DOUBLE PRESENTATION
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DANA L. ROY—Biographical Sketch

Dana Roy received his B.S. in Geology from the University of Massachusetts at Amherst in 1978. He also attended the University of Vermont where he was awarded a M.S. in Geology in 1982.

From 1982-1983, he was employed by Cities Service Oil and Gas Corporation in Tulsa, Oklahoma, as a geologist in the Cities Service Exploration Training Program.

In 1983, he joined Triad Energy Corporation in Houston as an Exploration Geologist. From 1983-1985, his responsibilities included Triad's exploration efforts in the Wilcox and Yegua trends in Colorado, Lavaca and Wharton counties. He was also responsible for Triad's exploration efforts in the "Serpentine Plug" trend in Bastrop and Caldwell counties.

Since 1985, his primary responsibility at Triad Energy has been exploration and development geology at Alabama Ferry Field in Leon County, Texas, where his company holds a significant acreage position. His efforts there have focused on developing a predictive depositional model for this prolific Upper Glen Rose carbonate reservoir.

FACIES TYPES AND DIAGENETIC ASPECTS OF AN UPPER GLEN ROSE STRATIGRAPHIC TRAP: ALABAMA FERRY FIELD, LEON COUNTY, TEXAS*

The sparsely drilled eastern portion of Leon County, Texas was the site of the significant 1983 discovery of Alabama Ferry Field. The field produces from a shoal complex with three main porosity zones in a portion of the Upper Glen Rose section that is equivalent to the "D" zone of the Ft. Trinidad Field. Since the discovery of this stratigraphic trap, over 200 wells have been completed in the "D" zone on approximately 40,000 acres. The field has been estimated to contain nearly 100 million barrels of oil and 200 BCF of gas in place. To date, over 6 million barrels of oil and 13 BCF of gas have been produced under a restricted allowable. The size of the field and quality of the reservoir rocks has and will continue to make this stratigraphic interval an attractive exploration target along the Glen Rose shelf.

The interplay of dominant particle type, depositional texture and diagenesis controls reservoir quality. Grainstones, and some packstones, composed of skeletal (mollusk), intraclast and ooid particle types, are the principal reservoir facies. Some of these grainstone units are dominated by one particle type, while other units contain a variable mixture of the three main allochemical components, as well as accessory amounts of peloids, foraminifera, echinoderm and calcareous algae fragments, and other framework constituents. Grainstone facies trends vary from east to west across the field.

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Skeletal grainstones dominate the eastern portion of the field in a roughly north-south belt, while intraclast, ooid, skeletal, and mixed grainstone subfacies are spread across the broad western portion of the field, where these zones thin and pinch out.

The best reservoir-quality rock is skeletal grainstone, which usually contains interparticle and well-developed moldic porosity. Intraclast and ooid grainstone end members are good and moderate to poor reservoir rock types, respectively, with principally interparticle porosity and microporosity. Microporosity, often found within ooids and micritic grains, is associated with relatively higher irreducible water saturations and less effective pore systems (lower permeability). The overall reservoir quality of the different mixed-particle subfacies is often dependent on the proportion of dissolution-prone skeletal fragments, which control the distribution of moldic porosity.

Three major zones of porosity have been delineated in the field. The lowermost zone of porosity is a widely distributed grainstone unit of variable thickness. The best reservoir-quality rocks in this lowermost unit are skeletal and intraclast-rich grainstones. The better defined middle zone is a roughly north-south-trending shoal system in the eastern part of the field. This zone contains porous skeletal-rich grainstones, with less porous ooid and intraclast grainstone facies also noted. The uppermost zone is somewhat similar in overall geometry to the lowermost zone. Skeletal-rich and intraclast-rich grainstones are the best quality reservoir rock in this uppermost zone. These porous lithofacies occur along the southwestern edge of the field.

The suite of pore types and diagenetic events in Alabama Ferry Field are similar to many Lower Cretaceous carbonate reservoirs in the Gulf Coast province. Interparticle and early-formed moldic pore spaces are commonly lined with marine and meteoric phreatic calcite cements. Compaction, in several forms, can have a major effect on reservoir quality; micro/macrostylolitization, primarily in intraclast and ooid grainstones, has reduced porosity through volume reduction of interparticle pore space and through the release of calcite in solution, which reprecipitates locally as spar cement. The amount of calcite spar cement in these compacted intervals can, in some cases, result in almost complete occlusion of pores. Even without significant compaction, porosity in some skeletal grainstones with formerly high interparticle and moldic pore volume can be greatly reduced by a combination of calcite spar and baroque dolomite cements. Throughout the field, variable amounts of baroque dolomite, as well as accessory anhydrite and authigenic quartz, occur as late-stage cement types. Brittle collapse of interparticle and moldic pores may also reduce pore volume, but can enhance permeability; fractures are sparse and contribute little to reservoir pore volume or permeability.

As with many carbonate grainstone reservoirs, optimum facies, combined with porosity enhancement and preservation, are the main controls on reservoir quality in the shoal complex at Alabama Ferry Field.

**With Anthony J. Lomando, Lawrence Bruno, Gary Grinsfelder*