

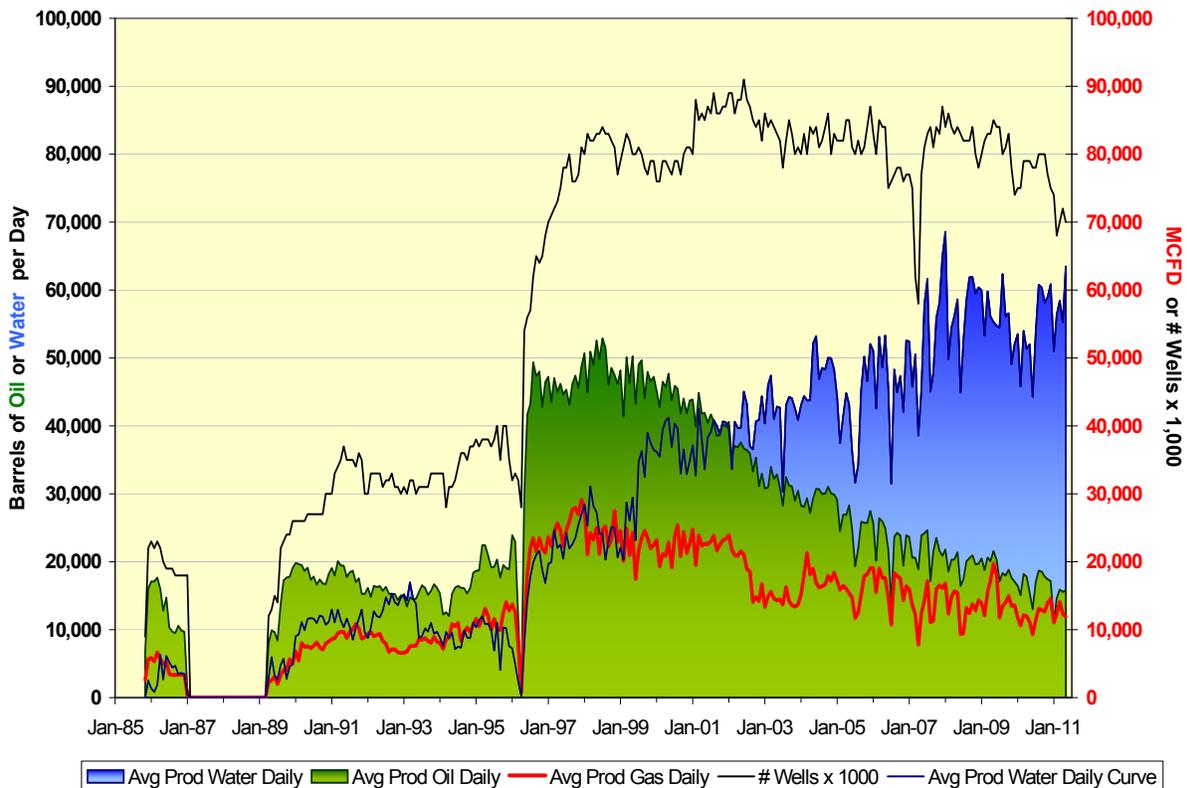
# Milne Point, Kuparuk River Oil Pool

## Summary

The Kuparuk River Oil Pool at Milne Point was discovered in 1969 by the Kavearak Pt No. 32-25 well. This pool was delineated and then developed by Conoco, Inc. beginning in 1980. Regular production began during November 1985, but low oil prices caused Conoco to curtail production and place the pool in a two-year “warm shut-down” that began in January 1987. Production resumed in April 1989, peaked twice at an average rate of about 20,000 barrels of oil per day (“bopd”) in January 1990 and again in April of 1991, then declined to a rate of about 17,000 bopd by year-end 1993.

## Milne Point Unit, Kuparuk River Oil Pool

### Average Daily Production Rates

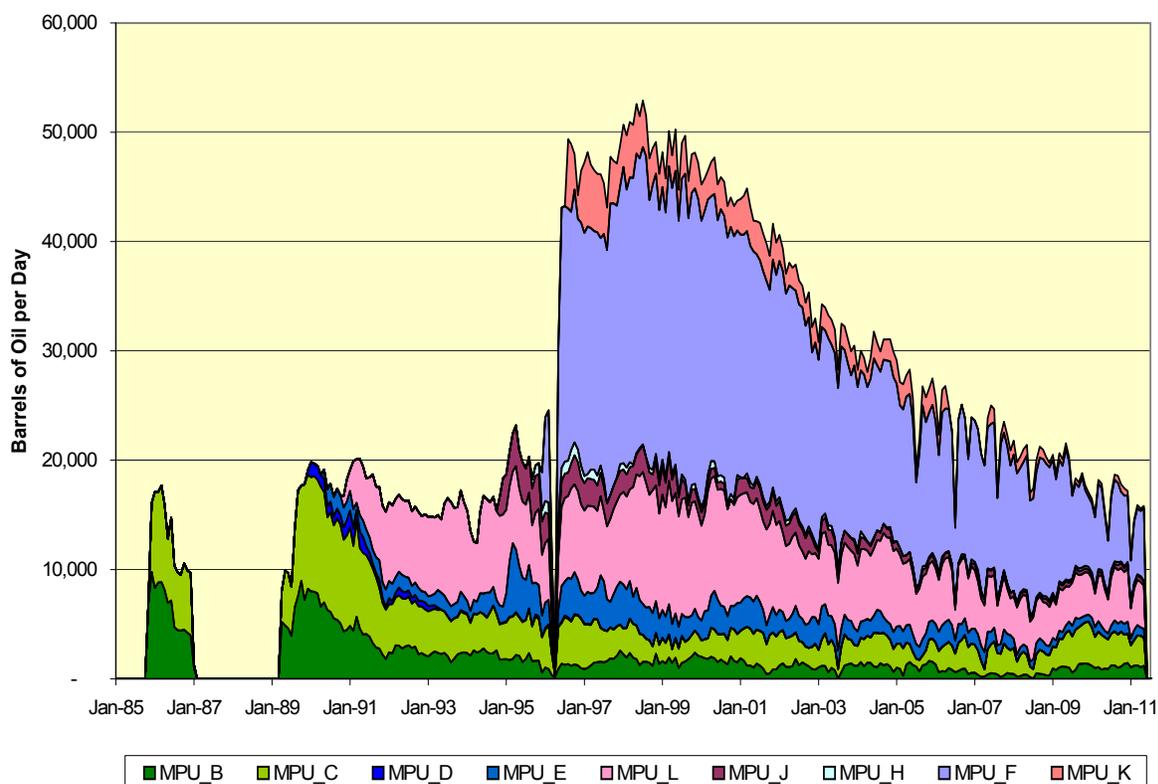


In early 1994, BP became operator of the Milne Point Unit (“MPU”) and began an aggressive development program. By June 1996, production jumped to 43,000 bopd with the addition of the F-Pad development at No Point along the northern coastline and the K-Pad development in the southeast portion of the unit. Production peaked at 52,900 bopd in July 1998, and has since declined. During the last quarter of 2005, the pool averaged 26,595 bopd and 64% water cut from 84 producers. By the first five months of 2011, average pool production declined to 14,600 bopd, and average water cut increased to 80% from between 68 and 74 producers. Currently, more than 230 well bores penetrate the pool, which is developed on 160-acre spacing.

## Geology

At Milne Point, the Kuparuk reservoir consists of a series of sandstones deposited on a shallow marine shelf during the Early Cretaceous (Neocomian). The Kuparuk River Oil Pool is defined as the

## Milne Point Unit, Kuparuk River Oil Pool Average Daily Oil Production by Pad



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 depths of 6,474 and 6,880 feet.<sup>1</sup> The reservoir is divided into four informal units that are named, in ascending order, "A", "B", "C", and "D." The A unit consists of very fine-grained sandstone, and the B unit comprises interlaminated siltstone and sandstone. The C unit is composed of mainly of fine to medium-grained sandstone, with the overlying D unit consists of shale. The "A" and "C" units are the major pay intervals within the Milne Point Unit.<sup>2</sup> The pool is situated mainly in the northeastern half of the Milne Point Unit, within crest and northeastern flank of a northwest-trending anticline that is broken near its crest by a series of northwest-trending, normal faults. The pool is further compartmentalized by numerous northeast-trending normal faults. According to operator supplied reservoir statistics, porosity averages 23 percent, and permeability ranges from 20 to 40 md.<sup>3</sup> Oil gravity ranges from 21 to 26 degrees API,<sup>4</sup> and averages 22 degrees API.<sup>5</sup>

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<sup>1</sup> The Kuparuk River Oil Pool in the Kuparuk River Field is defined as the accumulation of oil that is common to and correlates with the accumulation found in the Atlantic Richfield Company West Sak River State No. 1 well between the depths of 6,474 and 6,880 feet.

<sup>2</sup> Alaska Oil and Gas Conservation Commission, 2002, Conservation Order No. 432B, Kuparuk River Field, Kuparuk River Unit, Milne Point Unit, Kuparuk River Oil Pool

<sup>3</sup> BP, 2003, Reservoir Properties supplied by Operator for Alaska Oil and Gas Conservation Commission 2003 Annual Report

<sup>4</sup> Alaska Oil and Gas Conservation Commission, 1994, Conservation Order No. 349, Kuparuk River Field, Kuparuk River Unit, Milne Point Unit, Kuparuk River Oil Pool

<sup>5</sup> BP, 2003, cited above