

FEATHER 31-15
PRODUCED WATER TANK RELEASE
API #: 05-123 -21075
Spill/Release Point ID #: 444673
Remediation Project #: 10120

THIRD QUARTER 2018
Site Monitoring and Remediation Summary Report

August 31, 2018



Image: Google Earth

PREPARED ON BEHALF OF

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1.0 INTRODUCTION

This Third Quarter 2018 Site Monitoring and Remediation Summary Report (Report) presents the results of groundwater sampling activities and details regarding the installation and operation of an air sparge (AS) and soil vapor extraction (SVE) remediation system at the Feather 31-15 Produced Water Tank Release site (Site).

Field activities detailed in this report were performed by Tasman Geosciences, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble), in order to further evaluate groundwater conditions and conduct remediation activities at the Site. The data collected were used to develop the analytical summary tables, groundwater elevation map, benzene concentration map presented herein, and to evaluate emissions versus Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division Air Pollution Emission Notice (APEN) requirements.

1.1 Site Background

The Site is located approximately 2.07 miles north-northwest of Keenesburg in Weld County, Colorado (Figure 1). Surrounded by agricultural crop land, the Site legal description is the northwest 1/4 of the northeast 1/4 of Section 15, Township 2 north, Range 64 west, of the 6th Principal Meridian. The Site is located on relatively flat terrain that slopes gradually to the north-northeast. The Site is approximately 3,500 feet (ft.) east of County Road 55 and approximately 380 ft. north of the Feather 31-15 wellhead, and has coordinates of 40.145495°, -104.534330°.

On February 3, 2016, Noble discovered a leak from the Feather 31-15 produced water tank. Subsequently, Noble filed a Form 19 Initial Spill/Release Report (Form 19) with the Colorado Oil and Gas Conservation Commission (COGCC) for the incident (Document # 400983708). The Form 19 was received by the COGCC and the incident was designated Spill/Release ID # 444673.

Soil and groundwater assessment activities were conducted at the Site on January 26, 2016. Tasman advanced nine soil borings (BH01-BH09) and converted two borings to groundwater monitoring wells (BH03 and BH08) around the tank battery, as illustrated on Figure 2. Based on data gathered during assessment activities, impacted soil excavation was completed on March 2 and 3, 2016.

During excavation activities, monitoring well BH03 was destroyed. From August 28, 2016 through December 21, 2016, Tasman returned to the Site to install forty-six monitoring wells to further delineate dissolved phase impacts to groundwater at the Site. Analytical results for soil and groundwater samples collected during site assessment activities were previously reported to Noble in a Site Assessment and Excavation Report delivered on February 13, 2017. A Form 27 pertaining to remediation activities at the Site was received by the COGCC on April 3, 2017, and document number 401249112 and remediation project number 10120 were assigned to the Site.

1.2 Site Topography, Geology, and Hydrogeology

The Site is situated approximately 4,961 feet above mean sea level (ft. amsl). Surface topography across the Site slopes gently to the north.

Site assessment soil borings indicate that the subsurface geology immediately beneath the Site is composed of medium density, well graded sand and clayey sand, underlain by stiff, inorganic, high plasticity lean then fat clay.

Groundwater was encountered at a range of approximately 7 ft. below ground surface (bgs) to 14 ft. bgs during monitoring well installation and groundwater sampling activities. Historic groundwater monitoring data indicates that the groundwater potentiometric surface flows toward the northeast.

2.0 THIRD QUARTER 2018 GROUNDWATER MONITORING ACTIVITIES

Third Quarter 2018 groundwater monitoring activities were performed at the Site on July 19 and 30, 2018. Monitoring well BH54R was resampled July 30, 2018 due to suspect results. The activities included measurement of groundwater levels and collection of groundwater samples from all forty-seven Site monitoring well locations.

2.1 Groundwater Level Measurements

Both general procedures and significant observations for the groundwater gauging activities performed during the Third Quarter 2018 groundwater monitoring event are presented in the following sections.

General Procedures

Groundwater and light non-aqueous phase liquid (LNAPL) levels are gauged quarterly in order to evaluate hydraulic characteristics and to provide information regarding seasonal and annual fluctuations in groundwater elevations at the Site. During the Third Quarter 2018 groundwater monitoring event, groundwater and LNAPL levels were gauged at all monitoring well locations the Site monitoring network. Groundwater and LNAPL elevation measurements are presented in Table 2.

Groundwater and LNAPL levels are measured on the north side of the well casing to the nearest 0.01-foot using an oil-water interface probe (IP). Groundwater level data were subsequently converted to elevations (ft. amsl) by subtracting the measured depth-to-water (DTW) from the well's top-of-casing (TOC) elevation survey datum. DTW data for wells containing LNAPL was converted to elevation by using the assumed LNAPL density of 0.75 times that of water. The formula used is presented in Table 2.

Significant Observations

During the Third Quarter 2018 groundwater monitoring event, the groundwater elevation at the Site ranged from 4,956.07 ft. amsl in BH53R to 4,954.84 ft. amsl in BH13. The groundwater potentiometric surface at the site slopes to the northeast, with a hydraulic gradient of approximately 0.003 feet per foot between wells BH13 and BH53R. Groundwater elevation contours and the inferred flow direction are illustrated on Figure 3. LNAPL was not measured in any of the Site monitoring wells during the Third Quarter 2018 monitoring event.

2.2 Groundwater Purging and Sampling

This section summarizes both general procedures and significant observations from the groundwater purging and sampling activities conducted on July 19 and 30, 2018. During the Third Quarter 2018 groundwater monitoring event, groundwater samples were collected from each of the wells in the Site monitoring well network.

General Procedures

Prior to collecting groundwater samples, groundwater levels were measured at each of the Site monitoring wells, as described above. The presence of LNAPL was also evaluated using an IP. Subsequently, a minimum of three casing volumes of groundwater (calculated from total well depth and groundwater level measurements) was purged from the each well prior to collecting a groundwater sample.

Groundwater samples were collected using dedicated, disposable, polyethylene bailers. Monitoring well BH54R was sampled using a peristaltic pump, due to an obstruction in the well that precluded sampling with a bailer. Samples were placed in clean laboratory-supplied containers for the selected analytical method, packed in an ice-filled cooler, and kept at approximately 4 degrees Celsius for transportation to the laboratory.

Groundwater samples were submitted under standard chain-of-custody procedures to Summit Scientific Laboratory in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States Environmental Protection Agency (USEPA) Method 8260B.

Significant Observations

- LNAPL was not observed in any of the Site monitoring wells during the Third Quarter 2018 monitoring event.

3.0 THIRD QUARTER 2018 GROUNDWATER SAMPLING RESULTS

This section presents the laboratory analytical results for groundwater samples collected during the Third Quarter 2018 groundwater monitoring event. Groundwater laboratory analytical data

is presented in Table 1 and illustrated on Figure 4. The complete laboratory analytical reports are provided in Attachment A. A summary of the groundwater laboratory analytical data collected by Tasman is presented below:

- Benzene was detected above the COGCC Table 910-1 groundwater standard of five micrograms per liter ($\mu\text{g/L}$) in fifteen of the forty-seven monitoring wells sampled (BH13, BH15, BH16, BH19, BH22, BH23R2, BH24, BH25R, BH27, BH30R, BH31, BH33, BH36R, BH44 and BH50). Benzene concentrations associated with these fifteen monitoring wells ranged from 11 $\mu\text{g/L}$ in BH44 to 4,800 $\mu\text{g/L}$ in BH16. Isoconcentration contours indicating the area where benzene concentrations in groundwater were above the regulatory standard during the Third Quarter 2018 sampling event are illustrated on Figure 4.
- Toluene was detected above the COGCC Table 910-1 groundwater standard of 560 $\mu\text{g/L}$ in two of the forty-seven Site monitoring wells sampled (BH23R2 and BH36R). The toluene concentrations associated with these monitoring wells were 2,200 and 3,800 $\mu\text{g/L}$, respectively.
- Ethylbenzene was not detected above the COGCC Table 910-1 groundwater standard of 700 $\mu\text{g/L}$ in any of the forty-seven Site monitoring wells sampled.
- Total xylenes were detected above the COGCC Table 910-1 groundwater standard of 1,400 $\mu\text{g/L}$ in two of the forty-seven Site monitoring wells sampled (BH23R2 and BH36R). Total xylenes concentrations associated with these monitoring wells were 8,600 and 4,400 $\mu\text{g/L}$, respectively

4.0 REMEDIATION SYSTEM

This section summarizes the installation and operational data for the AS/SVE remediation system that is currently in operation at the Site. The remediation system is shut down a minimum of one week prior to quarterly sampling events to allow for normalization of Site groundwater levels.

4.1 AS/SVE Remediation System Installation

Between November 14 and 29, 2017, Tasman retrofitted eight monitoring wells for use as AS wells and thirteen for use as SVE wells to be used in operation of the remediation system (System). The AS/SVE remediation well network is illustrated on Figure 4. The remediation wells are connected to the System remediation equipment via above ground conveyance lines. The System remediation equipment is housed in a trailer that was placed along the southern end of the Site.

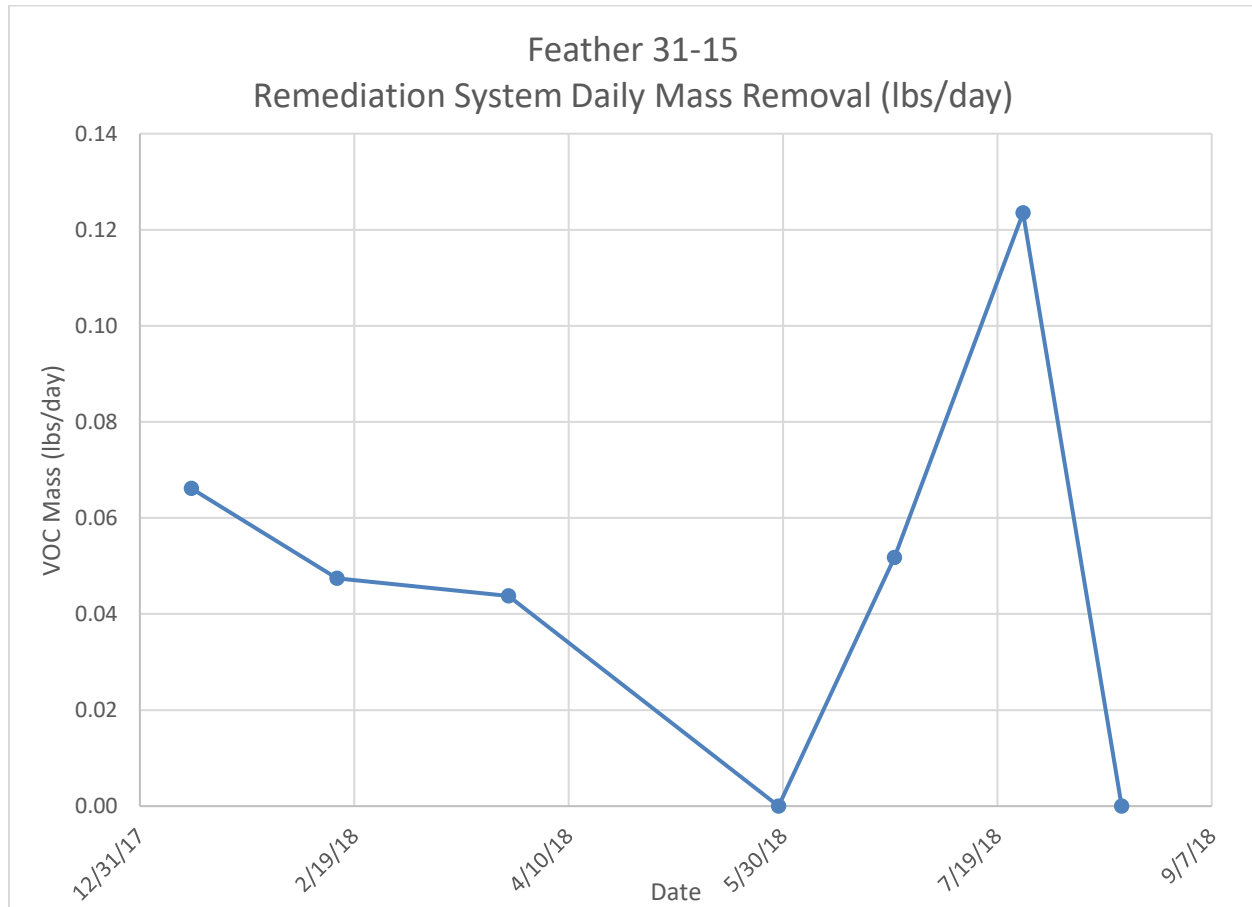
4.2 AS/SVE Remediation System Operations

Full-time operation of the AS System was initiated on December 4, 2017. On January 5, 2018, the SVE component of the System was initiated. From May 29 to August 17, 2018, the System SVE wells were operated at an average flow rate of 6.75 cubic feet per minute (cfm) at an average vacuum of 14.5 inches of water. The AS wells operated at an average pressure of 15.0 pounds per square inch (psi), and an average flow rate of 11.7 cfm. From May 29 to August 17, 2018 the System operated with an average uptime of 68.04%.

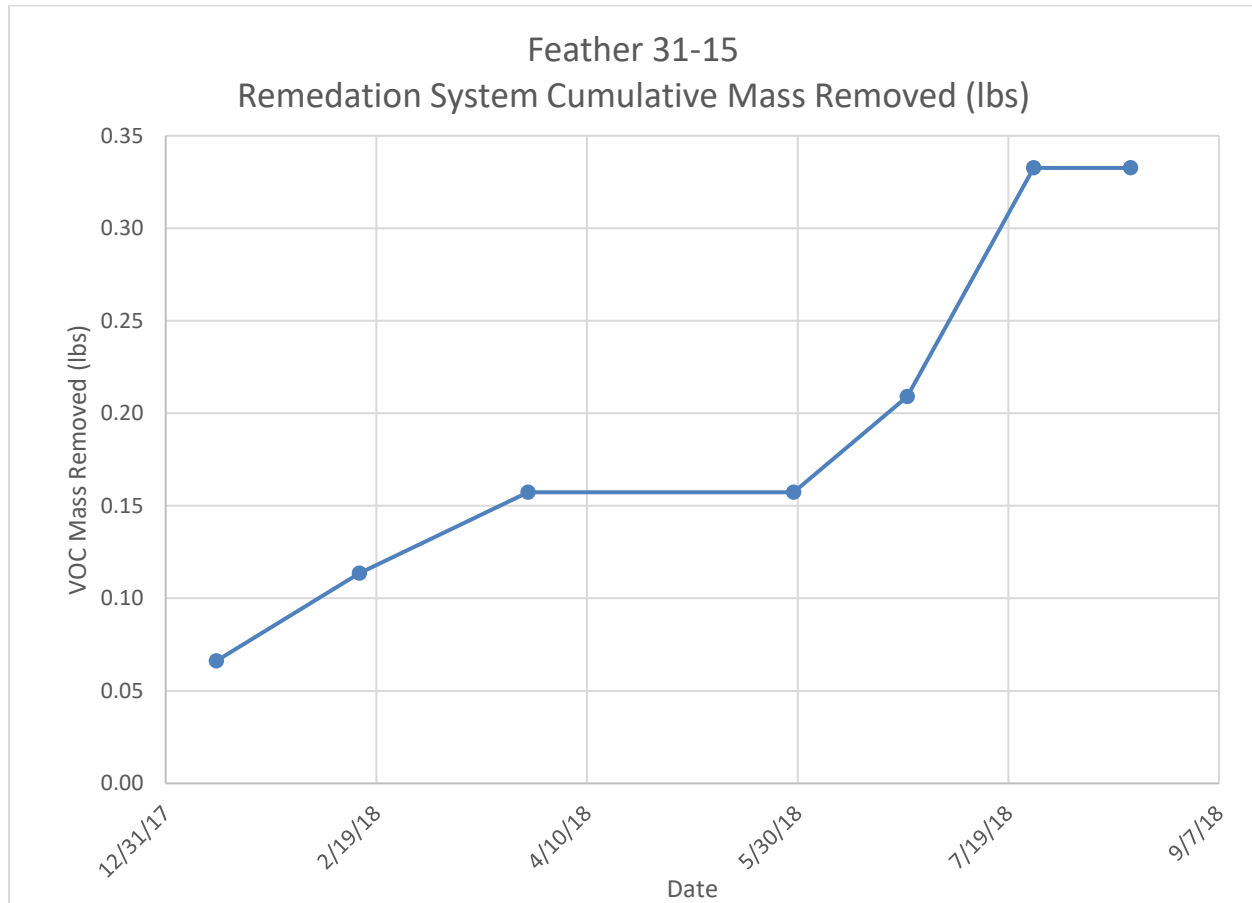
Remediation system air emission analytical samples were collected on June 25, July 25 and, August 17, 2018 and submitted to Origins Laboratory in Denver, Colorado for analysis of BTEX and total petroleum hydrocarbons – gasoline range organics (TPH-GRO) by USEPA Method TO-15. Laboratory analytical results for these samples are summarized in Table 3. This laboratory data is used to calculate System effluent emission mass calculations. Tasman will continue to collect emission samples through the end of 2018 to determine if a CDPHE APEN will be required for the System operations. As detailed in Table 3, as of August 17, 2018, approximately 0.33 pounds of petroleum hydrocarbons has been emitted by the System since startup. Based on the air emission data collected to date, an APEN is currently not required as part of the System operations.

The following two charts illustrate the daily and total mass of hydrocarbons removed by the System since operations were initiated.

**Chart 1 - Daily Mass Removal
Remediation System Air Emissions**



**Chart 2 - Cumulative Mass Removal
Remediation System Air Emissions**



5.0 UPCOMING SITE ACTIVITIES

Anticipated upcoming Site activities include the following:

- Modify Remediation System layout to address northern portion of plume; and
- Complete the Fourth Quarter 2018 groundwater sampling event in October; and
- Continue operations and maintenance of the remediation system; and
- Continue monthly effluent sampling of remediation system emissions.

TABLES

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH03	01/28/16	940	3,700	430	7,100
BH03	09/01/16	Removed from Monitoring Network-Well Destroyed			
BH08	01/28/16	<1.0	1.1	<1.0	3.2
BH08	09/01/16	<1.0	<1.0	<1.0	<1.0
BH08	11/03/16	<1.0	<1.0	<1.0	<1.0
BH08	01/24/17	<1.0	<1.0	<1.0	<1.0
BH08	04/05/17	<1.0	<1.0	<1.0	<2.0
BH08	07/27/17	<1.0	<1.0	<1.0	<2.0
BH08	10/30/17	<1.0	<1.0	<1.0	<2.0
BH08	01/25/18	<1.0	<1.0	<1.0	<2.0
BH08	04/19/18	<1.0	<1.0	<1.0	<2.0
BH08	07/19/18	<1.0	<1.0	<1.0	<2.0
BH10	09/01/16	<1.0	<1.0	<1.0	<1.0
BH10	11/03/16	<1.0	<1.0	<1.0	<1.0
BH10	01/24/17	<1.0	<1.0	<1.0	<1.0
BH10	04/05/17	<1.0	<1.0	<1.0	<2.0
BH10	07/27/17	<1.0	<1.0	<1.0	<2.0
BH10	10/30/17	<1.0	<1.0	<1.0	<2.0
BH10	01/25/18	<1.0	<1.0	<1.0	<2.0
BH10	04/19/18	<1.0	<1.0	<1.0	<2.0
BH10	07/19/18	<1.0	<1.0	<1.0	<2.0
BH11	09/01/16	<1.0	<1.0	<1.0	18
BH11	11/03/16	57	70	24	260
BH11	01/24/17	<1.0	<1.0	<1.0	<1.0
BH11	04/05/17	13	<1.0	8.1	30
BH11	07/27/17	9.4	<1.0	20	13
BH11	10/30/17	<1.0	<1.0	<1.0	<2.0
BH11	01/25/18	1.1	<1.0	1.2	<2.0
BH11	04/19/18	4.7	<1.0	10	5.2
BH11	07/19/18	<1.0	<1.0	<1.0	<2.0
BH12	09/01/16	<1.0	<1.0	<1.0	<1.0
BH12	11/03/16	<1.0	<1.0	<1.0	<1.0
BH12	01/24/17	<1.0	<1.0	<1.0	<1.0
BH12	04/05/17	<1.0	<1.0	<1.0	<2.0
BH12	07/27/17	<1.0	<1.0	<1.0	<2.0
BH12	10/30/17	<1.0	<1.0	<1.0	<2.0
BH12	01/25/18	<1.0	<1.0	<1.0	<2.0
BH12	04/19/18	<1.0	<1.0	<1.0	<2.0
BH12	07/19/18	<1.0	<1.0	<1.0	<2.0
BH13	09/01/16	5,000	4,700	<1.0	16,000
BH13	11/03/16	4,800	2,900	690	15,000
BH13	01/24/17	3,000	610	380	13,000
BH13	04/05/17	2,900	670	1,100	11,000

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NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH13	07/27/17	1,000	190	470	3,200
BH13	10/30/17	470	27	2.3	2,600
BH13	01/25/18	22	<1.0	12.0	85
BH13	04/19/18	66	<1.0	220	130
BH13	07/19/18	12	<1.0	150	42
BH14	09/01/16	<1.0	<1.0	<1.0	<1.0
BH14	11/03/16	<1.0	<1.0	<1.0	<1.0
BH14	01/24/17	<1.0	<1.0	<1.0	<1.0
BH14	04/05/17	<1.0	<1.0	<1.0	<2.0
BH14	07/27/17	<1.0	<1.0	<1.0	<2.0
BH14	10/30/17	<1.0	<1.0	<1.0	<2.0
BH14	01/25/18	<1.0	<1.0	<1.0	<2.0
BH14	04/19/18	<1.0	<1.0	<1.0	<2.0
BH14	07/19/18	<1.0	<1.0	<1.0	<2.0
BH15	09/01/16	4,300	8,000	410	7,900
BH15	11/03/16	2,300	4,700	380	6,500
BH15	01/24/17	8,400	2,800	600	10,000
BH15	04/05/17	4,000	170	510	2,900
BH15	07/27/17	4,500	990	510	2,300
BH15	10/30/17	1,700	210	320	1,600
BH15	01/25/18	4,800	56	260	670
BH15	04/19/18	3,700	67	370	1,200
BH15	07/19/18	740	31	35	230
BH16	09/01/16	32,000	51,000	1,100	34,000
BH16	11/03/16	22,000	34,000	1,500	23,000
BH16	01/24/17	21,000	31,000	680	29,000
BH16	04/05/17	26,000	20,000	2,200	33,000
BH16	07/27/17	17,000	18,000	2,400	34,000
BH16	10/30/17	18,000	21,000	1,600	23,000
BH16	01/25/18	3,000	1,100	170	2,300
BH16	04/19/18	970	73	83	270
BH16	07/19/18	4,800	140	100	330
BH17	09/23/16	<1.0	<1.0	<1.0	<1.0
BH17	11/03/16	<1.0	<1.0	<1.0	<1.0
BH17	01/24/17	<1.0	<1.0	<1.0	<1.0
BH17	04/05/17	<1.0	<1.0	<1.0	<2.0
BH17	07/27/17	<1.0	<1.0	<1.0	<2.0
BH17	10/30/17	<1.0	<1.0	<1.0	<2.0
BH17	01/25/18	<1.0	<1.0	<1.0	<2.0
BH17	04/19/18	<1.0	<1.0	<1.0	<2.0
BH17	07/19/18	<1.0	<1.0	<1.0	<2.0
BH18	09/23/16	<1.0	<1.0	<1.0	<1.0
BH18	11/03/16	<1.0	<1.0	<1.0	<1.0
BH18	01/24/17	<1.0	<1.0	<1.0	<1.0

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NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH18	04/05/17	<1.0	<1.0	<1.0	<2.0
BH18	07/27/17	<1.0	<1.0	<1.0	<2.0
BH18	10/30/17	<1.0	<1.0	<1.0	<2.0
BH18	01/25/18	<1.0	<1.0	<1.0	<2.0
BH18	04/19/18	<1.0	<1.0	<1.0	<2.0
BH18	07/19/18	<1.0	<1.0	<1.0	<2.0
BH19	09/23/16	1,000	500	72	1,300
BH19	11/03/16	8,000	3,700	520	9,100
BH19	01/24/17	5,400	1.2	<1.0	3,100
BH19	04/05/17	5,600	<1.0	560	1,700
BH19	07/27/17	280	44	<1.0	230
BH19	10/30/17	1,800	1.6	140	430
BH19	01/25/18	1,100	<1.0	27	60
BH19	04/19/18	1,800	<1.0	210	330
BH19	07/19/18	2,500	<1.0	200	110
BH20	09/23/16	<1.0	<1.0	<1.0	280
BH20	11/03/16	<1.0	<1.0	<1.0	<1.0
BH20	01/24/17	<1.0	<1.0	<1.0	<1.0
BH20	04/05/17	<1.0	<1.0	<1.0	<2.0
BH20	07/27/17	<1.0	<1.0	<1.0	<2.0
BH20	10/30/17	<1.0	<1.0	<1.0	<2.0
BH20	01/25/18	<1.0	<1.0	<1.0	<2.0
BH20	04/19/18	<1.0	<1.0	<1.0	<2.0
BH20	07/19/18	<1.0	<1.0	<1.0	<2.0
BH21	09/23/16	2,400	2,800	470	1,500
BH21	11/03/16	5,000	12,000	560	9,600
BH21	01/24/17	2,900	30	<1.0	6,200
BH21	04/05/17	4,700	<1.0	530	3,100
BH21	07/27/17	3,100	<1.0	380	130
BH21	10/30/17	1,900	150	40	6.2
BH21	01/25/18	<1.0	<1.0	<1.0	<2.0
BH21	04/19/18	430	<1.0	280	<2.0
BH21	07/19/18	<1.0	<1.0	<1.0	<2.0
BH22	09/23/16	8,800	24,000	1,900	28,000
BH22	11/03/16	5,500	10,000	670	19,000
BH22	01/24/17	9,100	13,000	2,000	51,000
BH22	04/05/17	8,900	2,800	2,000	23,000
BH22	07/27/17	4,800	330	750	17,000
BH22	10/30/17	1,800	91	770	3,500
BH22	01/25/18	92	1.3	2.7	2.7
BH22	04/19/18	520	1.9	110	34
BH22	07/19/18	740	<1.0	49	45
BH23	09/23/16	11,000	21,000	1,400	21,000
BH23	11/03/16	6,200	6,800	430	7,900

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH23	01/24/17	4,900	5,300	<1.0	11,000
BH23	04/05/17	3,800	4,900	420	7,200
BH23	07/27/17	<1.0	<1.0	<1.0	<2.0
BH23	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH23R	10/30/17	4,200	110	34	4,000
BH23R	01/26/18	35	47	12	250
BH23R2	04/19/18	3,200	6,000	550	13,000
BH23R2	07/19/18	2,700	2,200	630	8,600
BH24	09/23/16	13,000	5,200	500	4,200
BH24	11/03/16	12,000	1,900	650	2,400
BH24	01/24/17	6,300	47	<1.0	4,000
BH24	04/05/17	9,100	1.0	910	950
BH24	07/27/17	3,500	2.1	3.7	1,200
BH24	10/30/17	660	3.5	340	110
BH24	01/25/18	74	<1.0	19	14
BH24	04/19/18	1,700	48	220	190
BH24	07/19/18	2,200	22	<1.0	220
BH25	09/23/16	5,400	22,000	1,200	19,000
BH25	11/03/16	4,500	15,000	1,200	20,000
BH25	01/24/17	2,700	2,400	<1.0	16,000
BH25	04/05/17	3,400	1,100	400	14,000
BH25	07/27/17	2,900	9.9	290	11,000
BH25R	10/30/17	88	3.7	<1.0	1,800
BH25R	01/25/18	3,300	<1.0	180	7,300
BH25R	04/19/18	1,000	<1.0	180	1,500
BH25R	07/19/18	860	1.2	270	550
BH26	09/23/16	3,900	8,100	890	13,000
BH26	11/03/16	3,700	3,000	780	13,000
BH26	01/24/17	3,300	210	<1.0	8,900
BH26	04/05/17	3,200	160	250	4,300
BH26	07/27/17	1,600	13	95	1,200
BH26	10/30/17	400	120	350	4,400
BH26	01/25/18	100	18	5.3	140
BH26	04/19/18	550	<1.0	99	83
BH26	07/19/18	1.6	<1.0	13	<2.0
BH27	09/23/16	2,100	7,900	660	11,000
BH27	11/03/16	2,300	7,300	790	13,000
BH27	01/24/17	110	3	<1.0	190
BH27	04/05/17	1,100	19	120	1,600
BH27	07/27/17	810	<1.0	330	480
BH27	10/30/17	130	<1.0	1.1	46
BH27	01/25/18	290	<1.0	57	<2.0
BH27	04/19/18	120	<1.0	150	40
BH27	07/19/18	29	<1.0	57	7.9

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH28	09/23/16	<1.0	<1.0	<1.0	<1.0
BH28	11/03/16	<1.0	<1.0	<1.0	<1.0
BH28	01/24/17	<1.0	<1.0	<1.0	<1.0
BH28	04/05/17	<1.0	<1.0	<1.0	<2.0
BH28	07/27/17	<1.0	<1.0	<1.0	<2.0
BH28	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH28R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH28R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH28R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH28R	07/19/18	<1.0	<1.0	<1.0	2.2
BH29	09/23/16	<1.0	<1.0	<1.0	<1.0
BH29	11/03/16	<1.0	<1.0	<1.0	<1.0
BH29	01/24/17	<1.0	<1.0	<1.0	<1.0
BH29	04/05/17	<1.0	<1.0	<1.0	<2.0
BH29	07/27/17	<1.0	<1.0	<1.0	<2.0
BH29	10/30/17	<1.0	<1.0	<1.0	<2.0
BH29	01/25/18	<1.0	<1.0	<1.0	<2.0
BH29	04/19/18	<1.0	<1.0	<1.0	<2.0
BH29	07/19/18	<1.0	<1.0	<1.0	<2.0
BH30	10/25/16	4,300	24,000	1,100	18,000
BH30	11/03/16	3,900	18,000	1,100	19,000
BH30	01/24/17	2,200	11,000	670	12,000
BH30	04/05/17	1,400	4,900	640	6,000
BH30	07/27/17	21	17	3.7	59
BH30	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH30R	10/30/17	1,200	1,000	67	11,000
BH30R	01/25/18	1,400	<1.0	34	340
BH30R	04/19/18	250	<1.0	190	1,000
BH30R	07/19/18	200	<1.0	160	200
BH31	10/25/16	4,100	2,700	170	3,900
BH31	11/03/16	3,700	3,700	250	4,800
BH31	01/24/17	1,300	<1.0	<1.0	2,100
BH31	04/05/17	1,500	<1.0	99	120
BH31	07/27/17	<1.0	<1.0	<1.0	<2.0
BH31	10/30/17	1.2	1.4	46	28
BH31	01/25/18	1,100	<1.0	70	2.7
BH31	04/19/18	960	<1.0	160	<2.0
BH31	07/19/18	76	<1.0	14	12
BH32	10/25/16	<1.0	2.8	<1.0	2.7
BH32	11/03/16	<1.0	<1.0	<1.0	<1.0
BH32	01/24/17	<1.0	<1.0	<1.0	<1.0
BH32	04/05/17	<1.0	<1.0	<1.0	<2.0
BH32	07/27/17	<1.0	<1.0	<1.0	<2.0

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH32	04/19/18	<1.0	<1.0	<1.0	<2.0
BH32	07/19/18	<1.0	<1.0	<1.0	<2.0
BH33	10/25/16	11,000	17,000	790	12,000
BH33	11/03/16	10,000	18,000	870	15,000
BH33	01/24/17	<1.0	17	1.3	4,400
BH33	04/05/17	4,300	19	550	1,100
BH33	07/27/17	<1.0	<1.0	200	1,100
BH33	10/30/17	4,300	69	2.2	160
BH33	01/25/18	72	2.9	4.8	59
BH33	04/19/18	230	<1.0	74	140
BH33	07/19/18	28	<1.0	6.9	19
BH34	10/25/16	Not Sampled - Insufficient Water			
BH34	11/03/16	<1.0	<1.0	<1.0	<1.0
BH34	01/24/17	<1.0	<1.0	<1.0	<1.0
BH34	04/05/17	<1.0	<1.0	<1.0	<2.0
BH34	07/27/17	<1.0	<1.0	<1.0	<2.0
BH34	10/30/17	3.0	<1.0	<1.0	3.0
BH34	01/25/18	<1.0	<1.0	<1.0	<2.0
BH34	04/19/18	<1.0	<1.0	<1.0	<2.0
BH34	07/19/18	<1.0	<1.0	<1.0	<2.0
BH35	10/25/16	Not Sampled - Insufficient Water			
BH35	11/03/16	<1.0	<1.0	<1.0	<1.0
BH35	01/24/17	<1.0	<1.0	<1.0	<1.0
BH35	04/05/17	<1.0	<1.0	<1.0	<2.0
BH35	07/27/17	<1.0	<1.0	<1.0	<2.0
BH35	10/30/17	1.0	<1.0	<1.0	2.1
BH35	01/25/18	<1.0	<1.0	<1.0	<2.0
BH35	04/19/18	<1.0	<1.0	<1.0	<2.0
BH35	07/19/18	<1.0	<1.0	<1.0	<2.0
BH36	10/25/16	6,800	9,800	520	8,500
BH36	11/03/16	4,300	2,200	320	4,700
BH36	01/24/17	2,200	24	<1.0	150
BH36	04/05/17	2,600	510	260	1,200
BH36	07/27/17	2,200	56	250	480
BH36	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH36R	10/30/17	2,800	290	15	4,300
BH36R	01/25/18	2,700	<1.0	84	500
BH36R	04/19/18	1,300	<1.0	110	260
BH36R	07/19/18	1,400	3,800	250	4,400
BH37	10/25/16	4,700	4,800	170	4,300
BH37	11/03/16	4,900	3,200	210	4,400
BH37	01/24/17	<1.0	<1.0	<1.0	<1.0
BH37	04/05/17	2,500	1,100	210	960
BH37	07/27/17	1,000	<1.0	27	44

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH37	04/19/18	260	<1.0	42	3.8
BH37	07/19/18	<1.0	3.4	<1.0	8.4
BH38	10/25/16	3.8	7.1	<1.0	12
BH38	11/03/16	<1.0	<1.0	<1.0	<1.0
BH38	01/24/17	<1.0	<1.0	<1.0	<1.0
BH38	04/05/17	<1.0	<1.0	<1.0	<2.0
BH38	07/27/17	1.2	<1.0	<1.0	<2.0
BH38	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH38R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH38R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH38R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH38R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH39	11/03/16	<1.0	<1.0	<1.0	<1.0
BH39	01/24/17	<1.0	<1.0	<1.0	<1.0
BH39	04/05/17	<1.0	<1.0	<1.0	<2.0
BH39	07/27/17	<1.0	<1.0	<1.0	<2.0
BH39	10/30/17	<1.0	<1.0	<1.0	<2.0
BH39	01/25/18	<1.0	<1.0	<1.0	<2.0
BH39	04/19/18	<1.0	<1.0	<1.0	<2.0
BH39	07/19/18	<1.0	<1.0	<1.0	<2.0
BH40	11/03/16	<1.0	<1.0	<1.0	2.2
BH40	01/24/17	<1.0	<1.0	<1.0	<1.0
BH40	04/05/17	<1.0	<1.0	<1.0	<2.0
BH40	07/27/17	<1.0	<1.0	<1.0	<2.0
BH40	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH40R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH40R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH40R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH40R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH41	11/03/16	<1.0	<1.0	<1.0	<1.0
BH41	01/24/17	<1.0	<1.0	<1.0	<1.0
BH41	04/05/17	<1.0	<1.0	<1.0	<2.0
BH41	07/27/17	<1.0	<1.0	<1.0	<2.0
BH41	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH41R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH41R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH41R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH41R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH42	11/03/16	<1.0	<1.0	<1.0	<1.0
BH42	01/24/17	<1.0	<1.0	<1.0	<1.0
BH42	04/05/17	<1.0	<1.0	<1.0	<2.0
BH42	07/27/17	<1.0	<1.0	<1.0	<2.0
BH42	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH42R	10/30/17	<1.0	<1.0	<1.0	<2.0

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH42R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH42R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH42R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH43	11/03/16	<1.0	1.2	<1.0	27
BH43	01/24/17	<1.0	<1.0	<1.0	<1.0
BH43	04/05/17	<1.0	<1.0	<1.0	<2.0
BH43	07/27/17	<1.0	<1.0	<1.0	<2.0
BH43	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH43R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH43R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH43R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH43R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH44	11/03/16	4,200	20	2.3	590
BH44	01/24/17	<1.0	<1.0	<1.0	<1.0
BH44	04/05/17	580	<1.0	<1.0	<2.0
BH44	07/27/17	100	<1.0	<1.0	<2.0
BH44	10/30/17	<1.0	<1.0	<1.0	<2.0
BH44	01/25/18	21	<1.0	<1.0	<2.0
BH44	04/19/18	1.2	<1.0	<1.0	<2.0
BH44	07/19/18	11	<1.0	<1.0	<2.0
BH45	11/03/16	<1.0	9.3	<1.0	3.9
BH45	01/24/17	<1.0	<1.0	<1.0	<1.0
BH45	04/05/17	<1.0	<1.0	<1.0	<2.0
BH45	07/27/17	<1.0	<1.0	<1.0	<2.0
BH45	10/30/17	<1.0	<1.0	<1.0	<2.0
BH45	01/25/18	<1.0	<1.0	<1.0	<2.0
BH45	04/19/18	<1.0	<1.0	<1.0	<2.0
BH45	07/19/18	<1.0	<1.0	<1.0	<2.0
BH46	01/24/17	<1.0	<1.0	<1.0	<1.0
BH46	04/05/17	<1.0	<1.0	<1.0	<2.0
BH46	07/27/17	<1.0	<1.0	<1.0	<2.0
BH46	10/30/17	<1.0	<1.0	<1.0	<2.0
BH46	01/25/18	<1.0	<1.0	<1.0	<2.0
BH46	04/19/18	<1.0	<1.0	<1.0	<2.0
BH46	07/19/18	<1.0	<1.0	<1.0	<2.0
BH47	01/24/17	<1.0	<1.0	<1.0	<1.0
BH47	04/05/17	<1.0	<1.0	<1.0	<2.0
BH47	07/27/17	<1.0	<1.0	<1.0	<2.0
BH47	10/30/17	<1.0	<1.0	<1.0	<2.0
BH47	01/25/18	<1.0	<1.0	<1.0	<2.0
BH47	04/19/18	<1.0	<1.0	<1.0	<2.0
BH47	07/19/18	<1.0	<1.0	<1.0	<2.0
BH48	01/24/17	<1.0	<1.0	<1.0	<1.0
BH48	04/05/17	1,300	<1.0	<1.0	8.4
BH48	07/27/17	300	<1.0	<1.0	<2.0

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH48	10/30/17	1.2	<1.0	<1.0	<2.0
BH48	01/25/18	<1.0	<1.0	<1.0	<2.0
BH48	04/19/18	<1.0	<1.0	<1.0	<2.0
BH48	07/19/18	<1.0	<1.0	<1.0	<2.0
BH49	01/24/17	<1.0	<1.0	<1.0	<1.0
BH49	04/05/17	250	<1.0	<1.0	<2.0
BH49	07/27/17	64	<1.0	<1.0	<2.0
BH49	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH49R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH49R	01/25/18	230	<1.0	<1.0	<2.0
BH49R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH49R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH50	01/24/17	1,600	3,400	280	5,100
BH50	04/05/17	820	1.2	160	330
BH50	07/27/17	740	<1.0	170	340
BH50	10/30/17	<1.0	<1.0	<1.0	<2.0
BH50	01/25/18	170	<1.0	150	<2.0
BH50	04/19/18	190	<1.0	250	<2.0
BH50	07/19/18	44	<1.0	36	130
BH51	01/24/17	<1.0	<1.0	<1.0	<1.0
BH51	04/05/17	<1.0	<1.0	<1.0	<2.0
BH51	07/27/17	<1.0	<1.0	<1.0	<2.0
BH51	10/30/17	<1.0	<1.0	<1.0	<2.0
BH51	01/25/18	<1.0	<1.0	<1.0	<2.0
BH51	04/19/18	<1.0	<1.0	<1.0	<2.0
BH51	07/19/18	<1.0	<1.0	<1.0	<2.0
BH52	01/24/17	<1.0	<1.0	<1.0	<1.0
BH52	04/05/17	<1.0	<1.0	<1.0	<2.0
BH52	07/27/17	<1.0	<1.0	<1.0	<2.0
BH52	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH52R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH52R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH52R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH52R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH53	07/27/17	<1.0	<1.0	<1.0	<2.0
BH53	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH53R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH53R	01/25/18	67	<1.0	<1.0	<2.0
BH53R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH53R	07/19/18	<1.0	<1.0	<1.0	<2.0
BH54	07/27/17	Not Sampled - Insufficient Water			
BH54	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH54R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH54R	01/25/18	1,400	<1.0	<1.0	<2.0
BH54R	04/20/18	<1.0	<1.0	<1.0	<2.0
BH54R	07/19/18	16	<1.0	<1.0	<2.0
BH54R	07/30/18	<1.0	<1.0	<1.0	<2.0

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH55	07/27/17	<1.0	<1.0	<1.0	<2.0
BH55	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH55R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH55R	01/25/18	1.1	<1.0	<1.0	<2.0
BH55R	04/19/18	<1.0	<1.0	<1.0	<2.0
BH55R	07/19/18	<1.0	<1.0	<1.0	<2.0

Notes:

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

Groundwater standards referenced from COGCC Table 910-1

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

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH03	01/28/16	NS	22.98	15.17	ND	ND	NS
BH03	09/01/16	Removed from Monitoring Network-Well Destroyed					
BH08	01/28/16	NS	24.95	13.15	ND	ND	NS
BH08	09/01/16	4960.47	22.60	6.16	ND	ND	4954.31
BH08	11/03/16	4960.47	22.57	6.79	ND	ND	4953.68
BH08	01/24/17	4960.47	22.63	7.21	ND	ND	4953.26
BH08	04/05/17	4960.47	22.60	7.54	ND	ND	4952.93
BH08	07/27/17	4960.47	22.53	7.26	ND	ND	4953.21
BH08	10/30/17	4960.47	22.52	7.92	ND	ND	4952.55
BH08	01/25/18	4960.47	22.59	8.31	ND	ND	4952.16
BH08	04/19/18	4960.47	22.54	8.71	ND	ND	4951.76
BH08	07/19/18	4960.47	22.54	8.43	ND	ND	4952.04
BH10	09/01/16	4964.48	21.98	10.36	ND	ND	4954.12
BH10	11/03/16	4964.48	21.95	10.98	ND	ND	4953.50
BH10	01/24/17	4964.48	22.03	11.37	ND	ND	4953.11
BH10	04/05/17	4964.48	21.98	11.72	ND	ND	4952.76
BH10	07/27/17	4964.48	21.95	11.49	ND	ND	4952.99
BH10	10/30/17	4964.48	21.94	12.06	ND	ND	4952.42
BH10	01/25/18	4964.48	21.98	12.40	ND	ND	4952.08
BH10	04/19/18	4964.48	21.95	12.81	ND	ND	4951.67
BH10	07/19/18	4964.48	21.99	12.51	ND	ND	4951.97
BH11	09/01/16	4960.77	16.86	6.73	ND	ND	4954.04
BH11	11/03/16	4960.77	18.32	7.29	ND	ND	4953.48
BH11	01/24/17	4960.77	17.93	7.72	ND	ND	4953.05
BH11	04/05/17	4960.77	17.79	8.04	ND	ND	4952.73
BH11	07/27/17	4960.77	17.69	7.78	ND	ND	4952.99
BH11	10/30/17	4960.77	17.63	8.40	ND	ND	4952.37
BH11	01/25/18	4959.80	15.56	7.80	ND	ND	4952.00
BH11	04/19/18	4959.80	15.85	8.41	ND	ND	4951.39
BH11	07/19/18	4959.80	15.75	8.12	ND	ND	4951.68
BH12	09/01/16	4960.63	18.90	7.05	ND	ND	4953.58
BH12	11/03/16	4960.63	18.81	7.71	ND	ND	4952.92
BH12	01/24/17	4960.63	18.70	8.15	ND	ND	4952.48
BH12	04/05/17	4960.63	18.84	8.47	ND	ND	4952.16
BH12	07/27/17	4960.63	18.59	8.20	ND	ND	4952.43
BH12	10/30/17	4960.63	18.54	8.83	ND	ND	4951.80
BH12	01/25/18	4960.63	18.55	9.20	ND	ND	4951.43
BH12	04/19/18	4960.63	18.59	9.60	ND	ND	4951.03
BH12	07/19/18	4960.63	18.52	9.35	ND	ND	4951.28
BH13	09/01/16	4963.84	21.95	10.92	ND	ND	4952.92
BH13	11/03/16	4963.84	21.62	11.54	ND	ND	4952.30
BH13	01/24/17	4963.84	21.17	11.94	ND	ND	4951.90
BH13	04/05/17	4963.84	21.14	12.23	ND	ND	4951.61
BH13	07/27/17	4963.84	20.99	11.93	ND	ND	4951.91
BH13	10/30/17	4963.84	20.83	12.56	ND	ND ¹	4951.28

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH13	01/25/18	4959.84	16.36	8.87	ND	ND	4950.97
BH13	04/19/18	4963.84	16.29	9.28	ND	ND	4954.56
BH13	07/19/18	4963.84	16.34	8.98	ND	ND	4954.86
BH14	09/01/16	4960.84	19.50	8.60	ND	ND	4952.24
BH14	11/03/16	4960.84	19.39	9.22	ND	ND	4951.62
BH14	01/24/17	4960.84	19.10	9.57	ND	ND	4951.27
BH14	04/05/17	4960.84	19.02	9.84	ND	ND	4951.00
BH14	07/27/17	4960.84	19.03	9.54	ND	ND	4951.30
BH14	10/30/17	4960.84	18.90	10.10	ND	ND	4950.74
BH14	01/25/18	4960.84	15.83	10.42	ND	ND	4950.42
BH14	04/19/18	4960.84	15.88	10.82	ND	ND	4950.02
BH14	07/19/18	4960.84	15.92	10.48	ND	ND	4950.36
BH15	09/01/16	4961.83	21.04	10.90	ND	ND	4950.93
BH15	11/03/16	4961.83	22.32	11.39	ND	ND	4950.44
BH15	01/24/17	4961.83	22.32	11.67	ND	ND	4950.16
BH15	04/05/17	4961.83	22.40	11.92	ND	ND	4949.91
BH15	07/27/17	4961.83	22.35	11.57	ND	ND	4950.26
BH15	10/30/17	4961.83	22.36	12.03	ND	ND	4949.80
BH15	01/25/18	4961.83	22.32	12.38	ND	ND	4949.45
BH15	04/19/18	4961.83	22.60	13.06	ND	ND	4948.77
BH15	07/19/18	4961.83	22.27	12.26	ND	ND	4949.57
BH16	09/01/16	4960.67	19.54	8.85	ND	ND	4951.82
BH16	11/03/16	4960.67	19.50	9.44	ND	ND	4951.23
BH16	01/24/17	4960.67	19.55	9.77	ND	ND	4950.90
BH16	04/05/17	4960.67	19.60	10.04	ND	ND	4950.63
BH16	07/27/17	4960.67	19.49	9.68	ND	ND ¹	4950.99
BH16	10/30/17	4960.67	19.50	10.27	ND	ND	4950.40
BH16	01/25/18	4959.88	18.35	9.74	ND	ND	4950.14
BH16	04/19/18	4959.88	18.14	10.71	ND	ND	4949.17
BH16	07/19/18	4959.88	18.07	9.80	ND	ND	4950.08
BH17	09/23/16	4961.27	18.52	8.53	ND	ND	4952.74
BH17	11/03/16	4961.27	18.26	8.97	ND	ND	4952.30
BH17	01/24/17	4961.27	17.72	9.36	ND	ND	4951.91
BH17	04/05/17	4961.27	17.71	9.66	ND	ND	4951.61
BH17	07/27/17	4961.27	17.68	9.40	ND	ND	4951.87
BH17	10/30/17	4961.27	17.55	9.91	ND	ND	4951.36
BH17	01/25/18	4961.27	17.42	10.30	ND	ND	4950.97
BH17	04/19/18	4961.27	17.40	10.67	ND	ND	4950.60
BH17	07/19/18	4961.27	17.26	10.19	ND	ND	4951.08
BH18	09/23/16	4962.91	21.43	11.30	ND	ND	4951.61
BH18	11/03/16	4962.91	22.26	11.72	ND	ND	4951.19
BH18	01/24/17	4962.91	22.33	12.06	ND	ND	4950.85
BH18	04/05/17	4961.27	22.30	12.34	ND	ND	4948.93
BH18	07/27/17	4961.27	22.18	12.06	ND	ND	4949.21
BH18	10/30/17	4961.27	22.29	12.51	ND	ND	4948.76
BH18	01/25/18	4961.27	22.25	12.85	ND	ND	4948.42
BH18	04/19/18	4961.27	22.21	13.22	ND	ND	4948.05
BH18	07/19/18	4961.27	22.24	12.68	ND	ND	4948.59

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH19	09/23/16	4961.23	18.11	9.11	ND	ND	4952.12
BH19	11/03/16	4961.23	18.59	9.53	ND	ND	4951.70
BH19	01/24/17	4961.23	18.58	9.87	ND	ND	4951.36
BH19	04/05/17	4961.23	18.57	10.16	ND	ND	4951.07
BH19	07/27/17	4961.23	18.49	9.82	ND	ND	4951.41
BH19	10/30/17	4961.23	18.46	10.38	ND	ND	4950.85
BH19	01/25/18	4960.28	17.52	9.81	ND	ND	4950.47
BH19	04/19/18	4960.28	17.66	10.17	ND	ND	4950.11
BH19	07/19/18	4960.28	17.75	9.74	ND	ND	4950.54
BH20	09/23/16	4959.06	19.43	8.72	ND	ND	4950.34
BH20	11/03/16	4959.06	19.34	9.05	ND	ND	4950.01
BH20	01/24/17	4959.06	19.14	9.29	ND	ND	4949.77
BH20	04/05/17	4959.06	19.05	9.52	ND	ND	4949.54
BH20	07/27/17	4959.06	19.06	9.13	ND	ND	4949.93
BH20	10/30/17	4959.06	18.91	9.62	ND	ND	4949.44
BH20	01/25/18	4959.06	18.90	9.90	ND	ND	4949.16
BH20	04/19/18	4959.06	18.95	10.27	ND	ND	4948.79
BH20	07/19/18	4959.06	18.84	9.90	ND	ND	4949.16
BH21	09/23/16	4960.89	21.22	14.49	ND	ND	4946.40
BH21	11/03/16	4960.89	21.22	12.18	ND	ND	4948.71
BH21	01/24/17	4960.89	21.20	12.27	ND	ND	4948.62
BH21	04/05/17	4960.89	21.30	12.57	ND	ND	4948.32
BH21 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH21	10/30/17	4960.90	21.24	12.59	ND	ND	4948.31
BH21	01/25/18	4960.90	21.40	12.96	ND	ND	4947.94
BH21	04/19/18	4960.90	21.24	13.23	ND	ND	4947.67
BH21	07/19/18	4960.90	21.22	12.81	ND	ND	4948.09
BH22	09/23/16	4961.11	20.94	11.49	ND	ND	4949.62
BH22	11/03/16	4961.11	20.90	11.79	ND	ND	4949.32
BH22	01/24/17	4961.11	20.70	11.94	ND	ND	4949.17
BH22	04/05/17	4961.11	20.80	12.20	ND	ND	4948.91
BH22 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH22 ¹	10/30/17	4961.11	20.51	12.29	ND	ND	4948.82
BH22	01/25/18	4961.11	20.85	12.54	ND	ND	4948.57
BH22	04/19/18	4961.11	20.56	13.07	ND	ND	4948.04
BH22	07/19/18	4961.11	20.51	12.45	ND	ND	4948.66
BH23	09/23/16	4960.67	22.71	11.91	ND	ND	4948.76
BH23	11/03/16	4960.67	22.68	12.21	ND	ND	4948.46
BH23	01/24/17	4960.67	22.50	12.29	ND	ND	4948.38
BH23	04/05/17	4960.67	22.57	12.58	ND	ND	4948.09
BH23 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH23	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH23R	10/30/17	4960.74	22.91	12.65	ND	ND	4948.09
BH23R	01/25/18	Well Damaged - Elevation Control Lost			NM	NM	NM
BH23R2	04/19/18	4960.72	22.59	13.08	ND	ND	4947.64
BH23R2	07/19/18	4960.72	22.63	12.65	ND	ND	4948.07

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH24	09/23/16	4960.30	21.75	11.63	ND	ND	4948.67
BH24	11/03/16	4960.30	22.38	11.87	ND	ND	4948.43
BH24	01/24/17	4960.30	22.70	11.95	ND	ND	4948.35
BH24	04/05/17	4960.30	22.82	12.22	ND	ND	4948.08
BH24	07/27/17	4960.30	22.75	11.91	ND	ND	4948.39
BH24	10/30/17	4960.30	22.77	12.23	ND	ND	4948.07
BH24	01/25/18	4960.30	22.95	12.59	ND	ND	4947.71
BH24	04/19/18	4960.30	23.25	13.15	ND	ND	4947.15
BH24	07/19/18	4960.30	22.97	12.44	ND	ND	4947.86
BH25	09/23/16	4960.28	22.91	11.98	ND	ND	4948.30
BH25	11/03/16	4960.28	22.91	12.23	ND	ND	4948.05
BH25	01/24/17	4960.28	22.88	12.36	ND	ND	4947.92
BH25	04/05/17	4960.28	22.94	12.63	ND	ND	4947.65
BH25 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH25	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH25R	10/30/17	4960.31	22.87	16.03	ND	ND	4944.28
BH25R	01/25/18	4960.31	23.04	12.92	ND	ND	4947.39
BH25R	04/19/18	4960.31	22.87	13.24	ND	ND	4947.07
BH25R	07/19/18	4960.31	22.91	12.89	ND	ND	4947.42
BH26	09/23/16	4959.46	22.85	12.76	ND	ND	4946.70
BH26	11/03/16	4959.46	22.60	12.96	ND	ND	4946.50
BH26	01/24/17	4959.46	22.51	12.89	ND	ND	4946.57
BH26	04/05/17	4959.46	22.60	13.07	ND	ND	4946.39
BH26	07/27/17	4959.46	22.51	12.72	ND	ND	4946.74
BH26	10/30/17	4959.46	22.50	13.01	ND	ND	4946.45
BH26	01/25/18	4959.46	22.42	13.18	ND	ND	4946.28
BH26	04/19/18	4959.46	22.38	15.10	ND	ND	4944.36
BH26	07/19/18	4959.46	22.28	13.15	ND	ND	4946.31
BH27	09/23/16	4958.65	22.47	13.43	ND	ND	4945.22
BH27	11/03/16	4958.65	22.38	13.59	ND	ND	4945.06
BH27	01/24/17	4958.65	22.32	13.53	ND	ND	4945.12
BH27	04/05/17	4958.65	22.44	13.72	ND	ND	4944.93
BH27 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH27	10/30/17	4958.64	22.37	13.51	ND	ND	4945.13
BH27	01/25/18	4958.64	22.52	13.80	ND	ND	4944.84
BH27	04/19/18	4958.64	22.37	14.05	ND	ND	4944.59
BH27	07/19/18	4958.64	22.41	13.84	ND	ND	4944.80
BH28	09/23/16	4957.57	22.68	14.01	ND	ND	4943.56
BH28	11/03/16	4957.57	22.56	14.05	ND	ND	4943.52
BH28	01/24/17	4957.57	22.38	13.91	ND	ND	4943.66
BH28	04/05/17	4957.57	22.46	14.01	ND	ND	4943.56
BH28 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH28	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH28R	10/30/17	4957.35	22.51	17.64	ND	ND	4939.71
BH28R	01/25/18	4957.35	22.59	13.61	ND	ND	4943.74
BH28R	04/19/18	4957.35	22.51	13.86	ND	ND	4943.49
BH28R	07/19/18	4957.35	22.56	13.69	ND	ND	4943.66

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH29	09/23/16	4958.73	21.53	13.07	ND	ND	4945.66
BH29	11/03/16	4958.73	21.86	13.30	ND	ND	4945.43
BH29	01/24/17	4958.73	21.93	13.26	ND	ND	4945.47
BH29	04/05/17	4958.73	21.92	13.45	ND	ND	4945.28
BH29 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH29	10/30/17	4958.73	22.05	13.32	ND	ND	4945.41
BH29	01/25/18	4958.73	22.10	13.50	ND	ND	4945.23
BH29	04/19/18	4958.73	22.06	13.83	ND	ND	4944.90
BH29	07/19/18	4958.73	22.13	13.59	ND	ND	4945.14
BH30	11/03/16	4957.11	22.22	13.75	ND	ND	4943.36
BH30	01/24/17	4957.11	22.16	13.62	ND	ND	4943.49
BH30	04/05/17	4957.11	22.27	13.71	ND	ND	4943.40
BH30 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH30	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH30R	10/30/17	4957.80	26.58	19.18	ND	ND	4938.62
BH30R	01/25/18	4957.80	26.76	14.30	ND	ND	4943.50
BH30R	04/19/18	4957.80	26.59	14.45	ND	ND	4943.35
BH30R	07/19/18	4957.80	26.62	14.24	ND	ND	4943.56
BH31	11/03/16	4958.22	20.43	13.14	ND	ND	4945.08
BH31	01/24/17	4958.22	20.35	13.09	ND	ND	4945.13
BH31	04/05/17	4958.22	24.20	13.25	ND	ND	4944.97
BH31 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH31	10/30/17	4958.23	20.50	13.08	ND	ND	4945.15
BH31	01/25/18	4958.23	20.75	13.36	ND	ND	4944.87
BH31	04/19/18	4958.23	26.00	13.56	ND	ND	4944.67
BH31	07/19/18	4958.23	20.40	13.26	ND	ND	4944.97
BH32	11/03/16	4959.15	22.97	13.61	ND	ND	4945.54
BH32	01/24/17	4959.15	22.98	13.61	ND	ND	4945.54
BH32	04/05/17	4959.15	23.05	13.82	ND	ND	4945.33
BH32 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH32	10/30/17	4959.15	23.02	14.77	ND	ND	4944.38
BH32	01/25/18	4959.15	23.05	13.89	ND	ND	4945.26
BH32	04/19/18	4959.15	18.02	14.22	ND	ND	4944.93
BH32	07/19/18	4959.15	23.09	13.94	ND	ND	4945.21
BH33	11/03/16	4956.82	22.78	14.91	ND	ND	4941.91
BH33	01/24/17	4956.82	22.71	14.66	ND	ND	4942.16
BH33	04/05/17	4956.82	22.83	14.76	ND	ND	4942.06
BH33 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH33	10/30/17	4956.84	22.69	14.38	ND	ND	4942.46
BH33	01/25/18	4956.84	22.65	14.40	ND	ND	4942.44
BH33	04/19/18	4956.84	22.26	15.46	ND	ND	4941.38
BH33	07/19/18	4956.84	22.13	14.44	ND	ND	4942.40
BH34	11/03/16	4957.08	21.84	19.37	ND	ND	4937.71
BH34	01/24/17	4957.08	21.82	13.08	ND	ND	4944.00
BH34	04/05/17	4957.08	21.88	13.22	ND	ND	4943.86
BH34 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH34	10/30/17	4958.32	23.09	14.19	ND	ND	4944.13
BH34	01/25/18	4958.32	23.16	14.41	ND	ND	4943.91
BH34	04/19/18	4958.32	23.09	14.62	ND	ND	4943.70
BH34	07/19/18	4958.32	23.13	14.48	ND	ND	4943.84

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH35	11/03/16	4957.41	22.52	17.90	ND	ND	4939.51
BH35	01/24/17	4957.41	22.49	15.03	ND	ND	4942.38
BH35	04/05/17	4957.41	17.56	15.17	ND	ND	4942.24
BH35	07/27/17	4957.41	22.51	14.74	ND	ND	4942.67
BH35	10/30/17	4957.41	22.52	14.79	ND	ND	4942.62
BH35	01/25/18	4957.41	22.59	14.90	ND	ND	4942.51
BH35	04/19/18	4957.41	22.51	15.13	ND	ND	4942.28
BH35	07/19/18	4957.41	22.57	14.99	ND	ND	4942.42
BH36	11/03/16	4955.19	22.02	14.64	ND	ND	4940.55
BH36	01/24/17	4955.19	21.96	14.34	ND	ND	4940.85
BH36	04/05/17	4955.19	22.06	14.36	ND	ND	4940.83
BH36 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH36	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH36R	10/30/17	4955.91	26.68	14.61	ND	ND	4941.30
BH36R	01/25/18	4955.91	26.69	14.71	ND	ND	4941.20
BH36R	04/19/18	4955.91	26.79	15.29	ND	ND	4940.62
BH36R	07/19/18	4955.91	26.02	14.64	ND	ND	4941.27
BH37	11/03/16	4954.95	22.13	15.97	ND	ND	4938.98
BH37	01/24/17	4954.95	22.14	15.56	ND	ND	4939.39
BH37	04/05/17	4954.95	22.17	15.61	ND	ND	4939.34
BH37 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH37	10/30/17	4954.98	22.29	15.15	ND	ND	4939.83
BH37	01/25/18	4954.98	22.27	15.06	ND	ND	4939.92
BH37	04/19/18	4954.98	22.06	17.02	ND	ND	4937.96
BH37	07/19/18	4954.98	22.03	15.11	ND	ND	4939.87
BH38	11/03/16	4955.15	22.05	15.13	ND	ND	4940.02
BH38	01/24/17	4955.15	22.02	14.80	ND	ND	4940.35
BH38	04/05/17	4955.15	22.07	14.84	ND	ND	4940.31
BH38 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH38	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH38R	10/30/17	4955.69	26.66	14.86	ND	ND	4940.83
BH38R	01/25/18	4955.69	26.69	14.83	ND	ND	4940.86
BH38R	04/19/18	4955.69	26.69	15.06	ND	ND	4940.63
BH38R	07/19/18	4955.69	26.69	14.92	ND	ND	4940.77
BH39	11/03/16	4955.83	22.46	14.25	ND	ND	4941.58
BH39	01/24/17	4955.83	22.42	13.98	ND	ND	4941.85
BH39	04/05/17	4955.83	22.49	14.06	ND	ND	4941.77
BH39 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH39	10/30/17	4955.85	22.41	13.70	ND	ND	4942.15
BH39	01/25/18	4955.85	22.42	13.71	ND	ND	4942.14
BH39	04/19/18	4955.85	22.23	13.96	ND	ND	4941.89
BH39	07/19/18	4955.85	22.20	13.79	ND	ND	4942.06
BH40	11/03/16	4960.60	21.72	11.08	ND	ND	4949.52
BH40	01/24/17	4960.60	21.43	11.24	ND	ND	4949.36
BH40	04/05/17	4960.60	21.31	11.56	ND	ND	4949.04
BH40 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH40	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH40R	10/30/17	4961.06	22.73	12.09	ND	ND	4948.97
BH40R	01/25/18	4961.06	22.40	12.37	ND	ND	4948.69
BH40R	04/19/18	4961.06	22.26	12.70	ND	ND	4948.36

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH40R	07/19/18	4961.06	22.12	12.24	ND	ND	4948.82
BH41	11/03/16	4959.08	21.13	11.14	ND	ND	4947.94
BH41	01/24/17	4959.08	20.94	11.27	ND	ND	4947.81
BH41	04/05/17	4959.08	20.92	11.52	ND	ND	4947.56
BH41 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH41	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH41R	10/30/17	4959.22	21.59	11.66	ND	ND	4947.56
BH41R	01/25/18	4959.22	21.65	12.00	ND	ND	4947.22
BH41R	04/19/18	4959.22	21.65	12.28	ND	ND	4946.94
BH41R	07/19/18	4959.22	21.64	11.89	ND	ND	4947.33
BH42	11/03/16	4959.24	22.18	12.44	ND	ND	4946.80
BH42	01/24/17	4959.24	22.07	12.25	ND	ND	4946.99
BH42	04/05/17	4959.24	22.17	12.50	ND	ND	4946.74
BH42 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH42	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH42R	10/30/17	4959.01	22.03	20.57	ND	ND	4938.44
BH42R	01/25/18	4959.01	22.10	12.48	ND	ND	4946.53
BH42R	04/19/18	4959.01	22.10	12.80	ND	ND	4946.21
BH42R	07/19/18	4959.01	22.08	12.54	ND	ND	4946.47
BH43	11/03/16	4959.74	21.72	11.53	ND	ND	4948.21
BH43	01/24/17	4959.74	21.26	11.64	ND	ND	4948.10
BH43	04/05/17	4959.74	21.10	11.82	ND	ND	4947.92
BH43 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH43	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH43R	10/30/17	4960.58	22.53	20.23	ND	ND	4940.35
BH43R	01/25/18	4960.58	22.60	13.00	ND	ND	4947.58
BH43R	04/19/18	4960.58	22.61	13.30	ND	ND	4947.28
BH43R	07/19/18	4960.58	22.58	12.98	ND	ND	4947.60
BH44	11/03/16	4955.00	21.68	17.75	ND	ND	4937.25
BH44	01/24/17	4955.00	21.64	17.29	ND	ND	4937.71
BH44	04/05/17	4955.00	21.71	17.24	ND	ND	4937.76
BH44 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH44	10/30/17	4955.00	21.67	16.70	ND	ND	4938.30
BH44	01/25/18	4955.00	21.90	16.72	ND	ND	4938.28
BH44	04/19/18	4955.00	21.95	16.85	ND	ND	4938.15
BH44	07/19/18	4955.00	21.91	16.82	ND	ND	4938.18
BH45	11/03/16	4954.87	22.21	21.08	ND	ND	4933.79
BH45	01/24/17	4954.87	22.19	17.14	ND	ND	4937.73
BH45	04/05/17	4954.87	22.25	17.06	ND	ND	4937.81
BH45 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH45	10/30/17	4954.89	22.23	16.49	ND	ND	4938.40
BH45	01/25/18	4954.89	22.30	16.50	ND	ND	4938.39
BH45	04/19/18	4954.89	22.35	16.55	ND	ND	4938.34
BH45	07/19/18	4954.89	22.27	16.51	ND	ND	4938.38
BH46	01/24/17	4955.31	22.25	15.64	ND	ND	4939.67
BH46	04/05/17	4955.31	22.30	15.64	ND	ND	4939.67
BH46 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH46	10/30/17	4955.32	22.27	15.24	ND	ND	4940.08
BH46	01/25/18	4955.32	22.34	15.23	ND	ND	4940.09

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH46	04/19/18	4955.32	22.38	15.42	ND	ND	4939.90
BH46	07/19/18	4955.32	22.30	15.29	ND	ND	4940.03
BH47	01/24/17	4954.60	22.25	18.91	ND	ND	4935.69
BH47	04/05/17	4954.60	22.31	18.51	ND	ND	4936.09
BH47 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH47	10/30/17	4954.63	22.31	17.90	ND	ND	4936.73
BH47	01/25/18	4954.63	22.39	17.85	ND	ND	4936.78
BH47	04/19/18	4954.63	22.40	17.86	ND	ND	4936.77
BH47	07/19/18	4954.63	22.35	17.79	ND	ND	4936.84
BH48	01/24/17	4954.71	22.30	18.58	ND	ND	4936.13
BH48	04/05/17	4954.71	22.36	18.54	ND	ND	4936.17
BH48 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH48	10/30/17	4954.72	22.35	17.97	ND	ND	4936.75
BH48	01/25/18	4954.72	22.42	17.86	ND	ND	4936.86
BH48	04/19/18	4954.72	22.43	18.87	ND	ND	4935.85
BH48	07/19/18	4954.72	22.34	17.79	ND	ND	4936.93
BH49	01/24/17	4954.51	22.22	18.39	ND	ND	4936.12
BH49	04/05/17	4954.51	22.29	18.23	ND	ND	4936.28
BH49 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH49	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH49R	10/30/17	4954.53	25.93	17.48	ND	ND	4937.05
BH49R	01/25/18	4954.53	26.03	17.26	ND	ND	4937.27
BH49R	04/19/18	4954.53	25.43	18.67	ND	ND	4935.86
BH49R	07/19/18	4954.53	25.45	17.31	ND	ND	4937.22
BH50	01/24/17	4955.18	22.26	16.87	ND	ND	4938.31
BH50	04/05/17	4955.18	22.40	16.68	ND	ND	4938.50
BH50 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH50	10/30/17	4955.18	22.27	16.06	ND	ND	4939.12
BH50	01/25/18	4955.18	22.49	16.05	ND	ND	4939.13
BH50	04/19/18	4955.18	22.55	16.17	ND	ND	4939.01
BH50	07/19/18	4955.18	22.26	16.67	ND	ND	4938.51
BH51	01/24/17	4955.85	22.10	19.59	ND	ND	4936.26
BH51	04/05/17	4955.85	22.17	19.26	ND	ND	4936.59
BH51 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH51	10/30/17	4955.87	22.16	18.43	ND	ND	4937.44
BH51	01/25/18	4955.87	22.20	18.27	ND	ND	4937.60
BH51	04/19/18	4955.87	22.35	15.40	ND	ND	4940.47
BH51	07/19/18	4955.87	22.30	18.27	ND	ND	4937.60
BH52	01/24/17	4955.46	22.31	19.45	ND	ND	4936.01
BH52	04/05/17	4955.46	22.36	17.34	ND	ND	4938.12
BH52 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH52	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH52R	10/30/17	4954.68	29.59	16.46	ND	ND	4938.22
BH52R	01/25/18	4954.68	29.65	15.22	ND	ND	4939.46
BH52R	04/19/18	4954.68	29.69	15.42	ND	ND	4939.26
BH52R	07/19/18	4954.68	29.64	15.28	ND	ND	4939.40
BH53 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH53	07/27/17	Broken Casing - Monitoring Well Destroyed					

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH53R	10/30/17	4956.07	33.21	20.83	ND	ND	4935.24
BH53R	01/25/18	4956.07	33.18	20.60	ND	ND	4935.47
BH53R	04/19/18	4956.07	31.77	20.83	ND	ND	4935.24
BH53R	07/19/18	4956.07	31.66	20.45	ND	ND	4935.62
BH54 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	DRY
BH54	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH54R	10/30/17	4957.29	32.62	22.13	ND	ND	4935.16
BH54R	01/25/18	4957.29	32.53	21.21	ND	ND	4936.08
BH54R	04/20/18	Unable to Gauge - Well Obstruction					
BH54R	07/19/18	4957.29	31.91	21.58	ND	ND	4935.71
BH55 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH55	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH55R	10/30/17	4957.03	36.46	20.82	ND	ND	4936.21
BH55R	01/25/18	4957.03	36.55	20.46	ND	ND	4936.57
BH55R	04/19/18	4957.03	35.20	22.06	ND	ND	4934.97
BH55R	07/19/18	4957.03	35.10	20.36	ND	ND	4936.67

Notes:

ft. = Feet

AMSL = Above mean sea level

BTOC = Below top of casing

LNAPL = Light non-aqueous phase liquid

ND = No LNAPL detected

NM = Not measured

NS = Not surveyed

Monitoring wells MW-01 through MW-06 were destroyed during site excavations

* Groundwater elevation was corrected for product thickness (when present) using the following calculation:

Groundwater elevation=(TOC Elevation-Measured Depth to Water)+(LNAPL Thickness in WellxLNAPL Relative Density)

LNAPL relative density was assumed to be approximately 0.75

1. Sheen present on groundwater.

2. Cattle damaged monitoring well prior to the 3Q2017 sampling event, resulting in lost casing elevation.

TABLE 3
REMEDIATION SYSTEM AIR EMISSION DATA SUMMARY
NOBLE ENERGY, INC. CHESNUT G22-3,4 HISTORIC RELEASE



Soil Vapor Extraction															
Date	SVE Runtime Meter Reading	Period Incremental Operating Hours	Total Hours In Operating Period	Period Runtime Factor (%)	Effluent Temp (°F)	Sys Vacuum (inches of WC)	Effluent OVC (ppm)	Effluent Concentration (ug/m3)	Air Flow Rate (cfm)	Grams/cubic feet	grams/minute	Mass Extracted (lbs)		Incremental Mass Removed (lbs)	Cumulative Mass Removed (lbs)
												lbs/hour	lbs total		
06/08/16	17,846.6	0.0	0	1.00	0.0	0.0	0.0	0	0	0.00000	0.00	0.000	0.0	0.0	0.0
07/19/16	17,992.0	145.4	984	15%	195.0	75.0	0.0	0	125	0.00000	0.00	0.000	0.0	0.0	0.0
08/26/16	18,605.5	613.5	912	67%	200.0	95.0	0.0	27,500	110	0.00078	0.09	0.011	6.9	6.9	6.9
09/29/16	19,336.1	730.6	816	90%	200.0	95.0	0.0	5,190	100	0.00015	0.01	0.002	1.4	1.4	8.4
10/31/16	19,864.8	528.7	768	69%	200.0	85.0	0.0	0	110	0.00000	0.00	0.000	0.0	0.0	8.4
11/29/16	20,560.0	695.2	696	100%	92.0	103.0	0.1	0	100	0.00000	0.00	0.000	0.0	0.0	8.4
12/02/16	20,632.0	72.0	72	100%	92.0	103.0	0.1	0	100	0.00000	0.00	0.000	0.0	0.0	8.4
12/09/16	Noble Energy permanently shut-in the tank battery on 12/9/16. As a result, the remediation system did not operate. The remediation system was restarted on 3/17/17.														
03/17/17	20,560.0	0.0	0	0%	92.0	103.0	0.1	0	100	0.00000	0.00	0.000	0.0	0.0	8.4
03/20/17	20,721.9	161.9	0	0%	92.0	103.0	0.1	0	100	0.00000	0.00	0.000	0.0	0.0	8.4
04/28/17	20,862.8	140.9	936	15%	75.0	90.0	32.9	159,000	105	0.00450	0.47	0.062	8.8	8.8	17.2
05/31/17	21,658.1	795.3	792	100%	200.0	94.0	1.6	3,240	100	0.00009	0.01	0.001	1.0	1.0	18.1
06/30/17	22,138.6	480.5	720	67%	200.0	85.0	0.0	2,590	110	0.00007	0.01	0.001	0.5	0.5	18.7
07/26/17	22,501.3	362.7	624	58%	95.0	85.0	0.6	1,850	115	0.00005	0.01	0.001	0.3	0.3	18.9
09/29/17	22,965.9	464.6	1,560	30%	125.0	88.0	1.7	0	105	0.00000	0.00	0.000	0.0	0.0	18.9
10/24/17	23,511.2	545.3	600	91%	95.0	110.0	1.2	3,280	100	0.00009	0.01	0.001	0.7	0.7	19.6
11/17/17	23,719.6	208.4	576	36%	100.0	113.0	1.1	5,760	89	0.00016	0.01	0.002	0.4	0.4	20.0
12/12/17	24,247.9	528.3	600	88%	105.0	100.0	0.1	13,400	100	0.00038	0.04	0.005	2.7	2.7	22.7
01/25/18	25,062.0	814.1	1,056	77%	50.0	44.0	0.0	2,410	140	0.00007	0.01	0.001	1.0	1.0	23.7
02/22/18	25,489.7	427.7	672	64%	30.0	35.2	3.8	159,000	130	0.00450	0.59	0.077	33.1	33.1	56.8
03/30/18	25,564.0	74.3	864	9%	55.0	44.0	36.7	38,700	140	0.00110	0.15	0.020	1.5	1.5	58.3
04/19/18	26,048.9	484.9	480	101%	75.0	40.00	20.3	200,000	135	0.00566	0.76	0.101	49.0	49.0	107.3
05/29/18	26,487.6	438.7	960	46%	100.0	55.00	13.2	5,090	125	0.00014	0.02	0.002	1.0	1.0	108.3
07/25/18	26,897.9	410.3	1,368	30%	77.3	52.00	0.0	25,600	99	0.00073	0.07	0.009	3.9	3.9	112.2
08/13/18	27,356.0	458.1	456	100%	215.0	45.00	0.0	2,820	130	0.00008	0.01	0.001	0.6	0.6	112.9
<div>Notes:</div> <div> <div>HC: Hydrocarbon</div> <div>OVC: Organic Vapor Concentration</div> <div>WC: Water Column</div> <div>° F : degrees fahrenheit</div> <div>ppm: parts per million</div> <div>cfm: cubic feet per minute</div> <div>Effluent concentration is based on total petroleum hydrocarbons - gasoline range organics</div> <div> <div></div> <div>No remediation system air emission laboratory analytical sample was collected on this date. Analytical data and mass extracted calculations from the previous sample date are used for this date.</div> </div> </div>															

Total Pounds Emitted Since Startup	112.9
Total Tons Emitted Since Startup	0.056
Total Pounds Emitted in 2018	90.2
Total Tons Emitted in 2018	0.045

FIGURES

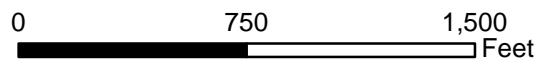
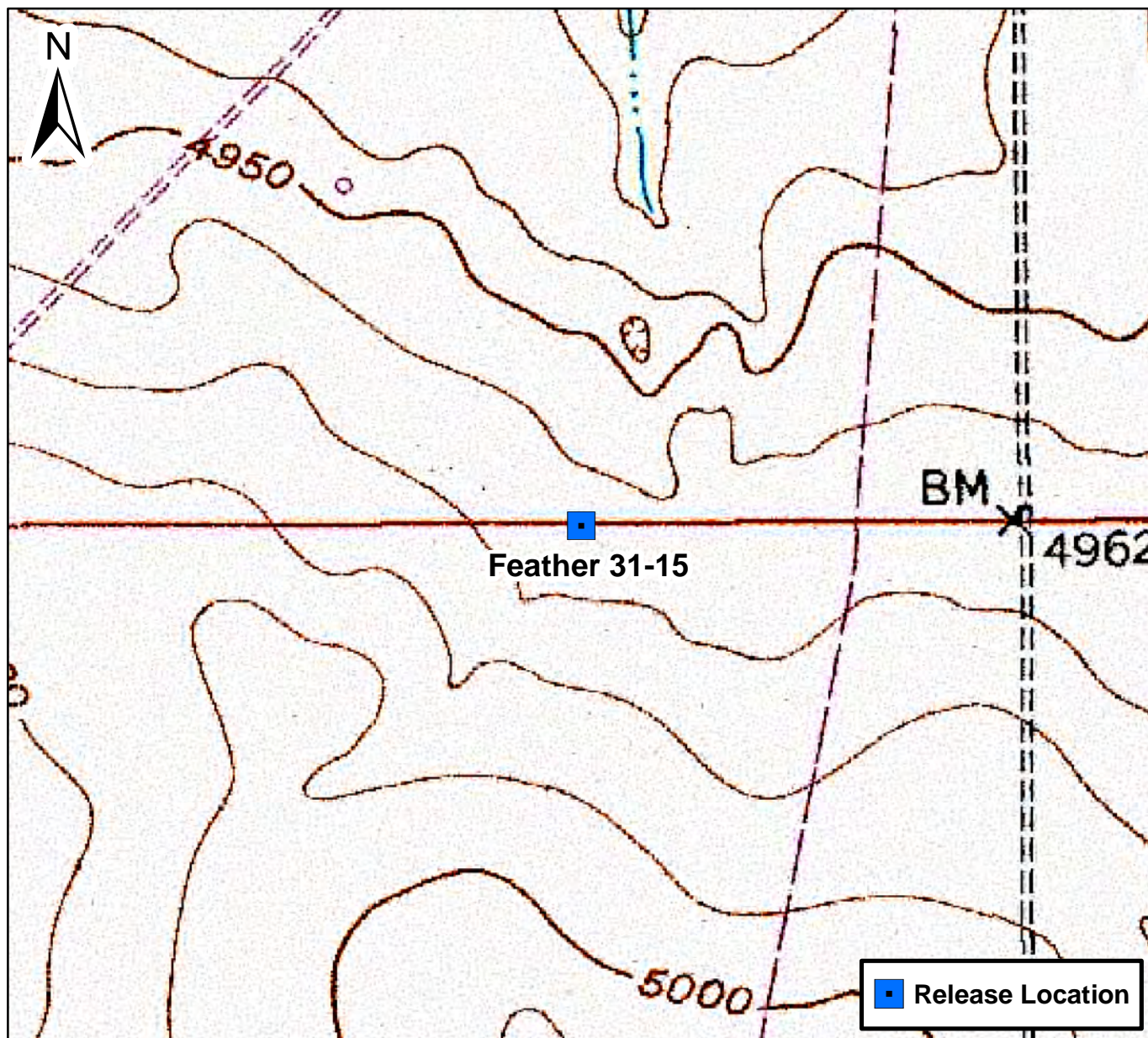
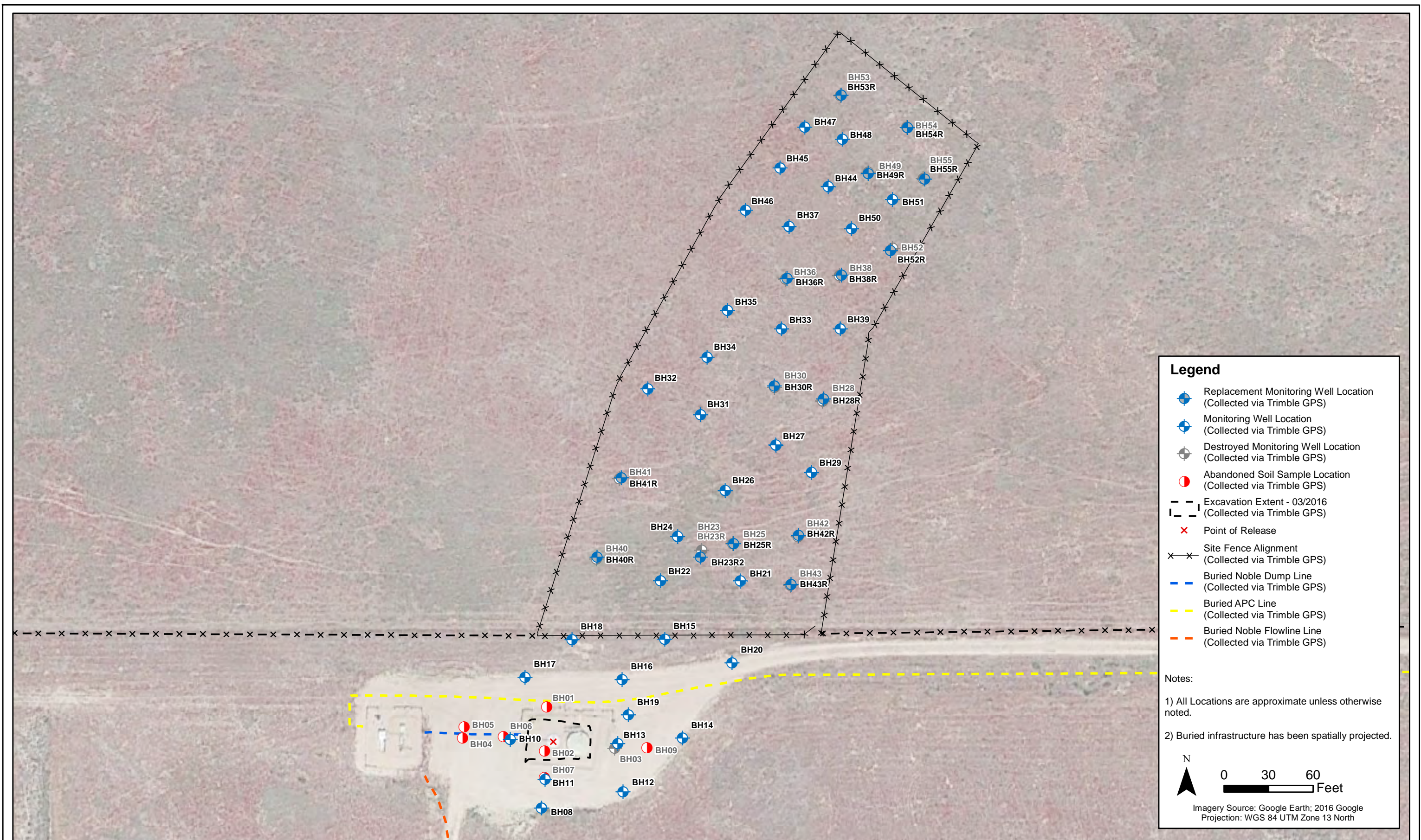


Figure 1

Site Location Map
Feather 31-15 Produced Water Tank Release
NWNE S15 T2N R64W
Weld County, Colorado





DATE:	August 2018
DESIGNED BY:	B.Bruns
DRAWN BY:	D. Arnold

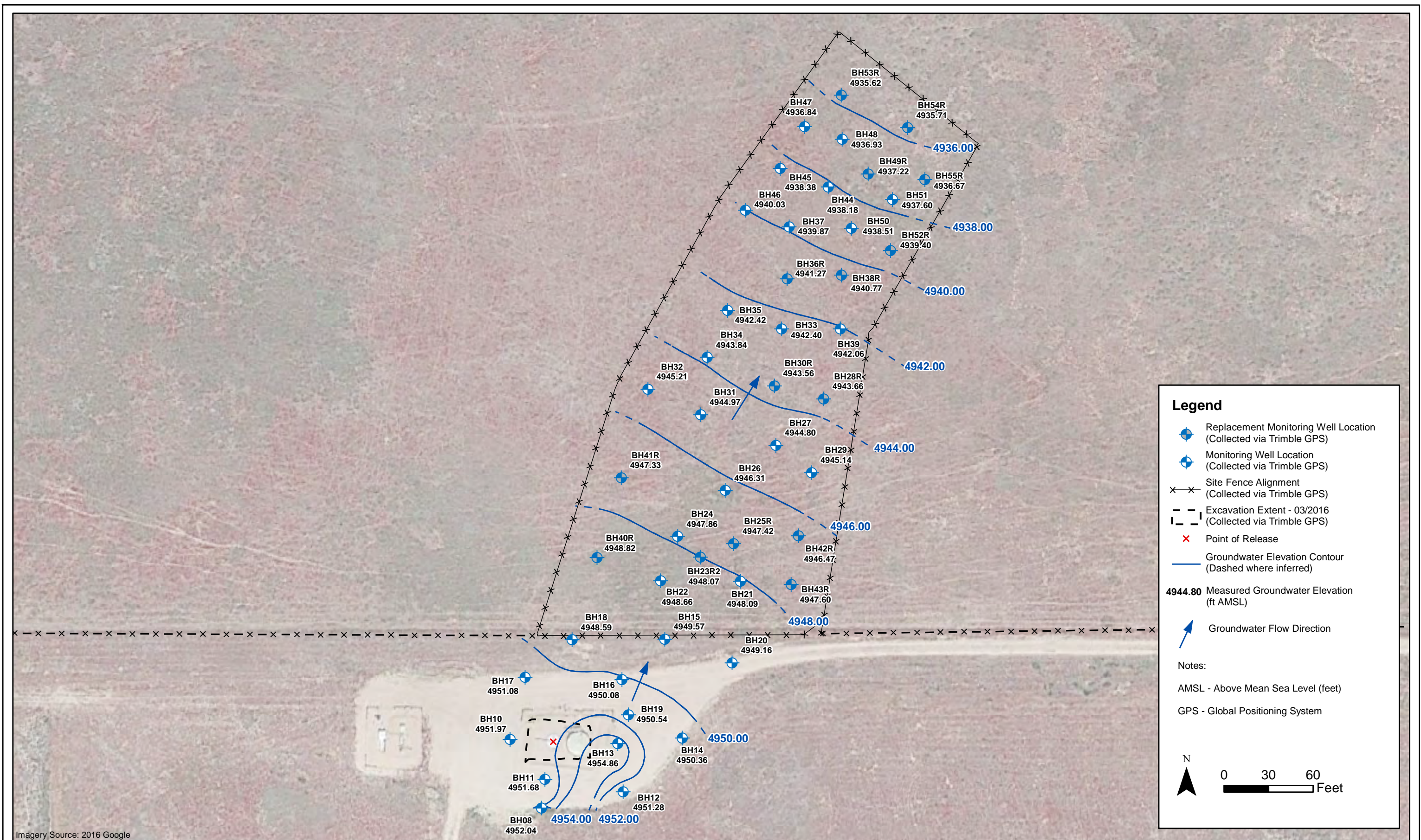


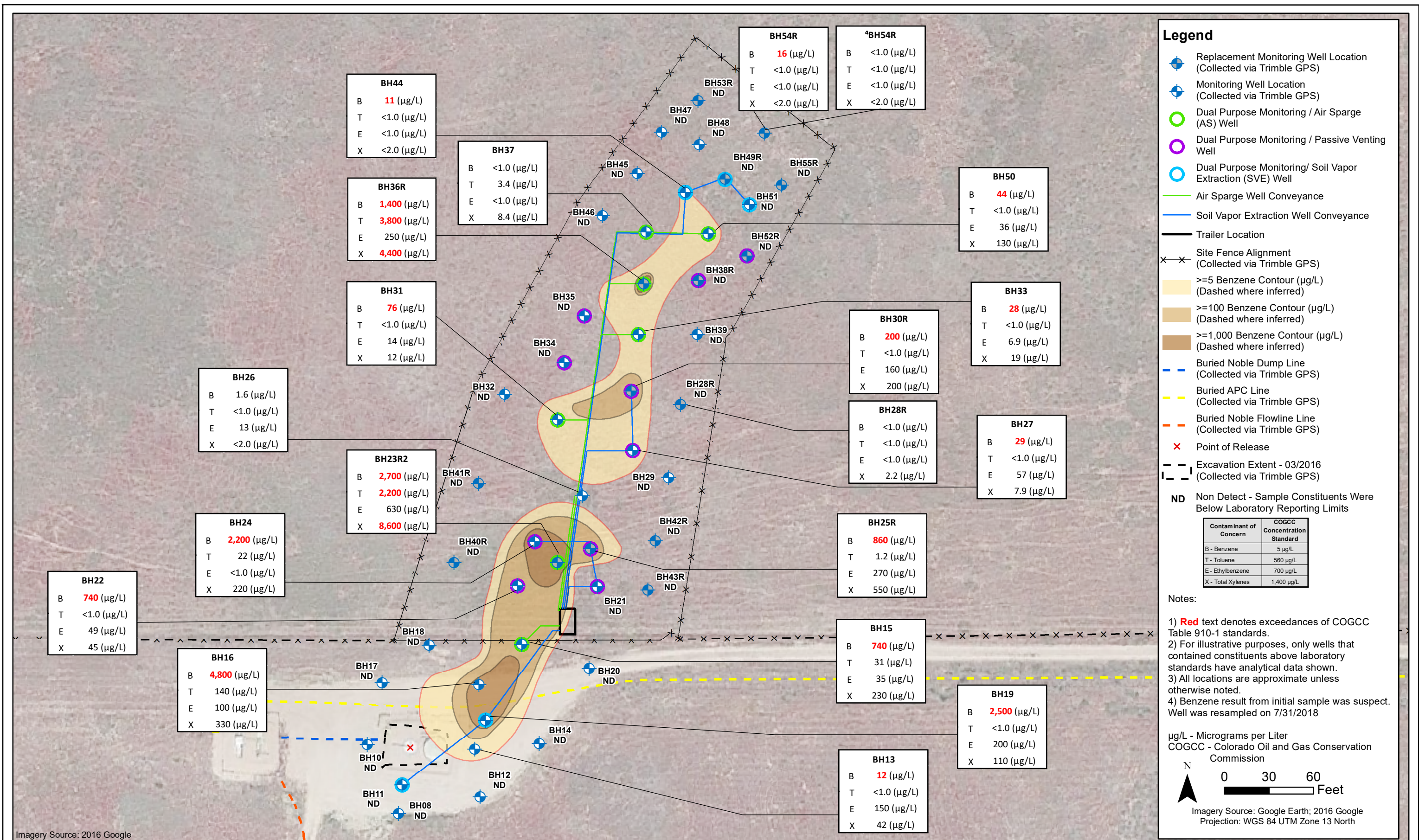
Tasman Geosciences, Inc.
6899 Pecos Street - Unit C
Denver, CO 80221

Noble Energy - DJ Basin
Feather 31-15 Produced Water Tank Release
NWNE Section 15, Township 2 North, Range 64 West
Weld County, Colorado

Site Overview
Map

Figure
2





ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORTS

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 25, 2018

Brandon Bruns
Tasman Geosciences
6899 Pecos St, Unit C
Denver, CO 80221
RE: Noble - Feather 31-15

Enclosed are the results of analyses for samples received by Summit Scientific on 07/19/18 18:18. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH08	1807257-01	Water	07/19/18 10:48	07/19/18 18:18
BH10	1807257-02	Water	07/19/18 13:18	07/19/18 18:18
BH11	1807257-03	Water	07/19/18 13:15	07/19/18 18:18
BH12	1807257-04	Water	07/19/18 13:24	07/19/18 18:18
BH13	1807257-05	Water	07/19/18 13:33	07/19/18 18:18
BH14	1807257-06	Water	07/19/18 13:30	07/19/18 18:18
BH15	1807257-07	Water	07/19/18 13:10	07/19/18 18:18
BH16	1807257-08	Water	07/19/18 13:30	07/19/18 18:18
BH17	1807257-09	Water	07/19/18 13:28	07/19/18 18:18
BH18	1807257-10	Water	07/19/18 13:20	07/19/18 18:18
BH19	1807257-11	Water	07/19/18 13:40	07/19/18 18:18
BH20	1807257-12	Water	07/19/18 13:02	07/19/18 18:18
BH21	1807257-13	Water	07/19/18 11:40	07/19/18 18:18
BH22	1807257-14	Water	07/19/18 11:45	07/19/18 18:18
BH23R2	1807257-15	Water	07/19/18 11:55	07/19/18 18:18
BH24	1807257-16	Water	07/19/18 12:15	07/19/18 18:18
BH25R	1807257-17	Water	07/19/18 11:58	07/19/18 18:18
BH26	1807257-18	Water	07/19/18 12:12	07/19/18 18:18
BH27	1807257-19	Water	07/19/18 13:00	07/19/18 18:18
BH28R	1807257-20	Water	07/19/18 11:34	07/19/18 18:18
BH29	1807257-21	Water	07/19/18 12:42	07/19/18 18:18
BH30R	1807257-22	Water	07/19/18 11:54	07/19/18 18:18
BH31	1807257-23	Water	07/19/18 12:40	07/19/18 18:18
BH32	1807257-24	Water	07/19/18 12:10	07/19/18 18:18
BH33	1807257-25	Water	07/19/18 12:05	07/19/18 18:18
BH34	1807257-26	Water	07/19/18 11:00	07/19/18 18:18
BH35	1807257-27	Water	07/19/18 10:10	07/19/18 18:18

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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH36R	1807257-28	Water	07/19/18 11:50	07/19/18 18:18
BH37	1807257-29	Water	07/19/18 11:30	07/19/18 18:18
BH38R	1807257-30	Water	07/19/18 10:30	07/19/18 18:18
BH39	1807257-31	Water	07/19/18 10:48	07/19/18 18:18
BH40R	1807257-32	Water	07/19/18 11:30	07/19/18 18:18
BH41R	1807257-33	Water	07/19/18 12:45	07/19/18 18:18
BH42R	1807257-34	Water	07/19/18 12:54	07/19/18 18:18
BH43R	1807257-35	Water	07/19/18 12:46	07/19/18 18:18
BH44	1807257-36	Water	07/19/18 10:15	07/19/18 18:18
BH45	1807257-37	Water	07/19/18 10:00	07/19/18 18:18
BH46	1807257-38	Water	07/19/18 10:30	07/19/18 18:18
BH47	1807257-39	Water	07/19/18 10:00	07/19/18 18:18
BH48	1807257-40	Water	07/19/18 09:36	07/19/18 18:18
BH49R	1807257-41	Water	07/19/18 09:25	07/19/18 18:18
BH50	1807257-42	Water	07/19/18 11:15	07/19/18 18:18
BH51	1807257-43	Water	07/19/18 09:30	07/19/18 18:18
BH52R	1807257-44	Water	07/19/18 09:41	07/19/18 18:18
BH53R	1807257-45	Water	07/19/18 09:00	07/19/18 18:18
BH54R	1807257-46	Water	07/19/18 09:02	07/19/18 18:18
BH55R	1807257-47	Water	07/19/18 09:20	07/19/18 18:18

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.

303-277-9310 ♦ 303-374-5933 Fax

Client: Noble / TASMAN

Project Manager:

E-Mail:

Project Name: Feather 31-15

Project Number:

www.s2scientific.com

1807257.3

303-277-9310 ♦ 303-374-5933 Fax

Page 3 of 5

Project Number:

www.s2scientific.com

Summit Scientific

Page 4 of 5

Project Manager: _____
E-Mail: _____
Project Name: *Feather 31-15* _____
Project Number: _____

www.s2scientific.com

Summit Scientific

741 Corporate Circle Suite I ♦ Golden, Colorado 80401

303-277-9310 ♦ 303-374-5933 Fax

Page 5 of 5Client: Noble/TASMAN

Address: _____

City/State/Zip: _____

Phone: _____ Fax: _____

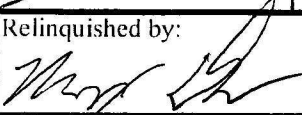
Sampler Name: _____

Project Manager: _____

E-Mail: _____

Project Name: Feather 31-15

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)	BTEX															
BH49R	7/19/18	925	3	X				X				X															
BH50		1115		X																							
BH51		930																									
BH52R		0941																									
BH53R		0900																									
BH54R		0902																									
BH55R		0920																									
Relinquished by: 				Date/Time: 7/19/18				Received by: _____				Date/Time: _____				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"/>											
Relinquished by: _____				Date/Time: _____				Received in Lab by: _____				Date/Time: _____				Sample Integrity: Temperature Upon Receipt: _____ Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>											

1807257.1

Page 1 of 5

Project Number: —

www.s2scientific.com

Sample Receipt Checklist

S2 Work Order 1807257

Client: Noble/Tusman Client Project ID: Feather 31-15

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

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

Temp (°C)	4.2
-----------	-----

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.	X			
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
If custody seals are present, are they intact ⁽¹⁾ ?			X	
Are samples with holding times due within 48 hours sample due within 48 hours present?			X	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	X			missing time
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?		X		missing time
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?	X			HCl, HNO ₃
Note the type of preservative in the Comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , ect				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			X	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			X	
Additional Comments (if any):				

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

AT
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

7/19/18 18:18
Date/Time



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH08
1807257-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.8 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH10
1807257-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.1 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH11
1807257-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.4 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH12
1807257-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.5 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH13
1807257-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	12	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	150	1.0	"	"	"	"	"	"	
Xylenes (total)	42	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.3 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH14
1807257-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.2 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH15
1807257-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	740	10	ug/l	10	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	31	1.0	"	1	"	"	"	"	
Ethylbenzene	35	1.0	"	"	"	"	"	"	
Xylenes (total)	230	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		111 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		93.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH16
1807257-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	4800	100	ug/l	100	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	140	1.0	"	1	"	"	"	"	
Ethylbenzene	100	1.0	"	"	"	"	"	"	
Xylenes (total)	330	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		120 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		97.6 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH17
1807257-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.0 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH18
1807257-10 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

BH19
1807257-11 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	2500	100	ug/l	100	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	200	1.0	"	"	"	"	"	"	
Xylenes (total)	110	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		123 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.4 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH20
1807257-12 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH21
1807257-13 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH22
1807257-14 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	740	10	ug/l	10	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	49	1.0	"	"	"	"	"	"	
Xylenes (total)	45	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		122 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.7 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH23R2
1807257-15 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	2700	100	ug/l	100	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	2200	100	"	"	"	"	"	"	
Ethylbenzene	630	100	"	"	"	"	"	"	
Xylenes (total)	8600	200	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		112 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		114 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.1 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH24
1807257-16 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	2200	10	ug/l	10	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	22	1.0	"	1	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	220	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.1 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH25R
1807257-17 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	860	10	ug/l	10	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	1.2	1.0	"	1	"	"	"	"	
Ethylbenzene	270	10	"	10	"	"	"	"	
Xylenes (total)	550	20	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		109 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.6 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		94.4 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

BH26
1807257-18 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.6	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	13	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.3 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

BH27
1807257-19 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	29	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	57	1.0	"	"	"	"	"	"	
Xylenes (total)	7.9	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH28R
1807257-20 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807258	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	2.2	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH29
1807257-21 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH30R
1807257-22 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	200	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	160	1.0	"	"	"	"	"	"	
Xylenes (total)	200	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH31
1807257-23 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	76	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	14	1.0	"	"	"	"	"	"	
Xylenes (total)	12	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.4 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH32
1807257-24 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH33
1807257-25 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	28	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	6.9	1.0	"	"	"	"	"	"	
Xylenes (total)	19	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

BH34
1807257-26 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

BH35
1807257-27 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

BH36R
1807257-28 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1400	100	ug/l	100	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	3800	100	"	"	"	"	"	"	
Ethylbenzene	250	100	"	"	"	"	"	"	
Xylenes (total)	4400	200	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		112 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		107 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH37
1807257-29 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	3.4	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	8.4	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH38R
1807257-30 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH39
1807257-31 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH40R
1807257-32 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH41R
1807257-33 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH42R
1807257-34 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH43R
1807257-35 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 12:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 12:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH44
1807257-36 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	11	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.2 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH45
1807257-37 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH46
1807257-38 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH47
1807257-39 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

BH48
1807257-40 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:36**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807259	07/20/18	07/22/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:36**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH49R
1807257-41 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807245	07/20/18	07/21/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH50
1807257-42 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	44	1.0	ug/l	1	1807245	07/20/18	07/21/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	36	1.0	"	"	"	"	"	"	
Xylenes (total)	130	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.0 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH51
1807257-43 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807245	07/20/18	07/21/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH52R
1807257-44 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807245	07/20/18	07/21/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.9 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH53R
1807257-45 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807245	07/20/18	07/21/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.0 %	21-167		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH54R
1807257-46 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	16	1.0	ug/l	1	1807245	07/20/18	07/21/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.9 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

BH55R
1807257-47 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1807245	07/20/18	07/21/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.5 %	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 - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

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 1807245 - EPA 5030 Water MS

Blank (1807245-BLK1)

Prepared: 07/20/18 Analyzed: 07/21/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.1		"	13.2		99.5	23-173			
Surrogate: Toluene-d8	12.2		"	13.3		91.8	20-170			
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		94.1	21-167			

LCS (1807245-BS1)

Prepared: 07/20/18 Analyzed: 07/21/18

Benzene	33.7	1.0	ug/l	33.3		101	70-130			
Toluene	34.0	1.0	"	33.3		102	70-130			
Ethylbenzene	37.3	1.0	"	33.3		112	70-130			
m,p-Xylene	68.6	2.0	"	66.7		103	70-130			
o-Xylene	32.1	1.0	"	33.3		96.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.5		"	13.2		102	23-173			
Surrogate: Toluene-d8	13.0		"	13.3		97.9	20-170			
Surrogate: 4-Bromofluorobenzene	12.0		"	13.3		90.4	21-167			

Matrix Spike (1807245-MS1)

Source: 1807257-41

Prepared: 07/20/18 Analyzed: 07/21/18

Benzene	32.8	1.0	ug/l	33.3	ND	98.4	70-130			
Toluene	33.9	1.0	"	33.3	ND	102	70-130			
Ethylbenzene	35.8	1.0	"	33.3	ND	107	70-130			
m,p-Xylene	65.4	2.0	"	66.7	ND	98.1	70-130			
o-Xylene	31.5	1.0	"	33.3	ND	94.4	70-130			
Surrogate: 1,2-Dichloroethane-d4	14.0		"	13.2		106	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	12.7		"	13.3		95.3	21-167			

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/25/18 06:35

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 1807245 - EPA 5030 Water MS

Matrix Spike Dup (1807245-MSD1)				Source: 1807257-41		Prepared: 07/20/18		Analyzed: 07/21/18		
Benzene	34.8	1.0	ug/l	33.3	ND	104	70-130	5.86	30	
Toluene	35.8	1.0	"	33.3	ND	107	70-130	5.34	30	
Ethylbenzene	39.2	1.0	"	33.3	ND	118	70-130	9.15	30	
m,p-Xylene	71.0	2.0	"	66.7	ND	106	70-130	8.18	30	
o-Xylene	34.3	1.0	"	33.3	ND	103	70-130	8.52	30	
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		107	23-173			
Surrogate: Toluene-d8	13.4		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	12.4		"	13.3		93.1	21-167			

Batch 1807258 - EPA 5030 Water MS

Blank (1807258-BLK1)				Prepared: 07/20/18		Analyzed: 07/22/18				
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.9		"	13.2		105	23-173			
Surrogate: Toluene-d8	12.8		"	13.3		96.3	20-170			
Surrogate: 4-Bromofluorobenzene	12.2		"	13.3		91.4	21-167			
LCS (1807258-BS1)				Prepared: 07/20/18		Analyzed: 07/22/18				
Benzene	30.9	1.0	ug/l	33.3		92.6	70-130			
Toluene	31.4	1.0	"	33.3		94.1	70-130			
Ethylbenzene	34.3	1.0	"	33.3		103	70-130			
m,p-Xylene	63.1	2.0	"	66.7		94.6	70-130			
o-Xylene	29.9	1.0	"	33.3		89.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	14.3		"	13.2		109	23-173			
Surrogate: Toluene-d8	13.1		"	13.3		98.2	20-170			
Surrogate: 4-Bromofluorobenzene	12.7		"	13.3		95.1	21-167			

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

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 1807258 - EPA 5030 Water MS

Matrix Spike (1807258-MS1)				Source: 1807257-01		Prepared: 07/20/18		Analyzed: 07/22/18		
Benzene	33.1	1.0	ug/l	33.3	ND	99.4	70-130			
Toluene	32.9	1.0	"	33.3	ND	98.7	70-130			
Ethylbenzene	36.8	1.0	"	33.3	ND	110	70-130			
m,p-Xylene	67.5	2.0	"	66.7	ND	101	70-130			
o-Xylene	32.1	1.0	"	33.3	ND	96.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	14.2		"	13.2		107	23-173			
Surrogate: Toluene-d8	13.0		"	13.3		97.1	20-170			
Surrogate: 4-Bromofluorobenzene	12.4		"	13.3		92.9	21-167			

Matrix Spike Dup (1807258-MSD1)				Source: 1807257-01		Prepared: 07/20/18		Analyzed: 07/22/18		
Benzene	36.1	1.0	ug/l	33.3	ND	108	70-130	8.66	30	
Toluene	36.2	1.0	"	33.3	ND	109	70-130	9.58	30	
Ethylbenzene	40.6	1.0	"	33.3	ND	122	70-130	9.85	30	
m,p-Xylene	74.1	2.0	"	66.7	ND	111	70-130	9.28	30	
o-Xylene	34.8	1.0	"	33.3	ND	104	70-130	7.99	30	
Surrogate: 1,2-Dichloroethane-d4	14.2		"	13.2		108	23-173			
Surrogate: Toluene-d8	13.1		"	13.3		98.0	20-170			
Surrogate: 4-Bromofluorobenzene	12.8		"	13.3		95.9	21-167			

Batch 1807259 - EPA 5030 Water MS

Blank (1807259-BLK1)				Prepared: 07/20/18		Analyzed: 07/22/18				
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.2		98.4	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	13.5		"	13.3		101	21-167			

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

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 1807259 - EPA 5030 Water MS

LCS (1807259-BS1)

Prepared: 07/20/18 Analyzed: 07/22/18

Benzene	33.3	1.0	ug/l	33.3		99.9	70-130			
Toluene	32.6	1.0	"	33.3		97.8	70-130			
Ethylbenzene	37.6	1.0	"	33.3		113	70-130			
m,p-Xylene	64.7	2.0	"	66.7		97.1	70-130			
o-Xylene	32.5	1.0	"	33.3		97.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		101	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	14.0		"	13.3		105	21-167			

Matrix Spike (1807259-MS1)

Source: 1807257-21

Prepared: 07/20/18 Analyzed: 07/22/18

Benzene	34.1	1.0	ug/l	33.3	ND	102	70-130			
Toluene	33.5	1.0	"	33.3	ND	101	70-130			
Ethylbenzene	39.0	1.0	"	33.3	ND	117	70-130			
m,p-Xylene	66.4	2.0	"	66.7	ND	99.6	70-130			
o-Xylene	32.7	1.0	"	33.3	ND	98.1	70-130			
Surrogate: 1,2-Dichloroethane-d4	12.7		"	13.2		96.5	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	21-167			

Matrix Spike Dup (1807259-MSD1)

Source: 1807257-21

Prepared: 07/20/18 Analyzed: 07/22/18

Benzene	33.0	1.0	ug/l	33.3	ND	99.2	70-130	3.19	30	
Toluene	31.8	1.0	"	33.3	ND	95.6	70-130	5.11	30	
Ethylbenzene	37.6	1.0	"	33.3	ND	113	70-130	3.78	30	
m,p-Xylene	64.2	2.0	"	66.7	ND	96.3	70-130	3.35	30	
o-Xylene	32.4	1.0	"	33.3	ND	97.1	70-130	0.984	30	
Surrogate: 1,2-Dichloroethane-d4	13.9		"	13.2		105	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		100	20-170			
Surrogate: 4-Bromofluorobenzene	14.2		"	13.3		106	21-167			

Summit Scientific

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/25/18 06:35

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

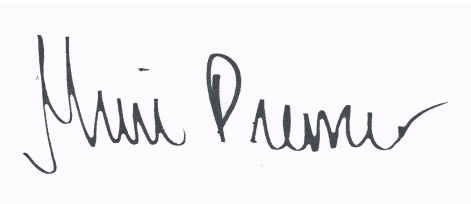
303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 03, 2018

Brandon Bruns
Tasman Geosciences
6899 Pecos St, Unit C
Denver, CO 80221
RE: Noble - Feather 31-15

Enclosed are the results of analyses for samples received by Summit Scientific on 07/30/18 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", is displayed on a light purple rectangular background.

Muri Premier For Ben Shrewsbury
Laboratory Manager



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/03/18 18:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH54R	1807391-01	Water	07/30/18 10:15	07/30/18 17:00

Summit Scientific

A handwritten signature in black ink, appearing to read "John Palmer", is written over a light purple rectangular background.

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1807391

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

Project Manager:	Brandon Bruns, Invoice: Jacob Evans
E-Mail:	Bbruns@tasman-geo.com
Project Name:	Feather 31-1S FEATHER 31-1S
Project Number:	N/A

				Preservative				Matrix			Analyze For:																										
Sample Description	Date Sampled	Time Sampled	Number of Containers	HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR			Special Instructions																			
B754R	7/30/18	1015	3			X		X				X																									
Relinquished by: 				Date/Time: 17:00 7/30/18				Received by: 7-30-18				Date/Time: 17:00				Turn Around Time (Check) Same Day <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 72 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/>				Notes:																	
Relinquished by:				Date/Time:				Received by:				Date/Time:				Sample Integrity: Temperature Upon Receipt: 1.0 Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																					
Relinquished by:				Date/Time:				Received in Lab by:				Date/Time:																									

1807391

Sample Receipt Checklist

S2 Work Order _____

Client: NOBLE ITASMAN Client Project ID: FEATHER 31-15Shipped Via: P.U. Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)Matrix (check all that apply): Air Soil/Solid X Water Other: _____
(Describe)

Temp (°C)	1.0
-----------	-----

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

Muri
Custodian Printed Name or Initials

MA 7-31-18
Signature of Custodian

17:36
Date/Time



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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/03/18 18:13

BH54R
1807391-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/30/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1808003	08/01/18	08/02/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **07/30/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.8 %	21-167		"	"	"	"	

Summit Scientific

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6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/03/18 18:13

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 1808003 - EPA 5030 Water MS

Blank (1808003-BLK1)

Prepared & Analyzed: 08/01/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		101	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		99.7	20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	21-167			

LCS (1808003-BS1)

Prepared & Analyzed: 08/01/18

Benzene	34.9	1.0	ug/l	33.3		105	70-130			
Toluene	36.0	1.0	"	33.3		108	70-130			
Ethylbenzene	38.6	1.0	"	33.3		116	70-130			
m,p-Xylene	63.1	2.0	"	66.7		94.6	70-130			
o-Xylene	35.0	1.0	"	33.3		105	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.2		100	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		98.8	20-170			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.7	21-167			

Matrix Spike (1808003-MS1)

Source: 1807384-01

Prepared & Analyzed: 08/01/18

Benzene	34.7	1.0	ug/l	33.3	1.28	100	70-130			
Toluene	33.3	1.0	"	33.3	ND	99.9	70-130			
Ethylbenzene	37.4	1.0	"	33.3	ND	112	70-130			
m,p-Xylene	67.2	2.0	"	66.7	ND	101	70-130			
o-Xylene	32.6	1.0	"	33.3	ND	97.9	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.5		"	13.2		102	23-173			
Surrogate: Toluene-d8	13.0		"	13.3		97.2	20-170			
Surrogate: 4-Bromofluorobenzene	12.2		"	13.3		91.9	21-167			

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6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/03/18 18:13

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 1808003 - EPA 5030 Water MS

Matrix Spike Dup (1808003-MSD1)	Source: 1807384-01			Prepared & Analyzed: 08/01/18						
Benzene	31.6	1.0	ug/l	33.3	1.28	91.0	70-130	9.41	30	
Toluene	30.9	1.0	"	33.3	ND	92.6	70-130	7.51	30	
Ethylbenzene	34.4	1.0	"	33.3	ND	103	70-130	8.24	30	
m,p-Xylene	62.3	2.0	"	66.7	ND	93.4	70-130	7.54	30	
o-Xylene	30.3	1.0	"	33.3	ND	91.0	70-130	7.27	30	
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		107	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		99.7	20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.8	21-167			

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

Project: Noble - Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/03/18 18:13

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