**OIL FIELDS**

# *Prudhoe Bay Oil Field*

*The permotriassic-aged Ivishak (also known as Sadlerochit) reservoir, the largest producing horizon in the field, is a series of* [*clastic*](http://petrowiki.org/Siliciclastic_reservoir_geology) *zones ranging from near-shore marine deposits in the lower sections to sandstones and conglomeratic braided-stream deposits in the remaining, more productive units that contain most of the original oil in place (OOIP). The reservoir is a structural stratigraphic trap consisting of a faulted, south- and southwestward-dipping, 1 to 2° homocline. The reservoir is bounded on the north by major faults and on the east by a major lower Cretaceous truncation.*

*originally containing approximately 25 billion barrels*

*permeabilities ranging from 50 to 3,000 md*

*Oil viscosity of 0.8 cp*

*The productive area is 213543 acres (864 km2) square miles*

*Recoverable 13billion bbl*

# *Kuparuk River oil field*

# *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. 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. Throughout the Kuparuk River Unit, C-unit sand deposition appears to have been influenced by syndepositional, northwest-trending normal faults.*

*It has approximately 5.9 billion bbl of stock tank original oil in place (STOOIP)*

*Occupying approximately 210square miles (544 km2)*

*The sandstone reservoir consists of two zones [A (62% of STOOIP) and C (38% of STOOIP)] that are separated by impermeable shales and siltstones*

*Viscosity at reservoir conditions of approximately 2.5 cp.*

*Recovery Factor of about 47.3%*

*Permeability ranges from 0.5 millidarcies to 500 millidarcies*

1. ***Hibernia oil field***

*The trap is a complexly faulted anticline created by rollover into the basin-bounding Murre fault. The integrated geological and geophysical interpretation of the field is based on the results of ten wells and 465 km2.*

*The field was discovered in 1979 and contains an estimated 940millionbbl of recoverable oil.*

*Sedimentological interpretation of core indicates that the principal reservoirs were deposited as high-bed load distributary channels in a fluvially dominated deltaic complex.*

*Reservoir properties range from 9 to 33 percent porosity and 150 to 950 mD permeability*

*The* field *contains approximately three (3) billion barrels of* oil in-place.

**Viscosity** *Gravity, °API: 35.0 specific gravity of 0.88*

1. ***Hebron Oil Field***

*Hebron is a heavy oil field estimated to produce more than 700 million barrels of recoverable resources*

*The current best estimate of* total oil in place *is. 2, 620 million barrels*

*Permeability 10 - 1000 md*

*Oil Viscosity 8.0cp*

*Significant discovery licenses covering this asset were awarded in the mid 1980ís based on four exploratory wells over an area of approximately 36 square kilometres.*

1. ***Albacora-Leste Oil Field***

*contains an estimated STOIIP of 4.4 billion bbl (by 1989, time of the development plan)*

*The total proven reserves of the Albacora-Leste oil field are around 534 million barrels*

*Area is 141sq km.*

*0.1mD < K < 1,624 mD*

*oil viscosity is 10cp*

1. ***Hawkins Oil Field***

*The Hawkins field occurs on a large northeastward-trending, faulted anticline situated near the north-central part of the East Texas geosynclinal basin. A major fault downthrown toward the northwest and trending northeast-southwest crosses the east part of the field. A pronounced gravity minimum indicates that the field is underlain by a deep-seated salt mass.*

*The structure caused by a deep-seated salt dome has 1,200 ft of closure and is extensively faulted. The reservoir is divided into two areas separated by a major fault.*

*Contained more than 1.8 billion barrels of original oil in place (OOIP)*

*Recovery Factor of 50%*

*Oil viscosity averages about 3.7 cp*

*1 to 3 darcy permeability*

*Area of about 35km2*

# Empire Abo field

This reservoir is a dolomitized reef structure (**Fig. 1**) with a dip angle of 10 to 20° from the crest toward the fore reef. The oil column is approximately 900 ft thick, but the average net pay is only 151 ft thick. The pore system of this reservoir is a network of vugs, fractures, and fissures because the primary pore system has been so altered by dolomitization; the average log-calculated porosity was 6.4% BV

Covers ≈11,000 acres (44.5km2)

Contains approximately 380 million stock tank barrels (STB) of original oil in place (OOIP)

Approximately 74% of the OOIP has been recovered from this field by application of the immiscible gas/oil gravity drainage process

Viscosity at reservoir conditions is approximately 0.4 cp.

Permeability of 0.2 to 50md

# Swanson River field

The original oil in place (OOIP) of this field is 435 million bbl

Viscosity of 1.1cp

Recovery factor of 58%

Permeability of 20 to 100md

Area 62km2

1. ***Wilmington Oil Field***

*It consists of seven zones between 2,500 and 7,000 ft true vertical depth subsea (TVDSS), the upper six of which are turbidite deposits of unconsolidated to poorly consolidated sandstone*

*Original oil in place was approximately 8.8 billion barrels. Cumulative oil production to date is approximately 2.4 billion barrels leaving a target of 6.4 billion barrels for improved recovery methods.*

*Permeability is 1 to 1000md*

*Area is 53.1km2*

*Oil Viscosity 260cp*

1. ***Ekofisk Oil Field***

*The Ekofisk field is a central graben, north-south trending anticline 49 km2 (19 sq mi) in area, with 244 m (801 ft) of vertical closure and a hydrocarbon column 305 m (1,001 ft) long, formed by Permian Zechstein salt movement in the form of salt pillows*

*Estimated 6.4 billion bbl stock tank original oil in place (STOOIP)*

*Estimated recoverable Reserves: Original 569.2 million Sm³ (3580 million bbl) oil*

*Has a viscosity of approximately 0.25 cp*

*Effective permeabilities that range from 1 to 50 md*

*Area is 49 km2*

1. ***Barracuda Oil Field***

*This giant oilfield contains in place volumes of 2,250 millionbbl and the total reserves are 867 million bbl*

*Covers an area of 157 km2*

*Permeability 400 to 3000md*

*Viscosity 18cp*

1. ***White Rose oil Field***

*The White Rose Field is a highly faulted complex of rotated fault blocks, cored by salt at depth. White*

*Rose is bounded to the north and west by basinward-dipping flanks of the White Rose salt dome. The*

*eastern margin of the structure abuts against the basin-bounding Voyager Fault, while the southern*

*boundary of the field encompasses the White Rose Terrace. The Terrace is bounded by major faults at its western, eastern, and probably, southern limits*

*Total oil in place is about 3 billion barrels*

*The White Rose oilfield development involves recovering an estimated 440 million barrels of oil*

*Area of 40km2*

*Permeability 10 to 300md*

*Viscosity is 0.8cp*

1. **Terra Nova Oil Field**

The reservoir was deposited as a large braided fluvial system.

About 1 billion barrels Stock-Tank Oil-In-Place (STOOIP) are trapped in a faulted plunging anticline, reservoired in stacked, braided fluvial sandstones which are of varying quality and extent due to onlap, cementation and facies transitions.

About 1 billion barrels Stock-Tank Oil-In-Place (STOOIP)

Estimated at approximately 516 million barrels

Area is 67km2

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# East Texas Oil Field

The primary productive geologic unit is the Cretaceous-age Woodbine Formation, a regional petroleum-bearing unit which had been known since the early part of the 20th century. This sandstone unit was deposited during a period when East Texas was a shallow sea, approximately 100 million years ago. During a subsequent period it was uplifted, eroded, and then covered again by the sea, which this time deposited a layer of impermeable chalk, creating a stratigraphic trap – a situation where oil, which is lighter than water and migrates upwards, reaches a point where it can move no farther, and pools. The source rock for the oil in East Texas is the overlying Eagle Ford Shale

Covering 140,000 acres (570 km2)

**Aneth Oil Field**

The Aneth field demonstration will take place in the 66-km2

**Arenque Oil Field**

Initial oil in place of approximately 1.2 billion barrels

RF. Currently 11%

# Mesa Oil Field

The structure of the Mesa field is relatively simple. Oil was trapped in two anticlinal structures in a band of the porous Miocene-age Vaqueros Sandstone formation, at a depth of between 2,000 to 2,500 feet (760 m). The two oil accumulations were about two-thirds of a mile apart horizontally, and around the same depth.

Total surface extent of 0.85 km2

produced 3,700,000 barrels (590,000 m3) of oil during its brief lifetime.

# Fife Field

The reservoir consists of thick Upper Jurassic, heavily bioturbated sandstones which are considered to have been deposited in a similar setting to the Fulmar Formation.

STOIIP is estimated at 132millionbbl and ultimate recovery is predicted to be 34 millionbbl oil. The low mobility of the oil and the low vertical permeability of the reservoir contribute to the predicted low (26%) recovery efficiencies.

# Kirkuk field

Kirkuk is a supergiant oil reservoir located in Iraq. Kirkuk began production in 1934, and 2 billion bbl of oil were produced before water injection was implemented in 1961. From 1961 to 1971, 3.2 billion bbl of oil were produced under pressure maintenance by waterdrive using river water. The 1971 production rate was approximately 1.1 million barrels of oil per day (BOPD). Since then, the field has continued to produce large volumes of oil by voidage-replacement water injection; however, few production details for recent years appear in the technical literature.

The primary pay interval for the Kirkuk field is the 1,200-ft-thick Main Limestone. This interval consists of a series of extensively fractured limestones, some porcelaneous and some dolomitized. These limestones were deposited in a variety of environments—back-reef/lagoonal, fore-reef, and basinal—and have a wide range of porosity and permeability properties. The oil is contained both in an extensive, extremely permeable but low-capacity fracture system and in a low-permeability but high-capacity, matrix-pore system. Also, the reservoir is underlain by a fieldwide aquifer. The oil gravity is approximately 36°API and was approximately 500 psi undersaturated at the original reservoir pressure of 1,100 psi.

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