May 27, 2020

Janpeter Lennie-Misgeld
Senior Advisor, Legislation and Policy
Office of the Regulator of Oil and Gas Operations
4th Floor, 5201-50 Avenue
Yellowknife, NT
X1A 3S9

RE: Information Request No. 2:
Application to Alter the Condition of a Well for the Abandonment of the Arrowhead River I-75 well (ACW-2019-012-CNRL-I-75-WID1981)

Dear Sir:

Canadian Natural Resources Limited (Canadian Natural) is responding to the Information Request email and attachments received May 7, 2020 from the Office of the Regulator of Oil and Gas Operations (OROGO) with the following information:

1.1 Isolation of Porous Zones

Request: Please submit detailed geological evidence, interpretation and supporting information (e.g. strip logs, well reports, geological reports) that clearly demonstrate the geology of the open hole section and how CNRL will ensure compliance with Section 56 of the OGDPR for the three identified porous zones in the open hole section.

Response: Please find attached CNRL's detailed Geological, Geophysical and Petrophysical review. In summary the detailed review supports the position that there are no discrete zones which require isolation in the open hole section. CNRL's proposed abandonment program is therefore in compliance with Section 56 of the OGDPR. Please note the detailed review is **confidential** and Canadian Natural is providing such information to OROGO with an expectation that it will be kept confidential.

If you have any questions, please contact the undersigned at Ryan.N.Munro@cnrl.com; or at (403) 386-6538.

Yours truly,
CANADIAN NATURAL RESOURCES LIMITED

Ryan Munro, P.Eng.
Manager, Abandonment Engineering

00/I75 60-40 122-45/0

KB: 517.9 m
RR: 2003-03-20
TD: 2878.0 m [MD]
FormTD: CNCG
Mode: Stand
Fluid: N/A
ANADARKO ARROWHEAD RIVER I-75

Schlumberger

Company: ANADARKO CANADA CORPORATION
Well: ANADARKO ARROWHEAD RIVER I-75
Field: ARROWHEAD
Province: NORTHWEST TERRITORIES

PLATFORM EXPRESS
COMPENSATED NEUTRON
LITHODENSITY LOG

Province	NORTHWEST TERRITORIES
Field	ARROWHEAD
Location	UNIT I SECTION 75
Well	ANADARKO ARROWHEAD RIVER I-75
Company	ANADARKO CANADA CORPORATION

LOCATION: UNIT I SECTION 75

Elev: KB 517.9 m, GL 510.8 m, DF 517.6 m

Permanent Datum	GROUND LEVEL	Elev 510.8 m
Log Measured From	KELLY BUSHING	7.1 m above Perm. Datum
Drilling Measured From	KELLY BUSHING	
API Serial No.	N/A	

Logging Date	20-Feb-2003
Run Number	TWO
Depth Driller	2878 m
Schlumberger Depth	2874.5 m
Bottom Log Interval	2869 m
Top Log Interval	2587.8 m
Casing Driller Size @ Depth	177.800 mm @ 2583.6 m
Casing Schlumberger	2587.8 m
Bit Size	156.000 mm
Type Fluid In Hole	POLYMER
Density / Viscosity	1100 kg/m3 / 51 s
Fluid Loss / PH	6.5 cm3 / 10.5
Source Of Sample	FLOW LINE
Rm @ Measured Temperature	1.330 ohm.m @ 15 degC
Rmf @ Measured Temperature	1.450 ohm.m @ 13 degC
Rmc @ Measured Temperature	1.680 ohm.m @ 12 degC
Source: Rmf / Rmc	MEASURED / MEASURED
Rm @ MRT / Rmf @ MRT	0.192 @ 125 / 0.225 @ 125
Maximum Recorded Temperatures	125 degC
Circulation Stopped	22-Feb-2003 / 17:00
Logger On Bottom	23-Feb-2003 / 3:15
Unit Number / Location	2016 / GRANDE PRAIRIE
Recorded By	CHRIS MOFFAT
Witnessed By	GORDON DIAMOND

Run 1 · Run 2 · Run 3 · Run 4

PowerSuite V5.0 developed by TriVision Geosystems Ltd. (403) 777-9454 (Canada) www.powerlogger.com

Well Information

Operator:	Anadarko Canada Corporation
Well Name:	Anadarko I-75
Location:	
UWI:	Anadarko I-75
Pool:	
Field:	
Province / State:	Northwest Territories
Country:	Canada

Elevations

Reference:		Ground:	510.8 m
Cut(-) / Fill(+):		Kelly Bushing:	517.9 m
K.B. to Ground:	m	Casing Flange:	m

Total Depth

Measurement Type	Measured Depth	True Vertical Depth
Drillers TD (Tally)	2878 m	2822.28 m
Drillers TD (Strap or SLM)	m	m
Loggers TD	2874.5 m	2818.94 m

Surface Co - Ordinates

Well Type:	Deviated		
Longitude:	122.58326	N / S Co - Ordinates:	
Latitude:	60.34423	E / W Co - Ordinates:	

Bottom Hole Co - Ordinates

Longitude:		N / S Co - Ordinates:	
Latitude:		E / W Co - Ordinates:	

Well Summary

Spud Date:	Jan 25, 2003
TD Date:	Feb 22, 2003 @ 08:15hrs
Rig Release Date:	
Contractor:	Shehtah Drilling Rig 5

Drilling Fluid Summary

Fluid Type	From	To
calcium carbonate - polymer	586 m	m

Casing Summary

Type	Hole Size	Casing Size	Landed
Surface	311 mm	244.5 mm	854.7 m

Work Schedule

Contractor	Geologist	Log Interval	Dates Logged
		0 m - m	Jan 25, 2003 -

Remarks

DEPTH SUMMARY LISTING

Date Created 23-FEB-2003 4:14:57

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type	IDW-B	Type	CMTD B/A	Type	7-46P
Serial Number	4930	Serial Number	2449	Serial Number	-999
Calibration Date	15-JAN-2003	Calibration Date	23-JAN-2003	Length	7315.20 M
Calibrator Serial Number	4	Calibrator Serial Number	-999	Conveyance Method	Wireline
Calibration Cable Type	7-46P	Calibration Gain	0.88	Rig Type	LAND
Wheel Correction 1	-5	Calibration Offset	346.00		
Wheel Correction 2	-5				

Depth Control Parameters

Log Sequence	Subsequent Trip To the Well
Reference Log Name	
Reference Log Run Number	
Reference Log Date	dd-Mmm-yyyy
Subsequent Trip Down Log Correction	5.00 M

Depth Control Remarks

1
2
3
4
5
6

OTHER SERVICES1	OTHER SERVICES2
OS1 ARRAY INDUCTION	OS1
OS2 NEUTRON / DENSITY	OS2
OS3 DSI SONIC	OS3
OS4 XY CALIPER	OS4
OS5 FMI	OS5

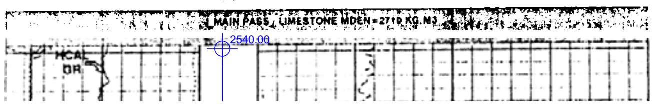
REMARKS: RUN NUMBER 1
ALL INTERVALS AND PRESENTATIONS AS PER CLIENT REQUEST
AIT RUN WITH 2 12.1 mm STANDOFFS IN COMPUTE STANDOFF MODE
NEUTRON RUN WITH 120 DEGREE OFFSET BOWSPRING
DSI SONIC RUN WITH 3 STANDOFFS
HOLE VOLUME CALCULATION DONE USING HCAL AND CAL2
HOLE VOLUME = 5.48 m3
REPEAT PASS DONE JUST BELOW CASING. DUE TO MAXIMUM TOOL TEMP BEING REACHED ON BOTTOM DURING FIRST PASS
CREW: C. LONGMORE J. WALLACE
RIG: SHEHETA WILLSON 5
PRINTS: 2 FIELD

REMARKS: RUN NUMBER 2

RUN 1		RUN 2	
SERVICE ORDER #	10807228	SERVICE ORDER #	
PROGRAM VERSION	15C0-306	PROGRAM VERSION	
FLUID LEVEL		FLUID LEVEL	
LOGGED INTERVAL START	STOP	LOGGED INTERVAL START	STOP

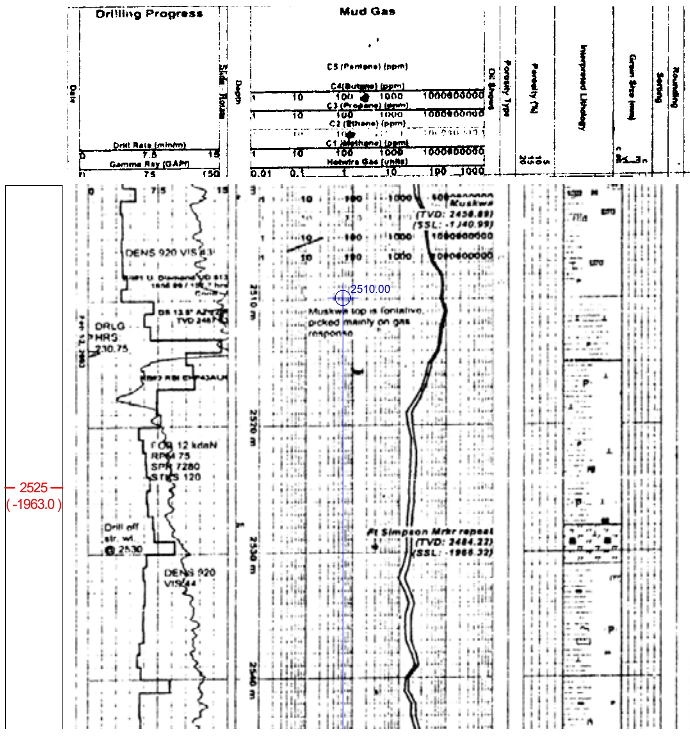
Tension (TENS) 20000 (N) 0
Caliper (HCAL) 125 (MM) 375
Gamma Ray (GR) 0 (GAPI) 150
Tool Tot. Drag From DJT to STIA
Std. Res. Formation Pe (PEFZ) 0 (----) 10
Density Correction (HDRA) 450 (K/M3) -50
Caliper 2 (CAL2) 125 (MM) 375
Cable Drag From STIA to STIT
NPOR for LIME (NPOR_LIM) 0.45 (V/V) -0.15
Bit Size (BS) 125 (MM) 375
Stuck Stretch (STIT) 0 (M) 20
DPHI for LIME (DPHI_LIM) 0.45 (V/V) -0.15

MAIN PASS , LIMESTONE MDEN = 2710 KG/M3



2525
(-1963.0)

Drilling Progress · Mud Gas · Lithology Description



clst plgs, tr slty mrlst plgs, nvs.

SH: v lt to m gy, plty, mnr mas, fis, tr bent clst plgs, tr dism pyr, pred non calc, no flor, v fnt slo gn wht cut.

SH: dk gy, mas to sbblky, sl rthy txt, mod hd, tr dism pyr, mod calc, nvs.

SH: m to dk gy, mas to plty, cmly mot, tr nodr pyr, mod calc, no flor, v fnt slo wht mas cut.

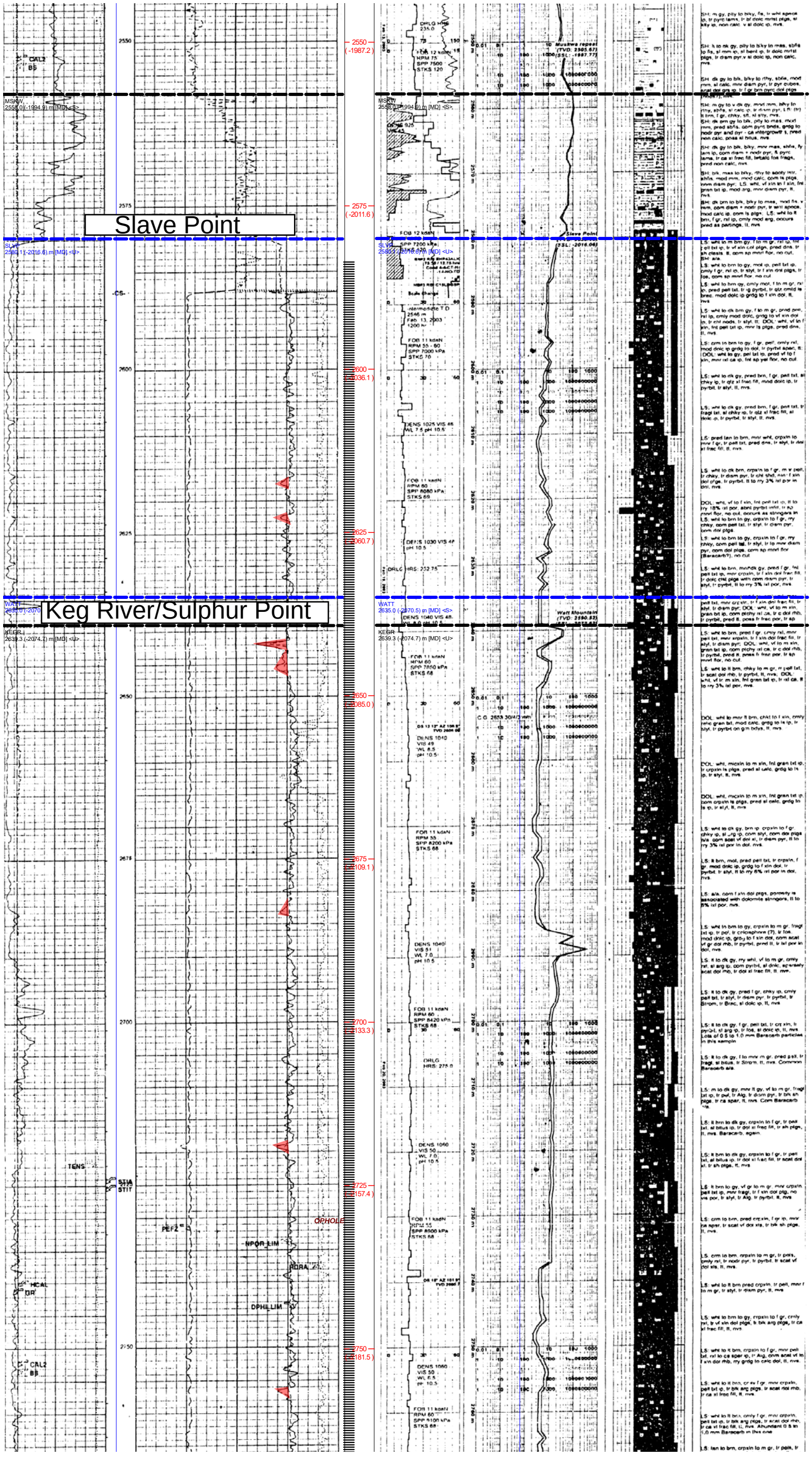
SH: m gy, plty to lbky, sl mot ip, sbfis, tr dism pyr, sl slty, sl calc ip, nvs.

SH: m brn gy to blk, blky to mas, fis, tr nodr pyr, tr ca xl frac fil, scat calc plgs, scat silt-size dol grs, overall carbonate content is quite low, nvs.

SH: lt gy to blk, plty to mas, fis, tr blk phosic nods; DOLC MRLST: wht to lt gy, plty, fis, sl calc ip, com scat vf xln dol rhb, mod to v arg, no macro por, nvs.

SH: lt to dk gy, plty to blky, sl mm, fis, tr dolc mrlst plgs, tr calc bnds, tr blk rthy phos nods, tr nodr pyr, nvs.

SH: lt to m gy, plty to blky, mot ip, fis, tr pyrc lams, tr blk phosic nods, tr gy lnp chl shd (nods?), nvs.



Intermediate Casing 2586.0 mKB

Tight with very poor fracture porosity stringers (in red)

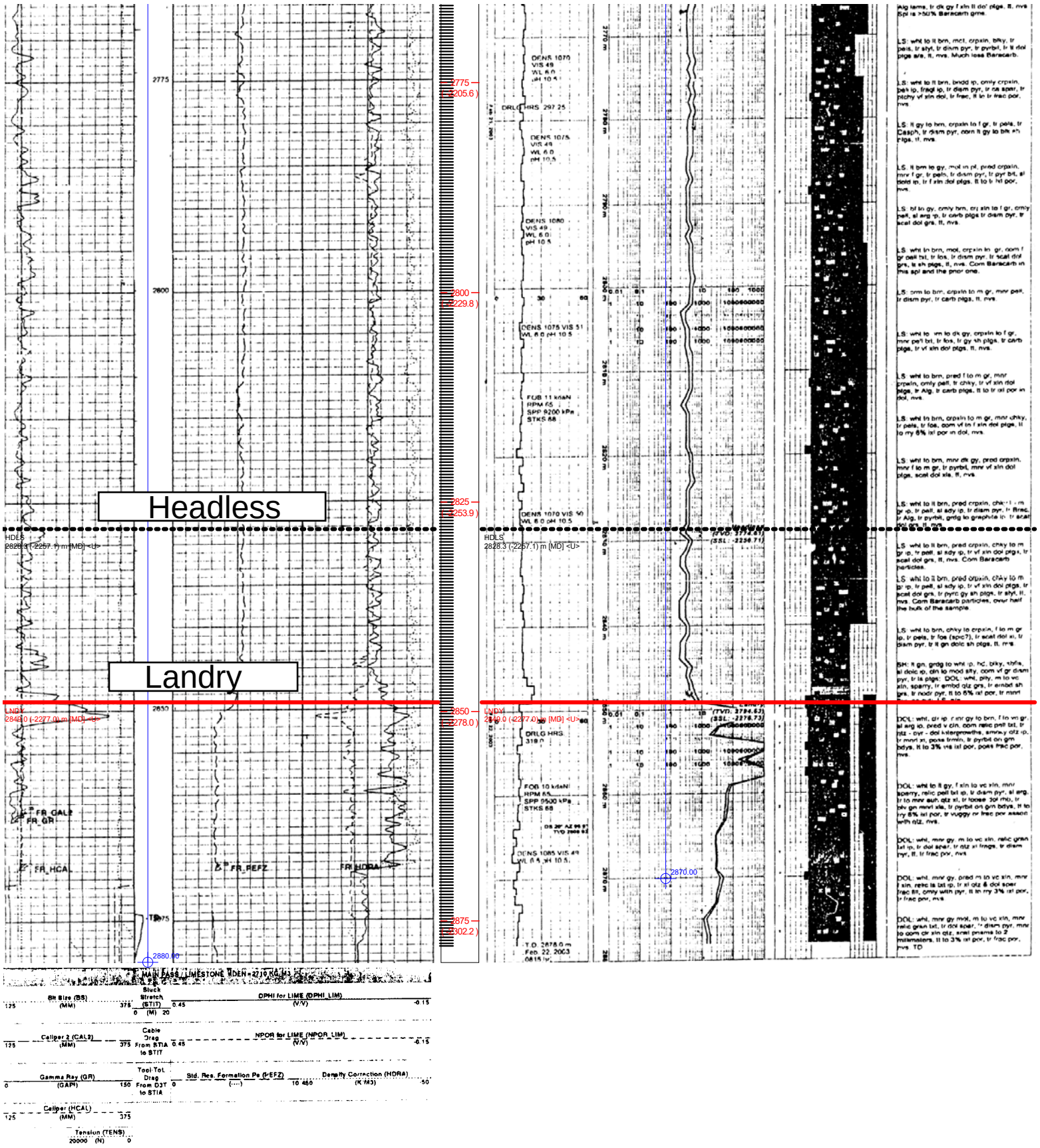
Tight

Porous Streak 2641-2646 mKB

Keg River/Sulphur Point

Tight

Tight with very poor fracture porosity stringers (in red)



Tight

Tight 2828-2849 mKB (Headless)

Porous 2849-2878 mKB (Landry)

DST Information

Prod	Oil (m3)	Gas (E3m3)	Water (m3)
Cum	0.0	0.0	0.0
Daily	0.0	0.0	0.0

Premium Value.
Defined Growth.
Independent.
Canadian Natural

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ARROWHEAD RIVER I-75
DETAILED OPENHOLE SECTION REVIEW

Les Gray P.Geol.

Anadarko Arrowhead River I-75 (300/I 75 60-40 122-45/0) License 1981

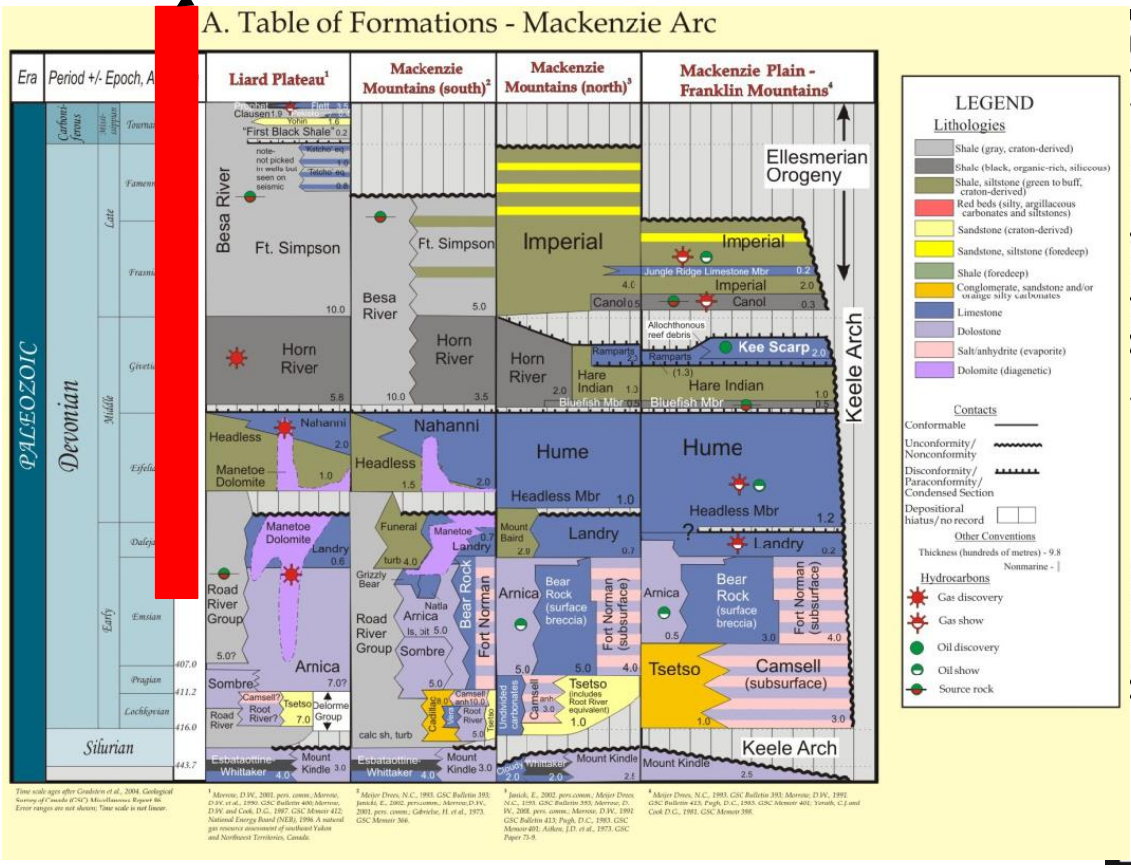
ANADARKO ARROWHEAD RIVER I-75 (300/I-75-60.40-122.45/00) License # 001981 was drilled down into the Slave Point at 2586 (mKB), logged with a full suite of logs and then cased with an intermediate casing. The well was then drilled into the open hole section and reached total depth in the Landry 2878 (mKB).

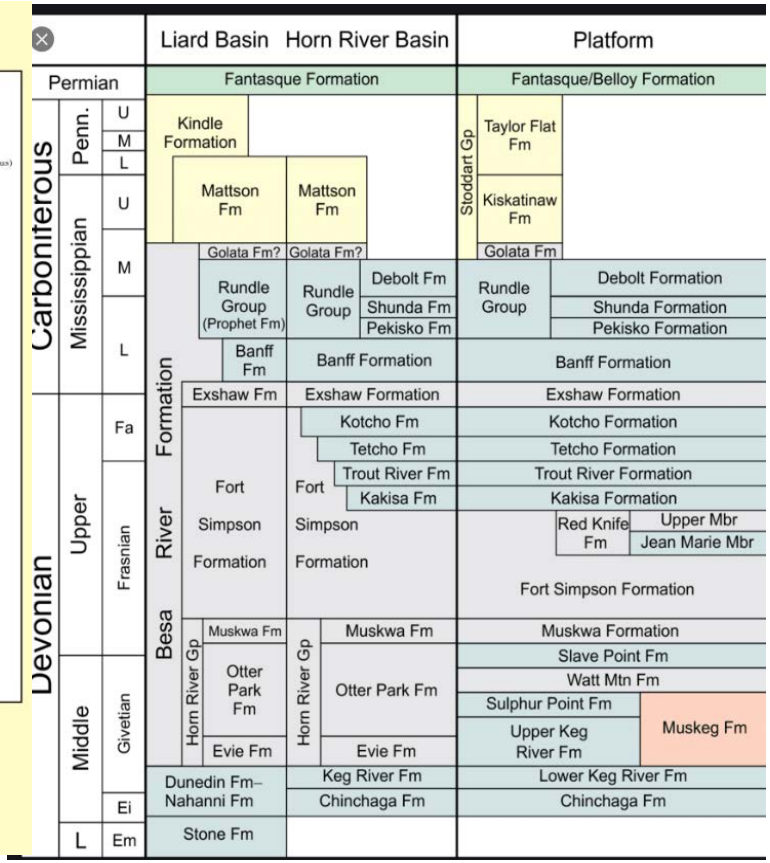
In the open hole section, a strip log (lithological log) which plots a curve based on ROP (rate of penetration) of the drilling rig was created during the drilling operation. A gas detector was installed at the shaker to record mud gas while drilling and the data was plotted on the same strip log.

Drill cuttings indicate a fractured reservoir which is supported by seismic data showing a fault across the zones in the open hole section (see geophysical review slide 7). This is evidence for connectivity between the Headless, Keg River and Landry and indicates that there are ***no discrete zones*** within the open hole section. The openhole log (attached) supports the cuttings.

Fort Liard Geological Formations

I 75 and K 35



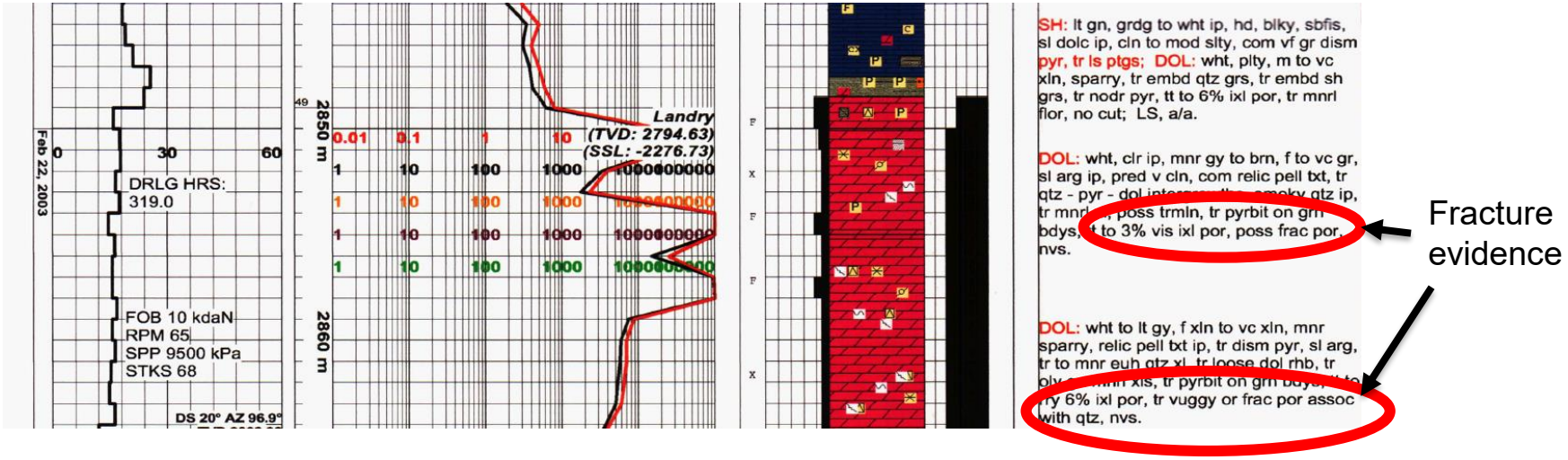


Anadarko Arrowhead River I-75

(300/I 75 60-40 122-45/0) License 1981 (Landry) - cuttings description, gas log

Gas response and porosity observed in the Landry with fractures evident.

Lithology/ Strip Log



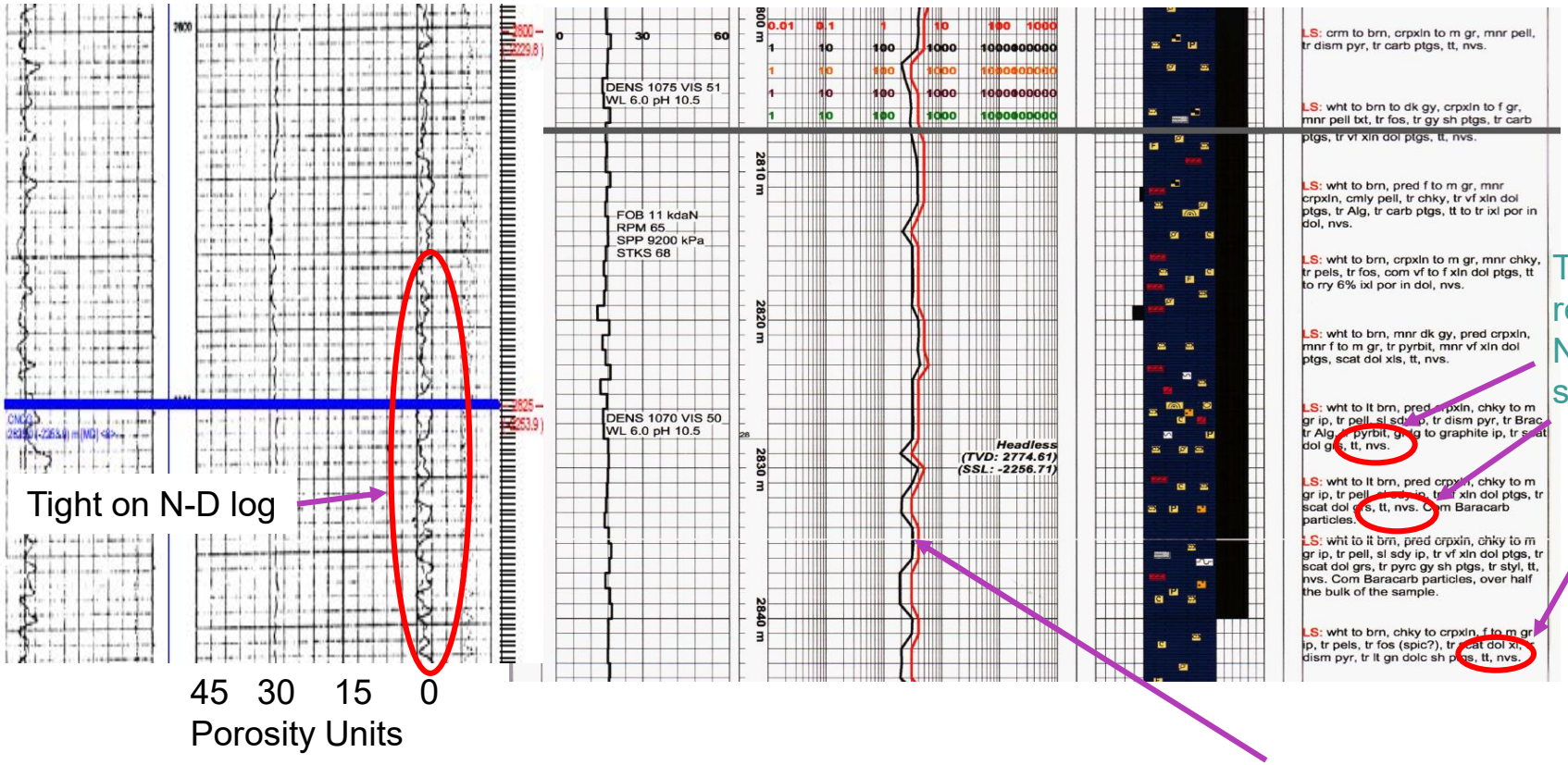
Anadarko Arrowhead River I-75

(300/I 75 60-40 122-45/0) License 1981 (Headless) - cuttings description, gas log

No gas response and “tight” (tt) reservoir with no visible shows (nvs)
reported in cuttings and Neutron-Density Log suggests zone is tight and not present or not discrete

Neutron-Density Log

Lithology/ Strip Log

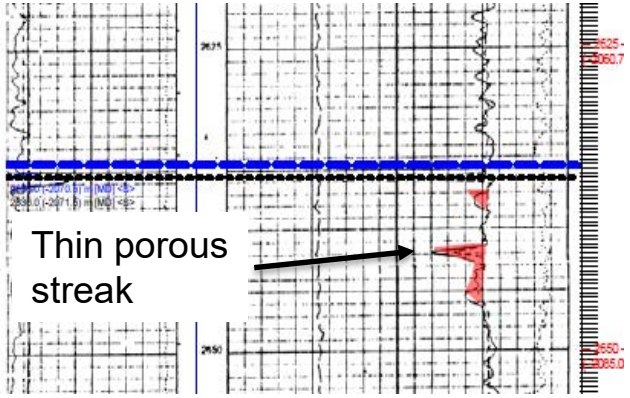


Anadarko Arrowhead River I-75

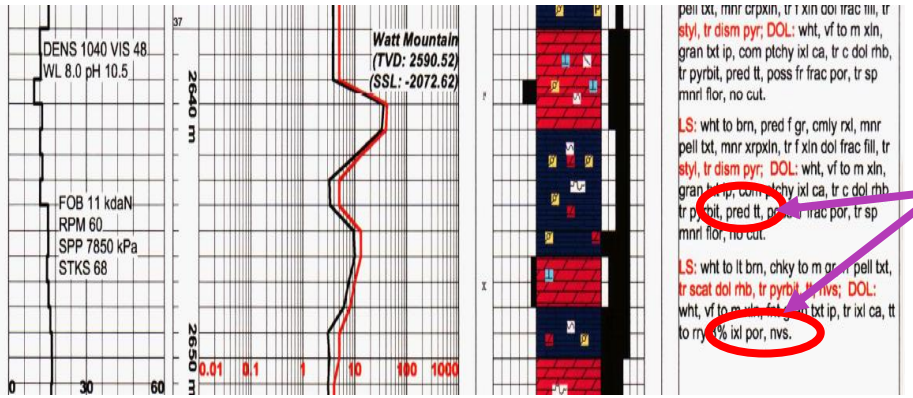
(300/l 75 60-40 122-45/0) License 1981 (Keg River/Sulphur Point) - cuttings description, gas log

Weak gas response and “tight” (tt) reservoir with no visible shows (nvs) reported in cuttings suggests zone is very poor or not present (non discrete). Thin porous streak on Neutron-Density Log (2641-2646 mKB)

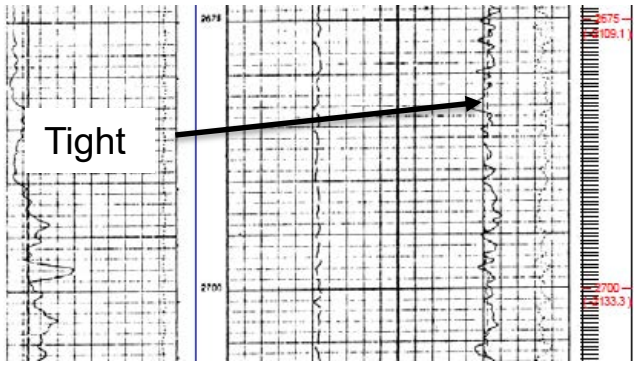
Neutron-Density Log

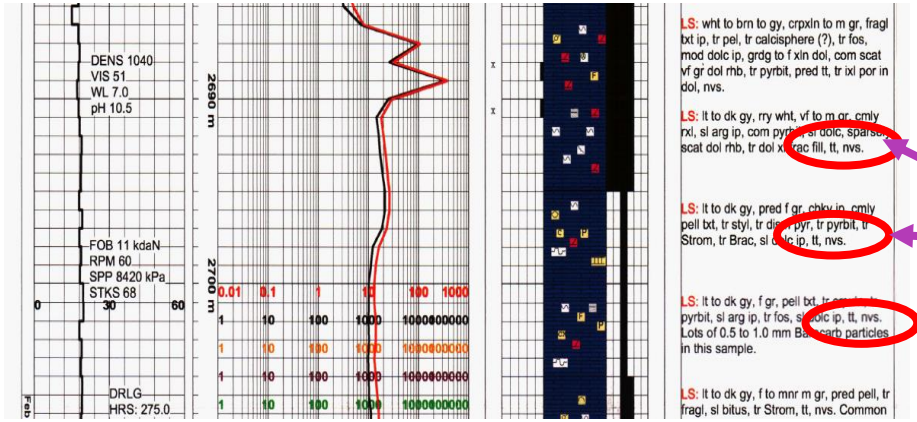


Lithology Log (strip log)



Tight (tt) no visible shows (nvs)

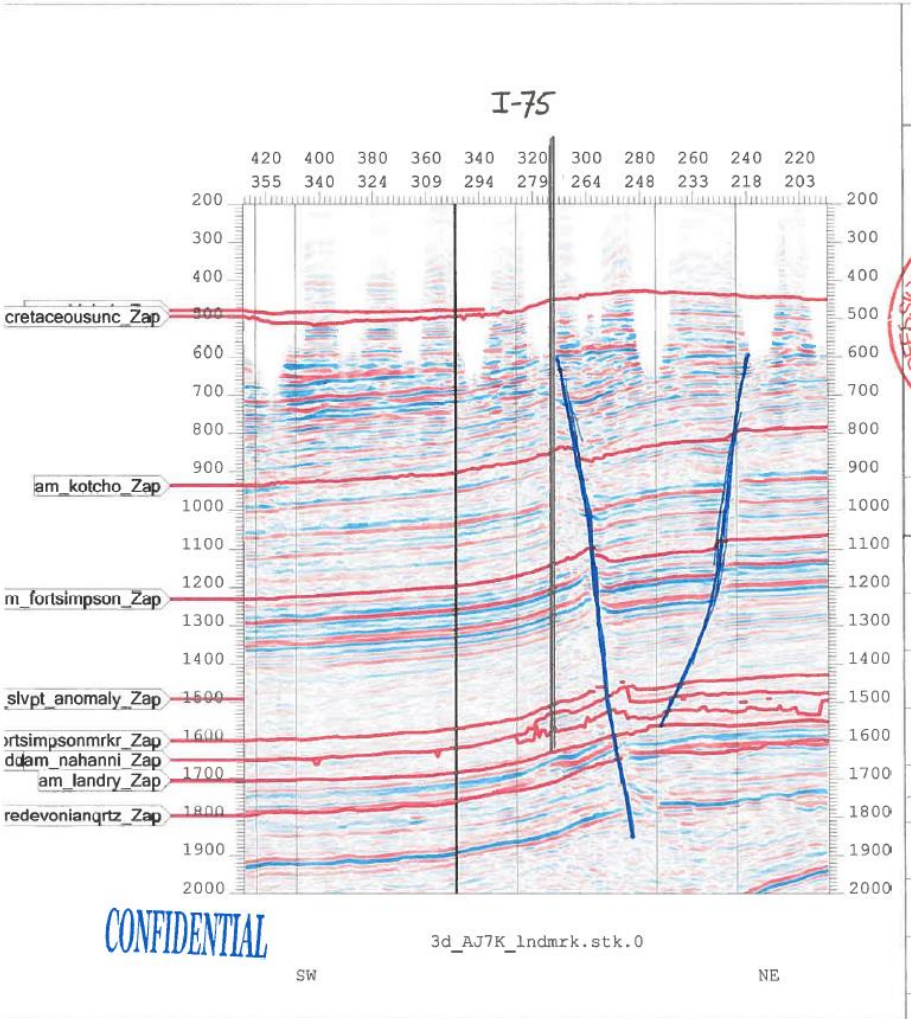


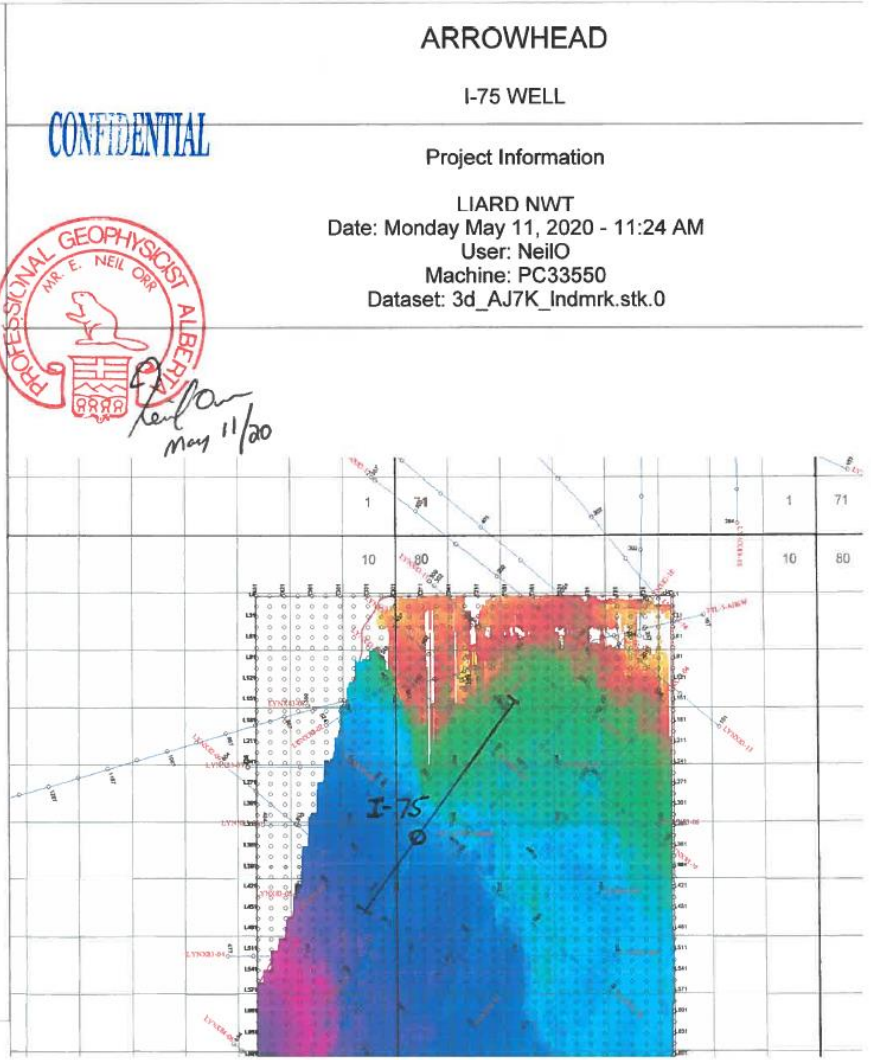


Tight (tt) no visible shows (nvs)

Anadarko Arrowhead River I-75

(300/I75 60-40 122-45/0) License 1981 (produced by Neil Orr)





Conclusion

- Drill cuttings and gas response indicate very poor / nil reservoir quality in the Keg River/Sulphur Point and Headless in both wells.
- Seismic data reveals a large near vertical fault system that intersects and connects all the open hole zones (Keg River, Headless and Landry).
- Drill cutting interpretation provides further evidence of the fault system in both wells with repeated notes on fracture features within the samples.
- ***It can be concluded with confidence that no discrete zones exist over the open hole section.***

PROVEN | EFFECTIVE | STRATEGY

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Downhole Schematic (Gov't Submission)
ANADARKO ARROWHEAD RIVER I-75

Canadian Natural

Current Event (UWI)	Surface Legal Location	License #	Field Name	Province
300/I-75-60.40-122.45/00		NT001981	FT LIARD	N.W.T

Well Profile	Fluid Type	Original KB Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)	KB-Tubing Head Distance (m)
Directional	Deep Gas	517.90	7.10	6.96	517.90

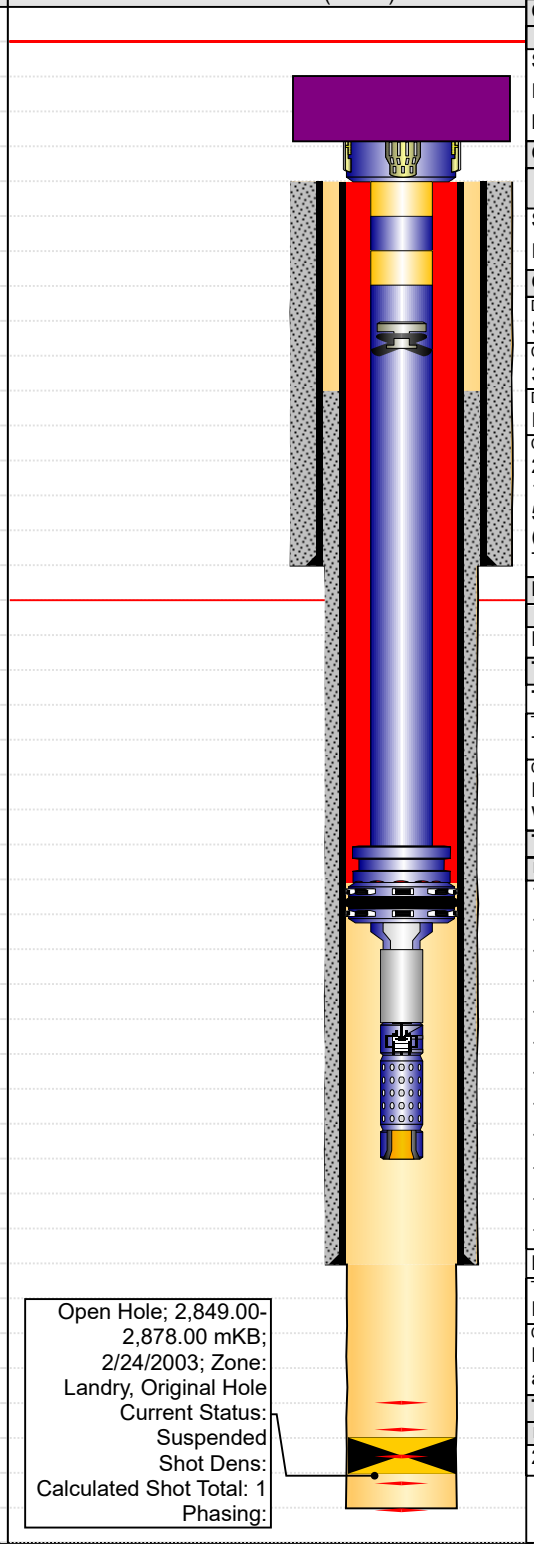
Latitude (°)	Longitude (°)	Orig Spud Date	Orig RR Date	C&C Date	GW Protected?	BGWP (mKB)	Oilsand Area
60° 34' 32.689" N	122° 57' 56.848" W	1/25/2003	2/28/2003				No

Directions To Well	H2S Classification
From Ft. Liard, NWT go NE on Hwy #7 to Km 72 road (app 34km), right along Km 72 road to Km 33.5, left past camp 1.4km to location	Sour

Directional - Original Hole, 6/1/2020 11:08:41 AM

MD (mKB)	TVD (mKB)
0.0	0.0
5.2	5.2
6.8	6.8
7.0	7.0
7.1	7.1
7.5	7.5
16.6	16.6
22.4	22.4
60.0	60.0
61.0	61.0
470.0	469.9
607.1	607.0
640.2	640.0
640.5	640.3
654.5	654.3
655.0	654.8
697.0	696.8
1,236.0	1,235.1
1,253.0	1,252.0
1,658.0	1,643.8
1,684.0	1,668.6
1,774.0	1,755.4
1,812.0	1,792.0
2,553.0	2,508.3
2,553.6	2,508.9
2,554.4	2,509.7
2,554.5	2,509.8
2,557.2	2,512.4
2,557.5	2,512.7
2,557.8	2,513.0
2,558.0	2,513.2
2,567.4	2,522.4
2,567.6	2,522.5
2,574.0	2,528.8
2,585.8	2,540.3
2,586.0	2,540.5
2,633.0	2,586.3
2,639.0	2,592.2
2,828.0	2,774.3
2,849.0	2,794.4
2,861.0	2,805.8
2,862.4	2,807.1
2,878.0	2,821.8

Vertical schematic (actual)



SCVF & GM Tests (Last 2 Records)

Test Date	Test Type	Failed?
6/1/2016	SCVF	No

Openhole Information

Section Des	Size (mm)	Top (mKB)	Bottom (mKB)
Surface	311.2	7.10	655.00
Intermediate 1	215.9	655.00	2,586.00
Main 1	155.6	2,586.00	2,878.00

Casing Strings

Csg Des	OD (mm)	Wt/Len (kg/m)	Grade	Top (mKB)	Set Depth (MD) (mKB)
Surface	244.5	59.527	L-80	7.10	655.00
Intermediate	177.8	38.692	L-80	7.10	2,586.00

Cement Stages

Description	Cementing Start Date	Top Depth (mKB)	Btm (mKB)	Vol Cement Re...
Surface Cement	2/1/2003	7.10	655.00	2.00

Comment: 39.0 tonnes (29.5m3) G, no additives, 2.0m3 cement returns

Description	Cementing Start Date	Top Depth (mKB)	Btm (mKB)	Vol Cement Re...
Intermediate Cement	2/16/2003	470.00	2,586.00	0.00

Comment: 29.4 (26m3) tonnes 1-1-2 G + 4.0% gel + 0.5% CD-31 + 0.05% R-3 + 5.0L/m3 AF-1 tailed with 7.3 tonnes Thermal 40F + 0.5% CD-32 + 0.4% FL-77 + 0.15% R-3 + 5.0L/m3 AF-1, 3.0m3 preflush returns - TOC calculated at 470mKB. (preflush/spacer was 6.0m3 HT40 NT, 6.0m3 Nowflush, 3.0m3 scavenger cement). TOC est'd at 470mKB.

Perforations

Zone	Top (mKB)	Btm (mKB)	Current Status
Landry, Original Hole	2,849.00	2,878.00	Suspended

Tubing Strings

Tubing - Production set at 2,567.63mKB on 2/28/2003 00:00

Tubing Description	String Max N...	Wt (kg/m)	String Grade
Tubing - Production	88.9	13.840	L-80

Comment: Packer pressure tested to 15 MPa - 2/28/2003
Wellhead installed, no comment about pressure testing seals - 2/28/2003

Tubing Components

Item #	Jts	Item Des	OD (mm)	ID (mm)	Len (m)	Top (mKB)	Btm (mKB)
1-1	1	Cooper Cameron Tubing Hanger c/w...	177.8	153.9	0.28	6.82	7.10
1-2	1	Hydril Pup Jt - pin x pin	88.9	76.0	0.44	7.10	7.54
1-3	1	Tubing - Hydril 553CB	88.9	76.0	9.05	7.54	16.59
1-4	3	Tubing Pup Joint - Hydril 553CB	88.9	76.0	5.84	16.59	22.43
1-5	268	Tubing - Hydril 553CB	88.9	76.0	2,530.59	22.43	2,553.02
1-6	1	Howco On-Off 47.63mm Baker "F" -...	139.0	76.0	0.63	2,553.02	2,553.65
1-7	1	Howco BWC Perm Packer	150.0	82.6	0.77	2,553.65	2,554.42
1-8	1	BWC Crossxover 88.9 x 60.3 mm	88.9	50.7	0.11	2,554.42	2,554.53
1-9	1	Tubing Pup Jt - Hydril 553 CB - coated	60.3	50.7	3.00	2,554.53	2,557.53
1-10	1	Baker "F" Nipple 46mm - coated	60.3	46.0	0.28	2,557.53	2,557.81
1-11	1	Perforated Pup Jt Hydril 553CB - co...	60.3	50.7	9.62	2,557.81	2,567.43
1-12	1	Wireline Guide 45.5mm No-Go - coa...	60.3	45.5	0.20	2,567.43	2,567.63

FWG Plug set at 2,557.81mKB on 2/20/2004 19:00

Tubing Description	String Max N...	Wt (kg/m)	String Grade
FWG Plug	45.9		

Comment: No positive test, negative only. First negative test failed overnight. Pulled, dressed and reran plug, appeared to hold negative preesure test.

Tubing Components

Item #	Jts	Item Des	OD (mm)	ID (mm)	Len (m)	Top (mKB)	Btm (mKB)
2-1		FSG Plug (1.81")	45.9		0.28	2,557.53	2,557.81

Downhole Schematic (Gov't Submission)
ANADARKO ARROWHEAD RIVER I-75

Canadian Natural

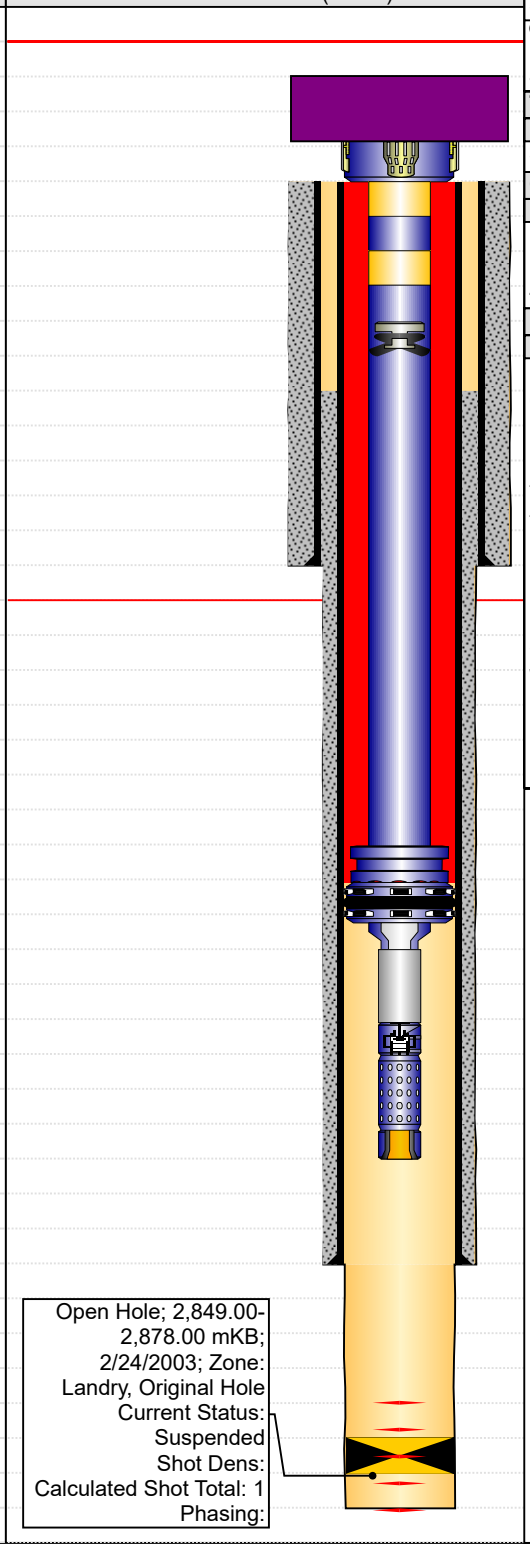
Current Event (UWI)	Surface Legal Location	License #	Field Name	Province
300/I-75-60.40-122.45/00		NT001981	FT LIARD	N.W.T

Well Profile	Fluid Type	Original KB Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)	KB-Tubing Head Distance (m)
Directional	Deep Gas	517.90	7.10	6.96	517.90

Directional - Original Hole, 6/1/2020 11:08:43 AM

MD (mKB)	TVD (mKB)
0.0	0.0
5.2	5.2
6.8	6.8
7.0	7.0
7.1	7.1
7.5	7.5
16.6	16.6
22.4	22.4
60.0	60.0
61.0	61.0
470.0	469.9
607.1	607.0
640.2	640.0
640.5	640.3
654.5	654.3
655.0	654.8
697.0	696.8
1,236.0	1,235.1
1,253.0	1,252.0
1,658.0	1,643.8
1,684.0	1,668.6
1,774.0	1,755.4
1,812.0	1,792.0
2,553.0	2,508.3
2,553.6	2,508.9
2,554.4	2,509.7
2,554.5	2,509.8
2,557.2	2,512.4
2,557.5	2,512.7
2,557.8	2,513.0
2,558.0	2,513.2
2,567.4	2,522.4
2,567.6	2,522.5
2,574.0	2,528.8
2,585.8	2,540.3
2,586.0	2,540.5
2,633.0	2,586.3
2,639.0	2,592.2
2,828.0	2,774.3
2,849.0	2,794.4
2,861.0	2,805.8
2,862.4	2,807.1
2,878.0	2,821.8

Vertical schematic (actual)



Tubing Strings

Slip Stop & HW Plug set at 61.00mKB on 2/20/2004 20:00

Tubing Description	String Max N...	Wt (kg/m)	String Grade
Slip Stop & HW Plug	88.9		

Comment: No positive test on lower plug prior to setting, tbg full of inhibited fluid. Slip stop set at 54mCF.

Tubing Components

Item #	Jts	Item Des	OD (mm)	ID (mm)	Len (m)	Top (mKB)	Btm (mKB)
3-1		Slip Stop and Hook Wall Plug	88.9	0.0	1.00	60.00	61.00

Other In Hole

Des	Run Date	Pull Date	Top (mKB)	Btm (mKB)
Inhibited Water			7.10	2,553.65
Inflatabale BP - Seal Off Wet Zone	2/24/2003		2,861.00	2,862.40

Formation Tops

Formation Name	Top (mKB)	Com
Base Ground Water	607.10	OROGO default
Chinkeh	697.00	Porous
Exshaw	1,236.00	Tight
Kotcho	1,253.00	Porous
Tetcho	1,658.00	Porous
Trout River	1,684.00	Porous
Kakisa	1,774.00	Tight
Fort Simpson	1,812.00	Tight
Muskwa	2,558.00	Tight
Slave Point	2,574.00	Tight
Watt Mountain	2,633.00	Tight
Keg River	2,639.00	Tight with porosity streak (poor)
Headless	2,828.00	Tight
Landry	2,849.00	Porous

Downhole Schematic (Gov't Submission)
ARROWHEAD RIVER I-75 - PROPOSED

Canadian Natural

Current Event (UWI)	Surface Legal Location	License #	Field Name	Province
300/I-75-60.40-122.45/00		NT001981		N.W.T

Well Profile	Fluid Type	Original KB Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)	KB-Tubing Head Distance (m)
Directional	Deep Gas	517.90	7.10	6.96	517.90

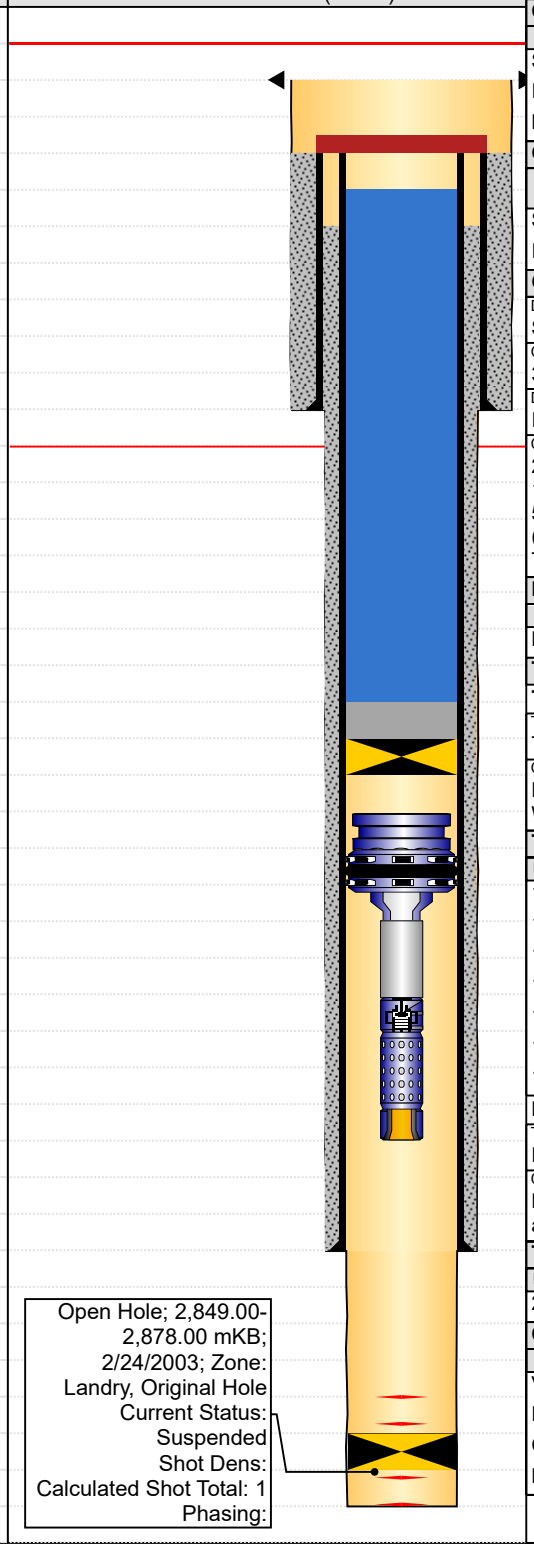
Latitude (°)	Longitude (°)	Orig Spud Date	Orig RR Date	C&C Date	GW Protected?	BGWP (mKB)	Oilsand Area
60° 34' 32.689" N	122° 57' 56.848" W	1/25/2003	2/28/2003				No

Directions To Well	H2S Classification
From Ft. Liard, NWT go NE on Hwy #7 to Km 72 road (app 34km), right along Km 72 road to Km 33.5, left past camp 1.4km to location	Sour

Directional - Original Hole, 6/1/2020 11:14:04 AM

MD (mKB)	TVD (mKB)
0.0	0.0
7.1	7.1
8.9	8.9
9.0	9.0
10.0	10.0
470.0	469.9
607.1	607.0
640.2	640.0
640.5	640.3
654.5	654.3
655.0	654.8
697.0	696.8
1,236.0	1,235.1
1,253.0	1,252.0
1,658.0	1,643.8
1,684.0	1,668.6
1,774.0	1,755.4
1,812.0	1,792.0
2,521.0	2,477.2
2,552.0	2,507.4
2,552.3	2,507.7
2,553.0	2,508.3
2,553.6	2,508.9
2,554.4	2,509.7
2,554.5	2,509.8
2,557.2	2,512.4
2,557.5	2,512.7
2,557.8	2,513.0
2,558.0	2,513.2
2,567.4	2,522.4
2,567.6	2,522.5
2,574.0	2,528.8
2,585.8	2,540.3
2,586.0	2,540.5
2,633.0	2,586.3
2,639.0	2,592.2
2,828.0	2,774.3
2,849.0	2,794.4
2,861.0	2,805.8
2,862.4	2,807.1
2,878.0	2,821.8

Vertical schematic (actual)



SCVF & GM Tests (Last 2 Records)

Test Date	Test Type	Failed?
6/1/2016	SCVF	No

Openhole Information

Section Des	Size (mm)	Top (mKB)	Bottom (mKB)
Surface	311.2	7.10	655.00
Intermediate 1	215.9	655.00	2,586.00
Main 1	155.6	2,586.00	2,878.00

Casing Strings

Csg Des	OD (mm)	Wt/Len (kg/m)	Grade	Top (mKB)	Set Depth (MD) (mKB)
Surface	244.5	59.527	L-80	9.00	655.00
Intermediate	177.8	38.692	L-80	9.00	2,586.00

Cement Stages

Description	Cementing Start Date	Top Depth (mKB)	Btm (mKB)	Vol Cement Re…
Surface Cement	2/1/2003	9.00	655.00	2.00

Comment: 39.0 tonnes (29.5m3) G, no additives, 2.0m3 cement returns

Description	Cementing Start Date	Top Depth (mKB)	Btm (mKB)	Vol Cement Re…
Intermediate Cement	2/16/2003	470.00	2,586.00	0.00

Comment: 29.4 (26m3) tonnes 1-1-2 G + 4.0% gel + 0.5% CD-31 + 0.05% R-3 + 5.0L/m3 AF-1 tailed with 7.3 tonnes Thermal 40F + 0.5% CD-32 + 0.4% FL-77 + 0.15% R-3 + 5.0L/m3 AF-1, 3.0m3 preflush returns - TOC calculated at 470mKB. (preflush/spacer was 6.0m3 HT40 NT, 6.0m3 Nowflush, 3.0m3 scavenger cement). TOC est'd at 470mKB.

Perforations

Zone	Top (mKB)	Btm (mKB)	Current Status
Landry, Original Hole	2,849.00	2,878.00	Suspended

Tubing Strings

Tubing - Production set at 2,567.63mKB on 2/28/2003 00:00

Tubing Description	String Max N…	Wt (kg/m)	String Grade
Tubing - Production	60.3	6.990	L80

Comment: Packer pressure tested to 15 MPa - 2/28/2003
Wellhead installed, no comment about pressure testing seals - 2/28/2003

Tubing Components

Item #	Jts	Item Des	OD (mm)	ID (mm)	Len (m)	Top (mKB)	Btm (mKB)
1-1	1	Howco On-Off 47.63mm Baker "F" -…	139.0	76.0	0.63	2,553.02	2,553.65
1-2	1	Howco BWC Perm Packer	150.0	82.6	0.77	2,553.65	2,554.42
1-3	1	BWC Crossxover 88.9 x 60.3 mm	88.9	50.7	0.11	2,554.42	2,554.53
1-4	1	Tubing Pup Jt - Hydril 553 CB - coated	60.3	50.7	3.00	2,554.53	2,557.53
1-5	1	Baker "F" Nipple 46mm - coated	60.3	46.0	0.28	2,557.53	2,557.81
1-6	1	Perforated Pup Jt Hydril 553CB - co…	60.3	50.7	9.62	2,557.81	2,567.43
1-7	1	Wireline Guide 45.5mm No-Go - coa…	60.3	45.5	0.20	2,567.43	2,567.63

FWG Plug set at 2,557.81mKB on 2/20/2004 19:00

Tubing Description	String Max N…	Wt (kg/m)	String Grade
FWG Plug	45.9		

Comment: No positive test, negative only. First negative test failed overnight. Pulled, dressed and reran plug, appeared to hold negative preesure test.

Tubing Components

Item #	Jts	Item Des	OD (mm)	ID (mm)	Len (m)	Top (mKB)	Btm (mKB)
2-1		FSG Plug (1.81")	45.9		0.28	2,557.53	2,557.81

Other In Hole

Des	Run Date	Pull Date	Top (mKB)	Btm (mKB)
Vented Steel Cap			8.95	9.00
Fresh Water			10.00	2,521.00
Cement			2,521.00	2,552.00
Bridge Plug - Permanent			2,552.00	2,552.30

Downhole Schematic (Gov't Submission)
ARROWHEAD RIVER I-75 - PROPOSED

Canadian Natural

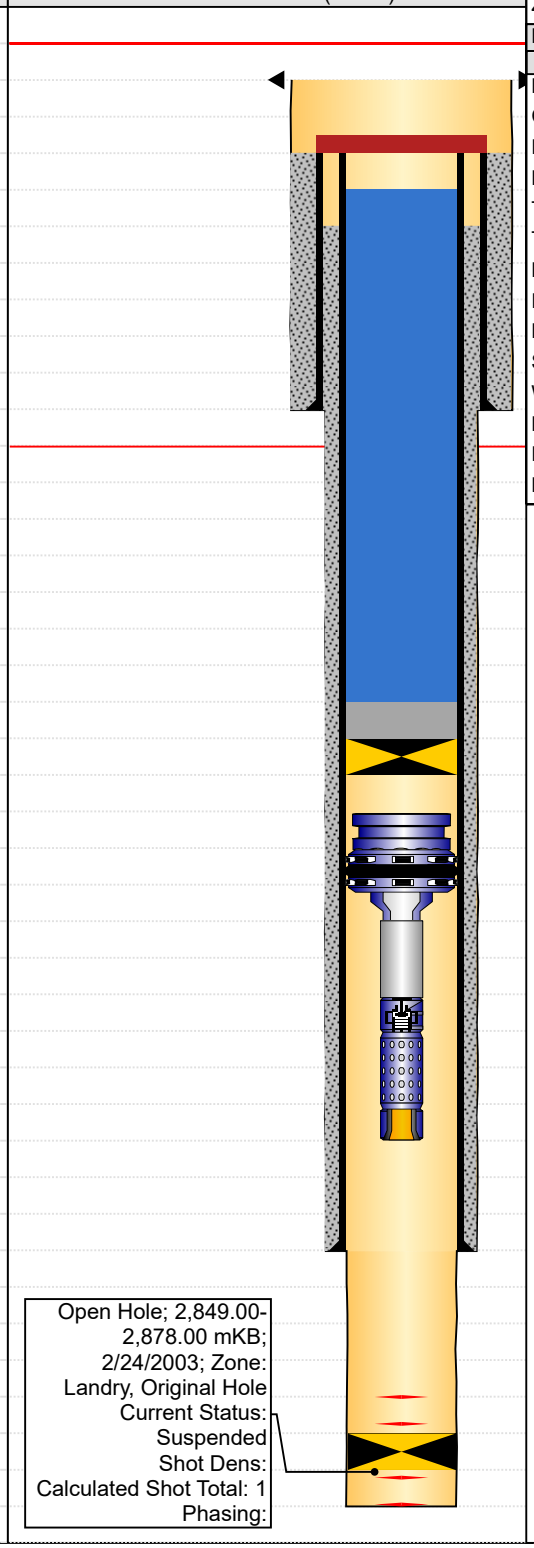
Current Event (UWI)	Surface Legal Location	License #	Field Name	Province
300/I-75-60.40-122.45/00		NT001981		N.W.T

Well Profile	Fluid Type	Original KB Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)	KB-Tubing Head Distance (m)
Directional	Deep Gas	517.90	7.10	6.96	517.90

Directional - Original Hole, 6/1/2020 11:14:06 AM

MD (mKB)	TVD (mKB)
0.0	0.0
7.1	7.1
8.9	8.9
9.0	9.0
10.0	10.0
470.0	469.9
607.1	607.0
640.2	640.0
640.5	640.3
654.5	654.3
655.0	654.8
697.0	696.8
1,236.0	1,235.1
1,253.0	1,252.0
1,658.0	1,643.8
1,684.0	1,668.6
1,774.0	1,755.4
1,812.0	1,792.0
2,521.0	2,477.2
2,552.0	2,507.4
2,552.3	2,507.7
2,553.0	2,508.3
2,553.6	2,508.9
2,554.4	2,509.7
2,554.5	2,509.8
2,557.2	2,512.4
2,557.5	2,512.7
2,557.8	2,513.0
2,558.0	2,513.2
2,567.4	2,522.4
2,567.6	2,522.5
2,574.0	2,528.8
2,585.8	2,540.3
2,586.0	2,540.5
2,633.0	2,586.3
2,639.0	2,592.2
2,828.0	2,774.3
2,849.0	2,794.4
2,861.0	2,805.8
2,862.4	2,807.1
2,878.0	2,821.8

Vertical schematic (actual)



Other In Hole

Des	Run Date	Pull Date	Top (mKB)	Btm (mKB)
Inflatabale BP - Seal Off Wet Zone	2/24/2003		2,861.00	2,862.40

Formation Tops

Formation Name	Top (mKB)	Com
Base Ground Water	607.10	OROGO default
Chinkeh	697.00	Porous
Exshaw	1,236.00	Tight
Kotcho	1,253.00	Porous
Tetcho	1,658.00	Porous
Trout River	1,684.00	Porous
Kakisa	1,774.00	Tight
Fort Simpson	1,812.00	Tight
Muskwa	2,558.00	Tight
Slave Point	2,574.00	Tight
Watt Mountain	2,633.00	Tight
Keg River	2,639.00	Tight with porosity streak (poor)
Headless	2,828.00	Tight
Landry	2,849.00	Porous