

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 23, 2023

Jacob Whritenour
Tasman Geosciences
6855 W. 119th Ave.
Broomfield, CO 80020
RE: Noble - Ries 3-19
Work Order #2301265

Enclosed are the results of analyses for samples received by Summit Scientific on 01/13/23 17:57. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott Sheely For Paul Shrewsbury
President



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Ries 3-19

Project Number: UWRWE-A2747-ABN

Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL01-F@3'	2301265-01	Soil	01/13/23 11:40	01/13/23 17:57
FL01-G@3'	2301265-02	Soil	01/13/23 11:55	01/13/23 17:57
FL01-I@3'	2301265-03	Soil	01/13/23 12:15	01/13/23 17:57

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Summit Scientific

2301265

S₂

4653 Table Mountain Drive ♦ Golden, Colorado 80403

303-277-9310

Page 1 of 1

Client: Noble / Tasman Project Manager: Jacob Whritenour Invoice: Cole Moore
 Address: 6855 W. 119th Ave E-Mail: JWhritenour@tasman-geo.com
 City/State/Zip: Broomfield/ CO/ 80020
 Phone: 503-915-3046 Project Name: RIES 3-19
 Sampler Name: Martin Medeiros Project Number: UWR WE- A274-7-ABN

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested					Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	VOC-915	TPH-915	PAH-915	Boron-HWS	pH, EC, SAR		
1	FL01-F@3'	1/13/23	11:40	2			X			X				X	X	X	X	X	pH, EC, SAR by saturated paste
2	FL01-G@3'	↓	11:55	↓										↓	↓	↓	↓		
3	FL01-I@3'	↓	12:15	↓										↓	↓	↓	↓		
4														↓	↓	↓	↓		
5																			
6																			
7																			
8																			
9																			
10																			

Relinquished by: <i>Martin Medeiros</i> Martin Medeiros	Date/Time: 1/13/23 14:30	Received by: Tasman's Lock Box	Date/Time: 1/13/23 14:30	Turn Around Time (Check) Same Day _____ 72 hours 24 hours _____ Standard <input checked="" type="checkbox"/> 48 hours _____	Notes:
Relinquished by: Tasman's Lock Box	Date/Time: 1/13/23 1757	Received by: <i>[Signature]</i>	Date/Time: 1/13/23 1757	Sample Integrity:	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Temperature Upon Receipt: 8.4 Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

S₂

Sample Receipt Checklist

S2 Work Order# 2301265

Client: Noble Fesman Client Project ID: Ries 3-19

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other Airbill #: _____

Matrix (Check all that apply) Air Soil/Solid Water Other

Temp (°C) 8.4 Thermometer # 1

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? ⁽¹⁾ NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>ON ICE</u>
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<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"/>	
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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"/>	
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"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling)? ⁽¹⁾ Note the type of preservative in the comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
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.

[Signature]
Custodian Printed Name

1-13-23 1757
Date/Time



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

FL01-F@3'
2301265-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGA0340	01/16/23	01/16/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0304	76.0 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0389	97.4 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0390	97.4 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGA0339	01/16/23	01/17/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	13.5	108 %		30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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FL01-F@3'
2301265-01 (Soil)

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PAH by EPA Method 8270D SIM

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGA0375	01/17/23	01/18/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0215	64.6 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0151	45.3 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.140	0.0100	mg/L	1	BGA0460	01/19/23	01/21/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Broomfield CO, 80020

Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

FL01-F@3'
2301265-01 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	83.9	0.0539	mg/L dry	1	BGA0455	01/18/23	01/20/23	EPA 6020B	
Magnesium	42.8	0.0539	"	"	"	"	"	"	
Sodium	136	0.0539	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	3.01	0.00100	units	1	BGA0530	01/22/23	01/22/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	92.8		%	1	BGA0464	01/19/23	01/19/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.74	0.0100	mmhos/cm	1	BGA0470	01/19/23	01/19/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **01/13/23 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.90		pH Units	1	BGA0469	01/19/23	01/19/23	EPA 9045D	

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Reported:
01/23/23 14:12

FL01-G@3'
2301265-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGA0340	01/16/23	01/16/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0268	67.0 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0394	98.6 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0406	101 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGA0339	01/16/23	01/17/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	12.1	97.0 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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FL01-G@3'
2301265-02 (Soil)

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PAH by EPA Method 8270D SIM

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGA0375	01/17/23	01/18/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0205	61.5 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0147	44.0 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.246	0.0100	mg/L	1	BGA0460	01/19/23	01/21/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

FL01-G@3'
2301265-02 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	108	0.0564	mg/L dry	1	BGA0455	01/18/23	01/20/23	EPA 6020B	
Magnesium	54.1	0.0564	"	"	"	"	"	"	
Sodium	250	0.0564	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	4.90	0.00100	units	1	BGA0530	01/22/23	01/22/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	88.6		%	1	BGA0464	01/19/23	01/19/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.33	0.0100	mmhos/cm	1	BGA0470	01/19/23	01/19/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **01/13/23 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.94		pH Units	1	BGA0469	01/19/23	01/19/23	EPA 9045D	

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FL01-I@3'
2301265-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGA0340	01/16/23	01/16/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0228	56.9 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0371	92.8 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0369	92.3 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGA0339	01/16/23	01/17/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	12.6	101 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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Reported:
01/23/23 14:12

FL01-I@3'
2301265-03 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGA0375	01/17/23	01/18/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	0.00671	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	0.00678	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	0.00526	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	0.0158	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	0.0154	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0238	71.3 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0190	56.9 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.293	0.0100	mg/L	1	BGA0460	01/19/23	01/21/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

FL01-I@3'
2301265-03 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	54.3	0.0586	mg/L dry	1	BGA0455	01/18/23	01/20/23	EPA 6020B	
Magnesium	34.8	0.0586	"	"	"	"	"	"	
Sodium	282	0.0586	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	7.34	0.00100	units	1	BGA0530	01/22/23	01/22/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	85.3		%	1	BGA0464	01/19/23	01/19/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.13	0.0100	mmhos/cm	1	BGA0470	01/19/23	01/19/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **01/13/23 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.88		pH Units	1	BGA0469	01/19/23	01/19/23	EPA 9045D	

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Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

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 BGA0340 - EPA 5030 Soil MS

Blank (BGA0340-BLK1)

Prepared & Analyzed: 01/16/23

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
1,2,4-Trimethylbenzene	ND	0.0050	"							
1,3,5-Trimethylbenzene	ND	0.0050	"							
Naphthalene	ND	0.0038	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0308		"	0.0400		77.0	50-150			
Surrogate: Toluene-d8	0.0426		"	0.0400		107	50-150			
Surrogate: 4-Bromofluorobenzene	0.0411		"	0.0400		103	50-150			

LCS (BGA0340-BS1)

Prepared & Analyzed: 01/16/23

Benzene	0.0712	0.0020	mg/kg	0.0750		95.0	70-130			
Toluene	0.0801	0.0050	"	0.0750		107	70-130			
Ethylbenzene	0.0926	0.0050	"	0.0750		123	70-130			
m,p-Xylene	0.185	0.010	"	0.150		123	70-130			
o-Xylene	0.0920	0.0050	"	0.0750		123	70-130			
1,2,4-Trimethylbenzene	0.0973	0.0050	"	0.0750		130	70-130			
1,3,5-Trimethylbenzene	0.0941	0.0050	"	0.0750		126	70-130			
Naphthalene	0.0771	0.0038	"	0.0750		103	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0346		"	0.0400		86.6	50-150			
Surrogate: Toluene-d8	0.0423		"	0.0400		106	50-150			
Surrogate: 4-Bromofluorobenzene	0.0360		"	0.0400		89.9	50-150			

Matrix Spike (BGA0340-MS1)

Source: 2301243-01

Prepared & Analyzed: 01/16/23

Benzene	0.0639	0.0020	mg/kg	0.0750	ND	85.2	70-130			
Toluene	0.0658	0.0050	"	0.0750	ND	87.7	70-130			
Ethylbenzene	0.0865	0.0050	"	0.0750	ND	115	70-130			
m,p-Xylene	0.180	0.010	"	0.150	ND	120	70-130			
o-Xylene	0.0840	0.0050	"	0.0750	ND	112	70-130			
1,2,4-Trimethylbenzene	0.0930	0.0050	"	0.0750	ND	124	70-130			
1,3,5-Trimethylbenzene	0.0971	0.0050	"	0.0750	ND	129	70-130			
Naphthalene	0.0746	0.0038	"	0.0750	ND	99.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0248		"	0.0400		62.1	50-150			
Surrogate: Toluene-d8	0.0364		"	0.0400		90.9	50-150			
Surrogate: 4-Bromofluorobenzene	0.0347		"	0.0400		86.8	50-150			

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Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

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 BGA0340 - EPA 5030 Soil MS

Matrix Spike Dup (BGA0340-MSD1)	Source: 2301243-01			Prepared & Analyzed: 01/16/23						
Benzene	0.0670	0.0020	mg/kg	0.0750	ND	89.3	70-130	4.72	30	
Toluene	0.0680	0.0050	"	0.0750	ND	90.7	70-130	3.41	30	
Ethylbenzene	0.0854	0.0050	"	0.0750	ND	114	70-130	1.26	30	
m,p-Xylene	0.180	0.010	"	0.150	ND	120	70-130	0.450	30	
o-Xylene	0.0884	0.0050	"	0.0750	ND	118	70-130	5.01	30	
1,2,4-Trimethylbenzene	0.0969	0.0050	"	0.0750	ND	129	70-130	4.14	30	
1,3,5-Trimethylbenzene	0.0978	0.0050	"	0.0750	ND	130	70-130	0.708	30	
Naphthalene	0.0812	0.0038	"	0.0750	ND	108	70-130	8.39	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0278</i>		<i>"</i>	<i>0.0400</i>		<i>69.4</i>	<i>50-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0391</i>		<i>"</i>	<i>0.0400</i>		<i>97.7</i>	<i>50-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0352</i>		<i>"</i>	<i>0.0400</i>		<i>88.1</i>	<i>50-150</i>			

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Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch BGA0339 - EPA 3550A

Blank (BGA0339-BLK1)

Prepared: 01/16/23 Analyzed: 01/17/23

C10-C28 (DRO)	ND	50	mg/kg							
C28-C36 (ORO)	ND	50	"							
Surrogate: <i>o</i> -Terphenyl	13.9		"	12.5		111	30-150			

LCS (BGA0339-BS1)

Prepared: 01/16/23 Analyzed: 01/17/23

C10-C28 (DRO)	453	50	mg/kg	500		90.6	70-130			
Surrogate: <i>o</i> -Terphenyl	12.5		"	12.5		100	30-150			

Matrix Spike (BGA0339-MS1)

Source: 2301243-01

Prepared: 01/16/23 Analyzed: 01/17/23

C10-C28 (DRO)	483	50	mg/kg	500	16.2	93.4	70-130			
Surrogate: <i>o</i> -Terphenyl	14.1		"	12.5		113	30-150			

Matrix Spike Dup (BGA0339-MSD1)

Source: 2301243-01

Prepared: 01/16/23 Analyzed: 01/17/23

C10-C28 (DRO)	474	50	mg/kg	500	16.2	91.5	70-130	1.96	20	
Surrogate: <i>o</i> -Terphenyl	12.1		"	12.5		96.9	30-150			

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Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

PAH by EPA Method 8270D SIM - Quality Control
Summit Scientific

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

Batch BGA0375 - EPA 5030 Soil MS

Blank (BGA0375-BLK1)

Prepared & Analyzed: 01/17/23

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
1-Methylnaphthalene	ND	0.00500	"							
2-Methylnaphthalene	ND	0.00500	"							
Surrogate: 2-Methylnaphthalene-d10	0.0361		"	0.0333	108	40-150				
Surrogate: Fluoranthene-d10	0.0296		"	0.0333	88.7	40-150				

LCS (BGA0375-BS1)

Prepared & Analyzed: 01/17/23

Acenaphthene	0.0469	0.00500	mg/kg	0.0333	141	31-137			QLCS-02
Anthracene	0.0416	0.00500	"	0.0333	125	30-120			QLCS-02
Benzo (a) anthracene	0.0310	0.00500	"	0.0333	93.1	30-120			
Benzo (a) pyrene	0.0341	0.00500	"	0.0333	102	30-120			
Benzo (b) fluoranthene	0.0381	0.00500	"	0.0333	114	30-120			
Benzo (k) fluoranthene	0.0433	0.00500	"	0.0333	130	30-120			QLCS-02
Chrysene	0.0349	0.00500	"	0.0333	105	30-120			
Dibenz (a,h) anthracene	0.0353	0.00500	"	0.0333	106	30-120			
Fluoranthene	0.0428	0.00500	"	0.0333	128	30-120			QLCS-02
Fluorene	0.0472	0.00500	"	0.0333	142	30-120			QLCS-02
Indeno (1,2,3-cd) pyrene	0.0312	0.00500	"	0.0333	93.5	30-120			
Pyrene	0.0349	0.00500	"	0.0333	105	35-142			
1-Methylnaphthalene	0.0386	0.00500	"	0.0333	116	35-142			
2-Methylnaphthalene	0.0373	0.00500	"	0.0333	112	35-142			
Surrogate: 2-Methylnaphthalene-d10	0.0364		"	0.0333	109	40-150			
Surrogate: Fluoranthene-d10	0.0424		"	0.0333	127	40-150			

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Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BGA0375 - EPA 5030 Soil MS

Matrix Spike (BGA0375-MS1)	Source: 2301243-01			Prepared & Analyzed: 01/17/23							
Acenaphthene	0.0261	0.00500	mg/kg	0.0333	ND	78.4	31-137				
Anthracene	0.0244	0.00500	"	0.0333	ND	73.1	30-120				
Benzo (a) anthracene	0.0203	0.00500	"	0.0333	ND	61.0	30-120				
Benzo (a) pyrene	0.0215	0.00500	"	0.0333	ND	64.6	30-120				
Benzo (b) fluoranthene	0.0221	0.00500	"	0.0333	ND	66.2	30-120				
Benzo (k) fluoranthene	0.0238	0.00500	"	0.0333	ND	71.3	30-120				
Chrysene	0.0208	0.00500	"	0.0333	ND	62.5	30-120				
Dibenz (a,h) anthracene	0.0230	0.00500	"	0.0333	ND	68.9	30-120				
Fluoranthene	0.0242	0.00500	"	0.0333	ND	72.7	30-120				
Fluorene	0.0276	0.00500	"	0.0333	ND	82.8	30-120				
Indeno (1,2,3-cd) pyrene	0.0197	0.00500	"	0.0333	ND	59.0	30-120				
Pyrene	0.0236	0.00500	"	0.0333	ND	70.8	35-142				
1-Methylnaphthalene	0.0233	0.00500	"	0.0333	ND	70.0	15-130				
2-Methylnaphthalene	0.0245	0.00500	"	0.0333	ND	73.4	15-130				
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0238</i>		<i>"</i>	<i>0.0333</i>		<i>71.3</i>	<i>40-150</i>				
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0248</i>		<i>"</i>	<i>0.0333</i>		<i>74.3</i>	<i>40-150</i>				

Matrix Spike Dup (BGA0375-MSD1)	Source: 2301243-01			Prepared & Analyzed: 01/17/23							
Acenaphthene	0.0293	0.00500	mg/kg	0.0333	ND	87.9	31-137	11.5	30		
Anthracene	0.0263	0.00500	"	0.0333	ND	78.9	30-120	7.69	30		
Benzo (a) anthracene	0.0225	0.00500	"	0.0333	ND	67.5	30-120	10.0	30		
Benzo (a) pyrene	0.0220	0.00500	"	0.0333	ND	66.0	30-120	2.13	30		
Benzo (b) fluoranthene	0.0246	0.00500	"	0.0333	ND	73.8	30-120	10.7	30		
Benzo (k) fluoranthene	0.0251	0.00500	"	0.0333	ND	75.3	30-120	5.53	30		
Chrysene	0.0220	0.00500	"	0.0333	ND	66.1	30-120	5.55	30		
Dibenz (a,h) anthracene	0.0228	0.00500	"	0.0333	ND	68.3	30-120	0.829	30		
Fluoranthene	0.0261	0.00500	"	0.0333	ND	78.4	30-120	7.47	30		
Fluorene	0.0283	0.00500	"	0.0333	ND	84.8	30-120	2.42	30		
Indeno (1,2,3-cd) pyrene	0.0210	0.00500	"	0.0333	ND	62.9	30-120	6.40	30		
Pyrene	0.0249	0.00500	"	0.0333	ND	74.8	35-142	5.45	30		
1-Methylnaphthalene	0.0251	0.00500	"	0.0333	ND	75.4	15-130	7.46	50		
2-Methylnaphthalene	0.0244	0.00500	"	0.0333	ND	73.1	15-130	0.438	50		
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0246</i>		<i>"</i>	<i>0.0333</i>		<i>73.8</i>	<i>40-150</i>				
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0273</i>		<i>"</i>	<i>0.0333</i>		<i>81.9</i>	<i>40-150</i>				

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control
Summit Scientific

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

Batch BGA0460 - EPA 3050B

Blank (BGA0460-BLK1)

Prepared: 01/19/23 Analyzed: 01/21/23

Boron ND 0.0100 mg/L

LCS (BGA0460-BS1)

Prepared: 01/19/23 Analyzed: 01/21/23

Boron 5.78 0.0100 mg/L 5.00 116 80-120

Duplicate (BGA0460-DUP1)

Source: 2301265-01

Prepared: 01/19/23 Analyzed: 01/21/23

Boron 0.137 0.0100 mg/L 0.140 2.11 20

Matrix Spike (BGA0460-MS1)

Source: 2301265-01

Prepared: 01/19/23 Analyzed: 01/21/23

Boron 5.83 0.0100 mg/L 5.00 0.140 114 75-125

Matrix Spike Dup (BGA0460-MSD1)

Source: 2301265-01

Prepared: 01/19/23 Analyzed: 01/21/23

Boron 5.83 0.0100 mg/L 5.00 0.140 114 75-125 0.0582 25

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Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGA0455 - General Preparation

Blank (BGA0455-BLK1)

Prepared: 01/18/23 Analyzed: 01/20/23

Calcium	ND	0.0500	mg/L wet							
Magnesium	ND	0.0500	"							
Sodium	ND	0.0500	"							

LCS (BGA0455-BS1)

Prepared: 01/18/23 Analyzed: 01/20/23

Calcium	5.61	0.0500	mg/L wet	5.00	112	70-130				
Magnesium	5.07	0.0500	"	5.00	101	70-130				
Sodium	4.92	0.0500	"	5.00	98.3	70-130				

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 6855 W. 119th Ave.
 Broomfield CO, 80020

Project: Noble - Ries 3-19

Project Number: UWRWE-A2747-ABN

Project Manager: Jacob Whritenour

Reported:
 01/23/23 14:12

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 BGA0464 - General Preparation

Duplicate (BGA0464-DUP1)

Source: 2301217-01

Prepared & Analyzed: 01/19/23

% Solids	98.8		%		98.5			0.266	20	
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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction - Quality Control
Summit Scientific

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

Batch BGA0470 - General Preparation

Blank (BGA0470-BLK1)

Prepared & Analyzed: 01/19/23

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BGA0470-BS1)

Prepared & Analyzed: 01/19/23

Specific Conductance (EC) 0.144 0.0100 mmhos/cm 0.150 95.8 95-105

Duplicate (BGA0470-DUP1)

Source: 2301241-01

Prepared & Analyzed: 01/19/23

Specific Conductance (EC) 0.308 0.0100 mmhos/cm 0.311 1.03 20

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Ries 3-19

Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGA0469 - General Preparation

LCS (BGA0469-BS1)

Prepared & Analyzed: 01/19/23

pH 9.18 pH Units 9.18 100 95-105

Duplicate (BGA0469-DUP1)

Source: 2301241-01

Prepared & Analyzed: 01/19/23

pH 7.77 pH Units 7.81 0.513 20

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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
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Ries 3-19
Project Number: UWRWE-A2747-ABN
Project Manager: Jacob Whritenour

Reported:
01/23/23 14:12

Notes and Definitions

QLCS-02 The spike recovery was outside acceptance limits for this analyte indicating a potential high bias.

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