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## NORTH AMERICAN EXPLORATIONISTS

### HGS NORTH AMERICAN EXPLORATIONISTS GROUP DINNER MEETING—MARCH 16, 1993 Social Period, 5:30 p.m., Dinner and Meeting, 6:30 p.m. Post Oak Doubletree Inn

DOUGLAS P. HAZLETT\*—Biographical Sketch



Douglas P. Hazlett is currently a Senior Exploration Geologist for Anadarko Petroleum Corporation in Houston, TX. He received his B.S. in geology from Virginia Polytechnic Institute & State University (1981). He has worked for Anadarko since 1984 in U.S. onshore exploration and has experience in areas that include the Hugoton Embayment, Basin and Range, Williston Basin and the Wichita

Mountain Front of the Anadarko Basin. Doug has published several abstracts/articles on the petroleum geology and potential of areas in Nevada as well as the Miocene to Recent volcanic and tectonic history of portions of north-eastern California.

#### JAMES B. HERSCH—Co-Author

James B. Hersch is currently a Staff Exploration Geologist for Anadarko International Company where he has worked a variety of exploration assignments. Prior to joining Anadarko's international group, Jim worked as a prospect geologist concentrating on offshore Gulf of Mexico, the Mississippi Salt Basin and the Basin and Range. He graduated from Appalachian State University with a B.A. in geology in 1974. He completed his M.S. in geology at the University of Tennessee in 1978 with a thesis in ore genesis.

\*Speaker

#### PETROLEUM POTENTIAL OF EAST CENTRAL NEVADA

The Basin and Range Province of east central Nevada, despite its vast size and over forty years of exploration, produces oil from only Railroad and Pine Valleys. Oil production has exceeded 36 MMBO from nine fields. Four fields produce predominantly from Paleozoic fractured and karsted carbonates subcropping beneath Tertiary valley-fill sequences. Prolific Grant Canyon Field of Railroad Valley has produced over 17 MMBO from Upper Devonian dolostones. The Paleozoic fields may be characterized as

hanging-wall structures above high- or low-angle Miocene or younger listric normal faults associated with Basin and Range taphrogeny. Five fields produce predominantly from fractured Oligocene acidic ashflow tuffs or Oligocene sandstones. The largest, Trap Springs Field in Railroad Valley, has produced over 11 MMBO. Tertiary fields fall into two overall trap styles. The most significant style, as typified by Trap Springs and Eagle Springs fields, is preferential reservoir preservation in a downdropped fault block. The second trap style is an updip stratigraphic pinchout draped across a structural nose, and accounts for less than 6 MMBO.

Produced oils have been typed and correlated to either the Mississippian Chainman marine shales or Early Tertiary Sheep Pass lacustrine shales. Due to complex tectonic, stratigraphic and thermal histories, source rock maturity varies rapidly; adjacent areas may have Chainman shale thermal maturities as measured by vitrinite reflectance ranging from less than 0.3% Ro to greater than 2.5% Ro. Consequently, basin modeling should be an integral part of exploration strategies.

All production found to date lies within, or directly beneath the Tertiary, with the possible exception of Blackburn Field in Pine Valley. This may be due to the lack of regional reservoir sealing rocks. The most likely Paleozoic seals are the Chainman and Pilot shales. However, these shales are silica- and carbonate-rich, respectively. This mineralogy may cause each unit to be susceptible to fracturing during severe Basin and Range extension. Formation Microscanner, drill stem test and formation water chemistry data may be used to suggest the Paleozoic section is a regional common aquifer and has no internal seals. Tertiary rocks, on the other hand, must contain sealing lithologies. However, the environments of deposition of these alluvial, lacustrine and volcanic rocks are local in nature and preclude development of regional seal lithologies. Effective reservoir seals may be the most elusive element of successful exploration in eastern Nevada.