

Lab #: 718323      Job #: 41536      IS-69033      Co. Job#:   
 Sample Name: BW\_NGL\_78801\_F\_R      Co. Lab#:   
 Company: Anadarko   
 API/Well:   
 Container: 125ml bottle   
 Field/Site Name: BWSE/GWA\_NGL\_Water\_Well   
 Location: SESE\_30\_3N\_65W   
 Formation/Depth: Q2   
 Sampling Point: 755053   
 Date Sampled: 5/07/2019 13:15      Date Received: 5/09/2019      Date Reported: 5/22/2019

$\delta$ D of water ----- -104.8 ‰ relative to VSMOW

$\delta$ <sup>18</sup>O of water ----- -13.70 ‰ relative to VSMOW

Tritium content of water ----- na

$\delta$ <sup>13</sup>C of DIC ----- -15.5 ‰ relative to VPDB

<sup>14</sup>C content of DIC ----- na

$\delta$ <sup>15</sup>N of nitrate ----- na

$\delta$ <sup>18</sup>O of nitrate ----- na

$\delta$ <sup>34</sup>S of sulfate ----- na

$\delta$ <sup>18</sup>O of sulfate ----- na

Vacuum Distilled? \* ----- No

Remarks: WO#89225208

nd = not detected. na = not analyzed.

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

Lab #: 718318 Job #: 41534 IS-69033 Co. Job#: \_\_\_\_\_  
 Sample Name: BW\_NGL\_78801\_F\_R Co. Lab#: \_\_\_\_\_  
 Company: Anadarko  
 API/Well: \_\_\_\_\_  
 Container: IsoFlask  
 Field/Site Name: BWSE/GWA\_NGL\_Water\_Well  
 Location: SESE\_30\_3N\_65W  
 Formation/Depth: Q2  
 Sampling Point: 755053  
 Date Sampled: 5/07/2019 13:15 Date Received: 5/09/2019 Date Reported: 6/17/2019

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰	Dissolved gas cc/L	Dissolved gas ppm
Carbon Monoxide -----	nd					
Helium -----	na					
Hydrogen -----	nd					
Argon -----	0.793				0.31	0.52
Oxygen -----	3.30					
Nitrogen -----	39.25				13	16
Carbon Dioxide -----	3.11					
Methane -----	53.34	-74.07	-266.9		21	14
Ethane -----	0.169	-37.4			0.072	0.090
Ethylene -----	nd					
Propane -----	0.0262				0.011	0.019
Propylene -----	nd					
Iso-butane -----	0.0049					
N-butane -----	0.0041					
Iso-pentane -----	0.0007					
N-pentane -----	nd					
Hexanes + -----	nd					

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.73

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.  
 WO#89225208 Ethane carbon isotope data obtained online via GC-C-IRMS. Insufficient propane, butane, and pentane 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. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.