



# **Well logs and core data from selected cored intervals, National Petroleum Reserve, Alaska**

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**U.S. DEPARTMENT OF THE INTERIOR  
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Well Logs and Core Data from Selected Cored Intervals  
National Petroleum Reserve, Alaska  
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In June, 2001, the U.S. Geological Survey presented a core workshop, "Petroleum plays and systems in the National Petroleum Reserve – Alaska (NPRA)", in conjunction with the Society for Sedimentary Geology and the American Association of Petroleum Geologists. This collection of plots of well logs and core measurements includes all cored intervals presented at that workshop (Table 1).

The left-most track on the plots includes the gamma-ray and spontaneous potential (SP) logs, which are sensitive to lithology. The second track gives the depth in feet.

The third track shows the resistivity logs, scaled in ohm-meters over two or three logarithmic cycles. The resistivity logs are of various types: deep induction (ILD), deep laterolog (LLD), shallow laterolog (LLS), laterolog 8 (LL8), spherically focused log (SFLA\_A), and 16-inch normal (R16 or SN).

The fourth track includes the neutron log, scaled in percent porosity. The bulk density log is scaled from 1.65 to 2.9 g/cc, so a sandstone with a grain density of 2.65 g/cc would have a porosity matching the neutron scale. The porosity measurements on core samples, labeled PORCORE, are scaled to match the neutron scale. Porosity increases to the left. Where available, total organic carbon (TOC) measurements, in weight percent, are also plotted in this track.

Permeability measurements on horizontal plugs (PERMCORE) are plotted in the fifth track. Permeability, in millidarcies over four logarithmic cycles, increases to the left.

The cored intervals (left red bar) and the intervals over which drill stem tests were conducted (right green bar) are shown in the sixth track.

Plots for all wells extend only over cored intervals, except the plot for the Lisburne well, which extends over the entire well. The Lisburne plot includes the sonic log and mud weight and also includes a color bar showing the Torok Formation and the thrust repeat sections of the Lisburne and Etivluk Groups.

Formation intervals were taken from Bird (1988), with a few modifications where Kemik Sandstone has been re-interpreted as Kingak Shale (Houseknecht, 2001). Well locations and well test results are also given by Bird (1988). Abbreviations for formation tops are used on the well log plots; these abbreviations are explained in Table 2.

## References

Bird, K.J., 1988, Alaskan North Slope stratigraphic nomenclature and data summary for government-drilled wells, Chapter 15 *in* Geology and exploration of the National Petroleum Reserve in Alaska, U.S. Geological Survey Professional Paper 1399, p. 317-353.

Houseknecht, D.W., 2001, Sequence stratigraphy and sedimentology of Beaufortian strata (Jurassic – Lower Cretaceous) in the National Petroleum Reserve – Alaska (NPRA), *in* Houseknecht, D.W., ed., NPRA Core Workshop; Petroleum plays and systems in the National Petroleum Reserve – Alaska, SEPM Core Workshop No. 21, p. 57-88.

Table 1. Plots listed alphabetically by well, with formations which were cored, and depth interval of the plot.

Well Name	Formations Cored	Top of Plot	Bottom of Plot	File Name
Atigaru Point 1	Basement Rocks	11180	11535	AtigaruPt-Basement.pdf
Drew Point 1	Kingak Shale and Sag River Sandstone	6800	7080	DrewPt-KingakSagR.pdf
Drew Point 1	Shublik Formation	7050	7500	DrewPt-Shublik.pdf
Drew Point 1	Sadlerochit Group and Basement Rocks	7500	7950	DrewPt-SadleroBase.pdf
East Simpson 1	Shublik Formation, Sadlerochit Group, and Basement Rocks	7400	7740	ESimp1-Shublik.pdf
East Simpson 2	Sag River Sandstone	6600	6800	ESimp2-SagR.pdf
East Simpson 2	Endicott Group and Basement Rocks	7140	7510	ESimp2-EndiBase.pdf
Fish Creek 1	Nanushuk Group	2800	4150	FishCrk-Nanushuk.pdf
Grandstand 1	Nanushuk Group	750	1100	Grandstand-Nanushuk.pdf
Ikpikpuk 1	Shublik Formation	10150	10500	Ikpikpuk-Shublik.pdf
Ikpikpuk 1	Lisburne Group	11650	12800	Ikpikpuk-Lisburne.pdf
Ikpikpuk 1	Basement Rocks	14800	15030	Ikpikpuk-Basement.pdf
Inigok 1	Torok Formation	3900	9100	Inigok-Torok.pdf
Inigok 1	Kingak Shale	9200	11800	Inigok-Kingak.pdf
Inigok 1	Shublik Formation	12150	12450	Inigok-Shublik.pdf
Inigok 1	Sadlerochit Group	12400	12800	Inigok-Sadlerochit.pdf
Inigok 1	Lisburne Group	13900	17150	Inigok-Lisburne.pdf
Inigok 1	Endicott Group	19200	19500	Inigok-Endicott.pdf
J.W. Dalton 1	Sadlerochit Group	7880	8250	JWDalton-Sadlerochit.pdf
J.W. Dalton 1	Lisburne Group	8280	8580	JWDalton-Lisburne.pdf
J.W. Dalton 1	Basement	9150	9370	JWDalton-Basement.pdf
Kuyanak 1	Kingak Shale	5000	5200	Kuyanak-Kingak.pdf
Kuyanak 1	Basement Rocks	6500	6690	Kuyanak-Basement.pdf
Lisburne 1	Lisburne Group	0	17000	Lisburne-Lisburne.pdf
Mikkelson Bay State 1	Hue Shale and Pebble Shale Unit	11450	11700	MikkelsonBaySt-HuePbbl.pdf
North Kalikpik 1	Torok Formation	3400	7000	NKalikpik-Torok.pdf
North Inigok	Hue Shale (gamma ray zone)	7380	7580	NInigok-Hue.pdf
Oumalik 1	Torok Formation	4350	10920	Oumalik-Torok.pdf
Peard 1	Torok Formation	2400	6250	Peard-Torok.pdf
Peard 1	Shublik Formation	8400	8600	Peard-Shublik.pdf

Peard 1	Sadlerochit Group	8820	9050	Peard-Sadlerochit.pdf
Peard 1	Sadlerochit Group	9400	9600	Peard-Sadlerochit2.pdf
Peard 1	Basement Rocks	10000	10220	Peard-Basement.pdf
Phoenix	Kingak Shale and Sag River Sandstone	7380	8300	Phoenix-SagRShubSadler.pdf
South Barrow 12	Sag River Sandstone and Basement Rocks	2150	2290	SBarrow12-SagRBase.pdf
South Barrow 13	Basement Rocks	2400	2535	SBarrow13-Basement.pdf
South Barrow 17	Sag River Sandstone	2250	2380	SBarrow17-SagR.pdf
South Barrow 18	Kingak Shale	1650	1850	SBarrow18-Kingak.pdf
South Barrow 2	Basement Rocks	2400	2502	SBarrow2-Basement.pdf
South Barrow 3	Basement Rocks	2700	2865	SBarrow3-Basement.pdf
South Harrison Bay 1	Lisburne Group	10400	10700	SHarrisonBay-Lisburne.pdf
Seabee 1	Kingak Shale	13150	14650	Seabee-Kingak.pdf
Simpson 1	Basement Rocks	6400	7000	Simpson-Basement.pdf
Square Lake 1	Nanushuk Group	1510	3990	SquareLake-Nanushuk.pdf
Topagoruk 1	Basement Rocks	9970	10510	Topagoruk-Basement.pdf
Tulageak 1	Kingak Shale	2900	3100	Tulageak-Kingak.pdf
Tulageak 1	Basement Rocks	3900	4020	Tulageak-Basement.pdf
Tunalik 1	Torok Formation	6200	10600	Tunalik-Torok.pdf
Tunalik 1	Kingak Shale	10840	12650	Tunalik-Kingak.pdf
Tunalik 1	Lisburne Group	17030	17930	Tunalik-Lisburne.pdf
West Dease 1	Sag River Sandstone, Shublik Formation, and Basement Rocks	3780	4170	WDease-SagRShubBase.pdf
W.T. Foran 1	Lisburne Group	8160	8360	WTForan-Lisburne.pdf
Walakpa 1	Kingak Shale	1970	2130	Walakpa1-Kingak.pdf
Walakpa 1	Kingak Shale	2920	3120	Walakpa1-Kingak2.pdf
Walakpa 1	Shublik Formation and Basement Rocks	3300	3670	Walakpa1-ShubBase.pdf
Walakpa 2	Kingak Shale	2550	2750	Walakpa2-Kingak.pdf
Walakpa 2	Kingak Shale	2900	3100	Walakpa2-Kingak2.pdf
Wolf Creek 3	Nanushuk	1365	3600	WolfCrk3-Nanushuk.pdf

Table 2. Explanation of abbreviations used for formation names on plots.

<b>Abbreviation</b>	<b>Formation Name</b>
NANU	Nanushuk Group
TORO	Torok Formation
GAMMA	Gamma Ray Zone
HUE	Hue Shale
PBBL	Pebble Shale Unit
KEMI	Kemik Sandstone
LCU	Lower Cretaceous Unconformity
KING	Kingak Shale
TBAR	Top of Barrow sandstone, Kingak Shale
BBAR	Bottom of Barrow sandstone, Kingak Shale
SAGR	Sag River Sandstone
SHUB	Shublik Formation
FIRE	Fire Creek Member of Ivishak Formation
LEDG	Ledge Sandstone Member of Ivishak Formation
KAVI	Kavik Member of Ivishak Formation
ECHO	Echooka Formation
LISB	Lisburne Group
ENDI	Endicott Group
BASE	Basement Rocks
TD	Total Depth