EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **PATHFINDER #2 WELL HEAD**

PROJECT NO. : **201807036**
COMPANY NAME : **AUSTIN EXPLORATION**
OFFICE / BRANCH: FLORENCE, CO
CUSTOMER REF:
PRODUCER :

ANALYSIS NO. : **01**
ANALYSIS DATE: JULY 09, 2018 11:06
SAMPLE DATE : JULY 3, 2018 09:30
TO:
EFFECTIVE DATE:

*****FIELD DATA*****

SAMPLE CYCLE:
SAMPLE PRES. : 206 psig
FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 105 ºf
AMBIENT TEMP.: ºf
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 1156
SAMPLED BY : GALE MCENDREE
SAMPLING COMPANY: EMPACT
H2S BY STAIN TUBE: **BDL** ppm
CO2 BY STAIN TUBE: - Mol %

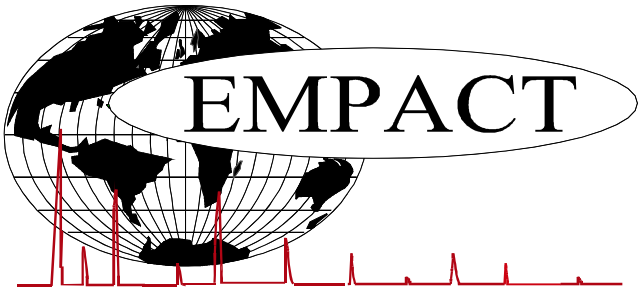
COMPONENT	MOLE %	MASS %	GPM @ 14.730	GPM @ 14.650
HELIUM	0.10	0.02	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.02	0.03	---	---
NITROGEN	1.6700	2.3700	---	---
CARBON DIOXIDE	0.29	0.65	---	---
METHANE	84.35550	68.63690	---	---
ETHANE	6.6469	10.1373	1.7824	1.7727
PROPANE	4.4134	9.8708	1.2194	1.2128
I-BUTANE	0.3844	1.1332	0.1257	0.1250
N-BUTANE	1.2786	3.7693	0.4041	0.4019
I-PENTANE	0.2774	1.0126	0.0995	0.0990
N-PENTANE	0.2928	1.0715	0.1066	0.1060
HEXANES PLUS	0.2710	1.2984	0.1054	0.1050
TOTALS	100.00000	100.00000	3.8431	3.8224

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0072	0.0285
TOLUENE	0.0048	0.0224
ETHYLBENZENE	0.0006	0.0033
XYLENES	0.0018	0.0098
TOTAL BTEX	0.0144	0.0640

BTU @		14.730	14.650
LOW	NET DRY REAL :	1065.2 **/scf**	1059.4 **/scf**
	NET WET REAL :	1046.7 **/scf**	1040.9 **/scf**
HIGH	GROSS DRY REAL :	1176.5 **/scf**	1170.1 **/scf**
	GROSS WET REAL :	1156.0 **/scf**	1149.7 **/scf**
	NET DRY REAL :	20529.6 **/lb**	20418.1 **/lb**
	GROSS DRY REAL :	22671.8 **/lb**	22548.7 **/lb**
	RELATIVE DENSITY (AIR=1):		0.6794
	DENSITY		0.05195 **lb/scf**
	COMPRESSIBILITY FACTOR :		0.99703
	REGULAR WOBBE INDEX		1424.1

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730, GPA 2261 & GPA 2286.*

(CALC: GPA 2172, GPA STD 2145 & TP-17 @14.696 & 60 F)

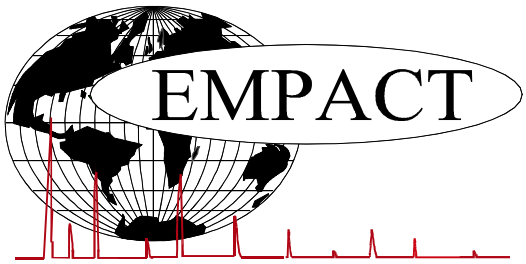


EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201807036	ANALYSIS NO. :	01
COMPANY NAME :	AUSTIN EXPLORATION	ANALYSIS DATE:	JULY 10, 2018 11:46
ACCOUNT NO. :		SAMPLE DATE :	JULY 3, 2018 09:30
PRODUCER :		CYLINDER NO. :	1156
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	PATHFINDER #2 WELL HEAD		
FIELD DATA		SAMPLE TEMP. :	105
SAMPLE PRES. :	206	AMBIENT TEMP.:	
COMMENTS :	***SPOT*** ***NO PROBE***		

Componet	Mole %	Wt %
Helium	0.10	0.02
Hydrogen	0.00	0.00
Carbon Dioxide	0.29	0.65
Nitrogen	1.67	2.37
Methane	84.35550	68.63690
Ethane	6.6469	10.1373
Propane	4.4134	9.8708
Isobutane	0.3844	1.1332
n-Butane	1.2786	3.7693
Isopentane	0.2535	0.9276
n-Pentane	0.2928	1.0715
Cyclopentane	0.0239	0.0850
n-Hexane	0.0495	0.2164
Cyclohexane	0.0117	0.0500
Other Hexanes	0.1011	0.4387
Heptanes	0.0441	0.2226
Methycyclohexane	0.0111	0.0553
2,2,4 Trimethylpentane	0.0006	0.0035
Benzene	0.0072	0.0285
Toluene	0.0048	0.0224
Ethylbenzene	0.0006	0.0033
Xylenes	0.0018	0.0098
C8+ Heavies	0.0385	0.2479
Subtotal	99.98000	99.97000
Oxygen/Argon	0.02	0.03
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **PATHFINDER #2**
WELL HEAD

PROJECT NO. : **201807036**
COMPANY NAME : **AUSTIN EXPLORATION**
OFFICE / BRANCH: FLORENCE, CO
CUSTOMER REF:
PRODUCER :
*****FIELD DATA*****
SAMPLE CYCLE:
SAMPLE PRES. : 206 psig
FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 105 ºf
AMBIENT TEMP.: ºf
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

ANALYSIS NO. : **01**
ANALYSIS DATE: JULY 09, 2018 11:06
SAMPLE DATE : JULY 3, 2018 09:30
TO:
EFFECTIVE DATE
SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 1156
SAMPLED BY : GALE MCENDREE
SAMPLING COMPANY: EMPACT
H2S BY STAIN TUBE: **BDL** ppm
CO2 BY STAIN TUBE: - Mol %

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.730**	GPM @ **14.650**
Helium	---	0.10	0.02	---	---
Oxygen/Argon	---	0.02	0.03	---	---
Nitrogen	---	1.67	2.37	---	---
Carbon Dioxide	---	0.29	0.65	---	---
Methane	P1	84.35550	68.63690	---	---
Ethane	P2	6.6469	10.1373	1.782	1.773
Propane	P3	4.4134	9.8708	1.219	1.213
i-Butane	I4	0.3844	1.1332	0.126	0.125
n-Butane	P4	1.2786	3.7693	0.404	0.402
2,2-Dimethylpropane	I5	0.0006	0.0022	0.000	0.000
i-Pentane	I5	0.2529	0.9254	0.093	0.092
n-Pentane	P5	0.2928	1.0715	0.107	0.106
2,2-Dimethylbutane	I6	0.0005	0.0022	0.000	0.000
Cyclopentane	N5	0.0239	0.0850	0.007	0.007
2,3-Dimethylbutane	I6	0.0037	0.0162	0.002	0.002
2-Methylpentane	I6	0.0236	0.1032	0.010	0.010
3-Methylpentane	I6	0.0412	0.1801	0.017	0.017
n-Hexane	P6	0.0495	0.2164	0.020	0.020
2,2-Dimethylpentane	I7	0.0001	0.0005	0.000	0.000
Methylcyclopentane	N6	0.0321	0.1370	0.011	0.011
2,4-Dimethylpentane	I7	0.0011	0.0056	0.001	0.001
Benzene	A6	0.0072	0.0285	0.002	0.002
Cyclohexane	N6	0.0117	0.0500	0.004	0.004
2-Methylhexane	I7	0.0034	0.0173	0.002	0.002
2,3-Dimethylpentane	I7	0.0037	0.0188	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0018	0.0090	0.001	0.001

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3-Methylhexane	I7	0.0064	0.0325	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0036	0.0179	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0028	0.0140	0.001	0.001
3-Ethylpentane	I7	0.0004	0.0020	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0065	0.0324	0.003	0.003
2,2,4-Trimethylpentane	I8	0.0006	0.0035	0.000	0.000
n-Heptane	P7	0.0119	0.0605	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0005	0.0025	0.000	0.000
Methylcyclohexane	N7	0.0111	0.0553	0.004	0.004
2,2-Dimethylhexane	I8	0.0010	0.0058	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0011	0.000	0.000
Ethylcyclopentane	N7	0.0017	0.0085	0.001	0.001
2,5-Dimethylhexane	I8	0.0003	0.0017	0.000	0.000
2,4-Dimethylhexane	I8	0.0006	0.0035	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0016	0.0091	0.001	0.001
1t,2c,4-Trimethylcyclopentane	N8	0.0012	0.0069	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0003	0.0017	0.000	0.000
Toluene	A7	0.0048	0.0224	0.002	0.002
2,3-Dimethylhexane	I8	0.0004	0.0023	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0003	0.0017	0.000	0.000
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0022	0.0127	0.001	0.001
4-Methylheptane	I8	0.0007	0.0041	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0007	0.0041	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0019	0.0108	0.001	0.001
3-Ethylhexane	I8	0.0003	0.0017	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0006	0.0034	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0004	0.0023	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0003	0.0017	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0010	0.0057	0.001	0.001
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0010	0.0057	0.001	0.001
n-Octane	P8	0.0032	0.0186	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0003	0.0017	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0003	0.0019	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0002	0.0013	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0012	0.0077	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0004	0.0026	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0007	0.0040	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0011	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0006	0.0033	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0007	0.0038	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0006	0.0033	0.000	0.000

3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0002	0.0013	0.000	0.000
4-Methyloctane	I9	0.0002	0.0013	0.000	0.000
2-Methyloctane	I9	0.0003	0.0019	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0004	0.0025	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0005	0.0027	0.000	0.000
i-Butylcyclopentane	N9	0.0003	0.0019	0.000	0.000
n-Nonane	P9	0.0014	0.0091	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
i-Propylbenzene	A9	0.0005	0.0030	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0003	0.0019	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0004	0.0024	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0014	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0004	0.0029	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0012	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
5-Methylnonane	I10	0.0002	0.0014	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
2-Methylnonane	I10	0.0002	0.0014	0.000	0.000
3-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0014	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0007	0.000	0.000
i-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0010	0.0065	0.001	0.001
n-Decane	P10	0.0007	0.0051	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
t-Decahydronaphthalene	A9	0.0001	0.0008	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Dimethyl-2-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0010	0.0072	0.001	0.001
n-Undecane	P11	0.0005	0.0040	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0001	0.0007	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0008	0.000	0.000
1,2,3,5-Tetramethylbenzene	A11	0.0001	0.0007	0.000	0.000
1,2-Methyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
1,2-Ethyl-n-propylbenzene	A11	0.0001	0.0008	0.000	0.000
2-Methylindan	A11	0.0001	0.0007	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
Tetrahydronaphthalene	A10	0.0001	0.0007	0.000	0.000
1-t-Butyl-3,5-dimethylbenzene	A12	0.0001	0.0008	0.000	0.000

UnknownC11s	U11	0.0006	0.0048	0.000	0.000
n-Dodecane	P12	0.0003	0.0026	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0008	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0001	0.0008	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
UnknownC12s	U12	0.0002	0.0016	0.000	0.000
n-Tridecane	P13	0.0002	0.0019	0.000	0.000
UnknownC13s	U13	0.0001	0.0009	0.000	0.000
n-Tetradecane	P14	0.0001	0.0010	0.000	0.000
UnknownC14s	U14	0.0001	0.0010	0.000	0.000
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
UnknownC15s	U15	0.0001	0.0011	0.000	0.000
n-Hexadecane	P16	0.0001	0.0012	0.000	0.000
UnknownC16s	U16	0.0001	0.0012	0.000	0.000
n-Heptadecane	P17	0.0001	0.0012	0.000	0.000
UnknownC17s	U17	0.0001	0.0012	0.000	0.000
n-Octadecane	P18	0.0001	0.0013	0.000	0.000
UnknownC18s	U18	0.0001	0.0013	0.000	0.000
TOTAL		100.00000	100.00000	3.8431	3.8224

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0072	0.0285
TOLUENE	0.0048	0.0224
ETHYLBENZENE	0.0006	0.0033
XYLENES	0.0018	0.0098
TOTAL BTEX	0.0144	0.0640

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730, GPA 2261 & GPA 2286.*

(CALC: GPA 2172, GPA STD 2145 & TP-17 @14.696 & 60 F)

	BTU @	**14.730**	**14.650**
LOW	NET DRY REAL :	1065.2 **/scf**	1059.4 **/scf**
	NET WET REAL :	1046.7 **/scf**	1040.9 **/scf**
HIGH	GROSS DRY REAL :	1176.5 **/scf**	1170.1 **/scf**
	GROSS WET REAL :	1156.0 **/scf**	1149.7 **/scf**
	NET DRY REAL :	20529.6 **/lb**	20418.1 **/lb**
	GROSS DRY REAL :	22671.8 **/lb**	22548.7 **/lb**
	RELATIVE DENSITY (AIR=1):		0.6794
	DENSITY		0.05195 **lb/scf**
	COMPRESSIBILITY FACTOR :		0.99703
	REGULAR WOBBE INDEX		1424.1

C6+ Fraction of DHA Gas Analysis @60°F, 14.696 psia

Net Dry Ideal BTU	4749.6 **/scf**	Relative Density - SG (Air=1)	3.2571	***C6+factors***
Gross Dry Ideal BTU	5113.2 **/scf**	**Z** Compressiblity Factor	0.99176	0.99104
Net Dry Ideal BTU	19355.9 **/lb**	Density Factor	248.61 **lbm/1000 ft3**	
Gross Dry Ideal BTU	20836.2 **/lb**	Molar Mass or MW	94.347 **g/mol**	
		Volume Liquid Ideal gas	0.105 **scf/gal**	23.4

This hexanes plus fraction may be applied in place of published C6+ factors. The Z & GPM need additional calc for C6+ factors.
#DIV/0 or 0 (zero) will appear in this section when there is no hexanes plus in the sample to calculate C6+ factors.