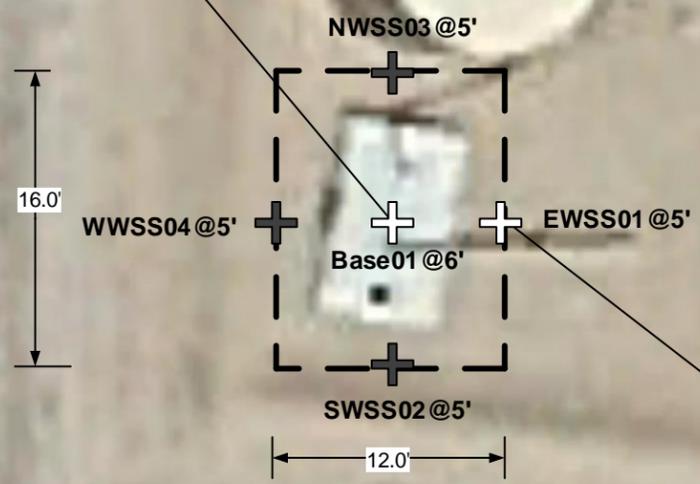


Base01 @6'
 B - <0.0020 mg/kg
 T - <0.0050 mg/kg
 E - <0.0050 mg/kg
 X - <0.010 mg/kg
 TPH - <50 mg/kg
 N - <0.010 mg/kg



EWSS01 @5'
 B - <0.0020 mg/kg
 T - <0.0050 mg/kg
 E - <0.0050 mg/kg
 X - <0.010 mg/kg
 TPH - <50 mg/kg
 N - <0.010 mg/kg
 SAR - 0.399
 EC - 0.526 mmhos/cm
 pH - **9.43**

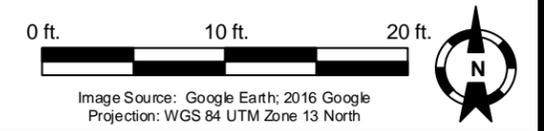
Legend

- Excavation Sample Location
- Excavation Sample Location (Not Submitted for Laboratory Analysis)
- Excavation Extent
- GPS Global Positioning System
- mg/kg Milligrams per Kilogram
- mmhos/cm Millihos per Centimeter

Notes

- 1) All locations are approximate unless otherwise noted.
- 2) Site infrastructure has been removed. Shown for illustrative purposes only.
- 3) **RED** value indicates a concentration greater than COGCC table 910-1 soil standard (see table below).

Contaminant of Concern	COGCC Soil Concentration Standard
B - Benzene	0.17 mg/kg
T - Toluene	85 mg/kg
E - Ethylbenzene	100 mg/kg
X - Total Xylenes	175 mg/kg
TPH- Total Petroleum Hydrocarbons	500 mg/kg
N - Naphthalene	23 mg/kg
SAR - Sodium Absorption Ratio	<12 ⁵
EC - Electrical Conductivity	<4mmhos/cm or 2x background
pH	6-9



DATE: 10/24/2017
 DESIGNED BY: B.Fields
 DRAWN BY: B.Fields

TASMAN GEOSCIENCES
 Tasman Geosciences, Inc.
 6899 Pecos Street – Unit C
 Denver, CO 80221

Noble Energy, Inc. – DJ Basin
Herbst 27-03 Vault Removal – Location ID: 323316
 NENE, Section 27, Township 5 North, Range 65 West
 Weld County, Colorado

Excavation Soil Analytical
 Results Map
 (October 18, 2017)

FIGURE 1

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 24, 2017

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Herbst 27-03

Enclosed are the results of analyses for samples received by Summit Scientific on 10/18/17 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/24/17 09:35

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EWSS01@5'	1710206-01	Soil	10/18/17 12:42	10/18/17 17:00
Base01@6'	1710206-02	Soil	10/18/17 12:59	10/18/17 17:00

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Summit Scientific

1710206

741 Corporate Circle Suite I ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 1

Client: Noble/Tasman
Address: 6899 Pecos St. Unit. C
City/State/Zip: Denver CO 80221
Phone: 720-626-6362 Fax: _____
Sampler Name: B. Fields

Project Manager: Brandon Bruns / Jacob Evans (Noble)
E-Mail: bbruns@tasman-geo.com
Project Name: Herbst 27-03
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:					Special Instructions			
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR				
<u>EWSS0105'</u>	<u>10/18/17</u>	<u>1242</u>	<u>2</u>			X			X				X	X	X				
<u>Base 01 @ 6'</u>	<u>10/18/17</u>	<u>1259</u>	<u>1</u>			X			X				X	X					
Relinquished by: <u>[Signature]</u>	Date/Time: <u>10/18/17</u>	Received by: <u>[Signature]</u>	Date/Time: <u>10-18-17 17:00</u>	Turn Around Time (Check)				Notes:											
Relinquished by:	Date/Time:	Received by:	Date/Time:	Same Day	<input type="checkbox"/>	72 Hours	<input type="checkbox"/>												
				24 Hours	<input type="checkbox"/>	Standard	<input checked="" type="checkbox"/>												
				48 Hours	<input type="checkbox"/>														
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	Sample Integrity:				Notes: <u>one!</u>											
				Temperature Upon Receipt: <u>5.0°C</u>															
				Intact: Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>														

1710206

Sample Receipt Checklist

S2 Work Order: _____

Client: Tasman Client Project ID: Herbst 27-03

Shipped Via: PLU Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply): Air Soil/Solid Water Other: _____
(Describe)

Cooler ID					
Temp (°C)	5.0°C				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ?				
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	✓			on ice
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?	✓			
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			✓	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			✓	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			✓	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			✓	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

Eric H
 Custodian Printed Name

[Signature]
 Signature or Initials of Custodian

10-18-17 17:00
 Date/Time



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
10/24/17 09:35

EWSS01@5'
1710206-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/18/17 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1710201	10/19/17	10/21/17	8015M	

Date Sampled: **10/18/17 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		109 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/18/17 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1710200	10/19/17	10/21/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/18/17 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.2 %	21-167		"	"	"	"	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **10/18/17 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	367	10.8	mg/kg dry	1	1710165	10/19/17	10/19/17	EPA 6020/Mod. USDA60 6(2, 3A)	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/24/17 09:35

EWSS01@5'
1710206-01 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Magnesium	203	5.39	mg/kg dry	1	1710165	10/19/17	10/19/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Sodium	38.4	5.39	"	"	"	"	"	"	"
Sodium Adsorption Ratio	0.399		units	"	1710225	10/20/17	10/20/17	"	"

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/18/17 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	9.43	0.100	pH Units	1	1710234	10/23/17	10/23/17	EPA 9045	
Specific Conductance (EC)	0.526	0.0100	mmhos/cm	"	1710235	10/23/17	10/23/17	SM 2510B	
% Solids	92.7		%	"	1710199	10/19/17	10/19/17	% calculation	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/24/17 09:35

Base01@6'
1710206-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/18/17 12:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1710201	10/19/17	10/21/17	8015M	

Date Sampled: **10/18/17 12:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		111 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/18/17 12:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1710200	10/19/17	10/21/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/18/17 12:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
10/24/17 09:35

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch 1710201 - EPA 3550A

Blank (1710201-BLK1)				Prepared: 10/19/17 Analyzed: 10/21/17							
C10-C28 (DRO)	ND	50	mg/kg								
Surrogate: <i>o</i> -Terphenyl	13.3		"	12.5		106	30-150				
LCS (1710201-BS1)				Prepared: 10/19/17 Analyzed: 10/21/17							
C10-C28 (DRO)	515	50	mg/kg	499		103	73-134				
Surrogate: <i>o</i> -Terphenyl	14.8		"	12.5		118	30-150				
Matrix Spike (1710201-MS1)				Source: 1710203-01		Prepared: 10/19/17 Analyzed: 10/21/17					
C10-C28 (DRO)	495	50	mg/kg	499	10.6	97.0	50-148				
Surrogate: <i>o</i> -Terphenyl	14.4		"	12.5		115	30-150				
Matrix Spike Dup (1710201-MSD1)				Source: 1710203-01		Prepared: 10/19/17 Analyzed: 10/21/17					
C10-C28 (DRO)	500	50	mg/kg	499	10.6	98.1	50-148	1.05		20	
Surrogate: <i>o</i> -Terphenyl	13.7		"	12.5		110	30-150				

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
10/24/17 09:35

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1710200 - EPA 5030 Soil MS

Blank (1710200-BLK1)

Prepared: 10/19/17 Analyzed: 10/21/17

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0406		"	0.0400		102	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0402		"	0.0400		100	21-167			

LCS (1710200-BS1)

Prepared: 10/19/17 Analyzed: 10/21/17

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.110	0.0020	"	0.100		110	58-130			
Toluene	0.110	0.0050	"	0.100		110	61-134			
Ethylbenzene	0.129	0.0050	"	0.0992		130	74-139			
m,p-Xylene	0.241	0.010	"	0.200		121	73-137			
o-Xylene	0.118	0.0050	"	0.0980		120	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0423		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0412		"	0.0400		103	21-167			

Matrix Spike (1710200-MS1)

Source: 1710203-01

Prepared: 10/19/17 Analyzed: 10/21/17

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.109	0.0020	"	0.100	ND	109	30-131			
Toluene	0.111	0.0050	"	0.100	ND	111	30-134			
Ethylbenzene	0.126	0.0050	"	0.0992	ND	127	22-153			
m,p-Xylene	0.236	0.010	"	0.200	ND	118	10-159			
o-Xylene	0.118	0.0050	"	0.0980	ND	121	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0439		"	0.0400		110	23-173			
Surrogate: Toluene-d8	0.0401		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400		101	21-167			

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
10/24/17 09:35

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1710200 - EPA 5030 Soil MS

Matrix Spike Dup (1710200-MSD1)	Source: 1710203-01			Prepared: 10/19/17		Analyzed: 10/21/17				
Naphthalene	ND	0.010	mg/kg	ND	ND	109	23-173	1.04	34	
Benzene	0.110	0.0020	"	0.100	ND	110	30-131	2.80	30	
Toluene	0.114	0.0050	"	0.100	ND	114	30-134	3.07	24	
Ethylbenzene	0.130	0.0050	"	0.0992	ND	131	22-153	3.04	68	
m,p-Xylene	0.244	0.010	"	0.200	ND	122	10-159	1.01	38	
o-Xylene	0.120	0.0050	"	0.0980	ND	122	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0434</i>		<i>"</i>	<i>0.0400</i>		<i>109</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.7</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0409</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/24/17 09:35

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

Batch 1710165 - General Preparation

Blank (1710165-BLK1)

Prepared & Analyzed: 10/19/17

Calcium	ND	10.0	mg/kg wet							
Magnesium	ND	5.00	"							
Sodium	ND	5.00	"							

LCS (1710165-BS1)

Prepared & Analyzed: 10/19/17

Calcium	544	10.0	mg/kg wet	500	109	82.9-118				
Magnesium	538	5.00	"	500	108	77.1-123				
Sodium	526	5.00	"	500	105	71-129				

Duplicate (1710165-DUP1)

Source: 1710162-05

Prepared & Analyzed: 10/19/17

Calcium	605	12.0	mg/kg dry	578			4.42	200		
Magnesium	840	6.00	"	950			12.3	200		
Sodium	375	6.00	"	383			2.01	200		

Matrix Spike (1710165-MS1)

Source: 1710162-05

Prepared & Analyzed: 10/19/17

Calcium	1180	12.0	mg/kg dry	600	578	100	75-125			
Magnesium	1620	6.00	"	600	950	112	75-125			
Sodium	1070	6.00	"	600	383	115	75-125			

Matrix Spike Dup (1710165-MSD1)

Source: 1710162-05

Prepared & Analyzed: 10/19/17

Calcium	1220	12.0	mg/kg dry	600	578	107	75-125	3.44	25	
Magnesium	1440	6.00	"	600	950	81.4	75-125	12.2	25	
Sodium	1080	6.00	"	600	383	116	75-125	0.127	25	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/24/17 09:35

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1710199 - General Preparation

Duplicate (1710199-DUP1)		Source: 1710184-01			Prepared & Analyzed: 10/19/17						
% Solids	84.9		%		84.7				0.236	20	

Batch 1710234 - General Preparation

LCS (1710234-BS1)								Prepared & Analyzed: 10/23/17			
pH	9.18	0.100	pH Units		9.16	100	95-105				
Duplicate (1710234-DUP1)		Source: 1710185-01			Prepared & Analyzed: 10/23/17						
pH	8.67	0.100	pH Units		8.65				0.231	20	

Batch 1710235 - General Preparation

Blank (1710235-BLK1)								Prepared & Analyzed: 10/23/17			
Specific Conductance (EC)	ND	0.0100	mmhos/cm								
LCS (1710235-BS1)								Prepared & Analyzed: 10/23/17			
Specific Conductance (EC)	0.749	0.0100	mmhos/cm		0.750	99.9	90-110				
Duplicate (1710235-DUP1)		Source: 1710185-01			Prepared & Analyzed: 10/23/17						
Specific Conductance (EC)	34.2	0.0100	mmhos/cm		31.6				7.86	20	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Herbst 27-03

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/24/17 09:35

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference