

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

December 11, 2018

Brandon Bruns  
Tasman Geosciences  
6899 Pecos St, Unit C  
Denver, CO 80221

RE: Noble - Duncan D20-12, 20-13

Enclosed are the results of analyses for samples received by Summit Scientific on 12/10/18 18:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Paul Shrewsbury', written in a cursive style.

Paul Shrewsbury For Ben Shrewsbury  
Laboratory Manager



Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
12/11/18 11:18

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@3'	1812109-01	Soil	12/10/18 10:40	12/10/18 18:00
SS02@3'	1812109-02	Soil	12/10/18 12:00	12/10/18 18:00
SS03@3'	1812109-03	Soil	12/10/18 10:44	12/10/18 18:00
SS04@3'	1812109-04	Soil	12/10/18 12:10	12/10/18 18:00
GW01	1812109-05	Water	12/10/18 12:35	12/10/18 18:00

Summit Scientific

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# Summit Scientific

1812109

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

Page 7 of 7

Client: Noble/Tasman  
Address: -  
City/State/Zip: -  
Phone: 979-255-4235 Fax: -  
Sampler Name: Max Garza

Project Manager: Brandon Bruns, Invoice: Jacob Evans  
E-Mail: Bbruns@tasman-geo.com  
Project Name: Duncan D20-12, 20-13  
Project Number: N/A

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:					Special Instructions		
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR			
SS01@3'	12/10/18	1040	1			X			X				X	X				
SS02@3'		1200	1			X							X	X				
SS03@3'		1044	1			X							X	X				
SS04@3'		1210	1			X							X	X				
GWO1		1235	3			X		X				X						

  

Relinquished by: <u>[Signature]</u>	Date/Time: <u>12/10/18</u>	Received by: <u>[Signature]</u>	Date/Time: <u>12.10.18</u>	<b>Turn Around Time (Check)</b> Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 Hours <input type="checkbox"/>	Notes:
Relinquished by:	Date/Time:	Received by:	Date/Time:		
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:		

Sample Integrity:  
Temperature Upon Receipt: 2.1  
Intact: Yes  No

**Sample Receipt Checklist**

S2 Work Order: 1812109

Client: Noble/Tasman Client Project ID: Duncan D20-12, 20-13

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

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

Temp (°C)	2.1
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Thermometer ID: 61857155-K

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

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

JP  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

10.10.18 10:10  
Date/Time



Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
12/11/18 11:18

**SS01@3'**  
**1812109-01 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **12/10/18 10:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1812132	12/10/18	12/10/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **12/10/18 10:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173	"	"	"	"	
Surrogate: Toluene-d8		98.1 %		20-170	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %		21-167	"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **12/10/18 10:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1812123	"	12/10/18	EPA 8015M	

Date Sampled: **12/10/18 10:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		117 %		30-150	"	"	"	"	

Summit Scientific

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Brun

Reported:  
12/11/18 11:18

**SS02@3'**  
**1812109-02 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **12/10/18 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.043</b>	0.0020	mg/kg	1	1812132	12/10/18	12/10/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.36</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.13</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.72</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1000</b>	50	"	100	"	"	"	"	

Date Sampled: **12/10/18 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		134 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **12/10/18 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>1300</b>	50	mg/kg	1	1812123	"	12/10/18	EPA 8015M	

Date Sampled: **12/10/18 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		122 %	30-150		"	"	"	"	

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Brun

Reported:  
12/11/18 11:18

**SS03@3'**  
**1812109-03 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **12/10/18 10:44**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1812132	12/10/18	12/10/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **12/10/18 10:44**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **12/10/18 10:44**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1812123	"	12/10/18	EPA 8015M	

Date Sampled: **12/10/18 10:44**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		120 %	30-150		"	"	"	"	

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
12/11/18 11:18

**SS04@3'**  
**1812109-04 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>9.3</b>	0.20	mg/kg	100	1812132	12/10/18	12/10/18	EPA 8260B	
<b>Toluene</b>	<b>2.0</b>	0.50	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>33</b>	0.50	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>320</b>	1.0	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>8.3</b>	1.0	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>7000</b>	50	"	"	"	"	"	"	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		137 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		197 %	21-167		"	"	"	"	S-02

**Extractable Petroleum Hydrocarbons by 8015**

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>3700</b>	50	mg/kg	1	1812123	"	12/10/18	EPA 8015M	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		152 %	30-150		"	"	"	"	S-02

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

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>2970</b>	11.6	mg/kg dry	1	1812131	12/10/18	12/11/18	EPA 6020B	
<b>Magnesium</b>	<b>621</b>	5.81	"	"	"	"	"	"	

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6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
12/11/18 11:18

**SS04@3'**  
**1812109-04 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>920</b>	5.81	mg/kg dry	1	1812131	12/10/18	12/11/18	EPA 6020B
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**Calculated Analysis**

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>4.01</b>	0.100	units	1	1812141	12/11/18	12/11/18	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>86.1</b>		%	1	1812139	12/10/18	12/11/18	Calculation	
<b>pH</b>	<b>8.43</b>		pH Units	"	1812138	12/10/18	12/10/18	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>2.95</b>	0.0100	mmhos/cm	1	1812137	"	12/10/18	EPA 120.1	

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6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
12/11/18 11:18

**GW01**  
**1812109-05 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **12/10/18 12:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>970</b>	100		ug/l	100	1812136	12/10/18	12/10/18	EPA 8260B	
<b>Toluene</b>	<b>3.2</b>	1.0		"	1	"	"	"	"	
<b>Ethylbenzene</b>	<b>560</b>	100		"	100	"	"	"	"	
<b>Xylenes (total)</b>	<b>3800</b>	200		"	"	"	"	"	"	

Date Sampled: **12/10/18 12:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		90.9 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		21-167		"	"	"	"	

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
12/11/18 11:18

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1812132 - EPA 5030 Soil MS

##### Blank (1812132-BLK1)

Prepared & Analyzed: 12/10/18

Benzene	ND	0.0020	mg/kg								
Toluene	ND	0.0050	"								
Ethylbenzene	ND	0.0050	"								
Xylenes (total)	ND	0.010	"								
Naphthalene	ND	0.010	"								
Gasoline Range Hydrocarbons	ND	50	"								
Surrogate: 1,2-Dichloroethane-d4	0.0417		"	0.0396		105	23-173				
Surrogate: Toluene-d8	0.0410		"	0.0400		102	20-170				
Surrogate: 4-Bromofluorobenzene	0.0432		"	0.0400		108	21-167				

##### LCS (1812132-BS1)

Prepared & Analyzed: 12/10/18

Benzene	0.118	0.0020	mg/kg	0.100		118	70-130				
Toluene	0.117	0.0050	"	0.100		117	70-130				
Ethylbenzene	0.123	0.0050	"	0.100		123	70-130				
m,p-Xylene	0.236	0.010	"	0.200		118	70-130				
o-Xylene	0.113	0.0050	"	0.100		113	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0447		"	0.0396		113	23-173				
Surrogate: Toluene-d8	0.0409		"	0.0400		102	20-170				
Surrogate: 4-Bromofluorobenzene	0.0440		"	0.0400		110	21-167				

##### Matrix Spike (1812132-MS1)

Source: 1812077-01

Prepared & Analyzed: 12/10/18

Benzene	0.119	0.0020	mg/kg	0.100	ND	119	70-130				
Toluene	0.114	0.0050	"	0.100	ND	114	70-130				
Ethylbenzene	0.123	0.0050	"	0.100	ND	123	70-130				
m,p-Xylene	0.241	0.010	"	0.200	0.00732	117	70-130				
o-Xylene	0.109	0.0050	"	0.100	ND	109	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0431		"	0.0396		109	23-173				
Surrogate: Toluene-d8	0.0411		"	0.0400		103	20-170				
Surrogate: 4-Bromofluorobenzene	0.0431		"	0.0400		108	21-167				

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
12/11/18 11:18

**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 1812132 - EPA 5030 Soil MS**

**Matrix Spike Dup (1812132-MSD1)**

Source: 1812077-01

Prepared: 12/10/18 Analyzed: 12/11/18

Benzene	0.117	0.0020	mg/kg	0.100	ND	117	70-130	1.12	30	
Toluene	0.119	0.0050	"	0.100	ND	119	70-130	4.47	30	
Ethylbenzene	0.124	0.0050	"	0.100	ND	124	70-130	0.752	30	
m,p-Xylene	0.239	0.010	"	0.200	0.00732	116	70-130	0.587	30	
o-Xylene	0.111	0.0050	"	0.100	ND	111	70-130	1.78	30	
Surrogate: 1,2-Dichloroethane-d4	0.0440		"	0.0396		111	23-173			
Surrogate: Toluene-d8	0.0420		"	0.0400		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0451		"	0.0400		113	21-167			

**Batch 1812136 - EPA 5030 Water MS**

**Blank (1812136-BLK1)**

Prepared & Analyzed: 12/10/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	11.9		"	13.2		90.1	23-173			
Surrogate: Toluene-d8	15.6		"	13.3		117	20-170			
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		93.6	21-167			

**LCS (1812136-BS1)**

Prepared & Analyzed: 12/10/18

Benzene	31.2	1.0	ug/l	33.3		93.5	70-130			
Toluene	30.8	1.0	"	33.3		92.3	70-130			
Ethylbenzene	30.2	1.0	"	33.3		90.6	70-130			
m,p-Xylene	59.2	2.0	"	66.7		88.8	70-130			
o-Xylene	29.4	1.0	"	33.3		88.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	12.1		"	13.2		91.7	23-173			
Surrogate: Toluene-d8	14.0		"	13.3		105	20-170			
Surrogate: 4-Bromofluorobenzene	12.6		"	13.3		94.2	21-167			

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
12/11/18 11:18

**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 1812136 - EPA 5030 Water MS**

<b>Matrix Spike (1812136-MS1)</b>	<b>Source: 1812102-01</b>			<b>Prepared &amp; Analyzed: 12/10/18</b>						
Benzene	42.4	1.0	ug/l	33.3	11.4	93.3	70-130			
Toluene	30.9	1.0	"	33.3	ND	92.6	70-130			
Ethylbenzene	31.1	1.0	"	33.3	ND	93.3	70-130			
m,p-Xylene	59.2	2.0	"	66.7	ND	88.8	70-130			
o-Xylene	30.2	1.0	"	33.3	ND	90.7	70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.4</i>		<i>"</i>	<i>13.2</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.6</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.5</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>21-167</i>			

<b>Matrix Spike Dup (1812136-MSD1)</b>	<b>Source: 1812102-01</b>			<b>Prepared &amp; Analyzed: 12/10/18</b>						
Benzene	42.5	1.0	ug/l	33.3	11.4	93.3	70-130	0.259	30	
Toluene	31.1	1.0	"	33.3	ND	93.2	70-130	0.646	30	
Ethylbenzene	32.0	1.0	"	33.3	ND	96.1	70-130	2.91	30	
m,p-Xylene	61.5	2.0	"	66.7	ND	92.2	70-130	3.71	30	
o-Xylene	30.5	1.0	"	33.3	ND	91.5	70-130	0.889	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.8</i>		<i>"</i>	<i>13.2</i>		<i>97.3</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.6</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.4</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>21-167</i>			

Summit Scientific

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
12/11/18 11:18

**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 1812123 - EPA 3550A**

**Blank (1812123-BLK1)**

Prepared & Analyzed: 12/10/18

C10-C28 (DRO) ND 50 mg/kg

**LCS (1812123-BS1)**

Prepared & Analyzed: 12/10/18

C10-C28 (DRO) 580 50 mg/kg 500 116 70-130

**Matrix Spike (1812123-MS1)**

**Source: 1812088-01**

Prepared & Analyzed: 12/10/18

C10-C28 (DRO) 560 50 mg/kg 500 ND 112 70-130

**Matrix Spike Dup (1812123-MSD1)**

**Source: 1812088-01**

Prepared & Analyzed: 12/10/18

C10-C28 (DRO) 580 50 mg/kg 500 ND 116 70-130 3.51 20

Summit Scientific

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
12/11/18 11:18

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

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

**Batch 1812131 - General Preparation**

**Blank (1812131-BLK1)**

Prepared: 12/10/18 Analyzed: 12/11/18

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

**LCS (1812131-BS1)**

Prepared: 12/10/18 Analyzed: 12/11/18

Calcium	387	10.0	mg/kg wet	500	9180	77.3	70-130			
Magnesium	358	5.00	"	500	760	71.7	70-130			
Sodium	350	5.00	"	500	42.7	70.0	70-130			

**Duplicate (1812131-DUP1)**

Source: 1812099-01

Prepared: 12/10/18 Analyzed: 12/11/18

Calcium	10000	10.0	mg/kg wet	500	9180	89.9	70-130	0.466	25	
Magnesium	855	5.00	"	500	760	117	70-130	3.57	25	
Sodium	50.9	5.00	"	500	42.7	115	70-130	2.22	25	

**Matrix Spike (1812131-MS1)**

Source: 1812099-01

Prepared: 12/10/18 Analyzed: 12/11/18

Calcium	9630	10.0	mg/kg wet	500	9180	89.9	70-130	0.466	25	
Magnesium	1350	5.00	"	500	760	117	70-130	3.57	25	
Sodium	616	5.00	"	500	42.7	115	70-130	2.22	25	

**Matrix Spike Dup (1812131-MSD1)**

Source: 1812099-01

Prepared: 12/10/18 Analyzed: 12/11/18

Calcium	9590	10.0	mg/kg wet	500	9180	81.0	70-130	0.466	25	
Magnesium	1300	5.00	"	500	760	108	70-130	3.57	25	
Sodium	630	5.00	"	500	42.7	118	70-130	2.22	25	

Summit Scientific

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
12/11/18 11:18

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

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

**Batch 1812138 - General Preparation**

**LCS (1812138-BS1)**

Prepared & Analyzed: 12/10/18

pH 9.2 pH Units 9.18 100 95-105

**Duplicate (1812138-DUP1)**

Source: 1812109-04

Prepared & Analyzed: 12/10/18

pH 8.4 pH Units 8.4 0.119 20

**Batch 1812139 - General Preparation**

**Duplicate (1812139-DUP1)**

Source: 1812109-04

Prepared: 12/10/18 Analyzed: 12/11/18

% Solids 84.4 % 86.1 1.99 20

Summit Scientific

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
12/11/18 11:18

**Specific Conductance by EPA Method 120.1 - Quality Control**  
**Summit Scientific**

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

**Batch 1812137 - General Preparation**

**Blank (1812137-BLK1)**

Prepared & Analyzed: 12/10/18

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (1812137-BS1)**

Prepared & Analyzed: 12/10/18

Specific Conductance (EC) 0.749 0.0100 mmhos/cm 0.750 99.9 90-110

**Duplicate (1812137-DUP1)**

**Source: 1812109-04**

Prepared & Analyzed: 12/10/18

Specific Conductance (EC) 2.96 0.0100 mmhos/cm 2.95 0.372 20

Summit Scientific

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Tasman Geosciences  
6899 Pecos St, Unit C  
Denver CO, 80221

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
12/11/18 11:18

### Notes and Definitions

- S-02      The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
- 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