

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

LEASE #:		NAME/DESCRIP :	SILVERTON 16-10 SALES GAS
PROJECT NO. :	201701044	ANALYSIS NO. :	02
COMPANY NAME :	NIGHTHAWK PRODUCTION CO	ANALYSIS DATE:	JANUARY 18, 2017 07:33
OFFICE / BRANCH:	HIGHLANDS RANCH, CO	SAMPLE DATE :	JANUARY 11, 2017 08:40
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	25 psig	CYLINDER NO. :	1451
LAB PRES:	psig	SAMPLED BY :	GALE MCENDREE
SAMPLE TEMP. :	67 °f	SAMPLING COMPANY:	EMPACT
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	17 ppm
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:	NO PROBE		
LAB COMMENTS:			

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.730</u>	<u>GPM @ 14.650</u>
ALCOHOLS	0.0155	0.0166		
HELIUM	0.88	0.12	---	---
HYDROGEN	0.03	0.00	---	---
OXYGEN/ARGON	0.45	0.48	---	---
NITROGEN	50.6400	47.4500	---	---
CARBON DIOXIDE	3.56	5.24	---	---
METHANE	25.49650	13.68190	---	---
ETHANE	4.2010	4.2253	1.1264	1.1203
PROPANE	5.7643	8.5021	1.5916	1.5830
I-BUTANE	1.2069	2.3464	0.3959	0.3937
N-BUTANE	3.8842	7.5515	1.2269	1.2202
I-PENTANE	0.9935	2.3953	0.3617	0.3598
N-PENTANE	1.3388	3.2310	0.4853	0.4827
HEXANES PLUS	1.5393	4.7599	0.6416	0.6388
TOTALS	100.00000	100.00000	5.8294	5.7985

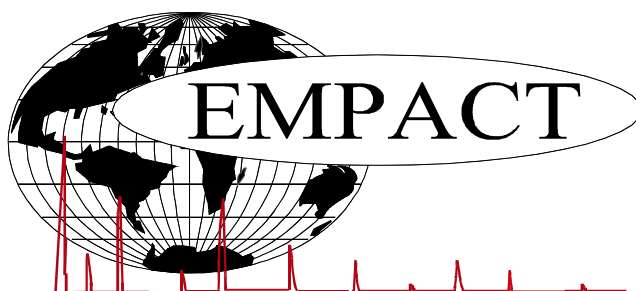
<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>	<u>BTU @ 14.730</u>	<u>14.650</u>	
BENZENE	0.0040	0.0104	LOW NET DRY REAL :	747.6 /scf	743.5 /scf
TOLUENE	0.0036	0.0111	NET WET REAL :	734.6 /scf	730.5 /scf
ETHYLBENZENE	0.0004	0.0014	HIGH GROSS DRY REAL :	816.4 /scf	812.0 /scf
XYLENES	0.0018	0.0064	GROSS WET REAL :	802.2 /scf	797.8 /scf
TOTAL BTEX	0.0098	0.0293	NET DRY REAL :	9512.3 /lb	9460.6 /lb
			GROSS DRY REAL :	10394.5 /lb	10338.1 /lb

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

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

RELATIVE DENSITY (AIR=1): 1.0312
COMPRESSIBILITY FACTOR : 0.99751

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.



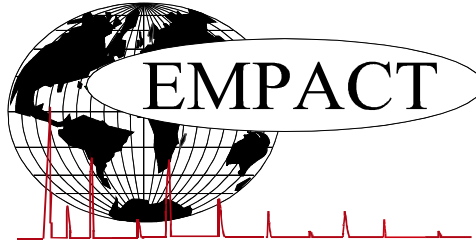
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GLYCALC INFORMATION

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ACCOUNT NO. :		SAMPLE DATE :	JANUARY 11, 2017 08:40
PRODUCER :		CYLINDER NO. :	1451
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SILVERTON 16-10 SALES GAS		
FIELD DATA		SAMPLE TEMP. :	67
SAMPLE PRES. :	25	AMBIENT TEMP.:	
COMMENTS :	NO PROBE SPOT		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.88	0.12
Hydrogen	0.03	0.00
Carbon Dioxide	3.56	5.24
Nitrogen	50.64	47.45
Methane	25.49650	13.68190
Ethane	4.2010	4.2253
Propane	5.7643	8.5021
Isobutane	1.2069	2.3464
n-Butane	3.8842	7.5515
Isopentane	0.9580	2.3120
n-Pentane	1.3388	3.2310
Cyclopentane	0.0355	0.0833
n-Hexane	0.3743	1.0789
Cyclohexane	0.0890	0.2505
Other Hexanes	0.5161	1.4803
Heptanes	0.3057	1.0199
Methycyclohexane	0.0888	0.2916
2,2,4 Trimethylpentane	0.0015	0.0057
Benzene	0.0040	0.0104
Toluene	0.0036	0.0111
Ethylbenzene	0.0004	0.0014
Xylenes	0.0018	0.0064
C8+ Heavies	0.1541	0.6037
<u>Subtotal</u>	<u>99.53450</u>	<u>99.50340</u>
Oxygen/Argon	0.45	0.48
<u>Alcohols</u>	<u>0.0155</u>	<u>0.0166</u>
Total	100.00000	100.00000

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EXTENDED NATURAL GAS ANALYSIS (*DHA)
DHA COMPONENT LIST

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LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SILVERTON 16-10 SALES GAS		
FIELD DATA		SAMPLE TEMP. :	67
SAMPLE PRES. :	25	AMBIENT TEMP.:	
COMMENTS :	NO PROBE SPOT		

<u>COMPONENT</u>	<u>PIANO #</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.730</u>	<u>GPM @ 14.650</u>
Helium	---	0.88	0.12	---	---
Hydrogen	---	0.03	0.00	---	---
Oxygen/Argon	---	0.45	0.48	---	---
Nitrogen	---	50.64	47.45	---	---
Carbon Dioxide	---	3.56	5.24	---	---
Methane	P1	25.49650	13.68190	---	---
Ethane	P2	4.2010	4.2253	1.126	1.120
Propane	P3	5.7643	8.5021	1.592	1.583
i-Butane	I4	1.2069	2.3464	0.396	0.394
Methanol	X1	0.0155	0.0166	0.002	0.002
n-Butane	P4	3.8838	7.5507	1.227	1.220
2,2-Dimethylpropane	I5	0.0074	0.0179	0.003	0.003
i-Pentane	I5	0.9506	2.2941	0.349	0.347
UnknownC4s	U4	0.0004	0.0008	0.000	0.000
n-Pentane	P5	1.3345	3.2206	0.485	0.483
2,2-Dimethylbutane	I6	0.0052	0.0150	0.002	0.002
Cyclopentane	N5	0.0355	0.0833	0.010	0.010
2,3-Dimethylbutane	I6	0.0186	0.0536	0.008	0.008
2-Methylpentane	I6	0.1240	0.3574	0.051	0.051
3-Methylpentane	I6	0.2533	0.7302	0.104	0.103
UnknownC5s	U5	0.0043	0.0104	0.002	0.002
n-Hexane	P6	0.3743	1.0789	0.155	0.154
2,2-Dimethylpentane	I7	0.0002	0.0007	0.000	0.000
Methylcyclopentane	N6	0.1085	0.3054	0.038	0.038
2,4-Dimethylpentane	I7	0.0060	0.0201	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0005	0.0017	0.000	0.000
Benzene	A6	0.0040	0.0104	0.001	0.001
3,3-Dimethylpentane	I7	0.0002	0.0007	0.000	0.000
Cyclohexane	N6	0.0890	0.2505	0.030	0.030
2-Methylhexane	I7	0.0320	0.1073	0.015	0.015
2,3-Dimethylpentane	I7	0.0110	0.0369	0.005	0.005
1,1-Dimethylcyclopentane	N7	0.0089	0.0292	0.004	0.004
3-Methylhexane	I7	0.0477	0.1599	0.022	0.022
1c,3-Dimethylcyclopentane	N7	0.0172	0.0565	0.008	0.008
1t,3-Dimethylcyclopentane	N7	0.0137	0.0450	0.006	0.006
3-Ethylpentane	I7	0.0034	0.0114	0.002	0.002
1t,2-Dimethylcyclopentane	N7	0.0319	0.1048	0.015	0.015
2,2,4-Trimethylpentane	I8	0.0015	0.0057	0.001	0.001
UnknownC6s	U6	0.0065	0.0187	0.003	0.003

n-Heptane	P7	0.1138	0.3814	0.052	0.052
1c,2-Dimethylcyclopentane	N7	0.0025	0.0082	0.001	0.001
Methylcyclohexane	N7	0.0888	0.2916	0.036	0.036
2,2-Dimethylhexane	I8	0.0072	0.0275	0.003	0.003
1,1,3-Trimethylcyclopentane	N7	0.0012	0.0045	0.001	0.001
Ethylcyclopentane	N7	0.0046	0.0151	0.002	0.002
2,5-Dimethylhexane	I8	0.0015	0.0057	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0004	0.0015	0.000	0.000
2,4-Dimethylhexane	I8	0.0029	0.0111	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0060	0.0225	0.003	0.003
3,3-Dimethylhexane	I8	0.0006	0.0023	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0086	0.0323	0.004	0.004
2,3,4-Trimethylpentane	I8	0.0002	0.0008	0.000	0.000
Toluene	A7	0.0036	0.0111	0.001	0.001
2,3-Dimethylhexane	I8	0.0023	0.0088	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0010	0.0038	0.000	0.000
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0004	0.000	0.000
2-Methylheptane	I8	0.0169	0.0646	0.009	0.009
4-Methylheptane	I8	0.0041	0.0157	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0010	0.0038	0.000	0.000
3,4-Dimethylhexane	I8	0.0006	0.0023	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0005	0.0019	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0002	0.0007	0.000	0.000
3-Methylheptane	I8	0.0051	0.0195	0.003	0.003
1c,2t,3-Trimethylcyclopentane	N8	0.0135	0.0507	0.007	0.007
3-Ethylhexane	I8	0.0022	0.0084	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0038	0.0143	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0008	0.0030	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0002	0.0009	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0011	0.0041	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0010	0.0038	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0024	0.0090	0.001	0.001
2,2,4-Trimethylhexane	I9	0.0002	0.0009	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0034	0.0128	0.002	0.002
1c,2c,3-Trimethylcyclopentane	N8	0.0005	0.0019	0.000	0.000
UnknownC7s	U7	0.0109	0.0365	0.005	0.005
n-Octane	P8	0.0258	0.0986	0.013	0.013
1c,4-Dimethylcyclohexane	N8	0.0007	0.0026	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0004	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0002	0.0009	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0009	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0004	0.0017	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0004	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0007	0.0026	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0034	0.0144	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0019	0.0082	0.001	0.001
2,4-Dimethylheptane	I9	0.0003	0.0013	0.000	0.000
4,4-Dimethylheptane	I9	0.0007	0.0030	0.000	0.000
Ethylcyclohexane	N8	0.0018	0.0068	0.001	0.001
n-Propylcyclopentane	N8	0.0008	0.0030	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0013	0.000	0.000
2,5-Dimethylheptane	I9	0.0005	0.0021	0.000	0.000
3,3-Dimethylheptane	I9	0.0003	0.0013	0.000	0.000
3,5-Dimethylheptane	I9	0.0002	0.0009	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0009	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
Ethylbenzene	I8	0.0004	0.0014	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0010	0.0042	0.001	0.001
2,3-Dimethylheptane	I9	0.0002	0.0009	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0009	0.0032	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0004	0.0014	0.000	0.000
3,4-Dimethylheptane	I9	0.0004	0.0017	0.000	0.000

3,4-Dimethylheptane (2)	I9	0.0006	0.0026	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0009	0.000	0.000
4-Methyloctane	I9	0.0010	0.0043	0.001	0.001
2-Methyloctane	I9	0.0010	0.0043	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0003	0.0013	0.000	0.000
3-Ethylheptane	I9	0.0003	0.0013	0.000	0.000
3-Methyloctane	I9	0.0017	0.0073	0.001	0.001
1c,2t,4c-Trimethylcyclohexane	I9	0.0002	0.0008	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0004	0.000	0.000
3,3-Diethylpentane	I9	0.0002	0.0009	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0005	0.0018	0.000	0.000
i-Butylcyclopentane	N9	0.0007	0.0029	0.000	0.000
UnknownC8s	U8	0.0006	0.0023	0.000	0.000
n-Nonane	P9	0.0040	0.0172	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0009	0.0038	0.001	0.001
i-Propylbenzene	A9	0.0006	0.0024	0.000	0.000
i-Propylcyclohexane	N9	0.0002	0.0008	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
n-Butylcyclopentane	N9	0.0005	0.0021	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
n-Propylbenzene	A9	0.0005	0.0020	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0009	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0002	0.0009	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0008	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0004	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0008	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
5-Methylnonane	I10	0.0003	0.0014	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0008	0.000	0.000
3-Ethylheptane	I10	0.0001	0.0005	0.000	0.000
3-Methylnonane	I10	0.0002	0.0009	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0009	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0005	0.000	0.000
i-Butylbenzene	A10	0.0001	0.0004	0.000	0.000
UnknownC9s	U9	0.0062	0.0266	0.003	0.003
n-Decane	P10	0.0007	0.0033	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0002	0.0008	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0002	0.0009	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0004	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0004	0.000	0.000
UnknownC10s	U10	0.0015	0.0071	0.001	0.001
n-Undecane	P11	0.0001	0.0005	0.000	0.000
UnknownC11s	U11	0.0001	0.0005	0.000	0.000
TOTAL		100.00000	100.00000	5.8334	5.8025

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.730	14.650
BENZENE	0.0040	0.0104	LOW NET DRY REAL :	747.6 /scf	743.5 /scf
TOLUENE	0.0036	0.0111	NET WET REAL :	734.6 /scf	730.5 /scf
ETHYLBENZENE	0.0004	0.0014	HIGH GROSS DRY REAL :	816.4 /scf	812.0 /scf
XYLENES	0.0018	0.0064	GROSS WET REAL :	802.2 /scf	797.8 /scf
TOTAL BTEX	0.0098	0.0293	NET DRY REAL :	9512.3 /lb	9460.6 /lb
			GROSS DRY REAL :	10394.5 /lb	10338.1 /lb

RELATIVE DENSITY (AIR=1): 1.0312
 COMPRESSIBILITY FACTOR : 0.99751

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

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