Trend**  
25 Holes

**LEGEND**

- TOWNSHIP / RANGE LINE
- SECTION LINE
- EXISTING ACCESS ROAD
- PRE 2011 DRILL HOLE LOCATION
- 2011 DRILL HOLE LOCATION
- 2012 DRILL HOLE LOCATION
- RESOURCE AREA
- DELINEATION DRILLING AREA
- EXPLORATION DRILLING AREA

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**JUNIPER RIDGE PEA**  
**FREMONT COUNTY, WYOMING**

RECOMMENDED DRILLING			
DRAWN BY:	RHCP	REVISION NO.	DATE
DATE DRAWN:	9/11/13	1	12/15/16
CHECKED BY:	DLB	2	6/7/17
DATE ISSUED:	6/7/17		

DRAWING SCALE: 1" = 1000'

DRAWING NUMBER: 26.1

CAD FILE: UCOLO - JUNIPER RIDGE PEA - 1130 MA PR AVENUE, RIVERTON, WY - 82501

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