

REPORT ON A TRACT OF LAND IN THE HUDSON COAL FIELD,
FREMONT COUNTY, WYOMING.

BY

G. B. Morgan, Geologist,
March, 1921.

LOCATION OF FIELD.

The Hudson, or Popo Agie, coal field is located in T. 34 N., R. 98 W., and T. 33 N., R. 98 W., Sixth Principal Meridian, near the town of Hudson on the Chicago and Northwestern Railway. The land which is the subject of this report is described as follows:

T. 34 N., R. 98 W., Section 22, $E\frac{1}{2}SW\frac{1}{4}$, $S\frac{1}{2}SE\frac{1}{4}$, $NE\frac{1}{4}SE\frac{1}{4}$,
200 acres.
Section 23, $SW\frac{1}{4}SW\frac{1}{4}$ - 40 acres.
Section 26, $W\frac{1}{2}NE\frac{1}{4}$, $NW\frac{1}{4}$, $SW\frac{1}{4}$, $W\frac{1}{2}SE\frac{1}{4}$ - 480 acres.
Section 27, $NE\frac{1}{4}$, $SE\frac{1}{4}$, $E\frac{1}{2}NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$, -
520 acres.
Section 28, $S\frac{1}{2}SE\frac{1}{4}$, $SE\frac{1}{4}SW\frac{1}{4}$ - 120 acres.
Section 33, $NE\frac{1}{4}$ - 160 acres.
Section 34, $N\frac{1}{2}$, $N\frac{1}{4}SE\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$, - 440 acres
Section 35, $W\frac{1}{2}NE\frac{1}{4}$, $SE\frac{1}{4}NE\frac{1}{4}$, $NW\frac{1}{4}$, $N\frac{1}{2}SW\frac{1}{4}$,
 $N\frac{1}{2}SE\frac{1}{4}$ - 440 acres.
Total, 2400 acres.

DEVELOPMENT AND SURFACE FEATURES.

The Hudson coal field lies along the east side of the Little Popo Agie River which it parallels for several miles. Reference is made at this time to the sketch map accompanying this report for location, surface and underground development.

The main part of the field lies south and southeast of the town of Hudson, a small mining town on the C. & N. W. R. R.

The field also extends north of Hudson for several miles, but development in this portion has been abandoned, as the coal therein does not compare favorably in quality and quantity with the coal in the southern part of the field. The lands in question, which will be hereafter designated as "the tract", lie in the latter area. These lands are mostly in the government coal withdrawal which are classified as coal lands by the U. S. Geological Survey. The Big Popo Agie River, which is joined by the Little Popo Agie near Hudson, may be called the dividing line between the northern and southern portions of the field. The C. & N. W. R. R. has a double spur leaving the main line near Hudson, which crosses the southwestern portion of this tract. This spur is in the form of a "Y", one branch going to Mine No. 1 and the other to Mine No. 2 of the Puposia Coal Company. Both branches cross the tract and existing conditions are therefore very favorable to coal mine development.

The underground workings of Mine No. 1 of the Puposia Coal Company are located in Sections 3 and 4, T. 33 N., R. 98 W., and Sections 33 and 34 T. 34 N., R. 98 W. The slopes and levels are thus being extended toward the tract. No. 2 Mine is located in the SE $\frac{1}{4}$ of Section 10, T. 33 N., R. 98 W., about $1\frac{1}{2}$ miles southeast of No. 1. Both mines are being worked and a large amount of coal has been taken out of them. It is a well known fact that the Puposia Company operates the only commercial mine on the C. & N. W. R. R. in Wyoming and Nebraska.

The natural conditions for coal mine operations in this district are unusually good. This is more or less demonstrated by the fact that the Puposia Coal Company has been able to operate on a large scale, meet competition on other railroad lines and make a success of this undertaking despite the fact that its mining methods are to a large extent antiquated

and inefficient. I do not propose to go into this phase other than to state that I believe the overhead charges could be cut from 25 to 30% by electrifying the mines throughout, by putting in mining machines, and by replacing the boiler system with up-to-date equipment designed to burn slack and fine coal which are now a waste products.

No difficulties would be encountered on the surface of the tract in sinking a shaft close to the railroad and constructing the necessary switches, tipples, power house and other buildings which go to make up a coal plant. The topography is also favorable to the location of a modern mining camp.

TOPOGRAPHY AND GEOLOGY.

Generally speaking, this tract lies in a shallow valley with low ridges on each side. The valley runs practically north and south and is traversed its entire length by the mine railroad. The western ridge terminates abruptly in a rather high escarpment facing the Little Popo Agie River. The Mesaverde formation of Upper Cretaceous Age is the principal formation exposed in this escarpment and is the one which contains the coal measures. Flat-lying Tertiary beds of sandstone and shale of the Wind River formation lie unconformably on the Mesaverde in places. This formation thickens appreciably to the east over the downward dipping Mesaverde. The coal measures dip to the northeast on an angle of N. 60° E. The strike is N. 30° W. The average dip of the formations is 10° from the horizontal. This entire tract is underlain by this formation and the coal beds contained therein. The coal outcrop can be traced from a point a short distance south of Hudson, where it dips below the surface of the valley, to No. 2 Mine, a distance of about 3 miles. The outcrop shows 2 beds of coal, the upper being about $4\frac{1}{2}$ feet thick and the lower about 6 feet thick, separated by about 50 feet

of shale and sandstone. However, these beds appear to come together and to thicken down the dip to the east and northeast. This is evidenced by the fact that in No. 1 Mine the face of the coal is from 12 to 20 feet thick and almost as thick in No. 2 Mine. In one of the north levels in No. 1 Mine a number of places were examined where the coal showed thicknesses, ranging from 17 to 19 feet. The north levels are run at an angle of about N. 35° W., and some of them probably approach very close to the property line, which is the southern boundary of this tract. The coal is very clean in the northern portion of the mine and has no rock partings but has a good sandstone roof. The coal is sub-bituminous and has a heat value of about 12,000 b. t. u. The main slope of the mine has been driven down the dip on the coal and is in about 5,000 feet. At least one of the north levels has been driven about the same distance and the others are in from a few hundred to about 2400 feet long.

The coal beds of the Mesaverde formation occur in the form of extensive lenses. From the indications on the surface and in the mine, it is my opinion that the thickest and best part of this great lens is under the valley that crosses this tract and extends up into Sections 3 and 10. Therefore, there is every reason to believe that the best coal land in this tract will be found in Sections 33 and 34 and that the coal underlying the same will be found to be as good and as thick as in Mine No. 1. However, this cannot be stated with absolute certainty, as formations sometimes change underground without surface evidence. The coal measures on the other hand are very extensive and persistent. The same formation, containing workable coal at approximately the same horizon, is exposed at Alkali Butte 16 or 18 miles east of this field where it again comes to the surface on the eastern limits of the syncline. The coal

beds themselves are subject to local variation, which is noticeable within the limits of one mine, as for instance in No. 1 Mine there are several places where the coal bed is separated into two benches by a shale parting and there is also considerable variation in thickness. It is well, therefore, to prospect this tract by drilling (preferably with a diamond drill) before beginning development.

The coal which can be recovered from a seam of this kind amounts to about 1000 tons per acre-foot. I think it may be assumed for a preliminary estimate that the bed will average 15 feet thick under a considerable portion of this tract. Therefore, the recoverable coal will approximate about 15,000 tons per acre, or 9,600,000 tons to the section of land.

In my opinion this tract will have to be opened and operated by means of a shaft which should be located somewhere near the center of a fairly large block of coal. A location which suggests itself by being on the railroad and near the center of such a block is in section 34 about one-quarter mile north of the center. Another good location, also on the railroad, would be a point near the center of the $E\frac{1}{2}$ of $NE\frac{1}{4}$ of Section 33, (See map for definite location). At the first location the coal will be found at a depth of approximately 1100 feet below the surface and in the second location at about 650 feet depth. The cost of sinking a shaft would be, no doubt, somewhat greater than that of driving a slope on a 10° angle. On the other hand, I think it has been demonstrated in the east and middle west that mining through a shaft is more efficient and less costly. Therefore, I believe in the long run the excess in first cost would be more than offset. Again, there is almost as much dead work in driving a slope as in sinking a shaft 500 or 600 feet deep. In the first place, the slope starts in over the coal and goes down several hundred feet before it penetrates the coal bed. Then it is necessary to drive several hundred feet

farther from the outcrop to get into merchantable coal and to begin driving side entries or levels. Consequently, even if this tract did contain locations for slope mining, I would be constrained to advise a shaft on general grounds of efficiency, upkeep, and mining costs.

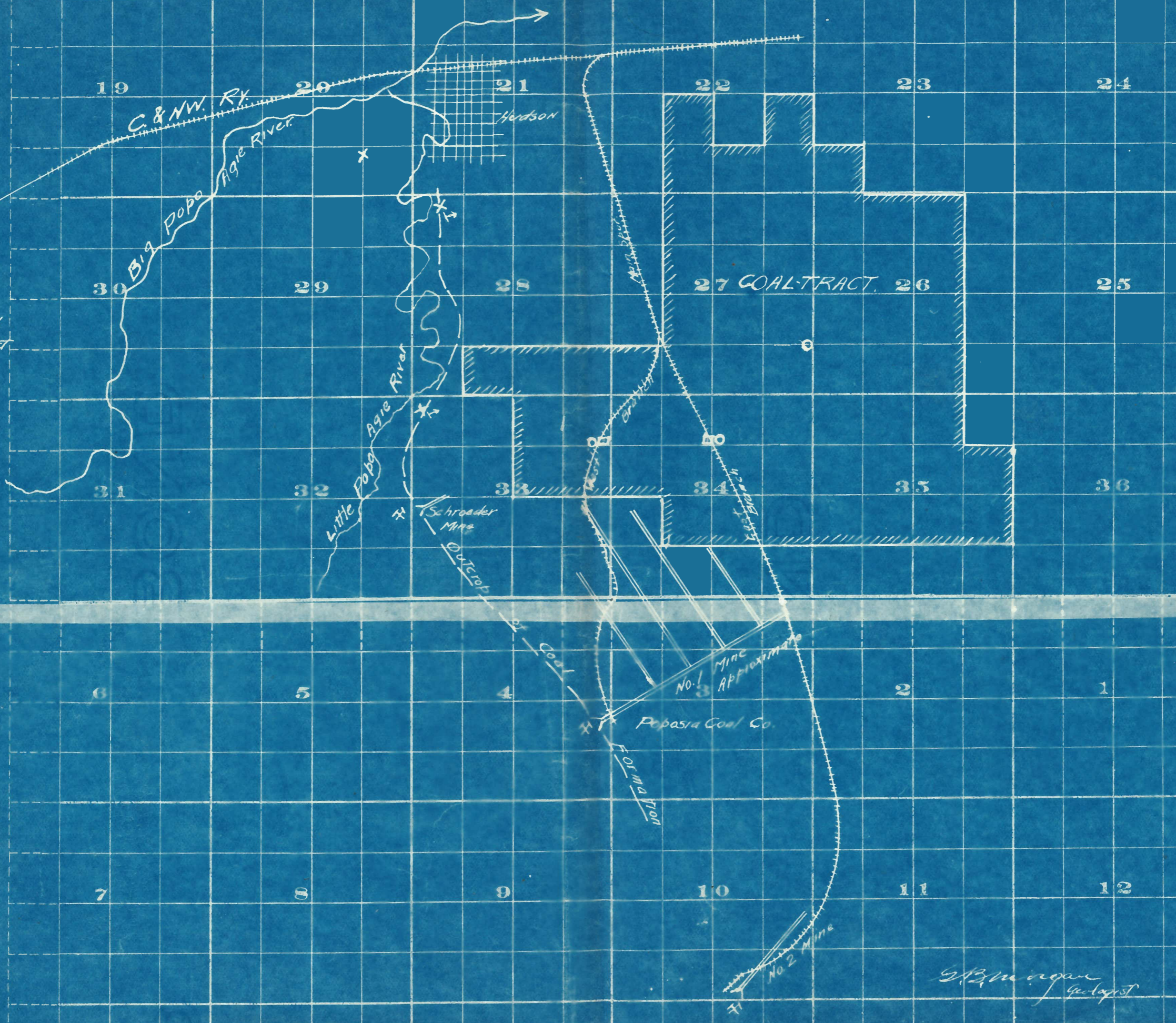
RECOMMENDATIONS.

It is believed that the tract examined contains great merit as a coal mining proposition and it certainly deserves future investigation and prospecting by means of a drill. I do not recommend that development be commended without such prospecting. I would suggest that at least three holes be put down to the coal, two of them being at the locations of the proposed shafts and the third about one-quarter of a mile north of the southeast corner of Section 27. I would suggest that a survey be made of the property, showing land lines, surface elevations and structural contours based on the principal coal bed as a key rock. With a map made from such a survey at hand, it might be advisable to modify my recommendations to some extent, but that would make no material difference in the general proposition embodied in this report.

MAP OF HUDSON COAL FIELD

T. 34 N. R. 98 W.

- Legend
- x Prospect
 - * Mine
 - o Drilling site
 - Shaft site



T. 33 N. R. 98 W.

S.B. Morgan Geologist

State Geologist