MARTIN YATES, III
1912 - 1985
FRANK W. YATES
1936 - 1986

YATES PETROLEUM CORPORATION

105 SOUTH FOURTH STREET
ARTESIA, NEW MEXICO 88210
TELEPHONE (505) 748-1471

S. P. YATES
CHAIRMAN OF THE BOARD
JOHN A. YATES
PRESIDENT
PEYTON YATES
EXECUTIVE VICE PRESIDENT
RANDY G. PATTERSON
SECRETARY
DENNIS G. KINSEY
TREASURER

# GEOLOGICAL EXPLANATION OF THE LIVINGSTON RIDGE AREA, EDDY COUNTY, NEW MEXICO

Yates Petroleum Corporation seeks approval of four proposed locations on two state leases in Section 2 of Township 22 S - Range 31 E. The proposed wells (located 660' FNL & 1650' FEL, 1980' FNL & 1650' FEL, 660' FSL & 2310' FWL, and 1980' FSL & 2310' FWL of Section 2 of Township 22 S - Range 31 E) will be drilled to a projected depth of 8500 feet to test the hydrocarbon potential of the Delaware Mountain Group.

The primary objective is to test the basal Cherry Canyon Formation and extend the western limits of the Lost Tank and Livingston Ridge Pools. Secondary objectives include the Brushy Canyon and Bell Canyon Formations. The sands of these three formations are submarine channel/fan complexes that were deposited in the Delaware Basin in Permian time.

Cross-section A - A' is a southwest - northeast stratigraphic cross-section. The cross-section is hung on the top of a Cherry Canyon shale marker. Correlations of the Cherry Canyon and Brushy Canyon Formations are shown along with perforated intervals. The "Main Pay" zone is colored in orange along with three "Secondary Pay" zones and a "Potential Pay" zone. Producing zones can be correlated to the Clayton Williams well in section 15, southwest of the Lost Tank Pool. These zones were not tested in the Clayton Williams well, with the exception of the "Potential Pay" zone which produced oil during a drill-stem test. The possible potential of the Clayton Williams well suggests the reservoirs should extend further west of the existing pools.

The structure map, with the top of the Cherry Canyon shale marker as a datum, shows the east dip in the Livingston Ridge area. The proposed locations are situated updip from established production, thus the oil/water contact should not be encountered.

The article titled Guadalupian Depositional Cycles of the Delaware Basin and Northwest Shelf by Jacka et al. describes the depositional environment of Delaware Mountain Group. Jacka et al. believe the Delaware sands were deposited by deep sea (submarine) fans. Figure 8 (page 85) shows a plan view of a submarine fan, the channels of the fan are separating and fingering into the fan as they move away from

**YATES PETROLEUM CORP.**
**BEFORE THE COMMISSION**
**NMOCD CASE NOS. 10446-10449**
**DATE: 09/09/92 DE NOVO**
**EXHIBIT NO. //**

the source area. This depositional model can be applied to the Delaware sands in the Livingston Ridge area.

The Net Porosity map shows the limits of the "Main Pay" reservoir. The map is an isopach of density porosity of 15% or greater. Wells with porosity of 15% or greater should produce commercial amounts of oil from this zone. The depositional environment present is represented by channels within a submarine fan system similar to the one Jacka et al. described. The north-south trending channels that carry sand throughout the system are represented in orange and yellow on the map. The different colors are not used to distinguish between reservoir and nonreservoir, the colors are used to highlight the sand thicks and show how they trend. The sand thicks represent the fingering channels that Jacka et al show in their figure 8. Most of Section 2 should have a sufficient amount of porosity to establish good commercial production.

The Initial Potential map shows the initial daily production from each well in the established field. An Initial Potential map was constructed instead of a cumulative production map because most of the wells have been completed within the last year. Green numbers represent barrels of oil per day, red represents thousand cubic feet of gas per day, and blue represents barrels of water per day. All of the wells on this map are producing from the "Main Pay" zone, except for three. The three exceptions are producing from one of the "Secondary Pay" zones. Many of the wells are producing from both the "Main Pay" zone and one or more of the "Secondary Pay" zones. The four wells in Section 2 are currently producing. Two of the requested locations are direct offsets from production and the other two are one location away from direct offsets.

In summary, four locations have been proposed. These tests should encounter the "Main Pay" zone along with several "Secondary Pay" zones. The pay zones should be updip of producing wells and the amount and quality of reservoir encountered should be sufficient to produce economic wells. The locations are very near current production, if not directly offsetting. These developmental locations will further define the western limits of the Lost Tank and Livingston Ridge Pools. Each well is estimated to produce 125,000 barrels of oil and at a rate of $20/barrel the four wells should generate approximately 10 million dollars in revenue.