

EXCAVATION SUMMARY REPORT

BIERIG 1-26 HISTORICAL RELEASE

COGCC SPILL TRACKING # 455230
COGCC REMEDIATION # Not Assigned

Prepared for:



2115 117th Avenue
Greeley, CO 80631

Prepared by:



6899 North Pecos Street, Unit C
Denver, CO 80221

July 19, 2018

Mr. Jacob Evans
Noble Energy Inc.
2115 117th Avenue
Greeley, CO 80631

Subject: **2018 Excavation Summary Report**
 Bierig 1-26 Historical Release
 API #: 05-123-12735
 Spill/Release Point ID #: 455230
 Remediation Project #: Not Assigned
 NENE S26 T5N R66W
 Weld County, Colorado

Dear Mr. Evans:

Below please find a copy of the above referenced Excavation Summary Report (Report) for the Bierig 1-26 Historical Release site (Site) in Weld County, Colorado. The text below describes excavation and environmental sampling conducted at the Site on May 18, 2018 (Excavation) by Tasman Geosciences, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble).

Introduction

The purpose of this document is to describe the excavation and removal of impacted soil and subsequent soil sampling activities conducted as part of the Excavation. The activities described below were performed in response to the discovery of impacted media beneath the Bierig 1-26 separator during plugging and abandonment procedures on May 18, 2018.

Facility Background

The Site is located within the city limits of Evans in Weld County, Colorado, as shown on Figure 1. The Site is surrounded by crop land, and the legal description is the northeast ¼ of the northeast ¼ of Section 26, Township 5 North, Range 66 West, of the 6th Principal Meridian. The Site is located on relatively flat terrain. The Site is approximately 0.3 miles south of 37th Street in Evans, Colorado and has coordinates of 40.373436°, -104.742267°.

Initial excavation soil sampling activities were conducted at the Site on May 18, 2018. On May 26, 2018, based on laboratory analytical results, historic impacts were confirmed beneath the Bierig 1-26 separator during plug and abandonment activities. The approximate release location is shown on Figure 2. A Form 19 was submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on May 27, 2018. The COGCC subsequently issued Spill/Release Point ID Number 455230 for this event and the site was plugged and abandoned.

Excavation Field Activities

After the separator was removed, Excavation activities were conducted at the Site on May 18, 2018. Excavation activities were guided in the field through the use of a photo-ionization detector (PID) and standard headspace soil screening techniques. Impacted soils surrounding the release location were excavated and transported off-Site for disposal at the Waste Management Landfill in Ault, Colorado under signed Noble waste manifests. A total of approximately 50 cubic yards of impacted material were removed from the Site for disposal. The final excavation area measured approximately 17 ft. by 13 ft. by 10 ft. below ground surface (bgs). Based on PID readings collected from soil samples collected on the excavation extent, four test pits were completed around the outside of the excavation to approximately 10 ft. bgs to further assess potential subsurface impacts.

During excavation activities, soil samples were collected from nine (9) locations (SS01 and SS03 through SS10) along the sidewalls and test pits between approximately 4 ft. and 10 ft. bgs. Based on PID readings, a laboratory analytical sample was not collected at soil sample location SS02. Soil samples were submitted to Summit Scientific Laboratory in Golden, Colorado (Summit) 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. Soil analytical data is summarized in Table 1, and the final excavation extent and soil sample locations are illustrated on Figure 2. The laboratory analytical report is included as Attachment A. After sampling activities were completed, the excavation was backfilled with imported clean fill. Groundwater was not encountered during excavation activities.

Results

Laboratory analytical results for the nine (9) soil samples collected at the Site indicate petroleum hydrocarbon soil impacts are present above applicable COGCC Table 910-1 soil standards beneath and to the north, south, and west of the former Bierig 1-26 separator location.

Conclusions

Based upon field and laboratory data collected during excavation activities, vadose zone soil impacts above applicable COGCC standards remain at the Site. Additional assessment and remedial efforts will be completed at the Site to address hydrocarbon impacts to soil.

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.

Sincerely,
Tasman Geosciences, Inc.

A handwritten signature in blue ink that reads 'Brandon Bruns'.

Brandon Bruns, PE
Project Manager

Attachments:

Table 1 – Soil Analytical Data

Figure 1 – Site Location Map

Figure 2 – Excavation Soil Analytical Results Map (May 18, 2018)

Attachment A – Laboratory Analytical Data Report

TABLES

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - BIERIG 1-26
HISTORICAL RELEASE

| Soil Sample ID | Date | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Total Xylenes (mg/kg) | TPH-GRO (mg/kg) | TPH-DRO (mg/kg) | Naphthalene (mg/kg) |
|----------------------------|----------|-----------------|-----------------|----------------------|-----------------------|-----------------|-----------------|---------------------|
| COGCC Soil Standard | | 0.17 | 85 | 100 | 175 | 500 | | 23 |
| SS01@10' | 05/18/18 | 0.15 | <0.0050 | 18 | 230 | 3,200 | 600 | 2.0 |
| SS03@5' | 05/18/18 | 0.022 | <0.0050 | <0.0050 | 0.85 | 1,100 | 240 | 0.25 |
| SS04@4' | 05/18/18 | <0.0020 | <0.0050 | <0.0050 | <0.010 | <50 | <50 | <0.010 |
| SS05@5' | 05/18/18 | <0.0020 | <0.0050 | <0.0050 | <0.010 | <50 | <50 | <0.010 |
| SS06@10' | 05/18/18 | <0.0020 | <0.0050 | 1.7 | 28 | 760 | 120 | 1.1 |
| SS07@10' | 05/18/18 | <0.0020 | <0.0050 | 6.1 | 83 | 1,300 | 610 | 1.4 |
| SS08@10' | 05/18/18 | 0.20 | 0.037 | 0.12 | 90 | 1,400 | 780 | 0.071 |
| SS09@10' | 05/18/18 | <0.0020 | <0.0050 | <0.0050 | 18 | <50 | 230 | 0.010 |
| SS10@5' | 05/18/18 | <0.0020 | <0.0050 | <0.0050 | <0.010 | <50 | <50 | <0.010 |

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

< = 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

FIGURES

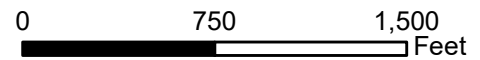
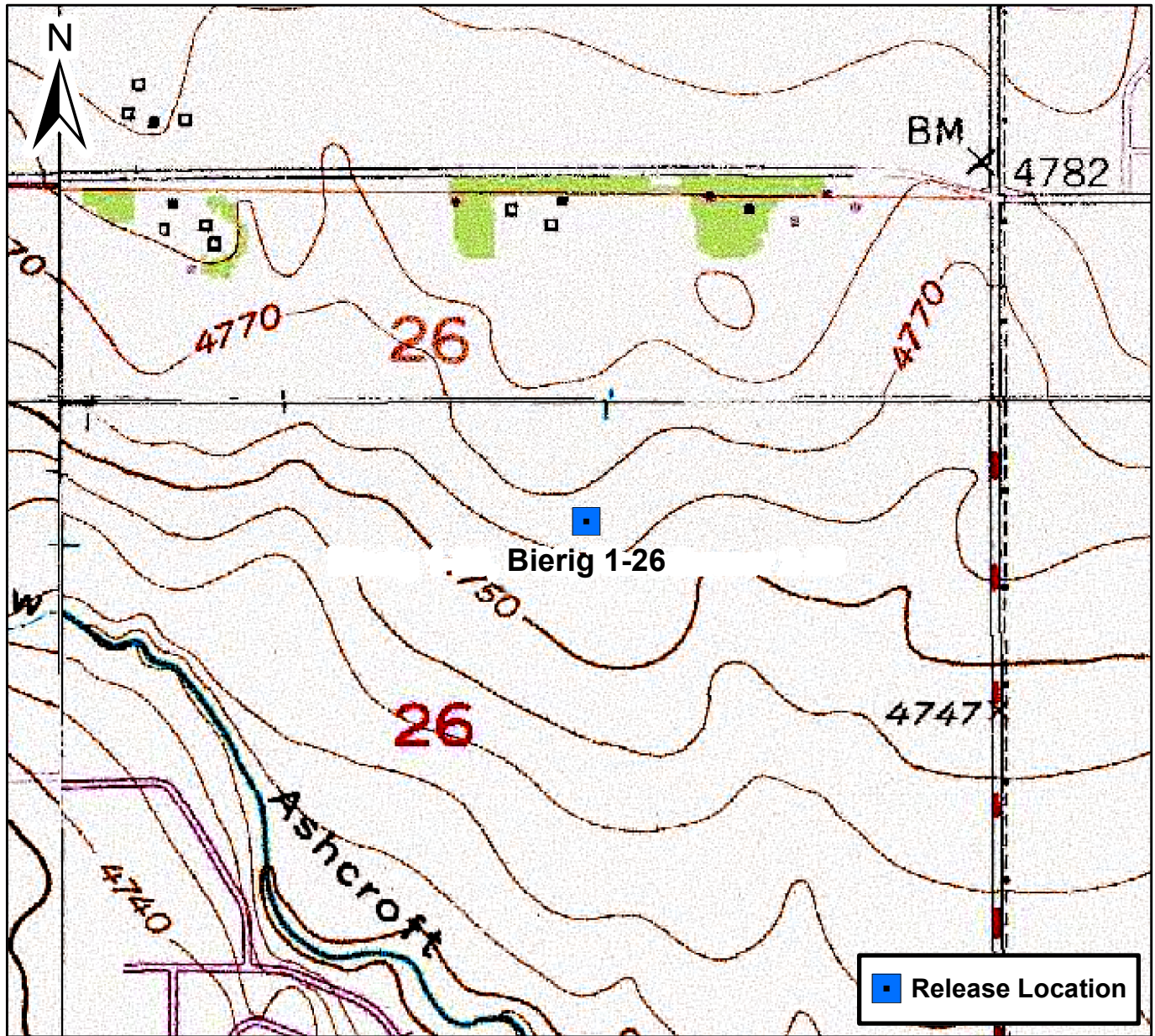
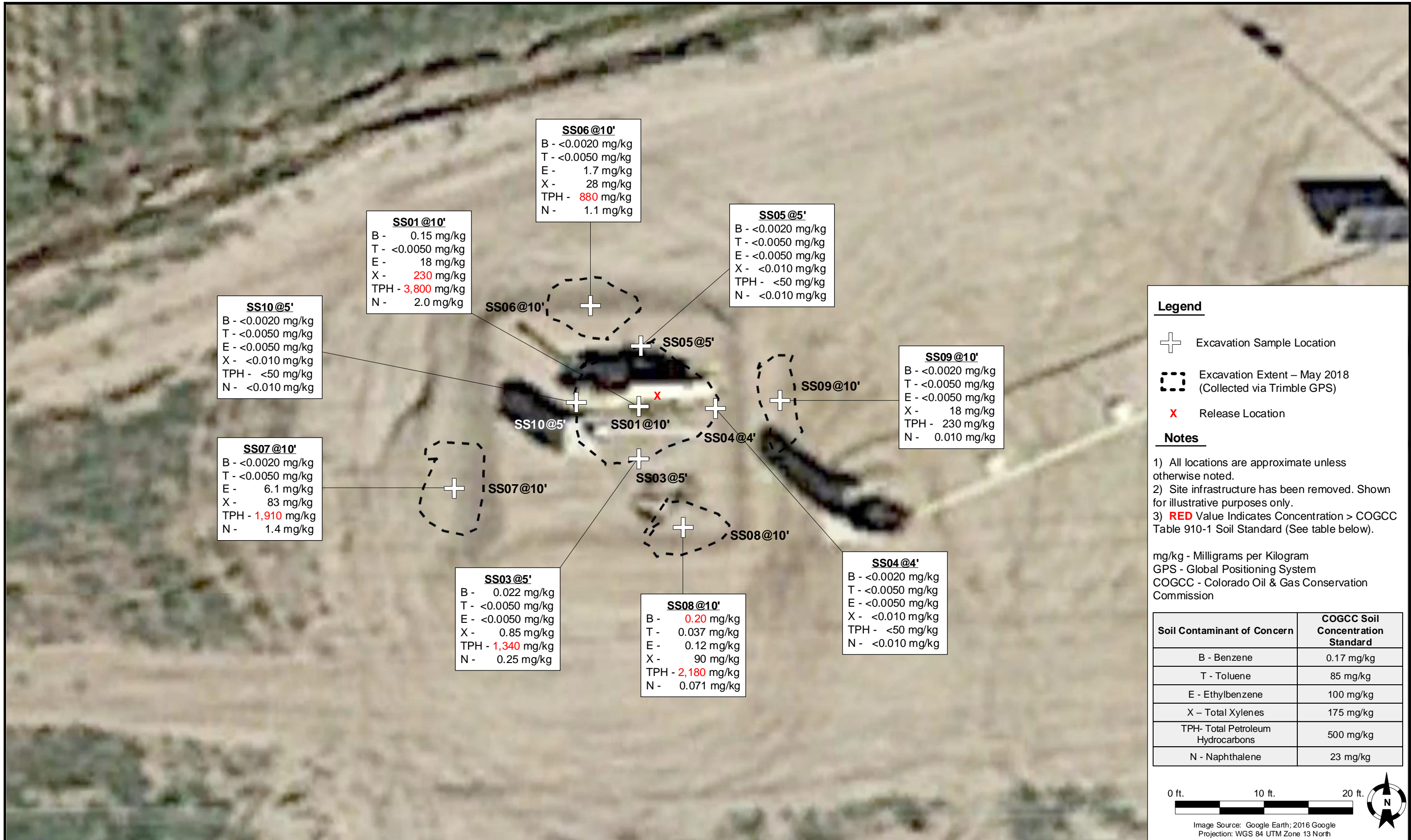


Figure 1

Site Location Map
 Bierig 1-26 Historical Release
 NENE S26 T5N R66W
 Weld County, Colorado





Legend

- ✚ Excavation Sample Location
- ⊞ Excavation Extent – May 2018 (Collected via Trimble GPS)
- X Release Location

Notes

- 1) All locations are approximate unless otherwise noted.
- 2) Site infrastructure has been removed. Shown for illustrative purposes only.
- 3) **RED** Value Indicates Concentration > COGCC Table 910-1 Soil Standard (See table below).

mg/kg - Milligrams per Kilogram
 GPS - Global Positioning System
 COGCC - Colorado Oil & Gas Conservation Commission

| Soil Contaminant of Concern | COGCC Soil 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 |

0 ft. 10 ft. 20 ft.

Image Source: Google Earth; 2016 Google
 Projection: WGS 84 UTM Zone 13 North

DATE: 7/18/2018

DESIGNED BY: DA

DRAWN BY: GB



Noble Energy – DJ Basin
Bierig 1-26 Historical Release
 SWNE, Section 26, Township 5 North, Range 66 West
 Weld County, Colorado

Excavation Soil Analytical
 Results Map
 (05/18/18)

FIGURE
 2

ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 25, 2018

Brandon Bruns
Tasman Geosciences
6899 Pecos St, Unit C
Denver, CO 80221
RE: Noble - Bierig 1-26

Enclosed are the results of analyses for samples received by Summit Scientific on 05/18/18 17:46. 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 - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/25/18 09:21

ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|-----------|---------------|--------|----------------|----------------|
| SS01@10' | 1805248-01 | Soil | 05/18/18 12:18 | 05/18/18 17:46 |
| SS03@5' | 1805248-02 | Soil | 05/18/18 12:25 | 05/18/18 17:46 |
| SS04@4' | 1805248-03 | Soil | 05/18/18 12:31 | 05/18/18 17:46 |
| SS05@5' | 1805248-04 | Soil | 05/18/18 12:42 | 05/18/18 17:46 |
| SS06@10' | 1805248-05 | Soil | 05/18/18 12:45 | 05/18/18 17:46 |
| SS07@10' | 1805248-06 | Soil | 05/18/18 13:51 | 05/18/18 17:46 |
| SS08@10' | 1805248-07 | Soil | 05/18/18 13:41 | 05/18/18 17:46 |
| SS09@10' | 1805248-08 | Soil | 05/18/18 13:45 | 05/18/18 17:46 |
| SS10@5' | 1805248-09 | Soil | 05/18/18 13:30 | 05/18/18 17:46 |

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

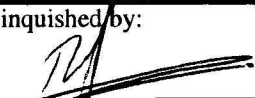
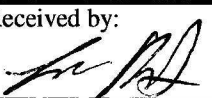

1805248

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

Page 1 of 1

Client: TASMAN/NOBLE
Address: _____
City/State/Zip: _____
Phone: 970-210-0571 Fax: _____
Sampler Name: T. LICHTENBERG

Project Manager: BRANDON BRUNS : INVOICE JACOB EVANS
E-Mail: BBRUNSO@TASMAN-GEO.COM
Project Name: BIERIG 1-26
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) | 0200-G015 | 8015-020 | Map/Notes | |
| SS01@10' | 5/18/18 | 1218 | 1 | | | X | | | X | | | X | X | + | per client |
| SS03@5' | | 1225 | | | | | | | | | | | | | |
| SS04@4' | | 1231 | | | | | | | | | | | | | |
| SS05@5' | | 1242 | | | | | | | | | | | | | |
| SS06@10' | | 1245 | | | | | | | | | | | | | |
| SS07@10' | | 1351 | | | | | | | | | | | | | |
| SS08@10' | | 1341 | | | | | | | | | | | | | |
| SS09@10' | | 1345 | | | | | | | | | | | | | |
| SS10@5' | | 1330 | | | | | | | | | | | | | |
| Relinquished by:  | | Date/Time: 5/18/18 1746 | Received by:  | | Date/Time: 5/18/18 1746 | Turn Around Time (Check) | | | Notes: | | | | | | |
| Relinquished by:  | | Date/Time: | Received by: | | Date/Time: | Same Day <input type="checkbox"/> | | | 72 Hours <input type="checkbox"/> | | | | | | |
| | | | | | | 24 Hours <input type="checkbox"/> | | | Standard <input checked="" type="checkbox"/> | | | | | | |
| | | | | | | 48 Hours <input type="checkbox"/> | | | on cc | | | | | | |
| Relinquished by: | | Date/Time: | Received in Lab by: | | Date/Time: | Sample Integrity: | | | Temperature Upon Receipt: 7.2 | | | | | | |
| | | | | | | Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No | | | | | | | | | |

Sample Receipt Checklist

S2 Work Order: 1805248

Client: TAMM/NESLE Client Project ID: BIRUG 1-26

Shipped Via: Pickup (UPS, FedEx, Hand Delivered, Pick-up, etc.) Airbill #: _____

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

| | |
|-----------|-----|
| Temp (°C) | 7.2 |
|-----------|-----|

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. | | | | |

W
Custodian Printed Name or Initials

[Signature]
Signature or Initials of Custodian

5/19/18 1830
Date/Time



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

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS01@10'
1805248-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 12:18**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------------------|-------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | 0.15 | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/23/18 | EPA 8260B | |
| Toluene | ND | 0.0050 | " | " | " | " | " | " | |
| Ethylbenzene | 18 | 0.50 | " | 100 | " | " | " | " | |
| Xylenes (total) | 230 | 1.0 | " | " | " | " | " | " | |
| Naphthalene | 2.0 | 1.0 | " | " | " | " | " | " | |
| Gasoline Range Hydrocarbons | 3200 | 500 | " | 10 | " | " | " | " | |

Date Sampled: **05/18/18 12:18**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 116 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 96.2 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 166 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 12:18**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | 600 | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 12:18**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: o-Terphenyl | | 61.7 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS03@5'
1805248-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 12:25**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------------------|--------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | 0.022 | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/22/18 | EPA 8260B | |
| Toluene | ND | 0.0050 | " | " | " | " | " | " | |
| Ethylbenzene | ND | 0.0050 | " | " | " | " | " | " | |
| Xylenes (total) | 0.85 | 0.10 | " | 10 | " | " | " | " | |
| Naphthalene | 0.25 | 0.010 | " | 1 | " | " | " | " | |
| Gasoline Range Hydrocarbons | 1100 | 50 | " | 100 | " | " | " | " | |

Date Sampled: **05/18/18 12:25**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 105 % | 23-173 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 129 % | 20-170 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 95.3 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 12:25**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | 240 | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 12:25**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: o-Terphenyl</i> | | 68.0 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS04@4'
1805248-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 12:31**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/22/18 | 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: **05/18/18 12:31**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 104 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 98.0 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 101 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 12:31**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | ND | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 12:31**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: o-Terphenyl | | 88.6 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS05@5'
1805248-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 12:42**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/22/18 | 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: **05/18/18 12:42**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 106 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 99.1 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 103 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 12:42**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | ND | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 12:42**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: o-Terphenyl | | 93.7 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS06@10'
1805248-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 12:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/23/18 | EPA 8260B | |
| Toluene | ND | 0.0050 | " | " | " | " | " | " | |
| Ethylbenzene | 1.7 | 0.50 | " | 100 | " | " | " | " | |
| Xylenes (total) | 28 | 1.0 | " | " | " | " | " | " | |
| Naphthalene | 1.1 | 1.0 | " | " | " | " | " | " | |
| Gasoline Range Hydrocarbons | 760 | 500 | " | 10 | " | " | " | " | |

Date Sampled: **05/18/18 12:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 103 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 96.4 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 113 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 12:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------|------------|-----------------|--------------|----------|----------------|-----------------|-----------------|------------------|-------|
| C10-C28 (DRO) | 120 | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 12:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: o-Terphenyl | | 91.0 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS07@10'
1805248-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 13:51**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------------------|-------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/23/18 | EPA 8260B | |
| Toluene | ND | 0.0050 | " | " | " | " | " | " | |
| Ethylbenzene | 6.1 | 0.50 | " | 100 | " | " | " | " | |
| Xylenes (total) | 83 | 1.0 | " | " | " | " | " | " | |
| Naphthalene | 1.4 | 1.0 | " | " | " | " | " | " | |
| Gasoline Range Hydrocarbons | 1300 | 500 | " | 10 | " | " | " | " | |

Date Sampled: **05/18/18 13:51**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 97.4 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 93.4 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 137 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 13:51**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | 610 | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 13:51**

| 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS08@10'
1805248-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 13:41**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------------------|--------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | 0.20 | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/23/18 | EPA 8260B | |
| Toluene | 0.037 | 0.0050 | " | " | " | " | " | " | |
| Ethylbenzene | 0.12 | 0.0050 | " | " | " | " | " | " | |
| Xylenes (total) | 90 | 1.0 | " | 100 | " | " | " | " | |
| Naphthalene | 0.071 | 0.010 | " | 1 | " | " | " | " | |
| Gasoline Range Hydrocarbons | 1400 | 500 | " | 10 | " | " | " | " | |

Date Sampled: **05/18/18 13:41**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 102 % | 23-173 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 95.8 % | 20-170 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 142 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 13:41**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | 780 | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 13:41**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: o-Terphenyl</i> | | 84.9 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS09@10'
1805248-08 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 13:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------|--------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/23/18 | EPA 8260B | |
| Toluene | ND | 0.0050 | " | " | " | " | " | " | |
| Ethylbenzene | ND | 0.0050 | " | " | " | " | " | " | |
| Xylenes (total) | 18 | 1.0 | " | 100 | " | " | " | " | |
| Naphthalene | 0.010 | 0.010 | " | 1 | " | " | " | " | |
| Gasoline Range Hydrocarbons | ND | 50 | " | " | " | " | " | " | |

Date Sampled: **05/18/18 13:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 97.7 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 96.0 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 115 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 13:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | 230 | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/22/18 | EPA 8015M | |

Date Sampled: **05/18/18 13:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: o-Terphenyl | | 57.5 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

SS10@5'
1805248-09 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/18/18 13:30**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 0.0020 | mg/kg | 1 | 1805238 | 05/21/18 | 05/22/18 | 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: **05/18/18 13:30**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 | | 104 % | 23-173 | | " | " | " | " | |
| Surrogate: Toluene-d8 | | 98.8 % | 20-170 | | " | " | " | " | |
| Surrogate: 4-Bromofluorobenzene | | 102 % | 21-167 | | " | " | " | " | |

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/18/18 13:30**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| C10-C28 (DRO) | ND | 50 | mg/kg | 1 | 1805239 | 05/21/18 | 05/23/18 | EPA 8015M | |

Date Sampled: **05/18/18 13:30**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: o-Terphenyl | | 51.6 % | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

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 1805238 - EPA 5030 Soil MS

Blank (1805238-BLK1)

Prepared: 05/21/18 Analyzed: 05/22/18

| | | | | | | | | | | | |
|----------------------------------|--------|--------|-------|--------|--|------|--------|--|--|--|--|
| 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 | 0.0362 | | " | 0.0396 | | 91.3 | 23-173 | | | | |
| Surrogate: Toluene-d8 | 0.0400 | | " | 0.0400 | | 100 | 20-170 | | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0374 | | " | 0.0400 | | 93.5 | 21-167 | | | | |

LCS (1805238-BS1)

Prepared: 05/21/18 Analyzed: 05/22/18

| | | | | | | | | | | | |
|----------------------------------|--------|--------|-------|--------|--|------|--------|--|--|--|--|
| Benzene | 0.139 | 0.0020 | mg/kg | 0.150 | | 92.9 | 70-130 | | | | |
| Toluene | 0.144 | 0.0050 | " | 0.150 | | 95.7 | 70-130 | | | | |
| Ethylbenzene | 0.147 | 0.0050 | " | 0.150 | | 97.8 | 70-130 | | | | |
| m,p-Xylene | 0.298 | 0.010 | " | 0.300 | | 99.3 | 70-130 | | | | |
| o-Xylene | 0.151 | 0.0050 | " | 0.150 | | 101 | 70-130 | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 0.0361 | | " | 0.0396 | | 91.2 | 23-173 | | | | |
| Surrogate: Toluene-d8 | 0.0406 | | " | 0.0400 | | 102 | 20-170 | | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0361 | | " | 0.0400 | | 90.3 | 21-167 | | | | |

Matrix Spike (1805238-MS1)

Source: 1805248-04

Prepared: 05/21/18 Analyzed: 05/22/18

| | | | | | | | | | | | |
|----------------------------------|--------|--------|-------|--------|----|------|--------|--|--|--|--|
| Benzene | 0.158 | 0.0020 | mg/kg | 0.150 | ND | 105 | 70-130 | | | | |
| Toluene | 0.165 | 0.0050 | " | 0.150 | ND | 110 | 70-130 | | | | |
| Ethylbenzene | 0.159 | 0.0050 | " | 0.150 | ND | 106 | 70-130 | | | | |
| m,p-Xylene | 0.339 | 0.010 | " | 0.300 | ND | 113 | 70-130 | | | | |
| o-Xylene | 0.170 | 0.0050 | " | 0.150 | ND | 113 | 70-130 | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 0.0374 | | " | 0.0396 | | 94.3 | 23-173 | | | | |
| Surrogate: Toluene-d8 | 0.0407 | | " | 0.0400 | | 102 | 20-170 | | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0378 | | " | 0.0400 | | 94.6 | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

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 1805238 - EPA 5030 Soil MS

| Matrix Spike Dup (1805238-MSD1) | Source: 1805248-04 | | | Prepared: 05/21/18 | Analyzed: 05/22/18 | | | | | |
|--|---------------------------|--------|-------|--------------------|--------------------|------|--------|------|----|--|
| Benzene | 0.122 | 0.0020 | mg/kg | 0.150 | ND | 81.7 | 70-130 | 25.4 | 30 | |
| Toluene | 0.128 | 0.0050 | " | 0.150 | ND | 85.4 | 70-130 | 25.4 | 30 | |
| Ethylbenzene | 0.128 | 0.0050 | " | 0.150 | ND | 85.3 | 70-130 | 21.6 | 30 | |
| m,p-Xylene | 0.263 | 0.010 | " | 0.300 | ND | 87.7 | 70-130 | 25.1 | 30 | |
| o-Xylene | 0.134 | 0.0050 | " | 0.150 | ND | 89.2 | 70-130 | 23.9 | 30 | |
| Surrogate: 1,2-Dichloroethane-d4 | 0.0380 | | " | 0.0396 | | 95.8 | 23-173 | | | |
| Surrogate: Toluene-d8 | 0.0408 | | " | 0.0400 | | 102 | 20-170 | | | |
| Surrogate: 4-Bromofluorobenzene | 0.0374 | | " | 0.0400 | | 93.4 | 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/25/18 09:21

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 1805239 - EPA 3550A

Blank (1805239-BLK1)

Prepared: 05/21/18 Analyzed: 05/22/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1805239-BS1)

Prepared: 05/21/18 Analyzed: 05/23/18

C10-C28 (DRO) 568 50 mg/kg 500 114 70-130

Matrix Spike (1805239-MS1)

Source: 1805250-04

Prepared: 05/21/18 Analyzed: 05/23/18

C10-C28 (DRO) 565 50 mg/kg 500 11.3 111 70-130

Matrix Spike Dup (1805239-MSD1)

Source: 1805250-04

Prepared: 05/21/18 Analyzed: 05/23/18

C10-C28 (DRO) 562 50 mg/kg 500 11.3 110 70-130 0.509 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
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Bierig 1-26

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/25/18 09:21

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