



SS05@5'
 B - <0.0020 mg/kg
 T - <0.0050 mg/kg
 E - <0.0050 mg/kg
 X - <0.010 mg/kg
 TPH - <50 mg/kg
 N - <0.010 mg/kg

SS02@3'
 B - <0.0020 mg/kg
 T - <0.0050 mg/kg
 E - <0.0050 mg/kg
 X - <0.010 mg/kg
 TPH - <50 mg/kg
 N - <0.010 mg/kg
 SAR - 0.665
 EC - 0.192 mmhos/cm
 pH - 6.7

Legend

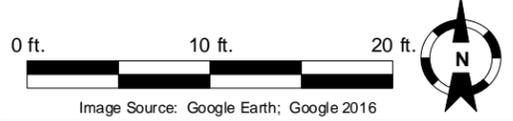
- Excavation Sample Location
- Excavation Sample Location (Not Submitted for Laboratory Analysis)
- Excavation Extent

Notes

- 1) Site Coordinates: 40.185020, -104.571763
- 2) All locations are approximate unless otherwise noted
- 3) **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

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
TPH- Total Petroleum Hydrocarbons	500 mg/kg
N - Naphthalene	23 mg/kg
SAR – Sodium Absorption Ratio	<12 ⁵
EC – Electrical Conductivity	<4mmhos/cm or 2x background
pH	6-9



DATE: 06/11/2018
 DESIGNED BY: JW
 DRAWN BY: JW

TASMAN GEOSCIENCES
 Tasman Geosciences, Inc.
 6899 Pecos Street – Unit C
 Denver, CO 80221

Noble Energy, Inc. – DJ Basin
Norris D32-1, 2, 7, 1J Vault Removal – Location ID: 329462
 NENE, Section 32, Township 3 North, Range 64 West
 Weld County, Colorado

Excavation Soil Analytical
 Results Map
 (05/07/2018)

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 14, 2018

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

RE: Noble - Norris D 32-1, 2, 7, 1J

Enclosed are the results of analyses for samples received by Summit Scientific on 05/07/18 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/14/18 10:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS02@3'	1805067-02	Soil	05/07/18 14:34	05/07/18 17:00
SS05@5'	1805067-05	Soil	05/07/18 14:45	05/07/18 17:00

Summit Scientific

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Summit Scientific

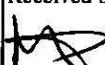
1805067

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

Page 1 of 1

Client: Noble/ Tasman
Address:
City/State/Zip:
Phone: 720-616-8383 Fax:
Sampler Name: J Whritenour

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: bbruns@tasman-geo.com
Project Name: Norris 032-1, 2, 7, 1j
Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:				Special Instructions		
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)						
550103'	5-7-18	1429	1			X			X			8200 GTEXU					Place 5501, 5503, 5504 on HOLD
550203'	↓	1434	1			X						X	X	X			
550303'	↓	1438	1			X											
550403'	↓	1440	1			X											
550505'	↓	1445	1			X						X	X				
Relinquished by:  Date/Time: 5/7/18 17:00				Received by:  Date/Time: 5-7-18 17:00				Turn Around Time (Check)				Notes:					
								Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/>				Standard <input checked="" type="checkbox"/>					
Relinquished by:				Received by:				48 Hours <input type="checkbox"/>				Sample Integrity:					
Date/Time:				Date/Time:				Temperature Upon Receipt: 1.5				on icp					
Relinquished by:				Received in Lab by:				Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>									
Date/Time:				Date/Time:													

1805067

Sample Receipt Checklist

S2 Work Order: _____

Client: Noble / Tasman

Client Project ID: Norris D 32 -1, 2, 7, 1j

Shipped Via: P.U.
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)	1.5				

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 short holding time analytes or samples with HTs 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.

Muri
Custodian Printed Name

MS 5-7-18
Signature or Initials of Custodian

18:00
Date/Time



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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/14/18 10:31

SS02@3'
1805067-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1805083	05/08/18	05/11/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		117 %	70-130		"	"	"	"	
Surrogate: Toluene-d8		95.8 %	70-130		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	70-130		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1805091	05/09/18	05/10/18	EPA 8015M	

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		88.6 %	30-150		"	"	"	"	

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

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	112	11.4	mg/kg dry	1	1805073	05/08/18	05/08/18	EPA 6020B	

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/14/18 10:31

SS02@3'
1805067-02 (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	190	5.70	mg/kg dry	1	1805073	05/08/18	05/08/18	EPA 6020B	
Sodium	49.8	5.70	"	"	"	"	"	"	"

Calculated Analysis

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.665	0.100	units	1	1805082	05/08/18	05/08/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.8		%	1	1805074	05/08/18	05/08/18	Calculation	
pH	6.7		pH Units	"	1805078	05/08/18	05/08/18	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **05/07/18 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.192	0.0100	mmhos/cm	1	1805077	05/08/18	05/08/18	EPA 120.1	

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/14/18 10:31

SS05@5'
1805067-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/07/18 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1805083	05/08/18	05/11/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **05/07/18 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		116 %	70-130		"	"	"	"	
Surrogate: Toluene-d8		98.5 %	70-130		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.8 %	70-130		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/07/18 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1805091	05/09/18	05/10/18	EPA 8015M	

Date Sampled: **05/07/18 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		85.4 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/14/18 10:31

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1805083 - EPA 5030 Soil MS

Blank (1805083-BLK1)

Prepared: 05/08/18 Analyzed: 05/09/18

Benzene	ND	0.0020	mg/kg								
Toluene	ND	0.0050	"								
Ethylbenzene	ND	0.0050	"								
Xylenes (total)	ND	0.010	"								
Naphthalene	ND	0.010	"								
Gasoline Range Hydrocarbons	ND	50	"								
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0396		108	70-130				
Surrogate: Toluene-d8	0.0386		"	0.0400		96.5	70-130				
Surrogate: 4-Bromofluorobenzene	0.0412		"	0.0400		103	70-130				

LCS (1805083-BS1)

Prepared: 05/08/18 Analyzed: 05/09/18

Benzene	0.151	0.0020	mg/kg	0.150		101	70-130				
Toluene	0.151	0.0050	"	0.150		101	70-130				
Ethylbenzene	0.154	0.0050	"	0.150		103	70-130				
m,p-Xylene	0.298	0.010	"	0.300		99.2	70-130				
o-Xylene	0.154	0.0050	"	0.150		103	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0406		"	0.0396		103	70-130				
Surrogate: Toluene-d8	0.0398		"	0.0400		99.4	70-130				
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400		97.6	70-130				

Matrix Spike (1805083-MS1)

Source: 1805066-01

Prepared: 05/08/18 Analyzed: 05/09/18

Benzene	0.137	0.0020	mg/kg	0.150	ND	91.7	70-130				
Toluene	0.138	0.0050	"	0.150	ND	92.0	70-130				
Ethylbenzene	0.139	0.0050	"	0.150	ND	92.3	70-130				
m,p-Xylene	0.269	0.010	"	0.300	ND	89.6	70-130				
o-Xylene	0.141	0.0050	"	0.150	ND	93.7	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0406		"	0.0396		103	70-130				
Surrogate: Toluene-d8	0.0405		"	0.0400		101	70-130				
Surrogate: 4-Bromofluorobenzene	0.0393		"	0.0400		98.2	70-130				

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/14/18 10:31

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 1805083 - EPA 5030 Soil MS

Matrix Spike Dup (1805083-MSD1)	Source: 1805066-01			Prepared: 05/08/18	Analyzed: 05/09/18					
Benzene	0.131	0.0020	mg/kg	0.150	ND	87.0	70-130	5.19	30	
Toluene	0.132	0.0050	"	0.150	ND	88.1	70-130	4.40	30	
Ethylbenzene	0.131	0.0050	"	0.150	ND	87.1	70-130	5.89	30	
m,p-Xylene	0.255	0.010	"	0.300	ND	84.9	70-130	5.40	30	
o-Xylene	0.131	0.0050	"	0.150	ND	87.5	70-130	6.89	30	
Surrogate: 1,2-Dichloroethane-d4	0.0423		"	0.0396		107	70-130			
Surrogate: Toluene-d8	0.0400		"	0.0400		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	70-130			

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/14/18 10:31

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1805091 - EPA 3550A

Blank (1805091-BLK1)

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1805091-BS1)

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) 421 50 mg/kg 500 84.1 81.4-129

Matrix Spike (1805091-MS1)

Source: 1805066-01

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) 413 50 mg/kg 500 22.0 78.2 77.8-133

Matrix Spike Dup (1805091-MSD1)

Source: 1805066-01

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) 430 50 mg/kg 500 22.0 81.5 77.8-133 3.91 8.48

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/14/18 10:31

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 1805073 - General Preparation

Blank (1805073-BLK1)

Prepared & Analyzed: 05/08/18

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

LCS (1805073-BS1)

Prepared & Analyzed: 05/08/18

Calcium	371	10.0	mg/kg wet	500		74.3	70-130			
Magnesium	458	5.00	"	500		91.6	70-130			
Sodium	485	5.00	"	500		97.0	70-130			

Duplicate (1805073-DUP1)

Source: 1805067-02

Prepared & Analyzed: 05/08/18

Calcium	123	11.4	mg/kg dry		112			9.63	20	
Magnesium	172	5.70	"		190			10.2	20	
Sodium	55.4	5.70	"		49.8			10.7	20	

Matrix Spike (1805073-MS1)

Source: 1805067-02

Prepared & Analyzed: 05/08/18

Calcium	591	11.4	mg/kg dry	570	112	84.0	70-130			
Magnesium	689	5.70	"	570	190	87.6	70-130			
Sodium	595	5.70	"	570	49.8	95.7	70-130			

Matrix Spike Dup (1805073-MSD1)

Source: 1805067-02

Prepared & Analyzed: 05/08/18

Calcium	555	11.4	mg/kg dry	570	112	77.8	70-130	6.24	25	
Magnesium	708	5.70	"	570	190	91.0	70-130	2.79	25	
Sodium	592	5.70	"	570	49.8	95.2	70-130	0.481	25	

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/14/18 10:31

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 1805074 - General Preparation

Duplicate (1805074-DUP1)	Source: 1805007-01			Prepared & Analyzed: 05/08/18							
% Solids	93.0		%		93.2				0.193	20	

Batch 1805078 - General Preparation

Duplicate (1805078-DUP1)	Source: 1805050-01			Prepared & Analyzed: 05/08/18							
pH	8.2		pH Units		8.2				0.244	20	

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
 Project Manager: Brandon Bruns

Reported:
 05/14/18 10:31

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 1805077 - General Preparation

Duplicate (1805077-DUP1)	Source: 1805050-01			Prepared & Analyzed: 05/08/18		
Specific Conductance (EC)	0.592	0.0100	mmhos/cm	0.592	0.169	20

Summit Scientific

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

Project: Noble - Norris D 32-1, 2, 7, 1J

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/14/18 10:31

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