

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

LEASE #:		NAME/DESCRIP :	SALEN 14-35 SALES GAS
PROJECT NO. :	201701044	ANALYSIS NO. :	04
COMPANY NAME :	NIGHTHAWK PRODUCTION CO	ANALYSIS DATE:	JANUARY 18, 2017 11:49
OFFICE / BRANCH:	HIGHLANDS RANCH, CO	SAMPLE DATE :	JANUARY 11, 2017 09:55
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	25 psig	CYLINDER NO. :	0533
LAB PRES:	psig	SAMPLED BY :	GALE MCENDREE
SAMPLE TEMP. :	86 °f	SAMPLING COMPANY:	EMPACT
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	43 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>
HELIUM	0.95	0.11	---	---
HYDROGEN	0.02	0.00	---	---
OXYGEN/ARGON	0.22	0.21	---	---
NITROGEN	28.0500	23.0400	---	---
CARBON DIOXIDE	5.09	6.57	---	---
METHANE	25.38910	11.93500	---	---
ETHANE	10.3692	9.1397	2.7882	2.7731
PROPANE	14.4394	18.6643	3.9999	3.9781
I-BUTANE	2.9196	4.9743	0.9607	0.9554
N-BUTANE	6.2695	10.6818	1.9868	1.9760
I-PENTANE	1.9651	4.1477	0.7126	0.7088
N-PENTANE	1.8391	3.8896	0.6703	0.6667
HEXANES PLUS	2.4790	6.6376	1.0207	1.0152
TOTALS	100.00000	100.00000	12.1392	12.0733

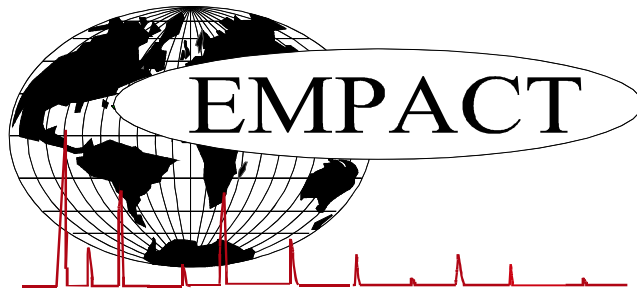
<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>	<u>BTU @ 14.730</u>	<u>14.650</u>	
BENZENE	0.0394	0.0902	LOW NET DRY REAL :	1273.3 /scf	1266.4 /scf
TOLUENE	0.0220	0.0594	NET WET REAL :	1251.2 /scf	1244.3 /scf
ETHYLBENZENE	0.0010	0.0031	HIGH GROSS DRY REAL :	1388.1 /scf	1380.5 /scf
XYLENES	0.0032	0.0099	GROSS WET REAL :	1364.0 /scf	1356.4 /scf
TOTAL BTEX	0.0656	0.1626	NET DRY REAL :	14204.9 /lb	14127.8 /lb
			GROSS DRY REAL :	15480.2 /lb	15396.1 /lb

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

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

RELATIVE DENSITY (AIR=1): 1.1764
COMPRESSIBILITY FACTOR : 0.99433

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.



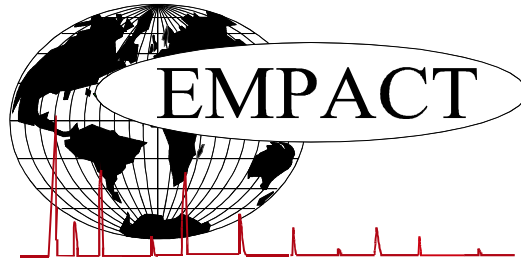
EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201701044	ANALYSIS NO. :	04
COMPANY NAME :	NIGHTHAWK PRODUCTION CO	ANALYSIS DATE:	JANUARY 18, 2017 11:49
ACCOUNT NO. :		SAMPLE DATE :	JANUARY 11, 2017 09:55
PRODUCER :		CYLINDER NO. :	0533
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SALEN 14-35 SALES GAS		
FIELD DATA		SAMPLE TEMP. :	86
SAMPLE PRES. :	25	AMBIENT TEMP.:	
COMMENTS :	NO PROBE SPOT		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.95	0.11
Hydrogen	0.02	0.00
Carbon Dioxide	5.09	6.57
Nitrogen	28.05	23.04
Methane	25.38910	11.93500
Ethane	10.3692	9.1397
Propane	14.4394	18.6643
Isobutane	2.9196	4.9743
n-Butane	6.2695	10.6818
Isopentane	1.8248	3.8593
n-Pentane	1.8391	3.8896
Cyclopentane	0.1403	0.2884
n-Hexane	0.3917	0.9895
Cyclohexane	0.0762	0.1880
Other Hexanes	1.1465	2.8770
Heptanes	0.5454	1.5869
Methycyclohexane	0.0627	0.1805
2,2,4 Trimethylpentane	0.0015	0.0050
Benzene	0.0394	0.0902
Toluene	0.0220	0.0594
Ethylbenzene	0.0010	0.0031
Xylenes	0.0032	0.0099
C8+ Heavies	0.1894	0.6481
<u>Subtotal</u>	<u>99.78000</u>	<u>99.79000</u>
<u>Oxygen/Argon</u>	<u>0.22</u>	<u>0.21</u>
Total	100.00000	100.00000

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.



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201701044	ANALYSIS NO. :	04
COMPANY NAME :	NIGHTHAWK PRODUCTION CO	ANALYSIS DATE:	JANUARY 18, 2017 11:49
ACCOUNT NO. :		SAMPLE DATE :	JANUARY 11, 2017 09:55
PRODUCER :		CYLINDER NO. :	0533
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	SALEN 14-35		
	SALES GAS		
FIELD DATA		SAMPLE TEMP. :	86
SAMPLE PRES. :	25	AMBIENT TEMP.:	
COMMENTS :	NO PROBE		
	SPOT		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.730	GPM @ 14.650
Helium	---	0.95	0.11	---	---
Hydrogen	---	0.02	0.00	---	---
Oxygen/Argon	---	0.22	0.21	---	---
Nitrogen	---	28.05	23.04	---	---
Carbon Dioxide	---	5.09	6.57	---	---
Methane	P1	25.38910	11.93500	---	---
Ethane	P2	10.3692	9.1397	2.788	2.773
Propane	P3	14.4394	18.6643	4.000	3.978
i-Butane	I4	2.9196	4.9743	0.961	0.955
n-Butane	P4	6.2695	10.6818	1.987	1.976
2,2-Dimethylpropane	I5	0.0107	0.0226	0.004	0.004
i-Pentane	I5	1.8141	3.8367	0.667	0.664
n-Pentane	P5	1.8386	3.8885	0.670	0.667
2,2-Dimethylbutane	I6	0.0052	0.0131	0.002	0.002
Cyclopentane	N5	0.1403	0.2884	0.041	0.041
2,3-Dimethylbutane	I6	0.0266	0.0672	0.011	0.011
2-Methylpentane	I6	0.2861	0.7227	0.119	0.118
3-Methylpentane	I6	0.4964	1.2540	0.204	0.203
UnknownC5s	U5	0.0005	0.0011	0.000	0.000
n-Hexane	P6	0.3917	0.9895	0.162	0.161
2,2-Dimethylpentane	I7	0.0002	0.0006	0.000	0.000
Methylcyclopentane	N6	0.3247	0.8011	0.116	0.115
2,4-Dimethylpentane	I7	0.0073	0.0214	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0007	0.0020	0.000	0.000
Benzene	A6	0.0394	0.0902	0.011	0.011
3,3-Dimethylpentane	I7	0.0014	0.0041	0.001	0.001
Cyclohexane	N6	0.0762	0.1880	0.026	0.026
2-Methylhexane	I7	0.0277	0.0814	0.013	0.013
2,3-Dimethylpentane	I7	0.0243	0.0714	0.011	0.011
1,1-Dimethylcyclopentane	N7	0.0085	0.0245	0.003	0.003
3-Methylhexane	I7	0.0827	0.2429	0.038	0.038
1c,3-Dimethylcyclopentane	N7	0.0538	0.1549	0.025	0.025
1t,3-Dimethylcyclopentane	N7	0.0421	0.1212	0.019	0.019
3-Ethylpentane	I7	0.0144	0.0423	0.006	0.006
1t,2-Dimethylcyclopentane	N7	0.1334	0.3840	0.062	0.061

2,2,4-Trimethylpentane	I8	0.0015	0.0050	0.001	0.001
UnknownC6s	U6	0.0075	0.0189	0.003	0.003
n-Heptane	P7	0.0917	0.2694	0.042	0.042
1c,2-Dimethylcyclopentane	N7	0.0091	0.0262	0.004	0.004
Methylcyclohexane	N7	0.0627	0.1805	0.025	0.025
2,2-Dimethylhexane	I8	0.0043	0.0144	0.002	0.002
1,1,3-Trimethylcyclopentane	N7	0.0009	0.0030	0.000	0.000
Ethylcyclopentane	N7	0.0169	0.0486	0.007	0.007
2,5-Dimethylhexane	I8	0.0021	0.0070	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0003	0.0010	0.000	0.000
2,4-Dimethylhexane	I8	0.0028	0.0094	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0124	0.0408	0.006	0.006
3,3-Dimethylhexane	I8	0.0005	0.0017	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0268	0.0881	0.012	0.012
2,3,4-Trimethylpentane	I8	0.0002	0.0007	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0003	0.000	0.000
Toluene	A7	0.0220	0.0594	0.007	0.007
2,3-Dimethylhexane	I8	0.0025	0.0084	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0016	0.0054	0.001	0.001
1,1,2-Trimethylcyclopentane	N8	0.0003	0.0010	0.000	0.000
2-Methylheptane	I8	0.0218	0.0730	0.011	0.011
4-Methylheptane	I8	0.0038	0.0127	0.002	0.002
3-Methyl-3-ethylpentane	I8	0.0013	0.0043	0.001	0.001
3,4-Dimethylhexane	I8	0.0009	0.0030	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0008	0.0026	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0003	0.0010	0.000	0.000
3-Methylheptane	I8	0.0043	0.0144	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0129	0.0424	0.007	0.007
3-Ethylhexane	I8	0.0020	0.0067	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0025	0.0082	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0011	0.0036	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0004	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0031	0.0102	0.002	0.002
2t-Ethylmethylcyclopentane	N8	0.0028	0.0092	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0085	0.0280	0.004	0.004
2,2,4-Trimethylhexane	I9	0.0002	0.0008	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0032	0.0105	0.002	0.002
UnknownC7s	U7	0.0303	0.0890	0.014	0.014
n-Octane	P8	0.0158	0.0529	0.008	0.008
1c,4-Dimethylcyclohexane	N8	0.0012	0.0040	0.001	0.001
i-Propylcyclopentane	I8	0.0007	0.0023	0.000	0.000
2,4,4-Trimethylhexane	I9	0.0002	0.0008	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0008	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0007	0.0026	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0004	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0006	0.0020	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0004	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0031	0.0115	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0025	0.0094	0.001	0.001
2,4-Dimethylheptane	I9	0.0005	0.0019	0.000	0.000
4,4-Dimethylheptane	I9	0.0010	0.0037	0.001	0.001
Ethylcyclohexane	N8	0.0046	0.0151	0.002	0.002
n-Propylcyclopentane	N8	0.0006	0.0020	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0011	0.000	0.000
2,5-Dimethylheptane	I9	0.0007	0.0026	0.000	0.000
3,3-Dimethylheptane	I9	0.0005	0.0019	0.000	0.000
3,5-Dimethylheptane	I9	0.0005	0.0019	0.000	0.000
2,6-Dimethylheptane	I9	0.0005	0.0019	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0003	0.0011	0.000	0.000

Ethylbenzene	I8	0.0010	0.0031	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0032	0.0118	0.002	0.002
2,3-Dimethylheptane	I9	0.0004	0.0015	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0014	0.0044	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0005	0.0015	0.000	0.000
3,4-Dimethylheptane	I9	0.0003	0.0011	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0006	0.0023	0.000	0.000
4-Ethylheptane	I9	0.0003	0.0011	0.000	0.000
4-Methyloctane	I9	0.0006	0.0023	0.000	0.000
2-Methyloctane	I9	0.0007	0.0026	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0005	0.0018	0.000	0.000
3-Ethylheptane	I9	0.0003	0.0011	0.000	0.000
3-Methyloctane	I9	0.0016	0.0060	0.001	0.001
1c,2t,4c-Trimethylcyclohexane	I9	0.0003	0.0011	0.000	0.000
1,1,2-Trimethylcyclohexane	N9	0.0002	0.0007	0.000	0.000
3,3-Diethylpentane	I9	0.0002	0.0008	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0013	0.0040	0.000	0.000
i-Butylcyclopentane	N9	0.0007	0.0026	0.000	0.000
UnknownC8s	U8	0.0010	0.0033	0.001	0.001
n-Nonane	P9	0.0024	0.0090	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0006	0.0022	0.000	0.000
i-Propylbenzene	A9	0.0011	0.0039	0.000	0.000
i-Propylcyclohexane	N9	0.0002	0.0007	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0004	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0004	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0004	0.000	0.000
n-Butylcyclopentane	N9	0.0003	0.0011	0.000	0.000
3,3-Dimethyloctane	I10	0.0002	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0009	0.0032	0.000	0.000
3,6-Dimethyloctane	I10	0.0005	0.0021	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0003	0.0013	0.000	0.000
1,3-Methylethylbenzene	A9	0.0003	0.0011	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0003	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0007	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0004	0.000	0.000
5-Methylnonane	I10	0.0003	0.0013	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0007	0.000	0.000
2-Methylnonane	I10	0.0001	0.0004	0.000	0.000
3-Ethylheptane	I10	0.0001	0.0004	0.000	0.000
3-Methylnonane	I10	0.0002	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0003	0.0012	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0004	0.000	0.000
1t-Methyl-2-n-propylcyclohexane	I10	0.0001	0.0004	0.000	0.000
UnknownC9s	U9	0.0063	0.0237	0.004	0.004
n-Decane	P10	0.0005	0.0021	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0002	0.0007	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0003	0.0012	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0004	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0004	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0004	0.000	0.000
1,2-Ethyl-i-propylbenzene	A10	0.0001	0.0004	0.000	0.000
UnknownC10s	U10	0.0023	0.0096	0.001	0.001
n-Undecane	P11	0.0002	0.0009	0.000	0.000

2-Methylindan	A11	0.0001	0.0004	0.000	0.000
UnknownC11s	U11	0.0004	0.0018	0.000	0.000
n-Dodecane	P12	0.0001	0.0005	0.000	0.000
<u>TOTAL</u>		<u>100.00000</u>	<u>100.00000</u>	<u>12.1392</u>	<u>12.0733</u>

BTEX COMPONENTS	MOLE%	WT%	BTU @	<u>14.730</u>	<u>14.650</u>
BENZENE	0.0394	0.0902	LOW NET DRY REAL :	1273.3 /scf	1266.4 /scf
TOLUENE	0.0220	0.0594	NET WET REAL :	1251.2 /scf	1244.3 /scf
ETHYLBENZENE	0.0010	0.0031	HIGH GROSS DRY REAL :	1388.1 /scf	1380.5 /scf
XYLENES	0.0032	0.0099	GROSS WET REAL :	1364.0 /scf	1356.4 /scf
<u>TOTAL BTEX</u>	<u>0.0656</u>	<u>0.1626</u>	NET DRY REAL :	14204.9 /lb	14127.8 /lb
			GROSS DRY REAL :	15480.2 /lb	15396.1 /lb

RELATIVE DENSITY (AIR=1): 1.1764
 COMPRESSIBILITY FACTOR : 0.99433

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

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

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.