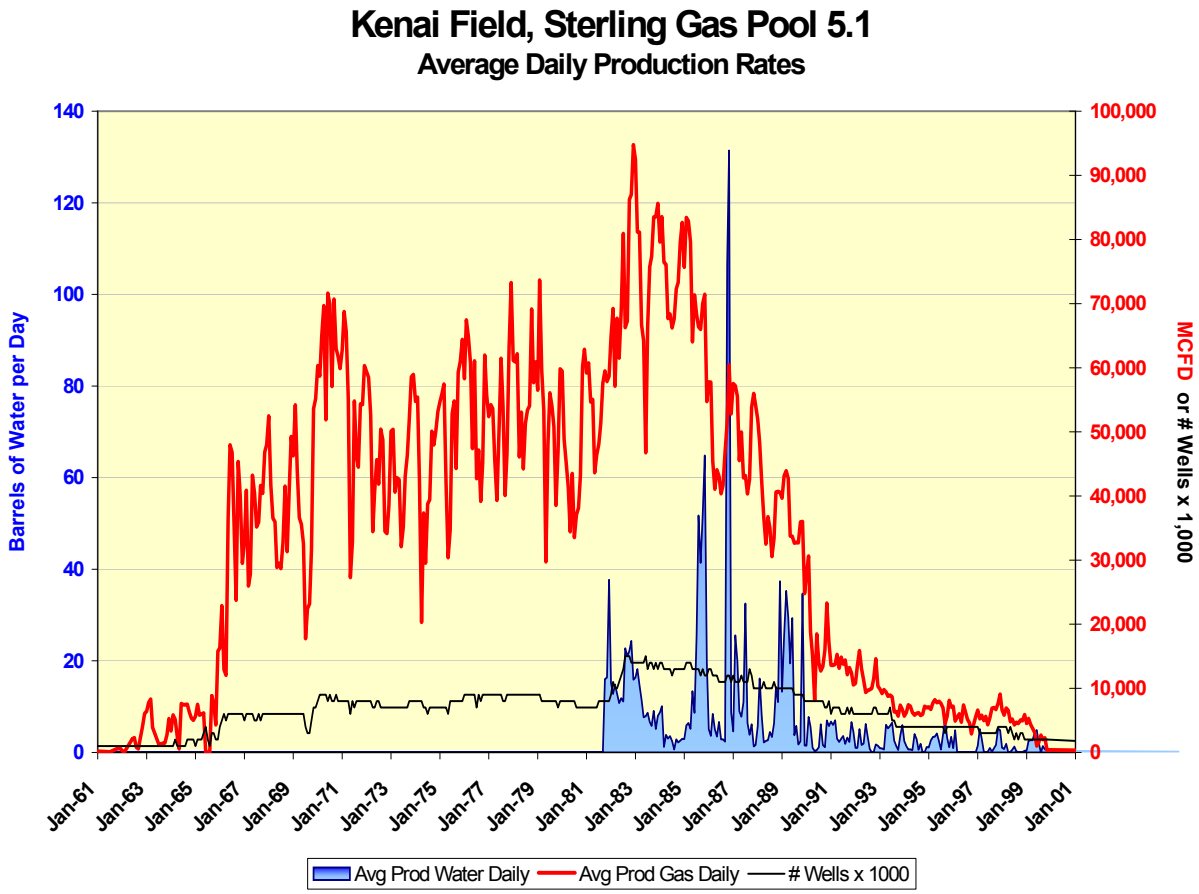
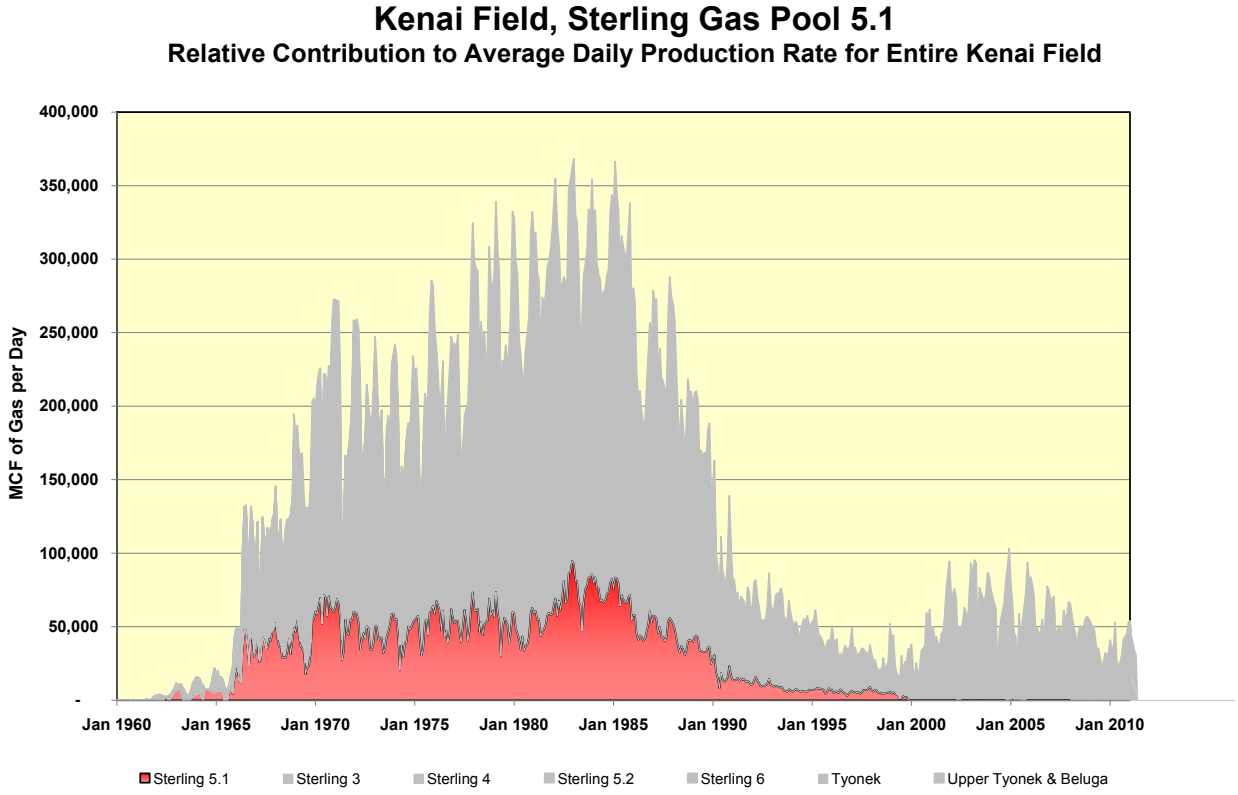
Kenai Gas Field, Sterling Gas Pool 5.1

Summary

Sterling Gas Pool 5.1 within the Kenai Gas Field is defined as the accumulation of gas common to and which correlates with the accumulation found in the interval 4576' to 4859' in the KU 21-06 well.[1] This pool was discovered on October 11, 1959 by the Kenai Unit No. 14-06 well, and regular gas production began in November 1961 from the Kenai Unit 33-30 well. Production increased consistently as additional wells were brought on production between 1964 and 1982. It peaked at an average daily rate of 94,776,000 cubic feet per day in December 1982, and then declined until the last two wells, Kenai Unit 13-06 and Kenai Unit 14-32, were shut-in during November 1999. A small amount of gas was produced from Sterling Gas Pool 5.1 by the Kenai Unit 21-07 well during April 2005, but this isolated, reported production is not considered regular gas production.[2]





Geology

The Kenai Gas Field structure consists of an asymmetric anticline that trends north-south that lies about 5 miles south of the City of Kenai. The axis of this anticline is parallel with, and about 1 mile east of, the eastern coastline of the Cook Inlet. The eastern flank of the anticline dips toward the east with a slope of about 300 feet per mile, while the western flank dips westward at about 800 feet per mile.[3] At the top of Sterling Gas Pool 5.1, the crest of the anticline lies about 3,800' below sea level, about 150' below the top of Sterling Gas Pool 4.[4] At the 4,300-foot elevation contour (below sea level), the anticline measures about 5-1/2 miles long and 3 miles wide.[5] The Kenai Gas Field anticline lies on trend with, but is fault-separated from and is shallower than, the Cannery Loop anticline that lies 5 miles to the north.[6]

In the Kenai-Cannery Loop area, the Pliocene-aged[7] Sterling Formation comprises thick, continuous, sandstones of good reservoir quality that were deposited by large, meandering streams. These streams flowed south and southeastward from the Aleutian-Alaska Ranges, parallel to the basin axis, and produced 30- to 60-foot thick point-bar sandstones that are laterally continuous and separated by layers of flood-plain siltstone, mudstone[8] and coal.[9] Active volcanism, uplift, and erosion of the Aleutian and Alaska

Ranges provided constituent sediments that ranged from sand (generally fine-grained, but rarely pebbly) to mud. The sand-sized sediment fraction consists mainly of quartz, plagioclase, biotite, and volcanic rock fragments. Rare pebbles consist of coarse-grained plutonic and fine-grained volcanic rocks. Sterling sandstones have good reservoir quality because of diagenetic dissolution of minerals and volcanic rock fragments producing secondary porosity[10] and yielding effective porosities ranging up to 31 percent and permeabilities that may exceed one darcy.[11] The Sterling Formation is characterized by a high net-to-gross sand ratio.[12]

SFD
July 15, 2011

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[1] Alaska Oil and Gas Conservation Commission, 1969, Conservation Order No. 82: Pool Rules for Kenai Gas Field, Sterling Gas Pools 3, 4, 5.1, 5.2, 6 and Tyonek Gas Pool 1

[2] Alaska Oil and Gas Conservation Commission, 2011, Well and Production Database

[3] Alaska Oil and Gas Conservation Commission, 1969, Conservation Order No. 82, cited above, Exhibit I, Structure Contour Map, Top Upper Kenai Gas Pool 4

[4] Alaska Oil and Gas Conservation Commission, 2011, Well log correlations, Geographix Database

[5] Alaska Oil and Gas Conservation Commission, 1969, Conservation Order No. 82, cited above, Exhibit I

[6] Swenson, R., 2003, Introduction to Tertiary Tectonics and Sedimentation in the Cook Inlet Basin; in Dallegge, T.A., ed., 2003, 2001 Guide to the Petroleum, Geology, and Shallow Gas Potential of the Kenai Peninsula, Alaska, AK DGGS Misc. Pub. 128, p. 17

[7] Levinson, R. A., 2011, Beluga River Gas Field, Cook Inlet, Alaska, in 2011 Western Region Meeting, SPE and Pacific Section AAPG, Anchorage, Alaska, Program with Abstracts, p.71 - 72

[8] Hayes, J.B., Harms, J.C., & Wilson, T.W., 1976, Contrasts between Braided & Meandering Stream Deposits, Beluga and Sterling Formations (Tertiary), Cook Inlet, AK, in Miller, T.P., ed., Recent & Ancient Sedimentary Environments in AK, AGS Symposium Proceedings, p.J1-J8

[9] Brimberry, D.L., Gardner, P.S., McCullough, M.L., and Trudell, S.E., 2003, Kenai Field, the Kenai Peninsula's Largest Gas Field: in Swenson, R.F., ed. 2002 Geology & Hydrocarbon Systems of the Cook Inlet Basin, AK: Field Trip Guide Book, p. 20-25

[10] Hayes, J.B., and others, 1976, cited above

[11] Brimberry, D.L., 2003, cited above

[12] Levinson, R. A., 2011, cited above