

## **Sunnyside Oil Sand Reservoirs at Bruin Point, Southwest Uinta Basin - A Core Photo Poster**

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### **ABSTRACT**

The south flank of the Uinta Basin in northeast Utah is the high Tavaputs Plateau, which dips gently northward towards the basin center and is deeply dissected by the Green River and its tributaries. Where not removed by canyon incision, bitumen-impregnated sandstones in the middle Green River Formation (lower Eocene) occur along nearly the full length of the plateau. The bituminous sandstones encompass an area greater than 600 square miles and hold an estimated 11.6 to 14.0 billion barrels (BBO) of crude oil, but the net thickness of the bituminous sandstone and the OOIP rarely exceed 70 feet and 80 thousand barrels per acre (MBO/ac), respectively. However, in an exceptional 4.5 square mile area centered on Bruin Point (elev. 10,120 ft) on the southwest basin rim, the net thickness of bituminous sandstone and OOIP are measured in hundreds of feet and MBO/ac, respectively. The estimated OOIP in just this small area is 1.16 BBO. Bruin Point is an erosional remnant of a structural- stratigraphic trap formed by the superposition of a monoclinical flexure on a thick stack of deltaic-littoral sandstones. In the 1970s-1980s, this unique area was extensively evaluated to characterize the reservoirs and delineate the oil resource. Over 120 test wells with cores were drilled and analyzed. As many as 32 stacked bituminous sandstone bodies were encountered, 17 of which hold nearly all of the oil. The sandstones were deposited in constantly shifting deltaic lobes and along inter-delta shorelines. They are encased in marsh and floodplain mudstone and littoral calcareous mudstone and bioclastites. The sandstones are poorly-sorted, fine-grained feldspathic arenites up to 115 ft thick in distributary channels, but less than 10 ft thick in beach deposits. Average porosity and permeability are 23% and 570 md, respectively, but values vary widely between, and even within, depositional settings. The bitumen at Bruin Point is heavy (8.6 degrees API) and highly viscous (10 million cp). Just 25 miles to the north, these same deltaic sandstones are the reservoirs in the greater Monument Butte conventional oil fields. Although many operators have attempted to exploit this site for liquid hydrocarbons using both in situ steam flood and mining with solvent extraction, so far only small-scale mining of the bituminous sands for road construction has been commercially successful. This poster presents four cores, several approaching 1,000 ft in length, that graphically display the distribution of oil resource as related to stratigraphic heterogeneity and location within the deposit.