UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COAL RESOURCE OCCURRENCE

AND

COAL DEVELOPMENT POTENTIAL

MAPS

OF THE

OLIVER DRAW QUADRANGLE,

CAMPBELL COUNTY, WYOMING

BY

INTRASEARCH INC.

DENVER, COLORADO

OPEN FILE REPORT 79-027

1979

This report is preliminary, and has not been edited or reviewed for conformity with United States Geological Survey standards or stratigraphic nomenclature.

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

CONVERSION TABLE

To Convert	Multiply By	To Obtain
inches	2.54	centimeters (cm)
feet	0.3048	meters (m)
miles	1.609	kilometers (km)
acres	0.40469	hectares (ha)
tons (short)	0.9072	metric tons (t)
cubic yards/ton	0.8428	cubic meters per metric ton
acre feet	0.12335	hectare-meters
Btu/lb	2.326	kilojoules/kilogram (kJ/kg)
Btu/lb	0.55556	kilocalories/kilogram kcal/kg)
Fahrenheit	5/9(F-32)	Celsius

I. Introduction

The report and accompanying maps set forth the Coal Resource Occurrence (CRO) and Coal Development Potential (CDP) of coal beds within the Oliver Draw Quadrangle, Campbell County, Wyoming. The CRO and CDP map series includes 19 plates (U.S. Geological Survey Open-File Report 79-027). The project is compiled by IntraSearch Inc., 1600 Ogden Street, Denver, Colorado under KRCRA Northeastern Powder River Basin, Wyoming Contract Number 14-08-0001-17180. This contract is a part of a program to provide an inventory of unleased federal coal in Known Recoverable Coal Resource Areas (KRCRA) in the western United States.

The Oliver Draw Quadrangle is located in Campbell County in northeastern Wyoming. It encompasses all or parts of Townships 54 and 55 North, Ranges 71 and 72 West, and covers the area: 44°37'30" to 44°45' north latitude; 105°22'30" to 105°30" west longitude.

Wyoming State Highway 59 provides the main access to the Oliver Draw quadrangle. This hard surface, secondary highway traverses the northeastern portion of the area and approximately parallels the eastern boundary of the quadrangle. A light-duty, improved surface road branches off Highway 59 slightly north of the junction between Horse Creek and Highway 59. Numerous unimproved roads branch from this east-west trending improved road, and form a network of accessibility

throughout much of the area. The nearest railroad is the Burlington Northern trackage, located approximately 21 miles (34 km) south of the area, near Gillette, Wyoming.

Wildcat Creek, the main drainage feature of the area, flows northward through the southern half of the quadrangle. Near the center of the quadrangle, Wildcat Creek joins Horse Creek, which flows northeastward through the northern half of the area. At the junction of Highway 59 and Horse Creek, the elevation of the valley floor is approximately 3600 feet (1097 m) above sea level. Numerous smaller drainages are tributary to Wildcat and Horse Creeks and drain fairly rugged terrain that attains a maximum elevation of 4371 feet (1332 m) above sea level. The somber grays, yellows, and browns of outcropping sandstones, shales, and siltstones contrast strikingly with the brilliant reds, oranges, and purples of "clinker," and deep greens of the juniper and pine tree growth.

The thirteen to fourteen inches (33 to 36 cm) of annual precipitation that falls in this semi-arid region accrues principally in the springtime. Summer and fall precipitation usually originates from thunderstorms, and infrequent snowfalls of six inches (15 cm) or less generally characterize winter precipitation. Although temperatures ranging from less than -25°F (-32°F) to more than 100°F (38°C) have been recorded near Arvada, Wyoming, average wintertime minimums and summertime maximums approach $+5^{\circ}$ to $+15^{\circ}$F (-15° and -9°C) and 75° to 90°F (24° to 32°C), respectively.

Surface ownership is divided among fee, state, and federal categories with the state and federal surface generally leased to ranchers for grazing purposes. Details of surface ownership are available at the Campbell County Courthouse in Gillette, Wyoming. Details of mineral ownership on federal lands are available from the U.S. Bureau of Land Management in Cheyenne, Wyoming. Federal coal ownership is shown on Plate 2 of the Coal Resource Occurrence maps. The non-federal coal ownership comprises both fee and state coal resources.

The Coal Resource Occurrence and Coal Development Potential program pertains to unleased federal coal and focuses upon: 1) the delineation of lignite, subbituminous, bituminous, and anthracite coal at the surface and in the subsurface on federal land; 2) the identification of total tons in place as well as recoverable tons; 3) categorization of these tonnages into measured, indicated, and inferred reserves and resources, and hypothetical resources; and 4) recommendations regarding the potential for surface mining, underground mining, and in-situ gasification of the coal beds. This report evaluates the coal resources of all unleased federal coal beds in the quadrangle which are 5 feet (1.5 m) or greater in thickness and occur at depths down to 3000 feet (914 m). No resources or reserves are computed for leased federal coal, state coal, fee coal, or lands encompassed by coal prospecting permits and preference right lease applications.

Surface and subsurface geological and engineering extrapolations drawn from the current data base suggest the occurrence of approximately 430 million tons (390 million metric tons) of total unleased federal coal-in-place in the Oliver Draw Quadrangle.

The suite of maps that accompany this report set forth and portray the coal resource and reserve occurrence in considerable detail. For the most part, this report supplements the cartographically displayed information with minimum verbal duplication of the CRO-CDP map data.

II. Geology

Regional. The thick, economic coal deposits of the Powder River Basin in northeastern Wyoming occur mostly in the Tongue River Member of the Fort Union Formation and in the lower part of the Wasatch Formation. Approximately 3000 feet (914 m) of the Fort Union Formation that includes the Tongue River, Lebo, and Tullock Members of Paleocene age, are unconformably overlain by approximately 700 feet (213 m) of the Wasatch Formation of Eocene age. These Tertiary formations lie in a structural basin flanked on the east by the Black Hills uplift, on the south by the Hartville and Casper Mountain uplifts, and on the west by the Casper Arch and the Big Horn Mountain uplift. The structural configuration of the Powder River Basin originated in Late Cretaceous time, with episodic uplift thereafter. The Cretaceous Cordillera was the dominant positive land form throughout the Rocky Mountain area at the close of Mesozoic time.

Outcrops of the Wasatch Formation and the Tongue River Member of the Fort Union Formation cover most of the areas of major coal resource occurrence in the Powder River Basin. The Lebo Member of the Fort Union Formation is mapped at the surface northeast of Recluse, Wyoming, east of the principal outcrops and associated clinkers (McKay, 1974), and presumably projects into the subsurface beneath much of the basin. One of the principal characteristics for separating the Lebo and Tullock Members (collectively referred to as the Ludlow Member east of Miles City, Montana) from the overlying Tongue River Member is the color differential between the lighter-colored upper portion and the somewhat darker lower portion (Brown, 1958). Although geologists working with subsurface data, principally geophysical logs, in the basin are trying to develop criteria for subsurface recognition of the Lebo-Tullock and Tongue River-Lebo contacts, no definitive guidelines are known to have been published. Hence, for subsurface mapping purposes the Fort Union Formation is not divided into its member subdivisions for this study.

During the Paleocene epoch, the Powder River Basin tropic to subtropic depositional environment included broad, inland flood basins with extensive swamps, marshes, freshwater lakes, and a sluggish but active, northeastward discharging drainage system, superimposed on a near base level, emerging sea floor. Much of the vast areas where organic debris collected was within a reducing depositional environment.

Localized uplifts began to disturb the near sea level terrain of northeastern Wyoming, following retreat of the Cretaceous seas. However, the extremely fine-grained characteristics of the Tongue River Member clastics suggest that areas of recurring uplift peripheral to the Powder River Basin were subdued during major coal deposit formation.

The uplift of areas surrounding the Powder River Basin created a structural basin of asymmetric characteristic, with the steep west flank located on the eastern edge of the Big Horn Mountains. The axis of the Powder River Basin is difficult to specifically define, but is thought to be located in the western part of the basin, and to display a north-south configuration some 15 to 20 miles (24 to 32 km) east of Sheridan, Wyoming. Thus, the sedimentary section described in this report lies on the east flank of the Powder River Basin, with gentle dips of two degrees or less disrupted by surface structure thought to relate to tectonic adjustment and differential compaction.

Some coal beds in the Powder River Basin exceed 200 feet (61 m) in thickness. Deposition of these thick in-situ coal beds requires a discrete balance between subsidence of the earth's crust and in-filling by tremendous volumes of organic debris. These conditions in concert with a favorable ground water table, non-oxidizing clear water and a climate amenable to the luxuriant growth of vegetation produce a stabilized swamp critical to the deposition of coal beds.

Deposition of the unusually thick coal beds of the Powder River Basin may be partially attributable to short distance water transportation of organic detritus into areas of crustal subsidence. Variations in coal bed thickness throughout the basin relate to changes in the depositional environment. Drill hole data that indicate either the complete absence or extreme attenuation of a thick coal bed probably relate to location within the ancient stream channel system servicing this low land area in Early Cenozoic time. Where thick coal beds thin rapidly from the depocenter of a favorable depositional environment, it is not unusual to encounter synclinal structure over the maximum coal thickness due to the differential compaction between organic debris in the coal depocenter, and fine-grained clastics in the adjacent areas.

The Wasatch Formation of Eocene age crops out over most of the central part of the Powder River Basin and exhibits a disconformable contact with the underlying Fort Union Formation. The contact has been placed at various horizons by different workers; however, for the purpose of this report, in western Campbell County, Wyoming, the contact is positioned at the top of the Roland coal bed as mapped by Olive (1957) and is considered to disconformably descend in the stratigraphic column to the top of the Wyodak-Anderson (Roland of Taff, 1909) along the eastern boundary of the coal measures. No attempt is made to differentiate the Wasatch and Fort Union Formations on geophysical

logs or in the subsurface mapping program that is a part of this CRO-CDP project.

Although Wasatch and Fort Union lithologies are too similar to allow differentiation in some areas, most of the thicker coal beds occur in the Fort Union section on the east flank of the Powder River Basin. Furthermore, orogenic movements peripheral to the basin apparently increased in magnitude during Wasatch time causing the deposition of friable, coarse-grained to gritty arkosic sandstones, fine to very fine-grained sandstones, siltstones, mudstones, claystones, and brown-to-black carbonaceous shales. These sediments are noticeably to imperceptibly coarser than the underlying Fort Union clastics.

The Oliver Draw Quadrangle is located in an area where surface rocks are classified into the Tongue River and Lebo Members of the Fort Union Formation. Although the Tongue River Member is reportedly 1200 to 1300 feet (366 to 396 m) thick (Olive, 1957), only 700 to 800 feet (213 to 244 m) are exposed in this area. Olive (1957) correlated coal beds in the Spotted Horse coal field with coal beds in the Sheridan coal field (Baker, 1929) and Gillette coal field (Dobbin and Barnett, 1927), Wyoming, and with coal beds in the Ashland coal field (Bass, 1932) in southeastern Montana. This report utilizes, where possible, the coal bed nomenclature used in previous reports. Baker (1929) assigned names to the Anderson and Canyon coal beds, and the Pawnee and Cache coal beds were named by Warren (1959). The Moyer and Oedekoven basal Tongue River Member coal beds, were informally named by IntraSearch (1979 and 1978a, respectively).

Local. The Oliver Draw Quadrangle lies on the eastern flank of the Powder River Basin, where the strata dip gently westward. The Tongue River Member of the Fort Union Formation crops out over the entire quadrangle. The Fort Union Formation is composed of very fine-grained sandstone, siltstone, claystone, shale, carbonaceous shale, and numerous coal beds.

A northwest-trending fault vertically displaces strata approximately 15 feet (5 m), and is located in Sections 2, 11, and 12, T. 54 N., R. 72 W. Relative displacement on this fault is downthrown to the south. Another smaller fault, located in the southwest corner of the quadrangle, trends northwestward with an approximate vertical displacement of 5 feet (1.5 m).

III. Data Sources

Areal geology of the coal bed outcrops and associated clinker is derived from the Preliminary Geologic Map of the Bertha 3 NW (Oliver Draw) Quadrangle (McKay, 1974). Regional correlations by IntraSearch necessitate the modification of nomenclature used by McKay (1974). Subsurface control on coal beds west of and within the Pitch Draw Quadrangle, west of the Oliver Draw Quadrangle, correlates with some of the coal bed outcrops and associated clinker as mapped by McLaughlin and McKay (1973). However, nomenclature problems exist between the subsurface coal bed names of IntraSearch and the outcrop nomenclature

of McLaughlin and McKay (1972), and McKay (1974). The massive areas of metamorphosed overburden in the Oliver Draw Quadrangle are considered by IntraSearch to result from burning of both the Anderson and Canyon coal beds. IntraSearch correlations suggest that the Cook and Wall coal beds pinch out west of this quadrangle, and the Canyon crop line of McKay (1974), approximately 300 feet (91 m) below the Canyon of IntraSearch, emerges as the Pawnee coal bed outcrop. IntraSearch further suggests that the Pawnee coal bed outcrop configuration of McKay (1974) in the northeast part of the quadrangle represents the surface occurrence of the Moyer coal bed as identified by IntraSearch.

The major source of subsurface control, particularly on deep coal beds, is the geophysical logs from oil and gas test bores and producing wells. Some geophysical logs are not applicable to this study, for the logs relate only to the deep potentially productive oil and gas zones. More than eighty percent of the logs include resistivity, conductivity, and self-potential curves. Occasionally the logs include gamma, density, and sonic curves. These logs are available from several commercial sources.

All geophysical logs available in the quadrangle are scanned to select those with data applicable to Coal Resource Occurrence mapping. Paper copies of the logs are obtained, interpreted, and coal intervals annotated. Maximum accuracy of coal bed identification is accomplished where gamma, density, and resistivity curves are available. Coal bed

tops and bottoms are picked on the logs at the midpoint between the minimum and maximum curve deflections. The correlation of coal beds within and between quadrangles is achieved utilizing a fence diagram to associate local correlations with regional coal occurrences.

In some parts of the Powder River Basin, additional subsurface control is available from U.S. Geological Survey open-file reports that include geophysical and lithologic logs of shallow holes drilled specifically for coal exploration. A sparse scattering of subsurface data points are shown on unpublished CRO-CDP maps compiled by the U.S. Geological Survey, and where these data are utilized, the rock-coal intervals are shown on the Coal Data Map (Plate 1). Inasmuch as these drillholes have no identifier headings, they are not set forth on the Coal Data Sheet (Plate 3). The geophysical logs of these drill holes were not available to IntraSearch to ascertain the accuracy of horizontal location, topographic elevation, and down-hole data interpretation.

The reliability of correlations, set forth by IntraSearch in this report, vary depending upon: the density and quality of lithologic and geophysical logs; the detail, thoroughness, and accuracy of published and unpublished surface geological maps; and interpretative proficiency. There is no intent on the part of IntraSearch to refute nomenclature established in the literature or used locally by workers in the area: The thrust of the IntraSearch intent focuses upon the suggestion of a regional nomenclature applicable throughout the eastern Powder River Basin.

It is expected and entirely reasonable that some differences of opinion regarding correlations as suggested by IntraSearch exist. Additional drilling for coal, oil, gas, water, and uranium, coupled with expanded mapping of coal bed outcrops and associated clinkers will broaden the data base for coal bed correlations and allow continued improvement in the understanding of coal bed occurrences in the eastern Powder River Basin.

The topographic map of the Oliver Draw Quadrangle is published by the U.S. Geologic Survey, compilation date, 1972. Land ownership data are compiled from land plats available from the U.S. Bureau of Land Management in Cheyenne, Wyoming. This information is current to October 13, 1977.

IV. Coal Bed Occurrence

Fort Union Formation coal beds that are present in all or part of the Oliver Draw Quadrangle include, in descending stratigraphic order, the Pawnee, Cache, Moyer, and Oedekoven coal beds. A complete suite of maps (structure, isopach, mining ratio, overburden/interburden identified resources and areal distribution of identified resources) is prepared for the Pawnee, Moyer, and Oedekoven coal beds. High elevations on the Oliver Draw Quadrangle are usually capped with resistant porcellanite rock that has formed from burning of the Anderson and Canyon coal beds. Although McKay (1974) maps three small areas where oxidation may not be complete in these coal beds, no coal bed thicknesses are known; hence the Anderson and Canyon are not mapped on this quadrangle.

Inasmuch as the Cache coal bed displays limited areal extent and thinness, it is excluded from detailed mapping.

No physical and chemical analyses are known to have been published regarding the coal beds in the Oliver Draw Quadrangle, and published analytical data on the Moyer and Oedekoven coal beds are thought to be nonexistent. However, the general "as received" basis proximate analyses for northern Campbell County, Wyoming coal beds are as follows:

COAL BED NAME		ASH	FIXED CARBON	MOISTURE	VOLATILES	SULPHUR	BTU/LB
Pawnee (U)	Hole 7424	7.880	31.029	31.910	29.183	0.386	7344
Cache (U)	Hole 741	9.481	30.517	31.420	28.582	0.488	7271

(U) - U.S. Geological Survey & Montana Bureau of Mines & Geology - 1974

The Coal Data Sheet, Plate 3, shows the downhole identification of coal beds within the quadrangle as interpreted from geophysical logs of oil and gas test bores and producing wells. Inasmuch as the Moyer coal bed underlies most of the quadrangle, it is designated as datum for the correlation diagram. The Pawnee and Cache coal beds exhibit marginal lateral extent; however, the Moyer and Oedekoven coal beds occur as laterally persistent horizons underlying most of the quadrangle.

An "insufficient data line" for the Pawnee coal bed extends north-south across the area, approximately parallel to the range line between Ranges 71 and 72 West. No subsurface data exists for Range 71 West;

therefore, the Pawnee coal bed is mapped only in the western half of the quadrangle. Outcrops of the Pawnee coal bed occur in the canyons of Horse Creek, north of Wildcat Creek, and south of White Tail Creek (see discussion in Data Sources). The Pawnee coal bed dips gently westward with an approximate gradient of 100 feet per mile (18 m/km). Coal bed thinning southward, from a maximum thickness of 17 feet (5 m) in the northwestern corner of the quadrangle, culminates in a pinchout line of the Pawnee coal bed in the southwestern portion of the area. Overburden thickness exceeds 400 feet (121 m) in the areas of higher terrain.

The Moyer coal bed crops out adjacent to Horse Creek, in the northeastern part of the quadrangle. The Moyer coal bed occurs approximately 415 feet (126 m) below the Pawnee coal bed. The Moyer coal bed dips gently westward with an approximate gradient of 80 feet per mile (14 m/km), attains a maximum thickness of 11 feet (3 m) in the north central area, and thins toward the northwestern corner of the quadrangle where it pinches out. Overburden thickness above the Moyer coal bed is in excess of 750 feet (229+ m) in areas of higher terrain.

The Oedekoven coal bed lies 175 to 123 feet (53 to 38 m) beneath the Moyer coal bed. The Oedekoven coal bed crops out a short distance west of Highway 59, in the northeastern part of the quadrangle. Three areas of zero thickness for the Oedekoven coal bed occur in the quadrangle, the largest of which is located near the boundary between

T. 54 N. and T. 55 N. in the eastern half of the study area. The two other areas of zero Oedekoven coal bed thickness occur in the northeast corner of the quadrangle, and in Section 34, T. 55 N., R. 72 W. The Oedekoven coal bed attains a maximum thickness of 12 feet (4 m) in the central part of the Oliver Draw Quadrangle. Structural contours on top of the Oedekoven coal bed define a westward dip of less than two degrees. In the areas of high elevation in the quadrangle, the overburden thickness above the Oedekoven coal bed is in excess of 1000 feet (305+ m).

V. Geological and Engineering Mapping Parameters

Subsurface mapping is based on geologic data within and adjacent to the Oliver Draw area. Data from geophysical logs are used to correlate coal beds and control contour lines for the coal thickness, structure, and overburden maps. Isopach lines are also drawn to honor selected measured sections where there is sparse subsurface control. Where isopach contours do not honor surface measured sections, the surface thicknesses are thought to be attenuated by oxidation and/or erosion, hence not reflective of total coal thickness. Structure contour maps are constructed on the tops of the main coal beds. Where subsurface data is scarce, supplemental structural control points are selected from the topographic map along coal outcrops.

In preparing overburden isopach maps, no attempt is made to identify coal beds that occur in the overburden to a particular coal bed under study. Mining ratio maps for this quadrangle are constructed

utilizing a 95% recovery factor. Contours on these maps identify the ratio of cubic yards of overburden to tons of recoverable coal. Where ratio control points are sparse, interpolated points are computed using coal structure, coal isopach, and topographic control. On the Areal Distribution of Identified Resources Map (ADIR), coal bed reserves are not calculated where the coal is less than 5 feet (1.5 m) thick, where the coal occurs at a depth greater than 500 feet (152 m), and where non-federal coal or federal coal leases exist.

Coal tonnage calculations involve the planimetering of areas of measured, indicated, inferred, and hypothetical resources to determine their areal extent in acres. Acres are multiplied by the average coal bed thickness and 1750 (the number of tons of lignite A per acre-foot; 12,874 metric tons per hectare-meter) to determine total tons in place. Recoverable tonnage is calculated at 95% of the total tons in place. North of the Oliver Draw Quadrangle in the Montana portion of the Powder River Basin, a recovery factor of 85 percent is utilized because of the general northward thinning of economic coal beds. Where tonnages are computed for the CRO-CTP map series, resources and reserves are expressed in millions of tons. Frequently the planimetering of coal resources on a sectionized basis involves complexly curvilinear lines (coal bed outcrop and 500-foot stripping limit designations) in relationship with linear section boundaries and circular resource category boundaries. Where these relationships occur, generalizations of complex curvilinear lines are discretely utilized, and resources and/or reserves are calculated within an estimated two to three percent plus or minus accuracy.

VI. Coal Development Potential

Strippable Coal Development Potential. Areas where coal beds are 5 feet (1.5 m) or more in thickness and are overlain by 500 feet (152 m) or less of overburden are considered to have potential for surface mining and are assigned a high, moderate, or low development potential based on the mining ratio (cubic yards of overburden per ton of recoverable coal). The formula used to calculate mining ratios is as follows:

$$MR = \frac{t_o (0.922)}{t_c (rf)}$$

where MR = mining ratio
t_o = thickness of overburden
t_c = thickness of coal
rf = recovery factor
0.922 = conversion factor (cu.yds/ton)

A surface mining potential map was prepared utilizing the following mining ratio criteria:

1. Low development potential = 15:1 and greater ratio.
2. Moderate development potential = 10:1 to 15:1 ratio.
3. High development potential = 0 to 10:1 ratio.

The surface mining potential is high for approximately fifteen percent of the federal coal in the Oliver Draw Quadrangle. These high potential areas are due to Moyer coal bed mining ratios of less than 10:1. Moderate development potential areas cover approximately fifteen percent of the area of federal coal occurrence and relate to increasing overburden thicknesses for the Moyer coal bed. Sixty

percent of the federal coal in the quadrangle is classified as low development potential for surface mining. These low potential areas result from mining ratios greater than 15:1 for the Pawnee, Moyer, and Oedekoven coal beds. Fee coal, state of Wyoming coal and, prospecting permits cover approximately half of the Oliver Draw Quadrangle. Table 1 sets forth the estimated strippable reserve base tonnages per coal bed for the quadrangle.

Underground Mining Coal Development Potential. Subsurface coal mining potential throughout the Oliver Draw Quadrangle is considered low. Table 2 sets forth the estimated coal resources in tons per coal bed.

In-Situ Gasification Coal Development Potential. The evaluation of subsurface coal deposits for "in-situ" gasification potential relates to the occurrence of coal beds more than 5 feet (1.5 m) thick buried from 500 to 3000 feet (152 to 914 m) beneath the surface. This categorization is as follows:

1. Low development potential relates to: 1) a total coal section less than 100 feet (30 m) thick that lies 500 feet (152 m) to 3000 feet (914 m) beneath the surface or 2) coal beds that are 5 feet (1.5 m) or more in thickness and lie 500 feet (152 m) to 1000 feet (305 m) beneath the surface.
2. Moderate development potential is assigned to a total coal section from 100 to 200 feet (30 to 61 m) thick, and from 1000 to 3000 feet (305 to 914 m) beneath the surface.

3. High development potential involves 200 feet (61 m) or more of total coal thickness buried from 1000 to 3000 feet (305 to 914 m).

The coal development potential for in-situ gasification on the Oliver Draw Quadrangle is low, hence no CDP map is generated for this map series. The resource tonnage for in-situ gasification with low development potential totals approximately 88 million tons (80 million metric tons) (Table 3). None of the coal beds in the Oliver Draw Quadrangle qualify for a moderate or high development potential rating.

Table 1.--Strippable Coal Reserve Base Data (in short tons) for Federal Coal Lands in the Oliver Draw Quadrangle, Campbell County, Wyoming.

Development potentials are based on mining ratios (cubic yards of overburden/ton of recoverable coal).

Coal Bed	High Development Potential (0-10:1 Mining Ratio)	Moderate Development Potential (10:1-15:1 Mining Ratio)	Low Development Potential (>15:1 Mining Ratio)	Total
Pawnee	6,100,000	370,000	37,500,000	43,970,000
Moyer	64,200,000	36,800,000	80,700,000	181,700,000
Oedekoven	--	--	98,340,000	98,340,000
TOTAL	70,300,000	37,170,000	216,540,000	324,010,000

Table 2.--Coal Resource Base Data (in short tons) for Underground Mining Methods for Federal Coal Lands in the Oliver Draw Quadrangle, Campbell County, Wyoming.

Coal Bed Name	High Development Potential	Moderate Development Potential	Low Development Potential	Total
Pawnee	-	-	-	-
Moyer	-	-	24,540,000	24,540,000
Oedekoven	-	-	63,900,000	63,900,000
TOTAL	-	-	88,440,000	88,440,000

Table 3.--Coal Resource Base Data (in short tons) for In-Situ Gasification for Federal Coal Lands in the Oliver Draw Quadrangle, Campbell County, Wyoming.

Coal Bed Name	High Development Potential	Moderate Development Potential	Low Development Potential	Total
Pawnee	-	-	-	-
Moyer	-	-	24,540,000	24,540,000
Cedekoven	-	-	63,900,000	63,900,000
TOTAL	-	-	88,440,000	88,440,000

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