

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Denver

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Tel: (303)736-0100

TestAmerica Job ID: 280-79617-1

Client Project/Site: Purg Wellhead

Sampling Event: PURG Wellhead+ DRO and Oil and Grease

For:

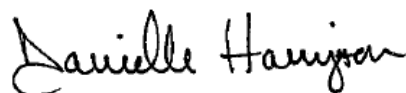
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Authorized for release by:

2/22/2016 2:23:43 PM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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## Definitions/Glossary

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

### Qualifiers

#### Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

#### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Job ID: 280-79617-1**

**Laboratory: TestAmerica Denver**

## Narrative

### CASE NARRATIVE

**Client: Pioneer Natural Resources**

**Project: PURG WELLHEAD**

**Report Number: 280-79617-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

This report may include reporting limits (RLs) less than TestAmerica's standard reporting limit. The reported sample results and associated reporting limits are being used specifically to meet the needs of this project. Note that data are not normally reported to these levels without qualification because they are inherently less reliable and potentially less defensible than required by the latest industry standards.

#### Receipt

The sample was received on 02/05/2016 with cooler temperatures of 2.6C.

All sample bottles were received in acceptable condition.

#### GC/MS Volatiles, SW 846 8260B

The Method 8260B MS/MSD performed on sample from another client and/or lot was within control limits.

Please note, due to network issues the whole batch (#313508) has incorrect time stamps. The instrument computer clock is 4 hours and 44 minutes behind the actual time so each injection time indicated in the batch is 4 hours and 44 minutes earlier than when it was actually injected.

No anomalies were observed.

#### Total Metals, MCAWW 200.7

Continuing Calibration Verification Low(CCVL) standards associated with the Method Blank in batch 313718 exhibited %D values out of range, biased high, for Sodium. This is an indicator that data may be biased high. As no detectable concentrations of Sodium are present in the associated samples, corrective action is deemed unnecessary.

The accuracy and precision of the Sodium MS/MSD performed on a sample WET CANYON BELOW MUD DUCK SW could not be reliably evaluated, as the concentrations present in the parent sample were 4 times greater than the matrix spike concentration. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

The Method 200.7 MS/MSD performed on sample WET CANYON ABOVE MUD DUCK SW was within control limits for Iron.

No anomalies were observed.

#### General Chemistry, Various Methods

Due to analytes present above the linear calibration curve or matrix interferences, sample MUD DUCK 21-26 SPILL PATH SW was analyzed at a dilution for various analyses. The reporting limits have been adjusted relative to the dilution required.

The method 1664A HEM Oil and Grease required MS/MSD could not be performed, due to insufficient sample volume. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis data.

## Case Narrative

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

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### Job ID: 280-79617-1 (Continued)

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#### Laboratory: TestAmerica Denver (Continued)

The Total Sulfide MS/MSDs were performed on samples WET CANYON ABOVE MUDDUCK SW and were in control.

All other MS/MSDs were performed on samples from other clients and/or jobs and were in control.

The Specific Conductance, Total Dissolved Solids, pH, and Total Suspended Solids Sample Duplicate was performed on sample WET CANYON ABOVE MUD DUCK SW and WET CANYON @ SUBLIME SW and was within control limits.

All other Sample Duplicates were performed on samples from other clients and/or jobs and were in control.

No other anomalies were observed.

# Detection Summary

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

## Client Sample ID: WETCANYON ABOVE MUDUCK SW

## Lab Sample ID: 280-79617-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	0.30		0.050		mg/L	1		200.7 Rev 4.4	Total Recoverable
Boron	0.071		0.050		mg/L	1		200.7	Total/NA
Calcium	68		0.10		mg/L	1		200.7	Total/NA
Iron	0.28		0.050		mg/L	1		200.7	Total/NA
Magnesium	24		0.10		mg/L	1		200.7	Total/NA
Manganese	0.28		0.010		mg/L	1		200.7	Total/NA
Sodium	350		2.0		mg/L	1		200.7	Total/NA
Bromide	0.87		0.20		mg/L	1		300.0	Total/NA
Chloride	140		3.0		mg/L	1		300.0	Total/NA
Sulfate	47		5.0		mg/L	1		300.0	Total/NA
Total Alkalinity	660		5.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	660		5.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	1100		10		mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	6.4		4.0		mg/L	1		SM 2540D	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Gravity	1.0012				No Unit	1		D1429-03	Total/NA
Specific Conductance	1600		1.0		umhos/cm	1		SM 2510B	Total/NA
pH	8.13	HF	0.100		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: WET CANYON BELOW MUD DUCK SW

## Lab Sample ID: 280-79617-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	0.28		0.050		mg/L	1		200.7 Rev 4.4	Total Recoverable
Boron	0.070		0.050		mg/L	1		200.7	Total/NA
Calcium	65		0.10		mg/L	1		200.7	Total/NA
Iron	0.20		0.050		mg/L	1		200.7	Total/NA
Magnesium	23		0.10		mg/L	1		200.7	Total/NA
Manganese	0.24		0.010		mg/L	1		200.7	Total/NA
Sodium	340		2.0		mg/L	1		200.7	Total/NA
Bromide	0.87		0.20		mg/L	1		300.0	Total/NA
Chloride	140		3.0		mg/L	1		300.0	Total/NA
Sulfate	47		5.0		mg/L	1		300.0	Total/NA
Total Alkalinity	670		5.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	660		5.0		mg/L	1		SM 2320B	Total/NA
Carbonate Alkalinity as CaCO3	7.5		5.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	1000		10		mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.8		4.0		mg/L	1		SM 2540D	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Gravity	1.0010				No Unit	1		D1429-03	Total/NA
Specific Conductance	1500		1.0		umhos/cm	1		SM 2510B	Total/NA
pH	8.14	HF	0.100		SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MUD DUCK 21-26 SPILL PATH SW

## Lab Sample ID: 280-79617-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	4.3		0.050		mg/L	1		200.7 Rev 4.4	Total Recoverable
Boron	0.81		0.050		mg/L	1		200.7	Total/NA
Calcium	37		0.10		mg/L	1		200.7	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

# Detection Summary

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: MUD DUCK 21-26 SPILL PATH SW**  
**(Continued)**

**Lab Sample ID: 280-79617-3**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	0.012		0.010		mg/L	1		200.7	Total/NA
Iron	4.8		0.050		mg/L	1		200.7	Total/NA
Potassium	9.4		5.0		mg/L	1		200.7	Total/NA
Magnesium	13		0.10		mg/L	1		200.7	Total/NA
Manganese	0.097		0.010		mg/L	1		200.7	Total/NA
Sodium	960		2.0		mg/L	1		200.7	Total/NA
HEM	9.5		4.7		mg/L	1		1664A	Total/NA
Bromide	4.5		0.40		mg/L	2		300.0	Total/NA
Chloride	640		60		mg/L	20		300.0	Total/NA
Total Alkalinity	1200		5.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	1100		5.0		mg/L	1		SM 2320B	Total/NA
Carbonate Alkalinity as CaCO3	89		5.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	2500		20		mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	74		6.7		mg/L	1		SM 2540D	Total/NA
Sulfide	0.21		0.050		mg/L	1		SM 4500 S2 D	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Gravity	1.0026				No Unit	1		D1429-03	Total/NA
Specific Conductance	3800		1.0		umhos/cm	1		SM 2510B	Total/NA
pH	8.50	HF	0.100		SU	1		SM 4500 H+ B	Total/NA

**Client Sample ID: WET CANYON @ SUBLIME SW**

**Lab Sample ID: 280-79617-4**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	0.14		0.050		mg/L	1		200.7 Rev 4.4	Total Recoverable
Boron	0.051		0.050		mg/L	1		200.7	Total/NA
Calcium	55		0.10		mg/L	1		200.7	Total/NA
Iron	0.13		0.050		mg/L	1		200.7	Total/NA
Magnesium	20		0.10		mg/L	1		200.7	Total/NA
Manganese	0.027		0.010		mg/L	1		200.7	Total/NA
Sodium	310		2.0		mg/L	1		200.7	Total/NA
Bromide	0.81		0.20		mg/L	1		300.0	Total/NA
Chloride	130		3.0		mg/L	1		300.0	Total/NA
Sulfate	44		5.0		mg/L	1		300.0	Total/NA
Total Alkalinity	580		5.0		mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	570		5.0		mg/L	1		SM 2320B	Total/NA
Carbonate Alkalinity as CaCO3	11		5.0		mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	900		10		mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.8		4.0		mg/L	1		SM 2540D	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Gravity	1.0011				No Unit	1		D1429-03	Total/NA
Specific Conductance	1400		1.0		umhos/cm	1		SM 2510B	Total/NA
pH	8.23	HF	0.100		SU	1		SM 4500 H+ B	Total/NA

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 280-79617-5**

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

## Method Summary

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

Method	Method Description	Protocol	Laboratory
8021B	Volatile Organic Compounds (GC)	SW846	TAL DEN
200.7	ICP Total Metals by 200.7	EPA	TAL DEN
200.7 Rev 4.4	Metals (ICP)	EPA	TAL DEN
1664A	HEM and SGT-HEM	1664A	TAL DEN
300.0	Anions by IC	EPA	TAL DEN
D1429-03	Specific Gravity	ASTM	TAL DEN
SM 2320B	Alkalinity	SM	TAL DEN
SM 2510B	Conductivity, Specific Conductance	SM	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
SM 4500 H+ B	pH	SM	TAL DEN
SM 4500 S2 D	Sulfide, Total	SM	TAL DEN

### Protocol References:

1664A = EPA-821-98-002

ASTM = ASTM International

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

## Sample Summary

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-79617-1	WETCANYON ABOVE MUDUCK SW	Water	02/04/16 10:08	02/05/16 10:10
280-79617-2	WET CANYON BELOW MUD DUCK SW	Water	02/04/16 10:20	02/05/16 10:10
280-79617-3	MUD DUCK 21-26 SPILL PATH SW	Water	02/04/16 10:33	02/05/16 10:10
280-79617-4	WET CANYON @ SUBLIME SW	Water	02/04/16 10:54	02/05/16 10:10
280-79617-5	TRIP BLANK	Water	02/04/16 00:00	02/05/16 10:10

# Client Sample Results

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: WETCANYON ABOVE MUDUCK SW**

**Lab Sample ID: 280-79617-1**

**Date Collected: 02/04/16 10:08**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

## Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			02/15/16 18:23	1
Ethylbenzene	ND		0.50		ug/L			02/15/16 18:23	1
Toluene	ND		0.50		ug/L			02/15/16 18:23	1
Xylenes, Total	ND		0.50		ug/L			02/15/16 18:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	89		85 - 115					02/15/16 18:23	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.30		0.050		mg/L		02/12/16 08:20	02/16/16 19:53	1

## Method: 200.7 - ICP Total Metals by 200.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.050		mg/L		02/12/16 08:20	02/16/16 16:01	1
Boron	0.071		0.050		mg/L		02/12/16 08:20	02/16/16 16:01	1
Calcium	68		0.10		mg/L		02/12/16 08:20	02/16/16 16:01	1
Chromium	ND		0.010		mg/L		02/12/16 08:20	02/16/16 16:01	1
Copper	ND		0.010		mg/L		02/12/16 08:20	02/16/16 16:01	1
Iron	0.28		0.050		mg/L		02/12/16 08:20	02/16/16 16:01	1
Potassium	ND		5.0		mg/L		02/12/16 08:20	02/20/16 02:54	1
Magnesium	24		0.10		mg/L		02/12/16 08:20	02/16/16 16:01	1
Manganese	0.28		0.010		mg/L		02/12/16 08:20	02/16/16 16:01	1
Sodium	350		2.0		mg/L		02/12/16 08:20	02/16/16 16:01	1
Selenium	ND		0.015		mg/L		02/12/16 08:20	02/16/16 16:01	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM	ND		4.7		mg/L		02/16/16 14:48	02/16/16 19:37	1
Bromide	0.87		0.20		mg/L			02/16/16 21:53	1
Chloride	140		3.0		mg/L			02/16/16 21:53	1
Sulfate	47		5.0		mg/L			02/16/16 21:53	1
Total Alkalinity	660		5.0		mg/L			02/16/16 13:22	1
Bicarbonate Alkalinity as CaCO3	660		5.0		mg/L			02/16/16 13:22	1
Carbonate Alkalinity as CaCO3	ND		5.0		mg/L			02/16/16 13:22	1
Hydroxide Alkalinity	ND		5.0		mg/L			02/16/16 13:22	1
Total Dissolved Solids	1100		10		mg/L			02/11/16 15:39	1
Total Suspended Solids	6.4		4.0		mg/L			02/11/16 16:15	1
Sulfide	ND		0.050		mg/L			02/11/16 18:40	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Gravity	1.0012				No Unit			02/11/16 19:30	1
Specific Conductance	1600		1.0		umhos/cm			02/16/16 18:57	1
pH	8.13	HF	0.100		SU			02/11/16 16:34	1

TestAmerica Denver

# Client Sample Results

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: WET CANYON BELOW MUD DUCK SW**

**Lab Sample ID: 280-79617-2**

**Date Collected: 02/04/16 10:20**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

## Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			02/15/16 18:53	1
Ethylbenzene	ND		0.50		ug/L			02/15/16 18:53	1
Toluene	ND		0.50		ug/L			02/15/16 18:53	1
Xylenes, Total	ND		0.50		ug/L			02/15/16 18:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	88		85 - 115					02/15/16 18:53	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.28		0.050		mg/L		02/12/16 08:20	02/16/16 20:03	1

## Method: 200.7 - ICP Total Metals by 200.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.050		mg/L		02/12/16 08:20	02/16/16 16:04	1
Boron	0.070		0.050		mg/L		02/12/16 08:20	02/16/16 16:04	1
Calcium	65		0.10		mg/L		02/12/16 08:20	02/16/16 16:04	1
Chromium	ND		0.010		mg/L		02/12/16 08:20	02/16/16 16:04	1
Copper	ND		0.010		mg/L		02/12/16 08:20	02/16/16 16:04	1
Iron	0.20		0.050		mg/L		02/12/16 08:20	02/16/16 16:04	1
Potassium	ND		5.0		mg/L		02/12/16 08:20	02/20/16 02:56	1
Magnesium	23		0.10		mg/L		02/12/16 08:20	02/16/16 16:04	1
Manganese	0.24		0.010		mg/L		02/12/16 08:20	02/16/16 16:04	1
Sodium	340		2.0		mg/L		02/12/16 08:20	02/16/16 16:04	1
Selenium	ND		0.015		mg/L		02/12/16 08:20	02/16/16 16:04	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM	ND		4.7		mg/L		02/16/16 14:48	02/16/16 19:37	1
Bromide	0.87		0.20		mg/L			02/16/16 22:24	1
Chloride	140		3.0		mg/L			02/16/16 22:24	1
Sulfate	47		5.0		mg/L			02/16/16 22:24	1
Total Alkalinity	670		5.0		mg/L			02/16/16 13:33	1
Bicarbonate Alkalinity as CaCO3	660		5.0		mg/L			02/16/16 13:33	1
Carbonate Alkalinity as CaCO3	7.5		5.0		mg/L			02/16/16 13:33	1
Hydroxide Alkalinity	ND		5.0		mg/L			02/16/16 13:33	1
Total Dissolved Solids	1000		10		mg/L			02/11/16 15:39	1
Total Suspended Solids	4.8		4.0		mg/L			02/11/16 16:15	1
Sulfide	ND		0.050		mg/L			02/11/16 18:40	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Gravity	1.0010				No Unit			02/11/16 19:30	1
Specific Conductance	1500		1.0		umhos/cm			02/16/16 18:57	1
pH	8.14	HF	0.100		SU			02/11/16 16:44	1

TestAmerica Denver

# Client Sample Results

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: MUD DUCK 21-26 SPILL PATH SW**

**Lab Sample ID: 280-79617-3**

**Date Collected: 02/04/16 10:33**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

## Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			02/15/16 19:22	1
Ethylbenzene	ND		0.50		ug/L			02/15/16 19:22	1
Toluene	ND		0.50		ug/L			02/15/16 19:22	1
Xylenes, Total	ND		0.50		ug/L			02/15/16 19:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	87		85 - 115					02/15/16 19:22	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	4.3		0.050		mg/L		02/12/16 08:20	02/16/16 20:06	1

## Method: 200.7 - ICP Total Metals by 200.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.050		mg/L		02/12/16 08:20	02/16/16 16:16	1
Boron	0.81		0.050		mg/L		02/12/16 08:20	02/16/16 16:16	1
Calcium	37		0.10		mg/L		02/12/16 08:20	02/16/16 16:16	1
Chromium	ND		0.010		mg/L		02/12/16 08:20	02/16/16 16:16	1
Copper	0.012		0.010		mg/L		02/12/16 08:20	02/16/16 16:16	1
Iron	4.8		0.050		mg/L		02/12/16 08:20	02/16/16 16:16	1
Potassium	9.4		5.0		mg/L		02/12/16 08:20	02/20/16 03:07	1
Magnesium	13		0.10		mg/L		02/12/16 08:20	02/16/16 16:16	1
Manganese	0.097		0.010		mg/L		02/12/16 08:20	02/16/16 16:16	1
Sodium	960		2.0		mg/L		02/12/16 08:20	02/20/16 03:07	1
Selenium	ND		0.015		mg/L		02/12/16 08:20	02/16/16 16:16	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM	9.5		4.7		mg/L		02/16/16 14:48	02/16/16 19:37	1
Bromide	4.5		0.40		mg/L			02/16/16 22:55	2
Chloride	640		60		mg/L			02/16/16 23:10	20
Sulfate	ND		10		mg/L			02/16/16 22:55	2
Total Alkalinity	1200		5.0		mg/L			02/16/16 13:39	1
Bicarbonate Alkalinity as CaCO3	1100		5.0		mg/L			02/16/16 13:39	1
Carbonate Alkalinity as CaCO3	89		5.0		mg/L			02/16/16 13:39	1
Hydroxide Alkalinity	ND		5.0		mg/L			02/16/16 13:39	1
Total Dissolved Solids	2500		20		mg/L			02/11/16 15:39	1
Total Suspended Solids	74		6.7		mg/L			02/11/16 16:15	1
Sulfide	0.21		0.050		mg/L			02/11/16 18:40	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Gravity	1.0026				No Unit			02/11/16 19:30	1
Specific Conductance	3800		1.0		umhos/cm			02/16/16 18:57	1
pH	8.50	HF	0.100		SU			02/11/16 16:49	1

TestAmerica Denver

# Client Sample Results

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: WET CANYON @ SUBLIME SW**

**Lab Sample ID: 280-79617-4**

**Date Collected: 02/04/16 10:54**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

## Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			02/15/16 19:52	1
Ethylbenzene	ND		0.50		ug/L			02/15/16 19:52	1
Toluene	ND		0.50		ug/L			02/15/16 19:52	1
Xylenes, Total	ND		0.50		ug/L			02/15/16 19:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	89		85 - 115					02/15/16 19:52	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.14		0.050		mg/L		02/12/16 08:20	02/16/16 20:08	1

## Method: 200.7 - ICP Total Metals by 200.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.050		mg/L		02/12/16 08:20	02/16/16 16:19	1
Boron	0.051		0.050		mg/L		02/12/16 08:20	02/16/16 16:19	1
Calcium	55		0.10		mg/L		02/12/16 08:20	02/16/16 16:19	1
Chromium	ND		0.010		mg/L		02/12/16 08:20	02/16/16 16:19	1
Copper	ND		0.010		mg/L		02/12/16 08:20	02/16/16 16:19	1
Iron	0.13		0.050		mg/L		02/12/16 08:20	02/16/16 16:19	1
Potassium	ND		5.0		mg/L		02/12/16 08:20	02/20/16 03:12	1
Magnesium	20		0.10		mg/L		02/12/16 08:20	02/16/16 16:19	1
Manganese	0.027		0.010		mg/L		02/12/16 08:20	02/16/16 16:19	1
Sodium	310		2.0		mg/L		02/12/16 08:20	02/16/16 16:19	1
Selenium	ND		0.015		mg/L		02/12/16 08:20	02/16/16 16:19	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM	ND		4.7		mg/L		02/16/16 14:48	02/16/16 19:37	1
Bromide	0.81		0.20		mg/L			02/16/16 23:57	1
Chloride	130		3.0		mg/L			02/16/16 23:57	1
Sulfate	44		5.0		mg/L			02/16/16 23:57	1
Total Alkalinity	580		5.0		mg/L			02/16/16 13:28	1
Bicarbonate Alkalinity as CaCO3	570		5.0		mg/L			02/16/16 13:28	1
Carbonate Alkalinity as CaCO3	11		5.0		mg/L			02/16/16 13:28	1
Hydroxide Alkalinity	ND		5.0		mg/L			02/16/16 13:28	1
Total Dissolved Solids	900		10		mg/L			02/11/16 15:39	1
Total Suspended Solids	4.8		4.0		mg/L			02/11/16 16:15	1
Sulfide	ND		0.050		mg/L			02/11/16 18:40	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Gravity	1.0011				No Unit			02/11/16 19:30	1
Specific Conductance	1400		1.0		umhos/cm			02/16/16 18:57	1
pH	8.23	HF	0.100		SU			02/11/16 16:54	1

TestAmerica Denver

# Client Sample Results

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 280-79617-5**

**Date Collected: 02/04/16 00:00**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

## Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			02/15/16 20:21	1
Ethylbenzene	ND		0.50		ug/L			02/15/16 20:21	1
Toluene	ND		0.50		ug/L			02/15/16 20:21	1
Xylenes, Total	ND		0.50		ug/L			02/15/16 20:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>a,a,a-Trifluorotoluene</i>	89		85 - 115					02/15/16 20:21	1

## Surrogate Summary

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

### Method: 8021B - Volatile Organic Compounds (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	TFT1 (85-115)
280-79585-H-3 MS	Matrix Spike	90
280-79585-H-3 MSD	Matrix Spike Duplicate	90
280-79617-1	WETCANYON ABOVE MUDUCK SW	89
280-79617-2	WET CANYON BELOW MUD DUCK SW	88
280-79617-3	MUD DUCK 21-26 SPILL PATH SW	87
280-79617-4	WET CANYON @ SUBLIME SV	89
280-79617-5	TRIP BLANK	89
LCS 280-313508/7	Lab Control Sample	90
LCSD 280-313508/8	Lab Control Sample Dup	91
MB 280-313508/6	Method Blank	89

#### Surrogate Legend

TFT = a,a,a-Trifluorotoluene

# Lab Chronicle

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: WETCANYON ABOVE MUDUCK SW**

**Lab Sample ID: 280-79617-1**

**Date Collected: 02/04/16 10:08**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	313508	02/15/16 18:23	TEM	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	314207	02/20/16 02:54	SJS	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	313718	02/16/16 16:01	SJS	TAL DEN
Total Recoverable	Prep	200.7			50 mL	50 mL	313291	02/12/16 08:20	SEJ	TAL DEN
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	313698	02/16/16 19:53	CMK	TAL DEN
Total/NA	Prep	1664A			1062 mL	1000 mL	313621	02/16/16 14:48	ARF	TAL DEN
Total/NA	Analysis	1664A		1	1062 mL	1000 mL	313686	02/16/16 19:37	ARF	TAL DEN
Total/NA	Analysis	300.0		1	5 mL	5 mL	313552	02/16/16 21:53	AFB	TAL DEN
Total/NA	Analysis	D1429-03		1			313687	02/11/16 19:30	MAS	TAL DEN
Total/NA	Analysis	SM 2320B		1			313730	02/16/16 13:22	NAS	TAL DEN
Total/NA	Analysis	SM 2510B		1		25 mL	313681	02/16/16 18:57	RSM	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	313282	02/11/16 15:39	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	313286	02/11/16 16:15	SVC	TAL DEN
Total/NA	Analysis	SM 4500 H+ B		1			313301	02/11/16 16:34	MAS	TAL DEN
Total/NA	Analysis	SM 4500 S2 D		1	10 mL	10 mL	313300	02/11/16 18:40	ARF	TAL DEN

**Client Sample ID: WET CANYON BELOW MUD DUCK SW**

**Lab Sample ID: 280-79617-2**

**Date Collected: 02/04/16 10:20**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	313508	02/15/16 18:53	TEM	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	314207	02/20/16 02:56	SJS	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	313718	02/16/16 16:04	SJS	TAL DEN
Total Recoverable	Prep	200.7			50 mL	50 mL	313291	02/12/16 08:20	SEJ	TAL DEN
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	313698	02/16/16 20:03	CMK	TAL DEN
Total/NA	Prep	1664A			1062 mL	1000 mL	313621	02/16/16 14:48	ARF	TAL DEN
Total/NA	Analysis	1664A		1	1062 mL	1000 mL	313686	02/16/16 19:37	ARF	TAL DEN
Total/NA	Analysis	300.0		1	5 mL	5 mL	313552	02/16/16 22:24	AFB	TAL DEN
Total/NA	Analysis	D1429-03		1			313687	02/11/16 19:30	MAS	TAL DEN
Total/NA	Analysis	SM 2320B		1			313730	02/16/16 13:33	NAS	TAL DEN
Total/NA	Analysis	SM 2510B		1		25 mL	313681	02/16/16 18:57	RSM	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	313282	02/11/16 15:39	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	313286	02/11/16 16:15	SVC	TAL DEN
Total/NA	Analysis	SM 4500 H+ B		1			313301	02/11/16 16:44	MAS	TAL DEN
Total/NA	Analysis	SM 4500 S2 D		1	10 mL	10 mL	313300	02/11/16 18:40	ARF	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: MUD DUCK 21-26 SPILL PATH SW**

**Lab Sample ID: 280-79617-3**

**Date Collected: 02/04/16 10:33**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	313508	02/15/16 19:22	TEM	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	314207	02/20/16 03:07	SJS	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	313718	02/16/16 16:16	SJS	TAL DEN
Total Recoverable	Prep	200.7			50 mL	50 mL	313291	02/12/16 08:20	SEJ	TAL DEN
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	313698	02/16/16 20:06	CMK	TAL DEN
Total/NA	Prep	1664A			1058 mL	1000 mL	313621	02/16/16 14:48	ARF	TAL DEN
Total/NA	Analysis	1664A		1	1058 mL	1000 mL	313686	02/16/16 19:37	ARF	TAL DEN
Total/NA	Analysis	300.0		2	5 mL	5 mL	313552	02/16/16 22:55	AFB	TAL DEN
Total/NA	Analysis	300.0		20	5 mL	5 mL	313552	02/16/16 23:10	AFB	TAL DEN
Total/NA	Analysis	D1429-03		1			313687	02/11/16 19:30	MAS	TAL DEN
Total/NA	Analysis	SM 2320B		1			313730	02/16/16 13:39	NAS	TAL DEN
Total/NA	Analysis	SM 2510B		1		25 mL	313681	02/16/16 18:57	RSM	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	313282	02/11/16 15:39	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	150 mL	250 mL	313286	02/11/16 16:15	SVC	TAL DEN
Total/NA	Analysis	SM 4500 H+ B		1			313301	02/11/16 16:49	MAS	TAL DEN
Total/NA	Analysis	SM 4500 S2 D		1	10 mL	10 mL	313300	02/11/16 18:40	ARF	TAL DEN

**Client Sample ID: WET CANYON @ SUBLIME SW**

**Lab Sample ID: 280-79617-4**

**Date Collected: 02/04/16 10:54**

**Matrix: Water**

**Date Received: 02/05/16 10:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	313508	02/15/16 19:52	TEM	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	314207	02/20/16 03:12	SJS	TAL DEN
Total/NA	Prep	200.7			50 mL	50 mL	313292	02/12/16 08:20	TEB	TAL DEN
Total/NA	Analysis	200.7		1	50 mL	50 mL	313718	02/16/16 16:19	SJS	TAL DEN
Total Recoverable	Prep	200.7			50 mL	50 mL	313291	02/12/16 08:20	SEJ	TAL DEN
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	313698	02/16/16 20:08	CMK	TAL DEN
Total/NA	Prep	1664A			1062 mL	1000 mL	313621	02/16/16 14:48	ARF	TAL DEN
Total/NA	Analysis	1664A		1	1062 mL	1000 mL	313686	02/16/16 19:37	ARF	TAL DEN
Total/NA	Analysis	300.0		1	5 mL	5 mL	313552	02/16/16 23:57	AFB	TAL DEN
Total/NA	Analysis	D1429-03		1			313687	02/11/16 19:30	MAS	TAL DEN
Total/NA	Analysis	SM 2320B		1			313730	02/16/16 13:28	NAS	TAL DEN
Total/NA	Analysis	SM 2510B		1		25 mL	313681	02/16/16 18:57	RSM	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	313282	02/11/16 15:39	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	313286	02/11/16 16:15	SVC	TAL DEN
Total/NA	Analysis	SM 4500 H+ B		1			313301	02/11/16 16:54	MAS	TAL DEN
Total/NA	Analysis	SM 4500 S2 D		1	10 mL	10 mL	313300	02/11/16 18:40	ARF	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Pioneer Natural Resources USA, Inc.  
Project/Site: Purg Wellhead

TestAmerica Job ID: 280-79617-1

**Client Sample ID: TRIP BLANK**

**Date Collected: 02/04/16 00:00**

**Date Received: 02/05/16 10:10**

**Lab Sample ID: 280-79617-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	313508	02/15/16 20:21	TEM	TAL DEN

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TestAmerica Denver  
4955 Yarrow Street  
Arvada, CO 80002  
Phone (303) 736-0100 Fax (303) 431-7171

## Chain of Custody

280-79617 Chain of Custody

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

<b>Client Information</b>		Lab P/N: Harrington, Danielle M		Carrier Tracking No(s): 280-34119-4609.1	
Client Contact: Bill Ward		Phone: A. Card: 11		Page: 1 of 1	
Company: Norwest Corporation		Email: danielle.harrington@testamerica.com		Job #:	
Address: 950 South Cherry Street Suite 800		Due Date Requested:		Analysis Requested	
City: Denver		TAT Requested (days): Ratone		Preservation Codes:	
State, Zip: CO, 80246		PO #:		A - HCL M - Hexane N - None O - AsNaO2 P - Na2OHS Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Phone:		WO #:		Other:	
Email: vwward@norwestcorp.com		Project #: 28001998		pH Temp EC	
Project Name: Pioneer Natural Resources		SSOW#:		Special Instructions/Note:	
Site: Colorado				Login: see special instructions	
Sample Identification		Sample Date		TOTAL Number of Containers	
Sample Type (C=Comp, G=grab)		Sample Time		Matrix (W=water, S=solid, O=oil, BT=Trace, A=Air)	
Wet Canyon Above Mud Duck SW		2/4 1008		G W	
Wet Canyon Below Mud Duck SW		1020		G W	
Mud Duck 21-26 Spill Path SW		1033		G W	
Wet Canyon @ Sublime SW		1054		G W	
Trip Blank				G W	
Possible Hazard Identification		Sample Date		Sample Time	
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Radiological					
Deliverable Requested: I, II, III, IV, Other (specify)					
Empty Kit Relinquished by:		Date:		Time:	
Relinquished by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		Remarks:	