



HYDROCARBON LIQUID ANALYSIS

Z0000443 - 7		30035	52136-2014-6514
CONTAINER IDENTITY	METER ID	WELL LICENSE NUMBER	LABORATORY FILE NUMBER
ARC Resources Ltd.			5
OPERATOR			PAGE
102/15-02-081-16W6/00	ARCRes HZ Parkland A16-35-80-16	678.2	
LOCATION (UWI)	WELL NAME	KB ELEV (m)	GR ELEV (m)
Parkland	Montney	Cathedral Energy	
FIELD OR AREA	POOL OR ZONE	SAMPLER	

TEST TYPE AND NO. _____ TEST RECOVERY _____

Oil Sight Glass

	POINT OF SAMPLE	SAMPLE POINT ID																
	<table border="0" style="width: 100%;"> <tr> <td style="width: 25%; border-bottom: 1px solid black;">PUMPING</td> <td style="width: 25%; border-bottom: 1px solid black;">FLOWING</td> <td style="width: 25%; border-bottom: 1px solid black;">GAS LIFT</td> <td style="width: 25%; border-bottom: 1px solid black;">SWAB</td> </tr> <tr> <td style="font-size: x-small;">WATER</td> <td style="font-size: x-small;">OIL</td> <td style="font-size: x-small;">GAS</td> <td style="font-size: x-small;">GAS</td> </tr> <tr> <td style="text-align: center;">15.7</td> <td style="text-align: center;">m³/d</td> <td style="text-align: center;">37.40</td> <td style="text-align: center;">m³/d</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">212700</td> <td style="text-align: center;">m³/d</td> </tr> </table>	PUMPING	FLOWING	GAS LIFT	SWAB	WATER	OIL	GAS	GAS	15.7	m ³ /d	37.40	m ³ /d			212700	m ³ /d	
PUMPING	FLOWING	GAS LIFT	SWAB															
WATER	OIL	GAS	GAS															
15.7	m ³ /d	37.40	m ³ /d															
		212700	m ³ /d															

TEST INTERVAL or PERFS (meters)			
2947			
SEPARATOR	RESERVOIR	OTHER	CONTAINER WHEN SAMPLED @ °C
			1310 @ 22 °C
		10	
		SEPARATOR	OTHER
at 09:00 hrs Pressures, kPa (gauge)		Temperatures, °C	

2014 07 12	2014 07 18	2014 07 29	TM
DATE SAMPLED (Y/M/D)	DATE RECEIVED (Y/M/D)	DATE ANALYZED (Y/M/D)	ANALYST
		AMT. AND TYPE CUSHION	MUD RESISTIVITY @ °C

COMPONENT	MOLE FRACTION	MASS FRACTION	LIQUID VOLUME FRACTION	mL/m ³
N ₂	0.0002	0.0001	0.0001	0.3
CO ₂	0.0004	0.0002	0.0002	0.9
H ₂ S	0.0000	0.0000	0.0000	0.0
C ₁	0.1030	0.0219	0.0465	232.9
C ₂	0.0909	0.0361	0.0645	323.0
C ₃	0.1404	0.0819	0.1029	515.9
iC ₄	0.0410	0.0315	0.0357	179.0
C ₄	0.1124	0.0864	0.0944	472.9
iC ₅	0.0448	0.0427	0.0436	218.7
C ₅	0.0710	0.0677	0.0685	343.5
C ₆	0.0852	0.0965	0.0924	467.7
C ₇₊	0.3107	0.5350	0.4512	2,258.1
Total	1.0000	1.0000	1.0000	5,012.9

OBSERVED PROPERTIES OF C ₇₊ RESIDUE (15/15°C)		
756.5 kg/m ³	0.7572	55.5
DENSITY	RELATIVE DENSITY	API @ 15.5 °C
130		
RELATIVE MOLECULAR MASS		

CALCULATED PROPERTIES OF TOTAL SAMPLE (15/15°C)		
638.2 kg/m ³	0.6387	90.2
DENSITY	RELATIVE DENSITY	API @ 15.5 °C
75.62		
RELATIVE MOLECULAR MASS		

GAS EQUIVALENT
0.1996 10 ³ m ³ Gas/m ³ Liquid (E ³ m ³ /m ³)

REMARKS: Saturation pressure @ 22°C (kPa gauge) = 2310
Refer to page 5a for extended analysis.

NOTE: All Properties have been calculated utilizing physical constants.



HYDROCARBON LIQUID ANALYSIS

Operator: ARC Resources Ltd.
 Well: ARCRes HZ Parkland A16-35-80-16
 Sample Point: Oil Sight Glass

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 File: 52136-2014-6514-7-Z0000443
 Date: 2014 07 31

Analysis of C₆₊ Fraction

Boiling Point: Range (° C)	Component	Carbon Number	Mole Fraction	Mass Fraction	Liq. Vol. Fraction
36.1- 68.9	Hexanes	C ₆	0.0817	0.0992	0.0946
68.9- 98.3	Heptanes	C ₇	0.0626	0.0883	0.0814
98.3-125.6	Octanes	C ₈	0.0533	0.0856	0.0770
125.6-150.6	Nonanes	C ₉	0.0364	0.0657	0.0577
150.6-173.9	Decanes	C ₁₀	0.0241	0.0482	0.0416
173.9-196.1	Undecanes	C ₁₁	0.0155	0.0320	0.0258
196.1-215.0	Dodecanes	C ₁₂	0.0094	0.0213	0.0169
215.0-235.0	Tridecanes	C ₁₃	0.0072	0.0177	0.0138
235.0-252.2	Tetradecanes	C ₁₄	0.0043	0.0114	0.0088
252.2-270.6	Pentadecanes	C ₁₅	0.0032	0.0093	0.0071
270.6-287.8	Hexadecanes	C ₁₆	0.0019	0.0059	0.0045
287.8-302.8	Heptadecanes	C ₁₇	0.0015	0.0050	0.0038
302.8-317.2	Octadecanes	C ₁₈	0.0012	0.0042	0.0031
317.2-330.0	Nonadecanes	C ₁₉	0.0009	0.0033	0.0025
330.0-344.4	Eicosanes	C ₂₀	0.0006	0.0023	0.0017
344.4-357.2	Heneicosanes	C ₂₁	0.0005	0.0020	0.0014
357.2-369.4	Docosanes	C ₂₂	0.0004	0.0018	0.0013
369.4-380.0	Tricosanes	C ₂₃	0.0003	0.0013	0.0009
380.0-391.1	Tetracosanes	C ₂₄	0.0003	0.0015	0.0011
391.1-401.7	Pentacosanes	C ₂₅	0.0003	0.0015	0.0011
401.7-412.2	Hexacosanes	C ₂₆	0.0002	0.0010	0.0007
412.2-422.2	Heptacosanes	C ₂₇	0.0002	0.0010	0.0008
422.2-431.7	Octacosanes	C ₂₈	0.0002	0.0011	0.0008
431.7-441.1	Nonacosanes	C ₂₉	0.0002	0.0011	0.0008
441.1 PLUS	Triacontanes Plus	C ₃₀₊	0.0006	0.0038	0.0027
80.0	Benzene	C ₆ H ₆	0.0036	0.0039	0.0028
110.6	Toluene	C ₇ H ₈	0.0089	0.0116	0.0084
136.1-138.9	Ethylbenzene, p + m-Xylene	C ₈ H ₁₀	0.0107	0.0160	0.0117
144.4	o-Xylene	C ₈ H ₁₀	0.0018	0.0027	0.0019
168.9	1,2,4 Trimethylbenzene	C ₉ H ₁₂	0.0028	0.0047	0.0034
48.9	Cyclopentane	C ₅ H ₁₀	0.0034	0.0033	0.0028
72.2	Methylcyclopentane	C ₆ H ₁₂	0.0140	0.0166	0.0140
81.1	Cyclohexane	C ₆ H ₁₂	0.0163	0.0193	0.0157
101.1	Methylcyclohexane	C ₇ H ₁₄	0.0274	0.0379	0.0310
	TOTAL		0.3959	0.6315	0.5436