THE GLENROCK OIL FIELD,

CONVERSE COUNTY, WYOMING.

The rocks exposed in the region south of Glenrock embrace strata of all ages from the Cambrian to the Tertiary, but only the later Carboniferous and succeeding formations may be considered in this report. The various formations, beginning with the youngest, are briefly described below:

QUATERNARY.

Wind blown sands, terrace gravel and soil;

TERTIARY.

White River Formation:

Gray, white, buff and maroon clay. Sandy and somewhat calcareous;

Fort Union Formation:

Gray, buff and red shales and sandstone. Contains some coal;

CRETACEOUS.

Fox Hills Formation:

Gray and born, concretionery, sandstones. Contains some coal;

Vierre Formation:

Dark carbonaceous shales with several sandstone beds, one of which is probably equivalent to the Shannon sandstone of the Salt Creek fields. This formation may yield oil in the dome which extends north and west from Glenrock. The upper portion of the formation exhibits a characteristic Pierre founa, Inoceramus cripsii and Scaphites Ventricosus having been identified.

Niobrara Formation:

Gray and yellow calcareous sandstones. The formation is

rich in fossils, the principal forms being Inoceramus sagensis and Ostrea congesta;

Benton Formation:

Cark carbpnaceous shales with several sandstone beds. In the upper portion is a persistent ridge-making sandstone, the probable equivalent of the Wall Creek sand of the Salt Creek Field. Near the base are several hundred feet of thin shales which weather to a light gray color and contain numerous fish scales -- the Mowry Beds. The formation exhibits a characteristic Benton founa.

Dakota Sandstone:

Gray and brown ferruginous sandstones which, in the Brenning Basin, some twelve miles east of the Glenroch field, contain oil.

JURASSIC.

Morrison Formation:

Variagated shales and soft sandstones containing saurian remains.

Sundance Formation:

Gray shales and sandstones. The formation is richly fossiliferous, Belemnites bensus and Camptonecges Bellistriatus being the principal forms.

TRIASSIC:

Chugwater Formation:

Red shales and sandstones with several thin limestone beds and, near the top, a thick bed of gypsum.

CARBONIFEROUS:

Embar Formation:

Gray limestones with sandstone beds near the top and bottom. Will probably yield oil near Box Elder Canon.

GEOLOGIC HISTORY:

From late Carbpniferous (Embar) to the close of the Cretaceous age, the strata were liad down in apparent conformity. At the close of the Fort Union epoch the Laramie Mountains, including the Haystack and Deer Creek ranges, were uplifted, and the strata were tilted and profoundly faulted in an east-west direction. This faulting has materially affected the oil-bearing horizons and narrowly limits the field.(See map). In the little Tertiary times the White River formation was deposited upon the upturned edges of the older strata, a slight tilting to the South took place and the carving of the present topography began.

OIL:

The formations which are of interest from an economic viewpoint are the Embar, the Dakota, the Wall Creek member of the Benton, and the Shannon member of the Pierre. The Dakota, Wall Creek, and Shannon sandstones are steeply upturned by the fault above mentioned and but little return can be expected from wells drilled to tap them. These sandstones, although productive in other fields, exhibit no surface indications of oil along their outcrops in the Glenrock district.

In Section 6, Township 32 north, Range 74 west, near t the mouth of Box Elder Canon, and Section 6, Township 31 north, Range 77 west, west of Deer Creek Canon, a dark heavy oil of asphaltum base may be seen exuding from the sandstones of the Ekbar formation. Near Deer Creek Canon the strata have been cut off by faulting and the probability of obtaining oil is reduced to a minimum. Near Box Elder Canon, however, the fault plane lies some two miles north of the outcrop of the Embar bed, and the prospects appear much more favorable. In this r egion (See shaded area on the large map) the

surface indications and the geologic structure are favorable to the finding of oil, and productive wells should be obtained at depths ranging from six hundred to twenty-five hundred feet.

CHARACTER OF OIL:

In its chemical and physical characteristics the oil obtained in the Glenrock field will be similar to that produced in the Dallas field south of Lander. It will be of asphaltum base, ranging in specific gravity from 20° Be to 30° Be, and chiefly valuable in its raw state for fuel.

YIELD OF WELLS:

On account of lack of hydrostatic pressure flowing wells cannot be expected in the Glenrock field, nor can the wells be expected to yield, when pumped, more than one hundred barrels per day, each. The latter assumption is based on the viscidity of the oil, which will flow but slowly through the porous strata. While no aggregate measurements of the oil-bearing sandstones have been made, it does not seem probable that the ultimate yield per acre will exceed fifteen thousand barrels.

RECOMMENDATIONS:

At the present time, August 1st, 1912, a well is being drilled in the Southeast quarter of Section 31, Township 33 north, Range 74 west. Small amounts of oil have been obtained in this well at three horizons, the deepest not exceeding215 feet. These small strikes should not be overrated in their importance as indicating the probability of obtaining oil in commercial quantity, as they indicate, rather, the presence of numerous cross-faults, radiating from the major fault of the region, which may have, to a greater or lesser extent, drained the oil-bearing sand.

In view of the foregoing that the lands owned by J. E.

Higgins, J. M. Carey, and Alice C. Clayton (See small map) be leased on a royalty basis, but that drilling be postponed until the well now being drilled on Section 31, reaches the Embar formation and the productiveness of the sandstone determined.

Should drilling be started at once the J. E. Higgins land in the Southwest quarter of Section 32, Township 33 north, Range 74 west, offers an opportunity to test the sand at comparatively shallow depth. A well on this land (See small map) should reach the oil sand at from eight hundred to nine hundred feet depth.

Respectfully submitted,

C. D. Jamison

State Geologist.

Casper, Wyoming,
August 3rd, 1912.