
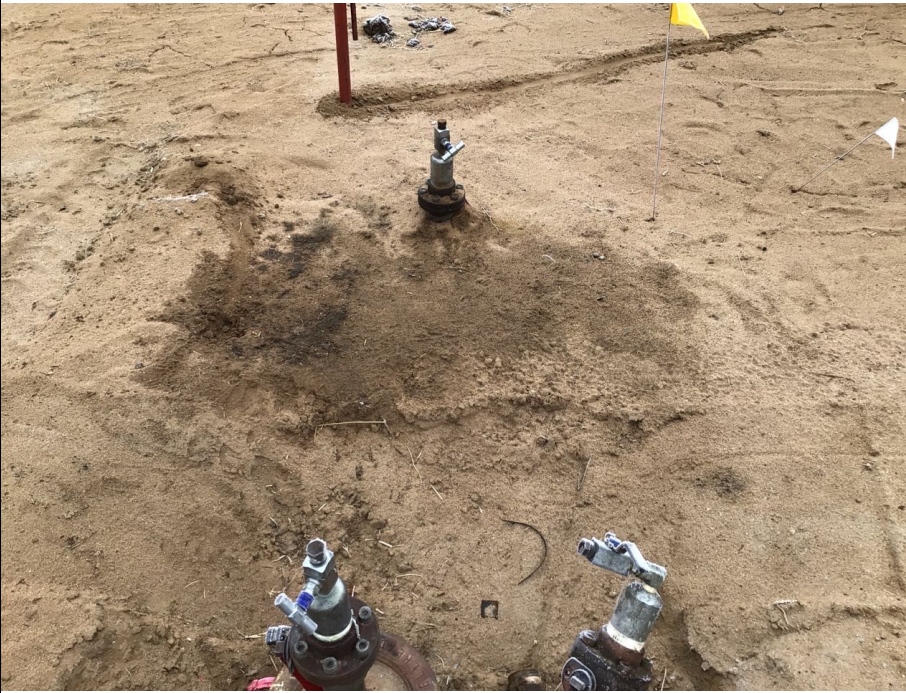


Wellhead Closure Checklist



COGCC Rule 911.a.(4) Environmental Site Closure Assessment Field Form

Additional attachments (optional)		Pit Closure		Tank Battery Closure		Flowline Closure		Partially Buried Vault Closure
Site Name & COGCC Facility Number Liam D34-33		Date: 3/11/21						Remediation Project #
Associated Wells		Age of Site						Number of Photos Attached 12
Location: (GPS coordinates of wellhead or southeastern most wellhead for multiple) 40.1784163, -104.5464459							Estimated Facility Size (acres)	
General Condition of Site: (General observations regarding housekeeping, corrosion, waste management, etc.) Good - no erosion, corrosion, debris. Healthy vegetation								
USCS Soil Type: sm - silty sand				Estimated Depth to Groundwater: 7 6'				
Hydrocarbon Impacted Soils / Spills (Note estimated size and if impact appears to be surficial or extends to an unknown depth) none observed								
Salt Crusted Soils or Impacted Vegetation: (Note estimated size and if impact appears to be surficial or extends to an unknown depth) none observed								
Wellhead(s)								
Well API	123 - 33933							
Age								
Condition of surface around wellhead	Good							
PID Readings	N/A							
Condition of subsurface (staining present)	Good							
PID Readings	0.1-15.3							
Sample taken? Location Sample ID	See below							
Photo Number(s)	5-9							
Other observations regarding wellheads: Samples collected from all 4 sidewalls and base of excavation (SS01 @ 2.5' - SS04 @ 2.5', FS01 @ 6')								
Summary								
Was impacted soil identified? <input checked="" type="radio"/> No Yes - less than 10 cubic yards Yes - more than 10 cubic yards								
Total number of samples field screened:				Total number of samples collected:				
Highest PID Reading:				Total number of samples submitted to lab for analysis:				
If more than 10 cubic yards of impacted soil were observed:								
Vertical extent:				Estimated spill volume:				
Lateral extent:				Volume of soil removed:				
Is additional investigation required?								
Was groundwater encountered during the investigation? <input checked="" type="radio"/> No Yes - not impacted or in contact with impacted soils Yes - groundwater impacted and/or in contact with impacted soils								
Measured depth to groundwater:				Was remedial groundwater removal conducted? Yes No				
Date Groundwater was encountered:				Commencement date of removal:				
Sheen on groundwater? Yes No				Volume of groundwater removed prior to sampling:				
Free product observed? Yes No				Volume of groundwater removed post sampling:				
Total number of samples collected:				Total Volume of groundwater removed:				
Total number of samples submitted to lab for analysis:								

Photographic Log

							
Equipment ID:		Equipment Type:		Equipment ID:		Equipment Type:	
Material:		Volume:		Material:		Volume:	
Contents:				Contents:			
Notes/Conditions: North side of wellhead. No hydrocarbon odor or staining				Notes/Conditions: East side of wellhead. No hydrocarbon odor or staining			



Photographic Log

											
Equipment ID:		Equipment Type:		Equipment ID:		Equipment Type:					
Material:		Volume:		Contents:		Material:		Volume:		Contents:	
Notes/Conditions: South side of wellhead. No hydrocarbon odor or staining						Notes/Conditions: West side of wellhead. No hydrocarbon odor or staining					

Photographic Log

											
Equipment ID:		Equipment Type:		Equipment ID:		Equipment Type:					
Material:		Volume:		Contents:		Material:		Volume:		Contents:	
Notes/Conditions: SS01 @2.5' sample location. No hydrocarbon odor or staining						Notes/Conditions: SS02 @2.5' sample location. No hydrocarbon odor or staining					

Photographic Log

											
Equipment ID:		Equipment Type:		Equipment ID:		Equipment Type:					
Material:		Volume:		Contents:		Material:		Volume:		Contents:	
Notes/Conditions: SS03@2.5' sample location. No hydrocarbon odor or staining						Notes/Conditions: SS03@2.5' sample location. No hydrocarbon odor or staining					

Photographic Log

											
Equipment ID:		Equipment Type:		Equipment ID:		Equipment Type:					
Material:		Volume:		Contents:		Material:		Volume:		Contents:	
Notes/Conditions: FS01 @ 6' sample location. No hydrocarbon odor or staining						Notes/Conditions: FL01-A @ 4' sample location. No hydrocarbon odor or staining					

Photographic Log

							
Equipment ID:		Equipment Type:		Equipment ID:		Equipment Type:	
Material:	Volume:	Contents:		Material:	Volume:	Contents:	
Notes/Conditions: Final wellhead excavation extent.				Notes/Conditions: BG01@2.5' sample location. No hydrocarbon odor or staining			

TABLE 1
SOIL SAMPLE LOCATIONS
NOBLE ENERGY, INC. - LIAM D34-33

Soil Sample ID	Date	PID (ppm)	Visual	Olfactory	Sample Type (Grab/Lab)	Latitude ¹	Longitude	PDOP
SS01@2.5'	03/11/21	0.1	No Staining	No Odor	Grab	40.17843634	-104.5464396	1.4
SS02@2.5'	03/11/21	15.3	No Staining	No Odor	Lab	40.17841879	-104.5464211	1.2
SS03@2.5'	03/11/21	1.5	No Staining	No Odor	Grab	40.17840073	-104.5464421	1.2
SS04@2.5'	03/11/21	0.7	No Staining	No Odor	Grab	40.17842206	-104.5464708	1.2
FS01@6'	03/11/21	1.3	No Staining	No Odor	Lab	40.17841524	-104.5464371	1.2
FL01-A@4'	03/11/21	1.5	No Staining	No Odor	Lab	40.17843007	-104.5464259	1.3
BG01@2.5'	03/11/21	0.7	No Staining	No Odor	Lab	40.17843212	-104.5463017	1.3

Notes:

PID = Photo-ionization detector

ppm = parts per million

PDOP = Position dilution of precision

HC = Hydrocarbon

1.) Latitude and longitude coordinates will be provided in decimal degrees with an accuracy and precision of 5 decimals of a degree using the North American Datum ("NAD") of 1983

TABLE 2
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - LIAM D34-33

Soil Sample ID	Date	¹ Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	1,2,4 - TMB (mg/kg)	1,3,5 - TMB (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	TPH-ORO (mg/kg)	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benz(a) (mg/kg)	Benzo(a) (mg/kg)	Benzo(b) (mg/kg)	Benzo(k) (mg/kg)	Chrysene (mg/kg)	A,H (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	1,2,3-CD (mg/kg)	Pyrene (mg/kg)	1-M (mg/kg)	2-M (mg/kg)
Residential SSL ²		1.2	490	5.8	58	30	27	2	500			360	1,800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	180	18	24
Protection of Groundwater SSL ^{2,3}		0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500			0.55	6	0.011	0.24	0.3	2.9	9	0.096	8.9	0.54	0.98	1.3	0.006	0.019
SS02@2.5'	03/11/21	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
FS01@6'	03/11/21	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
FL01-A@4'	03/11/21	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

Soil Sample ID	Date	pH	SAR	EC (mmhos/cm)	Boron (mg/L)
Residential SSL ²		6 - 8.3	<6	<4mmhos/cm	2
SS02@2.5'	03/11/21	7.8	0.46	0.29	0.2290
FS01@6'	03/11/21	7.9	0.62	0.27	0.6640
FL01-A@4'	03/11/21	7.9	0.61	0.24	0.0841

Notes:

1. Compounds referenced from 2 CCR 404-1, Table 915-1, effective January 15, 2021.

2. Soil Screening Levels (SSL) referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.

3. SSLs are applicable if a pathway for communication with groundwater is present.

Definitions:

COGCC = Colorado Oil and Gas Conservation Commission

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

TPH-ORO = Total petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram

SAR = Sodium Adsorption Ratio

EC = Electrical Conductivity

mmhos/cm = Millmhos per centimeter

mg/L = Milligrams per liter

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

Highlighted results are equal to or exceed the COGCC Table 915-1 standard

1,2,4 - TMB = 1,2,4 Trimethylbenzene

1,3,5 - TMB = 1,3,5 Trimethylbenzene

Benz(a) = Benzanthracene

Benzo(b) = Benzofluoranthene

Benzo(k) = Benzofluoranthene

Benzo(a) = Benzopyrene


A,H = Dibenzoanthracene

1,2,3-CD = Indenopyrene

1-M = 1-methylnaphthalene

2-M = 2-methylnaphthalene



DATE:	04/20/2021	 <div>Tasman Geosciences, Inc. 6855 W 119th Avenue Broomfield, CO 80020</div>	Noble Energy, Inc. – DJ Basin Liam D34-33 NWSW, Section 34, Township 3 North, Range 64 West Weld County, Colorado	Wellhead Closure & Soil Analytical Results Map (03/11/2021)	FIGURE 1
DESIGNED BY:	JW				
DRAWN BY:	HM				

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

March 29, 2021

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Liam D34-33

Work Order # 2103220

Enclosed are the results of analyses for samples received by Summit Scientific on 03/11/21 18:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury

President



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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS02@2.5'	2103220-01	Soil	03/11/21 09:20	03/11/21 18:00
FS01@6'	2103220-02	Soil	03/11/21 09:35	03/11/21 18:00
FL01-A@4'	2103220-03	Soil	03/11/21 09:40	03/11/21 18:00

Summit Scientific

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

Summit Scientific
S₂

Project Number:

www.s2scientific.com

Sample Receipt Checklist

S2 Work Order 2103220

Client: Noble/Tasman Geosciences

Client Project ID: Liam D34-33

Shipped Via: ☐ H.D./P.U./FedEx/UPS/USPS/Other

Airbill #: _____

Matrix (check all that apply):

☐ Air

☒ Soil/Solid

☐ Water

☐ Other: _____

(Describe)

Temp (°C)	5.1
-----------	-----

Thermometer ID: 61857155-K

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

Additional Comments (if any):

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

CS

Custodian Printed Name or Initials

Signature of Custodian

3/11/21

Date/Time



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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

SS02@2.5'
2103220-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/11/21 09:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEC0261	03/12/21	03/16/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	03/17/21	"	

Date Sampled: **03/11/21 09:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		83.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		117 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/11/21 09:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEC0280	03/16/21	03/16/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:20**

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

PAH by EPA Method 8270D SIM

Summit Scientific

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

SS02@2.5'
2103220-01 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/11/21 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEC0356	03/20/21	03/21/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		81.2 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		78.0 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/11/21 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.229	0.0100	mg/L	1	BEC0460	03/26/21	03/27/21	EPA 6020B	

Summit Scientific

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

FS01@6'
2103220-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/11/21 09:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEC0261	03/12/21	03/16/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		82.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		112 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/11/21 09:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEC0280	03/16/21	03/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:35**

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

PAH by EPA Method 8270D SIM

Summit Scientific

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

FS01@6'
2103220-02 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/11/21 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEC0356	03/20/21	03/21/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		83.9 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		83.4 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/11/21 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.664	0.0100	mg/L	1	BEC0460	03/26/21	03/27/21	EPA 6020B	

Summit Scientific

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

FL01-A@4'
2103220-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/11/21 09:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BEC0261	03/12/21	03/16/21	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		99.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		110 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/11/21 09:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BEC0280	03/16/21	03/17/21	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		114 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

FL01-A@4'
2103220-03 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/11/21 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BEC0356	03/20/21	03/21/21	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/11/21 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		85.5 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		82.5 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/11/21 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.0841	0.0100	mg/L	1	BEC0460	03/26/21	03/27/21	EPA 6020B	

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BEC0261 - EPA 5030 Soil MS

Blank (BEC0261-BLK1)

Prepared: 03/12/21 Analyzed: 03/17/21

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
1,2,4-Trimethylbenzene	ND	0.0050	"							
1,3,5-Trimethylbenzene	ND	0.0050	"							
Naphthalene	ND	0.0038	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0290		"	0.0400		72.6	23-173			
Surrogate: Toluene-d8	0.0482		"	0.0400		120	20-170			
Surrogate: 4-Bromofluorobenzene	0.0421		"	0.0400		105	21-167			

LCS (BEC0261-BS1)

Prepared: 03/12/21 Analyzed: 03/17/21

Benzene	0.0891	0.0020	mg/kg	0.100		89.1	70-130			
Toluene	0.0895	0.0050	"	0.100		89.5	70-130			
Ethylbenzene	0.0849	0.0050	"	0.100		84.9	70-130			
m,p-Xylene	0.154	0.010	"	0.200		77.0	70-130			
o-Xylene	0.0792	0.0050	"	0.100		79.2	70-130			
1,2,4-Trimethylbenzene	0.0808	0.0050	"	0.100		80.8	70-130			
1,3,5-Trimethylbenzene	0.0767	0.0050	"	0.100		76.7	70-130			
Naphthalene	0.0878	0.0038	"	0.100		87.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0246		"	0.0400		61.6	23-173			
Surrogate: Toluene-d8	0.0429		"	0.0400		107	20-170			
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400		96.7	21-167			

Matrix Spike (BEC0261-MS1)

Source: 2103217-01

Prepared: 03/12/21 Analyzed: 03/17/21

Benzene	0.0919	0.0020	mg/kg	0.100	ND	91.9	70-130			
Toluene	0.101	0.0050	"	0.100	ND	101	70-130			
Ethylbenzene	0.0928	0.0050	"	0.100	ND	92.8	70-130			
m,p-Xylene	0.171	0.010	"	0.200	ND	85.6	70-130			
o-Xylene	0.0858	0.0050	"	0.100	ND	85.8	70-130			
1,2,4-Trimethylbenzene	0.0920	0.0050	"	0.100	ND	92.0	70-130			
1,3,5-Trimethylbenzene	0.0871	0.0050	"	0.100	ND	87.1	70-130			
Naphthalene	0.0897	0.0038	"	0.100	ND	89.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0244		"	0.0400		61.1	23-173			
Surrogate: Toluene-d8	0.0469		"	0.0400		117	20-170			
Surrogate: 4-Bromofluorobenzene	0.0408		"	0.0400		102	21-167			

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

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

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

Batch BEC0261 - EPA 5030 Soil MS

Matrix Spike Dup (BEC0261-MSD1)		Source: 2103217-01			Prepared: 03/12/21 Analyzed: 03/17/21					
Benzene	0.0705	0.0020	mg/kg	0.100	ND	70.5	70-130	26.3	30	
Toluene	0.103	0.0050	"	0.100	ND	103	70-130	1.59	30	
Ethylbenzene	0.0997	0.0050	"	0.100	ND	99.7	70-130	7.14	30	
m,p-Xylene	0.177	0.010	"	0.200	ND	88.5	70-130	3.31	30	
o-Xylene	0.0896	0.0050	"	0.100	ND	89.6	70-130	4.34	30	
1,2,4-Trimethylbenzene	0.0940	0.0050	"	0.100	ND	94.0	70-130	2.19	30	
1,3,5-Trimethylbenzene	0.0883	0.0050	"	0.100	ND	88.3	70-130	1.33	30	
Naphthalene	0.0963	0.0038	"	0.100	ND	96.3	70-130	7.10	30	
<hr/>										
Surrogate: 1,2-Dichloroethane-d4	0.0269		"	0.0400		67.3	23-173			
Surrogate: Toluene-d8	0.0406		"	0.0400		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400		97.6	21-167			

Summit Scientific

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch BEC0280 - EPA 3550A

Blank (BEC0280-BLK1)

Prepared & Analyzed: 03/16/21

C10-C28 (DRO)	ND	50	mg/kg
C28-C36 (ORO)	ND	50	"

LCS (BEC0280-BS1)

Prepared & Analyzed: 03/16/21

C10-C28 (DRO)	552	50	mg/kg	500	110	70-130
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Matrix Spike (BEC0280-MS1)

Source: 2103218-01

Prepared & Analyzed: 03/16/21

C10-C28 (DRO)	522	50	mg/kg	500	26.2	99.2	70-130
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Matrix Spike Dup (BEC0280-MSD1)

Source: 2103218-01

Prepared & Analyzed: 03/16/21

C10-C28 (DRO)	458	50	mg/kg	500	26.2	86.4	70-130	13.1	20
---------------	-----	----	-------	-----	------	------	--------	------	----

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BEC0356 - EPA 5030 Soil MS

Blank (BEC0356-BLK1)

Prepared & Analyzed: 03/20/21

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
1-Methylnaphthalene	ND	0.00500	"							
2-Methylnaphthalene	ND	0.00500	"							
Surrogate: 2-Methylnaphthalene-d10	0.0366		"	0.0333		110	40-150			
Surrogate: Fluoranthene-d10	0.0322		"	0.0333		96.7	40-150			

LCS (BEC0356-BS1)

Prepared & Analyzed: 03/20/21

Acenaphthene	0.0296	0.00500	mg/kg	0.0333		88.8	31-137			
Anthracene	0.0298	0.00500	"	0.0333		89.3	30-120			
Benzo (a) anthracene	0.0283	0.00500	"	0.0333		84.9	30-120			
Benzo (a) pyrene	0.0291	0.00500	"	0.0333		87.4	30-120			
Benzo (b) fluoranthene	0.0308	0.00500	"	0.0333		92.4	30-120			
Benzo (k) fluoranthene	0.0303	0.00500	"	0.0333		91.0	30-120			
Chrysene	0.0293	0.00500	"	0.0333		87.8	30-120			
Dibenz (a,h) anthracene	0.0267	0.00500	"	0.0333		80.1	30-120			
Fluoranthene	0.0286	0.00500	"	0.0333		85.9	30-120			
Fluorene	0.0239	0.00500	"	0.0333		71.7	30-120			
Indeno (1,2,3-cd) pyrene	0.0270	0.00500	"	0.0333		80.9	30-120			
Pyrene	0.0276	0.00500	"	0.0333		82.9	35-142			
1-Methylnaphthalene	0.0297	0.00500	"	0.0333		89.1	35-142			
2-Methylnaphthalene	0.0304	0.00500	"	0.0333		91.2	35-142			
Surrogate: 2-Methylnaphthalene-d10	0.0306		"	0.0333		91.8	40-150			
Surrogate: Fluoranthene-d10	0.0330		"	0.0333		98.9	40-150			

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
03/29/21 11:37

PAH by EPA Method 8270D SIM - Quality Control

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

Batch BEC0356 - EPA 5030 Soil MS

Matrix Spike (BEC0356-MS1)			Source: 2103219-01			Prepared & Analyzed: 03/20/21					
Acenaphthene	0.0327	0.00500	mg/kg	0.0333	ND	98.1	31-137				
Anthracene	0.0330	0.00500	"	0.0333	ND	98.9	30-120				
Benzo (a) anthracene	0.0321	0.00500	"	0.0333	ND	96.4	30-120				
Benzo (a) pyrene	0.0334	0.00500	"	0.0333	ND	100	30-120				
Benzo (b) fluoranthene	0.0342	0.00500	"	0.0333	ND	103	30-120				
Benzo (k) fluoranthene	0.0334	0.00500	"	0.0333	ND	100	30-120				
Chrysene	0.0327	0.00500	"	0.0333	ND	98.2	30-120				
Dibenz (a,h) anthracene	0.0311	0.00500	"	0.0333	ND	93.3	30-120				
Fluoranthene	0.0315	0.00500	"	0.0333	ND	94.4	30-120				
Fluorene	0.0287	0.00500	"	0.0333	ND	86.0	30-120				
Indeno (1,2,3-cd) pyrene	0.0311	0.00500	"	0.0333	ND	93.3	30-120				
Pyrene	0.0307	0.00500	"	0.0333	ND	92.1	35-142				
1-Methylnaphthalene	0.0326	0.00500	"	0.0333	ND	97.9	15-130				
2-Methylnaphthalene	0.0326	0.00500	"	0.0333	ND	97.8	15-130				
Surrogate: 2-Methylnaphthalene-d10	0.0344		"	0.0333		103	40-150				
Surrogate: Fluoranthene-d10	0.0348		"	0.0333		104	40-150				

Matrix Spike Dup (BEC0356-MSD1)			Source: 2103219-01			Prepared & Analyzed: 03/20/21					
Acenaphthene	0.0330	0.00500	mg/kg	0.0333	ND	99.0	31-137	0.879	30		
Anthracene	0.0347	0.00500	"	0.0333	ND	104	30-120	5.16	30		
Benzo (a) anthracene	0.0332	0.00500	"	0.0333	ND	99.5	30-120	3.08	30		
Benzo (a) pyrene	0.0347	0.00500	"	0.0333	ND	104	30-120	3.69	30		
Benzo (b) fluoranthene	0.0352	0.00500	"	0.0333	ND	106	30-120	2.89	30		
Benzo (k) fluoranthene	0.0343	0.00500	"	0.0333	ND	103	30-120	2.47	30		
Chrysene	0.0337	0.00500	"	0.0333	ND	101	30-120	3.08	30		
Dibenz (a,h) anthracene	0.0331	0.00500	"	0.0333	ND	99.3	30-120	6.29	30		
Fluoranthene	0.0325	0.00500	"	0.0333	ND	97.4	30-120	3.12	30		
Fluorene	0.0292	0.00500	"	0.0333	ND	87.6	30-120	1.77	30		
Indeno (1,2,3-cd) pyrene	0.0328	0.00500	"	0.0333	ND	98.5	30-120	5.33	30		
Pyrene	0.0319	0.00500	"	0.0333	ND	95.6	35-142	3.77	30		
1-Methylnaphthalene	0.0330	0.00500	"	0.0333	ND	98.9	15-130	1.04	50		
2-Methylnaphthalene	0.0336	0.00500	"	0.0333	ND	101	15-130	2.93	50		
Surrogate: 2-Methylnaphthalene-d10	0.0348		"	0.0333		104	40-150				
Surrogate: Fluoranthene-d10	0.0358		"	0.0333		107	40-150				

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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control
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Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch BEC0460 - EPA 3050B

Blank (BEC0460-BLK1)

Prepared: 03/26/21 Analyzed: 03/27/21

Boron ND 0.0100 mg/L

LCS (BEC0460-BS1)

Prepared: 03/26/21 Analyzed: 03/27/21

Boron 4.99 0.0100 mg/L 5.00 99.9 80-120

Duplicate (BEC0460-DUP1)

Source: 2103220-01

Prepared: 03/26/21 Analyzed: 03/27/21

Boron 0.237 0.0100 mg/L 0.229 3.50 20

Matrix Spike (BEC0460-MS1)

Source: 2103220-01

Prepared: 03/26/21 Analyzed: 03/27/21

Boron 5.47 0.0100 mg/L 5.00 0.229 105 75-125

Matrix Spike Dup (BEC0460-MSD1)

Source: 2103220-01

Prepared: 03/26/21 Analyzed: 03/27/21

Boron 5.23 0.0100 mg/L 5.00 0.229 100 75-125 4.45 25

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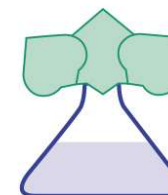
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20491

SUMMIT SCIENTIFIC

4653 TABLE MOUNTAIN DRIVE, SUITE B

GOLDEN CO 80403

NAME : 2103220

DATE RECEIVED: 03/19/2021

DATE REPORTED: 03/25/2021

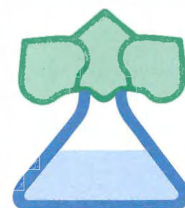
SOIL TEST RESULTS																	
LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH		EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA)		PHOSPHORUS						
				1 : 1 Soil	Buffer Woodruff				ppm	lbs/A	P1 ppm	Bicarb ppm	P2 ppm	M2 ppm	M3 ppm		
3326749	SS02 AT 2 5		0-30														
3326750	FS01 AT 6		0-72														
3326751	FL01 A AT 4		0-48														
LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable)				DTPA				BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION					
		K ppm	Ca ppm	Mg ppm	Na ppm	Zn ppm	Fe ppm	Mn ppm	Cu ppm			BASE	H	Ca	Mg	K	Na
3326749																	
3326750																	
3326751																	
LAB NUMBER	SOLUBLE (SAT. EXT.)			SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS				CHLORIDE		EXCH. NH4-N		ALUMINUM ppm	TOTAL N %	
	Ca me/L	Mg me/L	Na me/L				SAND %	SILT %	CLAY %	SOIL TEXTURE	ppm	lbs/A	ppm	lbs/A			
3326749	1.92	0.76	0.53	0.46	1	0											
3326750	1.77	0.74	0.69	0.62	1	0											
3326751	1.70	0.72	0.67	0.61	1	0											
SUGGESTED FERTILIZER RECOMMENDATIONS																	LIME REC 60% ECCE T/A
LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N	P2O5	K2O	S	Zn	MgO	Fe	Mn	Cu	B	Cl		
3326749	SS02 AT 2 5																
3326750	FS01 AT 6																
3326751	FL01 A AT 4																
Approved By: Kevin Grooms																	
Analysis By: American Agricultural Lab																	
Recommendations By: American Agricultural Lab																	

American Agricultural Laboratory, Inc.

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"Analysis You Can Grow With"®



SUMMIT SCIENTIFIC
4653 TABLE MOUNTAIN DRIVE SUITE B
GOLDEN, CO 80403

ACCOUNT NO: 20491
DATE RECEIVED: 03/19/2021
DATE REPORTED: 03/23/2021

SATURATED PASTE EXTRACT ANALYSIS

Lab No.	Grower	Sample ID	Depth inches	pH s.u.	Soluble Salts mmhos/cm
3326749	2103220	SS02@2.5'	0-30	7.8	0.29
3326750	2103220	FS01@6'	0-72	7.9	0.27
3326751	2103220	FL01-A@4'	0-48	7.9	0.24

By: Electronically Approved Kevin Grooms



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

Project: Noble - Liam D34-33

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/29/21 11:37

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