

REPORT ON

NEWCASTLE, OSAGE, UPTON and THORNTON OIL FIELD

I covered the Newcastle, Osage, Upton and Thornton Oil Field from March 29th to April 3rd, 1920, and found the same running parallel with the Burlington Railroad at the foot of the Black Hills in Weston and Crook Counties, Wyoming.

Climate and Altitude.

The climate is mild for Wyoming, as this field has an altitude of only from 4100 ft. to 4500 ft. This is an exceptional low altitude for Wyoming and has mild winters compared with the rest of the State, where altitude ranges from 6000 to 8000 ft. in other oil fields. The climatic condition is favorable for operations the year round except when general blizzards take place.

Formation

This field has the Benton formation exposed along both sides of the Burlington Railroad, and as you leave this line going Southwest you come in contact with the Niobrara, Pierre or Steel Shale, Fox Hills sand stones about 15 miles back the Tertiary.

The Benton formation is underlaid with the Cloverly, Morrison, Sundance, Chugwater or Redbeds, Forrelle lime stone Santanka and Casper; the Igneous rocks forming the base of the sedimentary rocks.

I have never been in a district where there were as many fossils exposed to the surface, as these sedimentary rocks are literally alive with the remains of prehistoric animal life, which, together with enormous deposits of vegetable matter, is very favorable for making oil deposits.

Structure

The structure is different than any other oil field in Wyoming, as it is a monocline very similar to the monocline from North to South across the States of Oklahoma and Kansas, and forming the vast oil structure of those two States.

Starting at the foot of the Black Hills we have the Benton formation exposed from 2 to 12 miles, and dipping Southwest at an average of 4 degrees. Paralleling very closely the line of contact and along the strike of Benton and Niobrara formations is a decided break or fault in the Earth's crust with a slip of around 300 ft. This break does not show on the surface as a break, but as a fold. If it were a true fold, the dip of strata would conform, but in this case it does not; the dip varies 100% within short distance of 200 ft. on the exposure.

I have seen a very similar break at the mouth of Centennial Valley Wyoming, where the break shows on the surface as a fold, but where the little Laramie river was eroded deeply into the formation, it plainly exposes the nature of the break as a true fault fissure vein 30 ft. wide, and acts as a barrier for oil, gas or water escaping to either side. At this break the formation dips very steeply from 10 to 55 degrees. The dip varies a great deal. Two miles west of Newcastle, I recorded a dip of 55 degrees, South of Osage 10 degrees, South of Upton 10 degrees, West of Thornton 25 degrees.

Another indication that it is a true break is that below the break the formation starts out with the same dip as above, an average of 4 degrees. This dip continues Southwest 15 miles, at which point the dip increases to 10 degrees and goes off on the big syncline extending 120 miles where the formation comes up again on the anticline of the Salt Creek oil fields.

A Vast Oil Reservoir

With the break in the Earth crust, which acts as a barrier, and extending from East of the Mule Creek Field in Niobrara County across Weston County, and passing one mile Northwest of Thornton into Crook County, and with the formation dipping Southwest for many miles, which acts as a vast drainage basin, there is no doubt in my mind but that there is a vast oil and gas reservoir extending the entire length of this break, and back on the dip to the Southwest for at least 4 miles.

The natural gathering place for light gasoline oils would be at the highest point on the structure. At Mule Creek the altitude is 3900 ft., Clifton 4100, Newcastle 4250, Osage 4312, Upton 4200, Thornton 4320 and formation and altitude continue to dip as you go North.

Heavy oil is encountered at Mule Creek, and high grade gasoline oil between Osage and Thornton. The wells already developed in this field prove the theory to be a fact that light oils gather at highest point of the structure.

Development

At Mule Creek the Ohio Oil Company have several wells opened up below the break with heavy production. Three miles Southwest of Osage on Sec. 19-46-63 is the Adams well, which only drilled to the top of sands with a production of light gasoline oil estimated at 500 bbls. per day.

Above Thornton extending along a line for 6 miles, every well put down to the 1st sands came in a commercial well. These wells are below the break. Efforts made to get oil above the break at this point were unsuccessful.

At Osage it is estimated that there are 53 wells completed above the break to the 1st sands with production of from 5 to 35 bbls. per day.

Wells drilled below the 1st sand above the break around Osage brought in flowing water wells, but drillers in that locality claim that the Dakota sand has never been penetrated with the bit. Future development will soon determine whether the Dakota sand carries oil above the break or not, as there are several test wells now going down.

The field is so new that there is doubt whether the Muddy or Dakota sand carries the heavy volume of oil or not, but it is positively determined that the Dakota sand always when opened up brings in a flowing water well.

The Adams well 1/4 mile below the break encountered the heavy oil sand at 1365 ft. and with a four degree dip to the Southwest, this sand will be 336 ft. deeper for each mile going Southwest with development, and in locating wells this fact must determine the size of the rig to be used, as depth means handling heavy casing.

Conclusion

With the break acting as a barrier for oil and gas, and the vast drainage basin to the Southwest and West with the numerous standard and independent companies obtaining holdings with capital and equipment at their command, I can see no reason but that this field will become one of the largest oil producing fields of Wyoming, if not the U. S.

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