## DINNER MEETING — DECEMBER 6, 1982

### BRUCE A. BLAKE - Biographical Sketch

*Bruce A. Blake, geo*physicist, is the Texas Exploration Coordinator for Hunt Oil Company's Gulf Coast Division in Houston. He attended Texas A&M University, receiving his Bachelor of Science degree in geophysics in 1977. Following graduation he joined Houston Oil and Minerals in Houston where he worked the Texas Gulf Coast, onshore and offshore. He joined Hunt Oil Company in 1980. Bruce is a member of the American Association of Petroleum Geologists, Society of Exploration Geophysicists, Society of Petroleum Engineers of AIME, Geophysical Society of Houston, and the Houston Geological Society.

### THREE DIMENSIONAL SEISMIC INTERPRETATION OF A PIERCEMENT SALT DOME

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Eugene Island Block 77 field is a shallow (1100 feet) piercement salt dome with a low relief overhang which is productive from Upper Miocene sands at depths between 13,000 feet and 15,800 feet (or between 3.260 and 3.690 seconds). Hydrocarbon accumulations are trapped in steeply dipping beds (10-40 degrees by dipmeter) between the salt mass and the rim syncline. Small radial faults (50 feet of throw) also affect reservoir limits, as is evidenced by varied gas/water contacts and reservoir production performance.

This combination of factors (piercement dome, salt overhang, deep objective, steeply dipping beds, tight rim syncline, small faults) makes Block 77 field difficult to map accurately with 2-D seismic. Unmigrated lines do not show the dip between the salt mass and rim syncline; migrated lines contain migration artifacts, making a salt interface interpretation ambiguous and recognition of small faults impossible. To overcome the problems inherent in the 2-D seismic method, a dense grid of data (trace spacing of 110 feet in both X and Y directions) was collected over this field and migrated in three dimensions. This placed events in their proper spatial relationship, enhancing both fault delineation and salt face interpretation.

In previous interpretations (based on 2-D data), only one fault was mapped - a large down to the north fault extending eastward from the northeast quadrant of the dome. The 3-D data show a more complicated combination of fault systems including other large parallel faults (some with compensating faults), buried, down to the south faults, and an extensive system of small radial faults.

Salt face maps based on 2-D data were very inaccurate. Due to sideswipe problems, only lines shot radially across the dome were interpretable. This created large areas of no control. Using a 3-D grid eliminated the sideswipe problem and increased the amount of control on which to base the interpretation. The salt face, as seen on the seismic, was tied to existing well control to make an accurate salt face interpretation.