



Florance 117
30-045-23827
Bradenhead Water Sample

75 Suttle Street
Durango, CO 81303
970.247.4220 Phone
970.247.4227 Fax
www.greenanalytical.com

17 August 2018

Sabre Beebe
BP America
380 Airport Rd.
Durango, CO 81303
RE: API

Enclosed are the results of analyses for samples received by the laboratory on 08/06/18 16:40.
If you need any further assistance, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink that reads "Jeremy D. Allen".

Jeremy D Allen For Debbie Zufelt
Reports Manager



All accredited analytes contained in this report are denoted by an asterisk (*). For a complete list of accredited analytes please do not hesitate to contact us via any of the contact information contained in this report. All of our certifications can be viewed at <http://greenanalytical.com/certifications/>

Green Analytical Laboratories is NELAP accredited through the Texas Commission on Environmental Quality. Accreditation applies to drinking water and non-potable water matrices for trace metals and a variety of inorganic parameters. Green Analytical Laboratories is also accredited through the Colorado Department of Public Health and Environment and EPA region 8 for trace metals, Cyanide, Fluoride, Nitrate, and Nitrite in drinking water.

Our affiliate laboratory, Cardinal Laboratories, is also NELAP accredited through the Texas Commission on Environmental Quality for a variety of organic constituents in drinking water, non-potable water and solid matrices. Cardinal is also accredited for regulated VOCs, TTHM, and HAA-5 in drinking water through the Colorado Department of Public Health and Environment and EPA region 8.



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BP America
380 Airport Rd.
Durango CO, 81303

Project: API
Project Name / Number: Bradenhead
Project Manager: Sabre Beebe

Reported:
08/17/18 16:04

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Florance 117	1808061-01	Water	08/06/18 09:12	08/06/18 16:40

Green Analytical Laboratories

A handwritten signature in blue ink, reading "Jeremy D. Allen".

Jeremy D Allen For Debbie Zufelt, Reports Manager

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08/17/18 16:04

Florance 117

1808061-01 (Water)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
General Chemistry									
Alkalinity, Bicarbonate as CaCO ₃ *	<10.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Alkalinity, Carbonate as CaCO ₃ *	54.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Alkalinity, Hydroxide as CaCO ₃ *	<10.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Alkalinity, Total as CaCO ₃ *	63.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Chloride*	<250	250	48.2	mg/L	250	08/16/18	EPA300.0		AES
Conductivity*	17900	10.0		uS/cm	1	08/09/18	2510 B		JDU
pH*	9.83			pH Units	1	08/07/18	EPA150.1		JDU
Resistivity	55.9			ohm/cm	1	08/13/18	2510 B		JDU
Total Dissolved Solids*	13000	20.0		mg/L	2	08/13/18	EPA160.1		JDU
Specific Gravity	1.013	0.8000		No Unit	1	08/13/18	Hydrometer		JDU
Sulfate*	9840	250	73.8	mg/L	250	08/16/18	EPA300.0		AES
Total Recoverable Metals by ICP (E200.7)									
Iron*	3.09	2.50	0.871	mg/L	50	08/16/18	EPA200.7		AES
Dissolved Metals by ICP									
Hardness	155	33.1	5.46	mg/L	50	08/16/18	2340 B		AES
Barium*	<1.00	1.00	0.104	mg/L	50	08/16/18	EPA200.7		AES
Calcium*	62.0	5.00	0.642	mg/L	50	08/16/18	EPA200.7		AES
Iron*	<2.50	2.50	1.38	mg/L	50	08/16/18	EPA200.7		AES
Magnesium*	<5.00	5.00	0.938	mg/L	50	08/16/18	EPA200.7		AES
Manganese*	<1.00	1.00	0.134	mg/L	50	08/16/18	EPA200.7		AES
Potassium*	<50.0	50.0	4.78	mg/L	50	08/16/18	EPA200.7		AES
Sodium*	4460	50.0	18.3	mg/L	50	08/16/18	EPA200.7		AES
Strontium*	9.18	5.00	0.144	mg/L	50	08/16/18	EPA200.7		AES
Cation/Anion Balance	-3.21								

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Jeremy D Allen For Debbie Zufelt, Reports Manager

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BP America	Project: API	
380 Airport Rd.	Project Name / Number: Bradenhead	Reported:
Durango CO, 81303	Project Manager: Sabre Beebe	08/17/18 16:04

General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B808077 - General Prep - Wet Chem										
Reference (B808077-SRM1)					Prepared & Analyzed: 08/07/18					
pH	8.72		pH Units	8.91		97.9	97.8-102.2			
Batch B808079 - General Prep - Wet Chem										
Reference (B808079-SRM1)					Prepared & Analyzed: 08/09/18					
Conductivity	486	10.0	uS/cm	491		99.0	90-110.1			
Batch B808089 - General Prep - Wet Chem										
Blank (B808089-BLK1)					Prepared: 08/10/18 Analyzed: 08/13/18					
Total Dissolved Solids	ND	10.0	mg/L							
Reference (B808089-SRM1)					Prepared: 08/10/18 Analyzed: 08/13/18					
Total Dissolved Solids	370	10.0	mg/L	380		97.4	85-115			
Batch B808098 - General Prep - Wet Chem										
Blank (B808098-BLK1)					Prepared & Analyzed: 08/13/18					
Alkalinity, Total as CaCO ₃	ND	10.0	mg/L							
LCS (B808098-BS1)					Prepared & Analyzed: 08/13/18					
Alkalinity, Total as CaCO ₃	100	10.0	mg/L	100		100	85-115			
LCS Dup (B808098-BSD1)					Prepared & Analyzed: 08/13/18					
Alkalinity, Total as CaCO ₃	111	10.0	mg/L	100		111	85-115	10.4	20	
Batch B808143 - General Prep - Wet Chem										
Blank (B808143-BLK1)					Prepared & Analyzed: 08/15/18					
Chloride	ND	1.00	mg/L							
Sulfate	ND	1.00	mg/L							
LCS (B808143-BS1)					Prepared & Analyzed: 08/15/18					
Chloride	22.9	1.00	mg/L	25.0		91.6	90-110			
Sulfate	23.2	1.00	mg/L	25.0		92.9	90-110			
LCS Dup (B808143-BSD1)					Prepared: 08/15/18 Analyzed: 08/16/18					
Chloride	23.8	1.00	mg/L	25.0		95.1	90-110	3.75	20	
Sulfate	24.0	1.00	mg/L	25.0		95.8	90-110	3.16	20	

Green Analytical Laboratories

Jeremy D. Allen

Jeremy D Allen For Debbie Zufelt, Reports Manager

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08/17/18 16:04

Total Recoverable Metals by ICP (E200.7) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B808075 - Total Rec. 200.7/200.8/200.2										
Blank (B808075-BLK1)				Prepared: 08/09/18 Analyzed: 08/15/18						
Iron	ND	0.050	mg/L							
LCS (B808075-BS1)				Prepared: 08/09/18 Analyzed: 08/15/18						
Iron	4.26	0.050	mg/L	4.00		106	85-115			
LCS Dup (B808075-BSD1)				Prepared: 08/09/18 Analyzed: 08/15/18						
Iron	4.36	0.050	mg/L	4.00		109	85-115	2.52	20	

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Reported:
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Dissolved Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B808081 - Diss. 200.7/200.8

Blank (B808081-BLK1)

Prepared: 08/10/18 Analyzed: 08/16/18

Barium	ND	0.020	mg/L
Calcium	ND	0.100	mg/L
Iron	ND	0.050	mg/L
Magnesium	ND	0.100	mg/L
Manganese	ND	0.020	mg/L
Potassium	ND	1.00	mg/L
Sodium	ND	1.00	mg/L
Strontium	ND	0.100	mg/L

LCS (B808081-BS1)

Prepared: 08/10/18 Analyzed: 08/15/18

Barium	2.43	0.020	mg/L	2.50	97.0	85-115
Calcium	5.02	0.100	mg/L	5.00	100	85-115
Iron	4.87	0.050	mg/L	5.00	97.4	85-115
Magnesium	24.7	0.100	mg/L	25.0	98.9	85-115
Manganese	2.45	0.020	mg/L	2.50	97.9	85-115
Potassium	10.1	1.00	mg/L	10.0	101	85-115
Sodium	3.79	1.00	mg/L	4.05	93.7	85-115
Strontium	4.94	0.100	mg/L	5.00	98.7	85-115

LCS Dup (B808081-BSD1)

Prepared: 08/10/18 Analyzed: 08/15/18

Barium	2.48	0.020	mg/L	2.50	99.2	85-115	2.17	20
Calcium	5.06	0.100	mg/L	5.00	101	85-115	0.651	20
Iron	4.93	0.050	mg/L	5.00	98.6	85-115	1.22	20
Magnesium	25.1	0.100	mg/L	25.0	100	85-115	1.31	20
Manganese	2.48	0.020	mg/L	2.50	99.2	85-115	1.27	20
Potassium	10.2	1.00	mg/L	10.0	102	85-115	0.933	20
Sodium	3.83	1.00	mg/L	4.05	94.4	85-115	0.789	20
Strontium	5.02	0.100	mg/L	5.00	100	85-115	1.64	20

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Project: API
Project Name / Number: Bradenhead
Project Manager: Sabre Beebe

Reported:
08/17/18 16:04

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
*Results reported on as received basis unless designated as dry.
RPD Relative Percent Difference
LCS Laboratory Control Sample (Blank Spike)
RL Report Limit
MDL Method Detection Limit

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

(970) 247-4220
Fax: (970) 247-4227

service@greenanalytical.com or dzufelt@greenanalytical.com
75 Suttle St Durango, CO 81303

Company Name (If Applicable): BP AMERICA				Bill to (if different):				ANALYSIS REQUEST									
Contact Person: SABRE BEEBE				P.O. #:													
Address:				Company:													
City:		State:		Zip:		Attn:											
Phone #: 970-347-0478 970-779-9398				Address:													
Email: Sabre.beebe@BP.com				City:													
Project Name(optional): Braden held				State: Zip:													
Project Number(optional):				Phone #:													
Sampler Name (Print): SCOTT WILLARD				Email:													
For Lab Use	Sample Name or Location	Collected		Matrix (check one)						# of containers						API Water Quality	
		Date	Time	GROUNDWATER	DRINKING WATER	SURFACEWATER	WASTEWATER	PRODUCEDWATER	SOIL	OTHER:	No preservation (general)	HNO ₃	HCl	H ₂ SO ₄	Other:		Other:
1808-061-01	FLORANCE 117	8-6-18	9:12AM														

PLEASE NOTE: GAL's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by GAL within 30 days after completion. In no event shall GAL be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by GAL, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date:	Received By:	ADDITIONAL REMARKS:	Report to State? (Circle) Yes No
<i>[Signature]</i>	8/6/18	<i>[Signature]</i>		
Relinquished By:	Time:	Time:		
<i>[Signature]</i>	1640	1640		
Relinquished By:	Date:	Received By:	3.3/3.12 #1 min D ₅₀	
<i>[Signature]</i>	8/6/18	<i>[Signature]</i>		
Relinquished By:	Time:	Time:		
<i>[Signature]</i>	1655	1655		
Relinquished By:	Date:	Received By:	3.3/3.12 #1 min D ₅₀	
<i>[Signature]</i>	8/8/18	<i>[Signature]</i>		
Relinquished By:	Time:	Time:		
<i>[Signature]</i>	0850	0850		
Delivered By: (Circle One)	Temperature at receipt:	CHECKED BY:		
Sampler - UPS - FedEx - Kangaroo - Other:	30.3 NO 1A	<i>[Signature]</i>		

† GAL cannot always accept verbal changes. Please fax or email written change requests.

* Chain of Custody must be signed in "Relinquished By:" as an acceptance of services and all applicable charges.



Florance 117
30-045-23827
Casing Sample

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

Analysis No: SO180162
Cust No: 15950-11240

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: FLORANCE #117;CSG
County/State: SAN JUAN NM
Location:
Field:
Formation: PC
Cust. Stn. No.: API # 3004523827

Source: CASING
Well Flowing: Y
Pressure: 129 PSIA
Flow Temp: DEG. F
Ambient Temp: 78 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 08/06/2018
Sample Time: 9.20 AM
Sampled By: SCOTT WILLARD
Sampled by (CO): PESCO

Heat Trace: N
Remarks:

NMCCD
FEB 13 2013
DISTRICT III

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.3824	0.3804	0.0420	0.00	0.0037
CO2	1.4294	1.4218	0.2450	0.00	0.0217
Methane	78.2659	77.8475	13.3150	790.49	0.4335
Ethane	11.0317	10.9728	2.9610	195.23	0.1145
Propane	4.6061	4.5815	1.2730	115.89	0.0701
Iso-Butane	1.0372	1.0317	0.3410	33.73	0.0208
N-Butane	1.2927	1.2858	0.4090	42.17	0.0259
I-Pentane	0.6313	0.6279	0.2320	25.26	0.0157
N-Pentane	0.4204	0.4182	0.1530	16.85	0.0105
Hexane Plus	0.9029	0.8981	0.4040	47.59	0.0299
Total	100.0000	99.4657	19.3750	1267.21	0.7464

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0038
BTU/CU.FT IDEAL: 1270.1
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1275.0
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1252.8
DRY BTU @ 15.025: 1300.5
REAL SPECIFIC GRAVITY: 0.749

CYLINDER #: 7083
CYLINDER PRESSURE: 118 PSIG
ANALYSIS DATE: 08/16/2018
ANALYSIS TIME: 12:15:00 AM
ANALYSIS RUN BY: SHYANN ELLEDGE

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: 08/23/2018

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: FLORANCE #117;CSG
Stn. No.: API # 3004523827
Mtr. No.:

CASING
PC

08/23/2018
15950-11240

Smpl Date: 08/06/2018
Test Date: 08/16/2018
Run No: SO180162

Nitrogen: 0.3824
CO2: 1.4294
Methane: 78.2659
Ethane: 11.0317
Propane: 4.6061
I-Butane: 1.0372
N-Butane: 1.2927
I-Pentane: 0.6313
N-Pentane: 0.4204
Hexane+: 0.9029

BTU: 1275.0
GPM: 19.3750
SPG: 0.7490



FLORANCE 117
30-045-23827
Tubing SAMPLE

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

Analysis No: SO180163
Cust No: 15950-11245

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
Well Name: FLORANCE #117; TBG
County/State: SAN JUAN NM
Location:
Field:
Formation: PC
Cust. Stn. No.: API # 3004523827

Source: TUBING
Well Flowing: Y
Pressure: 127 PSIA
Flow Temp: DEG. F
Ambient Temp: 78 DEG. F
Flow Rate: MCF/D
Sample Method: Purge & Fill
Sample Date: 08/06/2018
Sample Time: 9.30 AM
Sampled By: SCOTT WILLARD
Sampled by (CO): PESCO

Heat Trace: N
Remarks:

NM000
FEB 13 2013
DISTRICT III

Analysis

Component::	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.4117	0.4090	0.0450	0.00	0.0040
CO2	1.4072	1.3979	0.2410	0.00	0.0214
Methane	78.7300	78.2124	13.3940	795.17	0.4361
Ethane	10.8203	10.7492	2.9040	191.49	0.1123
Propane	4.5795	4.5494	1.2660	115.22	0.0697
Iso-Butane	1.0174	1.0107	0.3340	33.08	0.0204
N-Butane	1.2582	1.2499	0.3980	41.05	0.0252
I-Pentane	0.5626	0.5589	0.2060	22.51	0.0140
N-Pentane	0.3787	0.3762	0.1380	15.18	0.0094
Hexane Plus	0.8344	0.8289	0.3730	43.98	0.0276
Total	100.0000	99.3425	19.2990	1257.69	0.7402

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0038
BTU/CU.FT IDEAL: 1260.6
BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1265.3
BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1243.3
DRY BTU @ 15.025: 1290.6
REAL SPECIFIC GRAVITY: 0.7427

CYLINDER #: 7045
CYLINDER PRESSURE: 113 PSIG
ANALYSIS DATE: 08/16/2018
ANALYSIS TIME: 12:29:29 AM
ANALYSIS RUN BY: SHYANN ELLEDGE

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: 08/23/2018

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: FLORANCE #117; TBG
Stn. No.: API # 3004523827
Mtr. No.:

TUBING
PC

08/23/2018
15950-11245

Smpl Date: 08/06/2018
Test Date: 08/16/2018
Run No: SO180163

Nitrogen: 0.4117
CO2: 1.4072
Methane: 78.7300
Ethane: 10.8203
Propane: 4.5795
I-Butane: 1.0174
N-Butane: 1.2582
I-Pentane: 0.5626
N-Pentane: 0.3787
Hexane+: 0.8344

BTU: 1265.3
GPM: 19.2990
SPG: 0.7427