

## Mull Drilling Company Inc

Sample Delivery Group: L892007  
Samples Received: 02/23/2017  
Project Number: MULL DRILLING CO. IN  
Description: NWAU #27  
Site: NWAU #27  
Report To: Carl Smalley  
444047 County Road T  
P.O. Box 393  
Cheyenne Wells, CO 80810-0393

Entire Report Reviewed By:



Shane Gambill  
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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## NWAU SS #1 L892007-01 Solid

			Collected by Carl D. Smalley	Collected date/time 02/21/17 09:00	Received date/time 02/23/17 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	1	02/27/17 13:44	03/01/17 05:06	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	1	03/01/17 07:04	03/01/17 23:28	LM

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

## NWAU SS #2 L892007-02 Solid

			Collected by Carl D. Smalley	Collected date/time 02/21/17 09:00	Received date/time 02/23/17 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	960	02/27/17 13:44	03/02/17 13:09	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	5	03/01/17 07:04	03/02/17 00:24	LM

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

## NWAU SS #3 L892007-03 Solid

			Collected by Carl D. Smalley	Collected date/time 02/21/17 09:00	Received date/time 02/23/17 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	980	02/27/17 13:44	03/02/17 13:31	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	50	03/01/17 07:04	03/02/17 13:02	LM

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## NWAU SS #4 L892007-04 Solid

			Collected by Carl D. Smalley	Collected date/time 02/21/17 09:00	Received date/time 02/23/17 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	1	02/27/17 13:44	03/01/17 04:22	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	5	03/01/17 07:04	03/02/17 00:46	LM

## NWAU SS #5 L892007-05 Solid

			Collected by Carl D. Smalley	Collected date/time 02/21/17 09:00	Received date/time 02/23/17 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	1	02/27/17 13:44	03/01/17 03:59	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	1	03/01/17 07:04	03/01/17 23:39	LM

## NWAU SS #6 L892007-06 Solid

			Collected by Carl D. Smalley	Collected date/time 02/21/17 09:00	Received date/time 02/23/17 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	1	02/27/17 13:44	03/01/17 03:37	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	1	03/01/17 07:04	03/01/17 23:50	LM

## NWAU SS #7 L892007-07 Solid

			Collected by Carl D. Smalley	Collected date/time 02/21/17 09:00	Received date/time 02/23/17 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	1	02/27/17 13:44	03/01/17 03:15	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	1	03/01/17 07:04	03/02/17 00:01	LM

# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



NWAU SS #8 L892007-08 Solid

Collected by  
Carl D. Smalley

Collected date/time  
02/21/17 09:00

Received date/time  
02/23/17 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG956518	1	02/27/17 13:44	03/01/17 02:53	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG956806	1	03/01/17 07:04	03/02/17 00:13	LM

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Shane Gambill  
Technical Service Representative

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	2.09		0.100	1	03/01/2017 05:06	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	85.5		77.0-120		03/01/2017 05:06	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	03/01/2017 23:28	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	69.6		18.0-148		03/01/2017 23:28	<a href="#">WG956806</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	349		96.0	960	03/02/2017 13:09	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	96.3		77.0-120		03/02/2017 13:09	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1540		20.0	5	03/02/2017 00:24	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	166	<a href="#">J1</a>	18.0-148		03/02/2017 00:24	<a href="#">WG956806</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1590		98.0	980	03/02/2017 13:31	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	93.7		77.0-120		03/02/2017 13:31	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	8280		200	50	03/02/2017 13:02	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	0.000	<a href="#">J7</a>	18.0-148		03/02/2017 13:02	<a href="#">WG956806</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc





## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	<u>Qualifier</u>	RDL mg/kg	Dilution	Analysis date / time	<u>Batch</u>
TPH (GC/FID) Low Fraction	ND		0.100	1	03/01/2017 04:22	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	89.6		77.0-120		03/01/2017 04:22	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	<u>Qualifier</u>	RDL mg/kg	Dilution	Analysis date / time	<u>Batch</u>
TPH (GC/FID) High Fraction	ND		20.0	5	03/02/2017 00:46	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	57.3		18.0-148		03/02/2017 00:46	<a href="#">WG956806</a>

## Sample Narrative:

8015 L892007-04 WG956806: Cannot run at lower dilution due to viscosity of extract

1  
Cp2  
Tc3  
Ss4  
Cn5  
Sr6  
Qc7  
Gl8  
Al9  
Sc



## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	03/01/2017 03:59	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	89.9		77.0-120		03/01/2017 03:59	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	03/01/2017 23:39	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	59.4		18.0-148		03/01/2017 23:39	<a href="#">WG956806</a>

1  
Cp2  
Tc3  
Ss4  
Cn5  
Sr6  
Qc7  
Gl8  
Al9  
Sc



## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	03/01/2017 03:37	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	91.0		77.0-120		03/01/2017 03:37	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	28.3		4.00	1	03/01/2017 23:50	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	55.8		18.0-148		03/01/2017 23:50	<a href="#">WG956806</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	03/01/2017 03:15	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	91.0		77.0-120		03/01/2017 03:15	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	03/02/2017 00:01	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	62.5		18.0-148		03/02/2017 00:01	<a href="#">WG956806</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



## Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.341		0.100	1	03/01/2017 02:53	<a href="#">WG956518</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	90.4		77.0-120		03/01/2017 02:53	<a href="#">WG956518</a>

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	03/02/2017 00:13	<a href="#">WG956806</a>
(S) <i>o</i> -Terphenyl	52.0		18.0-148		03/02/2017 00:13	<a href="#">WG956806</a>

1  
Cp2  
Tc3  
Ss4  
Cn5  
Sr6  
Qc7  
Gl8  
Al9  
Sc



Method Blank (MB)

(MB) R3200216-3 03/01/17 00:40				
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
TPH (GC/FID) Low Fraction	0.0219	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	95.7			77.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3200216-1 02/28/17 23:33 • (LCSD) R3200216-2 02/28/17 23:55										
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
TPH (GC/FID) Low Fraction	5.50	5.31	5.23	96.5	95.0	70.0-136			1.48	20
(S) a,a,a-Trifluorotoluene(FID)				104	106	77.0-120				

L892007-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L892007-02 03/02/17 13:09 • (MS) R3200607-1 03/02/17 13:53 • (MSD) R3200607-2 03/02/17 14:15												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPH (GC/FID) Low Fraction	5.50	349	5970	5580	106	99.0	960	10.0-147			6.82	30
(S) a,a,a-Trifluorotoluene(FID)					101	101		77.0-120				



Method Blank (MB)

(MB) R3200451-2 03/01/17 17:43

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	65.6			18.0-148

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3200451-1 03/01/17 17:31 • (LCSD) R3200451-3 03/01/17 17:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	60.0	53.4	48.0	89.0	80.0	50.0-150			10.7	20
(S) o-Terphenyl				79.5	70.1	18.0-148				

L892039-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L892039-01 03/01/17 20:29 • (MS) R3200451-4 03/01/17 20:41 • (MSD) R3200451-5 03/01/17 20:52

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	78.2	ND	50.8	52.4	65.0	67.0	1	50.0-150			3.09	20
(S) o-Terphenyl					56.2	63.4		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



## Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
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J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



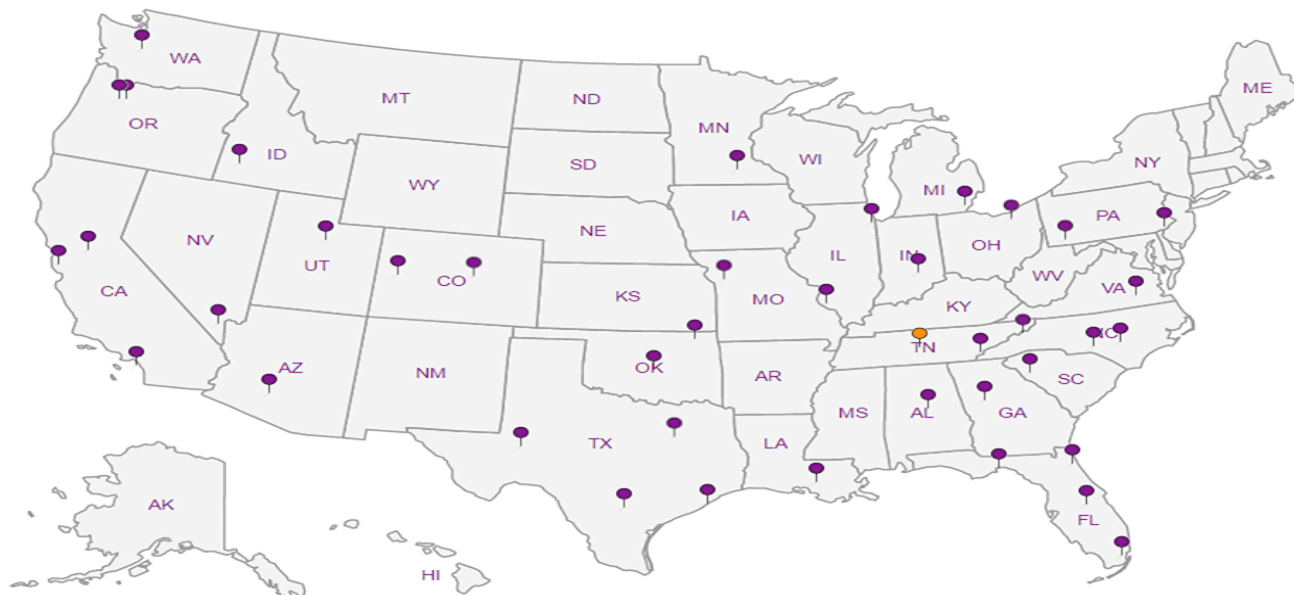


- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA-Crypto	IN00003		

## Our Locations



[illegible]

# ESC LAB SCIENCES Cooler Receipt Form

Client: <u>MULDRICWCO</u>		SDG#	<u>L892007</u>	
Cooler Received/Opened On: <u>2/ 23 /17</u>		Temperature:	<u>1.9</u>	
Received By: Michael Lowe				
Signature: <u>[Signature]</u>				
Receipt Check List		NP	Yes	No
COC Seal Present / Intact?		<u>✓</u>		
COC Signed / Accurate?			<u>✓</u>	
Bottles arrive intact?			<u>✓</u>	
Correct bottles used?			<u>✓</u>	
Sufficient volume sent?			<u>✓</u>	
If Applicable				
VOA Zero headspace?				
Preservation Correct / Checked?				