



GAS ANALYSIS

CAARA32G

MaxxID

Client ID

Meter Number

C311182:BLZ991-01

Laboratory Number

CANADIAN NATURAL RESOURCES LTD.

Operator Name

01-18-017-18-W4M

LSD

Well ID

CNRL ARMADA 01-18-017-18-W4M

GL

CNRL

Well/Plant/Facility

Initials of Sampler

Sampling Company

CLARESHOLM

SALES TO TC ENERGY

19089,20692

Field or Area

Pool or Zone

Sample Point

Container Identity

Percent Full

Test Recovery

Interval

Elevations (m)

Other(Miscellaneous)

Sample Gathering Point

Solution Gas

Test Type

No.

Multiple Recovery

From:

To:

KB

GRD

Gas

Well Fluid Status

Well Status Mode

Production Rates

90

Gauge Pressures kPa

4640

4460

Temperature °C

1.7

24

Well Status Type

Well Type

Water m³/d

Oil m³/d

Gas 1000 m³/d

Source

As Received

Source

As Received

Gas or Condensate Project

Licence No.

2023/02/14 14:10

2023/02/16

2023/02/24

2023/03/09

CB,RRC

Date Sampled Start

Date Sampled End

Date Received

Date Reported

Date Reissued

Analyst

COMPOSITION

Component	Mole Fraction Air Free*	Mole Fraction Air Free Acid Gas Free	Liquid Volume mL/m³ Air Free	Historical Avg. Mole Fraction (1 data points)	Tolerance Score
H ₂	Trace	Trace		0.0000	
He	0.0007	0.0007		0.0007	
N ₂	0.0321	0.0325		0.0309	
CO ₂	0.0129			0.0088	
H ₂ S	Trace			0.0000	
C ₁	0.8797	0.8912		0.8824	
C ₂	0.0482	0.0489	171.33	0.0505	
C ₃	0.0173	0.0175	63.44	0.0179	
iC ₄	0.0028	0.0028	12.10	0.0026	
nC ₄	0.0043	0.0044	18.18	0.0044	
iC ₅	0.0010	0.0010	4.71	0.0009	
nC ₅	0.0008	0.0008	3.64	0.0007	
C ₆	0.0002	0.0002	1.28	0.0002	
C ₇ +	Trace	Trace	0.30	0.0000	
Total	1.0000	1.0000	274.98		

Insufficient historical data to calculate T-Score

The H₂ content may be affected due to the degradation of H₂S.

*per Method GPA 2286-M

PROPERTIES

Calculated Molar Mass Moisture Free	Calculated Relative Densities
18.4 Total	95.0 C ₇ +
0.635 Moisture Free	0.623 Moisture & Acid Gas Free
	C ₇ +
Calculated Pseudo Critical Properties	Calculated Vapour Pressure
As Sampled	Acid Gas Free
4591.5 pPc (kPa)	200.6 pTc (Kelvin)
4555.0 pPc (kPa)	199.3 pTc (Kelvin)
	121 C ₅ +
Calculated Gross Heating Value (MJ/m³) @ 101.325 kPa & 15 °C	Gas Compressibility @ 101.325 kPa & 15 °C
39.24 GPA 2172	39.76 GPA 2172 Acid Gas Free
	195.00 C ₇ +
	0.9976
Hydrogen Sulphide	
On Site	In Lab
<1 Gastec (ppm v/v)	Tutweiler (mole %)
<0.01 Gastec (ppm v/v)	Tutweiler (mole %)
	H ₂ S from GC (mole %)
Onsite analysis is required for accurate source H ₂ S content.	
H ₂ S degrades variably in all sample containers and is also matrix dependent.	
QC Check Std #	9349/4561
Date	2023/02/16
QC Passed	Yes

Results relate only to items tested

Remarks:

NO PROTREND CODE PROVIDED.

Reference Method suffix "M" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

2023/03/09 11:33

Page 1 of 2

MaxxALERT





HISTORICAL REPORT

CAARA32G

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CANADIAN NATURAL RESOURCES LTD.

Operator Name

C311182:BLZ991-01

Laboratory Number

CNRL ARMADA 01-18-017-18-W4M

Well Name:

SALES TO TC ENERGY

Sample Point

CNRL

Sampling Company

Client ID

Sample Number:

Sample Pres (kPa) / Temp (°C):

Sampled Date Start:

Sampled Date End:

Hydrogen (H₂)
Helium (He)
Nitrogen (N₂)
Carbon Dioxide (CO₂)
Hydrogen Sulphide (H₂S)
Methane (C₁)
Ethane (C₂)
Propane (C₃)
Isobutane (iC₄)
n-Butane (nC₄)
Isopentane (iC₅)
n-Pentane (nC₅)
Hexanes (C₆)
Heptanes Plus (C₇+)
Relative Density Moisture Free
Gross Heating Value

Sample Number:

Sample Pres (kPa) / Temp (°C):

Sampled Date Start:

Sampled Date End:

Hydrogen (H₂)
Helium (He)
Nitrogen (N₂)
Carbon Dioxide (CO₂)
Hydrogen Sulphide (H₂S)
Methane (C₁)
Ethane (C₂)
Propane (C₃)
Isobutane (iC₄)
n-Butane (nC₄)
Isopentane (iC₅)
n-Pentane (nC₅)
Hexanes (C₆)
Heptanes Plus (C₇+)
Relative Density Moisture Free
Gross Heating Value

Sample Number:

XK3824

BLZ991

Sample Pres (kPa) / Temp (°C):

4426 / 60

4640 / 1.7

Sampled Date Start:

2020/02/11

2023/02/14

Sampled Date End:

Component	Avg. of Last 1 Samples	# 1	# 2	Variance	T-Score	Std. Dev
Hydrogen (H ₂)		Trace	Trace			
Helium (He)	0.0007	0.0007	0.0007	0.0000		N/A
Nitrogen (N ₂)	0.0309	0.0309	0.0321	0.0012		N/A
Carbon Dioxide (CO ₂)	0.0088	0.0088	0.0129	0.0041		N/A
Hydrogen Sulphide (H ₂ S)		0.0000	Trace			
Methane (C ₁)	0.8824	0.8824	0.8797	-0.0027		N/A
Ethane (C ₂)	0.0505	0.0505	0.0482	-0.0023		N/A
Propane (C ₃)	0.0179	0.0179	0.0173	-0.0006		N/A
Isobutane (iC ₄)	0.0026	0.0026	0.0028	0.0002		N/A
n-Butane (nC ₄)	0.0044	0.0044	0.0043	-0.0001		N/A
Isopentane (iC ₅)	0.0009	0.0009	0.0010	0.0001		N/A
n-Pentane (nC ₅)	0.0007	0.0007	0.0008	0.0001		N/A
Hexanes (C ₆)	0.0002	0.0002	0.0002	0.0000		N/A
Heptanes Plus (C ₇ +)		Trace	Trace			
Relative Density Moisture Free	0.632	0.632	0.635	0.003		N/A
Gross Heating Value	39.51	39.51	39.24	-0.27		N/A

Valid standard deviation and T-Score calculations require a minimum of five data points.

* Variance/Standard Deviation >= 2.0

** Variance/Standard Deviation >= 3.0