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INTRODUCTION

Cuttings and core samples have been analyzed using a Rock-Eval/TOC pyrolysis apparatus over the depth intervals noted for the fifty five wells listed below from northeast British Columbia, map sheets 94-G to 94-J. Typically up to a 100 mg of material was available for any depth hence duplicate or repeat analyses cannot be run if an instrument failure is suspected and thus the data are presented in an unedited form and must be used with caution. Every effort is made to obtain a representative sample from the vial of cuttings, but because of the small sample size, mixed lithology samples may not be completely representative and mixed lithology intervals may yield some scatter in the data.

Well name and location	*Depth Range*
SMR ET AL ADSETT A-019-F/094-J-02	830-2355m
SMR ET AL ADSETT A-020-L/094-J-02	1935-1960m
SUNCOR PC AEC BOUGIE A-023-G/094-G-15	1310-1350m
DOME FINA BUNCH A-023-I/094-G-14	885-1175m
PENZL MESA FONTAS A-024-H/094-J-08	6770-6840'
PHILLIPS MINAKER A-025-D/094-G-15	10032.5'
SUNCOR PC NORCEN TOMMY LAKES A-026-A/094-G-09	5000-5550'
HUBER CRESTAR BEG A-061-F/094-G-01	1025-1160m
SUNCOR PC ET AL CLARKE A-065-G/094-J-10	6661.8-6668.5'
CDN-SUP SUN STEAMBOAT A-069-J/094-J-12	10060-10140'
DEVON ET AL MINAKER A-083-J/094-G-11	3020-11030'
CNRL HOFFARD A-089-H/094-J-09	1955-1970m
CNRL SIKANNI B-043-B/094-G-07	3710-3990'
SUNCOR CHUATSE B-045-H/094-J-16	6510-6520'
FETGP ENCANA TOMMY B-055-K/094-G-09	1175-1220m
BRC HTR ESSO N BUBBLES B-057-G/094-G-08	265-3580m
UCEL W BEG B-059-C/094-G-01	1055-1230m
CNRL SIKANNI D-052-I/094-G-03	715-1000m
BAYTEX ET AL CARIBOU B-064-G/094-G-07	525-850m
SHELL QUINTANA JACKFISH B-064-K/094-J-08	6780-6850'
SUNCOR ET AL JULIENNE B-069-D/094-G-01	2780-3440'
FRONTIER ET AL EVIE B-088-H/094-J-14	6433-6444.4'

SUNCOR PC ET AL JEDNEY B-088-J/094-G-01 2990-4000'
SUNCOR EVIE LAKE B-089-E/094-J-15 7410.5'
COPOL MARK BEG C-003-F/094-G-01 610-1240m
CNRL ET AL BEG C-024-B/094-G-01 3190-3490'
SUNCOR PC LAPRISE C-028-H/094-G-08 350-1325m
PROGRESS ET AL BUBBLES C-040-A/094-G-08 1635-1850m
SWORD LAPRISE C-042-A/094-G-08 1000-1200m
AMOCO W SIKANNI D-046-L/094-G-03 2340-2615m
GULF ET AL BOAT C-050-G/094-G-16 900-3160m
SUNCOR PC N JULIENNE C-054-H/094-G-02 3600-4530'
BA SHELL KLUA C-070-E/094-J-09 6300-6320'
WEST NAT ET AL FORT NELSON C-070-I/094-J-10 1967.4-1968.9m
SHELL JACKFISH C-074-H/094-J-07 2140-2155m
DEVON ET AL BUBBLES C-077-I/094-G-01 1225-1330m
CNRL ET AL BEG C-080-G/094-G-01 740-1060m
HB PACIFIC POCKETKNIFE C-080-L/094-G-07 869.9-873.4m
TAQA NORTH W LAPRISE C-082-G/094-G-08 1940-4530'
ECA ECOG HZ CONROY C-082-H/094-G-16 960-1160m
CNRL ET AL W BEG C-084-C/094-G-01 2440-2680'
SUNCOR PC ET AL JEDNEY C-086-C/094-G-08 1426.9-1443.2m
ECA TENAKA C-086-K/094-J-03 3113-3119m
CNRL BEG D-002-B/094-G-01 1830-2120m
1023095AL ET AL MUSKWA A-005-A/094-J-14 2025-2040m
TAQA NORTH N JULIENNE D-033-H/094-G-02 2230-3790'
SUNCOR PC BEG D-039-K/094-G-01 1265-1485m
SMR ET AL ADSETT D-040-C/094-J-02 965-2500m
SUNCOR PC ET AL JEDNEY D-044-C/094-G-08 2170-3360'
AMOCO W SIKANNI D-046-L/094-G-03 620-2065m
MESA ET AL PINK D-063-D/094-G-02 4070-5100'
PRQ ET AL SASQUATCH D-064-E/094-G-01 680-690m
CNRL JACKFISH D-081-I/094-J-02 2435-2460m
PRQ ET AL SIKANNI D-088-F/094-G-02 2130.8-2133.1m
CNRL N BUBBLES D-A099-F/094-G-08 1316.6-1319.1m

Depth units used (feet or metres) are those in which the original well was drilled and logged, and in which the samples are currently labelled. In this open file, no attempt has been made to review the stratigraphy. As most of these wells were drilled several decades ago, before the stratigraphy in this area of Northeast British Columbia was reviewed, some terms are no longer in current use and some of the tops may be incorrect, and hence misleading. Therefore, any stratigraphic data included in this report should be treated with caution.

EXPERIMENTAL

Rock-Eval/TOC analysis provides fast and reliable characterization of the quantity and quality of sedimentary organic matter, as well as its thermal maturity. While most samples were analyzed on a Rock-Eval 6 Turbo (RE 6) instrument few pyrolysis experiments were conducted using Delsi Rock-Eval II (RE II) unit equipped with a Total Organic Carbon analysis module. The operating conditions and parameters for a RE II are provided in several GSC Open File reports. Although the measured parameters are nominally the same for the two instruments, the RE 6 operating conditions are slightly different as nitrogen is used as pyrolysis gas allowing for better temperature control. A typical RE 6 experiment is initiated with heating of a pulverized rock sample at 300ºC for 3 min in nitrogen atmosphere, when naturally occurring hydrocarbons (free and adsorbed) are volatilized. The oven temperature is then steadily increased to 650ºC at a rate of 25ºC/min and decomposition of kerogen occurs. The amount of hydrocarbons volatilized at 300ºC and evolved from kerogen during the ramped heating are quantitatively determined by a flame ionization detector, and recorded as the S1 and S2 peaks, respectively. The final stage involves oxidation and combustion of the residual organic matter at 850ºC. The temperature measured at the maximum of the S2 peak is referred to as Tpeak while Tmax is calculated by subtracting about 40ºC from Tpeak (the exact correction is determined using a manufacturer standard). The amounts of CO and CO_2 are quantitatively determined by infrared detectors. Additional details on the RE6 instrument are available in Behar et al. (2001).

The percentage of carbon in CO_2 formed during oxidation and in the hydrocarbon peaks S1 and S2 is used to define the total organic carbon content (TOC), expressed as a weight percentage. The determination of the quality of organic matter is based upon the calculation of Hydrogen (HI) and Oxygen (OI) indices (HI=100xS2/TOC, OI=100xS3/TOC) which are related to the atomic H/C and O/C ratios (Espitalié et al., 1977). The OI versus HI cross plots ("pseudo van Krevelen diagrams") can be used as an organic matter type indicator at low and moderate maturities. The Tmax is an indicator of relative thermal maturity. According to Espitalié et al. (1985) the oil window is defined by the following Tmax ranges: 440º-448ºC (Type I), 430º-455ºC (Type II) and 430º-470ºC (Type III). A cross plot of Tmax versus HI is used to constrain estimations of organic matter type and its thermal maturity, while the Production Index (PI=S1/[S1+S2]) is used to indicate staining of a sample or as an additional maturity parameter.

Rock-Eval results correlate to other techniques (Espitalié et al., 1985; Tissot and Welte, 1978). Source rock potential is sensitive to lithology, TOC and S2 values. It is common practice to rate carbonate rocks with lower TOC comparable with richer clastic rocks. Extractable HC yields from leaner carbonate rocks are comparable to richer clastic rocks (Tissot and Welte, 1978, p. 430; Gehman,

1962). The organic matter associated with carbonate rocks is often more hydrogen-rich and thermally labile than that in fine-grained clastic rocks. As a result, more TOC in carbonate rocks may be transformed into bitumen compared with average clastic source rocks of comparable maturity.

Rock-Eval/TOC parameters have reliable significance only above threshold TOC, S1 and S2 values. If TOC is less than less than or equal to 0.3% then all parameters have questionable significance and the experiment suggests no petroleum source potential. Oxygen Index (OI) has questionable significance if TOC is less than or equal to 0.5%. Both Tmax and Production Index (PI = S1/(S1+S2)), have questionable significance if S1 and S2 values are less than or equal to about 0.2 mg HC/g rock. Results can be affected by rock mineral composition. The mineral matrix may either retain hydrocarbon compounds, generally lowering the S1 or S2 peaks, while increasing Tmax, or liberate inorganic CO_2 increasing S3 and OI. These effects are important if TOC, S1 and S2 are low, an effect not significant where sources have TOC values greater than 5%. OI values greater than 150 mg/g TOC suggest either low TOC or a mineral matrix CO_2 contribution during pyrolysis. Generally, a TOC content of at least 2% is needed for a source rock. Note that TOC and Hydrogen Index decrease with increasing thermal maturity due to hydrocarbon generation. Additional guidelines on the interpretation of Rock-Eval data may be found in Peters (1986), Snowdon (1995) and Sykes and Snowdon (2002).

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