

SS01@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 - 0.197
 EC - 1.03 mmhos/cm
 pH - 7.14

SS05@7'
 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

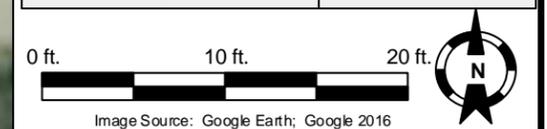
Legend

-  Excavation Sample Location
-  Excavation Sample Location (Not Submitted for Laboratory Analysis)
-  Excavation Extent
- mg/kg Milligrams Per Kilogram
- mmhos/cm Millimhos Per Centimeter

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).

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:	08/16/2017
DESIGNED BY:	DC
DRAWN BY:	GB



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

Noble Energy
Foss USX AA 5-3, 4 Vault Removal – Facility ID:418165
 NWSW, Section 5, Township 6 North, Range 63 West
 Weld County, Colorado

Excavation Soil Analytical
 Results Map
 (08/14/2017)

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 17, 2017

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Foss USX AA 5-3,4

Enclosed are the results of analyses for samples received by Summit Scientific on 08/14/17 16:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ben Shrewsbury', with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury
Laboratory Manager



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/17/17 18:56

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@3'	1708125-01	Soil	08/14/17 14:36	08/14/17 16:45
SS05@7'	1708125-02	Soil	08/14/17 14:48	08/14/17 16:45

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/17/17 18:56

Sample Receipt Checklist

S2 Work Order: 1748125
 Client: Noble/Tasman Client Project ID: Foss USX AA 5-3,4
 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)	4.0				

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.

Nakira
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

8/14/17 1730
Date/Time

[Signature]



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/17/17 18:56

SS01@3'
1708125-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/14/17 14:36**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1708134	08/15/17	08/16/17	8015M	

Date Sampled: **08/14/17 14:36**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/14/17 14:36**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1708135	08/15/17	08/17/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/14/17 14:36**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.9 %	21-167		"	"	"	"	

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

Date Sampled: **08/14/17 14:36**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	630	11.5	mg/kg dry	1	1708148	08/16/17	08/16/17	EPA 6020/Mod. USDA60 6(2, 3A)	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/17/17 18:56

SS01@3'
1708125-01 (Soil)

Summit Scientific

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

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Magnesium	213	5.75	mg/kg dry	1	1708148	08/16/17	08/16/17	EPA 6020/Mod. USDA60 6(2, 3A)
Sodium	22.4	5.75	"	"	"	"	"	"
Sodium Adsorption Ratio	0.197		units	"	1708164	08/17/17	08/17/17	"

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **08/14/17 14:36**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.14	0.100	pH Units	1	1708146	08/16/17	08/16/17	EPA 9045	
Specific Conductance (EC)	1.03	0.0100	mmhos/cm	"	1708147	08/16/17	08/17/17	SM 2510B	
% Solids	86.9		%	"	1708149	08/16/17	08/17/17	% calculation	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/17/17 18:56

SS05@7'
1708125-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/14/17 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1708134	08/15/17	08/16/17	8015M	

Date Sampled: **08/14/17 14:48**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/14/17 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1708135	08/15/17	08/17/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/14/17 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.6 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/17/17 18:56

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1708134 - EPA 3550A

Blank (1708134-BLK1)				Prepared & Analyzed: 08/15/17							
C10-C28 (DRO)	ND	50	mg/kg								
Surrogate: <i>o</i> -Terphenyl	13.2		"	12.5		106	30-150				
LCS (1708134-BS1)				Prepared & Analyzed: 08/15/17							
C10-C28 (DRO)	543	50	mg/kg	499		109	73-134				
Surrogate: <i>o</i> -Terphenyl	14.1		"	12.5		113	30-150				
Matrix Spike (1708134-MS1)				Source: 1708114-01		Prepared & Analyzed: 08/15/17					
C10-C28 (DRO)	552	50	mg/kg	499	26.6	105	50-148				
Surrogate: <i>o</i> -Terphenyl	15.3		"	12.5		123	30-150				
Matrix Spike Dup (1708134-MSD1)				Source: 1708114-01		Prepared & Analyzed: 08/15/17					
C10-C28 (DRO)	529	50	mg/kg	499	26.6	101	50-148	4.21	20		
Surrogate: <i>o</i> -Terphenyl	13.1		"	12.5		105	30-150				

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/17/17 18:56

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 1708135 - EPA 5030 Soil MS

Blank (1708135-BLK1)

Prepared: 08/15/17 Analyzed: 08/16/17

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0388</i>		<i>"</i>	<i>0.0400</i>		<i>97.1</i>	<i>21-167</i>			

LCS (1708135-BS1)

Prepared: 08/15/17 Analyzed: 08/16/17

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0926	0.0020	"	0.100		92.6	58-130			
Toluene	0.0997	0.0050	"	0.100		99.7	61-134			
Ethylbenzene	0.102	0.0050	"	0.0992		103	74-139			
m,p-Xylene	0.198	0.010	"	0.200		99.1	73-137			
o-Xylene	0.100	0.0050	"	0.0980		102	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0406</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0383</i>		<i>"</i>	<i>0.0400</i>		<i>95.7</i>	<i>21-167</i>			

Matrix Spike (1708135-MS1)

Source: 1708114-01

Prepared: 08/15/17 Analyzed: 08/16/17

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0814	0.0020	"	0.100	ND	81.4	30-131			
Toluene	0.0856	0.0050	"	0.100	ND	85.6	30-134			
Ethylbenzene	0.0825	0.0050	"	0.0992	ND	83.2	22-153			
m,p-Xylene	0.161	0.010	"	0.200	ND	80.5	10-159			
o-Xylene	0.0805	0.0050	"	0.0980	ND	82.1	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0405</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0377</i>		<i>"</i>	<i>0.0400</i>		<i>94.3</i>	<i>21-167</i>			

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/17/17 18:56

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 1708135 - EPA 5030 Soil MS

Matrix Spike Dup (1708135-MSD1)	Source: 1708114-01			Prepared: 08/15/17 Analyzed: 08/16/17		
Naphthalene	ND	0.010	mg/kg	ND	10-158	42
Benzene	0.0785	0.0020	"	0.100	ND	78.5 30-131 3.60 34
Toluene	0.0820	0.0050	"	0.100	ND	82.0 30-134 4.33 30
Ethylbenzene	0.0767	0.0050	"	0.0992	ND	77.3 22-153 7.31 24
m,p-Xylene	0.149	0.010	"	0.200	ND	74.8 10-159 7.24 68
o-Xylene	0.0769	0.0050	"	0.0980	ND	78.4 31-151 4.58 38
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0400		106 23-173
Surrogate: Toluene-d8	0.0412		"	0.0400		103 20-170
Surrogate: 4-Bromofluorobenzene	0.0382		"	0.0400		95.6 21-167

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/17/17 18:56

Soluble Nutrients by EPA 6020/Mod. 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 1708148 - General Preparation

Blank (1708148-BLK1)

Prepared & Analyzed: 08/16/17

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

LCS (1708148-BS1)

Prepared & Analyzed: 08/16/17

Calcium	436	10.0	mg/kg wet	500		87.3	82.9-118		
Magnesium	483	5.00	"	500		96.5	77.1-123		
Sodium	454	5.00	"	500		90.9	71-129		

Duplicate (1708148-DUP1)

Source: 1708114-01

Prepared & Analyzed: 08/16/17

Calcium	746	11.0	mg/kg dry		668			11.1	200
Magnesium	196	5.48	"		242			21.3	200
Sodium	191	5.48	"		195			2.32	200

Matrix Spike (1708148-MS1)

Source: 1708114-01

Prepared & Analyzed: 08/16/17

Calcium	1100	11.0	mg/kg dry	548	668	79.3	75-125		
Magnesium	656	5.48	"	548	242	75.6	75-125		
Sodium	653	5.48	"	548	195	83.6	75-125		

Matrix Spike Dup (1708148-MSD1)

Source: 1708114-01

Prepared & Analyzed: 08/16/17

Calcium	1180	11.0	mg/kg dry	548	668	93.1	75-125	6.66	25
Magnesium	654	5.48	"	548	242	75.2	75-125	0.360	25
Sodium	646	5.48	"	548	195	82.3	75-125	1.11	25

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/17/17 18:56

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 1708146 - General Preparation

LCS (1708146-BS1)					Prepared & Analyzed: 08/16/17					
pH	9.20	0.100	pH Units	9.16	100	95-105				
Duplicate (1708146-DUP1)					Source: 1708104-05 Prepared & Analyzed: 08/16/17					
pH	8.84	0.100	pH Units	8.87	0.339	20				

Batch 1708147 - General Preparation

Blank (1708147-BLK1)					Prepared: 08/16/17 Analyzed: 08/17/17					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1708147-BS1)					Prepared: 08/16/17 Analyzed: 08/17/17					
Specific Conductance (EC)	0.751	0.0100	mmhos/cm	0.750	100	90-110				
Duplicate (1708147-DUP1)					Source: 1708104-05 Prepared: 08/16/17 Analyzed: 08/17/17					
Specific Conductance (EC)	1.24	0.0100	mmhos/cm	1.25	0.361	20				

Batch 1708149 - General Preparation

Duplicate (1708149-DUP1)					Source: 1708124-01 Prepared: 08/16/17 Analyzed: 08/17/17					
% Solids	86.1		%	84.7	1.64	20				

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Foss USX AA 5-3,4

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/17/17 18:56

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