

Lab #: 732465      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Cosslett 1C-22H Production CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16191458   
 Formation:   
 Sampling Point: 456848   
 Date Sampled: 7/10/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0083			
Hydrogen -----	0.295			
Argon -----	0.0155			
Oxygen -----	0.26			
Nitrogen -----	0.97			
Carbon Dioxide -----	0.10			
Methane -----	76.11	-48.1	-244	
Ethane -----	12.44	-31.6		
Ethylene -----	0.0001			
Propane -----	5.44	-28.7		
Propylene -----	nd			
Iso-butane -----	0.818	-31.3		
N-butane -----	1.77	-27.6		
Iso-pentane -----	0.524	-28.3		
N-pentane -----	0.533	-27.4		
Hexanes + -----	0.720			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1295

Specific gravity, calculated: 0.747

Remarks: CO2 carbon isotope data unavailable could not resolve peak  
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732466 Job #: 42669 IS-94649 Co. Job#:   
 Sample Name: Cosslett 1A-22H Production CSG Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16191456   
 Formation:   
 Sampling Point: 456856   
 Date Sampled: 7/10/2019 Date Received: 8/30/2019 Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0107			
Hydrogen -----	0.108			
Argon -----	0.0115			
Oxygen -----	0.18			
Nitrogen -----	0.83			
Carbon Dioxide -----	0.065			
Methane -----	79.58	-47.4	-239	
Ethane -----	11.84	-31.3		
Ethylene -----	nd			
Propane -----	4.40	-28.7		
Propylene -----	nd			
Iso-butane -----	0.611	-31.2		
N-butane -----	1.23	-27.7		
Iso-pentane -----	0.346	-28.7		
N-pentane -----	0.294	-27.8		
Hexanes + -----	0.496			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1240

Specific gravity, calculated: 0.710

Remarks: CO2 carbon isotope data unavailable could not resolve peak  
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732467      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Anderson 32-32 Production CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: W70474   
 Formation:   
 Sampling Point: 420314   
 Date Sampled: 7/30/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	0.0314			
Argon -----	0.447			
Oxygen -----	10.33			
Nitrogen -----	37.37			
Carbon Dioxide -----	0.63	2.3		
Methane -----	32.07	-45.8	-251	
Ethane -----	11.51	-33.0		
Ethylene -----	0.0002			
Propane -----	5.36	-29.7		
Propylene -----	nd			
Iso-butane -----	0.575	-31.8		
N-butane -----	1.20	-28.2		
Iso-pentane -----	0.208	-28.4		
N-pentane -----	0.200	-28.0		
Hexanes + -----	0.0640			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 743

Specific gravity, calculated: 0.918

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732468      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Anderson 32-32 Surface CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: W70474   
 Formation:   
 Sampling Point: 420314   
 Date Sampled: 7/30/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0344			
Hydrogen -----	nd			
Argon -----	0.0344			
Oxygen -----	0.66			
Nitrogen -----	3.81			
Carbon Dioxide -----	0.007			
Methane -----	81.76	-52.5	-248	
Ethane -----	9.24	-33.0		
Ethylene -----	nd			
Propane -----	3.50	-29.0		
Propylene -----	0.0002			
Iso-butane -----	0.334	-30.9		
N-butane -----	0.466	-27.5		
Iso-pentane -----	0.0753	-28.0		
N-pentane -----	0.0456	-26.3		
Hexanes + -----	0.0364			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1115

Specific gravity, calculated: 0.667

Remarks: Insufficient CO2 concentration for isotopic analysis.  
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732469 Job #: 42669 IS-94649 Co. Job#:   
 Sample Name: Haley 41-20 Production CSG Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192288   
 Formation:   
 Sampling Point: 430587   
 Date Sampled: 8/12/2019 14:45 Date Received: 8/30/2019 Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0181			
Hydrogen -----	0.0354			
Argon -----	0.0214			
Oxygen -----	0.44			
Nitrogen -----	2.03			
Carbon Dioxide -----	1.94	0.4		
Methane -----	76.65	-50.2	-250	
Ethane -----	11.97	-33.6		
Ethylene -----	nd			
Propane -----	5.00	-29.7		
Propylene -----	nd			
Iso-butane -----	0.513	-30.8		
N-butane -----	1.09	-27.9		
Iso-pentane -----	0.152	-27.9		
N-pentane -----	0.0871	-26.5		
Hexanes + -----	0.0557			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1183

Specific gravity, calculated: 0.719

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732470      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Haley 41-20 Surface CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192288   
 Formation:   
 Sampling Point: 430587   
 Date Sampled: 8/12/2019 14:50      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0485			
Hydrogen -----	0.0116			
Argon -----	0.125			
Oxygen -----	2.86			
Nitrogen -----	12.21			
Carbon Dioxide -----	0.016			
Methane -----	72.84	-55.1	-226	
Ethane -----	4.33	-34.2		
Ethylene -----	nd			
Propane -----	4.67	-30.1		
Propylene -----	nd			
Iso-butane -----	0.735	-31.3		
N-butane -----	1.41	-27.7		
Iso-pentane -----	0.326	-28.3		
N-pentane -----	0.269	-27.7		
Hexanes + -----	0.150			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1036

Specific gravity, calculated: 0.734

Remarks: Insufficient CO2 concentration for isotopic analysis.  
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732471      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Wiggitt 7-0-13 Production CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192166   
 Formation:   
 Sampling Point: 296636   
 Date Sampled: 8/14/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0076			
Hydrogen -----	0.0955			
Argon -----	0.0068			
Oxygen -----	0.11			
Nitrogen -----	0.59			
Carbon Dioxide -----	1.47	2.5		
Methane -----	75.70	-47.5	-237	
Ethane -----	13.27	-31.2		
Ethylene -----	nd			
Propane -----	5.60	-28.6		
Propylene -----	nd			
Iso-butane -----	0.782	-31.1		
N-butane -----	1.67	-27.7		
Iso-pentane -----	0.356	-28.3		
N-pentane -----	0.296	-27.4		
Hexanes + -----	0.0451			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1256

Specific gravity, calculated: 0.739

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732472      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Wiggett 7-0-13 Surface CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192166   
 Formation:   
 Sampling Point: 296636   
 Date Sampled: 8/14/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0504			
Hydrogen -----	nd			
Argon -----	0.0431			
Oxygen -----	0.82			
Nitrogen -----	4.94			
Carbon Dioxide -----	0.006			
Methane -----	78.49	-55.2	-234	
Ethane -----	7.18	-33.5		
Ethylene -----	0.0001			
Propane -----	5.76	-30.0		
Propylene -----	nd			
Iso-butane -----	0.841	-31.8		
N-butane -----	1.29	-28.6		
Iso-pentane -----	0.276	-28.2		
N-pentane -----	0.196	-27.9		
Hexanes + -----	0.107			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1164

Specific gravity, calculated: 0.712

Remarks: Insufficient CO2 concentration for isotopic analysis.  
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



Lab #: 732473      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Wiggett 6-4-13 Production CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192165   
 Formation:   
 Sampling Point: 296646   
 Date Sampled: 8/14/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0080			
Hydrogen -----	nd			
Argon -----	0.0159			
Oxygen -----	0.30			
Nitrogen -----	1.23			
Carbon Dioxide -----	1.57	2.4		
Methane -----	73.85	-47.1	-233	
Ethane -----	13.74	-31.1		
Ethylene -----	0.0003			
Propane -----	5.93	-28.0		
Propylene -----	nd			
Iso-butane -----	0.879	-30.7		
N-butane -----	1.87	-27.1		
Iso-pentane -----	0.327	-28.3		
N-pentane -----	0.235	-27.5		
Hexanes + -----	0.0457			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1260

Specific gravity, calculated: 0.752

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732474      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Wiggett 6-4-13 Surface CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192165   
 Formation:   
 Sampling Point: 296646   
 Date Sampled: 8/14/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0088			
Hydrogen -----	nd			
Argon -----	0.0298			
Oxygen -----	0.66			
Nitrogen -----	2.57			
Carbon Dioxide -----	0.008			
Methane -----	75.10	-46.7	-232	
Ethane -----	13.16	-30.7		
Ethylene -----	0.0002			
Propane -----	5.49	-28.2		
Propylene -----	nd			
Iso-butane -----	0.822	-30.8		
N-butane -----	1.46	-27.2		
Iso-pentane -----	0.333	-28.2		
N-pentane -----	0.234	-27.3		
Hexanes + -----	0.122			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1239

Specific gravity, calculated: 0.732

Remarks: Insufficient CO2 concentration for isotopic analysis.  
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732475      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Wiggett 4-0-13 Production CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192241   
 Formation:   
 Sampling Point: 293670   
 Date Sampled: 8/14/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0140			
Hydrogen -----	0.0707			
Argon -----	0.0171			
Oxygen -----	0.36			
Nitrogen -----	1.66			
Carbon Dioxide -----	1.68	2.7		
Methane -----	86.12	-46.9	-235	
Ethane -----	8.38	-30.7		
Ethylene -----	0.0004			
Propane -----	0.823	-28.0		
Propylene -----	nd			
Iso-butane -----	0.0842	-31.2		
N-butane -----	0.601	-27.6		
Iso-pentane -----	0.117	-28.0		
N-pentane -----	0.0652	-26.3		
Hexanes + -----	0.0079			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1074

Specific gravity, calculated: 0.641

Remarks: Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 732476      Job #: 42669      IS-94649      Co. Job#:   
 Sample Name: Wiggett 4-0-13 Surface CSG      Co. Lab#:   
 Company: Crestone Peak Resources   
 API/Well:   
 Container: IsoTube®   
 Field/Site Name: Bradenhead Testing   
 Location: 16192241   
 Formation:   
 Sampling Point: 293670   
 Date Sampled: 8/14/2019      Date Received: 8/30/2019      Date Reported: 9/27/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0357			
Hydrogen -----	0.0112			
Argon -----	0.0820			
Oxygen -----	1.90			
Nitrogen -----	7.94			
Carbon Dioxide -----	0.013			
Methane -----	74.84	-52.6	-242	
Ethane -----	7.51	-34.5		
Ethylene -----	0.0001			
Propane -----	5.10	-30.4		
Propylene -----	nd			
Iso-butane -----	0.675	-32.3		
N-butane -----	1.29	-29.3		
Iso-pentane -----	0.276	-28.7		
N-pentane -----	0.228	-28.5		
Hexanes + -----	0.0946			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1111

Specific gravity, calculated: 0.724

Remarks: Insufficient CO2 concentration for isotopic analysis.  
 Isotopes analyzed online via GC-C-IRMS and GC-P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.