

Lab #: 775480 Job #: 46229 IS-104309 Co. Job#:
 Sample Name: SVP-14-N-7.5 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/05/2020 11:47 Date Received: 11/09/2020 Date Reported: 11/17/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0191			
Hydrogen -----	nd			
Argon -----	0.170			
Oxygen -----	1.89			
Nitrogen -----	17.34			
Carbon Dioxide -----	2.98	-27.75		
Methane -----	68.96	-49.44	-243.8	
Ethane -----	7.36			
Ethylene -----	nd			
Propane -----	1.20			
Propylene -----	nd			
Iso-butane -----	0.0476			
N-butane -----	0.0329			
Iso-pentane -----	0.0001			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 863

Specific gravity, calculated: 0.715

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 #: 775724 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV03-1108-1030 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 10:30 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.626			
Oxygen -----	15.61			
Nitrogen -----	70.30			
Carbon Dioxide -----	2.26			
Methane -----	10.31			
Ethane -----	0.867			
Ethylene -----	nd			
Propane -----	0.0249			
Propylene -----	nd			
Iso-butane -----	0.0010			
N-butane -----	0.0011			
Iso-pentane -----	0.0002			
N-pentane -----	nd			
Hexanes + -----	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 120

Specific gravity, calculated: 0.962

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 #: 775725 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV04-1108-1036 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 10:36 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.986			
Oxygen -----	1.27			
Nitrogen -----	95.06			
Carbon Dioxide -----	0.82			
Methane -----	1.71			
Ethane -----	0.149			
Ethylene -----	nd			
Propane -----	0.0002			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 20

Specific gravity, calculated: 0.971

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 #: 775726 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV05-1108-1047 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 10:47 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.673			
Oxygen -----	4.89			
Nitrogen -----	65.40			
Carbon Dioxide -----	1.10	-33.13		
Methane -----	24.72	-39.54	-217.2	
Ethane -----	2.39	-29.12		
Ethylene -----	nd			
Propane -----	0.713	-24.97		
Propylene -----	nd			
Iso-butane -----	0.0533			
N-butane -----	0.0599			
Iso-pentane -----	0.0045			
N-pentane -----	0.0001			
Hexanes + -----	0.0005			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 315

Specific gravity, calculated: 0.888

Remarks: Insufficient C4 & C5 concentrations for isotopic analysis.

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 #: 775727 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV06-1108-1051 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 10:51 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0109			
Hydrogen -----	nd			
Argon -----	0.408			
Oxygen -----	9.65			
Nitrogen -----	40.66			
Carbon Dioxide -----	1.02			
Methane -----	40.91			
Ethane -----	5.14			
Ethylene -----	nd			
Propane -----	1.72			
Propylene -----	nd			
Iso-butane -----	0.185			
N-butane -----	0.169			
Iso-pentane -----	0.0870			
N-pentane -----	0.0063			
Hexanes + -----	0.0312			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 566

Specific gravity, calculated: 0.838

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 #: 775728 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV07-1108-1145 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:45 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.560			
Oxygen -----	18.24			
Nitrogen -----	77.12			
Carbon Dioxide -----	2.10			
Methane -----	1.87			
Ethane -----	0.108			
Ethylene -----	nd			
Propane -----	0.0006			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0003			
Iso-pentane -----	0.0001			
N-pentane -----	0.0001			
Hexanes + -----	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 21

Specific gravity, calculated: 0.999

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 #: 775729 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV09-1108-1109 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:09 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.877			
Oxygen -----	11.20			
Nitrogen -----	77.99			
Carbon Dioxide -----	0.56			
Methane -----	8.72			
Ethane -----	0.643			
Ethylene -----	nd			
Propane -----	0.0100			
Propylene -----	nd			
Iso-butane -----	0.0007			
N-butane -----	0.0006			
Iso-pentane -----	0.0002			
N-pentane -----	nd			
Hexanes + -----	0.0001			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 100

Specific gravity, calculated: 0.954

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 #: 775730 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV10-1108-1116 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:16 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.660			
Oxygen -----	19.37			
Nitrogen -----	75.56			
Carbon Dioxide -----	0.38			
Methane -----	3.40			
Ethane -----	0.475			
Ethylene -----	nd			
Propane -----	0.107			
Propylene -----	nd			
Iso-butane -----	0.0140			
N-butane -----	0.0218			
Iso-pentane -----	0.0065			
N-pentane -----	0.0012			
Hexanes + -----	0.0022			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 47

Specific gravity, calculated: 0.986

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 #: 775731 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV11-1108-1122 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:22 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0187			
Hydrogen -----	nd			
Argon -----	0.179			
Oxygen -----	3.91			
Nitrogen -----	15.02			
Carbon Dioxide -----	0.66	-29.69		
Methane -----	65.82	-49.68	-237.7	
Ethane -----	8.42	-33.56		
Ethylene -----	nd			
Propane -----	3.94	-29.37		
Propylene -----	nd			
Iso-butane -----	0.567			
N-butane -----	1.02	-27.88		
Iso-pentane -----	0.269			
N-pentane -----	0.117			
Hexanes + -----	0.0602			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 987

Specific gravity, calculated: 0.756

Remarks: Insufficient iC4 & C5 concentrations for isotopic analysis.

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 #: 775732 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV12-1108-1127 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:27 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0230			
Hydrogen -----	nd			
Argon -----	0.0097			
Oxygen -----	0.13			
Nitrogen -----	1.09			
Carbon Dioxide -----	1.94	-35.14		
Methane -----	79.49	-49.72	-247.3	
Ethane -----	10.08	-33.54		
Ethylene -----	nd			
Propane -----	4.67	-29.44		
Propylene -----	nd			
Iso-butane -----	0.663	-31.99		
N-butane -----	1.30	-28.30		
Iso-pentane -----	0.307	-28.38		
N-pentane -----	0.214	-27.09		
Hexanes + -----	0.0862			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1194

Specific gravity, calculated: 0.713

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 #: 775733 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV13-1108-1132 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:32 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0206			
Hydrogen -----	nd			
Argon -----	0.196			
Oxygen -----	2.22			
Nitrogen -----	16.97			
Carbon Dioxide -----	4.17	-26.22		
Methane -----	69.28	-50.68	-246.9	
Ethane -----	7.06	-32.09		
Ethylene -----	nd			
Propane -----	0.0764			
Propylene -----	nd			
Iso-butane -----	0.0018			
N-butane -----	0.0030			
Iso-pentane -----	0.0003			
N-pentane -----	0.0004			
Hexanes + -----	0.0004			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 830

Specific gravity, calculated: 0.713

Remarks: Insufficient C3-C5 concentrations for isotopic analysis.

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 #: 775734 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV14-1108-1138 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:38 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.906			
Oxygen -----	19.43			
Nitrogen -----	76.09			
Carbon Dioxide -----	1.86			
Methane -----	1.51			
Ethane -----	0.173			
Ethylene -----	nd			
Propane -----	0.0261			
Propylene -----	nd			
Iso-butane -----	0.0011			
N-butane -----	0.0020			
Iso-pentane -----	0.0002			
N-pentane -----	0.0002			
Hexanes + -----	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 19

Specific gravity, calculated: 1.002

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 #: 775735 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV16-1108-1152 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:52 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.587			
Oxygen -----	8.77			
Nitrogen -----	49.84			
Carbon Dioxide -----	1.89			
Methane -----	31.48			
Ethane -----	4.42			
Ethylene -----	0.0002			
Propane -----	2.12			
Propylene -----	0.0018			
Iso-butane -----	0.305			
N-butane -----	0.445			
Iso-pentane -----	0.113			
N-pentane -----	0.0109			
Hexanes + -----	0.0180			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 481

Specific gravity, calculated: 0.887

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 #: 775736 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV17-1108-1156 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 11:56 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0110			
Hydrogen -----	nd			
Argon -----	0.453			
Oxygen -----	8.19			
Nitrogen -----	38.19			
Carbon Dioxide -----	2.11			
Methane -----	41.95			
Ethane -----	5.59			
Ethylene -----	nd			
Propane -----	2.56			
Propylene -----	0.0005			
Iso-butane -----	0.281			
N-butane -----	0.515			
Iso-pentane -----	0.110			
N-pentane -----	0.0194			
Hexanes + -----	0.0193			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 621

Specific gravity, calculated: 0.847

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 #: 775737 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV18-1108-1203 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 12:03 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0125			
Hydrogen -----	nd			
Argon -----	0.537			
Oxygen -----	10.20			
Nitrogen -----	46.05			
Carbon Dioxide -----	1.66			
Methane -----	37.29			
Ethane -----	3.91			
Ethylene -----	nd			
Propane -----	0.335			
Propylene -----	0.0002			
Iso-butane -----	0.0018			
N-butane -----	0.0074			
Iso-pentane -----	0.0001			
N-pentane -----	nd			
Hexanes + -----	0.0001			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 456

Specific gravity, calculated: 0.843

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 #: 775738 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV19-1108-1208 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 12:08 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.916			
Oxygen -----	19.57			
Nitrogen -----	77.84			
Carbon Dioxide -----	0.99			
Methane -----	0.592			
Ethane -----	0.0650			
Ethylene -----	nd			
Propane -----	0.0186			
Propylene -----	nd			
Iso-butane -----	0.0021			
N-butane -----	0.0033			
Iso-pentane -----	0.0006			
N-pentane -----	nd			
Hexanes + -----	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 8

Specific gravity, calculated: 1.001

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 #: 775739 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV20-1108-1213 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 12:13 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.547			
Oxygen -----	4.53			
Nitrogen -----	49.02			
Carbon Dioxide -----	5.39			
Methane -----	34.85			
Ethane -----	4.56			
Ethylene -----	nd			
Propane -----	0.969			
Propylene -----	0.0004			
Iso-butane -----	0.0663			
N-butane -----	0.0566			
Iso-pentane -----	0.0076			
N-pentane -----	0.0002			
Hexanes + -----	0.0009			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 463

Specific gravity, calculated: 0.871

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 #: 775740 Job #: 46263 IS-104309 Co. Job#:
 Sample Name: SV21-1108-1218 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/08/2020 12:18 Date Received: 11/10/2020 Date Reported: 12/01/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.917			
Oxygen -----	20.41			
Nitrogen -----	77.47			
Carbon Dioxide -----	0.090			
Methane -----	1.03			
Ethane -----	0.0818			
Ethylene -----	nd			
Propane -----	0.0009			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0002			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 12

Specific gravity, calculated: 0.995

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 #: 777087 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV22-1116-1053 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 10:53 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0065			
Hydrogen -----	nd			
Argon -----	0.876			
Oxygen -----	17.61			
Nitrogen -----	72.02			
Carbon Dioxide -----	0.68			
Methane -----	7.68			
Ethane -----	0.834			
Ethylene -----	nd			
Propane -----	0.239			
Propylene -----	nd			
Iso-butane -----	0.0228			
N-butane -----	0.0264			
Iso-pentane -----	0.0067			
N-pentane -----	0.0005			
Hexanes + -----	0.0009			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 101

Specific gravity, calculated: 0.970

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 #: 777088 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV23-1116-1106 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 11:06 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0063			
Hydrogen -----	nd			
Argon -----	0.972			
Oxygen -----	18.33			
Nitrogen -----	79.22			
Carbon Dioxide -----	1.46			
Methane -----	0.0077			
Ethane -----	0.0021			
Ethylene -----	nd			
Propane -----	0.0014			
Propylene -----	nd			
Iso-butane -----	0.0002			
N-butane -----	0.0004			
Iso-pentane -----	0.0002			
N-pentane -----	nd			
Hexanes + -----	0.0001			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 1.004

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 #: 777089 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV25-1116-1128 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 11:28 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.805			
Oxygen -----	1.47			
Nitrogen -----	69.40			
Carbon Dioxide -----	2.66			
Methane -----	22.24	-38.14	-229.9	
Ethane -----	2.70	-28.91		
Ethylene -----	nd			
Propane -----	0.668	-22.47		
Propylene -----	0.0004			
Iso-butane -----	0.0304			
N-butane -----	0.0234			
Iso-pentane -----	0.0002			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 292

Specific gravity, calculated: 0.902

Remarks: Insufficient C4/C5 concentrations for isotopic analysis.

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 #: 777090 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV26-1116-1136 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 11:36 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.948			
Oxygen -----	20.67			
Nitrogen -----	77.29			
Carbon Dioxide -----	0.17			
Methane -----	0.848			
Ethane -----	0.0596			
Ethylene -----	nd			
Propane -----	0.0088			
Propylene -----	nd			
Iso-butane -----	0.0007			
N-butane -----	0.0008			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 10

Specific gravity, calculated: 0.997

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 #: 777091 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV27-1116-1150 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 11:50 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.953			
Oxygen -----	19.54			
Nitrogen -----	77.99			
Carbon Dioxide -----	0.78			
Methane -----	0.733			
Ethane -----	0.0071			
Ethylene -----	nd			
Propane -----	0.0012			
Propylene -----	nd			
Iso-butane -----	0.0001			
N-butane -----	0.0002			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 8

Specific gravity, calculated: 0.999

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 #: 777092 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV31-1116-1249 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 12:49 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0065			
Hydrogen -----	nd			
Argon -----	0.989			
Oxygen -----	15.76			
Nitrogen -----	82.93			
Carbon Dioxide -----	0.27			
Methane -----	0.0457			
Ethane -----	0.0007			
Ethylene -----	nd			
Propane -----	0.0004			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0001			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 0.994

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 #: 777093 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV32-1116-1305 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 13:05 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	1.04			
Oxygen -----	9.70			
Nitrogen -----	88.89			
Carbon Dioxide -----	0.21			
Methane -----	0.157			
Ethane -----	0.0068			
Ethylene -----	nd			
Propane -----	0.0002			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 2

Specific gravity, calculated: 0.985

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 #: 777094 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV34-1116-1324 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 13:24 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.985			
Oxygen -----	6.50			
Nitrogen -----	83.85			
Carbon Dioxide -----	5.39			
Methane -----	3.00			
Ethane -----	0.257			
Ethylene -----	nd			
Propane -----	0.0214			
Propylene -----	nd			
Iso-butane -----	0.0002			
N-butane -----	0.0005			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 35

Specific gravity, calculated: 0.998

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 #: 777095 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV35-1116-1339 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 13:39 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.989			
Oxygen -----	13.71			
Nitrogen -----	81.60			
Carbon Dioxide -----	3.63			
Methane -----	0.0635			
Ethane -----	0.0053			
Ethylene -----	nd			
Propane -----	0.0012			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1

Specific gravity, calculated: 1.010

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 #: 777096 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV45-1116-1516 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 15:16 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.999			
Oxygen -----	16.57			
Nitrogen -----	82.01			
Carbon Dioxide -----	0.39			
Methane -----	0.0310			
Ethane -----	0.0004			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 0.996

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 #: 777097 Job #: 46336 IS-104309 Co. Job#:
Sample Name: SV44-1116-1618 Co. Lab#:
Company: LT Environmental
API/Well:
Container: IsoTube®
Field/Site Name: Sec Four Pad
Location: Erie, CO
Formation:
Sampling Point:
Date Sampled: 11/16/2020 16:18 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.950			
Oxygen -----	20.46			
Nitrogen -----	77.69			
Carbon Dioxide -----	0.90			
Methane -----	0.0003			
Ethane -----	nd			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 1.004

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 #: 777098 Job #: 46336 IS-104309 Co. Job#:
 Sample Name: SV49-1116-1630 Co. Lab#:
 Company: LT Environmental
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/16/2020 16:30 Date Received: 11/19/2020 Date Reported: 12/02/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.852			
Oxygen -----	4.48			
Nitrogen -----	71.86			
Carbon Dioxide -----	2.63			
Methane -----	17.17	-38.19	-233.6	
Ethane -----	2.14	-30.29		
Ethylene -----	nd			
Propane -----	0.752	-24.47		
Propylene -----	nd			
Iso-butane -----	0.0629			
N-butane -----	0.0466			
Iso-pentane -----	0.0020			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 234

Specific gravity, calculated: 0.927

Remarks: Insufficient C4/C5 concentrations for isotopic analysis.

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 #: 778814 Job #: 46514 IS-107457 Co. Job#:
 Sample Name: SV52-1121-1218 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/21/2020 12:18 Date Received: 12/10/2020 Date Reported: 1/28/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.855			
Oxygen -----	0.44			
Nitrogen -----	73.70			
Carbon Dioxide -----	16.74	-23.83		
Methane -----	7.49	-29.52	-210.0	
Ethane -----	0.779	-24.32		
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	0.0001			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0001			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 90

Specific gravity, calculated: 1.033

Remarks: Insufficient C3-C5 concentrations for isotopic analysis.
IsoTube at ATM.

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 #: 778815 Job #: 46514 IS-107457 Co. Job#:
 Sample Name: SV54-1121-1249 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 11/21/2020 12:49 Date Received: 12/10/2020 Date Reported: 1/28/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0095			
Hydrogen -----	nd			
Argon -----	0.452			
Oxygen -----	3.39			
Nitrogen -----	38.23			
Carbon Dioxide -----	3.33	-25.76		
Methane -----	48.54	-45.54	-237.8	
Ethane -----	5.09	-30.40		
Ethylene -----	nd			
Propane -----	0.905	-22.53		
Propylene -----	0.0003			
Iso-butane -----	0.0168	-22.7		
N-butane -----	0.0324	-12.9		
Iso-pentane -----	0.0001			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 607

Specific gravity, calculated: 0.801

Remarks: Butane carbon isotope data obtained online via GC-C-IRMS.
 Insufficient C5 concentrations for isotopic analysis.
 IsoTube at ATM.

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 #: 778816 Job #: 46514 IS-107457 Co. Job#:
 Sample Name: SV57-1202-1020 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/02/2020 10:20 Date Received: 12/10/2020 Date Reported: 1/28/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.970			
Oxygen -----	2.78			
Nitrogen -----	83.01			
Carbon Dioxide -----	12.36	-23.93		
Methane -----	0.832	-51.21	-232	
Ethane -----	0.0458			
Ethylene -----	nd			
Propane -----	0.0004			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 9

Specific gravity, calculated: 1.040

Remarks: C2 peak could not be resolved due to high background - no C2 isotope data available. Insufficient C3 -C5 concentrations for isotopic analysis.

IsoTube at ATM.

Methane hydrogen isotopes obtained online via 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 #: 778817 Job #: 46514 IS-107457 Co. Job#:
 Sample Name: SV58-1202-1035 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/02/2020 10:35 Date Received: 12/10/2020 Date Reported: 1/28/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.936			
Oxygen -----	1.24			
Nitrogen -----	79.84			
Carbon Dioxide -----	17.23	-24.87		
Methane -----	0.705	-42.12	-230	
Ethane -----	0.0501			
Ethylene -----	nd			
Propane -----	0.0007			
Propylene -----	nd			
Iso-butane -----	0.0001			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 8

Specific gravity, calculated: 1.065

Remarks: C2 peak could not be resolved due to high background - no C2 isotope data available. Insufficient C3 -C5 concentrations for isotopic analysis.

IsoTube at ATM.

Methane hydrogen isotopes obtained online via 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 #: 778818 Job #: 46514 IS-107457 Co. Job#:
 Sample Name: SV59-1202-1044 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/02/2020 10:44 Date Received: 12/10/2020 Date Reported: 1/28/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.962			
Oxygen -----	1.57			
Nitrogen -----	81.90			
Carbon Dioxide -----	15.17	-24.93		
Methane -----	0.362	-32.1	-223	
Ethane -----	0.0322			
Ethylene -----	nd			
Propane -----	0.0004			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 4

Specific gravity, calculated: 1.056

Remarks: C2 peak could not be resolved due to high background - no C2 isotope data available. Insufficient C3 -C5 concentrations for isotopic analysis.

IsoTube at ATM.

Methane isotopes obtained online via GC-C-IRMS/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 #: 779192 Job #: 46542 IS-107457 Co. Job#:
 Sample Name: PR01S-1211-1258 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/11/2020 12:58 Date Received: 12/15/2020 Date Reported: 1/04/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.938			
Oxygen -----	20.61			
Nitrogen -----	78.30			
Carbon Dioxide -----	0.11			
Methane -----	0.0093			
Ethane -----	0.0052			
Ethylene -----	nd			
Propane -----	0.0074			
Propylene -----	nd			
Iso-butane -----	0.0018			
N-butane -----	0.0072			
Iso-pentane -----	0.0029			
N-pentane -----	0.0031			
Hexanes + -----	0.0016			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1

Specific gravity, calculated: 1.000

Remarks: Insufficient hydrocarbon concentrations for isotopic analysis. IsoTube at ATM.

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 #: 779193 Job #: 46542 IS-107457 Co. Job#:
 Sample Name: PR01D-1211-1244 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/11/2020 12:44 Date Received: 12/15/2020 Date Reported: 1/04/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	0.0315			
Argon -----	0.685			
Oxygen -----	10.41			
Nitrogen -----	56.51			
Carbon Dioxide -----	8.96	-23.13		
Methane -----	18.36	-45.21	-238.6	
Ethane -----	2.90	-31.79		
Ethylene -----	nd			
Propane -----	1.43	-28.45		
Propylene -----	nd			
Iso-butane -----	0.189	-31.12		
N-butane -----	0.393	-27.51		
Iso-pentane -----	0.0762	-27.6		
N-pentane -----	0.0438	-26.0		
Hexanes + -----	0.0077			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 298

Specific gravity, calculated: 0.976

Remarks: IsoTube at ATM.
 Pentane carbon isotope data obtained online via GC-C-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 #: 779194 Job #: 46542 IS-107457 Co. Job#:
 Sample Name: PR02S-1211-1312 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/11/2020 13:12 Date Received: 12/15/2020 Date Reported: 1/04/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	0.011			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.908			
Oxygen -----	19.20			
Nitrogen -----	75.87			
Carbon Dioxide -----	3.90	-19.42		
Methane -----	0.0978	-46.7		
Ethane -----	0.0019			
Ethylene -----	nd			
Propane -----	0.0029			
Propylene -----	nd			
Iso-butane -----	0.0008			
N-butane -----	0.0029			
Iso-pentane -----	0.0012			
N-pentane -----	0.0013			
Hexanes + -----	0.0008			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1

Specific gravity, calculated: 1.019

Remarks: Insufficient methane concentration for hydrogen isotopic analysis. Insufficient C2-C5 concentrations for isotopic analysis. IsoTube at ATM.
 Methane carbon isotope obtained online via GC-C-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 #: 779892 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV12-1217-1529 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 15:29 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0225			
Hydrogen -----	nd			
Argon -----	0.0112			
Oxygen -----	0.18			
Nitrogen -----	1.08			
Carbon Dioxide -----	0.99	-37.00		
Methane -----	80.89	-49.78	-249.0	
Ethane -----	10.11	-33.54		
Ethylene -----	nd			
Propane -----	4.47	-29.13		
Propylene -----	nd			
Iso-butane -----	0.628	-31.69		
N-butane -----	1.15	-27.84		
Iso-pentane -----	0.278	-28.07		
N-pentane -----	0.141	-25.32		
Hexanes + -----	0.0489			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1192

Specific gravity, calculated: 0.696

Remarks: IsoTube at ATM.

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 #: 779893 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV20-1217-1502 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 15:02 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.764			
Oxygen -----	2.89			
Nitrogen -----	66.45			
Carbon Dioxide -----	5.06	-28.83		
Methane -----	23.01	-36.98	-228.6	
Ethane -----	1.71	-28.05		
Ethylene -----	nd			
Propane -----	0.103	-22.2		
Propylene -----	0.0001			
Iso-butane -----	0.0087			
N-butane -----	0.0038			
Iso-pentane -----	0.0011			
N-pentane -----	0.0005			
Hexanes + -----	0.0013			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 267

Specific gravity, calculated: 0.909

Remarks: Insufficient butane and pentane concentrations for isotopic analysis.
 IsoTube at ATM.
 Propane carbon isotope data obtained online via GC-C-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 #: 779894 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV17-1217-1517 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 15:17 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0111			
Hydrogen -----	nd			
Argon -----	0.457			
Oxygen -----	0.86			
Nitrogen -----	37.53			
Carbon Dioxide -----	3.09	-28.96		
Methane -----	50.94	-48.26	-244.6	
Ethane -----	5.42	-32.76		
Ethylene -----	0.0010			
Propane -----	1.32	-27.29		
Propylene -----	0.0035			
Iso-butane -----	0.182	-31.0		
N-butane -----	0.141	-27.0		
Iso-pentane -----	0.0374	-28.0		
N-pentane -----	0.0029			
Hexanes + -----	0.0046			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 658

Specific gravity, calculated: 0.792

Remarks: Butane and isopentane carbon isotope data obtained online via GC-C-IRMS. Insufficient n-pentane concentration for isotopic analysis.
 IsoTube at ATM.

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 #: 779895 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV18-1217-1526 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 15:26 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0147			
Hydrogen -----	nd			
Argon -----	0.412			
Oxygen -----	0.65			
Nitrogen -----	36.71			
Carbon Dioxide -----	2.28	-29.62		
Methane -----	55.39	-46.23	-242.6	
Ethane -----	4.28	-30.12		
Ethylene -----	0.0006			
Propane -----	0.251	-21.46		
Propylene -----	0.0008			
Iso-butane -----	0.0047			
N-butane -----	0.0058			
Iso-pentane -----	0.0010			
N-pentane -----	0.0003			
Hexanes + -----	0.0010			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 644

Specific gravity, calculated: 0.758

Remarks: Insufficient butane and pentane concentrations for isotopic analysis.
IsoTube at ATM.

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 #: 779896 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV54-1217-1340 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 13:40 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0054			
Hydrogen -----	nd			
Argon -----	0.555			
Oxygen -----	2.53			
Nitrogen -----	48.47			
Carbon Dioxide -----	2.87	-27.89		
Methane -----	41.30	-42.52	-236.2	
Ethane -----	3.86	-27.99		
Ethylene -----	nd			
Propane -----	0.395	-19.92		
Propylene -----	0.0003			
Iso-butane -----	0.0065			
N-butane -----	0.0090			
Iso-pentane -----	0.0001			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 497

Specific gravity, calculated: 0.823

Remarks: Insufficient butane and pentane concentrations for isotopic analysis.
IsoTube at ATM.

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 #: 779897 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV06-1217-1122 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 11:22 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0097			
Hydrogen -----	nd			
Argon -----	0.342			
Oxygen -----	4.84			
Nitrogen -----	29.07			
Carbon Dioxide -----	2.44	-31.68		
Methane -----	53.48	-44.45	-239.6	
Ethane -----	7.23	-31.29		
Ethylene -----	0.0003			
Propane -----	2.17	-24.82		
Propylene -----	0.0030			
Iso-butane -----	0.196	-28.29		
N-butane -----	0.141	-19.44		
Iso-pentane -----	0.0632	-24.9		
N-pentane -----	0.0013			
Hexanes + -----	0.0127			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 740

Specific gravity, calculated: 0.790

Remarks: Insufficient n-pentane concentration for isotopic analysis.
 Isopentane carbon isotope data obtained online via GC-C-IRMS.
 IsoTube at ATM.

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 #: 779898 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV25-1217-1230 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 12:30 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.756			
Oxygen -----	0.25			
Nitrogen -----	78.00			
Carbon Dioxide -----	2.59	-27.83		
Methane -----	16.59	-35.73	-224.6	
Ethane -----	1.61	-25.57		
Ethylene -----	nd			
Propane -----	0.189	-18.99		
Propylene -----	0.0001			
Iso-butane -----	0.0058			
N-butane -----	0.0045			
Iso-pentane -----	0.0001			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 202

Specific gravity, calculated: 0.919

Remarks: Insufficient butane and pentane concentrations for isotopic analysis.
IsoTube at ATM.

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 #: 779899 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV13-1217-1347 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 13:47 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0172			
Hydrogen -----	nd			
Argon -----	0.168			
Oxygen -----	0.67			
Nitrogen -----	15.29			
Carbon Dioxide -----	4.63	-27.53		
Methane -----	72.55	-48.79	-248.7	
Ethane -----	6.65	-29.64		
Ethylene -----	nd			
Propane -----	0.0218	-21.0		
Propylene -----	nd			
Iso-butane -----	0.0006			
N-butane -----	0.0006			
Iso-pentane -----	0.0001			
N-pentane -----	nd			
Hexanes + -----	0.0001			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 854

Specific gravity, calculated: 0.699

Remarks: Insufficient butane and pentane concentrations for isotopic analysis.
 IsoTube at ATM.
 Propane carbon isotope data obtained online via GC-C-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 #: 779900 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV11-1217-1415 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 14:15 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0161			
Hydrogen -----	nd			
Argon -----	0.142			
Oxygen -----	3.11			
Nitrogen -----	14.29			
Carbon Dioxide -----	0.98	-32.54		
Methane -----	67.18	-49.21	-247.9	
Ethane -----	8.46	-33.46		
Ethylene -----	nd			
Propane -----	3.93	-29.27		
Propylene -----	0.0005			
Iso-butane -----	0.566	-31.91		
N-butane -----	0.944	-27.14		
Iso-pentane -----	0.261	-28.24		
N-pentane -----	0.0781	-24.8		
Hexanes + -----	0.0437			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 997

Specific gravity, calculated: 0.749

Remarks: IsoTube at ATM.
 N-pentane carbon isotope data obtained online via GC-C-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 #: 779901 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV49-1217-1206 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 12:06 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.713			
Oxygen -----	0.43			
Nitrogen -----	78.79			
Carbon Dioxide -----	2.84	-27.46		
Methane -----	14.83	-33.98	-224.4	
Ethane -----	1.82	-28.82		
Ethylene -----	nd			
Propane -----	0.521	-22.30		
Propylene -----	0.0006			
Iso-butane -----	0.0401	-26.0		
N-butane -----	0.0129	-11.6		
Iso-pentane -----	0.0007			
N-pentane -----	nd			
Hexanes + -----	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 197

Specific gravity, calculated: 0.930

Remarks: Butane carbon isotope data obtained online via GC-C-IRMS.
 Insufficient pentane concentrations for isotopic analysis.
 IsoTube at ATM.

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 #: 779902 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV22-1217-1445 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/17/2020 14:45 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.569			
Oxygen -----	1.96			
Nitrogen -----	65.56			
Carbon Dioxide -----	1.62	-28.12		
Methane -----	26.64	-36.54	-229.5	
Ethane -----	3.14	-28.39		
Ethylene -----	0.0004			
Propane -----	0.435	-21.21		
Propylene -----	0.0010			
Iso-butane -----	0.0500	-26.6		
N-butane -----	0.0164	-20.8		
Iso-pentane -----	0.0070			
N-pentane -----	0.0007			
Hexanes + -----	0.0027			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 339

Specific gravity, calculated: 0.877

Remarks: Butane carbon isotope data obtained online via GC-C-IRMS.
 Insufficient pentane concentrations for isotopic analysis.
 IsoTube at ATM.

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 #: 779903 Job #: 46619 IS-107457 Co. Job#:
 Sample Name: SV-SECFOUR-22-4-1218-1322 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/18/2020 13:22 Date Received: 12/28/2020 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0238			
Hydrogen -----	nd			
Argon -----	0.0087			
Oxygen -----	0.17			
Nitrogen -----	1.00			
Carbon Dioxide -----	0.055			
Methane -----	81.06	-49.78	-250.6	
Ethane -----	10.13	-33.57		
Ethylene -----	nd			
Propane -----	4.81	-29.65		
Propylene -----	nd			
Iso-butane -----	0.693	-32.09		
N-butane -----	1.41	-28.71		
Iso-pentane -----	0.314	-28.37		
N-pentane -----	0.249	-27.89		
Hexanes + -----	0.0806			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1220

Specific gravity, calculated: 0.699

Remarks: CO2 isotope data unavailable due to high background.
IsoTube at ATM.

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 #: 780661 Job #: 46674 IS-107457 Co. Job#:
 Sample Name: SV13-1230-1032 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/30/2020 10:32 Date Received: 1/07/2021 Date Reported: 2/18/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0181			
Hydrogen -----	nd			
Argon -----	0.184			
Oxygen -----	0.36			
Nitrogen -----	16.79			
Carbon Dioxide -----	4.47	-27.05		
Methane -----	71.49	-48.58	-245.4	
Ethane -----	6.62	-29.26		
Ethylene -----	nd			
Propane -----	0.0339	-26.4		
Propylene -----	nd			
Iso-butane -----	0.0044			
N-butane -----	0.0133	-28.7		
Iso-pentane -----	0.0057			
N-pentane -----	0.0046			
Hexanes + -----	0.0038			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 844

Specific gravity, calculated: 0.703

Remarks: Insufficient isobutane and pentane concentrations for isotopic analysis.
 IsoTube arrived at ATM.
 Propane and n-butane carbon isotope data obtained online via GC-C-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 #: 780662 Job #: 46674 IS-107457 Co. Job#:
 Sample Name: SV12-1230-1015 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/30/2020 10:15 Date Received: 1/07/2021 Date Reported: 2/18/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0176			
Hydrogen -----	nd			
Argon -----	0.0871			
Oxygen -----	2.04			
Nitrogen -----	8.07			
Carbon Dioxide -----	1.05	-36.85		
Methane -----	73.27	-48.75	-245.0	
Ethane -----	9.45	-33.23		
Ethylene -----	nd			
Propane -----	4.08	-29.02		
Propylene -----	nd			
Iso-butane -----	0.557	-31.69		
N-butane -----	1.00	-27.81		
Iso-pentane -----	0.228	-28.07		
N-pentane -----	0.107	-25.6		
Hexanes + -----	0.0384			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1081

Specific gravity, calculated: 0.725

Remarks: IsoTube arrived at ATM.
 N-pentane carbon isotope data obtained online via GC-C-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 #: 780663 Job #: 46674 IS-107457 Co. Job#:
 Sample Name: SV18-1230-1307 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/30/2020 13:07 Date Received: 1/07/2021 Date Reported: 2/18/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0122			
Hydrogen -----	nd			
Argon -----	0.431			
Oxygen -----	0.84			
Nitrogen -----	39.58			
Carbon Dioxide -----	2.45	-29.04		
Methane -----	52.33	-45.91	-238.9	
Ethane -----	4.06	-29.58		
Ethylene -----	0.0005			
Propane -----	0.280	-22.10		
Propylene -----	0.0006			
Iso-butane -----	0.0053			
N-butane -----	0.0085			
Iso-pentane -----	0.0013			
N-pentane -----	0.0005			
Hexanes + -----	0.0009			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 610

Specific gravity, calculated: 0.772

Remarks: Insufficient butane and pentane concentrations for isotopic analysis.
IsoTube arrived at ATM.

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 #: 780664 Job #: 46674 IS-107457 Co. Job#:
 Sample Name: SV17-1230-1250 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/30/2020 12:50 Date Received: 1/07/2021 Date Reported: 2/18/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0073			
Hydrogen -----	nd			
Argon -----	0.729			
Oxygen -----	9.33			
Nitrogen -----	61.60			
Carbon Dioxide -----	1.73			
Methane -----	24.07	-50.53	-248.2	
Ethane -----	2.06	-33.39		
Ethylene -----	0.0006			
Propane -----	0.365	-26.66		
Propylene -----	0.0015			
Iso-butane -----	0.0534	-31.1		
N-butane -----	0.0358	-25.9		
Iso-pentane -----	0.0125	-28.0		
N-pentane -----	0.0011			
Hexanes + -----	0.0023			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 293

Specific gravity, calculated: 0.898

Remarks: Butane and isopentane carbon isotope data obtained online via GC-C-IRMS.
 Insufficient n-pentane concentration for isotopic analysis. Insufficient sample volume for CO2 isotopic analysis.
 IsoTube arrived at ATM.

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 #: 780665 Job #: 46674 IS-107457 Co. Job#:
 Sample Name: SV54-1230-1448 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/30/2020 14:48 Date Received: 1/07/2021 Date Reported: 2/18/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0068			
Hydrogen -----	nd			
Argon -----	0.655			
Oxygen -----	4.75			
Nitrogen -----	57.79			
Carbon Dioxide -----	2.73	-28.12		
Methane -----	31.19	-42.00	-230.7	
Ethane -----	2.64	-27.45		
Ethylene -----	nd			
Propane -----	0.192	-19.6		
Propylene -----	0.0002			
Iso-butane -----	0.0065			
N-butane -----	0.0171	-26.4		
Iso-pentane -----	0.0064			
N-pentane -----	0.0082			
Hexanes + -----	0.0072			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 369

Specific gravity, calculated: 0.866

Remarks: Insufficient isobutane and pentane concentrations for isotopic analysis.
 IsoTube arrived at ATM.
 Propane and n-butane carbon isotope data obtained online via GC-C-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 #: 780666 Job #: 46674 IS-107457 Co. Job#:
 Sample Name: SV-SECFOUR-22-4-1230-1419 Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: Sec Four Pad
 Location: Erie, CO
 Formation:
 Sampling Point:
 Date Sampled: 12/30/2020 14:19 Date Received: 1/07/2021 Date Reported: 2/18/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0224			
Hydrogen -----	nd			
Argon -----	0.0759			
Oxygen -----	1.73			
Nitrogen -----	6.57			
Carbon Dioxide -----	0.074			
Methane -----	75.02	-49.70	-247.0	
Ethane -----	9.57	-33.48		
Ethylene -----	nd			
Propane -----	4.48	-29.51		
Propylene -----	nd			
Iso-butane -----	0.631	-32.02		
N-butane -----	1.27	-28.62		
Iso-pentane -----	0.275	-28.35		
N-pentane -----	0.213	-27.66		
Hexanes + -----	0.0704			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1130

Specific gravity, calculated: 0.720

Remarks: Insufficient sample volume for CO2 isotopic analysis.
IsoTube arrived at ATM.

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. %.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Kerr-McGee Oil & Gas Onshore LP

GWA_PW_Sec_Four_4_14

FID:299656 Reg:0 Freq.:SP

SGS Job Number: DA31877

Sampling Date: 01/14/21

Report to:

Anadarko E&P Onshore LLC
112 High Street
Buffalo, WY 82834
joel.mason@absarokasolutions.com; max.moran@absarokasolutions.com
ATTN: Max Mason

Total number of pages in report: 53



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



Jason Savoie
General Manager

Client Service contact: Carissa Cumine 303-425-6021

Certifications: CO (CO00049), NE (NE-OS-06-04), ND (R-027), UT (NELAP CO00049)
LA (LA150028), TX (T104704511), WY (8TMS-L)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.
Test results relate only to samples analyzed.

Table of Contents

-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Summary of Hits	9
Section 4: Sample Results	11
4.1: DA31877-1: BW_05_123_29457_14PM NESW_4_1N_68W	12
4.2: DA31877-1A: BW_05_123_29457_14PM NESW_4_1N_68W	16
4.3: DA31877-1F: BW_05_123_29457_14PM NESW_4_1N_68W	17
Section 5: Misc. Forms	18
5.1: Chain of Custody	19
Section 6: MS Volatiles - QC Data Summaries	21
6.1: Method Blank Summary	22
6.2: Blank Spike/Blank Spike Duplicate Summary	23
Section 7: GC Volatiles - QC Data Summaries	24
7.1: Method Blank Summary	25
7.2: Blank Spike/Blank Spike Duplicate Summary	27
Section 8: GC/LC Semi-volatiles - QC Data Summaries	29
8.1: Method Blank Summary	30
8.2: Blank Spike Summary	31
8.3: Matrix Spike/Matrix Spike Duplicate Summary	32
Section 9: General Chemistry - QC Data Summaries	33
9.1: Method Blank and Spike Results Summary	34
9.2: Duplicate Results Summary	35
9.3: Matrix Spike Results Summary	36
9.4: Matrix Spike Duplicate Results Summary	37
Section 10: Misc. Forms (SGS Scott, LA)	38
10.1: Chain of Custody	39
Section 11: Metals Analysis - QC Data (SGS Scott, LA)	43
11.1: Prep QC MP20319: B,Ca,Fe,Mg,Mn,K,Na,Sr	44
11.2: Prep QC MP20321: Ba,Se	49



Sample Summary

Kerr-McGee Oil & Gas Onshore LP

Job No: DA31877

GWA_PW_Sec_Four_4_14
Project No: FID:299656 Reg:0 Freq.:SP

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
DA31877-1	01/14/21	14:20 HH	01/15/21	AQ	Ground Water	BW_05_123_29457_14PM NESW_4_1N_68W
DA31877-1A	01/14/21	14:20 HH	01/15/21	AQ	Ground Water	BW_05_123_29457_14PM NESW_4_1N_68W
DA31877-1F	01/14/21	14:20 HH	01/15/21	AQ	Groundwater Filtered	BW_05_123_29457_14PM NESW_4_1N_68W

CASE NARRATIVE / CONFORMANCE SUMMARY

2

Client: Kerr-McGee Oil & Gas Onshore LP

Job No: DA31877

Site: GWA_PW_Sec_Four_4_14

Report Date 1/25/2021 7:43:20 PM

On 01/15/2021, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 4.2 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA31877 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

MS Volatiles By Method SW846 8260B

Matrix: AQ

Batch ID: V7V3547

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- DA31877-1: Dilution required due to matrix interference (surrogate standard failure at lesser dilution). Sample was not preserved to pH<2.

GC Volatiles By Method RSK175 MOD

Matrix: AQ

Batch ID: GFK145

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- DA31877-1A: Sample was not preserved to a pH < 2.

GC Volatiles By Method SW846 8015D

Matrix: AQ

Batch ID: GGD95

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- DA31877-1: Dilution required due to high silt content in the sample. Sample was not preserved to pH<2.

GC/LC Semi-volatiles By Method SW846-8015D

Matrix: AQ

Batch ID: OP19762

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA31873-1MS, DA31873-1MSD were used as the QC samples indicated.

Monday, January 25, 2021

Page 1 of 4

Metals Analysis By Method EPA 200.7

Matrix: AQ

Batch ID: L:MP20319

- The data for EPA 200.7 meets quality control requirements.
- DA31877-1F for Magnesium: Analysis performed at SGS Scott, LA.
- DA31877-1F for Boron: Analysis performed at SGS Scott, LA.
- DA31877-1F for Iron: Analysis performed at SGS Scott, LA.
- DA31877-1F for Manganese: Analysis performed at SGS Scott, LA.
- DA31877-1F for Calcium: Elevated reporting limit due to sample result over Linear Dynamic Range. Analysis performed at SGS Scott, LA.
- DA31877-1F for Potassium: Analysis performed at SGS Scott, LA.
- DA31877-1F for Strontium: Analysis performed at SGS Scott, LA.
- DA31877-1F for Sodium: Analysis performed at SGS Scott, LA.

Metals Analysis By Method EPA 200.8

Matrix: AQ

Batch ID: L:MP20321

- The data for EPA 200.8 meets quality control requirements.
- DA31877-1F for Selenium: Analysis performed at SGS Scott, LA.
- DA31877-1F for Barium: Analysis performed at SGS Scott, LA.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ

Batch ID: GP28425

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA31750-1MS, DA31750-1MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- DA31877-1 for Sulfate: Elevated detection limit due to matrix interference.
- DA31877-1 for Nitrogen, Nitrate: Sample analyzed beyond recommended hold time.
- DA31877-1 for Nitrogen, Nitrite: Sample analyzed beyond recommended hold time. Elevated detection limit due to matrix interference.
- DA31877-1 for Fluoride: Elevated detection limit due to matrix interference.

Matrix: AQ

Batch ID: R53860

- The data for EPA300.0/SW846 9056A meets quality control requirements.
- The following samples were run outside of holding time for method EPA300.0/SW846 9056A: DA31877-1
- DA31877-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method SM 2320B-2011

Matrix: AQ

Batch ID: GN52275

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA31707-1DUP, DA31748-1MS, DA31748-1MSD were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix: AQ

Batch ID: GN52276

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix: AQ

Batch ID: GN52277

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- DA31877-1 for Alkalinity, Carbonate: Remainder of total alkalinity is due to 2875 mg/l hydroxide.

General Chemistry By Method SM 2510B-2011

Matrix: AQ

Batch ID: GP28417

- Sample(s) DA31700-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ

Batch ID: GN52270

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA31744-2DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ

Batch ID: GN52340

- The data for SM1030E-2011 meets quality control requirements.
- DA31877-1 for Cation Anion Balance: Ion balance likely due to matrix interference

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ

Batch ID: GN52280

- The data for SM4500HB+-2011/9040C meets quality control requirements.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA31877-1
- DA31877-1 for pH: Field parameter analyzed by the laboratory upon request.

Field Data By Method FIELD

Matrix: AQ

Batch ID: R53867

- The data for FIELD meets quality control requirements.

SGS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting SGS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by SGS indicated via signature on the report cover.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS Wheat Ridge, CO

Job No DA31877

Site: ANADACOD: GWA_PW_Sec_Four_4_14

Report Date 1/22/2021 4:28:15 PM

1 samples, 0 trip blanks and 0 field blanks were collected on 01/14/2021 and were received intact at SGS North America Inc.-Scott (SGS) on 01/15/2021, properly preserved and cool at 0.8 Deg C. These samples received an SGS job number of DA31877. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Metals By Method EPA 200.7

Matrix: AQ

Batch ID: MP20319

- Sample(s) DA31805-1AMS, DA31805-1AMSD, DA31805-1ASDL were used as the QC samples for metals.
- Matrix Spike Duplicate Recovery(s) for Calcium, Sodium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- Matrix Spike Recovery(s) for Calcium, Sodium, Strontium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- Matrix Spike Recovery(s) for Calcium, Sodium, Strontium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for Serial Dilution for Iron are outside control limits for sample MP20319-SDL. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- DA31877-1F for Calcium: Elevated reporting limit due to sample result over Linear Dynamic Range.

Metals By Method EPA 200.8

Matrix: AQ

Batch ID: MP20321

- Sample(s) DA31873-1FMS, DA31873-1FMSD, DA31873-1FSDL were used as the QC samples for metals.

SGS North America Inc.-Scott (SGS) certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS and as stated on the COC. SGS certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Quality Manual except as noted above. This report is to be used in its entirety. SGS is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

Page 1 of 2

Job Number: DA31877
Account: Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14
Collected: 01/14/21

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

DA31877-1 BW_05_123_29457_14PM NESW_4_1N_68W

Benzene ^a	40.6	5.0	3.0	ug/l	SW846 8260B
Toluene ^a	113	5.0	2.5	ug/l	SW846 8260B
Ethylbenzene ^a	7.0	5.0	3.0	ug/l	SW846 8260B
Xylene (total) ^a	82.0	5.0	5.0	ug/l	SW846 8260B
m,p-Xylene ^a	64.9	5.0	4.8	ug/l	SW846 8260B
o-Xylene ^a	17.1	5.0	3.0	ug/l	SW846 8260B
TPH-GRO (C6-C10) ^b	1.73	0.25	0.25	mg/l	SW846 8015D
TPH-DRO (C10-C28)	5.80	0.19	0.18	mg/l	SW846-8015D
Alkalinity, Carbonate ^c	150	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO ₃	3030	5.0		mg/l	SM 2320B-2011
Bromide	1.7	1.3		mg/l	EPA300.0/SW846 9056A
Cation Anion Balance ^d	18.8			%	SM1030E-2011
Chloride	186	13		mg/l	EPA300.0/SW846 9056A
Nitrogen, Nitrate ^e	0.95	0.25		mg/l	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite ^f	0.95	0.35		mg/l	EPA300.0/SW846 9056A
Solids, Total Dissolved	2660	10		mg/l	SM 2540C-2011
Specific Conductivity	10700	1.0		umhos/cm	SM 2510B-2011
pH ^g	12.44			su	SM4500HB+ -2011/9040C
Specific Conductivity (Field)	1521	0.50		umhos/cm	FIELD
pH (Field)	12.64			su	FIELD
Temperature (Field)	18.4			Deg. C	FIELD

DA31877-1A BW_05_123_29457_14PM NESW_4_1N_68W

Methane ^h	2.53	0.0080	0.0070	mg/l	RSK175 MOD
Ethane ^h	0.922	0.016	0.010	mg/l	RSK175 MOD
Propane ^h	1.21	0.022	0.017	mg/l	RSK175 MOD

DA31877-1F BW_05_123_29457_14PM NESW_4_1N_68W

Barium ⁱ	4.43	0.0050		mg/l	EPA 200.8
Calcium ^j	587	1.5		mg/l	EPA 200.7
Magnesium ⁱ	0.164	0.10		mg/l	EPA 200.7
Potassium ⁱ	265	0.50		mg/l	EPA 200.7
Sodium ⁱ	208	0.50		mg/l	EPA 200.7
Strontium ⁱ	9.68	0.010		mg/l	EPA 200.7

- (a) Dilution required due to matrix interference (surrogate standard failure at lesser dilution). Sample was not preserved to pH < 2.
- (b) Dilution required due to high silt content in the sample. Sample was not preserved to pH < 2.
- (c) Remainder of total alkalinity is due to 2875 mg/l hydroxide.
- (d) Ion balance likely due to matrix interference
- (e) Sample analyzed beyond recommended hold time.

Summary of Hits

Job Number: DA31877
Account: Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14
Collected: 01/14/21



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

- (f) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
- (g) Field parameter analyzed by the laboratory upon request.
- (h) Sample was not preserved to a pH < 2.
- (i) Analysis performed at SGS Scott, LA.
- (j) Elevated reporting limit due to sample result over Linear Dynamic Range. Analysis performed at SGS Scott, LA.



Wheat Ridge, CO

Section 4

4

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	BW_05_123_29457_14PM NESW_4_1N_68W	Date Sampled:	01/14/21
Lab Sample ID:	DA31877-1	Date Received:	01/15/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	GWA_PW_Sec_Four_4_14		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	7V70670.D	5	01/20/21 15:10	JB	n/a	n/a	V7V3547
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	40.6	5.0	3.0	ug/l	
108-88-3	Toluene	113	5.0	2.5	ug/l	
100-41-4	Ethylbenzene	7.0	5.0	3.0	ug/l	
1330-20-7	Xylene (total)	82.0	5.0	5.0	ug/l	
	m,p-Xylene	64.9	5.0	4.8	ug/l	
95-47-6	o-Xylene	17.1	5.0	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	81%		70-130%
17060-07-0	1,2-Dichloroethane-D4	98%		70-130%
2037-26-5	Toluene-D8	99%		70-130%
460-00-4	4-Bromofluorobenzene	99%		70-130%

(a) Dilution required due to matrix interference (surrogate standard failure at lesser dilution). Sample was not preserved to pH < 2.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BW_05_123_29457_14PM NESW_4_1N_68W	Date Sampled:	01/14/21
Lab Sample ID:	DA31877-1	Date Received:	01/15/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8015D		
Project:	GWA_PW_Sec_Four_4_14		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	GD02434.D	5	01/18/21 21:20	JB	n/a	n/a	GGD95
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	1.73	0.25	0.25	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	101%		60-140%		

(a) Dilution required due to high silt content in the sample. Sample was not preserved to pH< 2.

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BW_05_123_29457_14PM NESW_4_1N_68W	Date Sampled:	01/14/21
Lab Sample ID:	DA31877-1	Date Received:	01/15/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846-8015D SW846 3510C		
Project:	GWA_PW_Sec_Four_4_14		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH054166.D	1	01/21/21 20:30	NO	01/21/21	OP19762	GFP2154
Run #2							

	Initial Volume	Final Volume
Run #1	1060 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	5.80	0.19	0.18	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		11-142%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: BW_05_123_29457_14PM NESW_4_1N_68W**Lab Sample ID:** DA31877-1**Matrix:** AQ - Ground Water**Project:** GWA_PW_Sec_Four_4_14**Date Sampled:** 01/14/21**Date Received:** 01/15/21**Percent Solids:** n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	< 5.0	5.0	mg/l	1	01/18/21	JD	SM 2320B-2011
Alkalinity, Carbonate ^a	150	5.0	mg/l	1	01/18/21	JD	SM 2320B-2011
Alkalinity, Total as CaCO ₃	3030	5.0	mg/l	1	01/18/21	JD	SM 2320B-2011
Bromide	1.7	1.3	mg/l	25	01/19/21 13:44	JB	EPA300.0/SW846 9056A
Cation Anion Balance ^b	18.8		%	1	01/25/21	EH	SM1030E-2011
Chloride	186	13	mg/l	25	01/19/21 13:44	JB	EPA300.0/SW846 9056A
Fluoride ^c	< 2.5	2.5	mg/l	25	01/19/21 13:44	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate ^d	0.95	0.25	mg/l	25	01/19/21 13:44	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite ^e	0.95	0.35	mg/l	1	01/19/21 13:44	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrite ^f	< 0.10	0.10	mg/l	25	01/19/21 13:44	JB	EPA300.0/SW846 9056A
Solids, Total Dissolved	2660	10	mg/l	1	01/18/21	GM	SM 2540C-2011
Specific Conductivity	10700	1.0	umhos/cm	1	01/18/21	AK	SM 2510B-2011
Sulfate ^c	< 13	13	mg/l	25	01/19/21 13:44	JB	EPA300.0/SW846 9056A
pH ^g	12.44		su	1	01/18/21	GM	SM4500HB+ -2011/9040C

Field Parameters

Specific Conductivity (Field)	1521	0.50	umhos/cm	1	01/14/21 14:20	SUB	FIELD
Temperature (Field)	18.4		Deg. C	1	01/14/21 14:20	SUB	FIELD
pH (Field)	12.64		su	1	01/14/21 14:20	SUB	FIELD

(a) Remainder of total alkalinity is due to 2875 mg/l hydroxide.

(b) Ion balance likely due to matrix interference

(c) Elevated detection limit due to matrix interference.

(d) Sample analyzed beyond recommended hold time.

(e) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

(f) Sample analyzed beyond recommended hold time. Elevated detection limit due to matrix interference.

(g) Field parameter analyzed by the laboratory upon request.

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID:	BW_05_123_29457_14PM NESW_4_1N_68W	Date Sampled:	01/14/21
Lab Sample ID:	DA31877-1A	Date Received:	01/15/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	RSK175 MOD		
Project:	GWA_PW_Sec_Four_4_14		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FK2176.D	10	01/20/21 15:08	JB	n/a	n/a	GFK145
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	21.3 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	2.53	0.0080	0.0070	mg/l	
74-84-0	Ethane	0.922	0.016	0.010	mg/l	
74-98-6	Propane	1.21	0.022	0.017	mg/l	

(a) Sample was not preserved to a pH < 2.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: BW_05_123_29457_14PM NESW_4_1N_68W**Lab Sample ID:** DA31877-1F**Matrix:** AQ - Groundwater Filtered**Project:** GWA_PW_Sec_Four_4_14**Date Sampled:** 01/14/21**Date Received:** 01/15/21**Percent Solids:** n/a

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Barium ^a	4.43	0.0050	mg/l	1	01/19/21	01/19/21	ALA EPA 200.8 ¹	EPA 200.8 ⁵
Boron ^a	< 0.10	0.10	mg/l	1	01/19/21	01/19/21	ALA EPA 200.7 ²	EPA 200.7 ⁴
Calcium ^b	587	1.5	mg/l	5	01/19/21	01/20/21	ALA EPA 200.7 ³	EPA 200.7 ⁴
Iron ^a	< 0.10	0.10	mg/l	1	01/19/21	01/19/21	ALA EPA 200.7 ²	EPA 200.7 ⁴
Magnesium ^a	0.164	0.10	mg/l	1	01/19/21	01/19/21	ALA EPA 200.7 ²	EPA 200.7 ⁴
Manganese ^a	< 0.010	0.010	mg/l	1	01/19/21	01/19/21	ALA EPA 200.7 ²	EPA 200.7 ⁴
Potassium ^a	265	0.50	mg/l	1	01/19/21	01/19/21	ALA EPA 200.7 ²	EPA 200.7 ⁴
Selenium ^a	< 0.0050	0.0050	mg/l	1	01/19/21	01/19/21	ALA EPA 200.8 ¹	EPA 200.8 ⁵
Sodium ^a	208	0.50	mg/l	1	01/19/21	01/19/21	ALA EPA 200.7 ²	EPA 200.7 ⁴
Strontium ^a	9.68	0.010	mg/l	1	01/19/21	01/19/21	ALA EPA 200.7 ²	EPA 200.7 ⁴

(1) Instrument QC Batch: L:MA20766

(2) Instrument QC Batch: L:MA20769

(3) Instrument QC Batch: L:MA20774

(4) Prep QC Batch: L:MP20319

(5) Prep QC Batch: L:MP20321

(a) Analysis performed at SGS Scott, LA.

(b) Elevated reporting limit due to sample result over Linear Dynamic Range. Analysis performed at SGS Scott, LA.

RL = Reporting Limit

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL: 303-425-6021 FAX: 303-425-6854
www.accutest.com

Bottle Order Control #	FED-EX Tracking #
SGS Quote #	SGS Job # DA31877

[illegible]

DA31877: Chain of Custody

Page 1 of 2

5.1

SGS Sample Receipt Summary

Job Number: DA31877

Client: ABSAROKA SOLUTIONS

Project: GWA_PW_SEC_FOUR_4_14

Date / Time Received: 1/15/2021 3:00:00 PM

Delivery Method:

Airbill #'s: CO

Cooler Temps (Initial/Adjusted): #1: (4.2/4.2):

Cooler Security

Y or N

1. Custody Seals Present: ☒ ☐
2. Custody Seals Intact: ☒ ☐

3. COC Present:

Y or N

4. Smpl Dates/Time OK

☒ ☐

Cooler Temperature

Y or N

1. Temp criteria achieved: ☒ ☐
2. Cooler temp verification: IR Gun;
3. Cooler media: Ice (Bag)
4. No. Coolers: 1

Quality Control Preservation

Y or N N/A

1. Trip Blank present / cooler: ☒ ☐ ☐
2. Trip Blank listed on COC: ☒ ☐ ☐
3. Samples preserved properly: ☒ ☐ ☐
4. VOCs headspace free: ☒ ☐ ☐

Comments

Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles: ☒ ☐
2. Container labeling complete: ☒ ☐
3. Sample container label / COC agree: ☒ ☐

Sample Integrity - Condition

Y or N

1. Sample recvd within HT: ☒ ☐
2. All containers accounted for: ☒ ☐
3. Condition of sample: Intact

Sample Integrity - Instructions

Y or N N/A

1. Analysis requested is clear: ☒ ☐
2. Bottles received for unspecified tests: ☐ ☒
3. Sufficient volume recvd for analysis: ☒ ☐
4. Compositing instructions clear: ☐ ☐ ☒
5. Filtering instructions clear: ☐ ☐ ☒

DA31877: Chain of Custody

Page 2 of 2

MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 1

Job Number: DA31877

Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP

Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3547-MB	7V70662.D	1	01/20/21	JB	n/a	n/a	V7V3547

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31877-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.60	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.60	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	1.0	0.96	ug/l	
95-47-6	o-Xylene	ND	1.0	0.60	ug/l	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	94% 70-130%
17060-07-0	1,2-Dichloroethane-D4	97% 70-130%
2037-26-5	Toluene-D8	99% 70-130%
460-00-4	4-Bromofluorobenzene	99% 70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

Job Number: DA31877

Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP

Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3547-BS	7V70659.D	1	01/20/21	JB	n/a	n/a	V7V3547
V7V3547-BSD	7V70660.D	1	01/20/21	JB	n/a	n/a	V7V3547

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31877-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	50	47.5	95	46.8	94	1	70-130/30
100-41-4	Ethylbenzene	50	49.2	98	48.2	96	2	69-130/30
108-88-3	Toluene	50	48.0	96	47.0	94	2	70-130/30
	m,p-Xylene	100	99.2	99	97.3	97	2	70-130/30
95-47-6	o-Xylene	50	49.3	99	48.4	97	2	70-130/30
1330-20-7	Xylene (total)	150	148	99	146	97	1	70-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	94%	94%	70-130%
17060-07-0	1,2-Dichloroethane-D4	99%	97%	70-130%
2037-26-5	Toluene-D8	98%	98%	70-130%
460-00-4	4-Bromofluorobenzene	101%	101%	70-130%

* = Outside of Control Limits.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: DA31877
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGD95-MB	GD02429.D	1	01/18/21	JB	n/a	n/a	GGD95

The QC reported here applies to the following samples: Method: SW846 8015D

DA31877-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.050	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	99% 60-140%

Method Blank Summary

Job Number: DA31877
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFK145-MB	FK2170.D	1	01/20/21	JB	n/a	n/a	GFK145

The QC reported here applies to the following samples: Method: RSK175 MOD

DA31877-1A

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00070	mg/l	
74-84-0	Ethane	ND	0.0016	0.0010	mg/l	
74-98-6	Propane	ND	0.0022	0.0017	mg/l	

7.1.2
7

Blank Spike/Blank Spike Duplicate Summary

Job Number: DA31877
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGD95-BS	GD02427.D	1	01/18/21	JB	n/a	n/a	GGD95
GGD95-BSD	GD02428.D	1	01/18/21	JB	n/a	n/a	GGD95

The QC reported here applies to the following samples: Method: SW846 8015D

DA31877-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	2.2	1.62	74	1.62	74	0	51-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
120-82-1	1,2,4-Trichlorobenzene	102%	99%	60-140%

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: DA31877
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFK145-BS	FK2168.D	10	01/20/21	JB	n/a	n/a	GFK145
GFK145-BSD	FK2169.D	10	01/20/21	JB	n/a	n/a	GFK145

The QC reported here applies to the following samples: Method: RSK175 MOD

DA31877-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
74-82-8	Methane	0.512	0.606	118	0.610	119	1	70-130/30
74-84-0	Ethane	0.923	1.18	128	1.19	129	1	70-142/30
74-98-6	Propane	1.38	1.67	121	1.68	122	1	70-137/30

* = Outside of Control Limits.

GC/LC Semi-volatiles

QC Data Summaries



Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: DA31877
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP19762-MB	FH054148.D	1	01/21/21	NO	01/21/21	OP19762	GFP2154

The QC reported here applies to the following samples: Method: SW846-8015D

DA31877-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.20	0.19	mg/l	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	94% 11-142%

8.1.1
8

Blank Spike Summary

Job Number: DA31877
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP19762-BS	FH054150.D	1	01/21/21	NO	01/21/21	OP19762	GFP2154

The QC reported here applies to the following samples: Method: SW846-8015D

DA31877-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	3.79	76	22-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	96%	11-142%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA31877
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP19762-MS	FH054152.D	1	01/21/21	NO	01/21/21	OP19762	GFP2154
OP19762-MSD	FH054154.D	1	01/21/21	NO	01/21/21	OP19762	GFP2154
DA31873-1	FH054156.D	1	01/21/21	NO	01/21/21	OP19762	GFP2154

The QC reported here applies to the following samples: Method: SW846-8015D

DA31877-1

CAS No.	Compound	DA31873-1 mg/l	Spike Q mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	10	7.76	78	10	7.14	71	8	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA31873-1	Limits
84-15-1	o-Terphenyl	98%	93%	92%	11-142%

* = Outside of Control Limits.

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA31877
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN52276	5.0	0.0	mg/l	100	100	100.0	90-110%
Alkalinity, Carbonate	GN52277	5.0	0.0	mg/l	100	100	100.0	80-120%
Alkalinity, Total as CaCO3	GN52275			mg/l	100	100	100.0	90-110%
Alkalinity, Total as CaCO3	GN52275	5.0	0.0	mg/l	500	465	93.0	90-110%
Bromide	GP28425/GN52290	0.050	0.0	mg/l	0.5	0.512	102.4	90-110%
Chloride	GP28425/GN52290	0.50	0.0	mg/l	5	5.08	101.6	90-110%
Fluoride	GP28425/GN52290	0.10	0.0	mg/l	1	0.992	99.2	90-110%
Nitrogen, Nitrate	GP28425/GN52290	0.010	0.0	mg/l	0.1	0.107	107.0	90-110%
Nitrogen, Nitrite	GP28425/GN52290	0.0040	0.0	mg/l	0.05	0.0519	103.8	90-110%
Solids, Total Dissolved	GN52270	10	0.0	mg/l	250	251	100.4	90-110%
Specific Conductivity	GP28417/GN52283			umhos/cm	998	978	98.0	90-110%
Sulfate	GP28425/GN52290	0.50	0.0	mg/l	5	5.05	101.0	90-110%

Associated Samples:

Batch GN52270: DA31877-1

Batch GN52275: DA31877-1

Batch GN52276: DA31877-1

Batch GN52277: DA31877-1

Batch GP28417: DA31877-1

Batch GP28425: DA31877-1

(*) Outside of QC limits

9.1

6

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA31877
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO ₃	GN52275	DA31707-1	mg/l	138	143	3.6	0-20%
Solids, Total Dissolved	GN52270	DA31744-2	mg/l	485	483	0.4	0-5%
Specific Conductivity	GP28417/GN52283	DA31700-1	umhos/cm	866	874	0.9	0-20%

Associated Samples:

Batch GN52270: DA31877-1

Batch GN52275: DA31877-1

Batch GP28417: DA31877-1

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA31877
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO ₃	GN52275	DA31748-1	mg/l	145	100	235	90.0	80-120%
Bromide	GP28425/GN52290	DA31750-1	mg/l	0.0	5	5.3	106.0	80-120%
Chloride	GP28425/GN52290	DA31750-1	mg/l	125	50	173	96.0	80-120%
Fluoride	GP28425/GN52290	DA31750-1	mg/l	0.53	10	10.2	96.7	80-120%
Nitrogen, Nitrate	GP28425/GN52290	DA31750-1	mg/l	0.14	1	1.1	96.0	80-120%
Nitrogen, Nitrite	GP28425/GN52290	DA31750-1	mg/l	0.11	0.5	0.62	102.0	80-120%
Sulfate	GP28425/GN52290	DA31750-1	mg/l	38.1	50	87.1	98.0	80-120%

Associated Samples:

Batch GN52275: DA31877-1

Batch GP28425: DA31877-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA31877
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN52275	DA31748-1	mg/l	145	100	235	0.0	20%
Bromide	GP28425/GN52290	DA31750-1	mg/l	0.0	5	5.2	1.9	20%
Chloride	GP28425/GN52290	DA31750-1	mg/l	125	50	173	0.0	20%
Fluoride	GP28425/GN52290	DA31750-1	mg/l	0.53	10	10.2	0.0	20%
Nitrogen, Nitrate	GP28425/GN52290	DA31750-1	mg/l	0.14	1	1.2	8.7	20%
Nitrogen, Nitrite	GP28425/GN52290	DA31750-1	mg/l	0.11	0.5	0.60	3.3	20%
Sulfate	GP28425/GN52290	DA31750-1	mg/l	38.1	50	87.1	0.0	20%

Associated Samples:

Batch GN52275: DA31877-1

Batch GP28425: DA31877-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

Misc. Forms

Custody Documents and Other Forms

(SGS Scott, LA)

Includes the following where applicable:

- Chain of Custody



10.1

SGS Scott, LA

Date / Time: 1/15/2021 4:20:35 PM Sub Lab: SGS - Scott, LA City: Scott
 CSR: JEREMYD Address: 500 Ambassador Caffery Parkway State: LA Zip: 70583
 Job #: DA31877 Client Project: GWA_PW_Sec_Four_4_14 Deliverable: COMMBN Contact: Sample Management Phone: (337) 237-4775
 TAT: Due 1/22/2021

Sample #	Client Sample-Description	Analysis	Location	Sampled By	Date Sampled	Time Sampled	Aliquot
DA31877-1F	BW 05 123 29457 14PM NESW 4 1N 68W	B.BAMS.CA.FE.FILTERMET.K.MG.MN NA.SEMS.SR		HH	1/14/2021	2:20:00 PM	

Comments:

Sample Management Receipt: _____ Date: _____

1	Received by	Signature	Date	Received by	Signature	Date
2	Received by	Signature	Date	Received by	Signature	Date
3	Received by	Signature	Date	Received by	Signature	Date
4	Received by	Signature	Date	Received by	Signature	Date
5	Received by	Signature	Date	Received by	Signature	Date
6	Received by	Signature	Date	Received by	Signature	Date
7	Received by	Signature	Date	Received by	Signature	Date
8	Received by	Signature	Date	Received by	Signature	Date
9	Received by	Signature	Date	Received by	Signature	Date
10	Received by	Signature	Date	Received by	Signature	Date
11	Received by	Signature	Date	Received by	Signature	Date
12	Received by	Signature	Date	Received by	Signature	Date
13	Received by	Signature	Date	Received by	Signature	Date
14	Received by	Signature	Date	Received by	Signature	Date
15	Received by	Signature	Date	Received by	Signature	Date
16	Received by	Signature	Date	Received by	Signature	Date
17	Received by	Signature	Date	Received by	Signature	Date
18	Received by	Signature	Date	Received by	Signature	Date
19	Received by	Signature	Date	Received by	Signature	Date
20	Received by	Signature	Date	Received by	Signature	Date
21	Received by	Signature	Date	Received by	Signature	Date
22	Received by	Signature	Date	Received by	Signature	Date
23	Received by	Signature	Date	Received by	Signature	Date
24	Received by	Signature	Date	Received by	Signature	Date
25	Received by	Signature	Date	Received by	Signature	Date
26	Received by	Signature	Date	Received by	Signature	Date
27	Received by	Signature	Date	Received by	Signature	Date
28	Received by	Signature	Date	Received by	Signature	Date
29	Received by	Signature	Date	Received by	Signature	Date
30	Received by	Signature	Date	Received by	Signature	Date
31	Received by	Signature	Date	Received by	Signature	Date
32	Received by	Signature	Date	Received by	Signature	Date
33	Received by	Signature	Date	Received by	Signature	Date
34	Received by	Signature	Date	Received by	Signature	Date
35	Received by	Signature	Date	Received by	Signature	Date
36	Received by	Signature	Date	Received by	Signature	Date
37	Received by	Signature	Date	Received by	Signature	Date
38	Received by	Signature	Date	Received by	Signature	Date
39	Received by	Signature	Date	Received by	Signature	Date
40	Received by	Signature	Date	Received by	Signature	Date
41	Received by	Signature	Date	Received by	Signature	Date
42	Received by	Signature	Date	Received by	Signature	Date
43	Received by	Signature	Date	Received by	Signature	Date
44	Received by	Signature	Date	Received by	Signature	Date
45	Received by	Signature	Date	Received by	Signature	Date
46	Received by	Signature	Date	Received by	Signature	Date
47	Received by	Signature	Date	Received by	Signature	Date
48	Received by	Signature	Date	Received by	Signature	Date
49	Received by	Signature	Date	Received by	Signature	Date
50	Received by	Signature	Date	Received by	Signature	Date
51	Received by	Signature	Date	Received by	Signature	Date
52	Received by	Signature	Date	Received by	Signature	Date
53	Received by	Signature	Date	Received by	Signature	Date
54	Received by	Signature	Date	Received by	Signature	Date
55	Received by	Signature	Date	Received by	Signature	Date
56	Received by	Signature	Date	Received by	Signature	Date
57	Received by	Signature	Date	Received by	Signature	Date
58	Received by	Signature	Date	Received by	Signature	Date
59	Received by	Signature	Date	Received by	Signature	Date
60	Received by	Signature	Date	Received by	Signature	Date
61	Received by	Signature	Date	Received by	Signature	Date
62	Received by	Signature	Date	Received by	Signature	Date
63	Received by	Signature	Date	Received by	Signature	Date
64	Received by	Signature	Date	Received by	Signature	Date
65	Received by	Signature	Date	Received by	Signature	Date
66	Received by	Signature	Date	Received by	Signature	Date
67	Received by	Signature	Date	Received by	Signature	Date
68	Received by	Signature	Date	Received by	Signature	Date
69	Received by	Signature	Date	Received by	Signature	Date
70	Received by	Signature	Date	Received by	Signature	Date
71	Received by	Signature	Date	Received by	Signature	Date
72	Received by	Signature	Date	Received by	Signature	Date
73	Received by	Signature	Date	Received by	Signature	Date
74	Received by	Signature	Date	Received by	Signature	Date
75	Received by	Signature	Date	Received by	Signature	Date
76	Received by	Signature	Date	Received by	Signature	Date
77	Received by	Signature	Date	Received by	Signature	Date
78	Received by	Signature	Date	Received by	Signature	Date
79	Received by	Signature	Date	Received by	Signature	Date
80	Received by	Signature	Date	Received by	Signature	Date
81	Received by	Signature	Date	Received by	Signature	Date
82	Received by	Signature	Date	Received by	Signature	Date
83	Received by	Signature	Date	Received by	Signature	Date
84	Received by	Signature	Date	Received by	Signature	Date
85	Received by	Signature	Date	Received by	Signature	Date
86	Received by	Signature	Date	Received by	Signature	Date
87	Received by	Signature	Date	Received by	Signature	Date
88	Received by	Signature	Date	Received by	Signature	Date
89	Received by	Signature	Date	Received by	Signature	Date
90	Received by	Signature	Date	Received by	Signature	Date
91	Received by	Signature	Date	Received by	Signature	Date
92	Received by	Signature	Date	Received by	Signature	Date
93	Received by	Signature	Date	Received by	Signature	Date
94	Received by	Signature	Date	Received by	Signature	Date
95	Received by	Signature	Date	Received by	Signature	Date
96	Received by	Signature	Date	Received by	Signature	Date
97	Received by	Signature	Date	Received by	Signature	Date
98	Received by	Signature	Date	Received by	Signature	Date
99	Received by	Signature	Date	Received by	Signature	Date
100	Received by	Signature	Date	Received by	Signature	Date

5581C1/1136/0552

ORIGIN: DENVER (303) 425-6021
 DEST: DENVER
 365
 4036 YOUNGFILED STREET
 WHEAT RIDGE, CO 80033
 UNITED STATES US

SHIP DATE: 15-JAN-21
 ACTUWT: 25.00 LB 16.66N
 CNO: 0859493/CHPE340Z

BILL SENDER

TO: SAMPLE RECEIVING
 ACCUTEST LOUISIANA
 500 AMBASSADOR CAFFERY DRIVE
 SCOTT LA 70583

REF: 70583
 DEPT: LFT

2010191108014

FedEx
 EXPD1688

E

TRK# 1724 4208 4116
 [0201]

SATURDAY 12:00P
 PRIORITY OVERNIGHT

X0 LFTA

70583
 LA-US LFT

Part 5 158143-034 RPT EXP 07/21

1 = 250ml unap (3WZF) 1

DA31877: Chain of Custody
 Page 3 of 4

SGS Sample Receipt Summary

Job Number: DA31877

Client: SGS NORTH AMERICA

Project: GWA

Date / Time Received: 1/16/2021 10:15:00 AM

Delivery Method: FedEx

Airbill #'s: 1724 4208 4116

Cooler Temps (Initial/Adjusted): #1: (0.8/0.8); DV462

Cooler Security

	Y	or	N		Y	or	N
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Cooler Temperature

	Y	or	N
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Thermometer ID:	DV462;		
3. Cooler media:	Ice (direct contact)		
4. No. Coolers:	1		

Quality Control Preservation

	Y	or	N	N/A
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Sample Integrity - Documentation

	Y	or	N
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Sample Integrity - Condition

	Y	or	N
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		

Sample Integrity - Instructions

	Y	or	N	N/A
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

DA31877: Chain of Custody

Page 4 of 4

Metals Analysis

QC Data Summaries

(SGS Scott, LA)

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA31877
Account: ALMS - SGS Wheat Ridge, CO
Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20319
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/19/21

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	9.6	29		
Antimony	6.0	2.3	3.4		
Arsenic	10	3.4	5		
Barium	10	.29	.8		
Beryllium	4.0	.03	.4		
Boron	100	.75	4	-0.30	<100
Cadmium	5.0	.19	.4		
Calcium	300	15	21	19.5	<300
Chromium	10	.37	.9		
Cobalt	10	.42	1.1		
Copper	10	.56	3.7		
Iron	100	3.3	9.5	11.2	<100
Lead	10	1.7	2.9		
Magnesium	100	18	47	13.9	<100
Manganese	10	.1	.6	0.15	<10
Molybdenum	10	.26	.8		
Nickel	10	.54	1.5		
Potassium	500	45	110	-0.80	<500
Selenium	10	2.5	3.9		
Silver	10	.96	1.8		
Sodium	500	15	140	242	<500
Strontium	10	.12	.5	0.14	<10
Thallium	10	1.5	3.7		
Tin	10	.91	1.6		
Titanium	10	.42	1.2		
Vanadium	10	.33	.6		
Zinc	20	.26	3.1		
Lithium	10	2.2	4.4		

Associated samples MP20319: DA31877-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA31877
 Account: ALMS - SGS Wheat Ridge, CO
 Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20319
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 01/19/21

Metal	DA31805-1A Original MS		Spikelot MPICPMS6 % Rec	QC Limits	
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron	220	327	100	107.0	70-130
Cadmium					
Calcium	90200	90900	5000	14.0 (a)	70-130
Chromium					
Cobalt					
Copper					
Iron	16.3	5230	5000	104.3	70-130
Lead					
Magnesium	16200	20500	5000	86.0	70-130
Manganese	16.1	117	100	100.9	70-130
Molybdenum					
Nickel	anr				
Potassium	16300	20500	5000	84.0	70-130
Selenium					
Silver					
Sodium	138000	136000	5000	-40.0(a)	70-130
Strontium	796	861	100	65.0 (a)	70-130
Thallium					
Tin					
Titanium					
Vanadium					
Zinc	anr				
Lithium					

Associated samples MP20319: DA31877-1F

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA31877
 Account: ALMS - SGS Wheat Ridge, CO
 Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20319
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 01/19/21

Metal	DA31805-1A Original MSD	Spikelot MPICPMS6 % Rec	MSD RPD	QC Limit
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron	220	329	100	109.0
Cadmium				
Calcium	90200	92300	5000	42.0 (a)
Chromium				
Cobalt				
Copper				
Iron	16.3	5230	5000	104.3
Lead				
Magnesium	16200	20800	5000	92.0
Manganese	16.1	115	100	98.9
Molybdenum				
Nickel	anr			
Potassium	16300	20900	5000	92.0
Selenium				
Silver				
Sodium	138000	137000	5000	-20.0(a)
Strontium	796	878	100	82.0
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			
Lithium				

Associated samples MP20319: DA31877-1F

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA31877

Account: ALMS - SGS Wheat Ridge, CO

Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20319

Methods: EPA 200.7

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

01/19/21

Metal	BSP Result	Spikelot MPICPMS6	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron	113	100	113.0	85-115
Cadmium				
Calcium	5190	5000	103.8	85-115
Chromium				
Cobalt				
Copper				
Iron	5260	5000	105.2	85-115
Lead				
Magnesium	5500	5000	110.0	85-115
Manganese	103	100	103.0	85-115
Molybdenum				
Nickel	anr			
Potassium	5070	5000	101.4	85-115
Selenium				
Silver				
Sodium	5290	5000	105.8	85-115
Strontium	101	100	101.0	85-115
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			
Lithium				

Associated samples MP20319: DA31877-1F

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: DA31877
 Account: ALMS - SGS Wheat Ridge, CO
 Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20319
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 01/19/21

Metal	DA31805-1A Original SDL 1:5		%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron	220	205	6.6	0-10
Cadmium				
Calcium	90200	88100	2.3	0-10
Chromium				
Cobalt				
Copper				
Iron	16.3	0.00	100.0(a)	0-10
Lead				
Magnesium	16200	15900	2.2	0-10
Manganese	16.1	15.8	1.4	0-10
Molybdenum				
Nickel	anr			
Potassium	16300	15900	2.2	0-10
Selenium				
Silver				
Sodium	138000	134000	2.8	0-10
Strontium	796	771	3.1	0-10
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			
Lithium				

Associated samples MP20319: DA31877-1F

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA31877
Account: ALMS - SGS Wheat Ridge, CO
Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20321
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/19/21

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	7.3	57		
Antimony	5.0	.0087	.54		
Arsenic	4.0	.077	.4		
Barium	5.0	.025	.42	-0.012	<5.0
Beryllium	2.0	.006	.49		
Boron	20	2.4	8.3		
Cadmium	2.0	.017	.5		
Calcium	200	11	110		
Chromium	4.0	.71	.5		
Cobalt	2.0	.028	.45		
Copper	2.0	.086	.46		
Iron	100	9.4	43		
Lithium	2.0	1.5	1.2		
Lead	1.0	.11	.45		
Magnesium	100	1.1	45		
Manganese	2.0	.25	.75		
Molybdenum	2.0	.044	.58		
Nickel	2.0	.047	.39		
Potassium	100	15	37		
Selenium	5.0	.52	2.6	-0.63	<5.0
Silver	1.0	.0025	.46		
Sodium	100	8.4	68		
Strontium	4.0	.19	1.8		
Thallium	2.0	.087	.49		
Tin	4.0	.21	.37		
Titanium	2.0	.17	.95		
Uranium	1.0	.0026	.58		
Vanadium	10	.091	.36		
Zinc	5.0	.43	3.8		

Associated samples MP20321: DA31877-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA31877
 Account: ALMS - SGS Wheat Ridge, CO
 Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20321
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 01/19/21

Metal	DA31873-1F Original MS	Spikelot MPICPMS6	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	55.1	151	100	95.9 70-130
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lithium				
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium				
Selenium	0.0	442	500	88.4 70-130
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP20321: DA31877-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA31877
 Account: ALMS - SGS Wheat Ridge, CO
 Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20321
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 01/19/21

	DA31873-1F		Spikelot		MSD	QC
Metal	Original MSD		MPICPMS6	% Rec	RPD	Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	55.1	149	100	93.9	1.3	20
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron	anr					
Lithium						
Lead	anr					
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Potassium						
Selenium	0.0	443	500	88.6	0.2	20
Silver	anr					
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP20321: DA31877-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA31877

Account: ALMS - SGS Wheat Ridge, CO

Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20321

Methods: EPA 200.8

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

01/19/21

Metal	BSP Result	Spikelot MPICPMS6	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	95.7	100	95.7	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lithium				
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium				
Selenium	505	500	101.0	85-115
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP20321: DA31877-1F

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: DA31877
 Account: ALMS - SGS Wheat Ridge, CO
 Project: ANADACOD: GWA_PW_Sec_Four_4_14

QC Batch ID: MP20321
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 01/19/21

Metal	DA31873-1F	Original	SDL 1:5	%DIF	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	55.1	59.1	7.2	0-10	
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron	anr				
Lithium					
Lead	anr				
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Potassium					
Selenium	0.00	0.00	NC	0-10	
Silver	anr				
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP20321: DA31877-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Kerr-McGee Oil & Gas Onshore LP

GWA_PW_Sec_Four_4_14

FID:299656 REG:0 FREQ:SP

SGS Job Number: DA31876

Sampling Date: 01/14/21



Report to:

Anadarko E&P Onshore LLC
112 High Street
Buffalo, WY 82834
joel.mason@absarokasolutions.com; max.moran@absarokasolutions.com

ATTN: Max Mason

Total number of pages in report: 17



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



Jason Savoie
General Manager

Client Service contact: Carissa Cumine 303-425-6021

Certifications: CO (CO00049), NE (NE-OS-06-04), ND (R-027), UT (NELAP CO00049)
LA (LA150028), TX (T104704511), WY (8TMS-L)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.
Test results relate only to samples analyzed.

Table of Contents

-1-

Section 1: Sample Summary 3

Section 2: Case Narrative/Conformance Summary 4

Section 3: Summary of Hits 5

Section 4: Sample Results 6

4.1: DA31876-1: BW_05_123_29457_14PM_TRIP_BLANK 7

Section 5: Misc. Forms 9

5.1: Chain of Custody 10

Section 6: MS Volatiles - QC Data Summaries 12

6.1: Method Blank Summary 13

6.2: Blank Spike/Blank Spike Duplicate Summary 14

Section 7: GC Volatiles - QC Data Summaries 15

7.1: Method Blank Summary 16

7.2: Blank Spike/Blank Spike Duplicate Summary 17



Sample Summary

Kerr-McGee Oil & Gas Onshore LP

Job No: DA31876

GWA_PW_Sec_Four_4_14
Project No: FID:299656 REG:0 FREQ:SP

Sample Number	Collected		Matrix		Client	
	Date	Time By	Received	Code Type	Sample ID	

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

DA31876-1	01/14/21	14:20 HH	01/15/21	AQ	Trip Blank Water	BW_05_123_29457_14PM_TRIP_B LANK
-----------	----------	----------	----------	----	------------------	-------------------------------------

CASE NARRATIVE / CONFORMANCE SUMMARY

2

Client: Kerr-McGee Oil & Gas Onshore LP

Job No: DA31876

Site: GWA_PW_Sec_Four_4_14

Report Date 1/21/2021 6:57:06 PM

On 01/15/2021, 0 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 4.2 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA31876 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

MS Volatiles By Method SW846 8260B

Matrix: AQ

Batch ID: V7V3545

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

GC Volatiles By Method SW846 8015D

Matrix: AQ

Batch ID: GGD95

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

SGS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting SGS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by SGS indicated via signature on the report cover.

Thursday, January 21, 2021

Page 1 of 1

Summary of Hits

Job Number: DA31876
Account: Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14
Collected: 01/14/21



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

DA31876-1 BW_05_123_29457_14PM_TRIP_BLANK

No hits reported in this sample.



Wheat Ridge, CO

Section 4

4

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 1

Client Sample ID:	BW_05_123_29457_14PM_TRIP_BLANK	Date Sampled:	01/14/21
Lab Sample ID:	DA31876-1	Date Received:	01/15/21
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	GWA_PW_Sec_Four_4_14		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V70642.D	1	01/19/21 11:53	JB	n/a	n/a	V7V3545
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.60	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.60	ug/l	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	
	m,p-Xylene	ND	1.0	0.96	ug/l	
95-47-6	o-Xylene	ND	1.0	0.60	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		70-130%
17060-07-0	1,2-Dichloroethane-D4	97%		70-130%
2037-26-5	Toluene-D8	99%		70-130%
460-00-4	4-Bromofluorobenzene	102%		70-130%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BW_05_123_29457_14PM_TRIP_BLANK	Date Sampled:	01/14/21
Lab Sample ID:	DA31876-1	Date Received:	01/15/21
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8015D		
Project:	GWA_PW_Sec_Four_4_14		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GD02432.D	1	01/18/21 20:11	JB	n/a	n/a	GGD95
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.050	0.050	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	101%		60-140%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL: 303-425-6021 FAX: 303-425-6854
www.accutest.com

Bottle Order Control #	FED-EX Tracking #
SGS Quote #	SGS Job # DA31876

[illegible]

DA31876: Chain of Custody

Page 1 of 2

SGS Sample Receipt Summary

Job Number: DA31876

Client: ABSAROKA SOLUTIONS

Project: GWA_PW_SEC_FOUR_4_14

Date / Time Received: 1/15/2021 3:00:00 PM

Delivery Method:

Airbill #'s: CO

Cooler Temps (Initial/Adjusted): #1: (4.2/4.2):

Cooler Security

Y or N

1. Custody Seals Present: ☒ ☐
2. Custody Seals Intact: ☒ ☐

3. COC Present:

Y or N

4. Smpl Dates/Time OK

☒ ☐

Cooler Temperature

Y or N

1. Temp criteria achieved: ☒ ☐
2. Cooler temp verification: IR Gun;
3. Cooler media: Ice (Bag)
4. No. Coolers: 1

Quality Control Preservation

Y or N N/A

1. Trip Blank present / cooler: ☒ ☐ ☐
2. Trip Blank listed on COC: ☒ ☐ ☐
3. Samples preserved properly: ☒ ☐ ☐
4. VOCs headspace free: ☒ ☐ ☐

Comments

Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles: ☒ ☐
2. Container labeling complete: ☒ ☐
3. Sample container label / COC agree: ☒ ☐

Sample Integrity - Condition

Y or N

1. Sample recvd within HT: ☒ ☐
2. All containers accounted for: ☒ ☐
3. Condition of sample: Intact

Sample Integrity - Instructions

Y or N N/A

1. Analysis requested is clear: ☒ ☐
2. Bottles received for unspecified tests: ☐ ☒
3. Sufficient volume recvd for analysis: ☒ ☐
4. Compositing instructions clear: ☐ ☐ ☒
5. Filtering instructions clear: ☐ ☐ ☒

DA31876: Chain of Custody

Page 2 of 2

MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 1

Job Number: DA31876

Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP

Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3545-MB	7V70639.D	1	01/19/21	JB	n/a	n/a	V7V3545

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31876-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.60	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.60	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	1.0	0.96	ug/l	
95-47-6	o-Xylene	ND	1.0	0.60	ug/l	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	95% 70-130%
17060-07-0	1,2-Dichloroethane-D4	97% 70-130%
2037-26-5	Toluene-D8	98% 70-130%
460-00-4	4-Bromofluorobenzene	100% 70-130%

Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

Job Number: DA31876

Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP

Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3545-BS	7V70636.D	1	01/19/21	JB	n/a	n/a	V7V3545
V7V3545-BSD	7V70637.D	1	01/19/21	JB	n/a	n/a	V7V3545

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31876-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	50	45.8	92	47.0	94	3	70-130/30
100-41-4	Ethylbenzene	50	47.5	95	48.4	97	2	69-130/30
108-88-3	Toluene	50	46.1	92	47.1	94	2	70-130/30
	m,p-Xylene	100	94.6	95	97.2	97	3	70-130/30
95-47-6	o-Xylene	50	47.2	94	48.5	97	3	70-130/30
1330-20-7	Xylene (total)	150	142	95	146	97	3	70-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	95%	94%	70-130%
17060-07-0	1,2-Dichloroethane-D4	100%	99%	70-130%
2037-26-5	Toluene-D8	98%	98%	70-130%
460-00-4	4-Bromofluorobenzene	101%	99%	70-130%

* = Outside of Control Limits.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: DA31876
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGD95-MB	GD02429.D	1	01/18/21	JB	n/a	n/a	GGD95

The QC reported here applies to the following samples: Method: SW846 8015D

DA31876-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.050	0.050	mg/l	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	99% 60-140%

7.1.1
7

Blank Spike/Blank Spike Duplicate Summary

Job Number: DA31876
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_PW_Sec_Four_4_14

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGD95-BS	GD02427.D	1	01/18/21	JB	n/a	n/a	GGD95
GGD95-BSD	GD02428.D	1	01/18/21	JB	n/a	n/a	GGD95

The QC reported here applies to the following samples: Method: SW846 8015D

DA31876-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	2.2	1.62	74	1.62	74	0	51-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
120-82-1	1,2,4-Trichlorobenzene	102%	99%	60-140%

* = Outside of Control Limits.

Lab #: 781805 Job #: 46754 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_13PM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/13/2021 16:40 Date Received: 1/19/2021 Date Reported: 1/26/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0050			
Hydrogen -----	nd			
Argon -----	0.930			
Oxygen -----	20.86			
Nitrogen -----	78.04			
Carbon Dioxide -----	0.10			
Methane -----	0.0537			
Ethane -----	0.0088			
Ethylene -----	nd			
Propane -----	0.0044			
Propylene -----	nd			
Iso-butane -----	0.0008			
N-butane -----	0.0015			
Iso-pentane -----	0.0004			
N-pentane -----	0.0003			
Hexanes + -----	0.0001			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1

Specific gravity, calculated: 1.000

Remarks: 90329147
 IsoTube at ATM.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 781884 Job #: 46764 IS-69033 Co. Job#:
Sample Name: BW_05_123_29457_14PM Co. Lab#:
Company: Anadarko
API/Well:
Container: 125ml Plastic Bottle
Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
Location: NESW_4_1N_68W
Formation/Depth: SP
Sampling Point: 299656
Date Sampled: 1/14/2021 14:20 Date Received: 1/20/2021 Date Reported: 2/03/2021

δD of water ----- -101.3 ‰ relative to VSMOW

$\delta^{18}O$ of water ----- -12.62 ‰ relative to VSMOW

Tritium content of water ----- na

$\delta^{13}C$ of DIC ----- na

^{14}C content of DIC ----- na

$\delta^{15}N$ of nitrate ----- na

$\delta^{18}O$ of nitrate ----- na

$\delta^{34}S$ of sulfate ----- na

$\delta^{18}O$ of sulfate ----- na

Vacuum Distilled? * ----- Yes

Remarks: 90329147
Insufficient DIC concentration for isotopic analysis.

nd = not detected. na = not analyzed.

*Indicates if vacuum distillation was utilized for hydrogen and oxygen isotopic analysis of water

Lab #: 781806 Job #: 46754 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_14AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/14/2021 6:50 Date Received: 1/19/2021 Date Reported: 1/26/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.930			
Oxygen -----	20.84			
Nitrogen -----	78.10			
Carbon Dioxide -----	0.097			
Methane -----	0.0218			
Ethane -----	0.0038			
Ethylene -----	nd			
Propane -----	0.0019			
Propylene -----	nd			
Iso-butane -----	0.0003			
N-butane -----	0.0007			
Iso-pentane -----	0.0002			
N-pentane -----	0.0002			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 1.000

Remarks: 90329147
 IsoTube at ATM.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 781807 Job #: 46754 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_15AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/15/2021 6:30 Date Received: 1/19/2021 Date Reported: 2/05/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0358			
Hydrogen -----	0.0447			
Argon -----	0.253			
Oxygen -----	4.99			
Nitrogen -----	20.57			
Carbon Dioxide -----	nd			
Methane -----	59.66	-50.05	-245.9	
Ethane -----	6.66	-33.54		
Ethylene -----	0.0001			
Propane -----	4.48	-29.48		
Propylene -----	nd			
Iso-butane -----	0.866	-31.94		
N-butane -----	1.57	-28.65		
Iso-pentane -----	0.398	-28.36		
N-pentane -----	0.326	-27.96		
Hexanes + -----	0.151			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 953

Specific gravity, calculated: 0.797

Remarks: 90329147

Insufficient CO2 concentration for isotopic analysis.

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 #: 782187 Job #: 46810 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_18AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/18/2021 6:45 Date Received: 1/22/2021 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0252			
Hydrogen -----	0.178			
Argon -----	0.0838			
Oxygen -----	1.53			
Nitrogen -----	7.43			
Carbon Dioxide -----	nd			
Methane -----	73.17	-50.10	-251.1	
Ethane -----	9.18	-33.61		
Ethylene -----	0.0005			
Propane -----	5.06	-29.62		
Propylene -----	0.0001			
Iso-butane -----	0.795	-32.04		
N-butane -----	1.65	-28.72		
Iso-pentane -----	0.391	-28.45		
N-pentane -----	0.337	-28.12		
Hexanes + -----	0.166			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1152

Specific gravity, calculated: 0.740

Remarks: 90329147

Insufficient CO2 concentration for isotopic analysis.

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 #: 782188 Job #: 46810 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_19AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/19/2021 6:40 Date Received: 1/22/2021 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0378			
Hydrogen -----	0.112			
Argon -----	0.0966			
Oxygen -----	1.83			
Nitrogen -----	9.07			
Carbon Dioxide -----	nd			
Methane -----	72.55	-49.92	-249.6	
Ethane -----	8.14	-33.43		
Ethylene -----	0.0006			
Propane -----	4.77	-29.46		
Propylene -----	0.0002			
Iso-butane -----	0.858	-32.00		
N-butane -----	1.69	-28.63		
Iso-pentane -----	0.399	-28.35		
N-pentane -----	0.320	-27.99		
Hexanes + -----	0.129			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1121

Specific gravity, calculated: 0.741

Remarks: 90329147

Insufficient CO2 concentration for isotopic analysis.

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 #: 782189 Job #: 46810 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_20AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/20/2021 7:10 Date Received: 1/22/2021 Date Reported: 2/08/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0147			
Hydrogen -----	nd			
Argon -----	0.508			
Oxygen -----	11.32			
Nitrogen -----	41.02			
Carbon Dioxide -----	0.007			
Methane -----	36.58	-49.69	-241.7	
Ethane -----	4.94	-33.53		
Ethylene -----	0.0001			
Propane -----	3.10	-29.63		
Propylene -----	nd			
Iso-butane -----	0.551	-32.04		
N-butane -----	1.12	-28.76		
Iso-pentane -----	0.321	-28.49		
N-pentane -----	0.298	-28.13		
Hexanes + -----	0.219			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 627

Specific gravity, calculated: 0.886

Remarks: 90329147

Insufficient CO2 concentration for isotopic analysis.

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 #: 782189 Job #: 46810 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_20AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/20/2021 7:10 Date Received: 1/22/2021 Date Reported: 1/29/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0147			
Hydrogen -----	nd			
Argon -----	0.508			
Oxygen -----	11.32			
Nitrogen -----	41.02			
Carbon Dioxide -----	0.007			
Methane -----	36.58			
Ethane -----	4.94			
Ethylene -----	0.0001			
Propane -----	3.10			
Propylene -----	nd			
Iso-butane -----	0.551			
N-butane -----	1.12			
Iso-pentane -----	0.321			
N-pentane -----	0.298			
Hexanes + -----	0.219			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 627

Specific gravity, calculated: 0.886

Remarks: 90329147

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 782726 Job #: 46859 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_21AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/21/2021 7:10 Date Received: 1/29/2021 Date Reported: 2/05/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.921			
Oxygen -----	20.62			
Nitrogen -----	77.44			
Carbon Dioxide -----	0.079			
Methane -----	0.686			
Ethane -----	0.0910			
Ethylene -----	nd			
Propane -----	0.0518			
Propylene -----	nd			
Iso-butane -----	0.0091			
N-butane -----	0.0223			
Iso-pentane -----	0.0107			
N-pentane -----	0.0155			
Hexanes + -----	0.0507			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 14

Specific gravity, calculated: 0.999

Remarks: 90329147
 IsoTube at ATM.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 782727 Job #: 46859 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_22AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/22/2021 7:10 Date Received: 1/29/2021 Date Reported: 2/05/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.926			
Oxygen -----	20.79			
Nitrogen -----	78.19			
Carbon Dioxide -----	0.087			
Methane -----	0.0005			
Ethane -----	nd			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	0.0001			
Hexanes + -----	0.0020			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 1.000

Remarks: 90329147
 IsoTube at ATM.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 782728 Job #: 46859 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_25AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/25/2021 7:00 Date Received: 1/29/2021 Date Reported: 2/18/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	0.0261			
Argon -----	0.871			
Oxygen -----	19.09			
Nitrogen -----	72.89			
Carbon Dioxide -----	0.062	-12.1		
Methane -----	5.57	-49.57	-241.2	
Ethane -----	0.675	-33.42		
Ethylene -----	nd			
Propane -----	0.438	-29.46		
Propylene -----	nd			
Iso-butane -----	0.0858	-31.9		
N-butane -----	0.173	-28.8		
Iso-pentane -----	0.0507	-28.3		
N-pentane -----	0.0425	-28.1		
Hexanes + -----	0.0280			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 93

Specific gravity, calculated: 0.982

Remarks: 90329147

Carbon dioxide, butane, and pentane carbon isotope data obtained online via GC-C-IRMS.
IsoTube at ATM.

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 #: 782728 Job #: 46859 IS-69033 Co. Job#:
Sample Name: SP_05_123_29457_25AM Co. Lab#:
Company: Anadarko
API/Well:
Container: IsoTube®
Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
Location: NESW_4_1N_68W
Formation: SP
Sampling Point: 299656
Date Sampled: 1/25/2021 7:00 Date Received: 1/29/2021 Date Reported: 2/05/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	0.0261			
Argon -----	0.871			
Oxygen -----	19.09			
Nitrogen -----	72.89			
Carbon Dioxide -----	0.062			
Methane -----	5.57			
Ethane -----	0.675			
Ethylene -----	nd			
Propane -----	0.438			
Propylene -----	nd			
Iso-butane -----	0.0858			
N-butane -----	0.173			
Iso-pentane -----	0.0507			
N-pentane -----	0.0425			
Hexanes + -----	0.0280			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 93

Specific gravity, calculated: 0.982

Remarks: 90329147
IsoTube at ATM.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 782729 Job #: 46859 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_26AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/26/2021 7:10 Date Received: 1/29/2021 Date Reported: 2/05/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.920			
Oxygen -----	20.68			
Nitrogen -----	78.31			
Carbon Dioxide -----	0.086			
Methane -----	0.0004			
Ethane -----	nd			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0003			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 1.000

Remarks: 90329147
 IsoTube at ATM.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 782730 Job #: 46859 IS-69033 Co. Job#:
 Sample Name: SP_05_123_29457_27AM Co. Lab#:
 Company: Anadarko
 API/Well:
 Container: IsoTube®
 Field/Site Name: BWSE/GWA_PW_Sec_Four_4_14
 Location: NESW_4_1N_68W
 Formation: SP
 Sampling Point: 299656
 Date Sampled: 1/27/2021 7:05 Date Received: 1/29/2021 Date Reported: 2/05/2021

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	nd			
Hydrogen -----	nd			
Argon -----	0.927			
Oxygen -----	20.82			
Nitrogen -----	78.16			
Carbon Dioxide -----	0.088			
Methane -----	0.0004			
Ethane -----	nd			
Ethylene -----	nd			
Propane -----	0.0002			
Propylene -----	nd			
Iso-butane -----	0.0002			
N-butane -----	0.0009			
Iso-pentane -----	0.0006			
N-pentane -----	0.0006			
Hexanes + -----	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 1.000

Remarks: 90329147
 IsoTube at ATM.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.