

RECONNAISSANCE REPORT

ON THE
HIDDEN DOME,
PUEBLO COUNTY, COLORADO

Report by

H. W. C. PROMMEL

August, 1922

(Under direction of Fisher & Lowrie)

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COLORADO SCHOOL OF MINES
GOLDEN, COLORADO

Report furnished by H. W. C. Prommel

FISHER & LOWRIE
GEOLOGISTS AND PETROLEUM ENGINEERS
711 FIRST NATIONAL BANK BUILDING
DENVER, COLORADO

August 5, 1922

Mr. H. N. Isenberg,
510 A. C. Foster Bldg.,
Denver, Colorado.

Dear Sir:

In compliance with your verbal request to Mr. H. W. Lowrie, Jr. I proceeded to Pueblo July 30 to make a reconnaissance investigation of the Hidden Dome situated in Townships 18 and 19 South, Range 65 West, Pueblo County, Colorado. The main object of this hasty reconnaissance investigation was to determine whether the Hidden Dome, which appears to be situated along the same line of folding as the Pueblo Anticline, shows closure at its south end. I was accompanied by Mr. H. W. Steffen who had discovered the Hidden Dome.

The formations which appear at the surface over this area belong to the basal part of the Pierre Shale and apparently the upper part of the underlying Appishapa Shales of the Niobrara Formation. Gilbert, in his Pueblo folio, maps the entire area as overlain by Pierre Shales. The possibility of the apex of this structure having been eroded into the top of the Appishapa Shales is based on the presence of numerous imprints of fish bones and the presence of fish scales and occasional ostrea in these shales. The lowest horizon of the Pierre is noted for its absence of fossils of any kind. As only a few days were spent in the field, this division of formations is not based on detailed measurements of the section but rather on paleontologic evidence.

The positive evidence of the Hidden Dome being closed to the south was found about one-half mile east of an elevation known as Gunboat Hill. Gunboat Hill is situated approximately at the center of the north line of Section 13, Township 19 South, Range 65 West. Starting at a point about three-fourths of a mile to the northwest of Gunboat Hill a sandy layer underlain by a concretionary horizon was followed to the southeast. Strike and dip measurements on this sandy layer showed this layer to swing around from a northwesterly strike to a due west strike and south dip and finally to a northeast strike and southeast dip. Exposures showing reverse dips to the southwest from the normal eastward dips are not over four hundred feet apart at this point. A short distance to the north of these exposures the concretionary layer can be followed across the axis of the structure. To the west the black fissile shales of the lower Pierre can be followed in a southeasterly direction to a point where the Denver & Rio Grande Railroad crosses the Pueblo-to-Colorado-Springs Highway. At this point the strike of the formation changes from northwest to west and northeast again showing closure of the Hidden Dome in the higher-lying formation than the sandy member above described. Similarly, the "rusty" horizon of the Pierre Shale is followed in a southwesterly direction still further south where it crosses the highway and swings around to the west towards Fountain Creek. The change in strike and dip in these three horizons establishes without doubt that the Hidden Dome is closed on the south end and that the axis of the structure plunges gently to the southwest over a distance of at least two and a half to three miles. The amount of reversal

to the south is probably well above 150 ft. Westerly dips can be obtained on the west flank or reverse side of the structure over a distance of six miles, showing that the Hidden Dome is a well developed arch in the Cretaceous formations, with steeper dips on the west side and gentler dips on the eastward or basinward side. The dips on the west flank of the Hidden Dome range from $4\frac{1}{2}$ to 15 degrees to the west, while on the east side they range from 3 to 7 degrees to the east.

As only three section corners could be definitely located in the field, the location of strike and dip measurements taken in the field should be considered approximate only; however, their location was also determined by following Steele Hollow and its tributaries. The courses of these streams were copied from the county map and are approximately correct; however, a detailed survey would no doubt show minor changes in the courses of these streams.

The general trend of the axis of the Hidden Dome appears to be a little west of north approximately thru the $W\frac{1}{2}$ of Section 13, $SE\frac{1}{4}$ and $E\frac{1}{2}$ of the $NW\frac{1}{4}$ of Section 11, thence northward thru the $E\frac{1}{2}$ of the $W\frac{1}{2}$ of Section 2, Township 19 South, Range 65 East. From here it extends roughly thru the $W\frac{1}{2}$ of the $W\frac{1}{2}$ of Sections 35 and 26, Township 18 South, Range 65 West. However, it is quite probably that several minor flexures in the axis exist.

The drilling depth to the Dakota Sandstone, which is considered as the main prospective horizon for production of oil and gas in commercial quantities, is approximately 1200 to 1400 ft.

Other anticlines known to be present in this general region are the Pueblo Arch at the city of Pueblo, the San Carlos, Rock Canyon and Wild Horse Anticlines to the southwest, west and northwest of Pueblo respectively. Of these the Pueblo Arch can be detected in the eastern part of the city of Pueblo; however, as both the north and south ends of this arch are covered by alluvium, the closure at Pueblo cannot be definitely determined. Wells sunk about one-fourth of a mile on the reverse or west side of this structure have found water in the Dakota Sandstone. The San Carlos, Rock Canyon and Wild Horse Anticlines appear to be located along the same anticlinal axis and they form a series of en echelon folds to the west of the Pueblo Arch, of which the Hidden Dome is the northern continuation. It will therefore be seen that the Hidden Dome is a basinward structure and lies in front of the gathering area of the Wild Horse Anticline. Erosion on the San Carlos Anticline has progressed to the Dakota Sandstone. On the Rock Canyon Anticline the Dakota is also exposed at the surface while on the Wild Horse Anticline it was reached at a very shallow depth (70 ft. ?) in a well drilled one-fourth of a mile from the axis of that structure.

From the above description it is readily seen that the finding of water in the wells on the flank of the Pueblo Arch and the absence of oil in the Dakota on the Wild Horse Anticline do not necessarily condemn the possibilities of oil in the Dakota on the Hidden Dome Structure. A good showing of oil has just been reported in the Wigwam Well which is being drilled to the northeast of the Hidden Dome. It is not known whether or not this well is located on a structure. It is therefore recommended that a test well to the Dakota be drilled on the Hidden Dome to test its oil and gas possibilities. Whether or not the Dakota will actually be found to be oil and gas bearing cannot be foretold and the final test of this in all cases is the drilling of a well.

I wish to call your attention to the fact that only a few days were spent in the field and before making the location for a test well it cannot be too emphatically recommended that a detailed plane table survey of the Hidden Dome be made and a structure contour map constructed. Such

a survey would show the accurate location of the axis of this fold and would give as nearly as it can be determined the actual drilling depth to the Dakota Sandstone. The time required for a detailed plane table survey and report would be about three to four weeks. We will be pleased to undertake this work for you within four or five days from date if you so desire.

Very truly yours

FISHER AND LOWRIE,

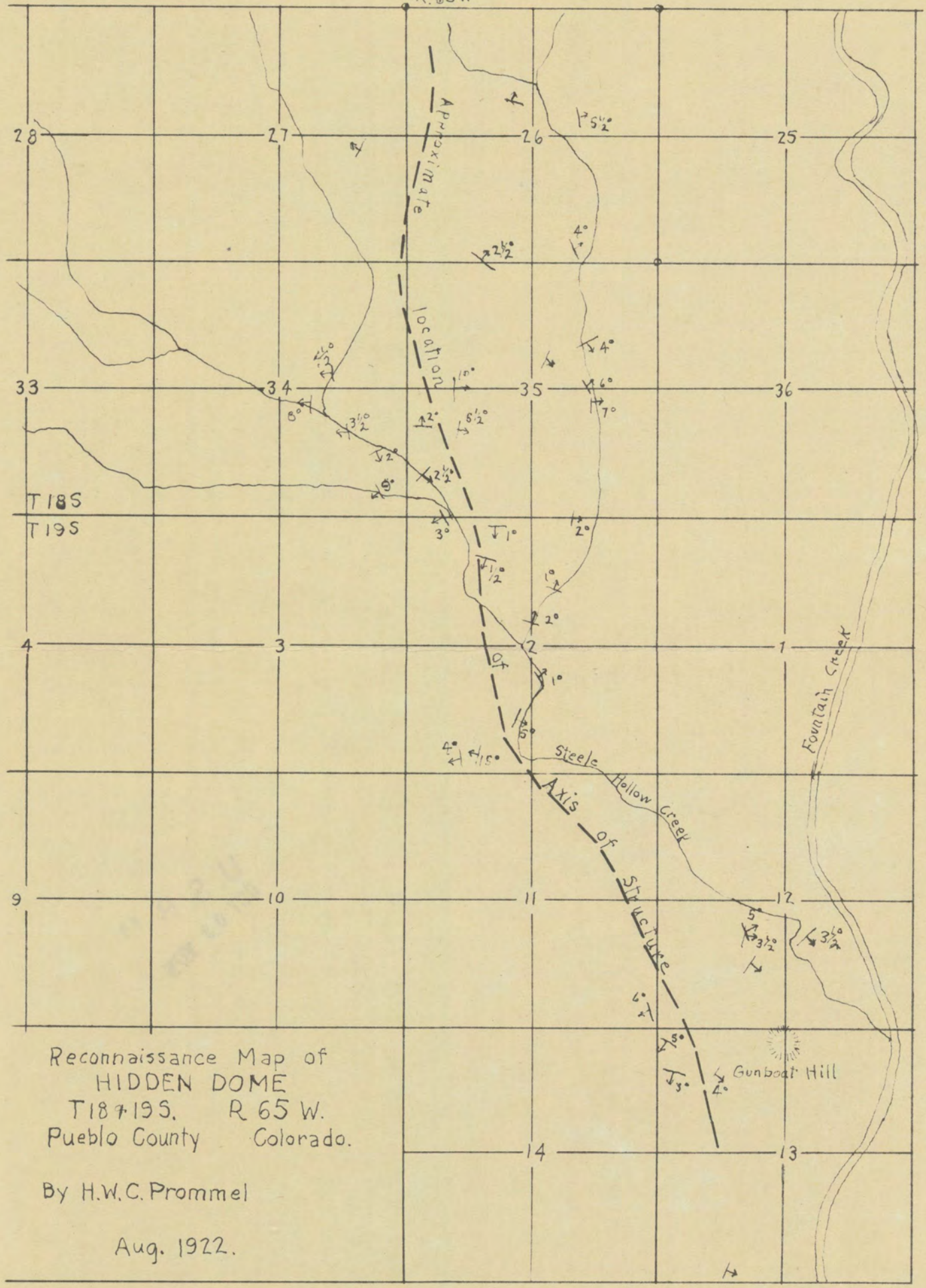
By Harold W. C. Prommel

HWCP:JD

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House

R. 65W



Reconnaissance Map of
 HIDDEN DOME
 T18 & 19S. R 65 W.
 Pueblo County Colorado.

By H.W.C. Prommel

Aug. 1922.