GEOGRAPHICAL AND GEOLOGICAL DISCUSSION OF THE AREA OF APPLICATION

GEOLOGIC EXHIBITS

The area of application for designation as a Tight Gas Formation (TGF) in the Morrow is located in southwestern Lea County, New Mexico, approximately 45 miles southwest of the city of Hobbs and 6 miles north of the New Mexico/Texas state line. Figure 1, a regional map whose scale is one inch equals approximately 12 miles, illustrates the geographical location of the area. Superimposed on this map are regionally recognized geological provinces in this portion of southeastern New Mexico identified as the Northwest Shelf, the Delaware Basin and the Central Basin Platform. The area of application is found in the Delaware Basin adjacent to the Pitchfork Ranch (Atoka/Morrow) Field which was discovered by Enron Oil & Gas Company (HNG) in 1982.

The Morrow formation is lower Pennsylvanian in age and lies above the Mississippian shale and below the Pennsylvania Atoka formation. This relationship is illustrated in Figure 2, a compensated density-neutron log with gamma ray from the BTA Oil Producers No. 1 Rojo 7811 JV-P well (Section 27-25S-33E), which is presented as a type log for the Morrow. Figure 2 also illustrates the three correlative units (lower, middle and upper) making up the Morrow formation. The BTA well log was chosen for a type log because it is one of only three wells in the area of application that penetrated the entire Morrow section. The well log is also the number six well on stratigraphic cross-section B-B'. The top and base of the Morrow on the log are at 14,728' and 16,600' respectively, making the Morrow formation 1,872' thick at the BTA well location in Section 27-25S-33E. The measured vertical depth to the top of Morrow increases from the northeast to southwest and east to west across the area of application with the average depth placed at 14,700'.

Although the Superior Oil Company No. 1 Ochoa Federal did not penetrate the total Morrow section its well log is presented as the second type log because it is common to both stratigraphic cross-sections A-A' (well log number 3) and B-B' (well log number 4) as it is located near the center of the area of application in Section 15-25S-33E. Figure 3, a compensated density-neutron log with gamma ray from Superior's well

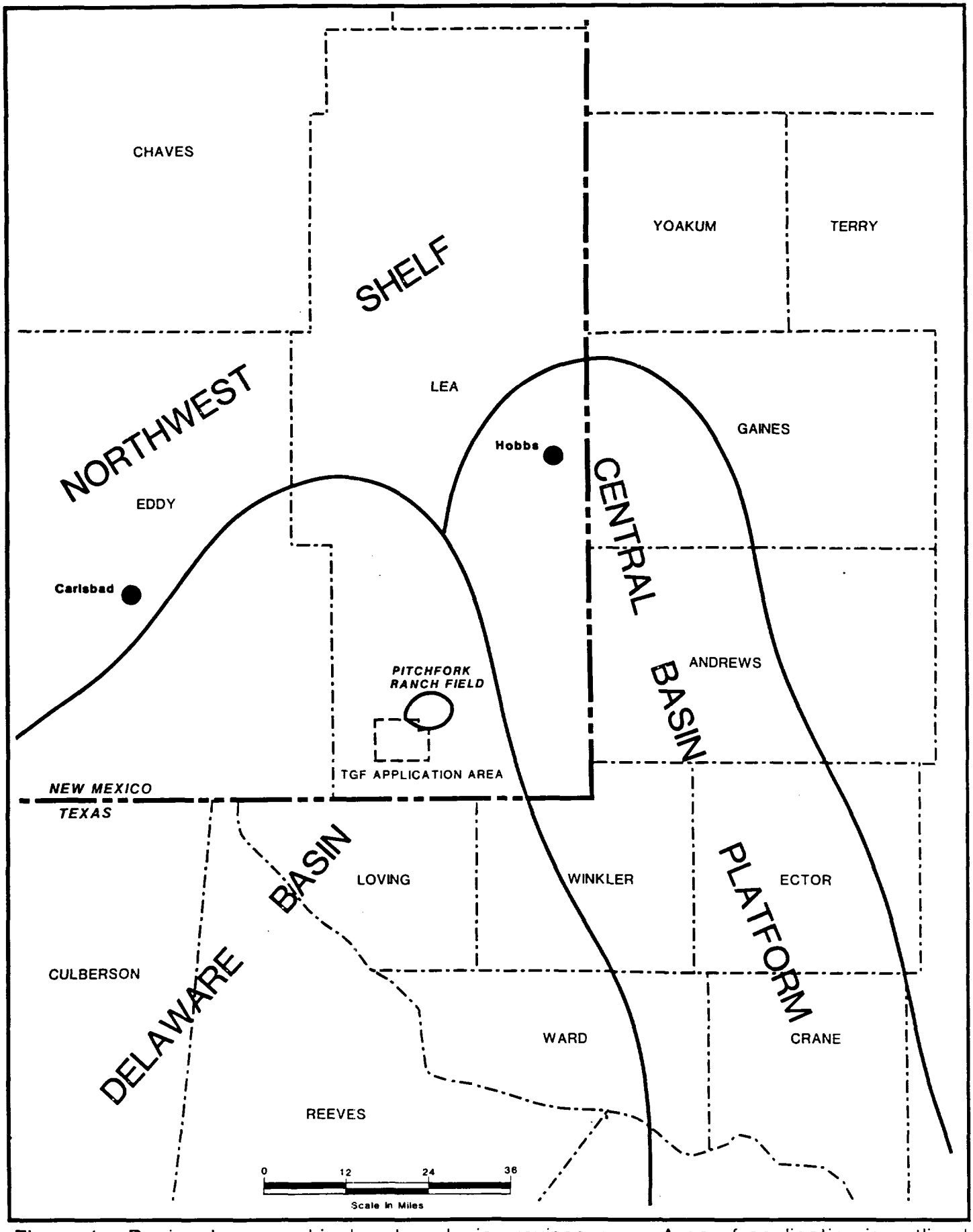

Figure 1 – Regional geographical and geologic province map. Area of application is outlined.

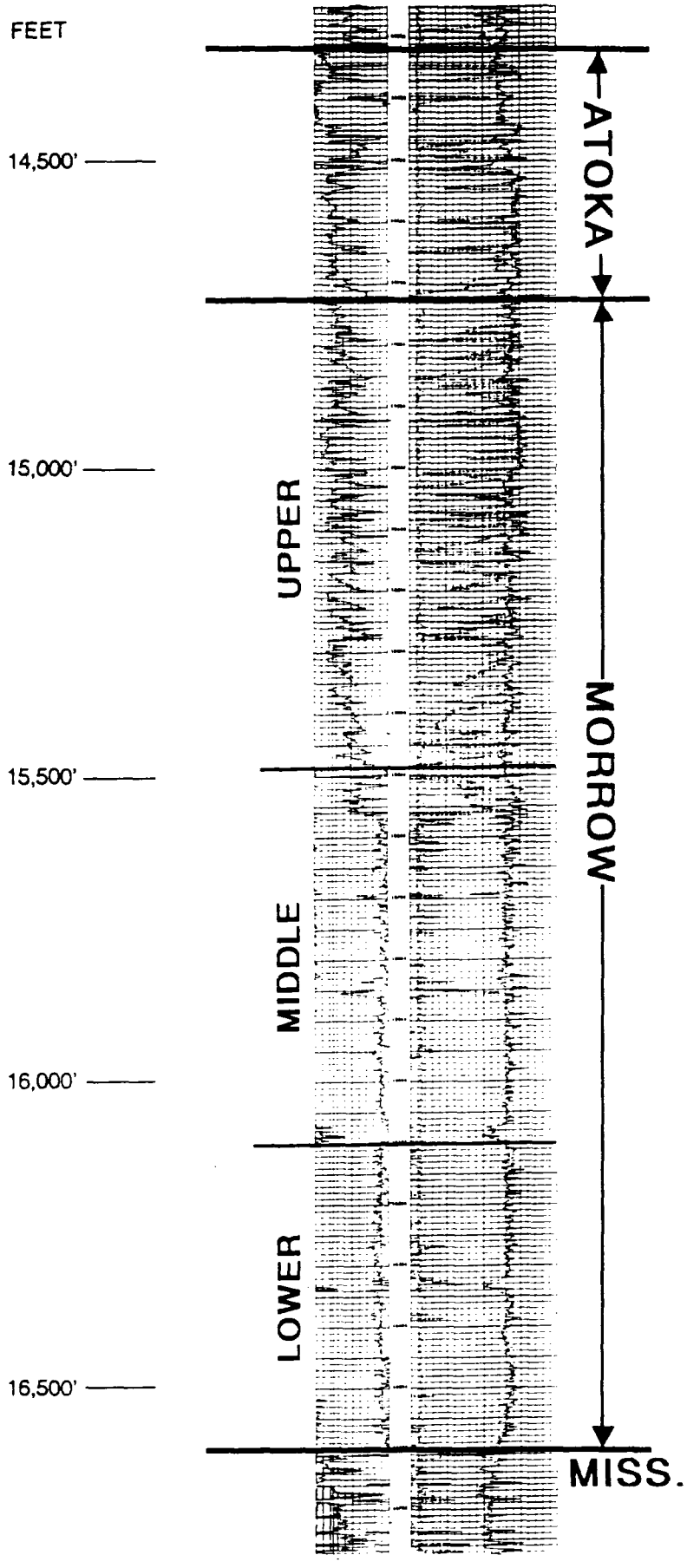

Figure 2 - Type Log: Compensated density-neutron log from BTA Oil Producers No. 1 Rojo 7811 JV-P.

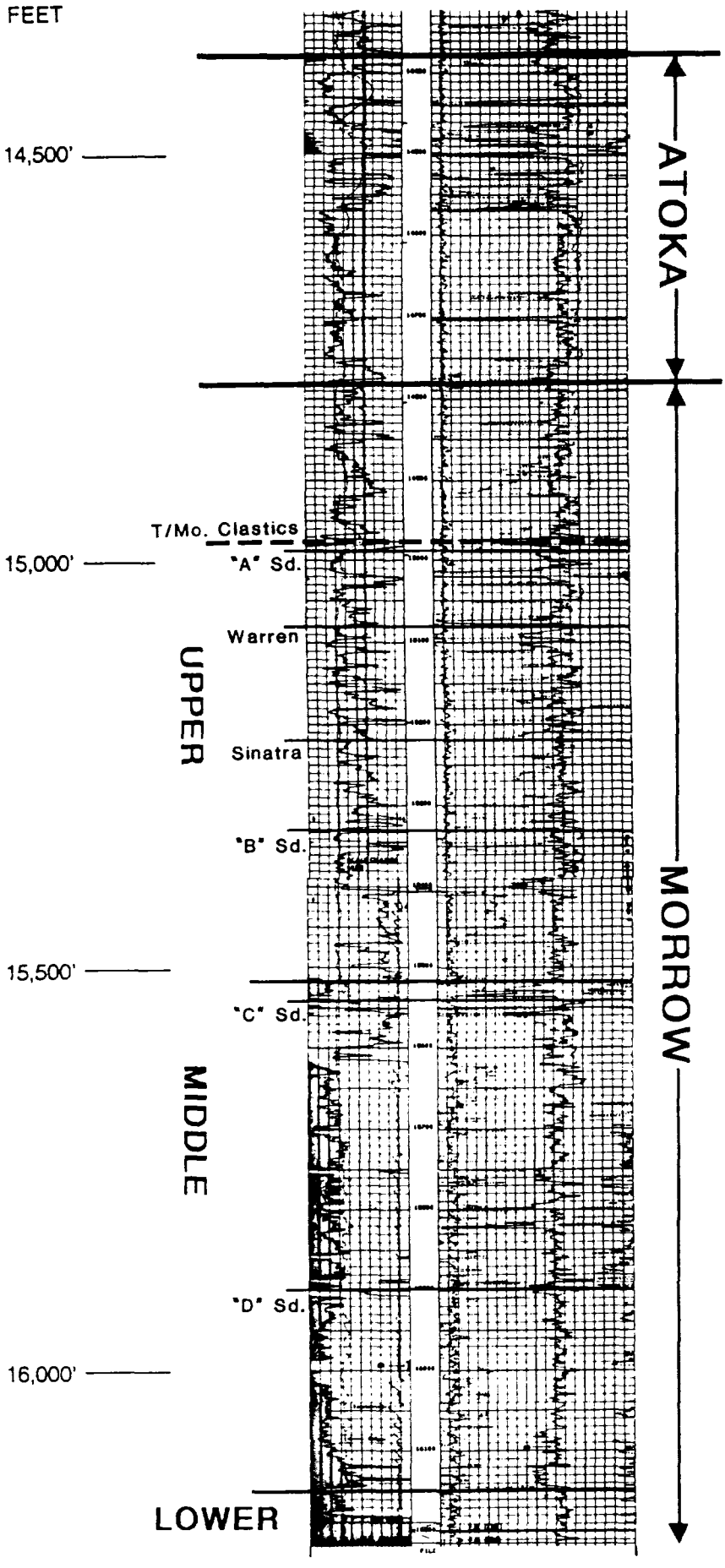

Figure 3 - Type Log: Compensated density-neutron log from The Superior Oil Company No. 1 Ochoa Federal

indicates only the middle and upper Morrow sediments were completely penetrated. Local nomenclature taken from the Pitchfork Ranch Field located immediately northeast of the area is used to identify the various clastic units found on the type log in Figure 3.

The Morrow TGF area of application appears on the Morrow "C" sand structure map as the black hatchered outline, while the shaded area represents a previously designated Morrow TGF area. Enron Oil & Gas Company's acreage is in yellow. This map, whose scale is one inch equals 2000', has a contour interval of 50'. Present day regional dip of the Morrow "C" sand in the area is south to southwest. The observed fault patterns are based primarily on seismic data but is supported somewhat by well control and production. Well logs that have been designated as type logs for the Morrow are indicated on the map. The traces for the two stratigraphic cross-sections are also shown on the map. Located within the application boundary are two areas designated windows on the structure map. These two areas are being excluded from the area of application due to localized Morrow reservoirs with high permeability and limited areal extent. Each window represents a 320 acre proration unit.

The same Morrow nomenclature used on the type log in Figure 3 is also used on stratigraphic cross-sections A-A' and B-B'. Each cross-section datum is the top of the Morrow clastics, a good stratigraphic marker common to all the wells in the area. Vertical scales are one inch equals 40' with horizontal scales of one inch equals 2,000'. Cross-sections A-A' runs east to west across the area of application while cross-section B-B' has a northeast to southwest trace through the area. These cross-sections show the disposition of the middle and upper Morrow within and around the area of application. Well completion information is also documented on the cross-sections.

During lower Morrow time the sediments deposited over the area of application were basinal shales. Middle Morrow deposition was characterized by an increase in clastic material sourced from the Central Basin Platform which created packages of lenticular sands within the deep water shales. Upper Morrow sediments

contain alternating sequences of limestones, shales and sands. This is probably indicative of a regressive Morrow sea and shallower water conditions.

The clastic deposits in the middle and upper Morrow are the dominate reservoir rocks of the Morrow formation in the Pitchfork Ranch Field and have been considered the primary targets in the area of application. For these reasons the majority of Morrow tests did not drill below the middle Morrow section. The middle and upper Morrow clastics become poorly developed in a southwest direction away from the Pitchfork Ranch Field across the area of application. Mud logs were available on many wells in the area and this data indicates the sands are more limy and less homogeneous with greater amounts of calcareous and siliceous cement. These lithologic changes have resulted in tighter rock which is supported by production data, log calculations and permeability calculations.

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