



Received 02/09/15

REM 8392

Document 2313960

January 27, 2015

Mr. Jacob Evans
Noble Energy Inc.
1600 Broadway
Denver, CO 80202

Subject: **Fourth Quarter 2014 Site Monitoring Report &
No Further Action Request**
Betz 30-11, 30-14
API # 05-123-22861, Remediation #8392
Weld County, Colorado

Dear Mr. Evans:

Please find an enclosed copy of the above-referenced Site Monitoring Report and No Further Action Request for the Betz 30-11, 30-14 site in Weld County, Colorado. The enclosed report describes groundwater monitoring activities conducted in accordance with the conditions of approval stated in the previously submitted Form 27 (COGCC Document #2148721). Please contact me at (303) 487-1228 if you require additional information.

Tasman appreciates the opportunity to provide this service.

Sincerely,
Tasman Geosciences, LLC

A handwritten signature in blue ink, appearing to read 'Daniel Wade'.

Daniel Wade P.G.
Senior Geologist

Enclosure: Fourth Quarter 2014 Site Monitoring Report & No Further Action Request

Betz 30-11, 30-14

**FOURTH QUARTER 2014
SITE MONITORING REPORT &
NO FURTHER ACTION REQUEST**

January 27, 2015



Image: Google, ESRI

PREPARED ON BEHALF OF

Noble Energy, Inc.
1600 Broadway
Denver, CO 80202



PREPARED BY

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



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1.0 INTRODUCTION

This Fourth Quarter 2014 Site Monitoring Report and No Further Action Request (Report) presents the results of groundwater field monitoring activities performed during the fourth quarter 2014 at the Betz 30-11, 30-14 Tank Battery (Site). Field activities were performed by Tasman Geosciences, LLC (Tasman), on behalf of Noble Energy, Inc. (Noble).

Field activities described in this Report were conducted to evaluate groundwater flow and quality conditions across the Site. The data collected were used to develop the analytical summary tables and maps included herein.

1.1 Site Background

The Site is located in the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 30, Township 5 North, Range 67 West, approximately 2.8 miles northwest of the town of Johnstown, in Weld County, Colorado (Figure 1). Groundwater monitoring activities are being performed as a result of historic petroleum hydrocarbon impacts discovered beneath the produced water vault on November 22, 2013. In response to impacts observed, production equipment at the Site was shut in and the produced water vault was removed. A release was reported to the Colorado Oil and Gas Conservation Commission (COGCC) via Form 19 on November 25, 2013.

A summary of significant and/or recent environmental monitoring and remediation activities is provided below:

- On November 22, 2013 excavation activities were conducted to remove soil with petroleum hydrocarbon impacts in the vicinity of the produced water vault. The final dimensions of the excavation were 11 feet (ft.) by 12 ft. by 3.5 ft. below ground surface (bgs), as described in the Site Excavation Report dated April 9, 2014 and illustrated in Figure 2. Approximately 10 cubic yards of impacted soil were transported to the Buffalo Ridge Landfill for disposal. Clean fill was then returned to the Site.
- Four confirmation soil samples were collected and submitted for laboratory analysis for benzene, toluene, ethylbenzene, and total xylenes (collectively referred to as BTEX), naphthalene, and total petroleum hydrocarbons-gasoline range organics (TPH-GRO) using United States Environmental Protection Agency (USEPA) Method 8260, and total petroleum hydrocarbons-diesel range organics (TPH-DRO) using USEPA Method 8015. Soil sample analytical data are presented in Table 1 and illustrated in Figure 3.
- Groundwater was encountered during the excavation at a depth of approximately 3.5 ft. bgs. A laboratory sample (GW01) was collected and analyzed for BTEX using USEPA Method 8260B. The groundwater was found to have concentrations above the COGCC Table 910-1 standard for benzene and toluene. Groundwater laboratory analytical results are presented in Table 2.
- Two groundwater monitoring wells (MW-2 and MW-3) were installed at the Site on December 19, 2013, as shown in Figure 2. Soil samples from the well borings were

collected and submitted for laboratory analysis. Soil boring laboratory analytical results are presented in Table 1 and illustrated in Figure 3.

- Two additional groundwater monitoring wells (MW-1 and MW-4) were installed at the Site on January 10, 2014.
- An initial groundwater monitoring event was conducted on January 23, 2014.
- Three soil borings (SS05, SS06, and SS07) were advanced on the Site on February 17, 2014. Soil samples from the well borings were collected and submitted for laboratory analysis. Soil boring laboratory analytical results are presented in Table 1 and illustrated in Figure 3.
- The second quarter 2014 groundwater monitoring event was conducted on April 17, 2014.
- The third quarter 2014 groundwater monitoring event was conducted on July 10, 2014.
- A replacement well (MW-3R) was installed at the site on October 28, 2014 to replace destroyed monitoring well MW-3. The replacement well was installed immediately adjacent to the location of the destroyed monitoring well.
- The fourth quarter 2014 groundwater monitoring event was conducted on October 29, 2014. Groundwater sampling procedures and results are described in subsequent sections of this Report.

1.2 Site Topography, Geology, and Hydrogeology

The Site is located approximately 4,795 feet above mean sea level (amsl), and the surface topography slopes gradually to the south towards the Big Thompson River. Groundwater is encountered at approximately 2 to 4 ft. bgs and is most likely influenced by flow of the Big Thompson River.

Site investigation activities indicate that the subsurface geology immediately beneath the ground surface consists of unconsolidated, loosely bedded, alluvial sediments. The alluvium is composed of poorly sorted, medium to coarse grain sand with minor gravel.

2.0 GROUNDWATER MONITORING ACTIVITIES

Fourth quarter 2014 groundwater monitoring activities were performed at the Site on October 29, 2014. The activities included measurement of groundwater levels and collection of groundwater samples from each of the four Site monitoring wells.

2.1 Groundwater Level Measurements

Both general and significant observations from the groundwater gauging event are presented in the following sections.

General

Groundwater levels are measured (i.e. gauged) in order to evaluate hydraulic characteristics and to provide information regarding seasonal and annual fluctuations in groundwater elevation at the Site. During the fourth quarter 2014 groundwater monitoring event, groundwater levels were measured at monitoring wells MW-1, MW-2, MW-3R, and MW-4.

Groundwater 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 groundwater depth-to-water (DTW) level from the well's top-of-casing (TOC) elevation survey datum.

Significant Observations

The groundwater table was encountered at approximately 2 to 4 ft. bgs and slopes to the south with a gradient of approximately 0.002 ft./ft., as measured between monitoring wells MW-4 and MW-2.

No measurable light non-aqueous phase liquid (LNAPL) was detected in groundwater monitoring wells during the fourth quarter 2014 groundwater monitoring event.

2.2 Groundwater Sampling

This section summarizes the groundwater sampling activities that were performed and the protocols followed during the fourth quarter 2014 groundwater monitoring event.

2.2.1 Groundwater Sampling Points

On October 29, 2014, Site groundwater monitoring wells MW-1, MW-2, MW-3R, and MW-4 were sampled as part of the fourth quarter groundwater monitoring event. The Site monitoring locations are illustrated in Figure 2.

2.2.2 Groundwater Purging and Sampling Activities

This section summarizes both general and significant observations from the groundwater purging and sampling activities.

General

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

Groundwater monitoring wells were sampled using individual, disposable, polyethylene bailers to limit the potential for cross-contamination between sampling points. Clean sample containers (40-

milliliter [ml] volatile organic analysis [VOA] vials) supplied by the analytical laboratory were used to contain liquid for subsequent analyses.

VOA vials were overfilled and capped to reduce the potential for any headspace and to prevent the loss of volatile analytes, and subsequently inverted and gently tapped to dislodge any air bubbles that may have formed around the cap or sides. Sample bottles were then labeled with the corresponding date, time, and well identification, and subsequently placed in an ice-filled cooler and maintained at approximately 4 degrees Celsius (°C) for transportation.

The groundwater samples were packed as designated by the analytical laboratory and transferred for analysis under chain-of-custody procedures to Summit Scientific in Golden, CO. The groundwater samples were submitted for analysis of BTEX using USEPA Method 8260B.

Significant Observations

- No hydrocarbon sheen was observed in purge water collected from any of the four groundwater monitoring locations.
- No hydrocarbon odors were detected in purge water collected from any of the four groundwater monitoring locations.

3.0 GROUNDWATER MONITORING RESULTS AND EVALUATION

Groundwater monitoring results are presented in the following sections.

3.1 Groundwater Monitoring Results

During the fourth quarter 2014 groundwater monitoring event, groundwater elevations ranged from 4792.43 ft. amsl at MW-2 to 4792.59 ft. amsl at MW-4. Groundwater elevation data are presented in Table 3 and groundwater potentiometric surface contours are illustrated in Figure 4. As illustrated, measured groundwater elevations from the three monitoring wells indicate a groundwater gradient to the southwest.

Groundwater analytical results for the fourth quarter 2014 groundwater monitoring event are summarized below, presented in Table 2, and illustrated in Figure 5. To evaluate Site conditions, groundwater analytical results are compared to the COGCC Table 910-1 standards for BTEX in groundwater. The laboratory analytical data reports are provided in Attachment A.

- Benzene was not detected above the COGCC Table 910-1 standard of 5 micrograms per liter ($\mu\text{g/L}$) in any of the four monitoring wells sampled.
- Toluene was not detected above the COGCC Table 910-1 standard of 560 $\mu\text{g/L}$ in any of the four monitoring wells sampled.
- Ethylbenzene was not detected above the COGCC Table 910-1 standard of 700 $\mu\text{g/L}$ in any of the four monitoring wells sampled.

- Total xylenes were not detected above the COGCC Table 910-1 standard of 1400 µg/L in any of the four monitoring wells sampled.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This section of the Report presents conclusions from the findings of the fourth quarter 2014 activities as well as recommendations for future activities.

4.1 Conclusions

Laboratory analytical data indicate that dissolved-phase petroleum hydrocarbon concentrations are not present above laboratory reporting limits in any of the Site groundwater monitoring well locations. These results are consistent with the previous three consecutive quarters of groundwater monitoring results.

These observations support the conclusion that petroleum hydrocarbon impacts are not present on-Site.

4.2 Recommendations

Based on empirical evidence gathered over the past four quarters, additional groundwater monitoring or remedial action will not be required at the Site. A no further action (NFA) designation is appropriate for the release.

5.0 UPCOMING SITE ACTIVITIES

Upcoming Site activities include the following items:

- Plugging and abandoning of the five Site monitoring wells will be conducted subsequent to NFA approval by the COGCC.

TABLES

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - BETZ 30-11, 30-14

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	Naphthalene (mg/kg)
COGCC Standard		0.17	85	100	175	500		23
SS01@3'	11/22/13	<0.0020	<0.0050	<0.0050	<0.010	<0.50	<50	<0.010
MW-2@1-3'	12/19/13	<0.0020	<0.0050	<0.0050	<0.010	<0.50	<50	<0.010
MW-3@1-3'	12/19/13	<0.0020	<0.0050	<0.0050	<0.010	<0.50	<50	<0.010
SS05@3'	02/17/14	<0.01	<0.01	<0.01	<0.01	<50	<50	<0.01
SS06@3'	02/17/14	<0.01	<0.01	<0.01	<0.01	<50	<50	<0.01
SS07@3'	02/17/14	<0.01	<0.01	<0.01	<0.01	<50	<50	<0.01

Soil Sample ID	Date	EC	pH	SAR
		4 or 2x BG	6-9	<12
SS01@3'	11/22/13	2.63	7.81	1.91

COGCC = Colorado Oil and Gas Conservation Commission

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

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

EC = Specific conductance

BG = Background

SAR = Sodium adsorption ratio

Soil standards referenced from COGCC Table 910-1

Highlighted results exceed the COGCC Table 910-1 standard

TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - BETZ 30-11, 30-14

Monitoring Well ID	Date	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Total Xylenes (µg/l)
COGCC Standard		5	560	700	1,400
GW01	11/22/13	350	590	120	840
MW-1	01/23/14	<1.0	<1.0	<1.0	<1.0
MW-1	04/17/14	<1.0	<1.0	<1.0	<1.0
MW-1	07/10/14	<1.0	<1.0	<1.0	<1.0
MW-1	10/29/14	<1.0	<1.0	<1.0	<1.0
MW-2	01/23/14	<1.0	<1.0	<1.0	<1.0
MW-2	04/17/14	<1.0	<1.0	<1.0	<1.0
MW-2	07/10/14	<1.0	<1.0	<1.0	<1.0
MW-2	10/29/14	<1.0	<1.0	<1.0	<1.0
MW-3	01/23/14	<1.0	<1.0	<1.0	<1.0
MW-3	04/17/14	<1.0	<1.0	<1.0	<1.0
MW-3	07/10/14	<1.0	<1.0	<1.0	<1.0
MW-3R	10/29/14	<1.0	<1.0	<1.0	6.1
MW-4	01/23/14	<1.0	<1.0	<1.0	<1.0
MW-4	04/17/14	<1.0	<1.0	<1.0	<1.0
MW-4	07/10/14	<1.0	<1.0	<1.0	<1.0
MW-4	10/29/14	<1.0	<1.0	<1.0	<1.0

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 exceed the COGCC Table 910-1 standard

TABLE 3
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - BETZ 30-11, 30-14

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)
MW-1	01/23/14	4797.84	7.94	5.58	ND	ND	4792.26
MW-1	04/17/14	4797.84	7.94	5.81	ND	ND	4792.03
MW-1	07/10/14	4797.84	7.94	5.68	ND	ND	4792.16
MW-1	10/29/14	4797.84	7.97	5.31	ND	ND	4792.53
MW-2	01/23/14	4794.00	9.78	1.92	ND	ND	4792.08
MW-2	04/17/14	4794.00	9.40	2.11	ND	ND	4791.89
MW-2	07/10/14	4794.00	9.43	2.09	ND	ND	4791.91
MW-2	10/29/14	4794.00	9.22	1.57	ND	ND	4792.43
MW-3	01/23/14	4794.24	9.54	2.12	ND	ND	4792.12
MW-3	04/17/14	4794.24	9.41	2.31	ND	ND	4791.93
MW-3	07/10/14	4794.24	9.34	2.25	ND	ND	4791.99
MW-3R	10/29/14	NS	6.02	1.98	ND	ND	NS
MW-4	01/23/14	4798.62	7.82	6.30	ND	ND	4792.32
MW-4	04/17/14	4798.62	7.84	6.53	ND	ND	4792.09
MW-4	07/10/14	4798.62	7.87	6.38	ND	ND	4792.24
MW-4	10/29/14	4798.62	7.86	6.03	ND	ND	4792.59

ft. = Feet

AMSL = Above mean sea level

BTOC = Below top of casing

LNAPL = Light non-aqueous phase liquid

ND = No LNAPL detected

NS = Not surveyed

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

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

LNAPL relative density was assumed to be approximately 0.75

FIGURES

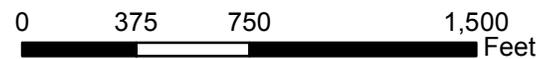
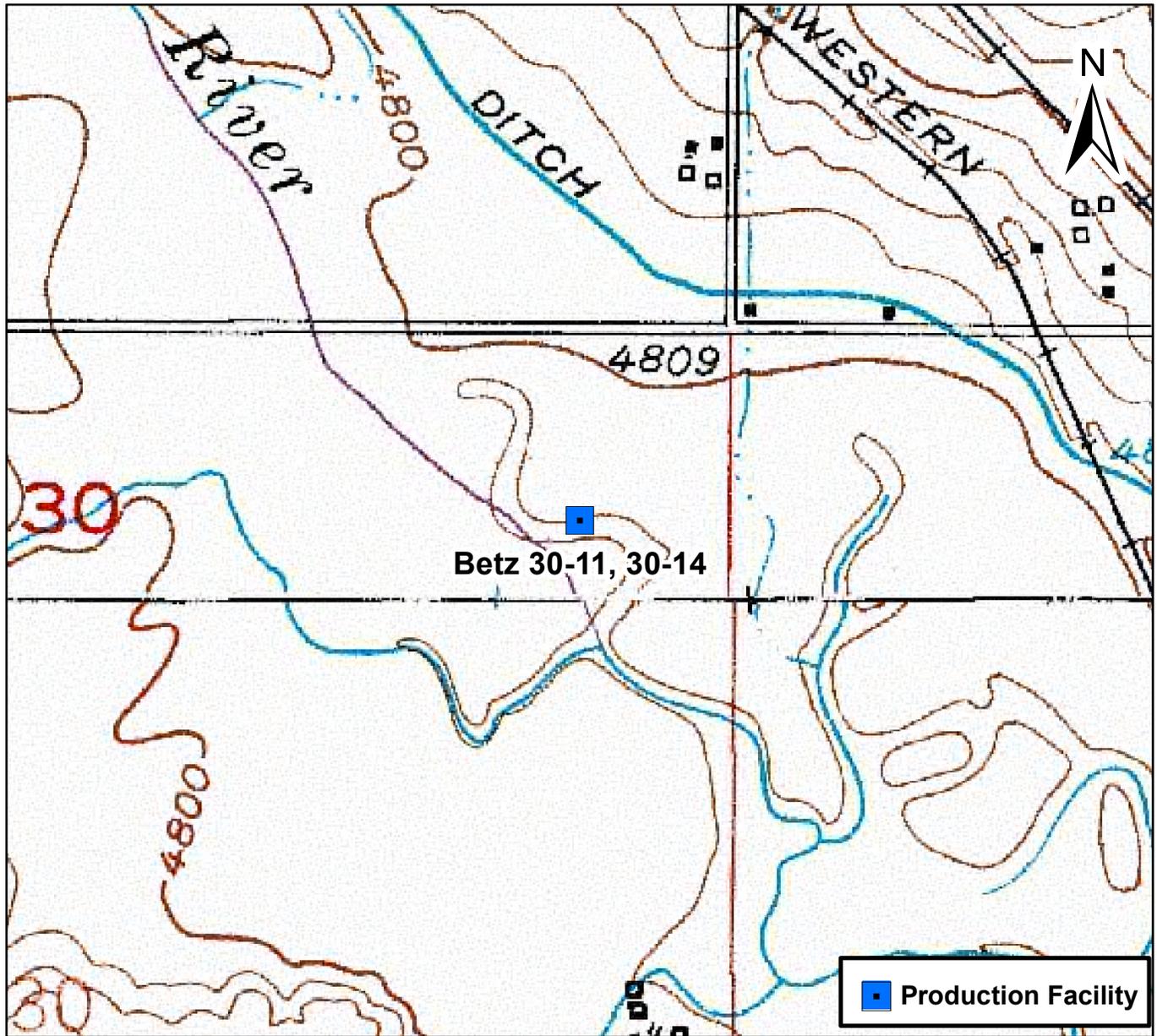


Figure 1

Site Location Map
 Betz 30-11, 30-14
 NENE S30 T5N R67W
 Weld County, Colorado

Drawn By: DBA
 Date: 12/16/2013





PROJECT NO:
 DRAWN BY: BAM
 DATE: 01/23/15

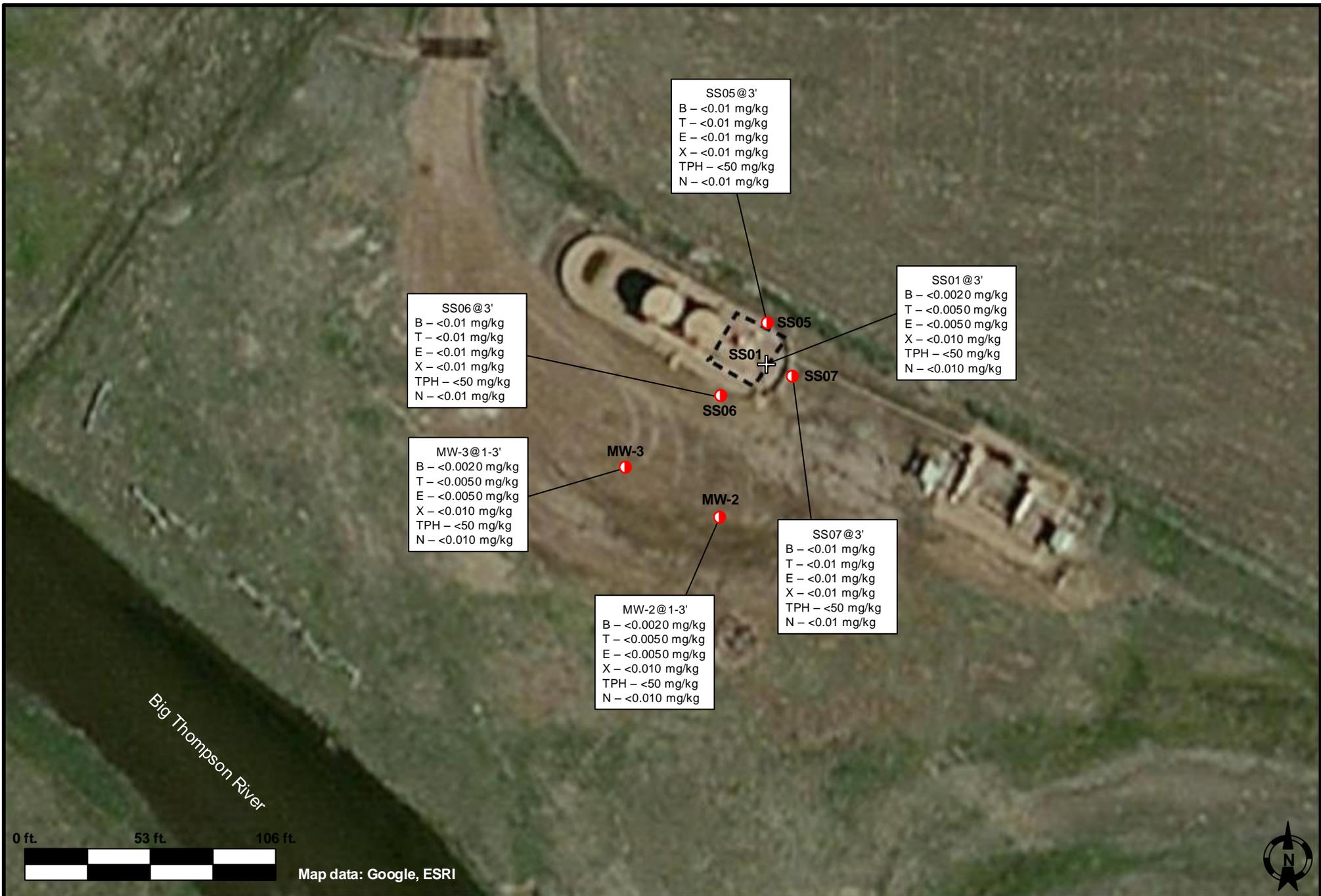


Facility
 Betz 30-11, 30-14
 Weld County, CO

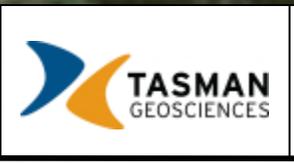
LEGEND:
 Groundwater Monitoring Well
 Excavation Extent (Surveyed Via Trimble GPS)

 Infrastructure

Site Overview Map
 Figure 2



PROJECT NO:
 DRAWN BY: BAM
 DATE: 01/23/15



Facility
 Betz 30-11, 30-14
 Weld County, CO

LEGEND: Excavation Soil Sample Location
 Borehole Sample Location
 Excavation Extent (Surveyed Via Trimble GPS)

Miligrams / Kilogram (mg/kg)

B - Benzene
 T - Toluene
 E - Ethylbenzene
 X - Total Xylenes
 TPH - Total Petroleum Hydrocarbons
 N - Naphthalene

Soil Analytical Results Map
 (11/22/13 - 02/17/14)
 Figure 3



PROJECT NO:
DRAWN BY: BAM
DATE: 01/26/15



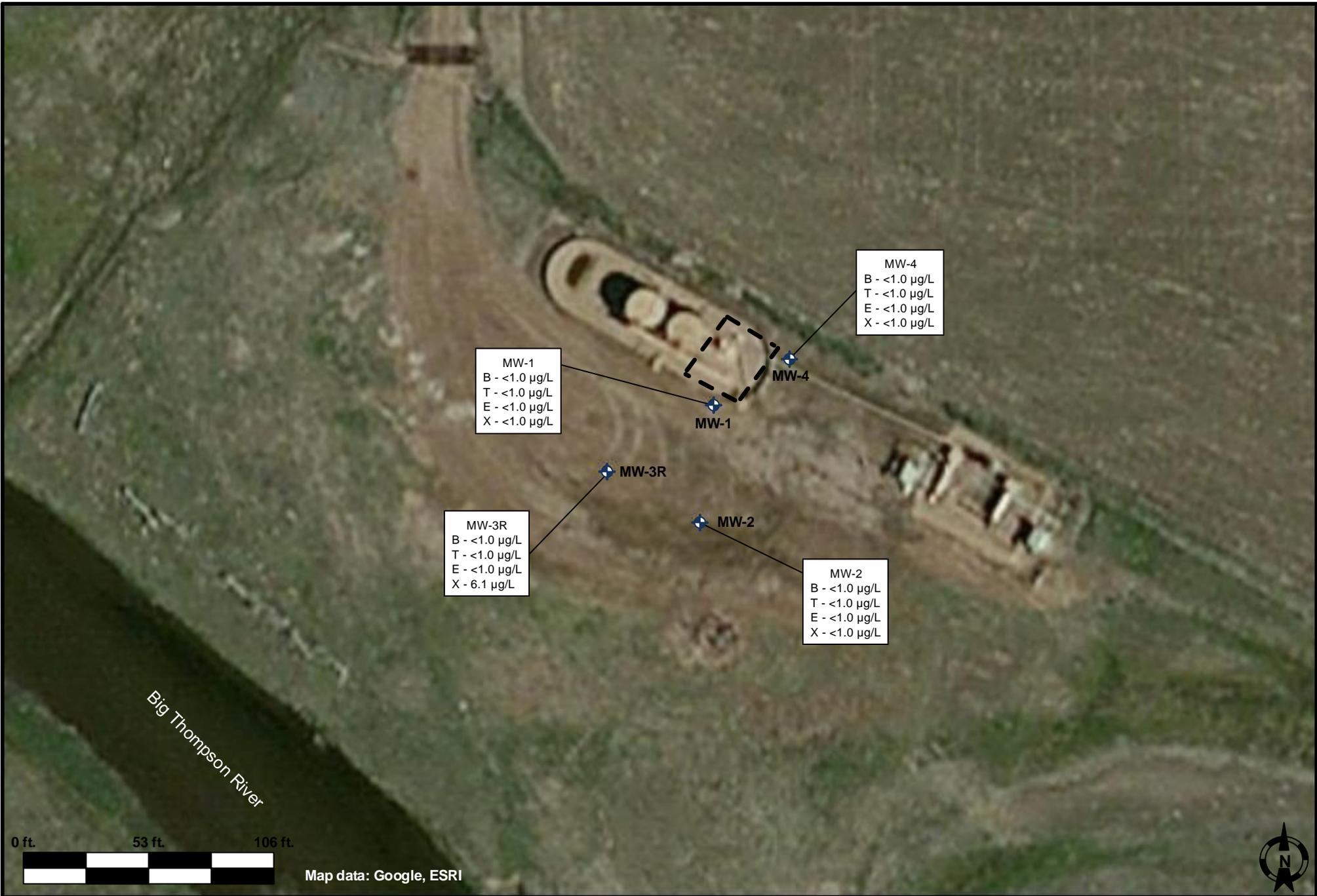
Facility
Betz 30-11, 30-14
Weld County, CO

LEGEND:

- Groundwater Monitoring Well
- Flow Direction

- Groundwater Elevation Contour (Dashed where inferred)
- 4792.16** Measured Groundwater Elevation
- Excavation Extent (Surveyed Via Trimble GPS)

Groundwater Potentiometric Surface Contour Map
(10/29/14)
Figure 4



PROJECT NO:
 DRAWN BY: BAM
 DATE: 01/23/15



Facility
 Betz 30-11, 30-14
 Weld County, CO

LEGEND:
 Groundwater Monitoring Well
 Excavation Extent
 (Surveyed Via Trimble GPS)

Micrograms / Liter (µg/L)

B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes

Groundwater Analytical
 Results Map
 (10/29/14)
 Figure 5

ATTACHMENT A
LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 09, 2014

Dan Wade
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Betz 30-11, 30-14

Enclosed are the results of analyses for samples received by Summit Scientific on 10/31/14 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Betz 30-11, 30-14

Project Number: [none]
Project Manager: Dan Wade

Reported:
11/09/14 13:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	1410331-01	Water	10/29/14 14:20	10/31/14 17:00
MW-2	1410331-02	Water	10/29/14 14:30	10/31/14 17:00
MW-3R	1410331-03	Water	10/29/14 14:40	10/31/14 17:00
MW-4	1410331-04	Water	10/29/14 14:50	10/31/14 17:00

Summit Scientific

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



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Betz 30-11, 30-14

Project Number: [none]
Project Manager: Dan Wade

Reported:
11/09/14 13:54

Summit Scientific

1410331

S₂

741 Corporate Circle Suite 1 ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-277-9531 Fax

Page () of 1

Client: Noble Energy Truman
Address: 6899 Pecos St Unit C Project Manager: Dan Wade
City/State/Zip: Denver, Co 80221 E-Mail: dwade@tasman-geo.com
Phone: 303 487 1228 Fax: Project Name: Betz 30-11, 30-14
Sampler Name: Andrew T. Fisher 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)					
MW-1	10/29	1420	3	X				X								
MW-2	10/29	1430	3	X				X								
MW-3R	10/29	1440	3	X				X								
MW-4	10/29	1450	3	X				X								
Relinquished by: <u>Andrew T. Fisher</u>	Date/Time: <u>10/31/14 730</u>	Received by: <u>MD</u>		Date/Time: <u>10/31/14 1700</u>	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: <u>6°C</u>											
					Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No											

www.s2scientific.com



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Betz 30-11, 30-14

Project Number: [none]
Project Manager: Dan Wade

Reported:
11/09/14 13:54

MW-1
1410331-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/29/14 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411034	11/04/14	11/07/14	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **10/29/14 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		84.2 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		97.7 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		98.2 %	45-146		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Betz 30-11, 30-14

Project Number: [none]
Project Manager: Dan Wade

Reported:
11/09/14 13:54

MW-2
1410331-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/29/14 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411034	11/04/14	11/07/14	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **10/29/14 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		82.7 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		94.3 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		95.0 %	45-146		"	"	"	"	

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 Street
Denver CO, 80221

Project: Betz 30-11, 30-14

Project Number: [none]
Project Manager: Dan Wade

Reported:
11/09/14 13:54

MW-3R
1410331-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/29/14 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411034	11/04/14	11/07/14	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	6.1	1.0	"	"	"	"	"	"	

Date Sampled: **10/29/14 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		83.7 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		92.5 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		97.3 %	45-146		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Betz 30-11, 30-14

Project Number: [none]
Project Manager: Dan Wade

Reported:
11/09/14 13:54

MW-4
1410331-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/29/14 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411034	11/04/14	11/07/14	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **10/29/14 14:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		85.5 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		94.1 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		94.8 %	45-146		"	"	"	"	

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Volatile Organic Compounds by EPA Method 8260B - Quality Control

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

Batch 1411034 - EPA 5030 Water MS

Blank (1411034-BLK1)

Prepared & Analyzed: 11/06/14

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	1.0	"								
Surrogate: 1,2-Dichloroethane-d4	11.5		"	13.2		86.8	37-154				
Surrogate: Toluene-d8	12.6		"	13.3		94.6	45-149				
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.9	45-146				

LCS (1411034-BS1)

Prepared & Analyzed: 11/06/14

Benzene	39.3	1.0	ug/l	33.3		118	51-132				
Toluene	39.7	1.0	"	33.3		119	51-138				
Ethylbenzene	42.0	1.0	"	33.1		127	58-146				
m,p-Xylene	82.0	2.0	"	66.5		123	57-144				
o-Xylene	41.3	1.0	"	32.8		126	53-146				
Surrogate: 1,2-Dichloroethane-d4	11.3		"	13.2		85.5	37-154				
Surrogate: Toluene-d8	12.8		"	13.3		96.2	45-149				
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.5	45-146				

Matrix Spike (1411034-MS1)

Source: 1410333-03

Prepared & Analyzed: 11/07/14

Benzene	40.1	1.0	ug/l	33.3	ND	120	34-141				
Toluene	40.0	1.0	"	33.3	ND	120	27-151				
Ethylbenzene	41.3	1.0	"	33.1	ND	125	29-160				
m,p-Xylene	81.7	2.0	"	66.5	ND	123	20-166				
o-Xylene	40.8	1.0	"	32.8	ND	124	33-159				
Surrogate: 1,2-Dichloroethane-d4	11.8		"	13.2		89.1	37-154				
Surrogate: Toluene-d8	12.8		"	13.3		96.4	45-149				
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.7	45-146				

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
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Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1411034 - EPA 5030 Water MS

Matrix Spike Dup (1411034-MSD1)	Source: 1410333-03			Prepared & Analyzed: 11/07/14						
Benzene	40.6	1.0	ug/l	33.3	ND	122	34-141	1.26	32	
Toluene	42.0	1.0	"	33.3	ND	126	27-151	4.95	25	
Ethylbenzene	41.8	1.0	"	33.1	ND	127	29-160	1.25	50	
m,p-Xylene	82.7	2.0	"	66.5	ND	124	20-166	1.20	36	
o-Xylene	41.2	1.0	"	32.8	ND	126	33-159	1.07	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>11.6</i>		<i>"</i>	<i>13.2</i>		<i>87.7</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>99.8</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>95.9</i>	<i>45-146</i>			

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11/09/14 13:54

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