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Horizontal Miscible Water Alternating Gas Development of the Alpine Field, Alaska

The Alpine oil field is located approximately 60 miles west of the Prudhoe Bay oil field on the North Slope of Alaska. It contains 430 million barrels of recoverable reserves and 1 billion barrels of oil-in-place. The Alpine reservoir is a Jurassic, marine sandstone with 40-degree API gravity oil with an average thickness of 50 feet. Daily production rates have ramped up from 40,000 barrels in November 2000 at startup to over 90,000 barrels per day in July 2001.

This poster summarizes the development plan evaluation for the Alpine oil field, which is drilling all horizontal wells and flooding the reservoir using a Miscible Water Alternating Gas (MWAG) process. Horizontal wells were selected over vertical wells based on higher expected productivity and improved recovery efficiency compared to vertical wells. Additional horizontal well considerations included aligning wells parallel to potential conductive fractures, using all open-hole completions and selecting an optimum well spacing. The Miscible Water Alternating Gas recovery process was found to be superior to either gas flooding or water flooding for this reservoir. Reservoir strategy considerations included pre-injecting an optimal water volume prior to gas injection, injecting gas prior to water breakthrough at the producers, and optimum distribution of the miscible gas among the injectors.