EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

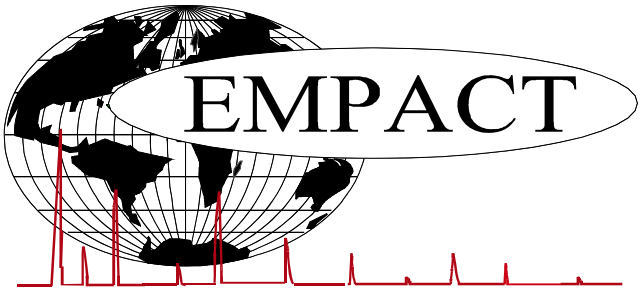
PRIMARY DB KEY:		NAME/DESCRIP :	**J.W. POWELL #23-35**
LEASE #:			**METER TUBE - TEST SEPARATOR**
FIELD/AREA:			**SALES GAS**
PROJECT NO. :	**201903069**	ANALYSIS NO. :	**02**
COMPANY NAME :	**AUSTIN EXPLORATION**	ANALYSIS DATE:	MARCH 18, 2019 11:12
OFFICE / BRANCH:	FLORENCE, CO	SAMPLE DATE :	MARCH 12, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
*****FIELD DATA*****			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	511 psig	PROBE :	YES
FLOW PRES. :	psig	CYLINDER NO. :	0206
LAB PRES:	psig	SAMPLED BY :	DANTE MARTINEZ
SAMPLE TEMP. :	79 ºf	SAMPLING COMPANY:	EMPACT
AMBIENT TEMP.:	ºf	H2S BY STAIN TUBE:	**BDL** ppm
H2O BY STAIN TUBE:	#/mmcf	CO2 BY STAIN TUBE:	Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENT	MOLE %	MASS %	GPM @ 14.730	GPM @ 14.650
HELIUM	0.07	0.01	---	---
HYDROGEN	0.02	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.8400	1.1400	---	---
CARBON DIOXIDE	1.96	4.17	---	---
METHANE	80.62840	62.55350	---	---
ETHANE	8.5146	12.3815	2.2836	2.2712
PROPANE	5.3229	11.3510	1.4711	1.4631
I-BUTANE	0.4380	1.2312	0.1438	0.1430
N-BUTANE	1.3160	3.6990	0.4163	0.4140
I-PENTANE	0.2322	0.8073	0.0834	0.0830
N-PENTANE	0.2487	0.8678	0.0905	0.0900
HEXANES PLUS	0.3992	1.7687	0.1575	0.1570
TOTALS	100.00000	100.00000	4.6462	4.6213

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0190	0.0718
TOLUENE	0.0094	0.0419
ETHYLBENZENE	0.0008	0.0041
XYLENES	0.0022	0.0113
TOTAL BTEX	0.0314	0.1291

BTU @		14.730	14.650
LOW	NET DRY REAL :	1088.4 **/scf**	1082.5 **/scf**
	NET WET REAL :	1069.5 **/scf**	1063.6 **/scf**
HIGH	GROSS DRY REAL :	1201.0 **/scf**	1194.5 **/scf**
	GROSS WET REAL :	1180.1 **/scf**	1173.6 **/scf**
	NET DRY REAL :	19993.2 **/lb**	19884.6 **/lb**
	GROSS DRY REAL :	22058.8 **/lb**	21939.0 **/lb**
	RELATIVE DENSITY (AIR=1):		0.7132
	DENSITY		0.05449 **lb/scf**
	COMPRESSIBILITY FACTOR :		0.99679
	REGULAR WOBBE INDEX		1418.9

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*
Mod ASTM D6730,GPA 2261 & GPA 2286.
(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)



EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201903069	ANALYSIS NO. :	02
COMPANY NAME :	AUSTIN EXPLORATION	ANALYSIS DATE:	MARCH 18, 2019 14:53
ACCOUNT NO. :		SAMPLE DATE :	MARCH 12, 2019
PRODUCER :		CYLINDER NO. :	0206
LEASE NO. :		SAMPLED BY :	DANTE MARTINEZ
NAME/DESCRIP :	J.W. POWELL #23-35 METER TUBE - TEST SEPARATOR SALES GAS		
FIELD DATA		SAMPLE TEMP. :	79
SAMPLE PRES. :	511	AMBIENT TEMP.:	
COMMENTS :	*SPOT, PROBE*		

Componet	Mole %	Wt %
Helium	0.07	0.01
Hydrogen	0.02	0.00
Carbon Dioxide	1.96	4.17
Nitrogen	0.84	1.14
Methane	80.62840	62.55350
Ethane	8.5146	12.3815
Propane	5.3229	11.3510
Isobutane	0.4380	1.2312
n-Butane	1.3160	3.6990
Isopentane	0.2033	0.7093
n-Pentane	0.2487	0.8678
Cyclopentane	0.0289	0.0980
n-Hexane	0.0747	0.3113
Cyclohexane	0.0236	0.0960
Other Hexanes	0.1376	0.5683
Heptanes	0.0788	0.3790
Methylcyclohexane	0.0171	0.0812
2,2,4 Trimethylpentane	0.0002	0.0011
Benzene	0.0190	0.0718
Toluene	0.0094	0.0419
Ethylbenzene	0.0008	0.0041
Xylenes	0.0022	0.0113
C8+ Heavies	0.0358	0.2027
Subtotal	99.99000	99.98000
Oxygen/Argon	0.01	0.02
Total	100.00000	100.00000

EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:		NAME/DESCRIP :	**J.W. POWELL #23-35**
LEASE #:			**METER TUBE - TEST SEPARATOR**
FIELD/AREA:			**SALES GAS**
PROJECT NO. :	**201903069**	ANALYSIS NO. :	**02**
COMPANY NAME :	**AUSTIN EXPLORATION**	ANALYSIS DATE:	MARCH 18, 2019 11:12
OFFICE / BRANCH:	FLORENCE, CO	SAMPLE DATE :	MARCH 12, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	511 psig	PROBE :	YES
FLOW PRES. :	psig	CYLINDER NO. :	0206
LAB PRES:	psig	SAMPLED BY :	DANTE MARTINEZ
SAMPLE TEMP. :	79 °f	SAMPLING COMPANY:	EMPACT
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	**BDL** ppm
H2O BY STAIN TUBE:	#/mmcf	CO2 BY STAIN TUBE:	Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.730**	GPM @ **14.650**
Helium	---	0.07	0.01	---	---
Hydrogen	---	0.02	0.00	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.84	1.14	---	---
Carbon Dioxide	---	1.96	4.17	---	---
Methane	P1	80.62840	62.55350	---	---
Ethane	P2	8.5146	12.3815	2.284	2.271
Propane	P3	5.3229	11.3510	1.471	1.463
i-Butane	I4	0.4380	1.2312	0.144	0.143
n-Butane	P4	1.3160	3.6990	0.416	0.414
2,2-Dimethylpropane	I5	0.0008	0.0028	0.000	0.000
i-Pentane	I5	0.2025	0.7065	0.074	0.074
n-Pentane	P5	0.2484	0.8667	0.091	0.090
2,2-Dimethylbutane	I6	0.0006	0.0025	0.000	0.000
Cyclopentane	N5	0.0289	0.0980	0.009	0.009
2,3-Dimethylbutane	I6	0.0044	0.0183	0.002	0.002
2-Methylpentane	I6	0.0506	0.2109	0.021	0.021
3-Methylpentane	I6	0.0294	0.1225	0.012	0.012
UnknownC5s	U5	0.0003	0.0011	0.000	0.000
n-Hexane	P6	0.0747	0.3113	0.031	0.031
2,2-Dimethylpentane	I7	0.0002	0.0010	0.000	0.000
Methylcyclopentane	N6	0.0526	0.2141	0.019	0.019
2,4-Dimethylpentane	I7	0.0021	0.0102	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0001	0.0005	0.000	0.000
Benzene	A6	0.0190	0.0718	0.005	0.005
3,3-Dimethylpentane	I7	0.0001	0.0005	0.000	0.000
Cyclohexane	N6	0.0236	0.0960	0.008	0.008

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2-Methylhexane	I7	0.0095	0.0460	0.004	0.004
2,3-Dimethylpentane	I7	0.0045	0.0218	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0030	0.0143	0.001	0.001
3-Methylhexane	I7	0.0116	0.0562	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0059	0.0280	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0066	0.0313	0.003	0.003
3-Ethylpentane	I7	0.0008	0.0039	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0121	0.0575	0.006	0.006
2,2,4-Trimethylpentane	I8	0.0002	0.0011	0.000	0.000
n-Heptane	P7	0.0191	0.0926	0.009	0.009
1c,2-Dimethylcyclopentane	N7	0.0010	0.0047	0.000	0.000
Methylcyclohexane	N7	0.0171	0.0812	0.007	0.007
2,2-Dimethylhexane	I8	0.0018	0.0100	0.001	0.001
Ethylcyclopentane	N7	0.0022	0.0105	0.001	0.001
2,5-Dimethylhexane	I8	0.0004	0.0022	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
2,4-Dimethylhexane	I8	0.0007	0.0039	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0014	0.0076	0.001	0.001
3,3-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0018	0.0098	0.001	0.001
2,3,4-Trimethylpentane	I8	0.0003	0.0016	0.000	0.000
Toluene	A7	0.0094	0.0419	0.003	0.003
2,3-Dimethylhexane	I8	0.0006	0.0033	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0003	0.0016	0.000	0.000
2-Methylheptane	I8	0.0031	0.0171	0.002	0.002
4-Methylheptane	I8	0.0008	0.0044	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0005	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
3-Methylheptane	I8	0.0013	0.0072	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0024	0.0130	0.001	0.001
3-Ethylhexane	I8	0.0004	0.0022	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0009	0.0049	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0016	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0005	0.0027	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0004	0.0022	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0013	0.0071	0.001	0.001
2,2,4-Trimethylhexane	I9	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0014	0.0076	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0011	0.0060	0.001	0.001
n-Octane	P8	0.0036	0.0199	0.002	0.002
i-Propylcyclopentane	I8	0.0001	0.0005	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0003	0.0016	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0013	0.0079	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0004	0.0025	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
Ethylcyclohexane	N8	0.0007	0.0038	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
Ethylbenzene	I8	0.0008	0.0041	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0002	0.0012	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0010	0.0051	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0006	0.0031	0.000	0.000

3,4-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0002	0.0013	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0006	0.000	0.000
4-Methyloctane	I9	0.0002	0.0013	0.000	0.000
2-Methyloctane	I9	0.0003	0.0018	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0006	0.000	0.000
3-Methyloctane	I9	0.0003	0.0018	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0006	0.0031	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0012	0.000	0.000
n-Nonane	P9	0.0008	0.0050	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0002	0.0012	0.000	0.000
i-Propylbenzene	A9	0.0003	0.0017	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0006	0.000	0.000
n-Butylcyclopentane	N9	0.0002	0.0012	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0007	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
5-Methylnonane	I10	0.0001	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0013	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0011	0.0068	0.001	0.001
n-Decane	P10	0.0002	0.0014	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	0.0006	0.000	0.000
UnknownC10s	U10	0.0003	0.0021	0.000	0.000
n-Undecane	P11	0.0001	0.0008	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
TOTAL		100.00000	100.00000	4.6462	4.6213

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0190	0.0718
TOLUENE	0.0094	0.0419
ETHYLBENZENE	0.0008	0.0041
XYLENES	0.0022	0.0113
TOTAL BTEX	0.0314	0.1291

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*
Mod ASTM D6730,GPA 2261 & GPA 2286.
(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

	BTU @	**14.730**	**14.650**
LOW	NET DRY REAL :	1088.4 **/scf**	1082.5 **/scf**
	NET WET REAL :	1069.5 **/scf**	1063.6 **/scf**
HIGH	GROSS DRY REAL :	1201.0 **/scf**	1194.5 **/scf**
	GROSS WET REAL :	1180.1 **/scf**	1173.6 **/scf**
	NET DRY REAL :	19993.2 **/lb**	19884.6 **/lb**
	GROSS DRY REAL :	22058.8 **/lb**	21939.0 **/lb**
	RELATIVE DENSITY (AIR=1):		0.7132
	DENSITY		0.05449 **lb/scf**
	COMPRESSIBILITY FACTOR :		0.99679
	REGULAR WOBBE INDEX		1418.9

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

Net Dry Ideal BTU	4606.8 **/scf**	Relative Density - SG (Air=1)	3.1638		***C6+factors***
Gross Dry Ideal BTU	4953.4 **/scf**	**Z** Compressiblity Factor	0.9915		0.99096
Net Dry Ideal BTU	19370.7 **/lb**	Density Factor	241.44	**lbm/1000 ft3**	
Gross Dry Ideal BTU	20829 **/lb**	Molar Mass or MW	91.622	**g/mol**	
		Volume Liquid Ideal gas	0.157	**scf/gal**	24.4

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.

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NATURAL GAS ANALYSIS

PRIMARY DB KEY:		NAME/DESCRIP :	**J.W. POWELL #23-35**
LEASE #:			**METER TUBE - TEST SEPARATOR**
FIELD/ AREA:			**SALES GAS**
PROJECT NO. :	**201903069**	ANALYSIS NO. :	**02**
COMPANY NAME :	**AUSTIN EXPLORATION**	ANALYSIS DATE:	MARCH 18, 2019 11:12
OFFICE / BRANCH:	FLORENCE, CO	SAMPLE DATE :	MARCH 12, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	511 psig	PROBE :	YES
FLOW PRES. :	psig	CYLINDER NO. :	0206
LAB PRES:	psig	SAMPLED BY :	DANTE MARTINEZ
SAMPLE TEMP. :	79 ºf	SAMPLING COMPANY:	EMPACT
AMBIENT TEMP.:	ºf	H2S BY STAIN TUBE:	**BDL** ppm
H2O BY STAIN TUBE	#/mmcf	CO2 BY STAIN TUBE:	Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENTS	NORM. MOLE%	**GPM @** 14.73	**GPM @** 14.65
HELIUM	0.07	-	-
HYDROGEN	0.02	-	-
OXYGEN/ARGON	0.01	-	-
NITROGEN	0.84	-	-
CO2	1.97	-	-
METHANE	80.64	-	-
ETHANE	8.51	2.2826	2.2702
PROPANE	5.33	1.4731	1.4651
ISOBUTANE	0.44	0.1448	0.1440
N-BUTANE	1.32	0.4173	0.4150
ISOPENTANE	0.20	0.0734	0.0730
N-PENTANE	0.25	0.0905	0.0900
HEXANES+	0.40	0.1740	0.1730
TOTAL	100.00	4.6557	4.6303

BTU @ 60 DEG F	**14.73**	**14.65**
GROSS DRY REAL =	1201.9 **/scf**	1195.4 **/scf**
GROSS SATURATED REAL =	1181.0 **/scf**	1174.5 **/scf**

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F)	0.7138
GRAVITY (LB/SCF)	0.05448
COMPRESSIBILITY FACTOR :	0.99678

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9

The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: **60% 30% 10%**