



**Gas Analysis**

Lot Number: **1032284**  
Report Number: 1956680  
Reference Sample ID: 4887619

Meter # / Sample ID: Clariant (Canada) INC dba Prairie Petro Chem Operator: High Mark Resources 9-21-12-27 Container Identity: EX11482/MLF  
Location: 09-21-012-27 Well Name: High Mark Resources 9-21-12-27 Well License No. KB Elev, m GR Elev, m

Field/Area: Prairie Petro-Chem Formation Pool Surface Location  
Test Type: No Sampler: From Well Casing Company: n/a Sampling Method: n/a  
Multiple Recovery: n/a Sample Point Other Information

Test Interval, m	Test Recovery:					
Perforations, m	Type of Production:	Pumping	Flowing	Gas Lift	Swab	
	Production Rates:	Water	m <sup>3</sup> /d	Oil	m <sup>3</sup> /d	Gas 10 <sup>3</sup> m <sup>3</sup> /d
Gauge Pressure, kPa	55		Other ID Schematic ID			
	Temperature, °C	22		Other		
Source		Sampled		Received		

2014-10-07 Date Sampled (Y-M-D) 2014-10-09 Date Received (Y-M-D) 2014-10-16 Date Reported (Y-M-D) Time Sampled Date On Date Off

Comp.	Mole Fraction		Petroleum Liquid Content mL/m <sup>3</sup>	Gross Heating Value, MJ/m <sup>3</sup>			Pseudocritical Properties	
	As Received	Acid Gas Free		AGA #5 As Received	AGA #5 Acid Gas Free	GPA 2172 As Received	Pressure, kPa	Temperature, K
H2	0.0200	0.0237		59.62	69.48	59.75	4706	301.0
He	0.0008	0.0009		<b>Density Ideal Gas (AGA #5)</b>			<b>Density Real Gas (GPA 2172)</b>	
N2	0.1542	0.1827		<b>Absolute, kg/m<sup>3</sup></b>		<b>Relative</b>	<b>Absolute, kg/m<sup>3</sup></b>	
CO2	0.1126	0.0000		1.601	1.307		1.615	1.319
H2S	0.0436	0.0000		<b>Relative Molecular Mass</b>			<b>Mole Fraction C7+ Vapour Pressure Pentanes Plus, kPa</b>	
C1	0.0499	0.0591		<b>Total Gas</b>		<b>C7+</b>	0.0039	104
C2	0.2571	0.3048	913.6	<b>C7+ Fraction As Gas</b>			<b>C7+ Density Liquid</b>	
C3	0.2252	0.2669	827.5	<b>Relative Density</b>		<b>GHV (MJ/m<sup>3</sup>)</b>	Relative	kg/m <sup>3</sup>
iC4	0.0420	0.0497	183.4	3.609	220.58		0.695	694
nC4	0.0632	0.0748	265.9	<b>Hydrogen Sulfide</b>			<b>Compressibility Z</b>	
iC5	0.0163	0.0193	79.6	<b>g/m<sup>3</sup></b>			AGA #5	GPA #2172
nC5	0.0062	0.0074	30.0	62.83			0.99256	0.99053
C6	0.0050	0.0059	27.4	<b>Hydrogen Sulfide</b>				
C7	0.0029	0.0035	17.9	ppm (mol/mol)	Method		Field Value (ppm)	Field Method
C8	0.0008	0.0010	5.5	43600	Chromatography TCD			
C9	0.0002	0.0002	1.5	• H2S analysis was corrected for 10 % air content.				
C10+	Trace	0.0001	0.0					
Total	1.0000	1.0000	2352.3					

Approved by: *Darren Crichton*

Darren Crichton, BSc, PChem  
Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).  
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Note: Physical constants used in calculations from GPA Standard 2145-09. Gas properties calculated on air and moisture free basis with reference conditions 101.325 kPa and 15 °C.

## Methodology and Notes

Bill To: Clariant (Canada) INC dba	Project:	Lot ID: <b>1032284</b>
Report To: Clariant (Canada) INC dba	ID:	Control Number:
738 - 6 Street	Name: High Mark Resources	Date Received: Oct 9, 2014
Estevan, SK, Canada	Location:	Date Reported: Oct 16, 2014
S4A 1A4	LSD: 09-21-012-27	Report Number: 1956680
Attn: Clinton Lund	P.O.:	
Sampled By:	Acct code:	
Company: Prairie Petro-Chem		

---

## Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Natural Gas - C7/10 Composition	GPA	* Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography, 2261-00	15-Oct-14	Exova Edmonton
Natural Gas - C7/10 Composition	GPA	Calculation of Gross Heating Value, Relative Density and Compressibility Factor for Natural Gas Mixtures from Compositional Analysis, 2172-09	15-Oct-14	Exova Edmonton

*\* Reference Method Modified*

## References

GPA Gas Processors Association

## Comments:

- Sample 1032284-1; 4887619 H2S analysis was corrected for 10 % air content.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

## Report Transmission Cover Page

Bill To: Clariant (Canada) INC dba	Project:	Lot ID: <b>1032284</b>
Report To: Clariant (Canada) INC dba	ID:	Control Number:
738 - 6 Street	Name: High Mark Resources	Date Received: Oct 9, 2014
Estevan, SK, Canada	Location:	Date Reported: Oct 16, 2014
S4A 1A4	LSD: 09-21-012-27	Report Number: 1956680
Attn: Clinton Lund	P.O.:	
Sampled By:	Acct code:	
Company: Prairie Petro-Chem		

Contact & Affiliation	Address	Delivery Commitments
Accounts Payable Clariant (Canada) INC dba Prairie	738 - 6 Street Estevan, Saskatchewan S4A 1A4 Phone: (306) 634-5808 Fax: (306) 634-6694 Email: ppc.payables@clariant.com	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Clinton Lund Clariant (Canada) INC dba Prairie	738 - 6 Street Estevan, Saskatchewan S4A 1A4 Phone: (306) 634-5808 Fax: (306) 634-6694 Email: clinton.lund@clariant.com	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Todd Leslie Clariant (Canada) INC dba Prairie	738 - 6 Street Estevan, Saskatchewan S4A 1A4 Phone: (204) 748-3198 Fax: null Email: todd.leslie@clariant.com	On [Report Approval] send (Test Report, COC) by Email - Merge Reports

### Notes To Clients:

- Sample 1032284-1; 4887619 H2S analysis was corrected for 10 % air content.

No Chain of Custody Available.