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GEOLOGY OF THE NORTH DRY VALLEY STRUCTURE

Caribou County, Idaho

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Dry Valley anticline was originally mapped by Mansfield (1927) as a long, relatively narrow anticline extending from Section 20, T. 7 S., R. 44 E., Caribou County, Idaho, to unsurveyed Section 15, T. 10 S., R. 44 E., just across the Bear Lake County line in southeastern Idaho.

Detailed field mapping in the northern part of this area has shown good evidence of a south-plunging asymmetrical anticlinal nose extending from Sections 19 and 20, T. 7 S., R. 44 E., to Section 15, T. 8 S., R. 44 E., and closed at the north by the large east-west Blackfoot fault. This northern part of the Dry Valley structure has been named the North Dry Valley anticline to differentiate it from the southern continuation of the same fold. (See Figure 1.)

The west flank of North Dry Valley anticline as well as Schmid syncline to the west are comparatively gentle with dips of from 30° to 50°, but the east flank of the structure is steep to overturned as the overturned isoclinal Georgetown syncline is approached. (See Figure 2.)

As the structure approaches the Blackfoot fault, numerous small folds and minor faults of less than 200 feet displacement occur along its broad crest. These probably do not extend to much depth, but reflect bedding-plane adjustments occurring over thin shale members of the upper Brazer and lower Wells limestones.

The Blackfoot fault provides north closure for the North Dry Valley anticline. Structural closure against this fault at a depth of 2,800 feet in the Brazer limestone is in excess of 1,100 feet, with 300 feet of primary closure independent of the fault. While no dips could be obtained on this fault, there is strong indication of a steep south dip of perhaps as much as 70°. Movement on the fault was largely strike-slip with a minor high-angle dip-slip component, the south side moving relatively up and to the east. The strike-slip movement can be obtained by measuring the offset in the Phosphoria formation on the east flank of the structure. This offset amounts to nearly two miles. The dip-slip component of the movement cannot be determined, since the crustal shortening accomplished by the eastward movement of the southern block has accentuated the folding in the northern block. Thus, comparison of the elevations of horizons across the fault zone does not give an accurate figure of the dip-slip movement.

The high ridge to the south of the well-site is defended by the very resistant Rex chert member of the Phosphoria formation. As the chert is followed north-

ward, it gradually transgresses the topographic lines and occurs part way down the east side of the ridge north of the well-site. Immediately below the Rex chert are 75 to 130 feet of non-resistant beds making up the Phosphatic shale member of the Phosphoria. The entire slope directly east of, and almost down to the well-site, consists of sandstones and limestones of the Pennsylvanian-Permian Wells formation, here about 2,100 feet thick. Dry Valley No. 1 spudded in the uppermost Brazer limestone of Mississippian age which outcrops in a rather narrow strip along the base of the ridge.

The low, nobby ridges protruding through the alluvium of Dry Valley proper are composed of the Wells formation. The fairly continuous and rather low ridge along the west side of the valley is again defended by the Rex chert. The east side of the high, forested ridge west of this is composed of the Triassic Woodside shale occurring in the trough of the Schmid syncline. The ridge itself, and its western side is composed of the Phosphoria, Wells, and part of the Brazer formations.

Standard Oil Company of California's Dry Valley Unit No. 1, NE¼ NE¼, Section 32, T. 7 S., R. 44 E., Boise Meridian, was drilled during the summer and fall of 1952. The well spudded in the uppermost Brazer limestone. The primary objective was the Silurian Laketown dolomite. Due to an abnormally thick section of Brazer limestone, the well bottomed at 7,868' in the Mississippian Madison limestone. There were no shows of oil or gas.

The Brazer formation from the surface to 7,524 feet was represented by light- to dark-gray, fine- to coarsely-crystalline, generally argillaceous limestone with interbeds of limy siltstone and thin beds of dark-gray to gray-green shale. Fracture permeability, porosity, and occasional thin zones of slightly vuggy limestone were present, but produced only water when tested, with no evidence of oil.

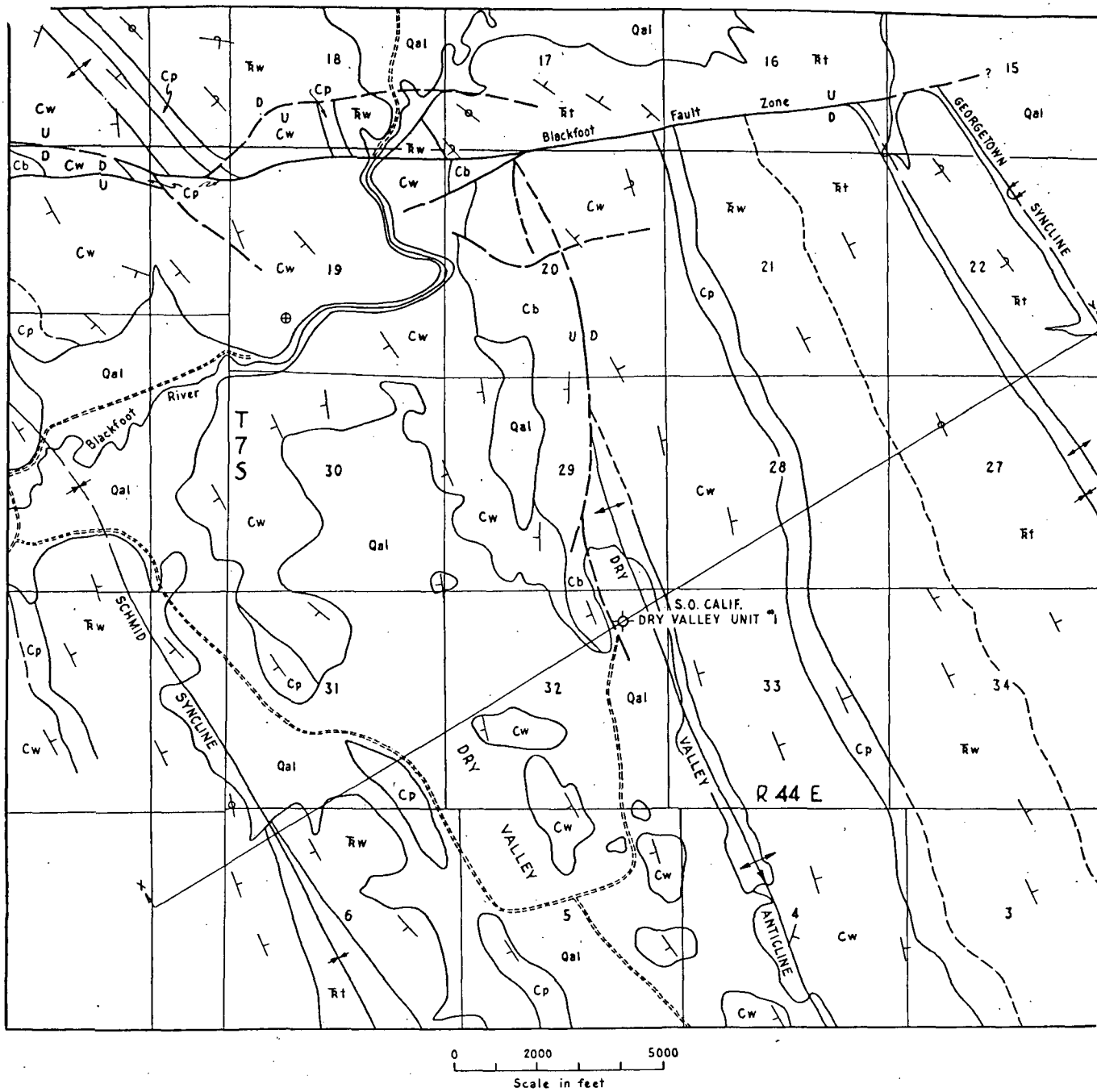
At total depth of 7,868 feet, the well had penetrated 344 feet into the lower Mississippian Madison limestone which consisted of medium- to dark-gray, medium- to coarsely-crystalline and clastic, fossiliferous limestone, becoming locally argillaceous. Some fracture porosity and permeability was present in this formation, but only water was recovered on a formation test.

The well was abandoned on December 7, 1952.

BIBLIOGRAPHY

Mansfield, G. R. (1927), "Geography, Geology, and Mineral Resources of Part of Southeastern Idaho," U. S. Geol. Survey Profess. Paper 152.

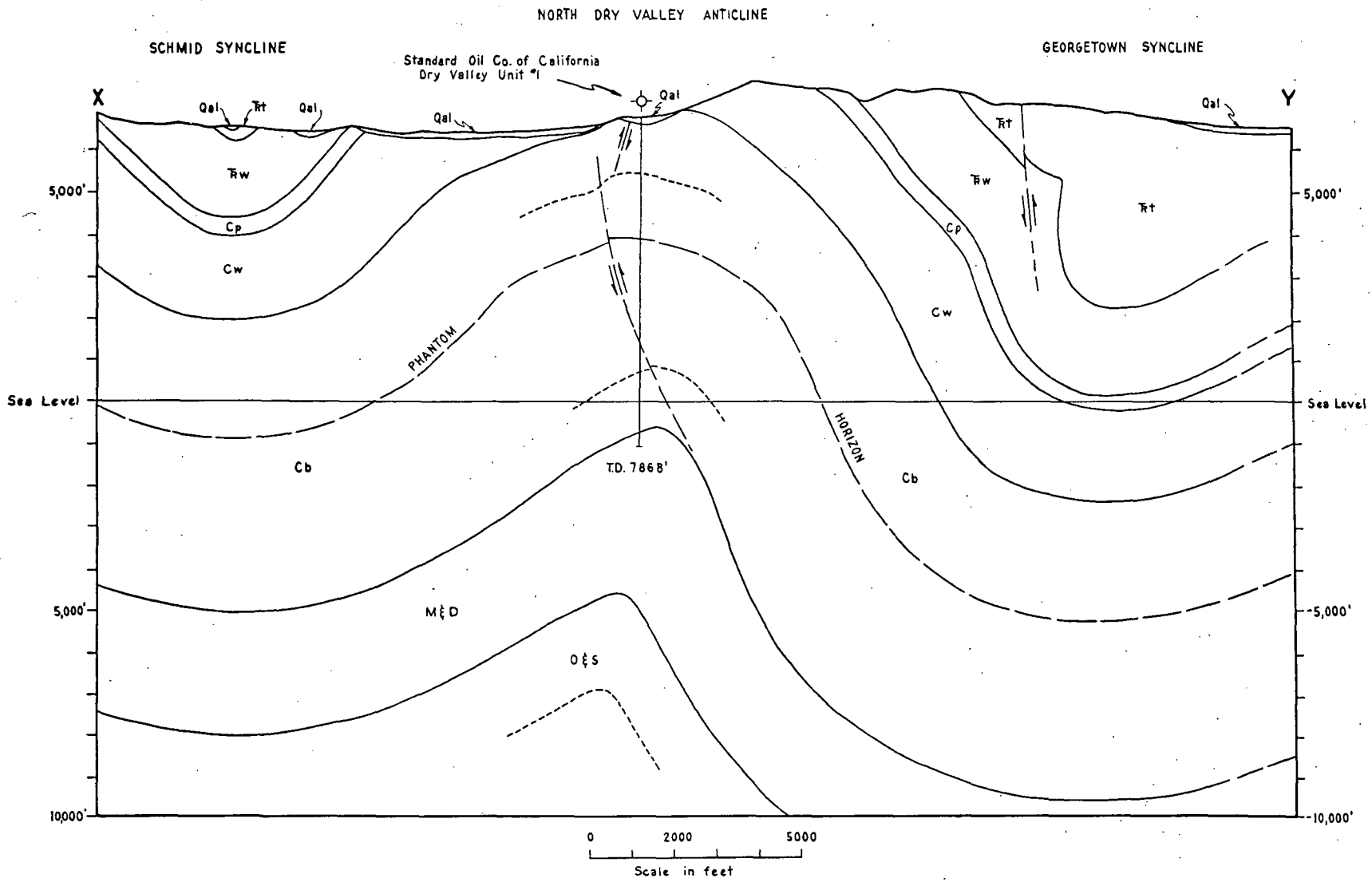
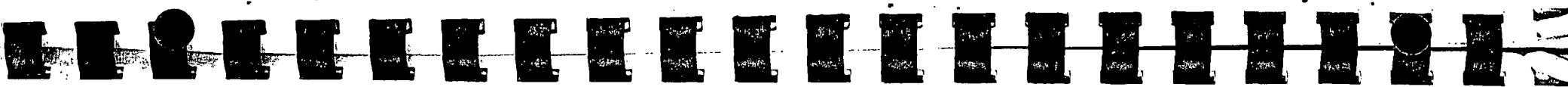
FIGURE 1.



GENERALIZED GEOLOGIC MAP, NORTH DRY VALLEY ANTICLINE AREA
CARIBOU CO, IDAHO

LEGEND

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|-----------------------|---|
| QUATERNARY | Qal - Quaternary alluvium |
| TRIASSIC | Rt - Thaynes fm. |
| | Rw - Woodside sh. |
| PERMIAN | Cp - Phosphoria fm. |
| PENNSYLVANIAN | Cw - Wells fm. |
| MISSISSIPPIAN | Cb - Brazer fm. |
| DEVONIAN | M&D - Mississippian Madison Ls. & undifferentiated Devonian |
| ORDOVICIAN & SILURIAN | O&S - Ordovician & Silurian undifferentiated |



STRUCTURE SECTION X-Y THRU DRY VALLEY UNIT #1, CARIBOU CO. IDAHO
FIGURE 2.

INTERMOUNTAIN ASSOCIATION OF PETROLEUM GEOLOGISTS