



June 1, 2010

CQI Report to Stakeholders

**Subject: May 2010 Condensate Results**

As of January 1, 2008, the Crude Quality Monitoring Project has modified its condensate testing program. We acknowledge that industry requirements and specifications are different for condensates than for other types of crude. As such, we have updated our condensate testing program in an effort to provide the industry with reliable, accurate, and usable information specifically relevant to condensates. We believe that this information will be valuable for numerous industry purposes, such as better blending data and formulating condensate specifications and guidelines. Should you have any questions regarding this report, or the modified condensate testing program, please contact Crude Quality Inc. at (780) 991-9900 or at [crudequality@gmail.com](mailto:crudequality@gmail.com).

**Observations:**

Attached are detailed C30+ compositional and trace sulphur analyses, as well as historical data from [crudemonitor.ca](http://crudemonitor.ca) pertaining to typical light ends and bulk properties for Condensate Blend (CRW).

In addition to the attached, we note the following testing results:

	Sample Date	Batch #	Sulphur (wt%)	API Gravity (degree)	Absolute Density (kg/m <sup>3</sup> )	MCR (wt%)	Viscosity @ 7.5° C (cSt)	RVP (kPa)	Organo-Phosphates (ppmw)	C7-Mercaptans (ppm)	Olefins (wt%)
<b>Current Data</b>	05/10/10	CRW-027	0.23	60.9	734.8	0.45	1.08	80.1	1.3	97	-
<b>Average To Date</b>			0.19	65.0	719.8	0.25	0.85	74.9	0.90	102	8xND
<b>Std Dev.</b>			0.08	2.4	8.8	0.15	0.15	4.0	0.23	17	-
<b>Avg+StdDev</b>			0.27	67.3	728.6	0.39	1.00	78.9	1.13	119	-
<b>Avg-StdDev</b>			0.10	62.7	711.1	0.10	0.70	70.9	0.67	86	-

Table 1: Summary of CRW current and average properties

The May sample of CRW had slightly higher than average density, MCR, viscosity and RVP. This sample was tested for volatile organo-phosphorus, and the resulting value was slightly higher than observed in previous samples. The C30+ compositional analysis indicated a slight decrease in C5s along with marginally higher than average C11s x C24s.



The sediment values observed for CRW since May 2009 have been tabulated below:

May09	Jun09	Jul09	Aug09	Sep09	Oct09	Nov09	Dec09	Jan10	Feb10	Mar10	Apr10	May10
90	130	140	73	43	39	<10	90	46	195	133	124	230

Table 2: Sediment values for CRW, in mg/L, from May 2009 to May 2010

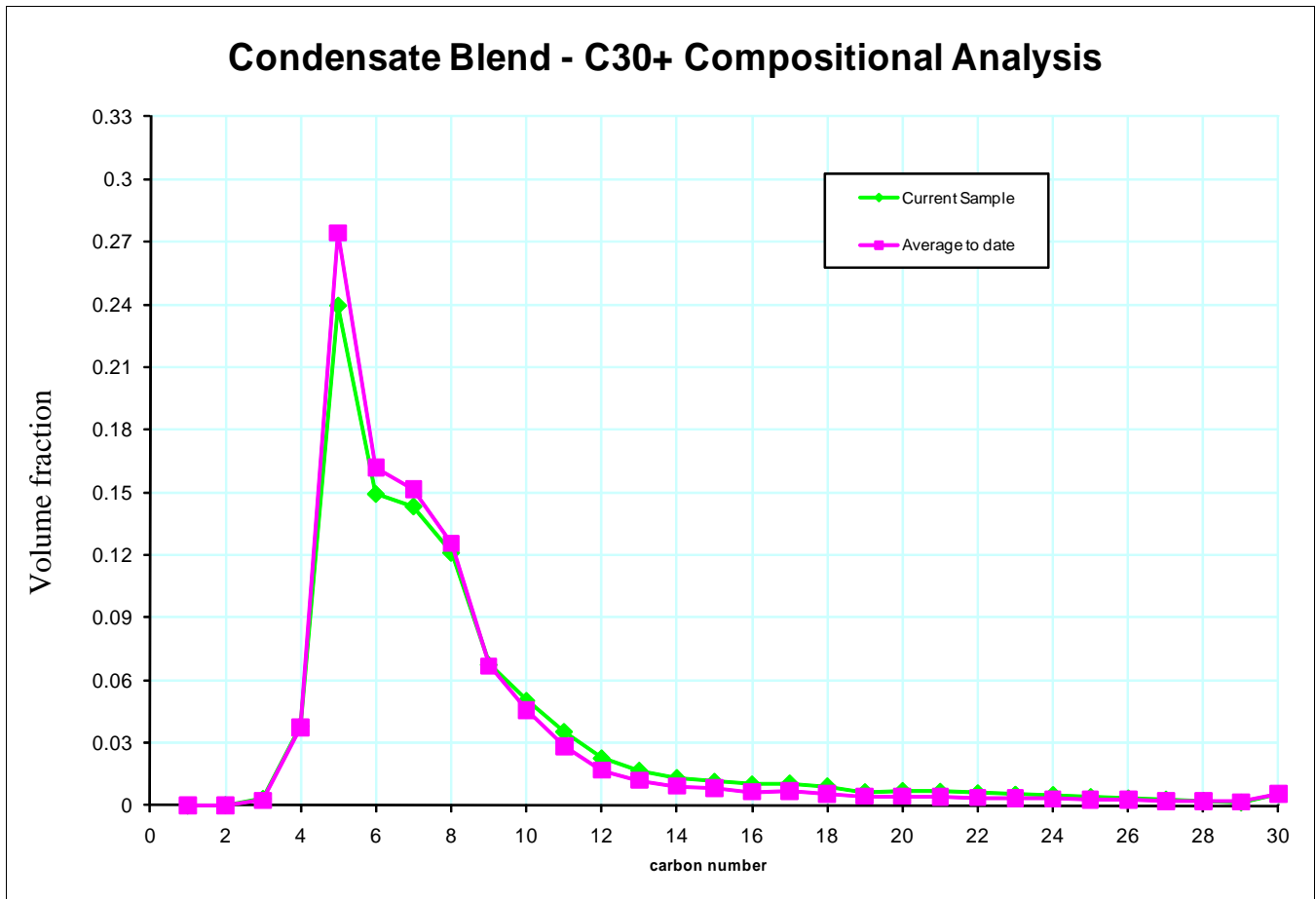


Figure 1: C30+ Compositional Analysis for CRW-027



# C30+ COMPOSITIONAL ANALYSIS

B033288:U15955

<i>MaxxID</i>	<i>Client ID</i>	<i>Meter Number</i>	<i>Laboratory Number</i>
CRUDE QUALITY INC.			
<i>Operator Name</i>		<i>LSD</i>	<i>Well ID</i>
CRUDE QUALITY INC. MAY 2010 LIGHT CRUDES			ENBRIDGE
<i>Well Name</i>		<i>Initials of Sampler</i>	<i>Sampling Company</i>
		COND. BLEND CRW-027	1L CAN
<i>Field or Area</i>	<i>Pool or Zone</i>	<i>Sample Point</i>	<i>Container Identity</i> <i>Percent Full</i>
<i>Test Recovery</i>	<i>Interval</i>	<i>Elevations (m)</i>	<i>Sample Gathering Point</i> <i>Solution Gas</i>
<i>Test Type</i> <i>No.</i> <i>Multiple Recovery</i>	From: _____ To: _____	KB _____      GRD _____	<i>Well Fluid Status</i> <i>Well Status Mode</i>
<i>Production Rates</i>	<i>Gauge Pressures kPa</i>	<i>Temperature °C</i>	<i>Well Status Type</i> <i>Well Type</i>
Water m3/d      Oil m3/d      Gas 1000m3/d	Source _____      As Received _____	22	<i>Gas or Condensate Project</i> <i>Licence No.</i>
2010/05/10	2010/05/17	2010/05/23	2010/05/25
<i>Date Sampled Start</i>	<i>Date Sampled End</i>	<i>Date Received</i>	<i>Date Reported</i> <i>Date Reissued</i> <i>Analyst</i>
			SK1,GS1,AS9,JM4,MC3,JHB,NJ

COMPOSITION			
COMPONENT	MOLE FRACTION	MASS FRACTION	VOLUME FRACTION
N2			
CO2			
H2S			
C1	0.0000	0.0000	0.0000
C2	0.0004	0.0001	0.0003
C3	0.0054	0.0023	0.0033
IC4	0.0078	0.0045	0.0058
NC4	0.0455	0.0262	0.0324
IC5	0.1415	0.1010	0.1168
NC5	0.1507	0.1075	0.1229
C6	0.1622	0.1383	0.1494
C7+	0.4865	0.6201	0.5691
TOTAL	1.0000	1.0000	1.0000

PROPERTIES						
RESIDUE	RELATIVE DENSITY @ 15 °C		RELATIVE MOLECULAR MASS		DATA SUMMARY	
	OBSERVED	CALCULATED	OBSERVED	CALCULATED	MOLE FRACTION	MASS FRACTION
C5+		0.729		104	0.9409	0.9669
C6+		0.762		118	0.6487	0.7584
C7+	0.787		140	129	0.4865	0.6201
C10+					0.1424	0.2735
C12+					0.0785	0.1809
TOTAL		0.722		101		0.1513

Calculated Absolute Density Total Sample: 721.4 kg/m3 @ 15°C  
 Gas Equivalent Factor: 160.76 m3 Gas/m3 Liquid

\*\* Information not supplied by client -- data derived from LSD information      Results relate only to items tested

Remarks:  
**Distillation Corrected to 101.3 kPa**



# C30+ COMPOSITIONAL ANALYSIS

CRUDE QUALITY INC.

B033288:U15955

Operator Name

Laboratory Number

CRUDE QUALITY INC. MAY 2010 LIGHT CRUDES

COND. BLEND CRW-027

Well Name

Sample Point

ENBRIDGE

Sampling Company

MaxxD

Client ID

2010/05/10

2010/05/17

2010/05/23

2010/05/25

SK1,GS1,AS9,JM4,MC3,JHB,NJ

Date Sampled Start

Date Sampled End

Date Received

Date Reported

Date Reissued

Analyst

COMPONENT	BOILING POINT (°C)	MOLE FRACTION	MASS FRACTION	VOLUME FRACTION
Nitrogen	-196			
Carbon Dioxide	-79			
Hydrogen Sulphide	-60			
Methane	-162	0.0000	0.0000	0.0000
Ethane	-89	0.0004	0.0001	0.0003
Propane	-42	0.0054	0.0023	0.0033
Iso-Butane	-12	0.0078	0.0045	0.0058
n-Butane	0	0.0455	0.0262	0.0324
Iso-Pentane	28	0.1415	0.1010	0.1168
n-Pentane	36	0.1507	0.1075	0.1229
Hexanes	37-69	0.1622	0.1383	0.1494
Heptanes	70-98	0.1604	0.1464	0.1434
Octanes	99-126	0.1227	0.1275	0.1212
Nonanes	127-151	0.0610	0.0727	0.0675
Decanes	152-174	0.0382	0.0529	0.0503
Undecanes	175-196	0.0257	0.0397	0.0354
Dodecanes	197-216	0.0153	0.0257	0.0227
Triadecanes	217-236	0.0106	0.0193	0.0168
Tetradecanes	237-253	0.0080	0.0156	0.0133
Pentadecanes	254-271	0.0065	0.0135	0.0115
Hexadecanes	272-287	0.0055	0.0121	0.0102
Heptadecanes	288-302	0.0056	0.0129	0.0107
Octadecanes	303-317	0.0044	0.0112	0.0093
NonaDecanes	318-331	0.0030	0.0079	0.0065
Eicosanes	332-343	0.0031	0.0086	0.0071
Heneicosanes	344-357	0.0028	0.0082	0.0067
Docosanes	358-369	0.0025	0.0074	0.0060
Triacosanes	370-380	0.0021	0.0066	0.0053
Tetracosanes	381-391	0.0020	0.0064	0.0051
Pentacosanes	392-402	0.0016	0.0053	0.0042
Hexacosanes	403-412	0.0013	0.0045	0.0035
Heptacosanes	413-422	0.0011	0.0038	0.0030
Octacosanes	423-432	0.0008	0.0031	0.0024
Nonacosanes	433-441	0.0005	0.0019	0.0015
triacontanes+	442-449+	0.0018	0.0069	0.0055
Totals		1.0000	1.0000	1.0000
neoHexane	50	0.0000	0.0000	0.0000
Methylcyclopentane	70	0.0325	0.0270	0.0253
Benzene	80	0.0140	0.0108	0.0087
Cyclohexane	81	0.0269	0.0224	0.0203
Methylcyclohexane	101	0.0378	0.0367	0.0337
Toluene	111	0.0230	0.0209	0.0171
Ethylbenzene	136	0.0029	0.0030	0.0025
m&p-Xylene	139	0.0151	0.0159	0.0128
o-Xylene	144	0.0039	0.0041	0.0032
1,2,4-Trimethylbenzene	169	0.0046	0.0056	0.0045

\*\* Information not supplied by client -- data derived from LSD information

Results relate only to items tested

Remarks:

**Distillation Corrected to 101.3 kPa**



# TRACE SULPHUR ANALYSIS

B033288:U15956

<i>MaxID</i>	<i>Client ID</i>	<i>Meter Number</i>	<i>Laboratory Number</i>
CRUDE QUALITY INC.			
<i>Operator Name</i>		<i>LSD</i>	<i>Well ID</i>
CRUDE QUALITY INC. MAY 2010 LIGHT CRUDES			ENBRIDGE
<i>Well Name</i>		<i>Initials of Sampler</i>	<i>Sampling Company</i>
		COND. BLEND CRW-027	1L CAN
<i>Field or Area</i>	<i>Pool or Zone</i>	<i>Sample Point</i>	<i>Container Identity</i> <i>Percent Full</i>
<i>Test Recovery</i>		<i>Elevations (m)</i>	<i>Sample Gathering Point</i> <i>Solution Gas</i>
<i>Test Type</i>	<i>No.</i> <i>Multiple Recovery</i>	From: _____ To: _____	<i>Well Fluid Status</i> <i>Well Status Mode</i>
<i>Production Rates</i>		KB      GRD	<i>Well Status Type</i> <i>Well Type</i>
Water m3/d	Oil m3/d      Gas 1000m3/d	Temperature °C	<i>Gas or Condensate Project</i> <i>Licence No.</i>
		23.0	
<i>Date Sampled Start</i>	<i>Date Sampled End</i>	<i>Date Received</i>	<i>Date Reported</i> <i>Date Reissued</i> <i>CB</i>
2010/05/10		2010/05/17	2010/05/23      2010/05/25      CB

COMPOSITION			Boiling Pt. (°C)	Sulphur mole ppm	Sulphur mass ppm	PROPERTIES
Component	Common Name					
Hydrogen Sulphide	H2S		-60.4	1.4	<0.5	<i>Molecular Wt. (g/mole)</i> Measured
Carbonyl Sulphide	COS		-50	14.8	4.0	
Methanethiol	Methyl mercaptan		6.2	11.8	3.2	
Ethanethiol	Ethyl mercaptan		35	96.7	26.5	
Dimethyl Sulphide	DMS		38	19.3	5.3	<i>Molecular Wt. (g/mole)</i> Calculated
Carbon Disulphide	CS2		46.5	3.5	1.0	
Iso-Propanethiol	Iso-propyl mercaptan		58	109.9	30.0	<i>Onsite H2S</i>  ppm(mole)      mole%
t-Butanethiol	tert-butyl mercaptan		64	14.9	4.1	
Methyl Ethyl Sulphide	MES		67	15.7	4.3	
n-Propanethiol	Propyl mercaptan		70	22.0	6.0	
Unknown			36-69	<0.5	<0.5	
Thiophene/sec-Butanethiol	Thiophene/sec-Butyl mercaptan		84/90	65.4	17.9	
Diethyl Sulphide	DES		92.1	7.1	1.9	
Iso-Butanethiol	Iso-butyl mercaptan		99	5.6	1.5	
n-Butanethiol	Butyl mercaptan		98	7.7	2.1	
Unknown			71-97	5.6	1.5	
Dimethyl Disulphide	DMDS		110	11.4	3.1	
n-Pentanethiol	Pentyl mercaptan		127	10.4	2.8	
Unknown			100-126	64.6	17.7	
n-Hexanethiol	Hexyl mercaptan		151	9.0	2.5	
Unknown			127-150	55.9	15.3	
n-Heptanethiol	Heptyl mercaptan		177	2.6	0.7	
Unknown			152-176	70.9	19.4	
Total Sulphur				8467	2315.7	
Mercaptan Sulphur on Naphtha fraction (IBP 204°C) ASTM D3227 (mass%) Naphtha IBP 204°C (volume %) Elemental Sulphur (mass ppm)						

\*\* Information not supplied by client -- data derived from LSD information

Results relate only to items tested

Remarks:

## Light Crude Quality Project Analyses Summary (December 2007)

Crude	Sample Date	No. Samples or Batch #	Sulphur (wt%)	API Density (degree)	Absolute Density (kg/m3)	Sediment (ppmw)	MCR (wt%)	Salt (ptb)	TAN (mgKOH/g)	Nickel (mg/L)	Vanadium (mg/L)
<b>CRW Condensate Blend</b>											
	2005 Q2	3	0.17	62.9	727.0		0.2			43.5	4.8
	2005 Q3	3	0.16	63.3	725.8		0.4			17.9	2.4
	2005 Q4	3	0.17	63.6	724.6		0.3				3.6
	2006 Q1	4	0.16	64.8	720.2		0.3				6.8
	2006 Q2	3	0.21	63.3	725.9		0.3				1.4
	2006 Q3	2	0.17	62.1	730.2		0.2				1.2
	2006 Q4	2	0.13	67.0	712.2		0.1				
	2007 Q1	3	0.13	65.4	718.1		0.2				
	2007 Q2	3	0.10	67.6	710.3		0.1				
	2007 Q3	3	0.13	65.7	717.0		0.2				
	2007 Q4	3	0.22	64.8	720.3		0.2				1.6
	2008 Q1	1	0.39	65.1	719.2		0.4				
	12/1/2007	CRW-753	0.15	67.6	710.2		0.1				
	1/1/2008	CRW-757	0.39	65.1	719.2		0.4				
	<b>Average</b>		<b>0.17</b>	<b>64.6</b>	<b>721.0</b>		<b>0.2</b>			<b>35.0</b>	<b>3.2</b>
	<b>Std Dev</b>		<b>0.07</b>	<b>2.1</b>	<b>7.7</b>		<b>0.1</b>			<b>13.1</b>	<b>2.0</b>
	<b>Avg + StdDev</b>		<b>0.24</b>	<b>66.7</b>	<b>728.7</b>		<b>0.4</b>			<b>48.1</b>	<b>5.2</b>
	<b>Avg - StdDev</b>		<b>0.10</b>	<b>62.5</b>	<b>713.3</b>		<b>0.1</b>			<b>21.9</b>	<b>1.2</b>

## Light Crude Quality Project Light Ends Summary (December 2007)

Crude Sample Date	Count of Batches or Batch No.	Ethane (vol%)	Propane (vol%)	Butanes (vol%)	Pentanes (vol%)	Hexanes (vol%)	Heptanes (vol%)	Octanes (vol%)	Nonanes (vol%)	Decanes (vol%)	Benzene (vol%)	Toluene (vol%)	Ethyl Benzene (vol%)	Xylenes (vol%)	
<b>CRW Condensate Blend</b>															
2005 Q2	3	0.02	0.32	3.54	23.63	21.20	15.23	10.08	5.12	2.28	1.15	2.10	0.23	1.86	
2005 Q3	3	0.02	0.23	3.23	23.45	21.28	16.37	10.77	5.51	2.45	1.23	2.34	0.25	2.03	
2005 Q4	3	0.02	0.23	3.15	21.79	21.60	16.33	11.80	6.09	2.40	1.16	2.26	0.30	2.13	
2006 Q1	4	0.02	0.19	2.76	22.50	22.77	14.89	10.86	6.18	2.49	1.23	2.07	0.28	1.92	
2006 Q2	3	0.02	0.27	3.42	22.51	19.93	15.65	10.90	5.69	2.30	1.06	2.08	0.26	1.86	
2006 Q3	2	0.02	0.28	2.96	20.36	19.74	16.38	11.82	6.08	2.52	1.06	2.19	0.29	2.06	
2006 Q4	2	0.02	0.22	3.37	25.43	22.50	15.32	10.35	5.29	2.09	1.13	2.00	0.25	1.82	
2007 Q1	3	0.02	0.24	3.33	24.64	24.26	15.17	10.54	5.29	2.17	1.27	2.10	0.27	1.93	
2007 Q2	3	0.02	0.20	3.22	25.40	23.30	15.51	10.59	5.37	1.96	1.25	2.15	0.27	1.86	
2007 Q3	3	0.02	0.24	3.42	23.97	20.53	15.46	10.25	5.10	2.08	1.08	2.13	0.25	1.82	
2007 Q4	3	0.02	0.26	3.49	24.77	21.60	16.06	11.39	5.70	2.22	1.08	2.15	0.30	1.97	
2008 Q1	1	0.02	0.21	3.06	25.40	21.80	16.14	11.48	5.53	2.05	1.07	2.13	0.31	1.99	
12/1/2007	CRW-753	0.02	0.18	2.89	26.08	22.84	16.97	11.76	5.53	2.07	1.14	2.22	0.3	1.94	
1/1/2008	CRW-757	0.02	0.21	3.06	25.4	21.8	16.14	11.48	5.53	2.05	1.07	2.13	0.31	1.99	
<b>Average</b>		<b>0.02</b>	<b>0.24</b>	<b>3.25</b>	<b>23.56</b>	<b>21.77</b>	<b>15.65</b>	<b>10.85</b>	<b>5.59</b>	<b>2.27</b>	<b>1.16</b>	<b>2.14</b>	<b>0.27</b>	<b>1.93</b>	
<b>Std Dev</b>		<b>0.01</b>	<b>0.06</b>	<b>0.34</b>	<b>2.28</b>	<b>1.95</b>	<b>0.94</b>	<b>0.96</b>	<b>0.65</b>	<b>0.30</b>	<b>0.12</b>	<b>0.16</b>	<b>0.04</b>	<b>0.16</b>	
<b>Avg + StdDev</b>		<b>0.03</b>	<b>0.30</b>	<b>3.59</b>	<b>25.84</b>	<b>23.72</b>	<b>16.59</b>	<b>11.82</b>	<b>6.24</b>	<b>2.56</b>	<b>1.28</b>	<b>2.30</b>	<b>0.31</b>	<b>2.09</b>	
<b>Avg - StdDev</b>		<b>0.01</b>	<b>0.18</b>	<b>2.91</b>	<b>21.28</b>	<b>19.82</b>	<b>14.71</b>	<b>9.89</b>	<b>4.94</b>	<b>1.97</b>	<b>1.04</b>	<b>1.99</b>	<b>0.23</b>	<b>1.78</b>	