Indigo Atoka-Morrow Unit
Description and Geologic Justification

Yates Petroleum Corporation is requesting the formation of the Indigo Atoka-Morrow unit to support the drilling of an exploratory well to be located in the NE/4 of Section 7 Township 12 South Range 35 East, in Lea County, New Mexico. The unit will include the following lands as shown on Figure 1; Sections 5,6,7 and 8 T12S R35E. The objective of the proposed well will be gas productive Atoka-Morrow sandstones at depths between 11,700 feet and 12,300 feet measured depth with the primary objective being the Upper Morrow sand. Evidence from seismic and subsurface mapping studies in the area indicates that the Morrow deposition was influenced by paleotopographic features that resulted from a period of faulting and erosion in late Mississippian and early Pennsylvanian time. The Morrow Formation was deposited on an unconformity surface, which included incised valleys, and fault bounded topographic highs. Seismic and subsurface evidence indicates that a thicker Morrow section, consisting of incised valley fill deposits, is present in the topographic lows that existed on this unconformity surface. These incised valleys are thought to have been the focus of deposition for coarse-grained sandstone sediments, which have been preserved and provide reservoirs for natural gas accumulations in the Atoka-Morrow formation. Figure 1 is a structure map of the unconformity surface (top of the Mississippian) and Figure 2 is a gross sand isopach of the Upper Morrow showing the accumulation of sand on the downthrown side of an SW-NE trending fault.

Cross section A-A' (Figure 3) shows evidence that the Upper Morrow sand, found in the Austral State E #1 well located in Section 6, T12S R35E, was deposited in a topographic low on the downthrown side of a major SW-NE fault that was probably present during Morrow deposition due to the pronounced difference in thickness between the upthrown and downthrown sides of the fault. There is no discernable missing section between the two sides of the fault; the section is just considerably thicker on the downthrown side leading to the conclusion that this fault was a paleotopographic feature during Morrow deposition and that the thinning on the upthrown side was not due to subsequent erosion. The isopach map (figure 2) of the Upper Morrow sand illustrates the increased thickness of the Morrow sediments that filled the incised valley.

The proposed unit is bounded on the west by a major fault. The northern boundary is defined by the thinning of the Upper Morrow sand in the State 32-1 well in Section 32, T11S R35E (Figure 3). The proposed locations in both Sections 7 and 8 should test the lateral extents of the Upper Morrow.

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Case No. 12372 Exhibit No. 8
Submitted by:
Yates Petroleum Corporation
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