EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PROJECT NO. :	201404102	ANALYSIS NO. :	02
COMPANY NAME :	LINN OPERATING	ANALYSIS DATE:	APRIL 28, 2014
ACCOUNT NO. :		SAMPLE DATE :	APRIL 7, 2014
PRODUCER :		CYLINDER NO. :	1088
LEASE NO. :		SAMPLED BY :	MIKE KELLY
NAME/DESCRIP :	CHEVRON 36-5D GRAND VALLEY FIELD; TUBING STRING		
FIELD DATA		SAMPLE TEMP. :	50
SAMPLE PRES. :	380	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE CO PRESENT IN SAMPLE-EMPACT		

COMPONENT	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
HELIUM	0.00	0.00	---	---
HYDROGEN	0.13	0.01	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.09	0.14	---	---
CARBON DIOXIDE	2.01	4.78	---	---
METHANE	88.45800	76.69130	---	---
ETHANE	6.7649	10.9934	1.8040	1.8138
PROPANE	1.5169	3.6150	0.4168	0.4190
I-BUTANE	0.3615	1.1355	0.1179	0.1186
N-BUTANE	0.2605	0.8183	0.0820	0.0824
I-PENTANE	0.1381	0.5381	0.0500	0.0502
N-PENTANE	0.0741	0.2889	0.0270	0.0271
HEXANES PLUS	0.1960	0.9895	0.0740	0.0742
TOTALS	100.00000	100.00000	2.5717	2.5853

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0086	0.0363
TOLUENE	0.0053	0.0264
ETHYLBENZENE	0.0005	0.0029
XYLENES	0.0018	0.0103
TOTAL BTEX	0.0162	0.0759

BTU @		14.650	14.730
LOW	NET DRY REAL :	983.7 /scf	989.1 /scf
	NET WET REAL :	966.5 /scf	971.9 /scf
HIGH	GROSS DRY REAL :	1089.0 /scf	1094.9 /scf
	GROSS WET REAL :	1070.0 /scf	1075.9 /scf
	NET DRY REAL :	20191.8 /lb	20302.0 /lb
	GROSS DRY REAL :	22348.7 /lb	22470.8 /lb
	RELATIVE DENSITY (AIR=1):		0.6381
	COMPRESSIBILITY FACTOR :		0.99744

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

(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730

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GLYCALC INFORMATION

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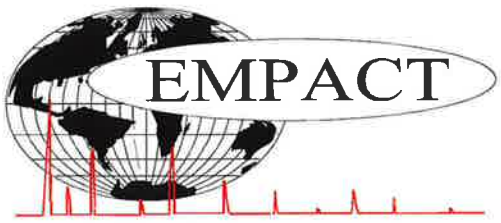
SAMPLE PRES. :	380	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE CO PRESENT IN SAMPLE-EMPACT		

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.13	0.01
Carbon Dioxide	2.01	4.78
Nitrogen	0.09	0.14
Methane	88.45800	76.69130
Ethane	6.7649	10.9934
Propane	1.5169	3.6150
Isobutane	0.3615	1.1355
n-Butane	0.2605	0.8183
Isopentane	0.1345	0.5245
n-Pentane	0.0741	0.2889
Cyclopentane	0.0036	0.0136
n-Hexane	0.0297	0.1383
Cyclohexane	0.0115	0.0523
Other Hexanes	0.0603	0.2795
Heptanes	0.0369	0.1987
Methycyclohexane	0.0176	0.0934
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0086	0.0363
Toluene	0.0053	0.0264
Ethylbenzene	0.0005	0.0029
Xylenes	0.0018	0.0103
C8+ Heavies	0.0238	0.1514
Subtotal	100.00000	100.00000
Oxygen/Argon	0.00	0.00
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201404102	ANALYSIS NO. :	02
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COMMENTS :	SPOT; NO PROBE CO PRESENT IN SAMPLE-EMPACT		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.650	GPM @ 14.730
Helium	---	0.00	0.00	---	---
Hydrogen	---	0.13	0.01	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.09	0.14	---	---
Carbon Dioxide	---	2.01	4.78	---	---
Methane	P1	88.45800	76.69130	---	---
Ethane	P2	6.7649	10.9934	1.804	1.814
Propane	P3	1.5169	3.6150	0.417	0.419
i-Butane	I4	0.3615	1.1355	0.118	0.119
n-Butane	P4	0.2605	0.8183	0.082	0.082
2,2-Dimethylpropane	I5	0.0017	0.0067	0.001	0.001
i-Pentane	I5	0.1328	0.5178	0.048	0.048
n-Pentane	P5	0.0741	0.2889	0.027	0.027
2,2-Dimethylbutane	I6	0.0018	0.0084	0.001	0.001
Cyclopentane	N5	0.0036	0.0136	0.001	0.001
2,3-Dimethylbutane	I6	0.0049	0.0228	0.002	0.002
2-Methylpentane	I6	0.0267	0.1244	0.011	0.011
3-Methylpentane	I6	0.0140	0.0652	0.006	0.006
n-Hexane	P6	0.0297	0.1383	0.012	0.012
2,2-Dimethylpentane	I7	0.0006	0.0032	0.000	0.000
Methylcyclopentane	N6	0.0129	0.0587	0.005	0.005
2,4-Dimethylpentane	I7	0.0012	0.0065	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0002	0.0011	0.000	0.000
Benzene	A6	0.0086	0.0363	0.002	0.002
3,3-Dimethylpentane	I7	0.0003	0.0016	0.000	0.000
Cyclohexane	N6	0.0115	0.0523	0.004	0.004
2-Methylhexane	I7	0.0062	0.0336	0.003	0.003
2,3-Dimethylpentane	I7	0.0021	0.0114	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0011	0.0058	0.000	0.000
3-Methylhexane	I7	0.0058	0.0314	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0020	0.0106	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0019	0.0101	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0016	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0031	0.0164	0.001	0.001
n-Heptane	P7	0.0112	0.0606	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0002	0.0011	0.000	0.000

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Methylcyclohexane	N7	0.0176	0.0934	0.007	0.007
2,2-Dimethylhexane	I8	0.0008	0.0049	0.000	0.000
Ethylcyclopentane	N7	0.0007	0.0037	0.000	0.000
2,5-Dimethylhexane	I8	0.0005	0.0031	0.000	0.000
2,4-Dimethylhexane	I8	0.0005	0.0031	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0006	0.0036	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0005	0.0030	0.000	0.000
Toluene	A7	0.0053	0.0264	0.002	0.002
2,3-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
2-Methylheptane	I8	0.0025	0.0155	0.001	0.001
4-Methylheptane	I8	0.0006	0.0037	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
3-Methylheptane	I8	0.0014	0.0087	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0021	0.0128	0.001	0.001
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0009	0.0055	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0008	0.0049	0.000	0.000
n-Octane	P8	0.0035	0.0216	0.002	0.002
1c,4-Dimethylcyclohexane	N8	0.0004	0.0024	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0008	0.0055	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0006	0.0042	0.000	0.000
Ethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
n-Propylcyclopentane	N8	0.0004	0.0024	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0005	0.0029	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,3-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0011	0.0063	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0003	0.0017	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0002	0.0014	0.000	0.000
2-Methyloctane	I9	0.0003	0.0021	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0003	0.0021	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0004	0.0023	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0014	0.000	0.000
n-Nonane	P9	0.0010	0.0069	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0013	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0003	0.0021	0.000	0.000
n-Decane	P10	0.0002	0.0015	0.000	0.000
UnknownC10s	U10	0.0003	0.0023	0.000	0.000

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TOTAL	100.00000	100.00000	2.5717	2.5853	

BTEX COMPONENTS	MOLE%	WT%
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	GROSS WET REAL :	1070.0 /scf	1075.9 /scf
	NET DRY REAL :	20191.8 /lb	20302.0 /lb
	GROSS DRY REAL :	22348.7 /lb	22470.8 /lb
	RELATIVE DENSITY (AIR=1):		0.6381
	COMPRESSIBILITY FACTOR :		0.99744

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

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993) ; ASTM D6730*

THIS DATA HAS BEEN ACQUIRED THROUGH APPLICATION OF CURRENT STATE-OF-THE-ART ANALYTICAL TECHNIQUES. THE USE OF THIS INFORMATION IS THE RESPONSIBLITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, ASSUMES NO RESPONSIBLITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

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