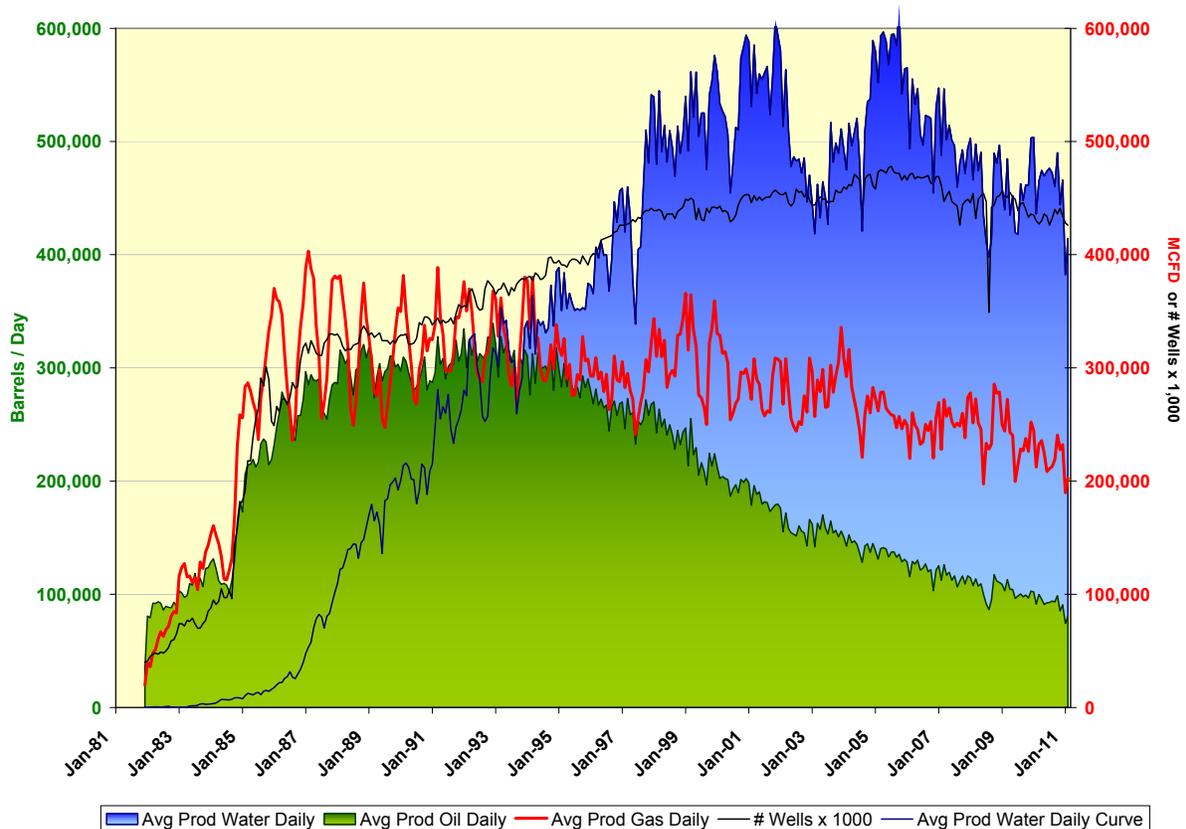


Kuparuk River Oil Pool

Summary

The Kuparuk River Oil Pool is the second largest on the Arctic Slope of Alaska, occupying approximately 300 square miles.¹ It was discovered in 1969 by the Sinclair Ugnu No. 1 well, and is defined as the accumulation of oil that is common to, and correlates with, the accumulation found in the ARCO West Sak River State No. 1 well between the measured depths of 6,474 and 6,880 feet.² The pool lies from approximately 5,600' to 6,500' true vertical depth below sea level.³ Step-out exploratory drilling of the Palm #1 and #1A wells in during 2001 discovered an extension of the pool to the west of the main pool.

Average Daily Production Rates



Regular production from the pool began in December of 1981, and water flood operations were initiated in February 1982. Production from the pool peaked in December 1992 at an average of 339,386 barrels of oil per day (“BOPD”). During the last six months of 2010, the pool averaged 92,480 BOPD from 435 production wells.⁴

Kuparuk oil has an API gravity of 23 degrees⁵ to 28 degrees.⁶ Reports of reservoir temperature range from 155° F⁷ to 200° F.⁸

Geology

The Kuparuk River Formation is a sequence of clastic sediments deposited on a shallow marine shelf during Neocomian (Early Cretaceous) time. The formation is divided into Upper and Lower Members. These two Members are comprised of four informal units that are termed, in ascending order, "A", "B", "C", and "D". The "A" and "C" units are the pay-bearing intervals. The A unit exists throughout the pool area, and it consists of sandstone, siltstone and mudstone in a series of regressive cycles that range to 70' thick. When mapped in detail, these individual cycles form elongate bodies that strike northeast-southwest. Porosity averages 23% and permeability averages about 80 md. The A unit thins to the west where it is truncated by an intraformational unconformity that lies at the base of the C unit.⁹ The C Unit is composed of glauconitic sandstone and siltstone with subordinate conglomerate and lesser shale. Bands of siderite-cemented sandstone are common. Porosity and permeability average 21% and 90 md, respectively.¹⁰ Throughout the Kuparuk River Unit, C-unit sand deposition appears to have been influenced by syndepositional, northwest-trending normal faults.¹¹

SFD

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¹ Davies acreage count based on the Kuparuk PA on 2004 DNR Kuparuk River Unit map

² Alaska Oil and Gas Conservation Commission, 1981, Conservation Order No. 173

³ AOGCC 2003 Annual Report, Kuparuk River Unit, Top of Kuparuk River Formation structure map.

⁴ Alaska Oil and Gas Conservation Commission, 2009, Production Database

⁵ Merritt, J.C., 1981, Geological Testimony, Alaska Oil and Gas Conservation Commission, Public Hearing Transcript dated March 25, 1981, p. 17 (see Conservation Order No. 173 Order File, p. 357.) See also Carmen, G.J. and Hardwick, P., 1983, Geology and Regional Setting of Kuparuk Oil Field, Alaska: American Association of Petroleum Geologists Bulletin, V. 67, p. 1027

⁶ ConocoPhillips Alaska, 2010, Reservoir Properties reported annually by operator (see Reservoir Properties table on page 3 of this summary).

⁷ Merritt, J.C., 1981, Geological Testimony, cited above, p. 357

⁸ ConocoPhillips Alaska, 2010, Reservoir Properties reported annually by operator, cited above.

⁹ Carmen, G.J. and Hardwick, P., 1983, cited above, p. 1025

¹⁰ Carmen, G.J. and Hardwick, P., 1983, cited above, p. 1026

¹¹ Alaska Oil and Gas Conservation Commission, 2002, Conservation Order No. 432B