

Summit Scientific

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 'P. Shrewsbury', with a stylized, cursive script.

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

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1812109

Page 4 of 4

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

www.s2scientific.com

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
-----------	-----

Thermometer ID: 61857155-K

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

Additional Comments (if any):

⁽¹⁾ 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 1510
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 Bruns

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

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

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

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Denver CO, 80221

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

Project Number: [none]
Project Manager: Brandon Bruns

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
Benzene	0.043	0.0020	mg/kg	1	1812132	12/10/18	12/10/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.36	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.13	0.010	"	"	"	"	"	"	
Naphthalene	0.72	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	1000	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
C10-C28 (DRO)	1300	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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Project Number: [none]
Project Manager: Brandon Bruns

Reported:
12/11/18 11:18

SS03@3'
1812109-03 (Soil)

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Volatile Organic Compounds by EPA Method 8260B

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

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

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

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

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

Project Number: [none]
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Reported:
12/11/18 11:18

SS04@3'
1812109-04 (Soil)

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Volatile Organic Compounds by EPA Method 8260B

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

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

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

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

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

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

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SS04@3'
1812109-04 (Soil)

Summit Scientific

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

Sodium	920	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
Sodium Adsorption Ratio	4.01	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
% Solids	86.1		%	1	1812139	12/10/18	12/11/18	Calculation	
pH	8.43		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
Specific Conductance (EC)	2.95	0.0100	mmhos/cm	1	1812137	"	12/10/18	EPA 120.1	

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12/11/18 11:18

GW01
1812109-05 (Water)

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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								
Benzene	970	100		ug/l	100	1812136	12/10/18	12/10/18	EPA 8260B	
Toluene	3.2	1.0		"	1	"	"	"	"	
Ethylbenzene	560	100		"	100	"	"	"	"	
Xylenes (total)	3800	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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Denver CO, 80221

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

Project Number: [none]
Project Manager: Brandon Brun

Reported:
12/11/18 11:18

Volatile Organic Compounds by EPA Method 8260B - Quality Control

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

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

Project Number: [none]
Project Manager: Brandon Bruns

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
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Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

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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6899 Pecos St, Unit C
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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	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1812136 - EPA 5030 Water MS

Matrix Spike (1812136-MS1)		Source: 1812102-01			Prepared & Analyzed: 12/10/18					
Benzene	42.4	1.0	ug/l	33.3	11.4	92.9	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			
<hr/>										
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		101	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	13.5		"	13.3		101	21-167			
<hr/>										
Matrix Spike Dup (1812136-MSD1)		Source: 1812102-01			Prepared & Analyzed: 12/10/18					
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	
<hr/>										
Surrogate: 1,2-Dichloroethane-d4	12.8		"	13.2		97.3	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	21-167			

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6899 Pecos St, Unit C
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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	
		Limit	Units		Result	%REC	Limits	RPD	Limit	Notes

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

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 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

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

Summit Scientific

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

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	77.3	70-130
Magnesium	358	5.00	"	500	71.7	70-130
Sodium	350	5.00	"	500	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	9180	8.97	20
Magnesium	855	5.00	"	760	11.8	20
Sodium	50.9	5.00	"	42.7	17.4	20

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
Magnesium	1350	5.00	"	500	760	117	70-130
Sodium	616	5.00	"	500	42.7	115	70-130

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 Bruns

Reported:
12/11/18 11:18

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

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

Batch 1812138 - General Preparation

LCS (1812138-BS1)

Prepared & Analyzed: 12/10/18

pH	9.2		pH Units	9.18	100	95-105
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Duplicate (1812138-DUP1)

Source: 1812109-04

Prepared & Analyzed: 12/10/18

pH	8.4		pH Units	8.4		0.119	20
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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
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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

Specific Conductance by EPA Method 120.1 - Quality Control
Summit Scientific

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

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