



OCD Received 10/28/2020

Well Name: LUDWICK LS 20E ; TBG
 API #: API # 300453399200
 Source: TUBING
 Sample Type: GAS
 Analysis No: SO200201
 Cust No: 15950-12365

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
 Well Name: LUDWICK LS 20E ; TBG
 County/State: NM
 Location:
 Lease/PA/CA:
 Formation:
 Cust. Stn. No.: API # 300453399200
 88187

Source: TUBING
 Well Flowing: Y
 Pressure: 84 PSIG
 Flow Temp: DEG. F
 Ambient Temp: 66 DEG. F
 Flow Rate: MCF/D
 Sample Method: Purge & Fill
 Sample Date: 09/24/2020
 Sample Time: 10.50 AM
 Sampled By: ERIK SHAW
 Sampled by (CO): ABC

Heat Trace: N
 Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.2163	0.2122	0.0240	0.00	0.0021
CO2	1.1279	1.1067	0.1930	0.00	0.0171
Methane	81.7038	80.1650	13.8980	825.21	0.4526
Ethane	9.2109	9.0374	2.4720	163.01	0.0956
Propane	4.1869	4.1080	1.1570	105.35	0.0637
Iso-Butane	0.7389	0.7250	0.2430	24.03	0.0148
N-Butane	1.1170	1.0960	0.3530	36.44	0.0224
I-Pentane	0.3752	0.3681	0.1380	15.01	0.0093
N-Pentane	0.3049	0.2992	0.1110	12.22	0.0076
Hexane Plus	1.0182	0.9990	0.4560	53.67	0.0337
Total	100.0000	98.1166	19.0450	1234.93	0.7190

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0036
 BTU/CU.FT IDEAL: 1237.8
 BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1242.1
 BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1220.5
 DRY BTU @ 15.025: 1267.0
 REAL SPECIFIC GRAVITY: 0.7213

CYLINDER #: 60
 CYLINDER PRESSURE: 81 PSIG
 ANALYSIS DATE: 10/02/2020
 ANALYSIS TIME: 02:40:50 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: 10/08/2020

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: LUDWICK LS 20E ; TBG
Stn. No.: API #
Mtr. No.: 88187

TUBING

10/08/2020
15950-12365

Smpl Date: 09/24/2020
Test Date: 10/02/2020
Run No: SO200201

Nitrogen: 0.2163
CO2: 1.1279
Methane: 81.7038
Ethane: 9.2109
Propane: 4.1869
I-Butane: 0.7389
N-Butane: 1.1170
I-Pentane: 0.3752
N-Pentane: 0.3049
Hexane+: 1.0182

BTU: 1242.1
GPM: 19.0450
SPG: 0.7213



OCD Received 10/28/2020

2030 Afton Place
Farmington, NM 87401
(505) 325-6622
GAS

Analysis No: SO200200
Cust No: 15950-12360

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: LUDWICK LS 20E ; INT
County/State: NM
Location:
Lease/PA/CA:
Formation:
Cust. Stn. No.: API # 300453399200
88187

Source: INTERMEDIATE
Well Flowing: Y
Pressure: 374 PSIG
Flow Temp: DEG. F
Ambient Temp: 66 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 09/24/2020
Sample Time: 11.00 AM
Sampled By: ERIK SHAW
Sampled by (CO): ABC

Heat Trace: N
Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.4092	0.4003	0.0450	0.00	0.0040
CO2	0.0043	0.0042	0.0010	0.00	0.0001
Methane	87.6676	85.7645	14.9020	885.44	0.4856
Ethane	7.0359	6.8832	1.8870	124.51	0.0730
Propane	3.0146	2.9492	0.8330	75.85	0.0459
Iso-Butane	0.4661	0.4560	0.1530	15.16	0.0094
N-Butane	0.7207	0.7051	0.2280	23.51	0.0145
I-Pentane	0.2267	0.2218	0.0830	9.07	0.0056
N-Pentane	0.1665	0.1629	0.0610	6.67	0.0041
Hexane Plus	0.2884	0.2821	0.1290	15.20	0.0095
Total	100.0000	97.8293	18.3220	1155.42	0.6517

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0029
BTU/CU.FT IDEAL: 1158.1
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1161.5
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1141.3
DRY BTU @ 15.025: 1184.8
REAL SPECIFIC GRAVITY: 0.6533

CYLINDER #: 36
CYLINDER PRESSURE: 354 PSIG
ANALYSIS DATE: 10/02/2020
ANALYSIS TIME: 02:56:20 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: 10/08/2020

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: LUDWICK LS 20E ; INT
Stn. No.: API #
Mtr. No.: 88187

INTERMEDIATE

10/08/2020
15950-12360

Smpl Date: 09/24/2020
Test Date: 10/02/2020
Run No: SO200200

Nitrogen: 0.4092
CO2: 0.0043
Methane: 87.6676
Ethane: 7.0359
Propane: 3.0146
I-Butane: 0.4661
N-Butane: 0.7207
I-Pentane: 0.2267
N-Pentane: 0.1665
Hexane+: 0.2884

BTU: 1161.5
GPM: 18.3220
SPG: 0.6533



Well Name: LUDWICK LS 20E ; CSG
 API #: API # 300453399200
 Source: CASING
 Sample Type: GAS
 Analysis No: SO200202
 Cust No: 15950-12370

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
 Well Name: LUDWICK LS 20E ; CSG
 County/State: SAN JUAN NM
 Location:
 Lease/PA/CA:
 Formation:
 Cust. Stn. No.: API # 300453399200
 88187

Source: CASING
 Well Flowing: Y
 Pressure: 86 PSIG
 Flow Temp: DEG. F
 Ambient Temp: 66 DEG. F
 Flow Rate: MCF/D
 Sample Method: Purge & Fill
 Sample Date: 09/24/2020
 Sample Time: 10.55 AM
 Sampled By: ERIK SHAW
 Sampled by (CO): ABC

Heat Trace: N
 Remarks:

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.2041	0.1862	0.0230	0.00	0.0020
CO2	0.2594	0.2367	0.0440	0.00	0.0039
Methane	81.8498	74.6800	13.9220	826.68	0.4534
Ethane	9.4827	8.6521	2.5450	167.82	0.0984
Propane	4.4522	4.0622	1.2310	112.02	0.0678
Iso-Butane	0.8998	0.8210	0.2950	29.26	0.0181
N-Butane	1.1033	1.0067	0.3490	35.99	0.0221
I-Pentane	0.4181	0.3815	0.1530	16.73	0.0104
N-Pentane	0.3395	0.3098	0.1230	13.61	0.0085
Hexane Plus	0.9911	0.9043	0.4430	52.24	0.0328
Total	100.0000	91.2405	19.1280	1254.35	0.7174

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0036
 BTU/CU.FT IDEAL: 1257.3
 BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1261.8
 BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1239.8
 DRY BTU @ 15.025: 1287.1
 REAL SPECIFIC GRAVITY: 0.7197

CYLINDER #: 1286
 CYLINDER PRESSURE: 81 PSIG
 ANALYSIS DATE: 10/02/2020
 ANALYSIS TIME: 02:23:30 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: 10/08/2020

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: LUDWICK LS 20E ; CSG
Stn. No.: API #
Mtr. No.: 88187

CASING

10/08/2020
15950-12370

Smpl Date: 09/24/2020
Test Date: 10/02/2020
Run No: SO200202

Nitrogen: 0.2041
CO2: 0.2594
Methane: 81.8498
Ethane: 9.4827
Propane: 4.4522
I-Butane: 0.8998
N-Butane: 1.1033
I-Pentane: 0.4181
N-Pentane: 0.3395
Hexane+: 0.9911

BTU: 1261.8
GPM: 19.1280
SPG: 0.7197