THE LOBO TREND OF SOUTH LAREDO AREA, WEBB AND ZAPATA COUNTIES, TEXAS

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ABSTRACT

Located deep in the South Texas brush country one hundred forty miles west of Corpus Christi is the Lobo Trend of the South Laredo area. Since its discovery in late 1973, 350-400 wells have been drilled with an estimated 75 percent success ratio.

The producing area is still not delineated and continues to expand eastward and southward across an indicated productive area covering 500,000 to 600,000 acres in Webb and Zapata counties. This region has been intensely surveyed by seismic crews and is tightly leased or held by production. It is expected to remain so for the foreseeable future.

The Lobo Trend is believed to be one of the most complex geological provinces in the entire Gulf Coast region. At least one angular unconformity is known to exist; others are suspected. The major reserves occur beneath the angular unconformity. One or more periods of intense faulting and structural activity occurred prior to the angular unconformity, with an additional period of faulting subsequent to the erosion and later deposition. The geology has been further complicated by even more recent regional gulfward tilting and faulting which affected the Lobo section as well as the overlying middle and upper Wilcox sediments.

Production in the Lobo Trend is from a series of geopressured, low-permeability, lower Wilcox sands encountered at depths ranging from approximately 4,400 feet up dip in Mexico to nearly 12,000 feet downdip/to the east in Zapata County, Texas. The producing sequence is marked at the top by geopressured lower Wilcox shale and at the base by the occurrence of *Vaginulina robusta,* a Midway foraminiferal marker fossil. Individual sands in the series attain maximum thickness of nearly 300 feet and seldom contain water contacts. Porosity and permeability ranges of 15-24 percent and 10-40 millidarcies are common for producing sands.

Trapping conditions are believed to be provided principally by counter-regional, westward-tilted fault blocks bounded by northwest-southeast striking, down-to-coast normal faults. Lateral seals most commonly appear to be due to shale-out, permeability barrier, or local closure. Displacements across the faults are frequently as much as 700 to 1000 feet. Since the stratigraphic sequence containing the major producing zones is commonly no more than 1000 feet thick, the exact location of a large fault becomes critical in certain areas, a problem most frequently and accurately solved when adequate seismic data and well control are available.

As of this date, approximately five years after completion of the No. 1 Clark discovery, reserves for the area are still impossible to determine. As was stated in an earlier paper, it is safe to say that at least a trillion cubic feet of gas is recoverable with 75 percent of it in Texas, and as much as three trillion cubic feet is not unlikely. Development of the trend is expected to continue through the next three to five years with as many as 50 new exploration and development wells being drilled each year. Perhaps then a reasonably accurate estimate of ultimately recoverable gas can be made.

Drilling and completion techniques for Lobo wells generally consist of setting protective casing near the top of the geo-pressured zone, which can very often be predicted accurately by a competent mud logger, then drilling to total depth, logging, and running liner from total depth back to protective casing. Up until early this year, fresh-water base drilling muds were used by all operators, however oil base mud is now being used by one active operator.

The logging program most commonly consists of the ISF/SONIC, the Compensated Neutron-Formation Density Log, and the dipmeter. Sidewall cores are routinely taken, but production casing or liner is usually run on the basis of favorable electrical log data. Only limited conventional coring has been attempted to date.

A number of wells have flowed naturally at initial rates of 500 MCFD up to 6,000 MCFD with a few exceptional wells flowing at much higher rates. However, sustained commercial production is dependent upon successful stimulation consisting of light acid treatment and heavy fracturing.

The average 9000′ Lobo test costs approximately $800,000 to drill and complete. Dry hole cost is $600,000 $\pm$. Recoverable reserves per well are expected to average 4 to 6 BCFG worth $8,000,000 to $12,000,000 at the area intrastate price of approximately $2.00/MCF.

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