



NMOCD REC'D
10/12/20

Well Name: HOWELL K 4; CSG
API #: API # 3004509570
Source: CASING
Sample Type: GAS
Analysis No: HS200230
Cust No: 35825-13045

Well/Lease Information

Customer Name: HILCORP (BHD PROJECT)
Well Name: HOWELL K 4; CSG
County/State:
Location:
Lease/PA/CA:
Formation: MV
Cust. Stn. No.: API # 3004509510
71-160-01

Source: CASING
Well Flowing: Y
Pressure: 31 PSIG
Flow Temp: DEG. F
Ambient Temp: DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 08/25/2020
Sample Time: 11.40 AM
Sampled By: RAMON FLOREZ
Sampled by (CO): HILCORP

AREA 4 / RUN 0409

Heat Trace:

Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.1140	0.1136	0.0130	0.00	0.0011
CO2	2.6972	2.6869	0.4620	0.00	0.0410
Methane	86.7195	86.3878	14.7400	875.87	0.4803
Ethane	6.4275	6.4029	1.7230	113.75	0.0667
Propane	2.3616	2.3526	0.6520	59.42	0.0360
Iso-Butane	0.2885	0.2874	0.0950	9.38	0.0058
N-Butane	0.5765	0.5743	0.1820	18.81	0.0116
I-Pentane	0.1541	0.1535	0.0570	6.17	0.0038
N-Pentane	0.1369	0.1364	0.0500	5.49	0.0034
Hexane Plus	0.5242	0.5222	0.2340	27.63	0.0173
Total	100.0000	99.6176	18.2080	1116.51	0.6671

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0029
BTU/CU.FT IDEAL: 1119.1
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1122.3
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1102.8
DRY BTU @ 15.025: 1144.8
REAL SPECIFIC GRAVITY: 0.6687

CYLINDER #: 6064
CYLINDER PRESSURE: 25 PSIG
ANALYSIS DATE: 08/28/2020
ANALYSIS TIME: 01:17:42 PM
ANALYSIS RUN BY: RICHARD WILSON

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500

Last Cal/Verify: 09/03/2020

GC Method: C6+ Gas



HILCORP (BHD PROJECT)
WELL ANALYSIS COMPARISON

Lease: HOWELL K 4; CSG
Stn. No.: API # 3004509510
Mtr. No.: 71-160-01

CASING
MV

09/03/2020
35825-13045

Smpl Date: 08/25/2020
Test Date: 08/28/2020
Run No: HS200230

Nitrogen: 0.1140
CO2: 2.6972
Methane: 86.7195
Ethane: 6.4275
Propane: 2.3616
I-Butane: 0.2885
N-Butane: 0.5765
I-Pentane: 0.1541
N-Pentane: 0.1369
Hexane+: 0.5242

BTU: 1122.3
GPM: 18.2080
SPG: 0.6687



Well Name: HOWELL K 4; INT CSG
 API #: API # 3004509510
 Source: INTERMEDIATE CASING
 Sample Type: GAS
 Analysis No: HS200231
 Cust No: 35825-13050

Well/Lease Information

Customer Name:	HILCORP (BHD PROJECT)	Source:	INTERMEDIATE CASING
Well Name:	HOWELL K 4; INT CSG	Well Flowing:	Y
County/State:		Pressure:	35 PSIG
Location:		Flow Temp:	DEG. F
Lease/PA/CA:		Ambient Temp:	DEG. F
Formation:	MV	Flow Rate:	MCF/D
Cust. Stn. No.:	API # 3004509510	Sample Method:	Purge & Fill
	71-160-01	Sample Date:	08/25/2020
	AREA 4 / RUN 0409	Sample Time:	11.30 AM
Heat Trace:		Sampled By:	RAMON FLOREZ
Remarks:		Sampled by (CO):	HILCORP

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.6052	0.3638	0.0670	0.00	0.0059
CO2	0.0494	0.0297	0.0080	0.00	0.0008
Methane	98.9343	59.4737	16.8020	999.24	0.5480
Ethane	0.1339	0.0805	0.0360	2.37	0.0014
Propane	0.0434	0.0261	0.0120	1.09	0.0007
Iso-Butane	0.0045	0.0027	0.0010	0.15	0.0001
N-Butane	0.0087	0.0052	0.0030	0.28	0.0002
I-Pentane	0.0085	0.0051	0.0030	0.34	0.0002
N-Pentane	0.0083	0.0050	0.0030	0.33	0.0002
Hexane Plus	0.2038	0.1225	0.0910	10.74	0.0067
Total	100.0000	60.1143	17.0260	1014.54	0.5641

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z):	1.002	CYLINDER #:	4025
BTU/CU.FT IDEAL:	1016.9	CYLINDER PRESSURE:	29 PSIG
BTU/CU.FT (DRY) CORRECTED FOR (1/Z):	1018.9	ANALYSIS DATE:	08/28/2020
BTU/CU.FT (WET) CORRECTED FOR (1/Z):	1001.2	ANALYSIS TIME:	12:56:59 AM
DRY BTU @ 15.025:	1039.3	ANALYSIS RUN BY:	RICHARD WILSON
REAL SPECIFIC GRAVITY:	0.565		

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500 Last Cal/Verify: 09/03/2020

GC Method: C6+ Gas



HILCORP (BHD PROJECT)
WELL ANALYSIS COMPARISON

Lease: HOWELL K 4; INT CSG
Stn. No.: API # 3004509510
Mtr. No.: 71-160-01

INTERMEDIATE CASING
MV

09/03/2020
35825-13050

Smpl Date: 08/25/2020
Test Date: 08/28/2020
Run No: HS200231

Nitrogen: 0.6052
CO2: 0.0494
Methane: 98.9343
Ethane: 0.1339
Propane: 0.0434
I-Butane: 0.0045
N-Butane: 0.0087
I-Pentane: 0.0085
N-Pentane: 0.0083
Hexane+: 0.2038

BTU: 1018.9
GPM: 17.0260
SPG: 0.5650



Well Name: HOWELL K 4; TBG
API #: API # 3004509510
Source: TUBING
Sample Type: GAS
Analysis No: HS200232
Cust No: 35825-13055

Well/Lease Information

Customer Name: HILCORP (BHD PROJECT)
Well Name: HOWELL K 4; TBG
County/State:
Location:
Lease/PA/CA:
Formation: MV
Cust. Stn. No.: API # 3004509510
71-160-01

Source: TUBING
Well Flowing:
Pressure: 26 PSIG
Flow Temp: DEG. F
Ambient Temp: DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 08/25/2020
Sample Time: 11.50 AM
Sampled By: RAMON FLOREZ
Sampled by (CO): HILCORP

AREA 4 / RUN 0409

Heat Trace:
Remarks:

Analysis

Component:	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.1473	0.1442	0.0160	0.00	0.0014
CO2	1.8423	1.8031	0.3150	0.00	0.0280
Methane	84.0822	82.2910	14.2960	849.23	0.4657
Ethane	7.8280	7.6613	2.1000	138.53	0.0813
Propane	3.3427	3.2715	0.9240	84.11	0.0509
Iso-Butane	0.5996	0.5868	0.1970	19.50	0.0120
N-Butane	0.9077	0.8884	0.2870	29.61	0.0182
I-Pentane	0.3241	0.3172	0.1190	12.97	0.0081
N-Pentane	0.2390	0.2339	0.0870	9.58	0.0060
Hexane Plus	0.6871	0.6725	0.3070	36.22	0.0227
Total	100.0000	97.8699	18.6480	1179.74	0.6943

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0032
BTU/CU.FT IDEAL: 1182.5
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1186.3
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1165.7
DRY BTU @ 15.025: 1210.1
REAL SPECIFIC GRAVITY: 0.6963

CYLINDER #: 4102
CYLINDER PRESSURE: 24 PSIG
ANALYSIS DATE: 08/28/2020
ANALYSIS TIME: 01:27:33 PM
ANALYSIS RUN BY: RICHARD WILSON

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500

Last Cal/Verify: 09/03/2020

GC Method: C6+ Gas



HILCORP (BHD PROJECT)
WELL ANALYSIS COMPARISON

Lease: HOWELL K 4; TBG
Stn. No.: API # 3004509510
Mtr. No.: 71-160-01

TUBING
MV

09/03/2020
35825-13055

Smpl Date: 08/25/2020
Test Date: 08/28/2020
Run No: HS200232

Nitrogen: 0.1473
CO2: 1.8423
Methane: 84.0822
Ethane: 7.8280
Propane: 3.3427
I-Butane: 0.5996
N-Butane: 0.9077
I-Pentane: 0.3241
N-Pentane: 0.2390
Hexane+: 0.6871

BTU: 1186.3
GPM: 18.6480
SPG: 0.6963