CROW TRIBAL LEGISLATURE
DECEMBER 14, 2006 SPECIAL SESSION

JOINT ACTION RESOLUTION NO. JAR06-14

INTRODUCED BY CARL E. VENNE, CHAIRMAN
CROW TRIBAL EXECUTIVE BRANCH

JOINT ACTION RESOLUTION OF THE CROW TRIBAL LEGISLATURE AND THE CROW TRIBAL EXECUTIVE BRANCH ENTITLED:

"APPROVAL FOR ENERGY AND MINERAL DEVELOPMENT PROJECT FOR AERIAL MAPPING AND GEOLOGIC MODELING OF TRACT II COAL RESOURCE."

WHEREAS, the Crow Tribe owns substantial coal resources located on the former Tract II lease in the Ceded Area (the "Tract II coal Resource"), which coal resources are held in trust by the United States of America for the Crow Tribe and are part of the Crow Indian Reservation (Act of May 19, 1958, Pub. L. No. 85-420, 72 Stat. 121; *Crow Tribe v. Montana*, 819 F.2d 895 (9th Cir. 1987), *aff'd,* 484 U.S. 997 (1988)); and

WHEREAS, the Crow Tribe wishes to develop its Tract II coal resource for the benefit of the Crow people through production royalties and taxes, employment, and possible other value-added industries including power generation and coal conversion, and to thereby also contribute to national energy independence; and

WHEREAS, the Tribe's Tract II coal resource has previously been the subject of limited exploration sufficient to indicate that the Tract II coal resource comprises well in excess of 100 million tons, and additional mapping and modeling are necessary to better confirm the volume of the resource and provide information necessary to design a more detailed exploration program for purposes of economic analysis and mine planning; and

WHEREAS, funding for the additional mapping and modeling of the Tract II coal resource is available through the Energy and Mineral Development Program ("EMDP") administered through the Division of Energy and Mineral Development ("DEMD") under the Assistant Secretary – Indian Affairs – Office of Indian Energy and Economic Development of the U.S. Department of the Interior; and

WHEREAS, the Tribe with the technical assistance of Westmoreland Coal Co. has prepared an application for a proposed EMDP project for "Aerial Mapping and Geologic Modeling of Tract II Coal Resource," in the amount of $162,956, a copy of which is attached hereto and incorporated herein by reference; and

WHEREAS, EMDP project grant applications require a Tribal resolution authorizing and approving the project together with certain other statements by the Tribe as set forth herein; and

WHEREAS, time is of the essence in submitting the Tribe's application for the proposed EMDP project for Fiscal Year 2007, because the application is due on December 15, 2006, and the information from the EMDP study is needed as soon as possible to begin delineating the Tract II coal resource for use in energy development projects planned by the Tribe;

NOW THEREFORE, BE IT RESOLVED BY THE LEGISLATURE AND THE EXECUTIVE BRANCH OF THE CROW TRIBE:

Section 1. That the Crow Tribe's proposed EMDP project for Fiscal Year 2007 in the amount of $162,956 for "Aerial Mapping and Geologic Modeling of Tract II Coal Resource," as described in the application attached hereto is hereby authorized and approved.

Section 2. That the Crow Tribe is willing to consider development of the potential coal resource discovered and identified pursuant to the proposed EMDP project.

Section 3. That the Crow Tribe prefers to have the EMDP project conducted primarily by private contractors and/or consultants and, as necessary for the timely completion of the project, in conjunction with DEMD professional staff.

Section 4. That the Crow Tribe will consider public release of general information obtained from the EMDP project, with the understanding that public release is meant to include publications, a poster session, attending a property fair or giving an oral presentation at industry or federal meetings and conferences, and does not include providing copies of the data or reports to any individual, private company or other government agency without express written permissions from the Crow Tribal Government, which permission may be withheld for any reason.

CERTIFICATION

I hereby certify that this Joint Action Resolution granting "Approval for EMDP Project for Aerial Mapping and Geologic Modeling of Tract II Coal Resource" was duly approved by the Crow Tribal Legislature with a vote of **16** in favor, **1** opposed, and **0** abstained and that a quorum was present on this **14th** day of **December**, 2006.

Speaker of the House
Crow Tribal Legislature

ATTEST:

Secretary, Crow Tribal Legislature

(CROW TRIBAL LEGISLATIVE SEAL)

EXECUTIVE ACTION

I hereby

____ approve,

_____ veto

this Joint Action Resolution granting "Approval for EMDP Project for Aerial Mapping and Geologic Modeling of Tract II Coal Resource" pursuant to the authority vested in the Chairman of the Crow Tribe by Article V, Section 8 of the Constitution and Bylaws of the Crow Tribe of Indians on this 15 day of December, 2006.

Chairman, Executive Branch
Crow Tribe of Indians

Bill or Resolution Number JAR06-14 Introduced by: Executive Date of Vote: 12-14-06

Representative:	Yes	No	Abstain
L. Plain Bull	X		
O. Costa	X		
V. Crooked Arm	X		
M. Not Afraid	X		
R. Iron	X		
B. House	X		
E. Fighter	X		
L. Hogan		X	
S. Fitzpatrick	X		
K. Real Bird	X		
M. Covers Up	X		
R. Old Crow	X		
L. Not Afraid	X		
B. Shane	X		
J. Stone	X		
D. Wilson			
L. Costa *Secretary of the House*	X		
D. Goes Ahead *Speaker of the House*	X		
Totals:	16	1	0

Result of Vote:

Passed **Not Passed** **Tabled** **Veto Override**

Signature Officer: Carbon Goes Ahead Date: 12-14-06

Westmoreland Power, Inc.

14th Floor, 2 North Cascade Avenue, Colorado Springs, CO 80903
Phone: (719) 442-2600 • Fax: (719) 448-5824

Mr. William Watt, Esq.
Attorney
Crow Tribal Legal Department
Crow Tribe of Indians
P.O. Box 340
BACHEEITCHE Avenue
Crow Agency, MT 53022

December 13, 2006

Re: EMDP, DEMD Grant Application for Aerial Mapping and Geologic Modeling of Tract II Coal Resource

Dear Bill:

Enclosed are seven copies of the above referenced grant application. Also included is a PDF file on a CD for your use.

Please distribute copies to the following:

Mr. Carl Venne, Chairman;
Mr. Cedric Black Eagle, Vice Chairman;
Mr. Carlson Goes Ahead, Speaker of the House;
Mr. William Watt, Attorney Crow Tribe;
Mr. Ed Lone Fight, Superintendent; and
Regional Office.

I will deliver copies to DEMD either today or tomorrow and will call after I have reviewed the application with Mr. Manydeeds.

Please call if you have questions.

Sincerely,

Thomas G. Durham P.E.
Westmoreland Power, Inc.

Copy: Bob Holzwarth
Doug Kathol
BonnieTurner
John Carter

Westmoreland Power, Inc.

14th Floor, 2 North Cascade Avenue, Colorado Springs, CO 80903
Phone: (719) 442-2600 • Fax: (719) 448-5824

December 12, 2006

Mr. Stephen A. Manydeeds
Chief – Division of Energy and
Mineral Development
Division of Energy and Mineral Development
12136 west Bayaud Ave., Suite 300
Lakewood, Colorado 80228

Re: Crow Tribe of Indians Grant Request
Energy and Mineral Development Project
For Aerial Mapping and Geologic Modeling
Of Tract II Coal Resource

Dear Mr. Manydeeds:

On behalf of Chairman Carl E. Venne and the Crow Tribal Legislature enclosed is the technical information for the above referenced Grant request. This request is being submitted under the Energy and Mineral Development Program administered by DEMD.

Questions pertaining to this submittal should be directed to Mr. Cedric Black Eagle, Vice Chairman of the Crow Tribe or Mr. Tom Durham, Westmoreland Power, Inc., who has served as technical advisor to the Tribe at (719) 448-5808.

We appreciate your consideration of this vital Crow energy development project and look forward to a favorable response.

Sincerely,

Douglas P. Kathol
Vice President
Westmoreland Power, Inc.

Copy: Mr. Cedric Black Eagle, Vice Chairman Crow Tribe
Mr. William Watt, Attorney Crow Tribe
Mr. Tom Durham, Westmoreland Power, Inc. Technical Advisor

CONFIDENTIAL PROPRIETARY TRIBAL MATERIALS

CROW TRIBE OF INDIANS
GRANT REQUEST SUBMITTED TO
US DEPARTMENT OF INTERIOR
DIVISION OF ENERGY AND MINERAL DEVELOPMENT
FOR
AERIAL MAPPING AND GEOLOGIC MODELING
OF
TRACT II COAL RESOURCE

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TRIBAL RESOULTION

Executive Summary

Resource Potential

The Crow Tribe of Indians own large contiguous coal resources within the Crow Indian Reservation in southeastern Montana. This Grant is being requested to fund creation of a Digital Terrain Model and for the preliminary geologic modeling of one of the Tribe's known coal resources commonly identified as the Crow Tract II coal resource. Tract II coal is held in trust for the Crow Tribe within the Ceded Strip. This area was ceded to the United States by the Act of April 27, 1904 (Ch. 1624, 33 Stat. 352), but the undisposed of Tribal coal resource was later restored to Tribal trust ownership and made a part of the Reservation by the Act of May 19, 1958 (72 Stat. 121; *see also, Crow Tribe v. Montana*, 819 F.2d 895, 898, 902 (9th Cir. 1987), *aff'd*, 484 U.S. 997 (1988)). Significant geologic data are available from exploration programs conducted by the former lessee, Westmoreland Resources, Inc., on the coal resources in Tract II. It is estimated that over 100 million recoverable tons of coal are contained within Tract II. However modern state of the art mapping and modeling have not been completed. These actions are necessary to clearly define the resource and serve as the foundation for more detailed economic analysis of the resource as a fuel supply for a planned Crow power project to be located on Tribal trust lands.

Commodity Marketability

The commodity being examined in this study is coal. Crow coal will be used to fuel a generating station located on Tribal trust lands thus eliminating the unknown reliability and expense of rail transportation. Another facet of the Tribe's investigation is power transmission to move its power to market. Market studies indicate that there is significant load growth in the southwest and northwest United States. These markets as well as a growing market in Montana will serve as customers for Crow power. By building a mine mouth generating station the Tribe substantially shields itself from commodity price risk associated with the open coal sales markets. Access to rail transportation is readily available to the Tract II resource. If market fundamentals warrant, the Tribe could also take advantage of outside coal sales in addition to supplying fuel to a mine mouth generating station thus improving the economics of the project. Having this availability helps mitigate the commercial risks of the project. The Tribe is also investigating this coal resource as feed stock for hydrogen generation and diesel fuel production. As a synergistic industry the Tribe is evaluating ethanol production which would use the waste steam from the power plant. This substantially improves the economics of ethanol production thus improving the Tribe's ability to successfully market the product. The Tribe, with support from Westmoreland Power, Inc. (WPI), has been working intensively on these potential power plant and coal conversion projects for more than a year.

Economic Benefits

The economic benefits to the Crow Tribe of this project are substantial. The ultimate goal of building a large coal-fueled electric generating station and a new coal mine to supply it will provide hundreds of high paying long term permanent jobs for members of the Tribe. Developing the Crow Power Project will lead to sustainable economic benefits

to the Tribe and the people in Montana in general. This power project will be a low cost base load unit and environmentally compliant under current and expected regulatory regimes. In conjunction with base load generation, the Tribe is also planning to develop its wind resources as a renewable component of its energy development. Having base load coal generation will allow the investment in transmission infrastructure which cannot be justified on wind generation alone.

The mapping and modeling project being addressed in this Grant request will serve as the foundation for the detailed engineering studies that will ultimately be necessary to plan and design the new coal mine that will serve the generating station. The Tribe has significant data that indicate the existence of an economically recoverable resource that is well in excess of 100 million tons. Utilization of these data will save the Tribe hundreds of thousands of dollars.

Willingness to Develop

The Crow Tribe has been pursuing long term energy projects for several years. The Tribe has been receiving income since 1974 from the coal resources being mined by Westmoreland Resources, Inc. The Tribe recently extended its lease with WRI to allow the continued operation of the existing Absaloka Mine. Now, the Tribe is targeting electric power generation and other coal conversion technologies. The Tribe's desire is to move up the value chain in the energy business to maximize the value of its available energy resources. The economic benefit of providing fuel for a generating station and owning an interest in the generating station are substantially greater than merely being a mineral lessor. Over the past 30 years, the Tribe has established a successful business relationship with Westmoreland Resources and has leveraged that knowledge to develop the power project with technical support from WPI. The Tribe is focused on and committed to development of its energy resources in long term conventional and renewable projects.

Tribal Commitment

The Crow Tribe is committed to executing a plan to develop its natural resources for the benefit of the Tribe and the State of Montana. The Tribe began this process several years ago and is focused on seeing it to successful implementation. The Tribe's plan, working with WPI and other industry partners and consultants,, is to develop its extensive natural resources which include human resources, wind, coal and water to create a sustainable economic engine that will benefit the region. The resources are there, they need additional study to bring them into production. This proposed study will be a big step toward accomplishing that task.

Carl Venne, Crow Tribal Chairman, recognizes the strategic benefit this project offers to the Crow Nation and has assigned the task of administering this vital project to Cedric Black Eagle, Vice-Chairman of the Crow Tribe. Chairman Venne, Vice-Chairman Black Eagle, the other elected Executive officials, and the Crow Tribal Legislature are all committed to energy development and have successfully positioned the Tribe to reap long term benefits.

Additional Participation

Westmoreland Power Inc. has served as technical advisor to the Crow Tribe throughout the development process. A sister company to WPI, Westmoreland Resources, Inc. has worked with the Tribe for over 32 years on the Absaloka mine. In addition to WPI, the Tribe anticipates working with energy and technical consultants and other major industry players to develop and finance these multi-billion dollar projects. However, at this time, the Tribe has not yet made any binding commitments of its coal and other resources within the scope of the projects covered by this Grant.

Overview and Technical Summary

Overview

The Crow Tribe of Indians controls a substantial undeveloped coal resource contained within Township 1 North, Ranges 36 and 37 East, in Big Horn County, Montana. The resource area is referred to as Tract II and is located directly west of the producing Westmorland Resources, Inc. (WRI), Absaloka Tract III mine, located approximately 30 miles northeast of the town of Hardin. See Figure 1. The estimated budget for the project proposed in this Grant request is $162,956.

Operations at the adjacent Absaloka site have been on-going since 1974, with mining primarily occurring in the Rosebud and McKay Seams. Mining has historically been conducted in the central part of the resource area known as Tract III. The area targeted in this study lies directly to the west of the existing mining operations in a resource area known as Tract II. The Tract II study area is contained entirely within the ceded strip where coal resources are held by the United States in trust for the Crow Tribe and considered to be part of the Crow Reservation. The Crow Tribe has a goal of developing a coal-fueled electric generating station on trust lands. This development will help generate the long term economic benefit to the Tribe.

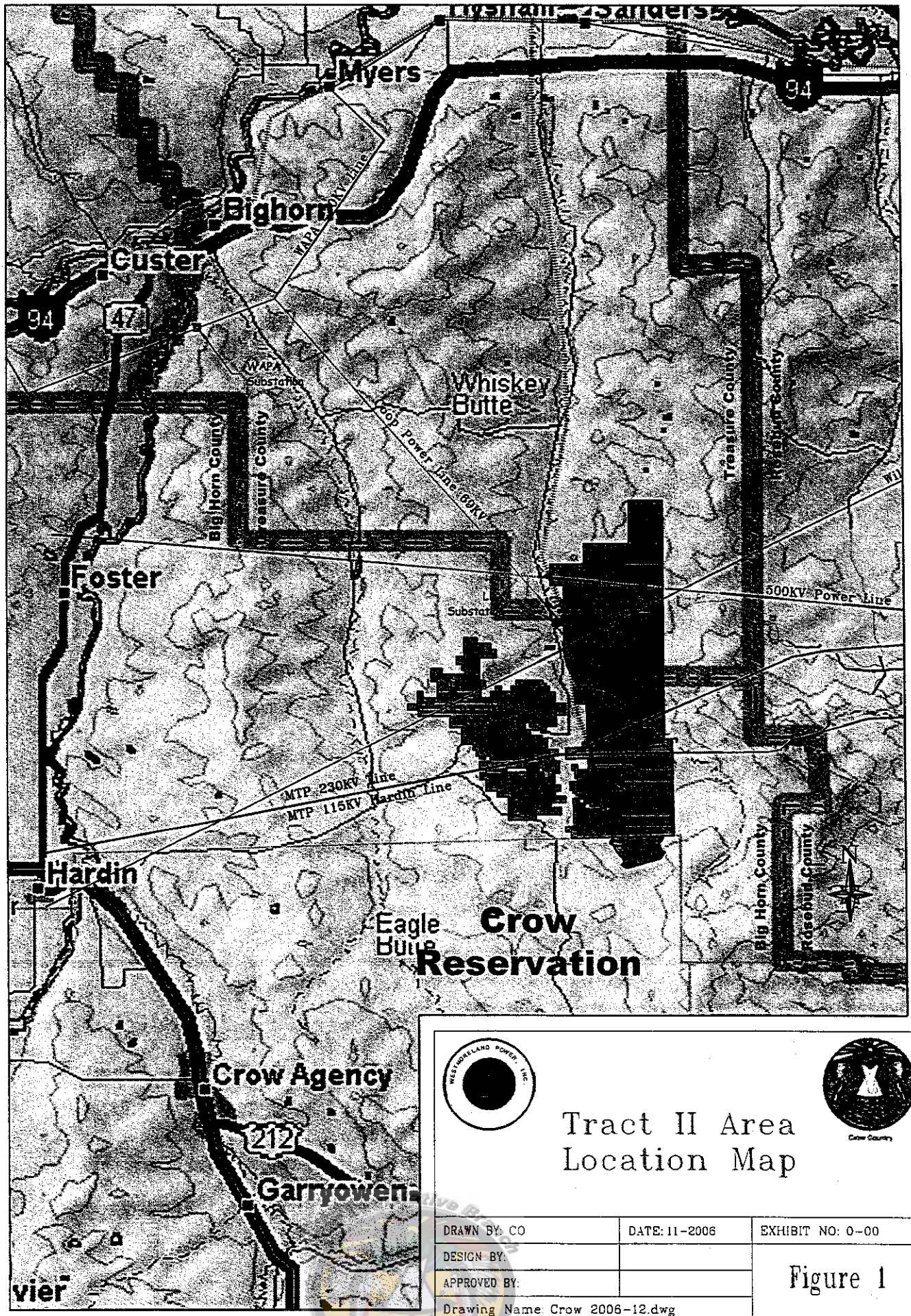
This project proposed herein is for a Phase I geologic investigation which is composed of two segments. First a digital terrain model (DTM) of the resource area must be compiled. This is accomplished by using aerial photography and digital scanning. This task will be completed by a reputable aerial mapping contractor with experience in the region. The DTM will form the foundation for detailed geologic analysis.

The second segment of the project consists of developing the Geologic Model of the resource area. Significant geologic data are available from previous exploration activities conducted in the early 1970's by WRI. DEMD has made hard copies of the data available to the Crow Tribe. These data describe the physical characteristics of the coal resource and contain limited quality data. These data must be compiled in an electronic geologic file to facilitate modeling the resource. The DTM will be merged with the with the geologic data file to create a digital geologic model of the resource. This project will confirm the volume of the resource and give clear definition of the requirements of a more detailed Phase II geologic exploration program that must be completed to facilitate detailed economic analysis of the fuel supply for the proposed generating station.

The Tribal Chairman has delegated the task of administering this project to Mr. Cedric Black Eagle, Vice-Chairman of the Crow Tribe. Mr. Black Eagle will work with WPI as technical advisor to manage and oversee the consultants who will complete the proposed tasks. He will dedicate all time necessary to administer this project. He will assume responsibility for this project in addition to his normal duties. This clearly demonstrates the importance and significance the Tribe places on the successful execution of this project.

FIGURE 1

LOCATION MAP



WESTMORELAND POWER, INC.

Tract II Area Location Map

DRAWN BY: CO	DATE: 11-2006	EXHIBIT NO: 0-00
DESIGN BY:		Figure 1
APPROVED BY:		
Drawing Name: Crow 2006-12.dwg		

Technical Summary

Coal seams of importance in the area are Paleocene in age and belong to the Tongue River member of the Fort Union Formation. The Tongue River member typically consists of gray claystones, fine-grained, poorly-cemented sandstones, and multiple lenticular coal seams. Specific seams contained within the Tract II resource area include the Rosebud, McKay and Robinson Seams. The Rosebud and McKay seams are of little value on Tract II due to erosion and oxidation. The primary seam of development interest is the Robinson Seam. The general stratigraphic column of interest is shown in Figure 2.

The structure of the Robinson Seam in the Tract II area is characterized by shallow dips and gently undulating folds that are probably compactional in nature. The gentle dips to the south that are typical in this portion of the Powder River Basin are masked by localized folding.

Overburden depths on the property range from 0 at outcrop to over 300 feet. Overburden depths are controlled principally by topography. The typical seam thickness of the Robinson Seam is approximately 15 feet.

Existing Geologic Data

A significant amount of exploration drilling, hard copy surface mapping and coal testing has occurred on these properties, primarily during the 1970's and early 1980's by WRI. During these early drilling programs approximately 175 exploration holes were completed on Tract II.

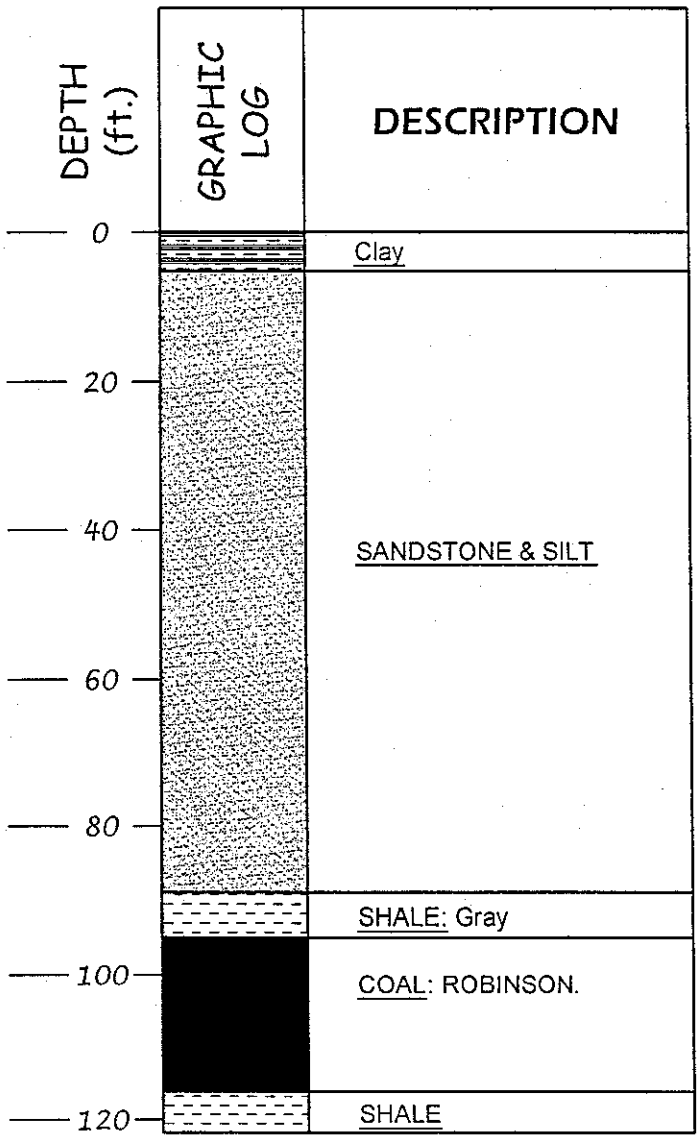
The geologic data acquired in these early programs generally consists of core or drillers logs that provide moderate level of lithologic descriptions, some geophysical logs and some basic coal analytical testing. The majority of the drilling was by "open-hole" methods. Twelve of these holes were cored and provide basic coal quality data. With proper modeling, these data are considered adequate to delineate the general aspects of the coal resource (thickness, structure, overburden, subcrop, strip ratio and approximate coal quality) and to demonstrate the potential of the opportunity. These data are not adequate however, to perform detailed geologic and mine engineering analyses required for a bankable quality project feasibility study. Specific areas where these data are deficient and will require upgrading in subsequent studies, are listed below.

- Modern, high quality geophysical logs;
- Detailed, incremental coal quality analyses;
- High quality core logging and cuttings descriptions;
- Accurate survey and topographic control;
- Geotechnical rock property analyses; and
- Hydrologic characterization.

This Phase I study contained in this application must be completed to accurately define the scope of work for complete geologic and engineering analyses that will be required to develop the mine as a fuel source for the generation project. This study will take approximately 16 weeks to complete. Assuming completion of the Phase I study with acceptable results the Phase II exploration program will be executed.

FIGURE 2

GENERAL STRATIGRAPHIC COLUMN



Tract II General Stratigraphic Column

DRAWN BY: CO	DATE: 11-2006	EXHIBIT NO: 0-00
DESIGN BY:		Figure 2
APPROVED BY:		
Drawing Name: Core Sample 2006-12.dwg		

Goals and Objectives

Goals

The ultimate Goal of this study is to facilitate the economic independence and security of the Crow Tribe of Indians. To do this the Tribe recognizes the need to develop long term employment opportunities through industrial development. In order to facilitate this drive to long term economic security, the Crow Tribe plans to develop its extensive coal resources in the Ceded Strip where mineral interests are held in trust for the Tribe and are considered to be part of the Reservation. . To achieve this goal the Crow Tribe has been working with Westmoreland Power, Inc. (WPI) to develop a technical analysis for a proposed mine mouth coal-fueled electric generating project on trust lands. This generating station would serve the growing power requirements in Montana, the upper northwest and southwest portions of the United States. A project of this nature would create tremendous long term economic benefit for the Crow Tribe and the State of Montana. The economic benefit to the Tribe would come from the Tribe's ownership of the power plant and creation of hundreds of long term high paying jobs for tribal members, in addition to the tax and royalty income from the coal and other Tribal resources utilized by the project.

Objective

The initial objective of this project consists of identifying coal resources that can satisfy the fuel supply requirements of a coal fired electric generating station capable of supplying 500 MW for a minimum of 35 years. (Other nearby Tribal coal resources are also expected to support additional 500 MW generating units at the same site.) At the anticipated in-place heat content of 8,500 BTU/lb, it is expected that a total in-place coal resource base of approximately 80 M tons will be required to satisfy the fuel needs of the generating station. Based on previous geologic investigations conducted in the 1970's it is strongly believed that the Tract II resource area, and specifically the Robinson Seam within this area, offers such an opportunity.

In order to demonstrate the technical and economic feasibility of developing this resource, detailed geologic and engineering studies are required. The creation of a digital geologic model is the precursor to all mine engineering studies. This proposal outlines the specific approach required to bring the Tract II resource area to the level of geologic assurance that will satisfy the feasibility level of study required to justify the substantial funding required to utilize this resource. This study will also provide the preliminary fuel characteristics necessary to begin the preliminary design of the generating station.

Results of Study

Based on successful completion of the Phase I study additional investigation must be completed to facilitate development of the project. More detailed engineering and economic analyses must also be completed.

The Phase II investigations will include comprehensive environmental examination of the resource area which includes a detailed examination of the cultural resources contained within the resource area. These studies will be conducted to insure the preservation of environmental integrity and any cultural resources that may be present.

Scope of Work

The Crow Tribe proposes a two-phased approach to delineating and defining the resource base and opportunity provided at Tract II. This Grant request only addresses Phase I. Phase II will be subject to the successful completion of Phase I. The Tribe plans to conduct this study with technical assistance from WPI. Qualified geologic and aerial mapping consultants will also be used under the direction of the Crow and WPI.

Phase I Database Construction and Geologic Modeling

Phase I for which this Grant is being requested will consist of preparing a preliminary resource assessment utilizing the existing and available exploration data and pertinent geologic reports. Principal components of the Phase I effort will be:

- Task 1 Digital Terrain Model;
- Task 2 Data acquisition and site visit;
- Task 3 Database construction;
- Task 4 Seam correlations;
- Task 5 Digital model construction;
- Task 6 Geologic analysis; and
- Task 7 Report preparation.

The work plan and specific components of each task are described in the following paragraphs.

Task 1 Digital Terrain Model

A digital terrain model must be developed to form the foundation for all geologic and engineering studies. The DTM will also be used for site examination and design. An aerial mapping contractor will photograph the area and digitally scan the photos to create the DTM. The DTM will be created by an aerial mapping contractor with experience in the region. The mapping specifications will be coordinated with the recent aerial mapping of the Reservation conducted by the Crow Tribe. This will be done to assure continuity and maximum utility of the product.

Task 2 Data Acquisition & Site Visit

Task 2 efforts will consist of acquiring and consolidating the available coal drilling data, topographic data, geologic data from public sources and identifying the existence (if any) oil and gas wells or other obvious cultural features important to assessing the property. The task will also convert the topographic data and aerial photographs from the planned flight surveys into a consolidated base map for use in the geologic modeling and mine planning. A site visit will be an important component in this Task, as it will provide an important perspective of the seam outcrop, extent of coal burn and general aspects of the topography.

Task 3 Database Construction

As previously noted the existing drilling data for Tract II consists of data from approximately 175 drill holes. This majority of data is currently in "hard copy" format with some geophysical logs having been scanned into "PDF" format. The primary

component of this task will be to compile the seam intercept and coal quality data into digital form. This will include the interpretations of geophysical logs, driller's logs and preliminary screening of the data including verification of borehole position and collar elevations.

Task 4 Seam Correlation

Components of Task 4 include the preparation of seam correlation charts, development of seam and parting nomenclature and final "coding" of the geologic database. Seam correlation charts are among the most important deliverables prepared in Task 4. These charts demonstrate correlation and seam continuity.

Task 5 Digital Model Construction

A digital geologic model will be prepared from the geologic database and DTM. This model will be prepared using Carlson Engineering's SurvCADD Modeling system. The model will consist of a series of contour maps and digital grid surfaces representing:

- Surface topography;
- Data locations;
- Seam structure;
- Coal and parting thicknesses;
- Seam interburden, overburden, split lines, and seam outcrop;
- Estimation of extent of coal burn or sub-crop; and
- Basic coal quality parameters (moisture, ash, sulfur and heat content).

Task 6 Geologic Analysis

The important components developed during this task include an assessment of the in-place coal resource base. Total coal tonnages will be presented by stripping ratio and overburden depth as well as by resource assurance categories as outlined in the USGS Circular 891.

The most important component of Task 6 is an assessment of the most logical mine areas and overall project boundaries. It is important that these initial resource boundaries be developed to confirm the required coal tonnages and at the same time facilitate focusing on the most promising resource area to optimize future exploration efforts. Once the general boundaries of the project area have been delineated, a detailed exploration plan can be developed. Deliverables prepared during Task 6 include a series of tables representing the in-place resources, a defined project boundary and a plan map illustrating exploration drilling requirements.

Task 7 Report Preparation

The final component of Phase I work will be to compile all data and analyses in a fully illustrated and documented report describing the coal resources contained within the area of Tract II. The geologic report will describe the following major components; the coal geology, source and distribution of data, an estimate of in-place and potentially recoverable resources and an assessment of the geologic and cultural factors which may impact mineability. A full series of geologic maps representing the geology will be contained in the report as well as a fully documented plan for future exploration to be conducted in Phase II. Six bound copies of the geologic report will be prepared. Six CDs

accompanying the report will contain a PDF version of the report and all digital files supporting the DTM and digital geologic model will be presented.

Deliverables

The deliverables developed in Phase I are summarized in Appendix 1. All deliverables will be delivered to the Crow Tribe in both electronic and printed copy format. Of particular value will be the electronic DTM and Geologic Model since these will be the foundation upon which more detailed geologic and engineering designs and studies are developed.

Key Personnel & Resources

The Crow Tribe has assigned Cedric Black Eagle, Crow Tribe Vice-Chairman, to administer this project. The Tribe plans to work with WPI as a technical advisor for the mapping and geologic modeling. The cost of this effort that will be incurred by the Tribe and WPI is not included in this Grant request. Resumes of key geologic experts who will conduct the data analysis and modeling are included in Appendix 2.

Aerial Mapping

The DTM will be created by an experienced aerial mapping firm with experience in the region. Two firms, Horizons, Inc. and Martinez Corporation have provided mapping services in the region and have been contacted to determine their availability to complete the project. Upon approval of the Grant these firms will be asked to competitively bid for the work. The bid will be awarded based on timeliness, price, experience and compatibility with the recent previous mapping work performed on the Crow Reservation. The aerial mapping contractor will submit the deliverables summarized under Task 1.

Geologic Analysis

The Tribe plans to contract with the international engineering and geologic consulting firm Norwest Corporation (Norwest) to compile the electronic geologic data file and to construct the geologic model. Norwest is a major geologic and engineering consulting firm with extensive experience in the region. This project will be implemented by Norwest through its Grand Junction, Colorado office. Norwest will also compile all deliverables summarized in Appendix 1 except those listed under Task 1. They have completed previous geologic and mining engineering projects on the adjacent Tract III reserves and are intimately familiar with the geologic regime in the area. The Tribe plans to leverage this knowledge and experience to reduce the time and cost to complete the evaluation.

Norwest proposes to assign Mr. Stephen Kerr as Project Manager and Senior Geologist to fulfill this assignment. Mr. Kerr has a Masters of Science degree in geology and has over 22 years of experience. He has over 16 years of experience in the Western U.S. Mr. Kerr will be primarily responsible for analysis of the geologic data and creation of the geologic model.

Mr. Richard Tifft who has over 25 years of experience in performing geologic evaluations will work closely with and provide direct assistance to Mr. Kerr when

appropriate. Mr. Tifft has over 20 years of experience in the western US coal regions and has worked on the adjacent Tract III resource area so he is intimately familiar with the geologic setting.

Mr. Lawrence Henchel, Manger of Geologic Services, who has been engaged on numerous projects in the region for over 23 years, will also provide project support as required to accomplish the objectives in a timely manner. Almost all of Mr. Henchel's experience in coal is in the western U.S.

Detailed resumes for these key professionals are attached in Appendix 2.

Budget

The Crow Tribe along with its technical advisor, WPI, will manage the contractors to assure the most cost effective and value oriented process possible. As such, the Tribe will strive to minimize expenditures in every way possible, including utilization of WPI technical expertise. This will be done without jeopardizing the product quality required from the study.

The Budget for the work proposed in this Grant request is estimated at $162,956 and is summarized in Table 1. Details for each Task within the proposed budget are outlined in Appendix 3.

TABLE 1

TASK		ESTIMATED COST
1	Digital Terrain Model	80,000
2	Data Acquisition & Site Visit	8,580
3	Database Construction	16,640
4	Seam Correlation	2,080
5	Digital Model Construction	10,400
6	Geologic Analysis	8,520
7	Report Preparation	18,240
Subtotal		144,460
Contingency 10%		14,446
Expenses		4,050
Grand Total		$162,956

Third party contractor services for the DTM and geologic modeling and evaluation will be bid on a not-to-exceed basis. This assures the work will be completed within the budget estimate.

The DTM should be completed within 12 weeks after the aerial photography is completed. Acquiring the aerial photography will depend upon ground and atmospheric conditions. Ideal photography can be conducted on a clear day when there is no snow cover on the ground and the vegetation is still dormant.

It is estimated that the project can be completed within three months after the aerial photography has been digitally scanned.

Phase II Plan

Phase II study which will be conducted assuming successful results from Phase I. Phase II tasks are not included in this proposal. Phase II consists of implementing an extensive drilling and coring program prepared and recommended from the Phase I component. This program will be designed and implemented to acquire the necessary detailed geologic, hydrogeologic and geotechnical data required for detailed mine planning, cost projections and coal quality forecasting. A separate Grant request will be submitted to cover the Phase II exploration plan.

Conclusion

The project contemplated in this grant proposal is vital to the Crow Tribe's energy development program. This project must be completed to take the Crow Power Project to the next level and eventual development. Chairman Venne has committed the Tribe and its resources to develop long term economic benefits for the Crow Nation and the state of Montana.

The Tribe has taken advantage of the significant data that are available and are now positioned to take the next step which can be accomplished with the funds granted under the Energy and Minerals Development Program administered by the Office of Indian Energy and Economic Development. Chairman Venne on behalf of the Crow Tribe respectfully requests prompt approval of this Grant to allow work to proceed in a timely fashion.

APPENDIX 1

DELIVERABLES

APPENDIX 2

RESUMES OF KEY PERSONNEL

APPENDIX 3

BUDGET DETAIL

TABLE 1

Crow Tract II Geologic Modeling and Resource Evaluation

PHASE I, DATABASE CONSTRUCTION AND GEOLOGIC MODELING

Task	Description	Deliverables
Task 1, Digital Terrain Model		
	Survey control	Documentation for USGS survey control points
	Aerial Photography	Aerial photos
	Digital Scan	Digital Terrain Model for geologic and engineering analysis
Task 2, Data acquisition & Site Visit		
	Coal Drill Data	Hardcopy drill files
	Oil & Gas Data	Location map of existing oil and gas wells
	Existing Geologic Maps	Compilation of public source geologic maps and applicable reports
	Land, Lease and Culture	Compilation map illustrating existing cultural features
	Topographic data	Digital topographic data files prepared from new topographic flight
	Photogeologic mapping	Stereographic aerial photos prepared from new topographic flight
	Site Visit (Travel and 1.5 days on site)	
Task 3, Database construction		
	Log Interpretation (175 holes)	
	Coal quality	
	Data Entry	
	Data Screening and Edits	
Task 4, Seam correlations		
	Correlation charts	Seam Correlation Charts, (Cross-Sections, illustrating seam correlation and stratigraphic continuity)
	Seam correlation & nomenclature	
	Database coding	Completed digital database in Excel Format
Task 5, Digital model construction		
	Drill hole and topographic basemap	AutoCad map (1) illustrating digital topography and borehole locations
	Structural analyses (SCM, OVBD, Ratio, Subcrop)	AutoCad maps (4) and (3) Structural Cross Sections (and digital gridded surfaces)
	Stratigraphic and coal thickness (2, Coal/Parting)	AutoCad maps (2) (and digital gridded surfaces)
	Coal quality modeling (4 Parameters/Maps)	AutoCad maps (4) Moisture, Ash, Sulfur & BTU/lb (and digital gridded surfaces)
	Map preparation (10 Final Maps)	
Task 6, Geologic analysis		
	Coal quality assessment	Resources delineated by In-place Strip Ratio & Depth of Cover
	Resource assessment	Resources delineated by Assurance Classification Categories (USGS Circular 891, Measured, Indicated and Inferred)
	Assessment of impacts & mineability	Estimate of extent of oxidation/burn, estimation of subcrop and depth of weathering
	Design of Exploration Plan (PHASE II)	Exploration plan map
Task 7, Report preparation		
	Draft report for review	
	Final report	Fully illustrated and documented report of the Geologic Resources contained within Tract II (3 bound copies and CD containing PDF version of report, Autocad maps and digital geologic models
	Presentation & review	Exploration plan and budget for Phase II, Property Exploration and Mine Development

APPENDIX 2

RESUMES OF KEY PERSONNEL

NORWEST
CORPORATION

Richard D. Tifft, III
Vice President Geologic Services

PROFESSIONAL HIGHLIGHTS

Mr. Tifft has 25 years of professional experience in geologic evaluations of mining properties, including 20 years in the coal industry. His geographical experience includes all major coal regions in the U.S., Western Canada, Alaska, India, China, and Mongolia.

Specific industry experience includes serving as mine-site geologist at numerous types of mining operations including high productivity underground longwall mines and multi-seam open-pit and strip coal mines. Mr. Tifft has planned and managed numerous development and exploration drilling programs in many areas throughout the world, many with challenging climatic conditions. He has specific expertise in computer applications in geology, data management and geologic interpretation.

Mr. Tifft has successfully utilized a variety of exploration data collection methods including underground and surface rotary and core drilling, geophysical logging and outcrop geologic mapping. Other indirect methods of exploration utilized include high resolution seismic surveys, resistivity surveys, satellite and airborne imagery. He has implemented numerous surface and underground mine geotechnical programs, including highwall and spoil stability, longwall gate road and pillar design and verification. Monitoring programs have included measurements of in-situ stress fields, pillar yield zones and convergence rates in areas of full pillar extraction. He was responsible for the implementation of a unique fully three dimensional longwall, ground monitoring program at a major western U.S. operation.

Significant areas of his technical responsibility include:

- Stratigraphic and structural interpretation in simple and complex environments;
- Reserve and coal quality evaluations;
- Evaluation of various geotechnical parameters affecting surface and underground mines; and
- Evaluation of various mining hazards and risk assessments.

WORK EXPERIENCE

1998 – PRESENT NORWEST CORPORATION, SALT LAKE CITY, UTAH
VICE PRESIDENT GEOLOGIC SERVICES
MANAGER GEOLOGIC SERVICES

Responsible for departmental supervision and geological project management. Management of drilling programs, geological mapping and interpretation, geophysical log interpretation, reserve evaluations, and deposit modeling. Project management of geologic studies of coal deposits in Colorado, Wyoming, North Dakota, India, Mongolia and petroleum saturated sands in the western US and Canada. Performed geologic audits and due diligence of numerous mining properties throughout the United States, Canada, India and Australia.

1995 – 1998 THE WHITEWOOD GEOLOGIC GROUP, INC., STEAMBOAT SPRINGS, COLORADO
PRESIDENT & SENIOR GEOLOGIST

Founded and participated in consulting group which provided exploration and geologic services. Company projects included various coal, oil shale, coal bed methane, and nahcolite projects in Colorado, Wyoming, Utah, New Mexico, and the Middle East.

EDUCATION

B.S. Geology, Utah State University, Logan, Utah, 1978

Course for Hazardous Waste Site Operations, Colorado School of Mines, Golden, Colorado, 1992

ASSOCIATIONS

American Institute of Mining Engineers

LICENSES & CERTIFICATIONS

Professional Geologist: State of Utah Lisc. #5190241-2250

MSHA Certification: Surface and Underground Coal

OSHA Certification: HS&E and Hazardous Waste Site Operations

1992 – 1996 INDEPENDENT GEOLOGICAL AND ENVIRONMENTAL CONSULTANT
INDEPENDENT CONSULTANT
Independent consultant for Western US coal mining companies and consulting companies.

1991 – 1991 ISLAND CREEK OF CHINA COAL, PEOPLES REPUBLIC OF CHINA
SENIOR MINE GEOLOGIST
A Tai Bao Surface Mine, Ping Sho, Peoples Republic of China. Responsible for quality control, reserve analysis, exploration, and geotechnical engineering.

1990 – 1990 CYPRUS GOLD COMPANY, ENGLEWOOD, COLORADO
PROJECT GEOLOGIST
Responsible for evaluation and test mine development of alluvial gold prospect in Alaska, with goal of producing up to 70,000 oz./yr. Reserves did not warrant mine development.

1986 – 1990 CYPRUS YAMPA VALLEY COAL CORPORATION, STEAMBOAT SPRINGS, COLORADO
SENIOR MINE GEOLOGIST
Responsibilities consisted of administration and applications of all geotechnical, ground control, geological, and scientific computer applications for a major surface mine and a premier western underground coal mine. Supervisor of CAD-based drafting department.

1984 – 1986 TWENTYMILE COAL COMPANY, STEAMBOAT SPRINGS, COLORADO
MINE GEOLOGIST
Responsible for planning and administration of geology, ground control, coal quality, hydrology and exploration functions for underground coal mines.

1981 – 1984 GETTY MINING COMPANY, SALT LAKE CITY, UTAH
PROJECT EXPLORATION GEOLOGIST
Underground and surface coal, property evaluation. Extensive geophysics, hydrologic and project management experience.

1980 – 1981 PETROTOMICS, GETTY OIL COMPANY, SHIRLEY BASIN, WYOMING
ORE CONTROL TECHNICAL SUPERVISOR
Supervisor, Ore Control Department, consisting of Geologists and Ore Control Specialists. Responsible for geologic mapping and quality control at open-pit uranium mine.

1978 – 1980 PETROTOMICS, GETTY OIL COMPANY, SHIRLEY BASIN, WYOMING
ORE CONTROL/EXPLORATION GEOLOGIST
Direct supervision of daily mining and quality control. Responsible for planning and supervision of mine.

NORWEST
CORPORATION

Steven B. Kerr
Senior Geologist

EDUCATION

MS, Geology Utah State University, Logan, Utah 1987

BS, Geology Utah State University, Logan, Utah 1981

TRAINING

Expertise in AutoCAD Map, Quicksurf, Geokit, Gemcom, Vulcan, NCSS, ENVI, Wilderness Emergency Medicine, Hazardous Materials Awareness.

Short courses in: Geostatistics, Soil-gas Geochemistry, Porphyry Deposits and Geochemistry, High and Low Sulfidation Ore Development, Spatial Analysis, Satellite Imagery and Thematic Mapping.

REGISTRATION AND AFFILIATION

Registered Professional Geologist: Alaska, Utah, Wyoming
Certified Professional Geologist: American Institute of Professional Geologists
Society of Mining, Metallurgy and Exploration; American Institute of Professional Geologists; Pittsburgh Geological Society; Geological Society of Nevada.

PROFESSIONAL HIGHLIGHTS

Twenty-two years professional experience in the exploration, evaluation and development of coal, mineral and industrial materials. Advanced computer skills in digital mapping, geologic and deposit modeling, statistics and geostatistics, resource/reserve estimation, satellite imagery, and thematic mapping. Extensive experience in field exploration techniques ranging from reconnaissance sampling to detailed delineation drilling programs.

Significant areas of technical expertise include:

- Structural and stratigraphic interpretation in complex terrains;
- Reserve audits, evaluations, and due-diligence reviews;
- Evaluation of adverse geologic conditions affecting mining operations and performance.

International consulting experience in Australia, Canada, China, Colombia, Jamaica, Mongolia, Republic of South Africa, and Sierra Leone.

WORK EXPERIENCE

2005 – PRESENT NORWEST CORPORATION, SALT LAKE CITY, UTAH

SENIOR GEOLOGIST

Is responsible for a wide variety of geologic services, including; exploration management, geologic modeling and reserve/resource reporting.

- Provided onsite management and technical oversight to a coal exploration project in southern Mongolia employing over 100 personnel.
- Prepared three NI43-101 Technical Reports on reserves and resources of coal deposits in southern Mongolia for the reporting requirements of the Canadian Securities Administration for a publicly held mining company
- Audited reserves of a large Colombian surface coal mine tracking life-of-mine production and future revenue stream for a royalty interest holder.

1997-2005 JOHN T. BOYD COMPANY, PITTSBURGH, PA

SENIOR GEOLOGIST

Manager of Geological Services Department, providing resource/reserve estimation, deposit modeling, geologic site assessments, due diligence, feasibility and exploration.

- Provided expert witness testimony in U. S. District Court, on the geology and mineralization of a mining operation in Alaska seeking compensation due to a "legislative takings".
- Evaluated exploration programs, ore control, and computer modeling systems for a bauxite mining operation in Jamaica.
- Evaluated numerous deep and surface coal deposits throughout North America and the Ordos Basin in China.
- Prepared and co-authored the ITR for the public listing of a major Chinese coal producer for the Hong Kong, London, and Ney Exchanges.

- Participated in numerous due-diligence studies and resource audits of public and private coal producers involved incorporate acquisitions and company refinancing.
- Evaluated iron ore resources for a proposed development in the Pilbara of Western Australia
- Provided consultation on identification and delineation of adverse geologic conditions affecting several mining operations and necessary corrective measures.

1987-1997 BARRICK RESOURCES (USA), INC., TOOELE, UT
SENIOR EXPLORATION GEOLOGIST
Exploration manager of the Mercur Gold Mine and the surrounding district. Duties included overseeing all exploration projects, personnel, negotiating exploration leases, service contracts, and providing geologic support to mining activities.

- Identified three new mineralized zones in the district.
- Successfully renegotiated service contracts at a savings of approximately $250,000 to the operation.

EXPLORATION GEOLOGIST
Performed prospect evaluation, project generation, regional reconnaissance, field/pit/outcrop mapping. Analyzed slope stability, deposit modeling and interpretation. Conducted geochemical and geophysical surveys, exploratory and delineation drilling, and data analysis.

- Project manager for numerous exploration projects throughout western Utah. Designed, implemented, managed, and interpreted mapping, geochemical surveys, geophysics, drilling, and trenching programs.
- Designed/implemented computer system for Geology Department. Trained department personnel in computer-aided mapping, database management, statistics, and geostatistics.
- Identified the major ore-controlling structures at Mercur through the development of an interactive geologic computer model. Led to greater understanding of structural parameters required for mineralization and targeting criteria for exploration.

1986 - 1987 UTAH GEOLOGICAL SURVEY, SALT LAKE CITY, UTAH
GEOTECHNICIAN
Compiled, edited, and mapped geologic and quality data on Utah's coal resources for state and federal research programs. Collected large volume research samples from active coal mines for Utah Coal Library. Compiled coal resource data maps for the USGS-NCRDS federal research program. Provided information to public and private inquiries on Utah's coal and mineral resources.

1983 – 1986 ARENTZ MINING ENGINEERS, SALT LAKE CITY, UTAH
CONSULTING GEOLOGIST
Provided geologic assessments and evaluations on disseminated and epithermal vein deposits in Arizona, Montana, Nevada, Utah and a placer deposit in Montana. Provided land acquisition services, land status reviews, geochemical and geophysical surveys.

1982 – 1982 PHILLIPS PETROLEUM COMPANY, GEOTHERMAL DIVISION
MURRAY, UTAH
CONTRACT GEOLOGIST
Conducted field reconnaissance for geothermal sources utilizing water chemistry sampling, soil-gas sampling, temperature-gradient logging. Performed database management. Logged and analyzed drill hole cuttings.

- Led field reconnaissance program in southern Sierras and Mojave Desert of California (9600 sq. mi.) sampling and testing source waters and temperature logging wells.
- Updated prospect file of all drill hole temperature-gradient data. Designed/implemented its conversion to a computer database.

1981 – 1981 BEAR CREEK MINING COMPANY (KENNECOTT EXPLORATION) **SPOKANE, WASHINGTON**
CONTRACT GEOLOGIST
Participated in projects in Idaho, Nevada, and Utah. Conducted extensive geochemical surveys, geologic mapping, claim staking. Sampled, logged, and monitored exploratory drilling operations. Managed drilling operations at two projects. The Star Pointer Project in Ruth, Nevada was later developed into operating gold mine leased by Kennecott to Alta Gold Company.

PUBLICATIONS AND PAPERS

1997 - "Geology of the Mercur Gold Mine, Oquirrh Mountains, Utah," Geology and Ore Deposits of the Oquirrh and Wasatch Mountains, Utah, Guidebook Series of the Society of Economic Geologists, Volume 29.

1994 - "High Tech Tools Help Barrick Target Deeper Horizons at Mercur," Mining Engineering, January.

1991 - "Sampling, Analysis and Data Compilation of Utah Coal Fields," UGMS Open File Report and Data Processing Publication.

NORWEST
CORPORATION

Lawrence D. Henchel
Manager Geologic Services

EDUCATION
BS, Geology, Saint Lawrence University, Canton, New York, 1978
Field Geology, Miami University of Ohio, Wind River Range, Wyoming, 1979

Seminars and Courses:
AutoCAD Training - Steamboat Springs
BPB Mineral Logging Symposium - Denver
Stratigraphic Concepts in Fossil Fuel Exploration, Colorado School of Mines
Coal Petrography - Houston
Clastic Depositional Systems - Houston
Depositional Models in Coal Exploration and Mine Planning, Colorado School of Mines

ASSOCIATIONS
Society of Mining Engineers/AIME

LICENSES & CERTIFICATIONS
Professional Geologist: State of Utah Lisc. #6087593-2250

MSHA Certification, Surface and Underground Mines

PROFESSIONAL HIGHLIGHTS
Twenty-three years experience in exploration for both surface and underground mining operations. Successful at consistently designing and managing cost-effective exploration programs, from initial needs assessment and project planning to multi-rig field operations management, well-site geology and data collection. Working experience in numerous positions in exploration and mining, including field geologist, field manager, project manager, mine geologist, and consultant. Experience working with coal, oil shale, coal bed methane and industrial mineral properties throughout the United States, Canada, India, South America, the Middle East, Mongolia and southern Africa.

Skilled in geologic modeling and reserve analysis of single and multi-seam coal deposits, CBM properties, oil shale reserves, and various mineral deposits. Proficient in the development and management of computerized databases. Experience with a wide range of modeling and data management software, including SurvCadd, Quicksurf, AutoCAD, Minex, MK/Eagles, Zycor, Radian CPS-1, and various databases and spreadsheets. Expert at property analysis using air photos, seismographic interpretation and field mapping.

Well-site and drilling engineering skills include drill cutting and core logging, sampling and handling; structural core logging, geotechnical sampling and RQD determinations; drill fluid engineering; drill rate monitoring; and well gas monitoring. Expert in the interpretation of geophysical logs and down-hole surveys. Thorough knowledge of well casing operations and well completion techniques for both monitoring and production purposes. Experienced in supervision of directional drilling operations and the installation of cased holes for mine gas ventilation. Stress creative problem solving to deal with difficult down-hole situations and field logistics.

Versatile in conducting in-mine support projects. Implemented and conducted numerous pit and underground quality programs. Worked closely with mine engineers in monitoring slope and highwall stabilities and underground mine hazard prediction. Planned and implemented coal quality and blending program at India's first privately-owned coal mine.

WORK EXPERIENCE
MAY 2002-PRESENT NORWEST CORPORATION, SALT LAKE CITY, UT
MANAGER GEOLOGIC SERVICES
Department and geological project management. Responsible for creating geological models for complex, multi-seam properties in Kentucky, Colorado, Montana, India, Columbia and Mongolia. Aided in the design and implementation of a geotechnical and development drilling program for a large Colorado surface mine. Planned and supervised several green-field coal exploration projects in Mongolia's South Gobi as well as numerous exploration programs worldwide. Conducted field mapping program and performed an analysis of rock jointing and coal cleat orientation for a gas production company in Wyoming. Served as geological consultant and trainer to surface coal mine in India. Participated in numerous due diligence efforts and procedural audits of exploration and mine development programs.

1995-2002 WHITEWOOD GEOLOGIC GROUP, INC., STEAMBOAT SPRINGS, CO
VP/SENIOR GEOLOGIST
Participated in various coal, coal bed methane, and industrial mineral projects throughout the western United States, and in oil shale exploration projects in Colorado and the Kingdom of Jordan.

1991-1995 INDEPENDENT GEOLOGIC CONSULTANT, STEAMBOAT SPRINGS, CO
SOLE PROPRIETOR
Participated in various coal projects in Colorado and Wyoming.

CYPRUS COAL COMPANY/GETTY MINING COMPANY STEAMBOAT SPRINGS, CO/SALT LAKE CITY, UT
GEOLOGIC ENGINEER (1985- 1987)
Responsible for on-going exploration at mine and satellite properties. Provided in-mine geologic and engineering support for 5M ton-per-year Colorado surface operation and assisted in start-up of premier underground mine. Responsible for reserve status and coal quality projections. Acted as computer operations liaison for engineering department. Supervised hardware selection and installation for transfer of company computer operations to VAX mainframe and MK/Eagles workstations.

PROJECT EXPLORATION GEOLOGIST (1981-1985)
Planned and supervised exploration projects throughout Northwest Colorado. Selected as Project Manager for Iles Mountain joint-venture exploration (Getty, Consol, Gulf, Exxon), supervising three staff geologists. Efficient management of personnel and equipment resulted in under-budget completion of the project. Mapped in-mine geologic features for mine plan and hazard prediction. Supervised installation of ground water monitor wells and well testing operations. Participated in exploration that was to result in Twentymile Coal's current underground operation.

1979–1981
ENERGY FUELS CORPORATION STEAMBOAT SPRINGS, CO
FIELD GEOLOGIST
Field-supervised drill and support contractors including geophysical loggers, surveyors, heavy equipment and well casing and completion crews. Gained experience core logging and geotechnical sampling. Performed extensive outcrop mapping. Assisted in database management and computer mapping for mine and satellite properties.

APPENDIX 3

BUDGET DETAIL

APPENDIX 3 BUDGET DETAIL

Task	Subtask	Man Days	
Task 1, Digital Terrain Model			
	Aerial Photography & Digital Scan		65,000
	Survey Ground Control		15,000
	Subtotal		80,000
Task 2, Data acquisition & Site Visit			
	Coal Drill Data	2	2,080
	Oil & Gas Data	0.5	260
	Existing Geolgoic Maps	1	1,040
	Land, Lease and Culture	1	1,040
	Topographic data	1.25	780
	Photogeologic mapping	1	780
	Site Visit (Travel and 1.5 days on site)	2.5	2,600
	Subtotal	9.25	8,580
Task 3, Database construction			
	Log Interpretation (175 holes)	8	8,320
	Coal quality	2	2,080
	Data Entry	4	4,160
	Data Screening and Edits	2	2,080
	Subtotal	16	16,640
Task 4, Seam correlations			
	Correlation charts	1	520
	Seam correlation & nomenclature	1	1,040
	Database coding	0.5	520
	Subtotal	2.5	2,080
Task 5, Digital model construction			
	Structural analyses (SCM, OVBD, Ratio, Subcrop)	1	1,040
	Borehole Location & Collar verification		2,080
	Stratigraphic and coal thickness (2, Coal/Parting)	2	2,080
	Coal quality modeling (4 Parameters/Maps)	2	2,080
	Map preparation (10 Final Maps)	4	3,120
	Subtotal	9	10,400
Task 6, Geologic analysis			
	Resource & quality assessment	2	2,080
	Assessment of impacts & mineability	0	-
	Design & Preparation of Exploration Plan (PHASE II)		6,440
	Subtotal	2	8,520
Task 7, Report preparation			
	Draft report for review	11	10,680
	Final report	5	3,840
	Presentation & review	3	3,720
	Subtotal	19	18,240
TOTAL FEES		57.75	64,460
	Total		144,460
Contingengy		**10%**	14,446
Norwest Expenses			
	Plotting		2,000
	Oil & Gas data		300
	Site Visit (Travel; air, hotel, food and car)		1,000
	Report materials		500
	Binders, etc		250
TOTAL EXPENSES			4,050
GRAND TOTAL, PHASE 1			**162,956**