

## **Beluga River Gas Field, Cook Inlet, Alaska**

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The Beluga River Gas Field is a large shallow gas accumulation located approximately 40 miles (64 km) west of Anchorage, in the northern Cook Inlet Basin in south-central Alaska. ConocoPhillips Alaska, Inc. operates the Beluga River Gas Field for itself and its co-owners Union Oil Company of California and Municipality of Anchorage d/b/a Municipal Light and Power, with each owner having a 33.33% interest. The Beluga River Gas Field is a major gas supplier for local electric utilities and home and commercial gas usage in the greater Anchorage area. Commercial gas production commenced in March, 1968, and over 1.19 TCF has been produced.

The Beluga River field was discovered in 1962 while exploring for a deeper oil objective. The field is approximately 7.25 miles (11.7 km) long by 2.5 miles (4 km) wide. The Beluga River structure is a broad north-northeast-trending fault-propagation fold with a steeply dipping reverse fault along the west side. Strata involved in the deformation are a thick sequence of fluvial dominated, non-marine, sediment deposited in a rapidly subsiding and deforming basin during Eocene to Pleistocene times. The gas field produces from two formations: the high net-to-gross, Pliocene-aged Sterling Formation, and the underlying low net-to-gross Miocene-aged Beluga Formation. The gross reservoir thickness is up to 3200 feet (975 m) and consists of dozens of stacked channel belt and crevasse splay sand bodies that are separated by laterally continuous, relatively impermeable flood basin siltstone, mudstone, and coal. The dominant reservoir sand facies are relatively small in size and have discontinuous channel belt form or fan-shaped geometries. Reservoir connectivity relates to net-to-gross, channel belt size and orientation relative to well spacing, and presence of thin, but widespread coal zones. Reservoir quality is variable, but relates to degree of compaction, and to sand composition, which varies from feldspathic litharenite to argillite-dominated litharenite. Produced gas is biogenic in origin, and is thought to be sourced from ubiquitous interbedded coals.

The field is at a mature state of development with much of the reservoir depleted to under 40% of original pressure, and most down-structure wells have seen water encroachment in some of the sands. Declining and differential pressures, water breakthroughs, and sand production present major operational problems. Pressure measurements indicate that much of the remaining gas resource resides in lower quality, low net-to-gross channel belt sand bodies in the lower portion of the reservoir.