

# REMEDIAL EXCAVATION REPORT AND NO FURTHER ACTION REQUEST

**LAPP A22-689**

COGCC SPILL TRACKING # 470541  
COGCC REMEDIATION # Not Assigned

Prepared for:



2115 117th Avenue  
Greeley, CO 80631

Prepared by:



6855 W 119th Avenue  
Broomfield, CO 80020

February 14, 2020

Mr. Howard Aamold  
Noble Energy Inc.  
2115 117th Avenue  
Greeley, CO 80631

Subject:       **Remedial Excavation Report and No Further Action Request**  
***Lapp A22-689***  
API #: 05-123-42821  
Spill/Release Point ID #: 470541  
Remediation Project #: Not Assigned  
SWSW S13 T6N R64W  
Weld County, Colorado

Dear Mr. Aamold,

Below please find a copy of the above referenced Remedial Excavation Report (Report) for the Lapp A22-689 site (Site) in Weld County, Colorado. The text below describes environmental sampling conducted at the Site between January 13, 2020 and January 24, 2020 (Excavation) by Tasman Geosciences, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble).

## **Introduction**

The purpose of this document is to describe the hydro-excavation of impacted soil performed by 1888 Industrial Services and subsequent soil sampling activities conducted by Tasman as part of the Excavation. The activities described below were performed in response to the discovery of suspected impacted material near the Lapp A22-689 wellhead on January 7, 2020.

## **Facility Background**

The Site is located approximately 6.7 miles east-northeast of the city of Greeley in Weld County, Colorado, as shown on Figure 1. The Site is surrounded by non-crop land, and the legal description is the southwest ¼ of the southwest ¼ of Section 13, Township 6 North, Range 64 West, of the 6<sup>th</sup> Principal Meridian. The Site is located on terrain that slopes gradually to the south and is approximately 0.1 miles east of Weld County Road 59, with coordinates of 40.480941°, -104.506398°.

As reported on the initial Form 19 submitted on January 4, 2020, the Lapp A22-689 flowline released approximately two barrels of fluids outside containment during operations. The facility was shut in as a result. The COGCC subsequently issued Spill/Release Point ID Number 470541 for this event. The approximate release location is shown on Figure 2.

## **Remedial Excavation Field Activities**

Remedial excavation activities were conducted at the Site between January 13, 2020 and January 24, 2020 to remove impacted soil near the Lapp A22-689 wellhead. Tasman collected a total of 67 soil

samples during excavation activities. All soil samples were field screened for volatile organic compounds (VOC) with a photoionization detector (PID) and standard headspace soil sampling techniques. A total of 34 soil samples were collected along the sidewalls of the excavation between approximately three feet below ground surface (ft. bgs) and 13 ft. bgs, and ten soil samples collected from the base of the excavation between approximately four ft. bgs and 14 ft. bgs, and were submitted to Summit Scientific Laboratory in Golden, Colorado (Summit). Soil samples were submitted for laboratory analyses of benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, and total petroleum hydrocarbons-gasoline range organics (TPH-GRO), using United States Environmental Protection Agency (USEPA) Method 8260B, as well as total petroleum hydrocarbons-diesel range organics (TPH-DRO) using USEPA Method 8015. Additionally, 23 of the sidewall soil samples and four of the base soil samples were analyzed for Sodium Adsorption Ratio (SAR) using USEPA Method 6020 / United States Department of Agriculture (USDA) Method 606(2,3A), Specific Conductance (EC), and pH via American Public Health Association (APHA)/American Society for Testing Materials (ASTM)/USEPA methods. Soil analytical data is summarized in Table 1, the excavation extent and soil sample locations are illustrated on Figure 2 and laboratory analytical data is illustrated on Figure 3. The laboratory analytical reports are included in Attachment A.

During hydro-excavation activities, a total of approximately 148 cubic yards of impacted material were removed for off-site disposal under signed Noble waste manifests. One hundred and twenty-eight cubic yards were transported to the Republic Services Tower Landfill in Commerce City, Colorado, and 20 cubic yards were transported to Waste Management – Ault Hauling in Ault, Colorado.

### **Conclusion**

Based upon field and laboratory analytical data collected during Excavation activities, vadose zone petroleum hydrocarbon soil impacts above applicable COGCC Table 910-1 standards have been successfully removed.

### **No Further Action Request**

Based on field and laboratory data collected during remedial activities presented herein, a No Further Action (NFA) designation is being requested from the COGCC for this project.

## Remarks

The discussion and conclusions contained in this report represent the professional opinions of Tasman Geosciences, Inc. These opinions are based on currently available information and are arrived at in accordance with currently accepted geologic and engineering practices.

Please contact me at (720) 431-1190 or at [bbruns@tasman-geo.com](mailto:bbruns@tasman-geo.com) if you require additional information or have questions regarding this project.

Sincerely,  
Tasman Geosciences, Inc.



Brandon Bruns, PE  
Project Manager

## Attachments:

Table 1 – Soil Analytical Data

Figure 1 – Site Location Map

Figure 2 – Remedial Excavation Sample Locations Map

Figure 3 – Excavation Soil Analytical Results Map (01/13/2020 – 01/24/2020)

Attachment A – Laboratory Analytical Data Reports

# **TABLES**

**TABLE 1**  
**SOIL ANALYTICAL DATA**  
**NOBLE ENERGY, INC. - LAPP A22-689**

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
<b>COGCC Standard</b>		<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>	
FS01@7'	01/13/20	0.0050	0.10	0.038	0.36	0.039	<50	66
FS02@6'	01/13/20	<b>0.23</b>	6.0	0.50	13	0.31	<50	280
FS03@4' <sup>(2)</sup>	01/13/20	<b>2.0</b>	26 <sup>(1)</sup>	5.6	50 <sup>(1)</sup>	3.9	<b>1,700 <sup>(1)</sup></b>	<b>420</b>
SS01@3'	01/13/20	<0.0020	0.042	0.024	0.23	0.024	<50	76
SS01@6'	01/13/20	<0.0020	<0.0050	<0.0050	0.019	<0.010	<50	<50
SS02@3'	01/13/20	0.068	0.79	0.25	1.7	0.12	<50	150
SS02@6'	01/13/20	0.012	0.23	0.070	0.59	0.049	<50	<50
SS03@3'	01/13/20	0.040	0.49	0.10	0.85	0.048	<50	<50
SS03@5' <sup>(2)</sup>	01/13/20	0.042	0.58	0.17	1.5	0.091	<50	62
SS04@3'	01/13/20	<b>21</b>	<b>190 <sup>(1)</sup></b>	27	<b>230</b>	6.6	<b>6,600</b>	<b>2,000</b>
SS05@3'	01/13/20	<b>23</b>	<b>190 <sup>(1)</sup></b>	27	<b>210 <sup>(1)</sup></b>	6.8	<b>5,500</b>	<b>570</b>
SS05@5'	01/13/20	<b>3.6</b>	30	4.9	45	0.43	<b>1,600</b>	<b>400</b>
SS06@3'	01/13/20	0.0030	0.060	0.025	0.21	0.016	<50	160
SS06@6'	01/13/20	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
FS04@6'	01/15/20	0.023	0.24	0.042	0.41	0.031	<50	<50
SS07@3'	01/15/20	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS07@5'	01/15/20	0.0058	0.015	<0.0050	0.034	<0.010	<50	<50
FS02@7'	01/16/20	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
FS03@8' <sup>(2)</sup>	01/16/20	<b>26</b>	<b>270 <sup>(1)</sup></b>	31	<b>280 <sup>(1)</sup></b>	6.3	<b>4,800</b>	<b>6,000</b>
FS03@9'	01/17/20	0.0095	0.022	<0.0050	0.12	<0.010	<50	<50
SS13@3'	01/17/20	<0.0020	0.0054	<0.0050	0.029	<0.010	<50	<50
SS13@7'	01/17/20	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS14@3'	01/17/20	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS14@7'	01/17/20	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS15@3'	01/20/20	0.047	0.097	0.010	0.11	<0.010	<50	<50
SS15@8'	01/20/20	0.0041	0.014	<0.0050	0.041	<0.010	<50	<50
FS05@9'	01/20/20	<b>0.39</b>	0.57	0.11	0.70	0.053	<50	<b>570</b>
SS20@3'	01/22/20	<0.0020	0.013	<0.0050	0.031	<0.010	<50	<50
SS20@9'	01/22/20	<b>5.3</b>	16 <sup>(1)</sup>	0.28	16	0.14	340	130
SS21@3'	01/22/20	0.017	0.15	0.029	0.28	0.023	<50	<50
SS21@9'	01/22/20	<b>0.88</b>	4.6	0.93	8.4	0.12	<b>610</b>	<b>160</b>
SS22@3'	01/22/20	0.0094	0.084	0.0095	0.26	0.017	<50	<50
SS22@9' <sup>(2)</sup>	01/22/20	<b>26</b>	<b>96 <sup>(1)</sup></b>	16	130	0.15	<b>3,500</b>	<b>5,000</b>
FS06@10'	01/22/20	0.15	0.49	0.099	0.91	0.080	<50	290
SS23@3'	01/23/20	<0.0020	0.0050	<0.0050	0.014	<0.010	<50	<50
SS23@10'	01/23/20	0.0075	0.019	<0.0050	0.031	<0.010	<50	<50
SS24@3'	01/23/20	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS24@10'	01/23/20	0.0035	0.015	<0.0050	0.027	<0.010	<5	<50
SS25@3'	01/23/20	0.032	0.14	0.017	0.19	0.011	<50	<50
SS25@9'	01/23/20	0.022	0.042	<0.0050	0.036	<0.010	<50	<50
FS07@14'	01/24/20	0.0057	0.027	0.0075	0.060	<0.010	<50	<50
SS24@13'	01/24/20	0.0062	0.021	0.0077	0.063	<0.010	<50	<50

**TABLE 1**  
**SOIL ANALYTICAL DATA**  
**NOBLE ENERGY, INC. - LAPP A22-689**

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
<b>COGCC Standard</b>		<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>	
SS25@13'	01/24/20	0.019	0.037	0.0062	0.046	<0.010	<50	<50

Soil Sample ID	Date	SAR	pH	EC (mmhos/cm)
<b>COGCC Standard</b>		<b>&lt;12</b>	<b>6-9</b>	<b>&lt;4mmhos/cm</b>
FS01@7'	01/13/20	0.192	8.37	0.557
FS02@6'	01/13/20	0.339	8.46	0.579
FS03@4'	01/13/20	0.911	8.45	0.708
SS01@3'	01/13/20	0.442	8.46	0.728
SS01@6'	01/13/20	0.170	8.38	0.902
SS02@3'	01/13/20	0.856	8.61	0.481
SS02@6'	01/13/20	0.327	8.51	0.536
SS03@3'	01/13/20	0.364	8.45	0.480
SS03@5'	01/13/20	0.211	8.39	0.466
SS04@3'	01/13/20	4.06	8.94	2.37
SS05@3'	01/13/20	0.183	8.18	0.678
SS05@5'	01/13/20	0.276	8.32	0.580
SS06@3'	01/13/20	0.257	8.53	0.381
SS06@6'	01/13/20	0.184	8.39	0.624
FS04@'6	01/15/20	0.228	8.57	0.437
SS07@3'	01/15/20	0.356	8.45	0.338
SS07@5'	01/15/20	0.343	8.61	0.298
SS13@3'	01/17/20	1.00	8.26	0.731
SS14@3'	01/17/20	0.610	8.60	0.309
SS15@3'	01/20/20	0.410	7.99	0.468
SS20@3'	01/22/20	0.483	7.65	0.522
SS21@3'	01/22/20	0.629	8.24	0.496
SS22@3'	01/22/20	0.196	8.48	0.279
SS23@3'	01/23/20	0.570	8.32	0.431
SS24@3'	01/23/20	0.54	8.02	1.29
SS25@3'	01/23/20	0.370	8.59	0.257

**TABLE 1**  
**SOIL ANALYTICAL DATA**  
**NOBLE ENERGY, INC. - LAPP A22-689**

**Notes:**

COGCC = Colorado Oil and Gas Conservation Commission

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

EC = Specific Conductivity

SAR = Sodium Adsorption Ratio

mmhos/cm = Millimhos per centimeter

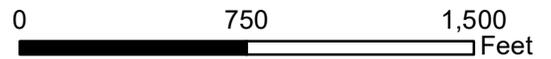
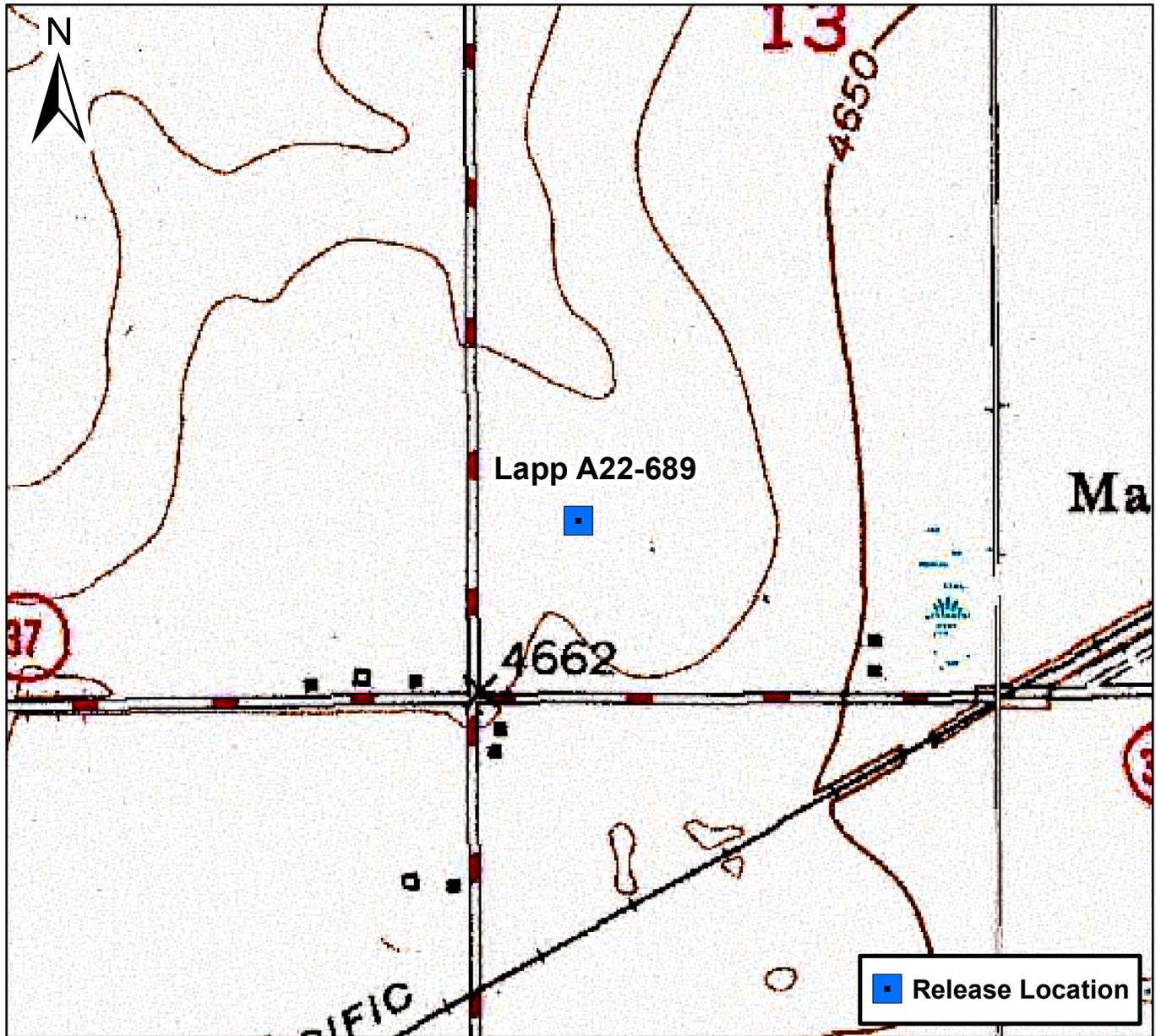
< = Analytical result is less than the indicated laboratory reporting limit

Soil standards referenced from COGCC Table 910-1

**Highlighted results are equal to or exceed the COGCC Table 910-1 standard**

1. The laboratory has assigned an E flag to this result meaning "the concentration indicated for this analyte is an estimated value above the calibration range of the instrument."
2. The laboratory has assigned an S-02 flag to the surrogate 4-Bromofluorobenzene in this sample, meaning "the surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract."

## **FIGURES**



### Figure 1

Site Location Map  
 Lapp A22-689  
 SWSW S13 T6N R64W  
 Weld County, Colorado





**Legend**

- Soil Sample Location (Collected via GPS Trimble)
- Soil Sample Location – Not Submitted for Laboratory Analysis (Collected via GPS Trimble)
- Release Location
- Lapp A22-689 Wellhead
- Excavation Access – Not Sampled (Collected via GPS Trimble)
- Noble Flowline (Collected via GPS Trimble)
- Excavation Extent (Collected via GPS Trimble)

**Notes**

1) All locations are approximate unless otherwise noted  
GPS – Global Positioning System

0 ft. 5 ft. 10 ft.

Image Source: Google Earth; Google 2016

DATE:	02/04/2020
DESIGNED BY:	JW
DRAWN BY:	KC

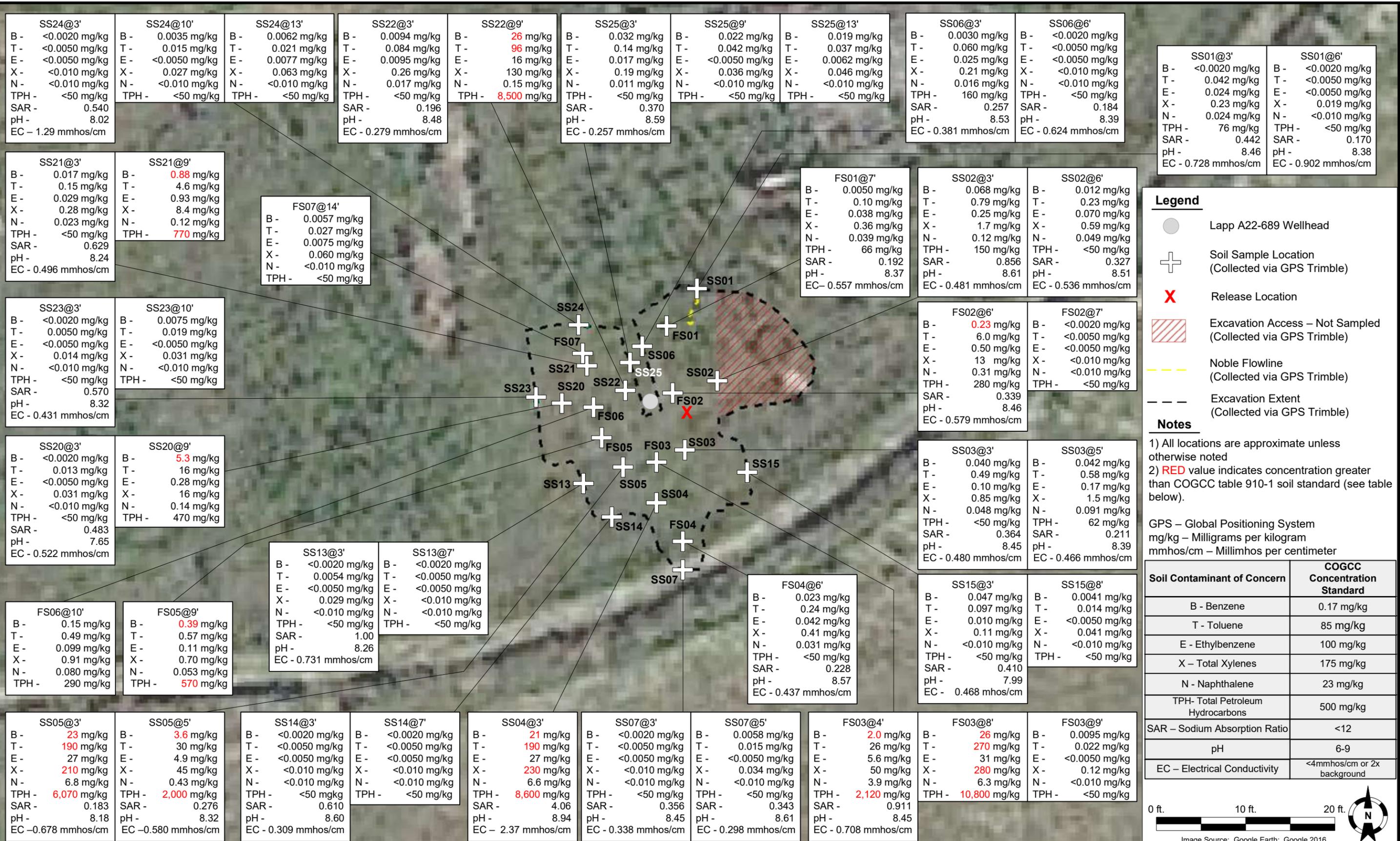
**TASMAN**  
GEOSCIENCES

Tasman Geosciences, Inc.  
6855 W 119<sup>th</sup> Avenue  
Broomfield, CO, 80020

**Noble Energy, Inc. – DJ Basin**  
**Lapp A22-689**  
SWSW, Section 13, Township 6 North, Range 64 West  
Weld County, Colorado

Site Overview Map

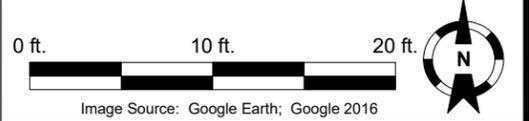
FIGURE  
2



SS01@3'		SS01@6'	
B -	<0.0020 mg/kg	B -	<0.0020 mg/kg
T -	0.042 mg/kg	T -	<0.0050 mg/kg
E -	0.024 mg/kg	E -	<0.0050 mg/kg
X -	0.23 mg/kg	X -	<0.010 mg/kg
N -	0.024 mg/kg	N -	<0.010 mg/kg
TPH -	76 mg/kg	TPH -	<50 mg/kg
SAR -	0.442	SAR -	0.170
pH -	8.46	pH -	8.38
EC -	0.728 mmhos/cm	EC -	0.902 mmhos/cm

- Legend**
- Lapp A22-689 Wellhead
  - ⊕ Soil Sample Location (Collected via GPS Trimble)
  - ✗ Release Location
  - ▨ Excavation Access – Not Sampled (Collected via GPS Trimble)
  - Noble Flowline (Collected via GPS Trimble)
  - - - Excavation Extent (Collected via GPS Trimble)
- Notes**
- 1) All locations are approximate unless otherwise noted
  - 2) **RED** value indicates concentration greater than COGCC table 910-1 soil standard (see table below).
- GPS – Global Positioning System  
 mg/kg – Milligrams per kilogram  
 mmhos/cm – Millimhos per centimeter

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



DATE: 02/05/2020  
 DESIGNED BY: JW  
 DRAWN BY: KC



**Noble Energy, Inc. – DJ Basin**  
**Lapp A22-689**  
 SWSW, Section 13, Township 6 North, Range 64 West  
 Weld County, Colorado

Excavation Soil Analytical Results Map (01/13/2020 - 01/24/2020) **FIGURE 3**

# **ATTACHMENT A**

## **LABORATORY ANALYTICAL DATA REPORT**

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 14, 2020

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Lapp A22-689

Work Order #2001140

Enclosed are the results of analyses for samples received by Summit Scientific on 01/13/20 17:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

Muri Premer For Paul Shrewsbury  
President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FS01@7'	2001140-01	Soil	01/13/20 14:20	01/13/20 17:15
FS02@6'	2001140-02	Soil	01/13/20 14:25	01/13/20 17:15
FS03@4'	2001140-03	Soil	01/13/20 14:30	01/13/20 17:15
SS01@3'	2001140-04	Soil	01/13/20 14:35	01/13/20 17:15
SS01@6'	2001140-05	Soil	01/13/20 14:40	01/13/20 17:15
SS02@3'	2001140-06	Soil	01/13/20 14:45	01/13/20 17:15
SS02@6'	2001140-07	Soil	01/13/20 14:50	01/13/20 17:15
SS03@3'	2001140-08	Soil	01/13/20 14:55	01/13/20 17:15
SS03@5'	2001140-09	Soil	01/13/20 15:00	01/13/20 17:15
SS04@3'	2001140-10	Soil	01/13/20 15:05	01/13/20 17:15
SS05@3'	2001140-11	Soil	01/13/20 15:10	01/13/20 17:15
SS05@5'	2001140-12	Soil	01/13/20 15:15	01/13/20 17:15
SS06@3'	2001140-13	Soil	01/13/20 15:20	01/13/20 17:15
SS06@6'	2001140-14	Soil	01/13/20 15:25	01/13/20 17:15

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.*

2001140.1

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Client: Noble / Tasman Geosciences Project Manager: Brandon Bruns, Invoice: Jacob Evans  
 Address: 6855 W 119th Ave. E-Mail: Bbruns@tasman-geo.com  
 City/State/Zip: Broomfield / CO / 80020  
 Phone: 303-487-1228 Project Name: Lapp A22-689  
 Sampler Name: Tanner Cook Project Number: RC: 425891476 Acct #: 515315

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	\$260 BTEX	\$260B GBTEXN	\$015 DRO	pH, EC, SAR		
1	FS01 @ 7'	1/13/20	1420	1			X			X				X	X	X		
2	FS02 @ 6'		1425															
3	FS03 @ 4'		1430															
4	SS01 @ 3'		1435															
5	SS01 @ 6'		1440															
6	SS02 @ 3'		1445															
7	SS02 @ 6'		1450															
8	SS03 @ 3'		1455															
9	SS03 @ 5'		1500															
10	SS04 @ 3'		1505															

Relinquished by: <i>[Signature]</i> Date/Time: 1/13/20 1715	Received by: Tasman's Lock Box Date/Time: 1/13/20 1715	<b>Turn Around Time (Check)</b> Same Day <input checked="" type="checkbox"/> 72 hours — 24 hours — Standard — 48 hours — <b>Sample Integrity:</b> Temperature Upon Receipt: 5.8 Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	<b>Notes:</b>
Relinquished by: Tasman's Lock Box Date/Time: 01/13/2020 1730	Received by: <i>[Signature]</i> Date/Time: 01/13/2020 1730		
Relinquished by:	Received by:		

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Client: Noble / Tasman Geosciences	Project Manager: Brandon Bruns, Invoice: Jacob Evans
Address: 6855 W 119th Ave.	E-Mail: Bbruns@tasman-geo.com
City/State/Zip: Broomfield / CO/ 80020	
Phone: 303-487-1228	Project Name: Lapp A22-689
Sampler Name: Tanner Cook	Project Number: RC: 425891476    Acct #: 515315

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR		
1	SS05 @ 3'	1/13/20	1510	1			X			X				X	X	X		
2	SS05 @ 5'	↓	1515	↓			↓			↓				↓	↓	↓		
3	SS06 @ 3'		1520															
4	SS06 @ 6'	↓	1525	↓														
5																		
6																		
7																		
8																		
9																		
10																		

Relinquished by: <i>Tanner Cook</i>	Date/Time: 1/13/20 1715	Received by: Tasman's Lock Box	Date/Time: 1/13/20 1715	Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 hours ___ 24 hours ___ Standard ___ 48 hours ___	Notes:
Relinquished by: Tasman's Lock Box	Date/Time: 6/13/2020 1720	Received by: <i>[Signature]</i>	Date/Time: 01/13/2020 1930	Sample Integrity: Temperature Upon Receipt: <u>5.8</u>	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Samples Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

### Sample Receipt Checklist

S2 Work Order 2001140

Client: Nobis/Tasman Client Project ID: Lapp AZZ-689

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

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

Temp (°C)	5.8
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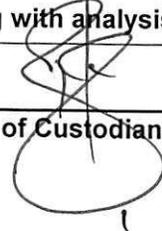
Thermometer ID: 61857155-K

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

Additional Comments (if any):

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

  
Custodian Printed Name or Initials

  
Signature of Custodian

01/13/2020  
Date/Time 1802



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/14/20 17:23

**FS01@7'**  
**2001140-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>0.0050</b>	0.0020		mg/kg	1	2001192	01/13/20	01/14/20	EPA 8260B	
<b>Toluene</b>	<b>0.10</b>	0.0050		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.038</b>	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.36</b>	0.010		"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.039</b>	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		90.7 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		114 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>C10-C28 (DRO)</b>	<b>66</b>	50		mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		93.9 %		30-150		"	"	"	"	

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

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Calcium</b>	<b>5330</b>	11.4		mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>458</b>	5.69		"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**FS01@7'**  
**2001140-01 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>54.4</b>	5.69	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.192</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>87.8</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.37</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.557</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**FS02@6'**  
**2001140-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.23</b>	0.0020	mg/kg	1	2001192	01/13/20	01/14/20	EPA 8260B	
<b>Toluene</b>	<b>6.0</b>	0.050	"	10	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.50</b>	0.0050	"	1	"	"	"	"	
<b>Xylenes (total)</b>	<b>13</b>	0.10	"	10	"	"	"	"	
<b>Naphthalene</b>	<b>0.31</b>	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		135 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		141 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>280</b>	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		93.0 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>7900</b>	12.3	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>401</b>	6.15	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**FS02@6'**  
**2001140-02 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>114</b>	6.15	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.339</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>81.3</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.46</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.579</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**FS03@4'**  
**2001140-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>2.0</b>	0.020	mg/kg	10	2001192	01/13/20	01/14/20	EPA 8260B	
<b>Toluene</b>	<b>26</b>	0.050	"	"	"	"	"	"	E
<b>Ethylbenzene</b>	<b>5.6</b>	0.050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>50</b>	0.10	"	"	"	"	"	"	E
<b>Naphthalene</b>	<b>3.9</b>	0.10	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1700</b>	50	"	"	"	"	"	"	E

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		119 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		115 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		269 %	21-167		"	"	"	"	S-02

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>420</b>	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		95.5 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>2600</b>	12.3	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>341</b>	6.14	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/14/20 17:23

**FS03@4'**  
**2001140-03 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>186</b>	6.14	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.911</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>81.4</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.45</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.708</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS01@3'**  
**2001140-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	2001192	01/13/20	01/13/20	EPA 8260B	
<b>Toluene</b>	<b>0.042</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.024</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.23</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.024</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	93.5 %	23-173	"	"	"	"	"	"	
Surrogate: Toluene-d8	108 %	20-170	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	104 %	21-167	"	"	"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>76</b>	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	92.8 %	30-150	"	"	"	"	"	"	

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

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>2440</b>	11.2	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>418</b>	5.61	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS01@3'**  
**2001140-04 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>89.7</b>	5.61	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.442</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.2</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.46</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.728</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**SS01@6'**  
**2001140-05 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	2001192	01/13/20	01/13/20	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.019</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		108 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		92.3 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>28800</b>	11.2	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>728</b>	5.60	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS01@6'**  
**2001140-05 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>107</b>	5.60	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.170</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.3</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.38</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.902</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS02@3'**  
**2001140-06 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.068</b>	0.0020	mg/kg	1	2001192	01/13/20	01/13/20	EPA 8260B	
<b>Toluene</b>	<b>0.79</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.25</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>1.7</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.12</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		167 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>150</b>	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		94.0 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>3120</b>	11.4	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>373</b>	5.68	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS02@3'**  
**2001140-06 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>190</b>	5.68	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.856</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>88.1</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.61</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.481</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS02@6'**  
**2001140-07 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.012</b>	0.0020	mg/kg	1	2001192	01/13/20	01/14/20	EPA 8260B	
<b>Toluene</b>	<b>0.23</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.070</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.59</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.049</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		120 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		104 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>3680</b>	11.9	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>466</b>	5.97	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS02@6'**  
**2001140-07 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>79.1</b>	5.97	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.327</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>83.8</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.51</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.536</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS03@3'**  
**2001140-08 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.040</b>	0.0020	mg/kg	1	2001192	01/13/20	01/14/20	EPA 8260B	
<b>Toluene</b>	<b>0.49</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.10</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.85</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.048</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		125 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		105 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>3760</b>	11.8	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>537</b>	5.92	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS03@3'**  
**2001140-08 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>90.1</b>	5.92	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.364</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>84.5</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.45</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.480</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS03@5'**  
**2001140-09 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.042</b>	0.0020	mg/kg	1	2001192	01/13/20	01/14/20	EPA 8260B	
<b>Toluene</b>	<b>0.58</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.17</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>1.5</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.091</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		191 %	21-167		"	"	"	"	S-02

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>62</b>	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>2820</b>	11.4	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>411</b>	5.72	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**SS03@5'**  
**2001140-09 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>45.4</b>	5.72	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.211</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>87.4</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.39</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.466</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**SS04@3'**  
**2001140-10 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	21	0.20	mg/kg	100	2001192	01/13/20	01/14/20	EPA 8260B	
Toluene	190	0.50	"	"	"	"	"	"	E
Ethylbenzene	27	0.50	"	"	"	"	"	"	
Xylenes (total)	230	1.0	"	"	"	"	"	"	
Naphthalene	6.6	1.0	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	6600	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		111 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		139 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	2000	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.8 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	3800	11.4	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
Magnesium	354	5.72	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS04@3'**  
**2001140-10 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>977</b>	5.72	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>4.06</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>87.4</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.94</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>2.37</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**SS05@3'**  
**2001140-11 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	23	0.20	mg/kg	100	2001192	01/13/20	01/14/20	EPA 8260B	
Toluene	190	0.50	"	"	"	"	"	"	E
Ethylbenzene	27	0.50	"	"	"	"	"	"	
Xylenes (total)	210	1.0	"	"	"	"	"	"	E
Naphthalene	6.8	1.0	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	5500	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		110 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		156 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	570	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		99.6 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	3150	12.0	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
Magnesium	313	5.98	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**SS05@3'**  
**2001140-11 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>40.3</b>	5.98	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.183</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>83.6</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.18</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.678</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS05@5'**  
**2001140-12 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	3.6	0.20	mg/kg	100	2001192	01/13/20	01/14/20	EPA 8260B	
Toluene	30	0.50	"	"	"	"	"	"	
Ethylbenzene	4.9	0.50	"	"	"	"	"	"	
Xylenes (total)	45	1.0	"	"	"	"	"	"	
Naphthalene	0.43	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	1600	50	"	100	"	"	"	"	

Date Sampled: **01/13/20 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		110 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		119 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	400	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 15:15**

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

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

Date Sampled: **01/13/20 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	3590	11.4	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
Magnesium	391	5.68	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS05@5'**  
**2001140-12 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>65.2</b>	5.68	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.276</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>88.1</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.32</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.580</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**SS06@3'**  
**2001140-13 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.0030</b>	0.0020	mg/kg	1	2001192	01/13/20	01/14/20	EPA 8260B	
<b>Toluene</b>	<b>0.060</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.025</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.21</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.016</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		125 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>160</b>	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		113 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>2990</b>	11.4	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
<b>Magnesium</b>	<b>312</b>	5.69	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS06@3'**  
**2001140-13 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>55.2</b>	5.69	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.257</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>87.8</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.53</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.381</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**SS06@6'**  
**2001140-14 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/13/20 15:25**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	2001192	01/13/20	01/14/20	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: **01/13/20 15:25**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		99.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		110 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/13/20 15:25**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	2001191	01/13/20	01/14/20	EPA 8015M	

Date Sampled: **01/13/20 15:25**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		105 %	30-150		"	"	"	"	

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

Date Sampled: **01/13/20 15:25**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Calcium	11000	11.2	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B	
Magnesium	435	5.60	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**SS06@6'**  
**2001140-14 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>72.4</b>	5.60	mg/kg dry	1	2001190	01/13/20	01/14/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/13/20 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.184</b>	0.100	units	1	2001199	01/14/20	01/14/20	Calculation	

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

Date Sampled: **01/13/20 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.3</b>		%	1	2001185	01/13/20	01/14/20	Calculation	
<b>pH</b>	<b>8.39</b>		pH Units	"	2001189	01/13/20	01/13/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/13/20 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.624</b>	0.0100	mmhos/cm	1	2001188	"	01/13/20	EPA 120.1	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**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 2001192 - EPA 5030 Soil MS**

**Blank (2001192-BLK1)**

Prepared: 01/13/20 Analyzed: 01/14/20

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	0.0338		"	0.0400		84.6	23-173			
Surrogate: Toluene-d8	0.0434		"	0.0400		108	20-170			
Surrogate: 4-Bromofluorobenzene	0.0445		"	0.0400		111	21-167			

**LCS (2001192-BS1)**

Prepared: 01/13/20 Analyzed: 01/14/20

Benzene	0.121	0.0020	mg/kg	0.100		121	70-130			
Toluene	0.112	0.0050	"	0.100		112	70-130			
Ethylbenzene	0.101	0.0050	"	0.100		101	70-130			
m,p-Xylene	0.209	0.010	"	0.200		105	70-130			
o-Xylene	0.0931	0.0050	"	0.100		93.1	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0327		"	0.0400		81.8	23-173			
Surrogate: Toluene-d8	0.0440		"	0.0400		110	20-170			
Surrogate: 4-Bromofluorobenzene	0.0432		"	0.0400		108	21-167			

**Matrix Spike (2001192-MS1)**

Source: 2001139-03

Prepared: 01/13/20 Analyzed: 01/14/20

Benzene	0.119	0.0020	mg/kg	0.100	ND	119	70-130			
Toluene	0.111	0.0050	"	0.100	ND	111	70-130			
Ethylbenzene	0.0981	0.0050	"	0.100	ND	98.1	70-130			
m,p-Xylene	0.205	0.010	"	0.200	ND	102	70-130			
o-Xylene	0.0918	0.0050	"	0.100	ND	91.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0348		"	0.0400		86.9	23-173			
Surrogate: Toluene-d8	0.0449		"	0.0400		112	20-170			
Surrogate: 4-Bromofluorobenzene	0.0429		"	0.0400		107	21-167			

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

**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 2001192 - EPA 5030 Soil MS**

**Matrix Spike Dup (2001192-MSD1)**

Source: 2001139-03

Prepared: 01/13/20 Analyzed: 01/14/20

Benzene	0.124	0.0020	mg/kg	0.100	ND	124	70-130	3.41	30
Toluene	0.115	0.0050	"	0.100	ND	115	70-130	3.37	30
Ethylbenzene	0.0992	0.0050	"	0.100	ND	99.2	70-130	1.13	30
m,p-Xylene	0.206	0.010	"	0.200	ND	103	70-130	0.803	30
o-Xylene	0.0917	0.0050	"	0.100	ND	91.7	70-130	0.0981	30
Surrogate: 1,2-Dichloroethane-d4	0.0352		"	0.0400		87.9	23-173		
Surrogate: Toluene-d8	0.0448		"	0.0400		112	20-170		
Surrogate: 4-Bromofluorobenzene	0.0434		"	0.0400		108	21-167		

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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**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 2001191 - EPA 3550A**

**Blank (2001191-BLK1)**

Prepared: 01/13/20 Analyzed: 01/14/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001191-BS1)**

Prepared: 01/13/20 Analyzed: 01/14/20

C10-C28 (DRO) 579 50 mg/kg 500 116 70-130

**Matrix Spike (2001191-MS1)**

**Source: 2001139-03**

Prepared: 01/13/20 Analyzed: 01/14/20

C10-C28 (DRO) 503 50 mg/kg 500 13.1 98.0 70-130

**Matrix Spike Dup (2001191-MSD1)**

**Source: 2001139-03**

Prepared: 01/13/20 Analyzed: 01/14/20

C10-C28 (DRO) 488 50 mg/kg 500 13.1 94.9 70-130 3.08 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**Soluble Nutrients by EPA 6020/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 2001190 - General Preparation**

**Blank (2001190-BLK1)**

Prepared: 01/13/20 Analyzed: 01/14/20

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

**LCS (2001190-BS1)**

Prepared: 01/13/20 Analyzed: 01/14/20

Calcium	564	10.0	mg/kg wet	500		113	70-130			
Magnesium	632	5.00	"	500		126	70-130			
Sodium	592	5.00	"	500		118	70-130			

**Duplicate (2001190-DUP1)**

Source: 2001138-01

Prepared: 01/13/20 Analyzed: 01/14/20

Calcium	12400	14.0	mg/kg dry		10900			13.5	20	
Magnesium	703	6.98	"		650			7.88	20	
Sodium	5080	6.98	"		4700			7.68	20	

**Matrix Spike (2001190-MS1)**

Source: 2001138-01

Prepared: 01/13/20 Analyzed: 01/14/20

Calcium	11500	14.0	mg/kg dry	698	10900	92.2	70-130			
Magnesium	1460	6.98	"	698	650	116	70-130			
Sodium	5530	6.98	"	698	4700	119	70-130			

**Matrix Spike Dup (2001190-MSD1)**

Source: 2001138-01

Prepared: 01/13/20 Analyzed: 01/14/20

Calcium	11500	14.0	mg/kg dry	698	10900	95.9	70-130	0.223	25	
Magnesium	1500	6.98	"	698	650	122	70-130	2.88	25	
Sodium	5560	6.98	"	698	4700	123	70-130	0.550	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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

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

**Summit Scientific**

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

**Batch 2001185 - General Preparation**

<b>Duplicate (2001185-DUP1)</b>		<b>Source: 2001137-01</b>		Prepared: 01/13/20 Analyzed: 01/14/20	
% Solids	72.4	%		72.1	0.415 20

**Batch 2001189 - General Preparation**

<b>LCS (2001189-BS1)</b>				Prepared & Analyzed: 01/13/20	
pH	9.14	pH Units	9.18	99.6	95-105
<b>Duplicate (2001189-DUP1)</b>		<b>Source: 2001138-01</b>		Prepared & Analyzed: 01/13/20	
pH	7.68	pH Units	7.76	1.04	20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/14/20 17:23

**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 2001188 - General Preparation**

**Blank (2001188-BLK1)**

Prepared & Analyzed: 01/13/20

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (2001188-BS1)**

Prepared & Analyzed: 01/13/20

Specific Conductance (EC) 0.739 0.0100 mmhos/cm 0.750 98.5 90-110

**Duplicate (2001188-DUP1)**

**Source: 2001138-01**

Prepared & Analyzed: 01/13/20

Specific Conductance (EC) 10.1 0.0100 mmhos/cm 9.86 2.16 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/14/20 17:23

### 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.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 17, 2020

Brandon Bruns  
Tasman Geosciences  
6855 W. 119th Ave.  
Broomfield, CO 80020  
RE: Noble - Lapp A22-689  
Work Order #2001171

Enclosed are the results of analyses for samples received by Summit Scientific on 01/15/20 17:42. 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', written in a cursive style.

Paul Shrewsbury  
President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FS04@6'	2001171-01	Soil	01/15/20 16:40	01/15/20 17:42
SS07@3'	2001171-02	Soil	01/15/20 16:45	01/15/20 17:42
SS07@5'	2001171-03	Soil	01/15/20 16:50	01/15/20 17:42

Summit Scientific

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2001171

# Summit Scientific

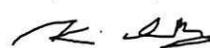
S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310 ♦ 303-374-5933 (f)

Client: Noble Enegry Project Manager: Brandon Bruns, Invoice: Howard Aamold  
Address: E-Mail: bbruns@tasman-geo.com  
City/State/Zip: Project Name: Lapp A22-689  
Phone: Sampler Name: Kevin Chritz Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions		
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	GBTEX	TPH-DRO	PH/EC/SAR				
1	FS04@6'	1/15/2020	16:40	1			X			X				X	X	X			
2	SS07@3'	1/15/2020	16:45	1			X			X				X	X	X			
3	SS07@5'	1/15/2020	16:50	1			X			X				X	X	X			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Relinquished by: 	Date/Time: 1/15/2020 17:16	Received by: Tasman Box	Date/Time: 1/15/2020 17:16	<b>Turn Around Time</b> (Check) Same Day <input checked="" type="checkbox"/> 72 hours ___ 24 hours ___ Standard ___ 48 hours ___ <b>Sample Integrity:</b> Temperature Upon Receipt: <u>55</u> Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	<b>Notes:</b>
Relinquished by: Tasman Box	Date/Time: 1/15/2020 1730	Received by: 	Date/Time: 01/15/2020 1730		
Relinquished by:	Date/Time:	Received by: 	Date/Time:		

**Sample Receipt Checklist**

S2 Work Order 2001171

Client: NOBLE ENERGY Client Project ID: LAPP A22-689

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

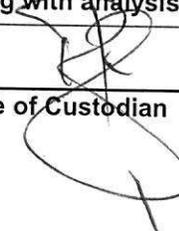
Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Temp (°C)	5.5
-----------	-----

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? 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):				
<b><sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.</b>				

RZ  
Custodian Printed Name or Initials

  
Signature of Custodian

1/15/20  
Date/Time



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

**FS04@6'**  
**2001171-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>0.023</b>	0.0020		mg/kg	1	2001225	01/15/20	01/15/20	EPA 8260B	
<b>Toluene</b>	<b>0.24</b>	0.0050		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.042</b>	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.41</b>	0.010		"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.031</b>	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		89.6 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		119 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		123 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	2001226	01/15/20	01/15/20	EPA 8015M	

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		105 %		30-150		"	"	"	"	

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

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Calcium</b>	<b>17000</b>	11.2		mg/kg dry	1	2001235	01/16/20	01/16/20	EPA 6020B	
<b>Magnesium</b>	<b>545</b>	5.59		"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/17/20 08:44

**FS04@6'**  
**2001171-01 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>111</b>	5.59	mg/kg dry	1	2001235	01/16/20	01/16/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.228</b>	0.100	units	1	2001245	01/17/20	01/17/20	Calculation	

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

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.4</b>		%	1	2001228	01/16/20	01/16/20	Calculation	
<b>pH</b>	<b>8.57</b>		pH Units	"	2001224	01/15/20	01/15/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/15/20 16:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.437</b>	0.0100	mmhos/cm	1	2001223	01/15/20	01/15/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

**SS07@3'**  
**2001171-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/15/20 16:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	2001225	01/15/20	01/15/20	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: **01/15/20 16:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		85.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		117 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/15/20 16:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001226	01/15/20	01/15/20	EPA 8015M	

Date Sampled: **01/15/20 16:45**

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

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

Date Sampled: **01/15/20 16:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	<b>2290</b>	11.0	mg/kg dry	1	2001235	01/16/20	01/16/20	EPA 6020B	
Magnesium	<b>346</b>	5.51	"	"	"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

**SS07@3'**  
**2001171-02 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>69.1</b>	5.51	mg/kg dry	1	2001235	01/16/20	01/16/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/15/20 16:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.356</b>	0.100	units	1	2001245	01/17/20	01/17/20	Calculation	

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

Date Sampled: **01/15/20 16:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>90.7</b>		%	1	2001228	01/16/20	01/16/20	Calculation	
<b>pH</b>	<b>8.45</b>		pH Units	"	2001224	01/15/20	01/15/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/15/20 16:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.338</b>	0.0100	mmhos/cm	1	2001223	01/15/20	01/15/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

**SS07@5'**  
**2001171-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.0058</b>	0.0020	mg/kg	1	2001225	01/15/20	01/15/20	EPA 8260B	
<b>Toluene</b>	<b>0.015</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.034</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		115 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		111 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001226	01/15/20	01/15/20	EPA 8015M	

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		113 %	30-150		"	"	"	"	

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

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>1970</b>	10.8	mg/kg dry	1	2001235	01/16/20	01/16/20	EPA 6020B	
<b>Magnesium</b>	<b>310</b>	5.41	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

**SS07@5'**  
**2001171-03 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>62.0</b>	5.41	mg/kg dry	1	2001235	01/16/20	01/16/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.343</b>	0.100	units	1	2001245	01/17/20	01/17/20	Calculation	

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

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>92.5</b>		%	1	2001228	01/16/20	01/16/20	Calculation	
<b>pH</b>	<b>8.61</b>		pH Units	"	2001224	01/15/20	01/15/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/15/20 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.298</b>	0.0100	mmhos/cm	1	2001223	01/15/20	01/15/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/17/20 08:44

### 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 2001225 - EPA 5030 Soil MS

##### Blank (2001225-BLK1)

Prepared: 01/15/20 Analyzed: 01/16/20

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	0.0413		"	0.0400		103	23-173				
Surrogate: Toluene-d8	0.0445		"	0.0400		111	20-170				
Surrogate: 4-Bromofluorobenzene	0.0416		"	0.0400		104	21-167				

##### LCS (2001225-BS1)

Prepared: 01/15/20 Analyzed: 01/16/20

Benzene	0.0890	0.0020	mg/kg	0.100		89.0	70-130				
Toluene	0.0981	0.0050	"	0.100		98.1	70-130				
Ethylbenzene	0.0749	0.0050	"	0.100		74.9	70-130				
m,p-Xylene	0.143	0.010	"	0.200		71.4	70-130				
o-Xylene	0.0723	0.0050	"	0.100		72.3	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0336		"	0.0400		83.9	23-173				
Surrogate: Toluene-d8	0.0419		"	0.0400		105	20-170				
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400		97.7	21-167				

##### Matrix Spike (2001225-MS1)

Source: 2001169-01

Prepared: 01/15/20 Analyzed: 01/16/20

Benzene	0.0871	0.0020	mg/kg	0.100	ND	87.1	70-130				
Toluene	0.0977	0.0050	"	0.100	ND	97.7	70-130				
Ethylbenzene	0.0755	0.0050	"	0.100	ND	75.5	70-130				
m,p-Xylene	0.145	0.010	"	0.200	ND	72.5	70-130				
o-Xylene	0.0743	0.0050	"	0.100	ND	74.3	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0339		"	0.0400		84.8	23-173				
Surrogate: Toluene-d8	0.0423		"	0.0400		106	20-170				
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400		97.0	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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/17/20 08:44

**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 2001225 - EPA 5030 Soil MS**

**Matrix Spike Dup (2001225-MSD1)**

Source: 2001169-01

Prepared: 01/15/20 Analyzed: 01/16/20

Benzene	0.0857	0.0020	mg/kg	0.100	ND	85.7	70-130	1.56	30
Toluene	0.0948	0.0050	"	0.100	ND	94.8	70-130	3.05	30
Ethylbenzene	0.0736	0.0050	"	0.100	ND	73.6	70-130	2.66	30
m,p-Xylene	0.140	0.010	"	0.200	ND	70.1	70-130	3.36	30
o-Xylene	0.0724	0.0050	"	0.100	ND	72.4	70-130	2.49	30
Surrogate: 1,2-Dichloroethane-d4	0.0337		"	0.0400		84.2	23-173		
Surrogate: Toluene-d8	0.0421		"	0.0400		105	20-170		
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.1	21-167		

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/17/20 08:44

**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 2001226 - EPA 3550A**

**Blank (2001226-BLK1)**

Prepared: 01/15/20 Analyzed: 01/16/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001226-BS1)**

Prepared: 01/15/20 Analyzed: 01/16/20

C10-C28 (DRO) 477 50 mg/kg 500 95.4 70-130

**Matrix Spike (2001226-MS1)**

Source: 2001169-01

Prepared: 01/15/20 Analyzed: 01/16/20

C10-C28 (DRO) 492 50 mg/kg 500 7.42 97.0 70-130

**Matrix Spike Dup (2001226-MSD1)**

Source: 2001169-01

Prepared: 01/15/20 Analyzed: 01/16/20

C10-C28 (DRO) 472 50 mg/kg 500 7.42 92.9 70-130 4.22 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/17/20 08:44

**Soluble Nutrients by EPA 6020/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 2001235 - General Preparation**

**Blank (2001235-BLK1)**

Prepared & Analyzed: 01/16/20

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

**LCS (2001235-BS1)**

Prepared & Analyzed: 01/16/20

Calcium	612	10.0	mg/kg wet	500		122	70-130		
Magnesium	606	5.00	"	500		121	70-130		
Sodium	587	5.00	"	500		117	70-130		

**Duplicate (2001235-DUP1)**

Source: 2001149-04

Prepared & Analyzed: 01/16/20

Calcium	10100	13.2	mg/kg dry		9880			2.67	20
Magnesium	952	6.58	"		986			3.45	20
Sodium	33.6	6.58	"		32.1			4.38	20

**Matrix Spike (2001235-MS1)**

Source: 2001149-04

Prepared & Analyzed: 01/16/20

Calcium	10600	13.2	mg/kg dry	658	9880	111	70-130		
Magnesium	1730	6.58	"	658	986	113	70-130		
Sodium	799	6.58	"	658	32.1	116	70-130		

**Matrix Spike Dup (2001235-MSD1)**

Source: 2001149-04

Prepared & Analyzed: 01/16/20

Calcium	10600	13.2	mg/kg dry	658	9880	112	70-130	0.0874	25
Magnesium	1660	6.58	"	658	986	103	70-130	3.67	25
Sodium	790	6.58	"	658	32.1	115	70-130	1.03	25

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

**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 2001224 - General Preparation**

**LCS (2001224-BS1)**

Prepared & Analyzed: 01/15/20

pH 9.14 pH Units 9.18 99.6 95-105

**Duplicate (2001224-DUP1)**

Source: 2001169-01

Prepared & Analyzed: 01/15/20

pH 8.26 pH Units 8.24 0.242 20

**Batch 2001228 - General Preparation**

**Duplicate (2001228-DUP1)**

Source: 2001171-01

Prepared & Analyzed: 01/16/20

% Solids 89.2 % 89.4 0.224 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/17/20 08:44

**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 2001223 - General Preparation**

**Blank (2001223-BLK1)**

Prepared & Analyzed: 01/15/20

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (2001223-BS1)**

Prepared & Analyzed: 01/15/20

Specific Conductance (EC) 0.822 0.0100 mmhos/cm 0.750 110 90-110

**Duplicate (2001223-DUP1)**

**Source: 2001169-01**

Prepared & Analyzed: 01/15/20

Specific Conductance (EC) 0.626 0.0100 mmhos/cm 0.658 5.06 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 08:44

### 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 17, 2020

Brandon Bruns  
Tasman Geosciences  
6855 W. 119th Ave.  
Broomfield, CO 80020  
RE: Noble - Lapp A22-689  
Work Order #2001186

Enclosed are the results of analyses for samples received by Summit Scientific on 01/16/20 17:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury  
President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 06:08

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FS02@7'	2001186-01	Soil	01/16/20 14:00	01/16/20 17:25
FS03@8'	2001186-02	Soil	01/16/20 14:08	01/16/20 17:25

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.*

# Summit Scientific

S<sub>2</sub>

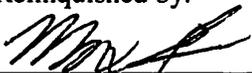
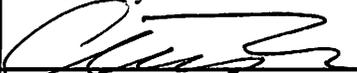
200186

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Page 1 of 4

Client: Noble / Tasman Geosciences Project Manager: Brandon Bruns, Invoice: ~~Jacob Evans~~ Howard Arnold  
Address: 6855 1<sup>st</sup> Ave. E-Mail: Bbruns@tasman-geo.com  
City/State/Zip: Broomfield / CO / 80020  
Phone: 303-487-1228 Project Name: Lapp A22-689  
Sampler Name: Max Lanza Project Number: N/A

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested				Special Instructions	
					HCl	HNO <sub>3</sub>	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO		pH, EC, SAR
1	FS02 @ 7'	1/16/20	1400	1			X			X			X	X			
2	FS03 @ 8'	↓	1408	↓			X			X			X	X			
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished by: 	Date/Time: 1/16/20 1225	Received by: Tasman's Lock Box	Date/Time: 1/16/20 1625	<b>Turn Around Time</b> (Check) Same Day <input checked="" type="checkbox"/> 72 hours ___ 24 hours ___ Standard ___ 48 hours ___ <b>Sample Integrity:</b> Temperature Upon Receipt: 5.5 Samples Intact: Yes No	<b>Notes:</b>
Relinquished by: Tasman's Lock Box	Date/Time: 1-16-20 1725	Received by: 	Date/Time: 1-16-20 1725		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

### Sample Receipt Checklist

S2 Work Order 2001186

Client: Tasman/Noble Client Project ID: LAPP A22-689

Shipped Via: D/P.U./FedEx/UPS/USPS/Other \_\_\_\_\_ Airbill #: \_\_\_\_\_

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

Temp (°C)	5-5
-----------	-----

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.	<input checked="" type="checkbox"/>			on ice
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input checked="" type="checkbox"/>			Same Day
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

AT  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

1-14-20  
Date/Time



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 06:08

**FS02@7'**  
**2001186-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/16/20 14:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	2001241	01/16/20	01/16/20	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: **01/16/20 14:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		82.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		120 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		116 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/16/20 14:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	2001242	01/16/20	01/16/20	EPA 8015M	

Date Sampled: **01/16/20 14:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		96.0 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 06:08

**FS03@8'**  
**2001186-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/16/20 14:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	26	0.20	mg/kg	100	2001241	01/16/20	01/17/20	EPA 8260B	
Toluene	270	0.50	"	"	"	"	"	"	E
Ethylbenzene	31	0.50	"	"	"	"	"	"	
Xylenes (total)	280	1.0	"	"	"	"	"	"	E
Naphthalene	6.3	1.0	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	4800	50	"	"	"	"	"	"	

Date Sampled: **01/16/20 14:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		121 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		117 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		171 %	21-167		"	"	"	"	S-02

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/16/20 14:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	6000	50	mg/kg	1	2001242	01/16/20	01/16/20	EPA 8015M	

Date Sampled: **01/16/20 14:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		142 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/17/20 06:08

### 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 2001241 - EPA 5030 Soil MS

##### Blank (2001241-BLK1)

Prepared: 01/16/20 Analyzed: 01/17/20

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	0.0300		"	0.0400		75.0	23-173				
Surrogate: Toluene-d8	0.0470		"	0.0400		118	20-170				
Surrogate: 4-Bromofluorobenzene	0.0482		"	0.0400		120	21-167				

##### LCS (2001241-BS1)

Prepared: 01/16/20 Analyzed: 01/17/20

Benzene	0.112	0.0020	mg/kg	0.100		112	70-130				
Toluene	0.0879	0.0050	"	0.100		87.9	70-130				
Ethylbenzene	0.0977	0.0050	"	0.100		97.7	70-130				
m,p-Xylene	0.205	0.010	"	0.200		103	70-130				
o-Xylene	0.0912	0.0050	"	0.100		91.2	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0302		"	0.0400		75.6	23-173				
Surrogate: Toluene-d8	0.0470		"	0.0400		117	20-170				
Surrogate: 4-Bromofluorobenzene	0.0460		"	0.0400		115	21-167				

##### Matrix Spike (2001241-MS1)

Source: 2001186-01

Prepared: 01/16/20 Analyzed: 01/17/20

Benzene	0.0882	0.0020	mg/kg	0.100	ND	88.2	70-130				
Toluene	0.0948	0.0050	"	0.100	ND	94.8	70-130				
Ethylbenzene	0.0990	0.0050	"	0.100	ND	99.0	70-130				
m,p-Xylene	0.211	0.010	"	0.200	ND	105	70-130				
o-Xylene	0.0966	0.0050	"	0.100	ND	96.6	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0318		"	0.0400		79.5	23-173				
Surrogate: Toluene-d8	0.0479		"	0.0400		120	20-170				
Surrogate: 4-Bromofluorobenzene	0.0464		"	0.0400		116	21-167				

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/17/20 06:08

**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 2001241 - EPA 5030 Soil MS**

**Matrix Spike Dup (2001241-MSD1)**

Source: 2001186-01

Prepared: 01/16/20 Analyzed: 01/17/20

Benzene	0.0898	0.0020	mg/kg	0.100	ND	89.8	70-130	1.75	30
Toluene	0.100	0.0050	"	0.100	ND	100	70-130	5.72	30
Ethylbenzene	0.0997	0.0050	"	0.100	ND	99.7	70-130	0.694	30
m,p-Xylene	0.210	0.010	"	0.200	ND	105	70-130	0.556	30
o-Xylene	0.0963	0.0050	"	0.100	ND	96.3	70-130	0.342	30
Surrogate: 1,2-Dichloroethane-d4	0.0309		"	0.0400		77.2	23-173		
Surrogate: Toluene-d8	0.0482		"	0.0400		121	20-170		
Surrogate: 4-Bromofluorobenzene	0.0452		"	0.0400		113	21-167		

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 06:08

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 2001242 - EPA 3550A**

**Blank (2001242-BLK1)**

Prepared & Analyzed: 01/16/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001242-BS1)**

Prepared: 01/16/20 Analyzed: 01/17/20

C10-C28 (DRO) 491 50 mg/kg 500 98.3 70-130

**Matrix Spike (2001242-MS1)**

Source: 2001184-02

Prepared: 01/16/20 Analyzed: 01/17/20

C10-C28 (DRO) 493 50 mg/kg 500 99.8 78.7 70-130

**Matrix Spike Dup (2001242-MSD1)**

Source: 2001184-02

Prepared: 01/16/20 Analyzed: 01/17/20

C10-C28 (DRO) 507 50 mg/kg 500 99.8 81.4 70-130 2.69 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/17/20 06:08

### 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.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 20, 2020

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Lapp A22-689

Work Order #2001199

Enclosed are the results of analyses for samples received by Summit Scientific on 01/17/20 17:34. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury

President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/20/20 07:26

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FS03@9'	2001199-01	Soil	01/17/20 14:50	01/17/20 17:34
SS13@3'	2001199-02	Soil	01/17/20 14:55	01/17/20 17:34
SS13@7'	2001199-03	Soil	01/17/20 15:00	01/17/20 17:34
SS14@3'	2001199-04	Soil	01/17/20 15:05	01/17/20 17:34
SS14@7'	2001199-05	Soil	01/17/20 15:10	01/17/20 17:34

Summit Scientific

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200199

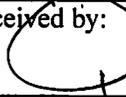
# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310 ♦ 303-374-5933 (f)

Client: Noble Enegry Project Manager: Brandon Bruns, Invoice: Howard Aamold  
Address: E-Mail: bbruns@tasman-geo.com  
City/State/Zip: Project Name: Lapp A22-689  
Phone: Sampler Name: Kevin Chritz Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions		
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	GBTEXN	TPH - DRO	pH / EC / SAR				
1	FS03@9'	1/17/2020	14:50	1			X			X			X	X	X				
2	SS13@3'	1/17/2020	14:55	1			X			X			X	X	X				
3	SS13@7'	1/17/2020	15:00	1			X			X			X	X	X				
4	SS14@3'	1/17/2020	15:05	1			X			X			X	X	X				
5	SS14@7'	1/17/2020	15:10	1			X			X			X	X	X				
6																			
7																			
8																			
9																			
10																			

Relinquished by:  Date/Time: 1/17/2020 17:07	Received by: Tasman Box Date/Time: 1/17/2020 17:07	Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard 48 hours <input type="checkbox"/>	Notes:
Relinquished by: Tasman Box Date/Time: 1/17/2020 1730	Received by:  Date/Time: 01/17/2020 1730	Sample Integrity: Temperature Upon Receipt: 3.5	
Relinquished by:	Received by: 	Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

**Sample Receipt Checklist**

S2 Work Order 2001199

Client: NOBLE ENERGY Client Project ID: LAPP A22-689

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

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

Temp (°C)	3.5
-----------	-----

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 samples with holding times due within 48 hours sample 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 w/ 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 <b>(excluding cooling)</b> <sup>(1)</sup> ? 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 <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.

RZ  
Custodian Printed Name or Initials

*RZ*  
Signature of Custodian

1/17/20  
Date/Time



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/20/20 07:26

**FS03@9'**  
**2001199-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/17/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.0095</b>	0.0020	mg/kg	1	2001249	01/17/20	01/18/20	EPA 8260B	
<b>Toluene</b>	<b>0.022</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.12</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/17/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/17/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001250	"	01/18/20	EPA 8015M	

Date Sampled: **01/17/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		107 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/20/20 07:26

**SS13@3'**  
**2001199-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	2001249	01/17/20	01/18/20	EPA 8260B	
<b>Toluene</b>	<b>0.0054</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.029</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		107 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.4 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001250	"	01/18/20	EPA 8015M	

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.4 %	30-150		"	"	"	"	

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

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>1640</b>	11.2	mg/kg dry	1	2001255	01/17/20	01/17/20	EPA 6020B	
<b>Magnesium</b>	<b>868</b>	5.62	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/20/20 07:26

**SS13@3'**  
**2001199-02 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>202</b>	5.62	mg/kg dry	1	2001255	01/17/20	01/17/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>1.00</b>	0.100	units	1	2001256	01/20/20	01/20/20	Calculation	

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

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.0</b>		%	1	2001254	01/17/20	01/20/20	Calculation	
<b>pH</b>	<b>8.26</b>		pH Units	"	2001253	"	01/17/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/17/20 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.731</b>	0.0100	mmhos/cm	1	2001252	01/17/20	01/17/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/20/20 07:26

**SS13@7'**  
**2001199-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/17/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	2001249	01/17/20	01/18/20	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: **01/17/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		107 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/17/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001250	"	01/18/20	EPA 8015M	

Date Sampled: **01/17/20 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.1 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/20/20 07:26

**SS14@3'**  
**2001199-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	2001249	01/17/20	01/18/20	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: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001250	"	01/18/20	EPA 8015M	

Date Sampled: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		99.4 %	30-150		"	"	"	"	

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

Date Sampled: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	<b>2260</b>	11.1	mg/kg dry	1	2001255	01/17/20	01/17/20	EPA 6020B	
Magnesium	<b>678</b>	5.56	"	"	"	"	"	"	

Summit Scientific

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Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/20/20 07:26

**SS14@3'**  
**2001199-04 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>129</b>	5.56	mg/kg dry	1	2001255	01/17/20	01/17/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.610</b>	0.100	units	1	2001256	01/20/20	01/20/20	Calculation	

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

Date Sampled: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>90.0</b>		%	1	2001254	01/17/20	01/20/20	Calculation	
<b>pH</b>	<b>8.60</b>		pH Units	"	2001253	"	01/17/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/17/20 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.309</b>	0.0100	mmhos/cm	1	2001252	01/17/20	01/17/20	EPA 120.1	

Summit Scientific

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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/20/20 07:26

**SS14@7'**  
**2001199-05 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/17/20 15:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	2001249	01/17/20	01/18/20	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: **01/17/20 15:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		117 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		109 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/17/20 15:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	2001250	"	01/18/20	EPA 8015M	

Date Sampled: **01/17/20 15:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		96.5 %	30-150		"	"	"	"	

Summit Scientific

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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/20/20 07:26

### 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 2001249 - EPA 5030 Soil MS

##### Blank (2001249-BLK1)

Prepared: 01/17/20 Analyzed: 01/18/20

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	0.0431		"	0.0400		108	23-173			
Surrogate: Toluene-d8	0.0417		"	0.0400		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0421		"	0.0400		105	21-167			

##### LCS (2001249-BS1)

Prepared: 01/17/20 Analyzed: 01/18/20

Benzene	0.143	0.0020	mg/kg	0.150		95.6	70-130			
Toluene	0.137	0.0050	"	0.150		91.1	70-130			
Ethylbenzene	0.146	0.0050	"	0.150		97.3	70-130			
m,p-Xylene	0.288	0.010	"	0.300		95.9	70-130			
o-Xylene	0.146	0.0050	"	0.150		97.4	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0385		"	0.0400		96.2	23-173			
Surrogate: Toluene-d8	0.0373		"	0.0400		93.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.0	21-167			

##### Matrix Spike (2001249-MS1)

Source: 2001182-01

Prepared: 01/17/20 Analyzed: 01/18/20

Benzene	0.132	0.0020	mg/kg	0.150	ND	87.8	70-130			
Toluene	0.134	0.0050	"	0.150	ND	89.3	70-130			
Ethylbenzene	0.136	0.0050	"	0.150	ND	90.4	70-130			
m,p-Xylene	0.267	0.010	"	0.300	ND	89.1	70-130			
o-Xylene	0.134	0.0050	"	0.150	ND	89.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0413		"	0.0400		103	23-173			
Surrogate: Toluene-d8	0.0389		"	0.0400		97.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.0	21-167			

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/20/20 07:26

**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 2001249 - EPA 5030 Soil MS**

**Matrix Spike Dup (2001249-MSD1)**

Source: 2001182-01

Prepared: 01/17/20 Analyzed: 01/18/20

Benzene	0.174	0.0020	mg/kg	0.150	ND	116	70-130	27.5	30
Toluene	0.176	0.0050	"	0.150	ND	117	70-130	26.9	30
Ethylbenzene	0.162	0.0050	"	0.150	ND	108	70-130	18.0	30
m,p-Xylene	0.320	0.010	"	0.300	ND	107	70-130	17.9	30
o-Xylene	0.156	0.0050	"	0.150	ND	104	70-130	14.9	30
Surrogate: 1,2-Dichloroethane-d4	0.0501		"	0.0400		125	23-173		
Surrogate: Toluene-d8	0.0392		"	0.0400		98.1	20-170		
Surrogate: 4-Bromofluorobenzene	0.0431		"	0.0400		108	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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/20/20 07:26

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 2001250 - EPA 3550A**

**Blank (2001250-BLK1)**

Prepared & Analyzed: 01/17/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001250-BS1)**

Prepared & Analyzed: 01/17/20

C10-C28 (DRO) 515 50 mg/kg 500 103 70-130

**Matrix Spike (2001250-MS1)**

Source: 2001194-01

Prepared & Analyzed: 01/17/20

C10-C28 (DRO) 6410 50 mg/kg 500 6390 4.23 70-130 QM-07

**Matrix Spike Dup (2001250-MSD1)**

Source: 2001194-01

Prepared & Analyzed: 01/17/20

C10-C28 (DRO) 8870 50 mg/kg 500 6390 496 70-130 32.2 20 QM-07

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/20/20 07:26

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

**Summit Scientific**

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

**Batch 2001255 - General Preparation**

**Blank (2001255-BLK1)**

Prepared & Analyzed: 01/17/20

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

**LCS (2001255-BS1)**

Prepared & Analyzed: 01/17/20

Calcium	525	10.0	mg/kg wet	500	105	70-130			
Magnesium	506	5.00	"	500	101	70-130			
Sodium	547	5.00	"	500	109	70-130			

**Duplicate (2001255-DUP1)**

Source: 2001199-02

Prepared & Analyzed: 01/17/20

Calcium	1800	11.2	mg/kg dry	1640			9.14	20	
Magnesium	864	5.62	"	868			0.498	20	
Sodium	208	5.62	"	202			3.09	20	

**Matrix Spike (2001255-MS1)**

Source: 2001199-02

Prepared & Analyzed: 01/17/20

Calcium	2310	11.2	mg/kg dry	562	1640	118	70-130		
Magnesium	1510	5.62	"	562	868	114	70-130		
Sodium	921	5.62	"	562	202	128	70-130		

**Matrix Spike Dup (2001255-MSD1)**

Source: 2001199-02

Prepared & Analyzed: 01/17/20

Calcium	2200	11.2	mg/kg dry	562	1640	98.9	70-130	4.84	25
Magnesium	1410	5.62	"	562	868	95.6	70-130	7.11	25
Sodium	911	5.62	"	562	202	126	70-130	1.13	25

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/20/20 07:26

**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		

**Batch 2001253 - General Preparation**

**LCS (2001253-BS1)**

Prepared & Analyzed: 01/17/20

pH 9.19 pH Units 9.18 100 95-105

**Duplicate (2001253-DUP1)**

Source: 2001199-02

Prepared & Analyzed: 01/17/20

pH 8.23 pH Units 8.26 0.364 20

**Batch 2001254 - General Preparation**

**Duplicate (2001254-DUP1)**

Source: 2001199-02

Prepared: 01/17/20 Analyzed: 01/20/20

% Solids 88.9 % 89.0 0.112 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/20/20 07:26

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

**Summit Scientific**

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

**Batch 2001252 - General Preparation**

**Blank (2001252-BLK1)**

Prepared & Analyzed: 01/17/20

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (2001252-BS1)**

Prepared & Analyzed: 01/17/20

Specific Conductance (EC) 0.807 0.0100 mmhos/cm 0.750 108 90-110

**Duplicate (2001252-DUP1)**

Source: 2001199-02

Prepared & Analyzed: 01/17/20

Specific Conductance (EC) 0.764 0.0100 mmhos/cm 0.731 4.55 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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/20/20 07:26

### Notes and Definitions

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
- 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 21, 2020

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Lapp A22-689

Work Order #2001212

Enclosed are the results of analyses for samples received by Summit Scientific on 01/20/20 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury

President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/21/20 06:21

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS15@3'	2001212-01	Soil	01/20/20 12:40	01/20/20 17:30
SS15@8'	2001212-02	Soil	01/20/20 12:45	01/20/20 17:30
FS05@9'	2001212-03	Soil	01/20/20 12:50	01/20/20 17:30

Summit Scientific

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2001212

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Client: Noble / Tasman Geosciences	Project Manager: Brandon Bruns, Invoice: Howard Arnold	Page   of
Address: 6855 W. 119th Ave.	E-Mail: bbruns@tasman-geo.com	
City/State/Zip: Broomfield / CO/ 80020		
Phone: 303-487-1228	Project Name: Lapp <del>A22</del> -689	
Sampler Name: Tanner Cook	Project Number: _____	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	\$260 BTEX	\$260B GBTEXN	\$015 DRO	pH, EC, SAR	
1	SS15 @ 3'	1/20/20	1240	1			X			X				X	X	X	
2	SS15 @ 8'	↓	1245	↓			↓			↓				↓	↓		
3	FS05 @ 9'	↓	1250	↓			↓			↓				↓	↓		
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished by: <i>Tanner Cook</i>	Date/Time: 1/20/20 1700	Received by: Tasman's Lock Box	Date/Time: 1/20/20 1700	Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard 48 hours <input type="checkbox"/>	Notes:
Relinquished by: Tasman's Lock Box	Date/Time: 01/20/2020 1715	Received by: <i>[Signature]</i>	Date/Time: 01/20/2020 1715	Sample Integrity:	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Temperature Upon Receipt: 4.0 Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

**Sample Receipt Checklist**

S2 Work Order 2001212

Client: NOBLE / TASMAN Client Project ID: LAPP A22-689

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

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

Temp (°C)	4.8
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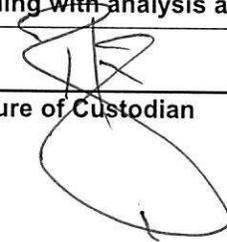
Thermometer ID: 61857155-K

	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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? 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):  
 \_\_\_\_\_  
 \_\_\_\_\_

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

RZ  
 Custodian Printed Name or Initials

  
 Signature of Custodian

1/20/20  
 Date/Time



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/21/20 06:21

**SS15@3'**  
**2001212-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>0.047</b>	0.0020		mg/kg	1	2001258	01/20/20	01/20/20	EPA 8260B	
<b>Toluene</b>	<b>0.097</b>	0.0050		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.010</b>	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.11</b>	0.010		"	"	"	"	"	"	
Naphthalene	ND	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		110 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.7 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	2001260	01/20/20	01/20/20	EPA 8015M	

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		95.9 %		30-150		"	"	"	"	

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

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Calcium</b>	<b>2500</b>	11.5		mg/kg dry	1	2001272	01/20/20	01/20/20	EPA 6020B	
<b>Magnesium</b>	<b>878</b>	5.76		"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/21/20 06:21

**SS15@3'**  
**2001212-01 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>94.0</b>	5.76	mg/kg dry	1	2001272	01/20/20	01/20/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.410</b>	0.100	units	1	2001273	01/21/20	01/21/20	Calculation	

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

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>86.8</b>		%	1	2001271	01/20/20	01/21/20	Calculation	
<b>pH</b>	<b>7.99</b>		pH Units	"	2001270	"	01/20/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/20/20 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.468</b>	0.0100	mmhos/cm	1	2001269	"	01/20/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/21/20 06:21

**SS15@8'**  
**2001212-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/20/20 12:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>0.0041</b>	0.0020		mg/kg	1	2001258	01/20/20	01/20/20	EPA 8260B	
<b>Toluene</b>	<b>0.014</b>	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.041</b>	0.010		"	"	"	"	"	"	
Naphthalene	ND	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **01/20/20 12:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		102 %		23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		102 %		20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.4 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/20/20 12:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	2001260	01/20/20	01/20/20	EPA 8015M	

Date Sampled: **01/20/20 12:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: o-Terphenyl</i>		95.2 %		30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/21/20 06:21

**FS05@9'**  
**2001212-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/20/20 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.39</b>	0.0020	mg/kg	1	2001258	01/20/20	01/20/20	EPA 8260B	
<b>Toluene</b>	<b>0.57</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.11</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.70</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.053</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/20/20 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		129 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/20/20 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>570</b>	50	mg/kg	1	2001260	01/20/20	01/20/20	EPA 8015M	

Date Sampled: **01/20/20 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		102 %	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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/21/20 06:21

### 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 2001258 - EPA 5030 Soil MS

##### Blank (2001258-BLK1)

Prepared & Analyzed: 01/20/20

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	0.0416		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0406		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400		98.8	21-167			

##### LCS (2001258-BS1)

Prepared & Analyzed: 01/20/20

Benzene	0.0916	0.0020	mg/kg	0.100		91.6	70-130			
Toluene	0.0932	0.0050	"	0.100		93.2	70-130			
Ethylbenzene	0.0818	0.0050	"	0.100		81.8	70-130			
m,p-Xylene	0.155	0.010	"	0.200		77.3	70-130			
o-Xylene	0.0754	0.0050	"	0.100		75.4	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0381		"	0.0400		95.2	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400		96.9	21-167			

##### Matrix Spike (2001258-MS1)

Source: 2001211-01

Prepared & Analyzed: 01/20/20

Benzene	0.0818	0.0020	mg/kg	0.100	ND	81.8	70-130			
Toluene	0.111	0.0050	"	0.100	ND	111	70-130			
Ethylbenzene	0.0754	0.0050	"	0.100	ND	75.4	70-130			
m,p-Xylene	0.144	0.010	"	0.200	ND	72.1	70-130			
o-Xylene	0.0710	0.0050	"	0.100	ND	71.0	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0399		"	0.0400		99.8	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0386		"	0.0400		96.5	21-167			

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/21/20 06:21

**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 2001258 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (2001258-MSD1)</b>	<b>Source: 2001211-01</b>			<b>Prepared &amp; Analyzed: 01/20/20</b>						
Benzene	0.0868	0.0020	mg/kg	0.100	ND	86.8	70-130	5.87	30	
Toluene	0.123	0.0050	"	0.100	ND	123	70-130	10.5	30	
Ethylbenzene	0.0848	0.0050	"	0.100	ND	84.8	70-130	11.7	30	
m,p-Xylene	0.161	0.010	"	0.200	ND	80.5	70-130	11.0	30	
o-Xylene	0.0790	0.0050	"	0.100	ND	79.0	70-130	10.8	30	
Surrogate: 1,2-Dichloroethane-d4	0.0392		"	0.0400		97.9	23-173			
Surrogate: Toluene-d8	0.0389		"	0.0400		97.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400		99.8	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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/21/20 06:21

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 2001260 - EPA 3550A**

**Blank (2001260-BLK1)**

Prepared & Analyzed: 01/20/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001260-BS1)**

Prepared & Analyzed: 01/20/20

C10-C28 (DRO) 513 50 mg/kg 500 103 70-130

**Matrix Spike (2001260-MS1)**

Source: 2001211-01

Prepared & Analyzed: 01/20/20

C10-C28 (DRO) 514 50 mg/kg 500 13.3 100 70-130

**Matrix Spike Dup (2001260-MSD1)**

Source: 2001211-01

Prepared & Analyzed: 01/20/20

C10-C28 (DRO) 514 50 mg/kg 500 13.3 100 70-130 0.102 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/21/20 06:21

**Soluble Nutrients by EPA 6020/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 2001272 - General Preparation**

**Blank (2001272-BLK1)**

Prepared & Analyzed: 01/20/20

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

**LCS (2001272-BS1)**

Prepared & Analyzed: 01/20/20

Calcium	585	10.0	mg/kg wet	500		117	70-130		
Magnesium	611	5.00	"	500		122	70-130		
Sodium	574	5.00	"	500		115	70-130		

**Duplicate (2001272-DUP1)**

Source: 2001212-01

Prepared & Analyzed: 01/20/20

Calcium	2560	11.5	mg/kg dry	2500				2.57	20
Magnesium	855	5.76	"	878				2.67	20
Sodium	89.2	5.76	"	94.0				5.20	20

**Matrix Spike (2001272-MS1)**

Source: 2001212-01

Prepared & Analyzed: 01/20/20

Calcium	2930	11.5	mg/kg dry	576	2500	74.4	70-130		
Magnesium	1340	5.76	"	576	878	80.9	70-130		
Sodium	668	5.76	"	576	94.0	99.6	70-130		

**Matrix Spike Dup (2001272-MSD1)**

Source: 2001212-01

Prepared & Analyzed: 01/20/20

Calcium	2950	11.5	mg/kg dry	576	2500	78.9	70-130	0.882	25
Magnesium	1370	5.76	"	576	878	85.8	70-130	2.07	25
Sodium	705	5.76	"	576	94.0	106	70-130	5.51	25

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/21/20 06:21

**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		

**Batch 2001270 - General Preparation**

**LCS (2001270-BS1)**

Prepared & Analyzed: 01/20/20

pH 9.13 pH Units 9.18 99.5 95-105

**Duplicate (2001270-DUP1)**

Source: 2001212-01

Prepared & Analyzed: 01/20/20

pH 8.29 pH Units 7.99 3.69 20

**Batch 2001271 - General Preparation**

**Duplicate (2001271-DUP1)**

Source: 2001212-01

Prepared: 01/20/20 Analyzed: 01/21/20

% Solids 86.9 % 86.8 0.115 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/21/20 06:21

**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 2001269 - General Preparation**

**Blank (2001269-BLK1)**

Prepared & Analyzed: 01/20/20

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (2001269-BS1)**

Prepared & Analyzed: 01/20/20

Specific Conductance (EC) 0.796 0.0100 mmhos/cm 0.750 106 90-110

**Duplicate (2001269-DUP1)**

Source: 2001212-01

Prepared & Analyzed: 01/20/20

Specific Conductance (EC) 0.385 0.0100 mmhos/cm 0.468 19.6 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/21/20 06:21

### 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 23, 2020

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Lapp A22-689

Work Order #2001243

Enclosed are the results of analyses for samples received by Summit Scientific on 01/22/20 17:48. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large, stylized initial "M".

Muri Premer For Paul Shrewsbury  
President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS20@3'	2001243-01	Soil	01/22/20 14:40	01/22/20 17:48
SS20@9'	2001243-02	Soil	01/22/20 14:42	01/22/20 17:48
SS21@3'	2001243-03	Soil	01/22/20 14:44	01/22/20 17:48
SS21@9'	2001243-04	Soil	01/22/20 14:46	01/22/20 17:48
SS22@3'	2001243-05	Soil	01/22/20 14:48	01/22/20 17:48
SS22@9'	2001243-06	Soil	01/22/20 14:50	01/22/20 17:48
FS06@10'	2001243-07	Soil	01/22/20 14:52	01/22/20 17:48

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.*

2001243

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Client: Tasman / Noble  
Address: 6855 W 119th Ave  
City/State/Zip: Broomfield / CO / 80020  
Phone: 303-487-1228 979-255-4235  
Sampler Name: Max Dahlgren Garza  
Project Manager: Brandon Bruns; Invoice: Howard Amosil  
E-Mail: bbruns@tasman-geo.com  
Project Name: Lopp A22-689  
Project Number: ✓

Page 1 of 4

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested				Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO		pH, EC, SAR
1	SS20 @ 3'	1/22/20	14:40	1			X			X				X	X	X	
2	SS20 @ 9'		14:42	1									X	X	X		
3	SS21 @ 3'		14:44	1													
4	SS21 @ 9'		14:46	1											X		
5	SS22 @ 3'		14:48	1													
6	SS22 @ 9'		14:50	1											X		
7	FS06 @ 10'	↓	14:52	↓									↓	↓			
8																	
9																	
10																	

Relinquished by: <i>Max A</i>	Date/Time: 16:10 1/22/20	Received by: Tasman's Lock Box	Date/Time: 16:10 1/22/20	<b>Turn Around Time</b> (Check) Same Day <input checked="" type="checkbox"/> 72 hours ___ 24 hours ___ Standard ___ 48 hours ___ <b>Sample Integrity:</b> Temperature Upon Receipt: 13 Samples Intact: <input checked="" type="radio"/> Yes No	<b>Notes:</b>
Relinquished by: Tasman's Lock Box	Date/Time: 01-22-2020 17:05	Received by: <i>[Signature]</i>	Date/Time: 01-22-2020 17:05		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

Sample Receipt Checklist

S2 Work Order 2001243

LAPP

Client: Tasman/Noble Client Project ID: Schuster-H

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

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

Temp (°C)	1.3
-----------	-----

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.	X			
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
If custody seals are present, are they intact <sup>(1)</sup> ?			X	
Are samples with holding times due within 48 hours sample due within 48 hours present?			X	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>			X	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?				
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			X	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			X	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			X	

Additional Comments (if any):

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

Muri P.  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

01-28-2020  
Date/Time



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**SS20@3'**  
**2001243-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	2001308	01/22/20	01/22/20	EPA 8260B	
<b>Toluene</b>	<b>0.013</b>	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.031</b>	0.010		"	"	"	"	"	"	
Naphthalene	ND	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		126 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	2001309	01/22/20	01/22/20	EPA 8015M	

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		107 %		30-150		"	"	"	"	

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

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Calcium</b>	<b>3250</b>	11.1		mg/kg dry	1	2001300	01/22/20	01/22/20	EPA 6020B	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**SS20@3'**  
**2001243-01 (Soil)**

**Summit Scientific**

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Magnesium	818	5.57	mg/kg dry	1	2001300	01/22/20	01/22/20	EPA 6020B	
Sodium	119	5.57	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.483	0.100	units	1	2001318	01/23/20	01/23/20	Calculation	

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

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	89.8		%	1	2001312	01/22/20	01/23/20	Calculation	
pH	7.65		pH Units	"	2001311	01/22/20	01/22/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/22/20 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.522	0.0100	mmhos/cm	1	2001310	01/22/20	01/22/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/23/20 17:10

**SS20@9'**  
**2001243-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/22/20 14:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>5.3</b>	0.020	mg/kg	10	2001308	01/22/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>16</b>	0.050	"	"	"	"	"	"	E
<b>Ethylbenzene</b>	<b>0.28</b>	0.0050	"	1	"	"	"	"	
<b>Xylenes (total)</b>	<b>16</b>	0.10	"	10	"	"	"	"	
<b>Naphthalene</b>	<b>0.14</b>	0.010	"	1	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>340</b>	50	"	10	"	"	"	"	

Date Sampled: **01/22/20 14:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		124 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		132 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/20 14:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>130</b>	50	mg/kg	1	2001309	01/22/20	01/22/20	EPA 8015M	

Date Sampled: **01/22/20 14:42**

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

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**SS21@3'**  
**2001243-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.017</b>	0.0020	mg/kg	1	2001308	01/22/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.15</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.029</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.28</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.023</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		119 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		122 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001309	01/22/20	01/22/20	EPA 8015M	

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		104 %	30-150		"	"	"	"	

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

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>3600</b>	11.3	mg/kg dry	1	2001300	01/22/20	01/22/20	EPA 6020B	
<b>Magnesium</b>	<b>759</b>	5.67	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**SS21@3'**  
**2001243-03 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>159</b>	5.67	mg/kg dry	1	2001300	01/22/20	01/22/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.629</b>	0.100	units	1	2001318	01/23/20	01/23/20	Calculation	

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

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>88.2</b>		%	1	2001312	01/22/20	01/23/20	Calculation	
<b>pH</b>	<b>8.24</b>		pH Units	"	2001311	01/22/20	01/22/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/22/20 14:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.496</b>	0.0100	mmhos/cm	1	2001310	01/22/20	01/22/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**SS21@9'**  
**2001243-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/22/20 14:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.88</b>	0.20	mg/kg	100	2001308	01/22/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>4.6</b>	0.50	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.93</b>	0.50	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>8.4</b>	1.0	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.12</b>	0.010	"	1	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>610</b>	50	"	100	"	"	"	"	

Date Sampled: **01/22/20 14:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		128 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/20 14:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>160</b>	50	mg/kg	1	2001309	01/22/20	01/22/20	EPA 8015M	

Date Sampled: **01/22/20 14:46**

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

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/23/20 17:10

**SS22@3'**  
**2001243-05 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.0094</b>	0.0020	mg/kg	1	2001308	01/22/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.084</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0095</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.26</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.017</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001309	01/22/20	01/22/20	EPA 8015M	

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.7 %	30-150		"	"	"	"	

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

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>3840</b>	11.1	mg/kg dry	1	2001300	01/22/20	01/22/20	EPA 6020B	
<b>Magnesium</b>	<b>631</b>	5.57	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**SS22@3'**  
**2001243-05 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>49.8</b>	5.57	mg/kg dry	1	2001300	01/22/20	01/22/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.196</b>	0.100	units	1	2001318	01/23/20	01/23/20	Calculation	

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

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.7</b>		%	1	2001312	01/22/20	01/23/20	Calculation	
<b>pH</b>	<b>8.48</b>		pH Units	"	2001311	01/22/20	01/22/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/22/20 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.279</b>	0.0100	mmhos/cm	1	2001310	01/22/20	01/22/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/23/20 17:10

**SS22@9'**  
**2001243-06 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/22/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	26	0.20	mg/kg	100	2001308	01/22/20	01/23/20	EPA 8260B	
Toluene	96	0.50	"	"	"	"	"	"	E
Ethylbenzene	16	0.50	"	"	"	"	"	"	
Xylenes (total)	130	1.0	"	"	"	"	"	"	
Naphthalene	0.15	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	3500	50	"	100	"	"	"	"	

Date Sampled: **01/22/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		124 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		169 %	21-167		"	"	"	"	S-02

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	5000	50	mg/kg	1	2001309	01/22/20	01/22/20	EPA 8015M	

Date Sampled: **01/22/20 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		107 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**FS06@10'**  
**2001243-07 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/22/20 14:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.15</b>	0.0020	mg/kg	1	2001308	01/22/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.49</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.099</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.91</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.080</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/22/20 14:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		123 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/20 14:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>290</b>	50	mg/kg	1	2001309	01/22/20	01/22/20	EPA 8015M	

Date Sampled: **01/22/20 14:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/23/20 17:10

### 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 2001308 - EPA 5030 Soil MS

##### Blank (2001308-BLK1)

Prepared: 01/22/20 Analyzed: 01/23/20

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	0.0423		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0410		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0419		"	0.0400		105	21-167			

##### LCS (2001308-BS1)

Prepared: 01/22/20 Analyzed: 01/23/20

Benzene	0.107	0.0020	mg/kg	0.100		107	70-130			
Toluene	0.0852	0.0050	"	0.100		85.2	70-130			
Ethylbenzene	0.112	0.0050	"	0.100		112	70-130			
m,p-Xylene	0.207	0.010	"	0.200		103	70-130			
o-Xylene	0.0976	0.0050	"	0.100		97.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0403		"	0.0400		101	23-173			
Surrogate: Toluene-d8	0.0418		"	0.0400		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0390		"	0.0400		97.4	21-167			

##### Matrix Spike (2001308-MS1)

Source: 2001243-01

Prepared: 01/22/20 Analyzed: 01/23/20

Benzene	0.0828	0.0020	mg/kg	0.100	ND	82.8	70-130			
Toluene	0.116	0.0050	"	0.100	0.0130	103	70-130			
Ethylbenzene	0.0998	0.0050	"	0.100	ND	99.8	70-130			
m,p-Xylene	0.221	0.010	"	0.200	0.0220	99.4	70-130			
o-Xylene	0.0907	0.0050	"	0.100	0.00942	81.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0429		"	0.0400		107	23-173			
Surrogate: Toluene-d8	0.0377		"	0.0400		94.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0524		"	0.0400		131	21-167			

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/23/20 17:10

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

**Summit Scientific**

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

**Batch 2001308 - EPA 5030 Soil MS**

**Matrix Spike Dup (2001308-MSD1)**

Source: 2001243-01

Prepared: 01/22/20 Analyzed: 01/23/20

Benzene	0.0796	0.0020	mg/kg	0.100	ND	79.6	70-130	4.03	30	
Toluene	0.113	0.0050	"	0.100	0.0130	99.6	70-130	2.94	30	
Ethylbenzene	0.0935	0.0050	"	0.100	ND	93.5	70-130	6.49	30	
m,p-Xylene	0.224	0.010	"	0.200	0.0220	101	70-130	1.32	30	
o-Xylene	0.0896	0.0050	"	0.100	0.00942	80.2	70-130	1.13	30	
Surrogate: 1,2-Dichloroethane-d4	0.0423		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0360		"	0.0400		90.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0506		"	0.0400		126	21-167			

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/23/20 17:10

**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 2001309 - EPA 3550A**

**Blank (2001309-BLK1)**

Prepared: 01/22/20 Analyzed: 01/23/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001309-BS1)**

Prepared: 01/22/20 Analyzed: 01/23/20

C10-C28 (DRO) 525 50 mg/kg 500 105 70-130

**Matrix Spike (2001309-MS1)**

**Source: 2001243-01**

Prepared: 01/22/20 Analyzed: 01/23/20

C10-C28 (DRO) 591 50 mg/kg 500 20.1 114 70-130

**Matrix Spike Dup (2001309-MSD1)**

**Source: 2001243-01**

Prepared: 01/22/20 Analyzed: 01/23/20

C10-C28 (DRO) 578 50 mg/kg 500 20.1 112 70-130 2.24 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

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

**Summit Scientific**

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

**Batch 2001300 - General Preparation**

**Blank (2001300-BLK1)**

Prepared & Analyzed: 01/22/20

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

**LCS (2001300-BS1)**

Prepared & Analyzed: 01/22/20

Calcium	593	10.0	mg/kg wet	500		119	70-130			
Magnesium	629	5.00	"	500		126	70-130			
Sodium	595	5.00	"	500		119	70-130			

**Duplicate (2001300-DUP1)**

Source: 2001237-01

Prepared & Analyzed: 01/22/20

Calcium	2630	10.9	mg/kg dry		2520			4.33	20	
Magnesium	520	5.45	"		507			2.70	20	
Sodium	441	5.45	"		422			4.40	20	

**Matrix Spike (2001300-MS1)**

Source: 2001237-01

Prepared & Analyzed: 01/22/20

Calcium	3100	10.9	mg/kg dry	545	2520	107	70-130			
Magnesium	1140	5.45	"	545	507	116	70-130			
Sodium	1040	5.45	"	545	422	114	70-130			

**Matrix Spike Dup (2001300-MSD1)**

Source: 2001237-01

Prepared & Analyzed: 01/22/20

Calcium	3220	10.9	mg/kg dry	545	2520	129	70-130	3.83	25	
Magnesium	1120	5.45	"	545	507	112	70-130	1.86	25	
Sodium	995	5.45	"	545	422	105	70-130	4.63	25	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

**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		

**Batch 2001311 - General Preparation**

**LCS (2001311-BS1)**

Prepared & Analyzed: 01/22/20

pH 9.17 pH Units 9.18 99.9 95-105

**Duplicate (2001311-DUP1)**

Source: 2001241-01

Prepared & Analyzed: 01/22/20

pH 7.72 pH Units 7.83 1.41 20

**Batch 2001312 - General Preparation**

**Duplicate (2001312-DUP1)**

Source: 2001241-01

Prepared: 01/22/20 Analyzed: 01/23/20

% Solids 72.6 % 74.7 2.85 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/23/20 17:10

**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 2001310 - General Preparation**

**Blank (2001310-BLK1)**

Prepared & Analyzed: 01/22/20

Specific Conductance (EC)      ND      0.0100    mmhos/cm

**LCS (2001310-BS1)**

Prepared & Analyzed: 01/22/20

Specific Conductance (EC)      0.784      0.0100    mmhos/cm      0.750      105      90-110

**Duplicate (2001310-DUP1)**

**Source: 2001241-01**

Prepared & Analyzed: 01/22/20

Specific Conductance (EC)      0.751      0.0100    mmhos/cm      0.881      16.0      20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/23/20 17:10

### 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.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 24, 2020

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Lapp A22-689

Work Order #2001257

Enclosed are the results of analyses for samples received by Summit Scientific on 01/23/20 17:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury

President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS23@3'	2001257-01	Soil	01/23/20 13:45	01/23/20 17:35
SS23@10'	2001257-02	Soil	01/23/20 13:50	01/23/20 17:35
SS24@3'	2001257-03	Soil	01/23/20 13:55	01/23/20 17:35
SS24@10'	2001257-04	Soil	01/23/20 14:00	01/23/20 17:35
SS25@3'	2001257-05	Soil	01/23/20 14:05	01/23/20 17:35
SS25@9'	2001257-06	Soil	01/23/20 14:10	01/23/20 17:35

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

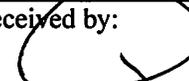
S<sub>2</sub>

2001257

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310 ♦ 303-374-5933 (f)

Client: Noble Energy Project Manager: Brandon Bruns, Invoice: Howard Aamold  
Address: E-Mail:  
City/State/Zip:  
Phone: Project Name: Lapp A22-689  
Sampler Name: Kevin Chritz Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions	
					HCl	HNO <sub>3</sub>	None	Other	Water	Soil	Air-Canister #	Other	GGTEXN	TPH - DRO	pH / EC / SAR			
1	SS23@3'	1/23/2020	13:45	1			X			X				X	X	X		
2	SS23@10'	1/23/2020	13:50	1			X			X				X	X	X		
3	SS24@3'	1/23/2020	13:55	1			X			X				X	X	X		
4	SS24@10'	1/23/2020	14:00	1			X			X				X	X	X		
5	SS25@3'	1/23/2020	14:05	1			X			X				X	X	X		
6	SS25@9'	1/23/2020	14:10	1			X			X				X	X	X		
7																		
8																		
9																		
10																		

Relinquished by:  Date/Time: 1/23/2020 16:37	Received by: Tasman Box Date/Time: 1/23/2020 16:37	Turn Around Time (Check) 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: Tasman Box Date/Time: 1/23/2020 1730	Received by:  Date/Time: 01/23/2020 1730	Sample Integrity:	
Relinquished by:	Received by: 	Temperature Upon Receipt:  Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

**Sample Receipt Checklist**

S2 Work Order 2001257

Client: NOBLE ENERGY Client Project ID: LAPP A22-689

Shipped Via:  H.D./P.U./FedEx/UPS/USPS/Other  Air  Water  Other: \_\_\_\_\_  
Airbill #: \_\_\_\_\_

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

Temp (°C)	5.5
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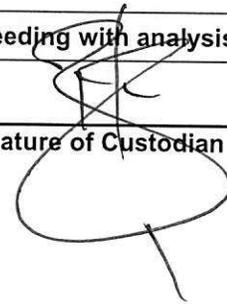
Thermometer ID: 61857155-K

	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 samples with holding times due within 48 hours sample 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 w/ 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, ect			✓	
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.

RZ  
Custodian Printed Name or Initials

  
Signature of Custodian

1/23/20  
Date/Time



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**SS23@3'**  
**2001257-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	2001329	01/23/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.0050</b>	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.014</b>	0.010		"	"	"	"	"	"	
Naphthalene	ND	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	2001331	01/23/20	01/23/20	EPA 8015M	

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		103 %		30-150		"	"	"	"	

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

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Calcium</b>	<b>1590</b>	11.4		mg/kg dry	1	2001328	01/23/20	01/23/20	EPA 6020B	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**SS23@3'**  
**2001257-01 (Soil)**

**Summit Scientific**

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

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Magnesium	767	5.69	mg/kg dry	1	2001328	01/23/20	01/23/20	EPA 6020B	
Sodium	110	5.69	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.570	0.100	units	1	2001334	01/24/20	01/24/20	Calculation	

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

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.8		%	1	2001314	01/23/20	01/24/20	Calculation	
pH	8.32		pH Units	"	2001320	"	01/23/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/23/20 13:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.431	0.0100	mmhos/cm	1	2001317	"	01/23/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/24/20 06:30

**SS23@10'**  
**2001257-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/23/20 13:50**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Benzene</b>	<b>0.0075</b>	0.0020	mg/kg	1	2001329	01/23/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.019</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.031</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/23/20 13:50**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		128 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/20 13:50**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	2001331	01/23/20	01/23/20	EPA 8015M	

Date Sampled: **01/23/20 13:50**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		98.8 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**SS24@3'**  
**2001257-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/23/20 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	2001329	01/23/20	01/23/20	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: **01/23/20 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		130 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		107 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/20 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	2001331	01/23/20	01/23/20	EPA 8015M	

Date Sampled: **01/23/20 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		95.4 %	30-150		"	"	"	"	

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

Date Sampled: **01/23/20 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Calcium	<b>3670</b>	11.4	mg/kg dry	1	2001328	01/23/20	01/23/20	EPA 6020B	
Magnesium	<b>957</b>	5.68	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**SS24@3'**  
**2001257-03 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>142</b>	5.68	mg/kg dry	1	2001328	01/23/20	01/23/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/23/20 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.540</b>	0.100	units	1	2001334	01/24/20	01/24/20	Calculation	

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

Date Sampled: **01/23/20 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>88.0</b>		%	1	2001314	01/23/20	01/24/20	Calculation	
<b>pH</b>	<b>8.02</b>		pH Units	"	2001320	"	01/23/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/23/20 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>1.29</b>	0.0100	mmhos/cm	1	2001317	"	01/23/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/24/20 06:30

**SS24@10'**  
**2001257-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/23/20 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.0035</b>	0.0020	mg/kg	1	2001329	01/23/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.015</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.027</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/23/20 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		116 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/20 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001331	01/23/20	01/23/20	EPA 8015M	

Date Sampled: **01/23/20 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.0 %	30-150		"	"	"	"	

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/24/20 06:30

**SS25@3'**  
**2001257-05 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.032</b>	0.0020	mg/kg	1	2001329	01/23/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.14</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.017</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.19</b>	0.010	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>0.011</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001331	01/23/20	01/23/20	EPA 8015M	

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.7 %	30-150		"	"	"	"	

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

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>3020</b>	11.1	mg/kg dry	1	2001328	01/23/20	01/23/20	EPA 6020B	
<b>Magnesium</b>	<b>462</b>	5.57	"	"	"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**SS25@3'**  
**2001257-05 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>83.6</b>	5.57	mg/kg dry	1	2001328	01/23/20	01/23/20	EPA 6020B
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**Calculated Analysis**

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.370</b>	0.100	units	1	2001334	01/24/20	01/24/20	Calculation	

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

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.8</b>		%	1	2001314	01/23/20	01/24/20	Calculation	
<b>pH</b>	<b>8.59</b>		pH Units	"	2001320	"	01/23/20	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **01/23/20 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.257</b>	0.0100	mmhos/cm	1	2001317	"	01/23/20	EPA 120.1	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**SS25@9'**  
**2001257-06 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/23/20 14:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Benzene</b>	<b>0.022</b>	0.0020	mg/kg	1	2001329	01/23/20	01/23/20	EPA 8260B	
<b>Toluene</b>	<b>0.042</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.036</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/23/20 14:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/20 14:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	2001331	01/23/20	01/23/20	EPA 8015M	

Date Sampled: **01/23/20 14:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		95.4 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/24/20 06:30

### 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 2001329 - EPA 5030 Soil MS

##### Blank (2001329-BLK1)

Prepared: 01/23/20 Analyzed: 01/24/20

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	0.0480		"	0.0400		120	23-173				
Surrogate: Toluene-d8	0.0429		"	0.0400		107	20-170				
Surrogate: 4-Bromofluorobenzene	0.0400		"	0.0400		100	21-167				

##### LCS (2001329-BS1)

Prepared: 01/23/20 Analyzed: 01/24/20

Benzene	0.0962	0.0020	mg/kg	0.100		96.2	70-130				
Toluene	0.115	0.0050	"	0.100		115	70-130				
Ethylbenzene	0.0782	0.0050	"	0.100		78.2	70-130				
m,p-Xylene	0.147	0.010	"	0.200		73.7	70-130				
o-Xylene	0.0737	0.0050	"	0.100		73.7	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0365		"	0.0400		91.4	23-173				
Surrogate: Toluene-d8	0.0391		"	0.0400		97.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0390		"	0.0400		97.6	21-167				

##### Matrix Spike (2001329-MS1)

Source: 2001255-01

Prepared: 01/23/20 Analyzed: 01/24/20

Benzene	0.101	0.0020	mg/kg	0.100	ND	101	70-130				
Toluene	0.126	0.0050	"	0.100	ND	126	70-130				
Ethylbenzene	0.0838	0.0050	"	0.100	ND	83.8	70-130				
m,p-Xylene	0.158	0.010	"	0.200	ND	78.9	70-130				
o-Xylene	0.0770	0.0050	"	0.100	ND	77.0	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0382		"	0.0400		95.6	23-173				
Surrogate: Toluene-d8	0.0396		"	0.0400		99.1	20-170				
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400		97.8	21-167				

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/24/20 06:30

**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 2001329 - EPA 5030 Soil MS**

**Matrix Spike Dup (2001329-MSD1)**

Source: 2001255-01

Prepared: 01/23/20 Analyzed: 01/24/20

Benzene	0.107	0.0020	mg/kg	0.100	ND	107	70-130	5.26	30
Toluene	0.127	0.0050	"	0.100	ND	127	70-130	1.52	30
Ethylbenzene	0.0857	0.0050	"	0.100	ND	85.7	70-130	2.30	30
m,p-Xylene	0.160	0.010	"	0.200	ND	80.2	70-130	1.68	30
o-Xylene	0.0802	0.0050	"	0.100	ND	80.2	70-130	4.16	30
Surrogate: 1,2-Dichloroethane-d4	0.0399		"	0.0400		99.7	23-173		
Surrogate: Toluene-d8	0.0403		"	0.0400		101	20-170		
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400		99.8	21-167		

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 2001331 - EPA 3550A**

**Blank (2001331-BLK1)**

Prepared & Analyzed: 01/23/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001331-BS1)**

Prepared & Analyzed: 01/23/20

C10-C28 (DRO) 514 50 mg/kg 500 103 70-130

**Matrix Spike (2001331-MS1)**

Source: 2001255-01

Prepared: 01/23/20 Analyzed: 01/24/20

C10-C28 (DRO) 517 50 mg/kg 500 19.7 99.6 70-130

**Matrix Spike Dup (2001331-MSD1)**

Source: 2001255-01

Prepared: 01/23/20 Analyzed: 01/24/20

C10-C28 (DRO) 536 50 mg/kg 500 19.7 103 70-130 3.54 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/24/20 06:30

**Soluble Nutrients by EPA 6020/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 2001328 - General Preparation**

**Blank (2001328-BLK1)**

Prepared & Analyzed: 01/23/20

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

**LCS (2001328-BS1)**

Prepared & Analyzed: 01/23/20

Calcium	582	10.0	mg/kg wet	500	116	70-130			
Magnesium	621	5.00	"	500	124	70-130			
Sodium	615	5.00	"	500	123	70-130			

**Duplicate (2001328-DUP1)**

Source: 2001255-01

Prepared & Analyzed: 01/23/20

Calcium	138	10.2	mg/kg dry	161	15.6	20			
Magnesium	71.9	5.08	"	62.0	14.8	20			
Sodium	31.5	5.08	"	29.4	6.59	20			

**Matrix Spike (2001328-MS1)**

Source: 2001255-01

Prepared & Analyzed: 01/23/20

Calcium	674	10.2	mg/kg dry	508	161	101	70-130		
Magnesium	720	5.08	"	508	62.0	130	70-130		
Sodium	646	5.08	"	508	29.4	121	70-130		

**Matrix Spike Dup (2001328-MSD1)**

Source: 2001255-01

Prepared & Analyzed: 01/23/20

Calcium	691	10.2	mg/kg dry	508	161	104	70-130	2.49	25
Magnesium	681	5.08	"	508	62.0	122	70-130	5.61	25
Sodium	604	5.08	"	508	29.4	113	70-130	6.75	25

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

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

**Summit Scientific**

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

**Batch 2001314 - General Preparation**

<b>Duplicate (2001314-DUP1)</b>		<b>Source: 2001237-01</b>			<b>Prepared &amp; Analyzed: 01/23/20</b>					
% Solids	91.8		%		91.7			0.109	20	

**Batch 2001320 - General Preparation**

<b>LCS (2001320-BS1)</b>						<b>Prepared &amp; Analyzed: 01/23/20</b>				
pH	9.21		pH Units		9.18		100	95-105		
<b>Duplicate (2001320-DUP1)</b>		<b>Source: 2001234-01</b>			<b>Prepared &amp; Analyzed: 01/23/20</b>					
pH	6.57		pH Units		6.59			0.304	20	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/24/20 06:30

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

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

**Batch 2001317 - General Preparation**

**Blank (2001317-BLK1)**

Prepared & Analyzed: 01/23/20

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (2001317-BS1)**

Prepared & Analyzed: 01/23/20

Specific Conductance (EC) 0.775 0.0100 mmhos/cm 0.750 103 90-110

**Duplicate (2001317-DUP1)**

**Source: 2001234-01**

Prepared & Analyzed: 01/23/20

Specific Conductance (EC) 0.171 0.0100 mmhos/cm 0.171 0.293 20

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/24/20 06:30

### 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 27, 2020

Brandon Bruns  
Tasman Geosciences  
6855 W. 119th Ave.  
Broomfield, CO 80020  
RE: Noble - Lapp A22-689  
Work Order #2001285

Enclosed are the results of analyses for samples received by Summit Scientific on 01/24/20 17:41. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury  
President



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/27/20 06:52

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FS07@14'	2001285-01	Soil	01/24/20 11:45	01/24/20 17:41
SS24@13'	2001285-02	Soil	01/24/20 12:30	01/24/20 17:41
SS25@13'	2001285-03	Soil	01/24/20 12:40	01/24/20 17:41

Summit Scientific

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# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310 ♦ 303-374-5933 (f)

Client: Noble Energy	Project Manager: Brandon Bruns, Invoice: Howard Aamold
Address:	E-Mail: bbruns@tasman-geo.com
City/State/Zip:	
Phone:	Project Name: Lapp A22-689
Sampler Name: Kevin Chritz	Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested						Special Instructions		
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	GETEX N	TPH - DRD						
1	FS07@14'	1/24/2020	11:45	1			X			X			X	X						
2	SS24@13'	1/24/2020	12:30	1			X			X			X	X						
3	SS25@13'	1/24/2020	12:40	1			X			X			X	X						
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Relinquished by: 	Date/Time: 1/24/2020 15:32	Received by: Tasman Box	Date/Time: 1/24/2020 15:32	Turn Around Time (Check)	Notes:
				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"/>	
				Sample Integrity:	
				Temperature Upon Receipt: 5.4	
				Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

**Sample Receipt Checklist**

S2 Work Order 200/285

Client: NOBLE ENERGY Client Project ID: LAPP A22-689

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

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

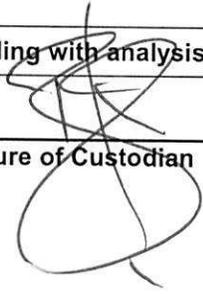
Temp (°C)	5.4
-----------	-----

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? 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):				

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

RZ  
 \_\_\_\_\_  
 Custodian Printed Name or Initials

  
 \_\_\_\_\_  
 Signature of Custodian

1/24/20  
 \_\_\_\_\_  
 Date/Time



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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/27/20 06:52

**FS07@14'**  
**2001285-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/24/20 11:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>0.0057</b>	0.0020		mg/kg	1	2001350	01/24/20	01/25/20	EPA 8260B	
<b>Toluene</b>	<b>0.027</b>	0.0050		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0075</b>	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.060</b>	0.010		"	"	"	"	"	"	
Naphthalene	ND	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **01/24/20 11:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		102 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.4 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.9 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/24/20 11:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	2001349	01/24/20	01/25/20	EPA 8015M	

Date Sampled: **01/24/20 11:45**

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

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/27/20 06:52

**SS24@13'**  
**2001285-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/24/20 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.0062</b>	0.0020	mg/kg	1	2001350	01/24/20	01/25/20	EPA 8260B	
<b>Toluene</b>	<b>0.021</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0077</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.063</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/24/20 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/24/20 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2001349	01/24/20	01/25/20	EPA 8015M	

Date Sampled: **01/24/20 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		114 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/27/20 06:52

**SS25@13'**  
**2001285-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **01/24/20 12:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Benzene</b>	<b>0.019</b>	0.0020	mg/kg	1	2001350	01/24/20	01/25/20	EPA 8260B	
<b>Toluene</b>	<b>0.037</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0062</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.046</b>	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **01/24/20 12:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<i>Surrogate: 1,2-Dichloroethane-d4</i>		102 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.8 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		100 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/24/20 12:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	2001349	01/24/20	01/25/20	EPA 8015M	

Date Sampled: **01/24/20 12:40**

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

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/27/20 06:52

**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 2001350 - EPA 5030 Soil MS**

**Blank (2001350-BLK1)**

Prepared: 01/24/20 Analyzed: 01/25/20

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	0.0413		"	0.0400		103	23-173			
Surrogate: Toluene-d8	0.0388		"	0.0400		96.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0409		"	0.0400		102	21-167			

**LCS (2001350-BS1)**

Prepared: 01/24/20 Analyzed: 01/25/20

Benzene	0.126	0.0020	mg/kg	0.150		83.9	70-130			
Toluene	0.126	0.0050	"	0.150		83.8	70-130			
Ethylbenzene	0.129	0.0050	"	0.150		85.8	70-130			
m,p-Xylene	0.251	0.010	"	0.300		83.6	70-130			
o-Xylene	0.132	0.0050	"	0.150		87.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400		98.8	21-167			

**Matrix Spike (2001350-MS1)**

Source: 2001281-01

Prepared: 01/24/20 Analyzed: 01/25/20

Benzene	0.124	0.0020	mg/kg	0.150	ND	82.4	70-130			
Toluene	0.124	0.0050	"	0.150	ND	82.8	70-130			
Ethylbenzene	0.127	0.0050	"	0.150	ND	84.7	70-130			
m,p-Xylene	0.246	0.010	"	0.300	ND	82.1	70-130			
o-Xylene	0.128	0.0050	"	0.150	ND	85.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0395		"	0.0400		98.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0400		102	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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/27/20 06:52

**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 2001350 - EPA 5030 Soil MS**

**Matrix Spike Dup (2001350-MSD1)**

Source: 2001281-01

Prepared: 01/24/20 Analyzed: 01/25/20

Benzene	0.120	0.0020	mg/kg	0.150	ND	80.1	70-130	2.73	30
Toluene	0.122	0.0050	"	0.150	ND	81.4	70-130	1.68	30
Ethylbenzene	0.125	0.0050	"	0.150	ND	83.1	70-130	1.95	30
m,p-Xylene	0.243	0.010	"	0.300	ND	81.1	70-130	1.19	30
o-Xylene	0.126	0.0050	"	0.150	ND	83.7	70-130	1.87	30
Surrogate: 1,2-Dichloroethane-d4	0.0393		"	0.0400		98.2	23-173		
Surrogate: Toluene-d8	0.0396		"	0.0400		99.1	20-170		
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167		

Summit Scientific

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

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Brun

**Reported:**  
01/27/20 06:52

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 2001349 - EPA 3550A**

**Blank (2001349-BLK1)**

Prepared & Analyzed: 01/24/20

C10-C28 (DRO) ND 50 mg/kg

**LCS (2001349-BS1)**

Prepared & Analyzed: 01/24/20

C10-C28 (DRO) 521 50 mg/kg 500 104 70-130

**Matrix Spike (2001349-MS1)**

Source: 2001281-01

Prepared & Analyzed: 01/24/20

C10-C28 (DRO) 552 50 mg/kg 500 7.84 109 70-130

**Matrix Spike Dup (2001349-MSD1)**

Source: 2001281-01

Prepared & Analyzed: 01/24/20

C10-C28 (DRO) 525 50 mg/kg 500 7.84 103 70-130 4.93 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  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Lapp A22-689

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/27/20 06:52

### 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