

Abstract

THE CROSSFIELD MEMBER IN THE LONE PINE CREEK AREA OF SOUTHWESTERN ALBERTA - RESERVOIR QUALITY CONTROLS AND HYDROCARBON POTENTIAL

Peter, Steven E., AGAT Laboratories, 3801-21st St. NE, Calgary, Ab, Canada T2E 6T5

The Lone Pine Creek Wabamun 'A' pool in southwestern Alberta produces gas from the Crossfield Member of the Wabamun Group. With initial established reserves of 8,900 10^6 m³ (316 Bcf) of gas, this pool is part of the Crossfield play which trends generally along the Fifth Meridian for at least 150 km. The reservoir zone consists primarily of very finely to medium crystalline dolomites, formed in a restricted platform, algal bank setting. The zone is sealed by overlying laminated and anhydritic dolomites, and thins laterally to the east where edge wells have increasingly more vug-filling anhydrite.

Reservoir quality is controlled by a combination of depositional environment, structure and diagenesis. Algal dolomites dominate the pool at Lone Pine Creek, while deeper stromatoporoid dolostones are prevalent in the Crossfield East pool to the west. Porosity at Lone Pine Creek consists of variable pore types unique to individual facies. Vug-filling anhydrite is common in edge wells and in the lower portions of the Crossfield Member, while calcite and early dolomite cements are more common in producing wells. The occurrence of favourable reservoir development may be related to the underlying structure.

Recent discoveries in the area suggest that the Crossfield play still offers exploration opportunities both east and west of the gas pool trend. Reservoir quality prediction is dependent on the integration of diagenetic modeling, structure and depositional facies.