

Lab #: 317056 Job #: 19853  
 Sample Name/Number: 007-098-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.434			
Oxygen -----	0.25			
Nitrogen -----	22.34			
Carbon Dioxide -----	2.52			
Methane -----	74.45			
Ethane -----	0.0030			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
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 = 0.36

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317057 Job #: 19853  
 Sample Name/Number: 007-131-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.437			
Oxygen -----	1.59			
Nitrogen -----	22.38			
Carbon Dioxide -----	2.40			
Methane -----	73.12			
Ethane -----	0.0697			
Ethylene -----	nd			
Propane -----	0.0007			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
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 = 0.30

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317058 Job #: 19853  
 Sample Name/Number: 007-081-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.414			
Oxygen -----	1.18			
Nitrogen -----	17.96			
Carbon Dioxide -----	3.35			
Methane -----	76.72			
Ethane -----	0.367			
Ethylene -----	nd			
Propane -----	0.0059			
Propylene -----	nd			
Iso-butane -----	0.0003			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0003			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.41

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317059 Job #: 19853  
 Sample Name/Number: 007-087-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.568			
Oxygen -----	3.18			
Nitrogen -----	25.77			
Carbon Dioxide -----	3.19			
Methane -----	67.26			
Ethane -----	0.0294			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
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 = 0.44

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317060 Job #: 19853  
 Sample Name/Number: 007-080-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.508			
Oxygen -----	0.65			
Nitrogen -----	20.12			
Carbon Dioxide -----	3.42			
Methane -----	75.28			
Ethane -----	0.0186			
Ethylene -----	nd			
Propane -----	0.0008			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
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 = 0.47

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317061 Job #: 19853  
 Sample Name/Number: 007-072-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.448			
Oxygen -----	1.92			
Nitrogen -----	16.68			
Carbon Dioxide -----	3.39			
Methane -----	76.57			
Ethane -----	0.812			
Ethylene -----	nd			
Propane -----	0.148			
Propylene -----	nd			
Iso-butane -----	0.0195			
N-butane -----	0.0127			
Iso-pentane -----	0.0017			
N-pentane -----	0.0004			
Hexanes + -----	0.0006			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.48

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317062 Job #: 19853  
 Sample Name/Number: 007-073-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.224			
Oxygen -----	0.71			
Nitrogen -----	10.10			
Carbon Dioxide -----	2.30			
Methane -----	84.93			
Ethane -----	1.45			
Ethylene -----	nd			
Propane -----	0.220			
Propylene -----	nd			
Iso-butane -----	0.0311			
N-butane -----	0.0252			
Iso-pentane -----	0.0060			
N-pentane -----	0.0023			
Hexanes + -----	0.0024			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.33

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317063 Job #: 19853  
 Sample Name/Number: 007-089-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.508			
Oxygen -----	2.60			
Nitrogen -----	18.83			
Carbon Dioxide -----	3.29			
Methane -----	73.94			
Ethane -----	0.694			
Ethylene -----	nd			
Propane -----	0.104			
Propylene -----	nd			
Iso-butane -----	0.0172			
N-butane -----	0.0138			
Iso-pentane -----	0.0035			
N-pentane -----	0.0013			
Hexanes + -----	0.0015			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.46

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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 #: 317064 Job #: 19853  
 Sample Name/Number: 007-090-111312  
 Company: Shaw Environmental & Infrastructure  
 Date Sampled: 11/13/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: LDNR-Bayou Corne  
 Location: Industrial Water Wells  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/15/2012 Date Reported: 11/27/2012

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.03			
Oxygen -----	18.59			
Nitrogen -----	56.58			
Carbon Dioxide -----	1.45			
Methane -----	22.10			
Ethane -----	0.244			
Ethylene -----	nd			
Propane -----	0.0024			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
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 = 0.49

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which 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. %.