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Monitoring Well Installation Report Nelson C-1

August 15, 2017

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1 Introduction

Talon/LPE (Talon) was contracted by Whiting Petroleum Corporation (Whiting) to conduct site investigation assessment activities associated with a flowline release identified at the Nelson C1 site (Site) in Weld County, Colorado. The site is located at the northwest quarter of the southeast quarter of Section 18, Township 10 North, Range 58 West, 6th Principal Meridian at 40°50'10.72"N and 103°54'17.73"W (Attachment 1). The site is identified by the State of Colorado Oil and Gas Conservation Commission (COGCC) as Spill/Release Point Facility ID 441208. The Site Plan is shown on Figure 1 and the general site location is shown on Figure 3.

The following document is an assessment of site investigation activities including the installation of monitoring wells, and groundwater monitoring.

2 Objective

The primary objective of this investigation is to determine the nature and extent of soil and/or groundwater impacts resulting from a flowline release. The release was discovered and reported on COGCC Form 19 on March 30, 2015. Assessment and remediation activities are being conducted as part of COGCC Form 27 Number 9146.

3 Regulatory Framework

The COGCC has regulatory jurisdiction over oil and natural gas industry operations in the State of Colorado. Section 900 of the COGCC Rules is for Exploration and Production Waste Management. More specifically, Section 910 details the Concentrations and Sampling for Soil and Groundwater rules. The regulatory limits for specific analytes in soil and groundwater are detailed in Table 910-1 and are summarized below.

Compound	COGCC Table 910-1 Soil Concentrations	COGCC Table 910-1 Groundwater Concentrations
Benzene	0.17 mg/kg	0.005 mg/L
Toluene	85 mg/kg	1.0 mg/L
Ethylbenzene	100 mg/kg	0.7 mg/L
Xylenes (total)	175 mg/kg	10 mg/L
Naphthalene	23 mg/kg	Not Applicable
TPH (total volatile and extractable petroleum hydrocarbons)	500 mg/kg	Not Applicable

4 Site Characteristics

4.1 Geography

The site is located in the Pawnee Grasslands in Weld County, which is the northeastern part of Colorado. The Grasslands are part of the Colorado Eastern Plains and are relatively flat with the exception of the Pawnee Creek which drains into the South Platte River.

4.2 Geologic Summary

Surficial geology surrounding the area consists of Tertiary age fluvial deposits of the lower Ogallala Formation. More specifically, these deposits are Miocene in age and are composed of gray to brown and semi-consolidated, ashy sands and silt beds with volcanic ash beds. Deposited material hardened into sandstone and siltstone which are grouped into three formations: White River, Arikaree, and Ogallala.

4.3 Groundwater

According to the Colorado Division of Water Resources Website, there are no water wells within 1,000-foot radius of the Site.

Depth to groundwater levels as measured on June 15, 2017, in the 20 groundwater monitoring wells range from 27.15 to 40.17 feet below top of casing (Table 3), which are above-ground by approximately three (3) feet (ft). Several wells had measurable amounts of phase-separated hydrocarbons (PSH) during the monitoring event.

5 Field Investigation Activities

5.1 Monitoring Well Installation

On June 27, 2017, Talon personnel oversaw Drilling Engineers advance two (2) monitoring wells (MW-21 and MW-22). Both wells were drilled to approximately 40 feet below ground surface (bgs). The depths of the monitoring wells were determined in the field based on observed lithology, hydrocarbon odors, and PID values; the goal was to drill until no further odors or elevated PIDs were observed and a confining lithologic layer was observed. Boring logs detailing observed lithology, and PID values are included in Attachment 3.

Three (3) soil samples were collected from each of the borings during drilling efforts from depths ranging from 25-40 ft bgs. Sample locations were determined based on elevated PID values. Additionally, soil samples were collected from the bottom of each boring and above the assumed groundwater interface to provide additional vertical delineation of any impacts. The collected soil samples were submitted to Summit Scientific (Summit) in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX), total petroleum hydrocarbons (TPH) as gasoline range organics (GRO), and diesel range organics (DRO) via method SW8015. The remaining soils were stockpiled on-site on a plastic liner pending laboratory analytical results.

Both monitoring wells were constructed using 4-inch diameter Schedule 40 PVC casing and 10-slot screen. Each well was completed with 10/20 silica sand pack to two (2) ft above the top of the screen interval, sealed with bentonite chips to near-surface, and included an above-ground well mount in a concrete pad. Well completion details are included in Attachment 3.

Both monitoring wells were gauged on June 29, 2017. Monitoring well MW-21 was dry and monitoring well MW-22 was observed to have 0.19 ft of PSH. Therefore, groundwater samples were not collected from either well. Monitoring well MW-22 was purged until it became dry. Depth to water and depth to PSH values are summarized in Table 3. Purge water generated during development was placed in 55-gallon drums within the tank battery berm for secondary containment pending off-site disposal.

5.1.1 Discussion of Results

Table 1 in Attachment 2 summarizes the well completion and survey information. Table 2 summarizes the soil sample laboratory analytical results, and Table 3 includes well gauging data. A copy of the laboratory reports and chain of custody documentation is included in Attachment 4.

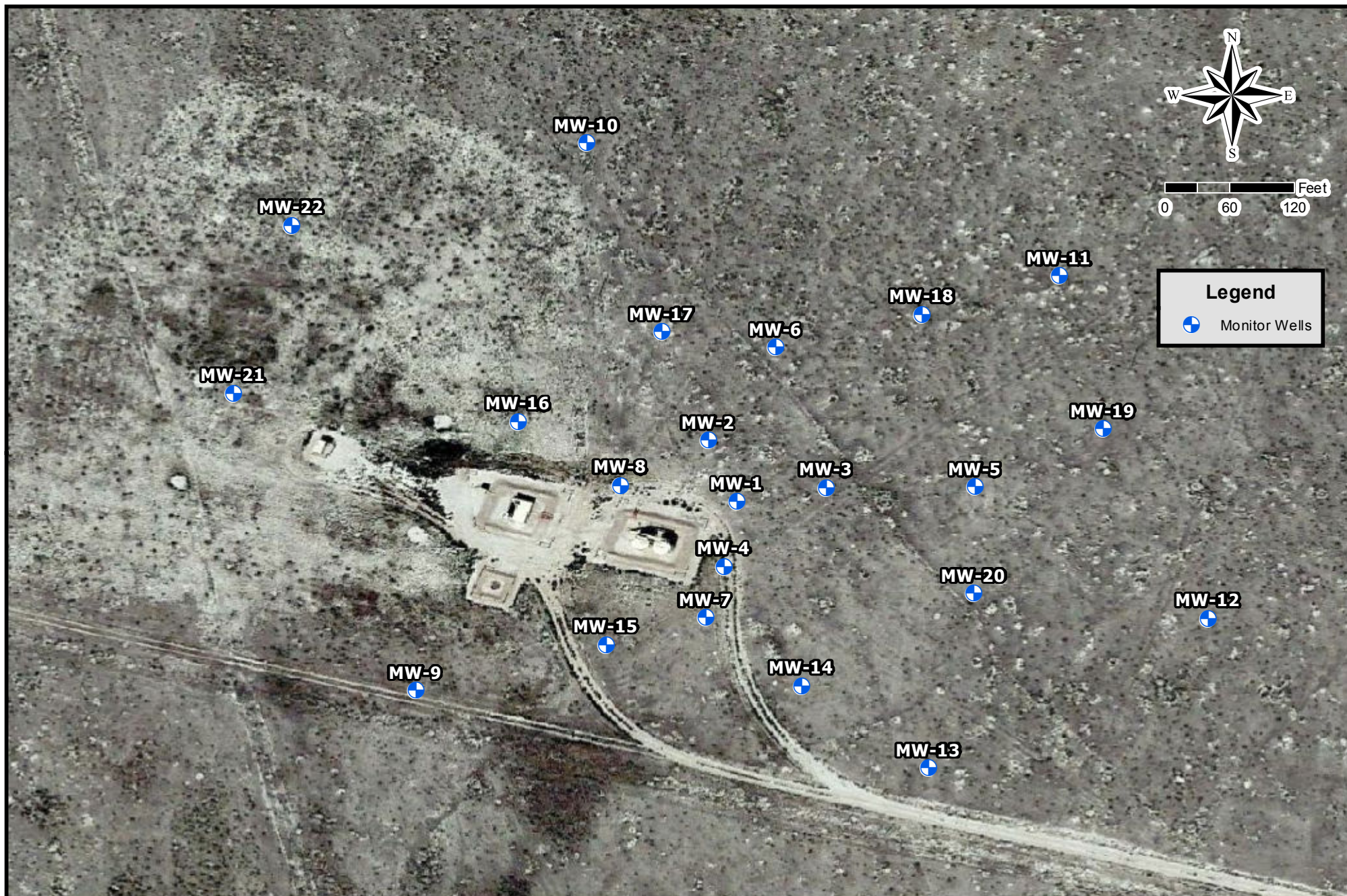
All soil analytical results were below laboratory detection limits (Figure 2). Groundwater samples were not collected due to MW-21 being dry and MW-22 having PSH levels greater than 0.1 feet. Talon will continue to monitor the wells during quarterly monitoring events.

6 Conclusions & Recommendations

The objective of this report was to document the nature and extent of the impacts at the Nelson C1 location. Talon has installed two (2) additional monitoring wells to assess soil or groundwater impacts from this release. All soil samples collected during these site activities were below laboratory detection limits. Groundwater samples were not collected, but Talon will continue to monitor all the wells on site during quarterly monitoring events.

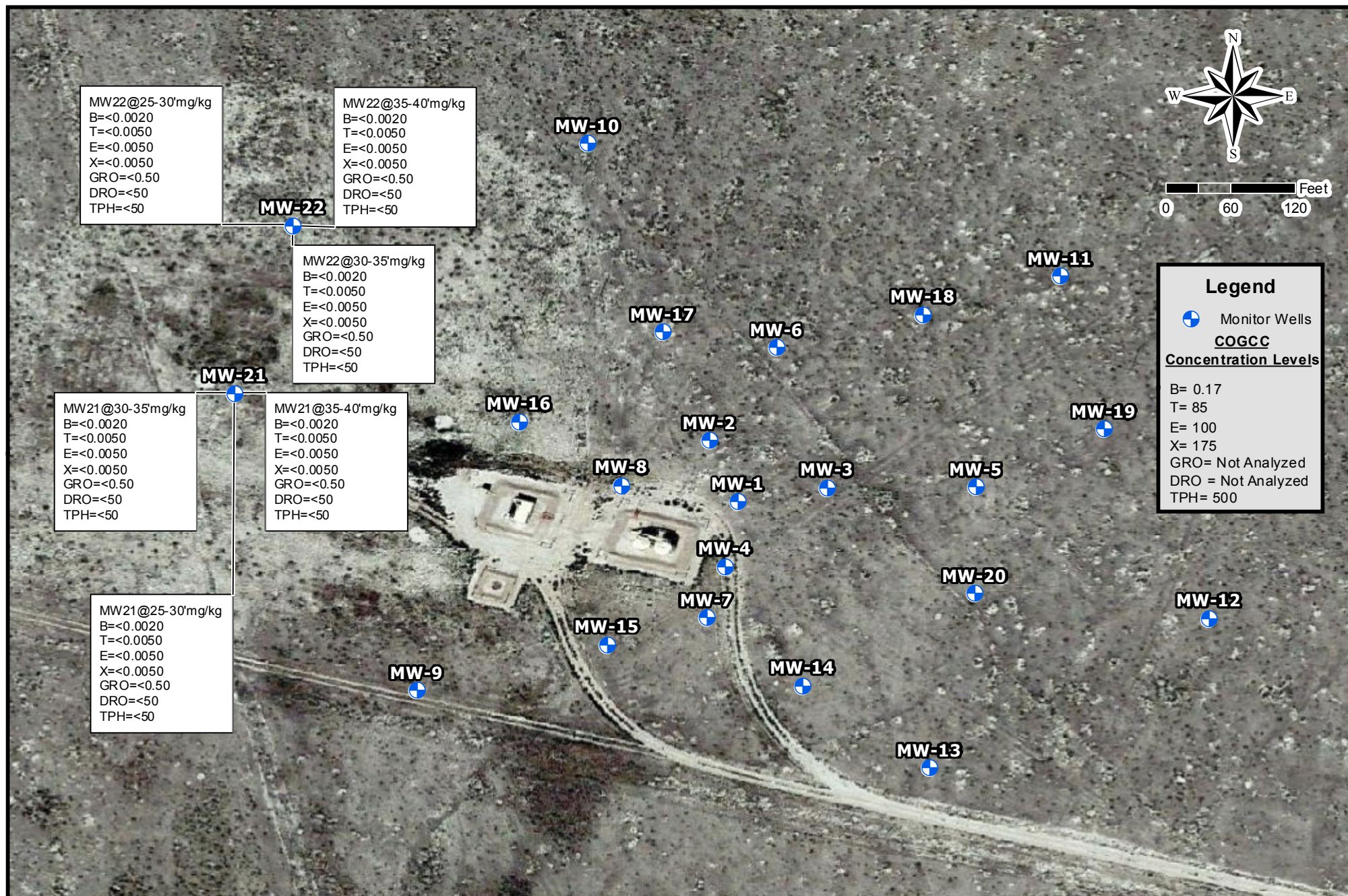
The presence of PSH in monitoring well MW-22 indicates groundwater impacts are not currently delineated for the west side of the site. Further subsurface investigation, such as installing additional monitoring wells, should be performed to provide additional delineation in this area.

Attachment 1
Figures



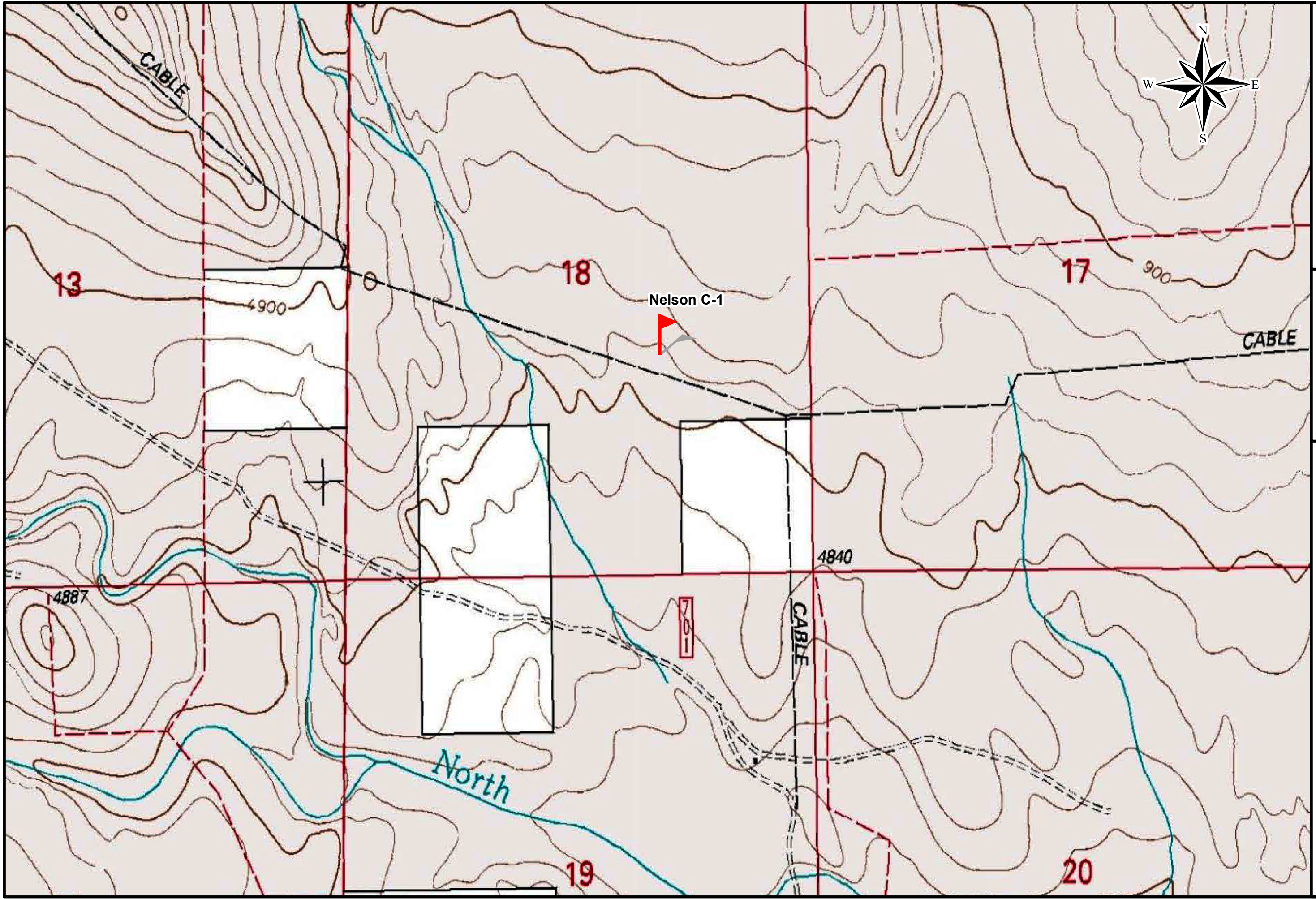
Drafted: 8/15/2017
1 in = 120 ft
Drafted By: IJM


Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado
Figure 1- Site Map



Drafted: 8/15/2017
1 in = 120 ft
Drafted By: IJM

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado
Figure 2 - Soil Concentration Map (06/27/2017)




<p>Drafted: 8/7/2017 Map Scale 1:10,000 Drafted By: IJM</p>
<p>Whiting Oil and Gas Corporation Nelson C-1 Weld County, Colorado Figure 3 - Topographic Map</p>

Attachment 2 Tables



Table 1 - Well Information

**Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado**

Well ID	Latitude	Longitude	Ground Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Screen Interval (ft bgs)	Total Depth (ft)
MW-1	40.836400	-103.904672	4861.9	4865.0	19.8-39.8	40.38
MW-2	40.836550	-103.904761	4862.2	4865.6	19-39	39.50
MW-3	40.836453	-103.904461	4863.2	4866.6	19.5-39.5	40.00
MW-4	40.836239	-103.904742	4860.6	4863.7	19.5-39.5	40.00
MW-5	40.836419	-103.904069	4865.0	4868.0	20-40	40.00
MW-6	40.836722	-103.904467	4863.8	4867.1	20-45	45.00
MW-7	40.836089	-103.904822	4859.3	4862.6	20-40	40.00
MW-8	40.836469	-103.904956	4860.9	4864.3	20-40	40.00
MW-9	40.835925	-103.905525	4857.9	4860.9	17-32	35.00
MW-10	40.837317	-103.905089	4864.5	4867.7	19-39	39.00
MW-11	40.836978	-103.903889	4868.6	4871.6	19-44	44.00
MW-12	40.836108	-103.903511	4867.0	4870.1	18-38	38.00
MW-13	40.835728	-103.904222	4861.5	4864.4	20-40	40.00
MW-14	40.835936	-103.904542	4860.4	4863.7	20-40	40.00
MW-15	40.836042	-103.905064	4858.6	4861.4	19-34	34.00
MW-16	40.836608	-103.905264	4860.1	4863.4	19-39	39.00
MW-17	40.836836	-103.904900	4862.8	4866.0	19-44	44.00
MW-18	40.836881	-103.904236	4865.8	4868.6	19-44	44.00
MW-19	40.836589	-103.903778	4867.3	4870.2	19-39	39.00
MW-20	40.836172	-103.904103	4864.1	4867.0	19-39	39.00
MW-21	40.836680	-103.905987	4861.2	4864.0	20-40	40.15
MW-22	40.837107	-103.905838	4863.9	4866.9	20-40	39.68

TOC - Top of Casing
ft bgs - Feet Below Ground Surface
ft amsl - Feet Above Mean Sea Level



Table 2 - Soil Analytical Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Sample ID	Lab ID	Date Sampled	Concentration (mg/kg)							
			Benzene	Toluene	Ethyl-Benzene	Xylenes	Naphthalene	GRO	DRO	TPH
COGCC Table 910-1 Concentration Levels			0.17	85	100	175	23	NA	NA	500
MW-1 @ 20-25'	1508471-4	08/25/15	1.2	2.6	0.65	3.8	0.1	19	32	51
MW-1 @ 25-30'	1508471-5	08/25/15	1.2	6.6	1.2	1.8	0.23	37	95	132
MW-1 @ 30-35'	1508471-6	08/25/15	1.5	1.8	0.23	1.3	<0.076	4.4	<7.6	<7.6
MW-1@ - 35-40'	1508471-7	08/25/15	<0.0059	<0.0059	<0.0059	<0.005	<0.0059	<0.35	<6	<6
MW-2 @ 20'	1510247-01	10/27/15	0.011	0.012	<0.005	0.01	NA	<0.50	<50	<50
MW-2 @ 25'	1510247-02	10/27/15	0.24	0.33	0.13	0.97	NA	48	<50	<50
MW-2 @ 30'	1510247-03	10/27/15	<0.0020	<0.0050	<0.0050	<0.0050	NA	3	<50	<50
MW-3 @ 25'	1510247-04	10/27/15	0.012	0.03	<0.0050	0.043	NA	4.6	<50	<50
MW-3 @ 30'	1510247-05	10/27/15	0.12	0.23	0.024	0.17	NA	3.1	<50	<50
MW-4 @ 30'	1510247-06	10/28/15	0.036	0.12	0.049	0.41	NA	50	<50	50
MW-4 @ 35'	1510247-07	10/28/15	<0.0020	<0.0050	<0.0050	<0.0050	NA	4.6	<50	<50
MW-4 @ 40'	1510247-08	10/28/15	<0.0020	<0.0050	<0.0050	0.049	NA	35	<50	<50
MW-5 @ 15-20'	1602102-01	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-5 @ 30-35'	1602102-02	02/11/16	0.0033	0.013	<0.0050	0.028	NA	0.77	<50	<50
MW-5 @ 35-39.5'	1602102-03	02/11/16	0.014	0.022	0.0073	0.081	NA	13	<50	<50
MW-5 @ 39.5-40'	1602102-04	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-6 @ 15-20'	1602102-05	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-6 @ 20-25'	1602102-06	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-6 @ 25-30'	1602102-07	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	0.82	<50	<50
MW-6 @ 30-35'	1602102-08	02/11/16	<0.0020	0.11	0.68	4.3	NA	870	330	1200
MW-6 @ 35-40'	1602102-09	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-6 @ 40-43'	1602102-10	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-6 @ 43-45'	1602102-11	02/11/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-7 @ 15-20'	1602102-12	02/12/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-7 @ 20-25'	1602102-13	02/12/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	0.98	<50	<50
MW-7 @ 25-30'	1602102-14	02/12/16	0.004	0.054	0.12	1.2	NA	250	150	400
MW-7 @ 30-35'	1602102-15	02/12/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-7 @ 38-40'	1602102-16	02/12/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-8 @ 10-15'	1602102-17	02/12/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-8 @ 15-20'	1602102-18	02/12/16	<0.0020	<0.0050	0.073	0.81	NA	86	86	172
MW-8 @ 20-25'	1602102-19	02/12/16	<0.0020	0.031	0.019	0.18	NA	76	100	176
MW-8 @ 25-30'	1602102-20	02/12/16	0.0033	0.011	0.013	0.17	NA	90	110	200
MW-8 @ 30-35'	1602102-21	02/12/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	5.2	<50	<50
MW-8 @ 35-37.5'	1602102-22	02/12/16	0.0032	<0.0050	<0.0050	<0.0050	NA	15	<50	<50
MW-8 @ 37.5-40'	1602102-23	02/12/16	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50



Table 2 - Soil Analytical Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Sample ID	Lab ID	Date Sampled	Concentration (mg/kg)							
			Benzene	Toluene	Ethyl-Benzene	Xylenes	Naphthalene	GRO	DRO	TPH
COGCC Table 910-1 Concentration Levels			0.17	85	100	175	23	NA	NA	500
MW-9 @ 10-15'	1603086-01	03/07/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-9 @ 15-20'	1603086-02	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-9 @ 30-35'	1603086-03	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-10 @ 15-20'	1603086-04	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-10 @ 30-35'	1603086-05	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-10 @ 35-40'	1603086-06	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-11 @ 15-20'	1603086-07	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-11 @ 20-25'	1603086-08	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-11 @ 25-30'	1603086-09	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-11 @ 40-45'	1603086-10	03/08/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-12 @ 15-20'	1603086-11	03/09/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-12 @ 20-25'	1603086-12	03/09/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-12 @ 35-40'	1603086-13	03/09/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-13 @ 10-15'	1603086-14	03/10/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-13 @ 15-20'	1603086-15	03/10/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-13 @ 35-40'	1603086-16	03/10/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-14 @ 10-15'	1603086-17	03/10/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-14 @ 20-25'	1603086-18	03/10/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-14 @ 30-35'	1603086-19	03/10/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-14 @ 35-40'	1603086-20	03/10/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-15 @ 15-20'	1603093-01	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-15 @ 20-25'	1603093-02	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-15 @ 25-30'	1603093-03	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-15 @ 30-34.5'	1603093-04	03/11/16	0.0029	<0.0050	<0.0050	<0.010	<0.010	0.84	<50	<50
MW-15 @ 34.5-35'	1603093-05	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-16 @ 10-15'	1603093-06	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-16 @ 15-20'	1603093-07	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-16 @ 20-25'	1603093-08	03/11/16	0.021	<0.0050	<0.0050	<0.010	<0.010	8.7	<50	<50
MW-16 @ 25-30'	1603093-09	03/11/16	0.039	<0.0050	<0.0050	0.014	<0.010	11	<50	<50
MW-16 @ 30-35'	1603093-10	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	1.1	<50	<50
MW-16 @ 35-37.5'	1603093-11	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	6.6	<50	<50
MW-16 @ 37.5-40'	1603093-12	03/11/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50



Table 2 - Soil Analytical Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Sample ID	Lab ID	Date Sampled	Concentration (mg/kg)							
			Benzene	Toluene	Ethyl-Benzene	Xylenes	Naphthalene	GRO	DRO	TPH
COGCC Table 910-1 Concentration Levels			0.17	85	100	175	23	NA	NA	500
MW-17 @ 20-25'	1603125-01	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-17 @ 25-30'	1603125-02	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	1	<50	<50
MW-17 @ 30-35'	1603125-03	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	0.095	28	55	83
MW-17 @ 35-40'	1603125-04	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	3.4	<50	<50
MW-17 @ 40-42'	1603125-05	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	0.028	12	<50	<50
MW-17 @ 42-45'	1603125-06	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	0.75	<50	<50
MW-18 @ 15-20'	1603125-07	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-18 @ 20-25'	1603125-08	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-18 @ 25-30'	1603125-09	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-18 @ 40-45'	1603125-10	03/15/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-19 @ 15-20'	1603125-11	03/16/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-19 @ 20-25'	1603125-12	03/16/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-19 @ 35-40'	1603125-13	03/16/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-20 @ 15-20'	1603125-14	03/16/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-20 @ 30-35'	1603125-15	03/16/16	<0.0020	<0.0050	<0.0050	<0.010	0.019	3.9	<50	<50
MW-20 @ 35-37.5'	1603125-16	03/16/16	0.0049	<0.0050	<0.0050	<0.010	0.046	17	<50	<50
MW-20 @ 37.5-40'	1603125-17	03/16/16	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<0.50	<50	<50
MW-21 @ 25-30'	1706318-01	06/27/17	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-21 @ 30-35'	1706318-02	06/27/17	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-21 @ 35-40'	1706318-03	06/27/17	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-22 @ 25-30'	1706318-04	06/27/17	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-22 @ 30-35'	1706318-05	06/27/17	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50
MW-22 @ 35-40'	1706318-06	06/27/17	<0.0020	<0.0050	<0.0050	<0.0050	NA	<0.50	<50	<50

mg/kg - milligrams per kilogram

< - Analytical result is less than the reporting limit

COGCC - Colorado Oil and Gas Conservation Commission

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

TPH - Total Petroleum Hydrocarbons (Combined GRO/DRO)



Table 3 - Gauging Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Well ID	Top of Casing Elevation (ft amsl)	Total Depth of Well (ft)	Date Gauged	Depth to Product (ft btoc)	DTW (ft btoc)	Product Thickness (ft)	Potentiometric Surface Elevation (ft)
MW-1	4865.00	40.38	11/4/2015	NA	36.49	0.00	4828.51
			12/3/2015	NA	30.88	0.00	4834.12
			12/8/2015	30.62	30.63	0.01	4834.38
			12/22/2015	NA	31.46	0.00	4833.54
			12/30/2015	NA	32.03	0.00	4832.97
			1/13/2016	NA	38.05	0.00	4826.95
			1/21/2016	NA	31.08	0.00	4833.92
			1/27/2016	31.10	31.13	0.03	4833.89
			2/8/2016	31.24	31.29	0.05	4833.75
			2/15/2016	30.90	30.92	0.02	4834.10
			2/16/2016	30.96	30.99	0.03	4834.03
			2/17/2016	NA	32.27	0.00	4832.73
			2/19/2016	NA	31.04	0.00	4833.96
			2/24/2016	NA	31.19	0.00	4833.81
			2/29/2016	NA	30.95	0.00	4834.05
			3/8/2016	NA	32.67	0.00	4832.33
			3/15/2016	NA	32.95	0.00	4832.05
			3/22/2016	NA	33.02	0.00	4831.98
			3/29/2016	NA	33.04	0.00	4831.96
			4/5/2016	NA	33.22	0.00	4831.78
			4/19/2016	NA	31.70	0.00	4833.30
			4/26/2016	NA	32.78	0.00	4832.22
			5/5/2016	NA	31.41	0.00	4833.59
			6/6/2016	31.35	31.36	0.01	4833.65
			6/20/2016	31.38	31.42	0.04	4833.61
			8/11/2016	NA	30.88	0.00	4834.12
			9/15/2016	NA	30.82	0.00	4834.18
			12/15/2016	30.98	30.99	0.01	4834.02
			3/16/2017	31.45	31.49	0.04	4833.54
			6/15/2017	31.91	31.95	0.04	4833.08
MW-2	4865.6	39.50	11/4/2015	31.15	31.20	0.05	4834.44
			12/3/2015	31.60	31.62	0.02	4834.00
			12/8/2015	31.50	31.52	0.02	4834.10
			12/22/2015	NA	31.29	0.00	4834.31
			12/30/2015	31.93	31.94	0.01	4833.67
			1/13/2016	NA	31.55	0.00	4834.05
			1/21/2016	NA	31.71	0.00	4833.89
			1/27/2016	NA	31.72	0.00	4833.88
			2/8/2016	31.90	31.92	0.02	4833.70
			2/15/2016	31.53	31.58	0.05	4834.06
			2/16/2016	31.63	31.66	0.03	4833.96
			2/17/2016	32.31	32.35	0.04	4833.28
			2/19/2016	31.68	31.73	0.05	4833.91
			2/24/2016	NA	31.80	0.00	4833.80
			2/29/2016	31.56	31.63	0.07	4834.03
			3/8/2016	NA	32.25	0.00	4833.35
			3/15/2016	NA	32.37	0.00	4833.23
			3/22/2016	NA	32.21	0.00	4833.39
			3/29/2016	NA	32.21	0.00	4833.39
			4/5/2016	NA	32.42	0.00	4833.18
			4/19/2016	32.25	32.27	0.02	4833.35
			4/26/2016	NA	32.36	0.00	4833.24
			5/5/2016	NA	32.12	0.00	4833.48
			6/6/2016	32.10	32.14	0.04	4833.49
			6/20/2016	32.15	32.17	0.02	4833.45
			8/11/2016	NA	31.43	0.00	4834.17
			9/15/2016	31.20	31.27	0.07	4834.39
			12/15/2016	38.31	38.50	0.49	4827.49
			3/16/2017	31.45	31.49	0.04	4834.14
			6/15/2017	32.15	32.20	0.05	4833.44



Table 3 - Gauging Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Well ID	Top of Casing Elevation (ft amsl)	Total Depth of Well (ft)	Date Gauged	Depth to Product (ft btoc)	DTW (ft btoc)	Product Thickness (ft)	Potentiometric Surface Elevation (ft)
MW-3	4866.6	40.00	11/4/2015	35.61	36.52	0.91	4830.81
			12/3/2015	34.74	35.89	1.15	4831.63
			12/8/2015	34.77	35.62	0.85	4831.66
			12/22/2015	34.44	35.36	0.92	4831.98
			12/30/2015	35.07	35.93	0.86	4831.36
			1/13/2016	37.32	37.82	0.50	4829.18
			1/21/2016	33.70	34.78	1.08	4832.69
			1/27/2016	33.62	35.13	1.51	4832.68
			2/8/2016	33.47	35.88	2.41	4832.66
			2/15/2016	32.95	36.07	3.12	4833.04
			2/16/2016	32.98	36.16	3.18	4833.00
			2/17/2016	35.38	36.50	1.12	4831.00
			2/19/2016	33.80	35.09	1.29	4832.55
			2/24/2016	33.58	35.29	1.71	4832.68
			2/29/2016	33.46	35.37	1.91	4832.77
			3/8/2016	33.68	34.69	1.01	4832.72
			3/15/2016	33.65	33.70	0.05	4832.94
			3/22/2016	34.55	35.55	1.00	4831.85
			3/29/2016	34.48	35.38	0.90	4831.94
			4/5/2016	34.95	35.05	0.10	4831.63
			4/19/2016	34.01	34.71	0.70	4832.45
			4/26/2016	34.45	35.04	0.59	4832.03
			5/5/2016	35.37	36.11	0.74	4831.08
			6/6/2016	33.91	34.82	0.91	4832.51
			6/20/2016	33.75	35.32	1.57	4832.54
			8/11/2016	33.90	34.60	0.70	4832.56
			9/15/2016	33.71	34.41	0.70	4832.75
			12/15/2016	33.79	34.30	0.51	4832.71
			3/16/2017	34.87	35.72	0.85	4831.56
			6/16/2017	33.90	34.70	0.80	4832.54
MW-4	4863.7	40.00	11/4/2015	NA	35.69	0.00	4828.01
			12/3/2015	NA	37.50	0.00	4826.20
			12/8/2015	NA	35.78	0.00	4827.92
			12/22/2015	NA	34.55	0.00	4829.15
			12/30/2015	NA	35.60	0.00	4828.10
			1/13/2016	NA	38.05	0.00	4825.65
			1/21/2016	NA	34.28	0.00	4829.42
			1/27/2016	NA	30.36	0.00	4833.34
			2/8/2016	NA	29.24	0.00	4834.46
			2/15/2016	NA	29.03	0.00	4834.67
			2/16/2016	NA	29.02	0.00	4834.68
			2/17/2016	NA	36.60	0.00	4827.10
			2/19/2016	NA	33.94	0.00	4829.76
			2/24/2016	NA	29.81	0.00	4833.89
			2/29/2016	NA	29.51	0.00	4834.19
			3/8/2016	NA	33.15	0.00	4830.55
			3/15/2016	NA	35.27	0.00	4828.43
			3/22/2016	NA	35.13	0.00	4828.57
			3/29/2016	NA	35.02	0.00	4828.68
			4/5/2016	NA	35.94	0.00	4827.76
			4/19/2016	NA	33.14	0.00	4830.56
			4/26/2016	NA	29.88	0.00	4833.82
			5/5/2016	NA	29.36	0.00	4834.34
			6/6/2016	NA	29.35	0.00	4834.35
			6/20/2016	NA	29.31	0.00	4834.39
			8/11/2016	NA	29.00	0.00	4834.70
			9/15/2016	NA	29.03	0.00	4834.67
			12/15/2016	NA	29.48	0.00	4834.22
			3/16/2017	NA	29.89	0.00	4833.81
			6/15/2017	NA	31.90	0.00	4831.80



Table 3 - Gauging Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Well ID	Top of Casing Elevation (ft amsl)	Total Depth of Well (ft)	Date Gauged	Depth to Product (ft btoc)	DTW (ft btoc)	Product Thickness (ft)	Potentiometric Surface Elevation (ft)
MW-5	4868.0	40.00	2/15/2016	40.31	40.41	0.10	4827.67
			2/16/2016	39.95	40.09	0.14	4828.02
			2/17/2016	Dry	Dry	0.00	
			2/19/2016	39.78	40.07	0.29	4828.16
			2/24/2016	38.60	39.19	0.59	4829.28
			2/29/2016	37.66	38.56	0.90	4830.16
			3/8/2016	36.66	37.95	1.29	4831.09
			3/15/2016	36.20	36.35	0.15	4831.77
			3/22/2016	35.95	37.80	1.85	4831.69
			3/29/2016	35.78	36.51	0.73	4832.08
			4/5/2016	NA	35.74	0.00	4832.26
			4/19/2016	35.65	38.30	2.65	4831.83
			4/26/2016	35.48	38.30	2.82	4831.97
			5/5/2016	35.52	35.53	0.01	4832.48
			6/6/2016	39.08	39.85	0.77	4828.77
			6/20/2016	37.22	38.46	1.24	4830.54
			8/11/2016	39.08	39.65	0.57	4828.81
			9/15/2016	37.18	38.37	1.19	4830.59
			12/15/2016	37.05	38.22	1.17	4830.72
			3/16/2017	37.10	38.22	1.12	4830.68
			6/15/2017	36.86	37.90	1.04	4830.94
MW-6	4867.1	45.00	2/15/2016	35.32	36.60	1.28	4831.53
			2/16/2016	35.33	36.91	1.58	4831.46
			2/17/2016	35.95	36.14	0.19	4831.11
			2/19/2016	35.55	36.50	0.95	4831.36
			2/24/2016	35.30	37.55	2.25	4831.36
			2/29/2016	34.76	38.19	3.43	4831.67
			3/8/2016	34.44	39.14	4.70	4831.74
			3/15/2016	34.28	38.44	4.16	4832.00
			3/22/2016	33.92	39.90	5.98	4832.01
			3/29/2016	33.88	40.03	6.15	4832.01
			4/5/2016	34.02	39.58	5.56	4831.99
			4/19/2016	34.11	40.91	6.80	4831.66
			4/26/2016	33.80	38.87	5.07	4832.31
			5/5/2016	34.01	40.78	6.77	4831.76
			6/6/2016	33.94	40.80	6.86	4831.82
			6/20/2016	34.72	39.50	4.78	4831.44
			8/11/2016	35.53	36.32	0.79	4831.42
			9/15/2016	35.17	36.99	1.82	4831.57
			12/15/2016	35.11	36.27	1.16	4831.76
			3/16/2017	35.19	36.20	1.01	4831.71
			6/15/2017	35.25	36.20	0.95	4831.66
MW-7	4862.6	40.00	2/15/2016	31.86	34.29	2.43	4830.26
			2/16/2016	30.00	33.03	3.03	4832.01
			2/17/2016	35.38	36.50	1.12	4827.00
			2/19/2016	30.26	32.22	1.96	4831.96
			2/24/2016	28.01	30.35	2.34	4834.13
			2/29/2016	27.75	29.91	2.16	4834.43
			3/8/2016	27.55	29.73	2.18	4834.62
			3/15/2016	27.61	29.90	2.29	4834.54
			3/22/2016	27.58	29.93	2.35	4834.56
			3/29/2016	27.55	29.95	2.40	4834.58
			4/5/2016	27.75	30.28	2.53	4834.35
			4/19/2016	27.89	27.91	0.02	4834.71
			4/26/2016	27.44	30.06	2.62	4834.65
			5/5/2016	27.81	29.09	1.28	4834.54
			6/6/2016	28.62	30.50	1.88	4833.61
			6/20/2016	28.10	29.61	1.51	4834.20
			8/11/2016	28.68	29.30	0.62	4833.80
			9/15/2016	28.38	29.27	0.89	4834.05
			12/15/2016	28.67	29.32	0.65	4833.80
			3/16/2017	28.96	29.66	0.70	4833.50
			6/15/2017	29.21	29.89	0.68	4833.26



Table 3 - Gauging Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Well ID	Top of Casing Elevation (ft amsl)	Total Depth of Well (ft)	Date Gauged	Depth to Product (ft btoc)	DTW (ft btoc)	Product Thickness (ft)	Potentiometric Surface Elevation (ft)
MW-8	4864.3	40.00	2/15/2016	NA	35.85	0.00	4828.45
			2/16/2016	NA	34.10	0.00	4830.20
			2/17/2016	NA	35.09	0.00	4829.21
			2/19/2016	NA	32.57	0.00	4831.73
			2/24/2016	NA	28.81	0.00	4835.49
			2/29/2016	NA	27.45	0.00	4836.85
			3/8/2016	NA	27.14	0.00	4837.16
			3/15/2016	NA	27.25	0.00	4837.05
			3/22/2016	NA	33.80	0.00	4830.50
			3/29/2016	NA	27.38	0.00	4836.92
			4/5/2016	27.70	27.73	0.03	4836.59
			4/19/2016	28.04	28.06	0.02	4836.26
			4/26/2016	27.72	27.75	0.03	4836.57
			5/5/2016	28.28	28.30	0.02	4836.02
			6/6/2016	28.46	28.52	0.06	4835.83
			6/20/2016	NA	27.83	0.00	4836.47
			8/11/2016	NA	26.28	0.00	4838.02
			9/15/2016	26.35	26.36	0.01	4837.95
			12/15/2016	NA	27.45	0.00	4836.85
			3/16/2017	28.06	28.07	0.01	4836.24
			6/15/2017	NA	27.15	0.00	4837.15
MW-9	4860.9	35.00	3/15/2016	NA	33.45	0.00	4827.45
			3/21/2016	NA	31.84	0.00	4829.06
			3/22/2016	NA	33.80	0.00	4827.10
			3/29/2016	NA	31.85	0.00	4829.05
			4/5/2016	NA	29.98	0.00	4830.92
			4/19/2016	NA	27.48	0.00	4833.42
			4/26/2016	NA	26.80	0.00	4834.10
			5/5/2016	NA	26.61	0.00	4834.29
			6/6/2016	NA	26.50	0.00	4834.40
			6/20/2016	NA	26.40	0.00	4834.50
			8/11/2016	NA	26.52	0.00	4834.38
			9/15/2016	NA	26.75	0.00	4834.15
			12/15/2016	NA	27.09	0.00	4833.81
			3/16/2017	NA	27.44	0.00	4833.46
			6/15/2017	NA	27.72	0.00	4833.18
MW-10	4867.7	39	3/15/2016	NA	Dry	0.00	
			3/21/2016	NA	Dry	0.00	
			3/22/2016	NA	Dry	0.00	
			3/29/2016	NA	Dry	0.00	
			4/5/2016	NA	39.12	0.00	4828.58
			4/19/2016	NA	38.19	0.00	4829.51
			4/26/2016	NA	37.78	0.00	4829.92
			5/5/2016	NA	37.58	0.00	4830.12
			6/6/2016	NA	37.35	0.00	4830.35
			6/20/2016	NA	37.32	0.00	4830.38
			8/11/2016	NA	37.20	0.00	4830.50
			9/15/2016	NA	37.13	0.00	4830.57
			12/15/2016	NA	36.89	0.00	4830.81
			3/16/2017	NA	36.75	0.00	4830.95
			6/15/2017	NA	36.41	0.00	4831.29
MW-11	4871.6	44.00	3/15/2016	NA	41.07	0.00	4830.53
			3/21/2016	NA	41.10	0.00	4830.50
			3/22/2016	NA	42.22	0.00	4829.38
			3/29/2016	NA	40.98	0.00	4830.62
			4/5/2016	NA	41.06	0.00	4830.54
			4/19/2016	NA	47.15	0.00	4824.45
			4/26/2016	NA	40.83	0.00	4830.77
			5/5/2016	NA	41.06	0.00	4830.54
			6/6/2016	NA	41.00	0.00	4830.60
			6/20/2016	NA	41.08	0.00	4830.52
			8/11/2016	NA	41.83	0.00	4829.77
			9/15/2016	NA	40.81	0.00	4830.79
			12/15/2016	NA	40.59	0.00	4831.01
			3/16/2017	NA	40.39	0.00	4831.21
			6/15/2017	NA	40.17	0.00	4831.43



Table 3 - Gauging Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Well ID	Top of Casing Elevation (ft amsl)	Total Depth of Well (ft)	Date Gauged	Depth to Product (ft btoc)	DTW (ft btoc)	Product Thickness (ft)	Potentiometric Surface Elevation (ft)
MW-12	4870.1	38.00	3/15/2016	NA	Dry	0.00	
			3/21/2016	NA	Dry	0.00	
			3/22/2016	NA	Dry	0.00	
			3/29/2016	NA	Dry	0.00	
			4/5/2016	NA	40.09	0.00	4830.01
			4/19/2016	NA	39.46	0.00	4830.64
			4/26/2016	NA	39.28	0.00	4830.82
			5/5/2016	NA	39.16	0.00	4830.94
			6/6/2016	NA	38.94	0.00	4831.16
			6/20/2016	NA	38.91	0.00	4831.19
			8/11/2016	NA	38.83	0.00	4831.27
			9/15/2016	NA	38.78	0.00	4831.32
			12/15/2016	NA	38.67	0.00	4831.43
			3/16/2017	NA	38.61	0.00	4831.49
			6/15/2017	NA	38.45	0.00	4831.65
MW-13	4864.4	40.00	3/15/2016	NA	Dry	0.00	
			3/21/2016	NA	38.86	0.00	4825.54
			3/22/2016	NA	39.35	0.00	4825.05
			3/29/2016	NA	37.37	0.00	4827.03
			4/5/2016	NA	35.84	0.00	4828.56
			4/19/2016	NA	33.26	0.00	4831.14
			4/26/2016	NA	32.39	0.00	4832.01
			5/5/2016	NA	31.71	0.00	4832.69
			6/6/2016	NA	30.83	0.00	4833.57
			6/20/2016	NA	30.76	0.00	4833.64
			8/11/2016	NA	31.00	0.00	4833.40
			9/15/2016	NA	30.77	0.00	4833.63
			12/15/2016	NA	31.06	0.00	4833.34
			3/16/2017	NA	31.15	0.00	4833.25
			6/15/2017	NA	31.30	0.00	4833.10
MW-14	4863.7	40.00	3/15/2016	NA	29.62	0.00	4834.08
			3/21/2016	NA	29.55	0.00	4834.15
			3/22/2016	NA	29.35	0.00	4834.35
			3/29/2016	NA	29.37	0.00	4834.33
			4/5/2016	NA	29.64	0.00	4834.06
			4/19/2016	NA	29.85	0.00	4833.85
			4/26/2016	NA	29.51	0.00	4834.19
			5/5/2016	NA	29.79	0.00	4833.91
			6/6/2016	NA	29.73	0.00	4833.97
			6/20/2016	NA	29.94	0.00	4833.76
			8/11/2016	NA	29.71	0.00	4833.99
			9/15/2016	NA	29.80	0.00	4833.90
			12/15/2016	NA	29.87	0.00	4833.83
			3/16/2017	NA	30.29	0.00	4833.41
			6/15/2017	NA	30.65	0.00	4833.05
MW-15	4861.4	34.00	3/15/2016	NA	35.15	0.00	4826.25
			3/21/2016	NA	33.75	0.00	4827.65
			3/22/2016	NA	34.15	0.00	4827.25
			3/29/2016	NA	31.69	0.00	4829.71
			4/5/2016	NA	30.14	0.00	4831.26
			4/19/2016	NA	28.50	0.00	4832.90
			4/26/2016	NA	27.96	0.00	4833.44
			5/5/2016	NA	27.64	0.00	4833.76
			6/6/2016	NA	27.12	0.00	4834.28
			6/20/2016	NA	27.00	0.00	4834.40
			8/11/2016	NA	27.47	0.00	4833.93
			9/15/2016	NA	27.19	0.00	4834.21
			12/15/2016	NA	27.60	0.00	4833.80
			3/16/2017	NA	28.11	0.00	4833.29
			6/15/2017	NA	28.59	0.00	4832.81



Table 3 - Gauging Data

Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado

Well ID	Top of Casing Elevation (ft amsl)	Total Depth of Well (ft)	Date Gauged	Depth to Product (ft btoc)	DTW (ft btoc)	Product Thickness (ft)	Potentiometric Surface Elevation (ft)
MW-16	4863.4	39.00	3/15/2016	NA	35.52	0.00	4827.88
			3/21/2016	NA	32.67	0.00	4830.73
			3/22/2016	36.31	36.34	0.03	4827.08
			3/29/2016	NA	30.70	0.00	4832.70
			4/5/2016	NA	29.65	0.00	4833.75
			4/19/2016	NA	29.19	0.00	4834.21
			4/26/2016	NA	28.98	0.00	4834.42
			5/5/2016	NA	29.18	0.00	4834.22
			6/6/2016	NA	29.27	0.00	4834.13
			6/20/2016	NA	29.30	0.00	4834.10
			8/11/2016	NA	29.30	0.00	4834.10
			9/15/2016	NA	29.20	0.00	4834.20
			12/15/2016	NA	29.15	0.00	4834.25
			3/16/2017	NA	29.13	0.00	4834.27
			6/15/2017	NA	29.53	0.00	4833.87
MW-17	4866.0	44.00	3/16/2016	NA	Dry	0.00	
			3/21/2016	43.16	NA	0.84	
			3/22/2016	44.45	45.53	1.08	4821.34
			3/29/2016	39.16	43.55	4.39	4825.98
			4/5/2016	36.62	42.32	5.70	4828.26
			4/19/2016	34.22	42.25	8.03	4830.21
			4/26/2016	33.39	42.16	8.77	4830.89
			5/5/2016	33.04	42.05	9.01	4831.19
			6/6/2016	32.71	41.94	9.23	4831.48
			6/20/2016	36.13	43.14	7.01	4828.50
			8/11/2016	44.20	45.25	1.05	4821.59
			9/15/2016	40.19	43.34	3.15	4825.19
			12/15/2016	40.75	43.09	2.34	4824.79
			3/16/2017	38.92	41.12	2.20	4826.65
			6/15/2017	38.00	39.74	1.74	4827.66
MW-18	4868.6	44.00	3/16/2016	NA	38.87	0.00	4829.73
			3/21/2016	NA	37.72	0.00	4830.88
			3/22/2016	NA	38.10	0.00	4830.50
			3/29/2016	NA	37.55	0.00	4831.05
			4/5/2016	NA	37.74	0.00	4830.86
			4/19/2016	NA	37.87	0.00	4830.73
			4/26/2016	NA	37.55	0.00	4831.05
			5/5/2016	NA	37.79	0.00	4830.81
			6/6/2016	NA	37.75	0.00	4830.85
			6/20/2016	NA	37.90	0.00	4830.70
			8/11/2016	NA	37.63	0.00	4830.97
			9/15/2016	NA	37.56	0.00	4831.04
			12/15/2016	NA	37.33	0.00	4831.27
			3/16/2017	NA	37.29	0.00	4831.31
			6/15/2017	NA	37.49	0.00	4831.11
MW-19	4870.2	39.00	3/21/2016	NA	Dry	0.00	
			3/22/2016	NA	Dry	0.00	
			3/29/2016	NA	Dry	0.00	
			4/5/2016	NA	Dry	0.00	
			4/19/2016	NA	39.87	0.00	4830.33
			4/26/2016	NA	39.56	0.00	4830.64
			5/5/2016	NA	39.44	0.00	4830.76
			6/6/2016	NA	39.20	0.00	4831.00
			6/20/2016	NA	39.18	0.00	4831.02
			8/11/2016	NA	39.10	0.00	4831.10
			9/15/2016	NA	39.05	0.00	4831.15
			12/15/2016	NA	38.92	0.00	4831.28
			3/16/2017	NA	38.81	0.00	4831.39
			6/15/2017	NA	38.68	0.00	4831.52



Table 3 - Gauging Data

**Whiting Oil and Gas Corporation
Nelson C-1
Weld County, Colorado**

Well ID	Top of Casing Elevation (ft amsl)	Total Depth of Well (ft)	Date Gauged	Depth to Product (ft btoc)	DTW (ft btoc)	Product Thickness (ft)	Potentiometric Surface Elevation (ft)
MW-20	4867.0	39.00	3/21/2016	33.95	38.85	4.90	4832.09
			3/22/2016	38.35	40.21	1.86	4828.29
			3/29/2016	38.34	39.15	0.81	4828.50
			4/5/2016	33.52	38.88	5.36	4832.43
			4/19/2016	33.67	38.29	4.62	4832.42
			4/26/2016	33.26	38.05	4.79	4832.80
			5/5/2016	33.60	36.30	2.70	4832.87
			6/6/2016	33.85	38.85	5.00	4832.17
			6/20/2016	33.80	38.30	4.50	4832.32
			8/11/2016	35.02	38.32	3.30	4831.33
			9/15/2016	33.89	37.57	3.68	4832.39
			12/15/2016	34.10	35.90	1.80	4832.55
			3/16/2017	34.27	35.91	1.64	4832.41
			6/15/2017	34.27	35.88	1.61	4832.41
MW-21	4864.0	40.15	6/29/2017	NA	Dry	0.00	
MW-22	4866.9	39.68	6/29/2017	35.69	35.88	0.19	4831.17

NA - Not Applicable

DTW - Depth to Water

ft btoc - Feet Below Top of Casing

ft amsl - Feet Above Mean Sea Level

Attachment 3
Boring Logs

SOIL BORING / MONITORING WELL LOG

PROJECT: Nelson C-1
 PROJECT NUMBER: 701530.020.08
 CLIENT: Whiting Oil & Gas
 BORING / WELL NUMBER: MW-21
 TOTAL DEPTH: 40'
 SURFACE ELEVATION: 4861.2
 GEOLOGIST: Ken Rogowski / Jason Leverton
 LATITUDE: 40.836680

DRILLING COMPANY: _____
 DRILLER: Shawn/DE
 DRILLING METHOD: HSA
 BORE HOLE DIAMETER: 7 7/8'
 SCREEN: Diam. 4" Length 20 Slot Size 0.010"
 CASING: Diam. 4" Length 23' Type SCH 40
 DATE DRILLED: 06/27/2017
 LONGITUDE: -103.905987

PAGE 1 of 2

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	PID	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
0							10 YR 6/2 Light Brownish Gray, Silty Clay, Few Gravels, Dry, Loose, No Odor	0
5			0.0				10 YR 4/3 Dark Grayish Brown, Clayey Silt, Slightly Plastic Seam @ 7', Some Black Coloration @ 7', Dense, No Odor	5
10			0.0			10'	10 YR 6/2 Light Brownish Gray, Silt @ 11', Silt stone 11' with Iron, Deposits Through, Non-Plastic, Dense, No Odor	10
15			0.0				10 YR 6/1 Seam of Clayey Silt From 15'-16', Loose, Dry, Non-Plastic 10 YR 7/1 Silt stone @ 16'-20', Dry, Dense, Non-Plastic, No Odor	15
20			0.0				5 YR 7/1, Silt stone, Dense, Reddish & Yellowish Deposits from 23-25; Dry, No Odor	20
25			0.0			25'	Gley 1 5/10 Y Greenish Gray, Siltstone, Iron Deposits, Dense, Greenish Gray, Minimal Moisture, Slight Odor	25
30			191.4	25'-30'			Gley 1 5/10 Y Greenish Gray, 34.5'-35' Gley 14/10 GY Dark Greenish	30

REMARKS:

THIS BORING LOG AND WELL DIAGRAM SHOULD NOT BE USED SEPARATE FROM THE ORIGINAL REPORT.



SOIL BORING / MONITORING WELL LOG

PROJECT: Nelson C-1
 PROJECT NUMBER: 701530.020.08
 CLIENT: Whiting Oil & Gas
 BORING / WELL NUMBER: MW-21
 TOTAL DEPTH: 40'
 SURFACE ELEVATION: 4861.2
 GEOLOGIST: Ken Rogowski / Jason Leverton
 LATITUDE: 40.836680

DRILLING COMPANY: _____
 DRILLER: Shawn/DE
 DRILLING METHOD: HSA
 BORE HOLE DIAMETER: 7 7/8'
 SCREEN: Diam. 4" Length 20 Slot Size 0.010"
 CASING: Diam. 4" Length 23' Type SCH 40
 DATE DRILLED: 06/27/2017
 LONGITUDE: -103.905987

PAGE 2 of 2

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	PID	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
35			96.0		30'-35'		Gray, Slight Odor	35
40			2.5		35'-40'	40'	Gley 1 4/10 GY Dark Greenish Gray, 39'-40'10 YR 6/3 , No Odor	40
45							Bottom of Hole	45
50								50
55								55
60								60

REMARKS:

THIS BORING LOG AND WELL DIAGRAM SHOULD NOT BE USED SEPARATE FROM THE ORIGINAL REPORT.



SOIL BORING / MONITORING WELL LOG

PROJECT: Nelson C-1
 PROJECT NUMBER: 701530.020.08
 CLIENT: Whiting Oil & Gas
 BORING / WELL NUMBER: MW-22
 TOTAL DEPTH: 40'
 SURFACE ELEVATION: 4863.9
 GEOLOGIST: KR / JL
 LATITUDE: 40.837107

DRILLING COMPANY: _____
 DRILLER: Shawn/DE
 DRILLING METHOD: HSA
 BORE HOLE DIAMETER: 7 7/8'
 SCREEN: Diam. 4" Length 20' Slot Size 0.010
 CASING: Diam. 4" Length 23' Type SCH 40
 DATE DRILLED: 06/27/2017
 LONGITUDE: -103.905838

PAGE 1 of 2

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	PID	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
0							10 YR 5/3 Brown, Silty Clay Loose 1-3, Firm 3'-5' W/Gravel, Dry, No Odor	0
5			0.1				10 YR 6/4 Light Yellowish Brown, Silty Clay, Loose, Non- Plastic, Dry, No Odor	5
10			0.0				10'-14' Single Grain, 10 YR 6/4 Silty Clay, Light Yellow Brown, Dry 14'-15' 10YR 6/3 Pale Brown, Sub-Angular Blocky, Silt/Silt Stone, Dry, Black Iron Deposits	10
15			0.3				10 YR 5/2 Grayish Brown, Silty Clay, Sub-Angular Blocky, Slight Moisture, Iron Deposits, Some Black Staining 20', No Odor	15
20			0.6			20'	10 YR 6/2 Light Brownish Gray, Silty Clay/ Silt Stone Plates, Slightly Moist, Sub-Angular Blocky, Iron Deposits, Dark Staining, No Odor	20
25			0.7		20'-25'	25'	Gley 1 6/10 Y Greenish Gray, Silt Stone, Dense, Moist, Iron Deposits/ Dark Staining, Slight Odor	25
30			70.4		25'-30'		Gley 1 6/10 Y Greenish Gray, Silt stone Dense. Moist, Iron Deposits/	30

REMARKS:

THIS BORING LOG AND WELL DIAGRAM SHOULD NOT BE USED SEPARATE FROM THE ORIGINAL REPORT.



SOIL BORING / MONITORING WELL LOG

PROJECT: <u>Nelson C-1</u>	DRILLING COMPANY: _____
PROJECT NUMBER: <u>701530.020.08</u>	DRILLER: <u>Shawn/DE</u>
CLIENT: <u>Whiting Oil & Gas</u>	DRILLING METHOD: <u>HSA</u>
BORING / WELL NUMBER: <u>MW-22</u>	BORE HOLE DIAMETER: <u>7 7/8'</u>
TOTAL DEPTH: <u>40'</u>	SCREEN: Diam. <u>4"</u> Length <u>20'</u> Slot Size <u>0.010</u>
SURFACE ELEVATION: <u>4863.9</u>	CASING: Diam. <u>4"</u> Length <u>23'</u> Type <u>SCH 40</u>
GEOLOGIST: <u>KR / JL</u>	DATE DRILLED: <u>06/27/2017</u>
LATITUDE: <u>40.837107</u>	LONGITUDE: <u>-103.905838</u>

PAGE 2 of 2

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	PID	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
35			1215		30'-35'		Dark Staining, Strong Odor	35
40			33.6		35'-40'	40'	Gley 10 YR 5/10 , Silt stone, Dense, Moist, More Iron Deposits, No Odor	40
45							Bottom of Hole	45
50								50
55								55
60								60

REMARKS:

THIS BORING LOG AND WELL DIAGRAM SHOULD NOT BE USED SEPARATE FROM THE ORIGINAL REPORT.



KEY TO SYMBOLS

Symbol Description

Strata symbols



Low plasticity
clay



Silt



Silty sand

Soil Samplers



Auger

Monitor Well Details



recessed cover
set in concrete



bentonite pellets



silica sand, blank PVC



slotted pipe w/ sand



endcap on pipe
packed in sand

Notes:

1. Exploratory borings were drilled on 06/27/2017 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

Attachment 4
Analytical Report

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 10, 2017

Jennifer Galles
Talon/LPE
1811 E Mulberry
Ft Collins, CO 80524
RE: Nelson C1

Enclosed are the results of analyses for samples received by Summit Scientific on 06/30/17 15:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Ben Shrewsbury
Laboratory Manager



Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-21@25-30'	1706318-01	Soil	06/27/17 09:04	06/30/17 15:50
MW-21@30-35'	1706318-02	Soil	06/27/17 09:20	06/30/17 15:50
MW-21@35-40'	1706318-03	Soil	06/27/17 09:30	06/30/17 15:50
MW-22@25-30'	1706318-04	Soil	06/27/17 11:31	06/30/17 15:50
MW-22@30-35'	1706318-05	Soil	06/27/17 11:40	06/30/17 15:50
MW-22@35-40'	1706318-06	Soil	06/27/17 11:53	06/30/17 15:50

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.

Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1

Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

Summit Scientific 1706318

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

Page 1 of 1

Client: Talon/LPE - Bill Whiting Petroleum

Address: 1811 East Mulberry

City/State/Zip: Fort Collins, CO 80524

Phone: 970-818-5330 Fax:

Sampler Name: Ken Rogowski/Jason Leverton

Project Manager: Jennifer Galles

E-Mail: jgalles@talonlpe.com

Project Name: Nelson C-1

Project Number:	701530.020.08
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[illegible]

www.s2scientific.com

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.



Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

Sample Receipt Checklist

S2 Work Order: 1706318

Client: Talon Client Project ID: Nelson C-1

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

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

Cooler ID					
Temp (°C)	<u>13.8</u>				

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

Muriel P.
Custodian Printed Name

NA 630-17
Signature or Initials of Custodian

18:20
Date/Time



Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

MW-21@25-30'
1706318-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/17 09:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1707010	07/03/17	07/03/17	8015M	

Date Sampled: **06/27/17 09:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/17 09:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1707012	07/03/17	07/03/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/27/17 09:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	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.



Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

MW-21@30-35'
1706318-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/17 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1707010	07/03/17	07/03/17	8015M	

Date Sampled: **06/27/17 09:20**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/17 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1707012	07/03/17	07/03/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/27/17 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		117 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		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.



Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

MW-21@35-40'
1706318-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/17 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1707010	07/03/17	07/03/17	8015M	

Date Sampled: **06/27/17 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.4 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/17 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1707012	07/03/17	07/03/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/27/17 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	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.



Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

MW-22@25-30'
1706318-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/17 11:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1707010	07/03/17	07/03/17	8015M	

Date Sampled: **06/27/17 11:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		105 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/17 11:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1707012	07/03/17	07/03/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/27/17 11:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		107 %	21-167		"	"	"	"	

Summit Scientific

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Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

MW-22@30-35'
1706318-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/17 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1707010	07/03/17	07/03/17	8015M	

Date Sampled: **06/27/17 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/17 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1707012	07/03/17	07/04/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/27/17 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	21-167		"	"	"	"	

Summit Scientific

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Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

MW-22@35-40'
1706318-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/17 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1707010	07/03/17	07/03/17	8015M	

Date Sampled: **06/27/17 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/17 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1707012	07/03/17	07/04/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/27/17 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		116 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Summit Scientific

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Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1707010 - EPA 3550A

Blank (1707010-BLK1)

Prepared & Analyzed: 07/03/17

C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	14.1		"	12.5	113	30-150				

LCS (1707010-BS1)

Prepared & Analyzed: 07/03/17

C10-C28 (DRO)	540	50	mg/kg	499	108	73-134				
Surrogate: o-Terphenyl	13.6		"	12.5	109	30-150				

Matrix Spike (1707010-MS1)

Source: 1706318-01

Prepared & Analyzed: 07/03/17

C10-C28 (DRO)	523	50	mg/kg	499	36.0	97.5	50-148			
Surrogate: o-Terphenyl	13.2		"	12.5	106	30-150				

Matrix Spike Dup (1707010-MSD1)

Source: 1706318-01

Prepared & Analyzed: 07/03/17

C10-C28 (DRO)	519	50	mg/kg	499	36.0	96.7	50-148	0.768	20	
Surrogate: o-Terphenyl	12.9		"	12.5	103	30-150				

Summit Scientific

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Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

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 1707012 - EPA 5030 Soil MS

Blank (1707012-BLK1)

Prepared & Analyzed: 07/03/17

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0417		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0405		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0424		"	0.0400		106	21-167			

LCS (1707012-BS1)

Prepared & Analyzed: 07/03/17

Benzene	0.0794	0.0020	mg/kg	0.100		79.4	58-130			
Toluene	0.0846	0.0050	"	0.100		84.6	61-134			
Ethylbenzene	0.0827	0.0050	"	0.0992		83.4	74-139			
m,p-Xylene	0.165	0.010	"	0.200		82.4	73-137			
o-Xylene	0.0856	0.0050	"	0.0980		87.3	73-141			
Xylenes (total)	0.250	0.0050	"				30-150			
Gasoline Range Hydrocarbons	0.320	0.50	"				30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0439		"	0.0400		110	23-173			
Surrogate: Toluene-d8	0.0408		"	0.0400		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0423		"	0.0400		106	21-167			

Matrix Spike (1707012-MS1)

Source: 1706318-01

Prepared & Analyzed: 07/03/17

Benzene	0.0877	0.0020	mg/kg	0.100	ND	87.7	30-131			
Toluene	0.0984	0.0050	"	0.100	ND	98.4	30-134			
Ethylbenzene	0.0960	0.0050	"	0.0992	ND	96.7	22-153			
m,p-Xylene	0.192	0.010	"	0.200	ND	96.4	10-159			
o-Xylene	0.0984	0.0050	"	0.0980	ND	100	31-151			
Xylenes (total)	0.291	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	0.367	0.50	"		ND		30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0431		"	0.0400		108	23-173			
Surrogate: Toluene-d8	0.0414		"	0.0400		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0436		"	0.0400		109	21-167			

Summit Scientific

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Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1
Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

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 1707012 - EPA 5030 Soil MS

Matrix Spike Dup (1707012-MSD1)		Source: 1706318-01			Prepared & Analyzed: 07/03/17					
Benzene	0.0770	0.0020	mg/kg	0.100	ND	77.0	30-131	13.0	34	
Toluene	0.0854	0.0050	"	0.100	ND	85.4	30-134	14.1	30	
Ethylbenzene	0.0842	0.0050	"	0.0992	ND	84.9	22-153	13.1	24	
m,p-Xylene	0.168	0.010	"	0.200	ND	84.2	10-159	13.5	68	
o-Xylene	0.0858	0.0050	"	0.0980	ND	87.6	31-151	13.7	38	
Xylenes (total)	0.254	0.0050	"		ND		30-150	13.5	20	
Gasoline Range Hydrocarbons	0.320	0.50	"		ND		30-150	13.7	20	
Surrogate: 1,2-Dichloroethane-d4	0.0422		"	0.0400		105	23-173			
Surrogate: Toluene-d8	0.0411		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0423		"	0.0400		106	21-167			

Summit Scientific

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Talon/LPE
1811 E Mulberry
Ft Collins CO, 80524

Project: Nelson C1

Project Number: 701530.020.08
Project Manager: Jennifer Galles

Reported:
07/10/17 15:07

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