

# Fourth Quarter 2017 Groundwater Monitoring Summary Report

## County Road 20 and Highway 85 Release Fort Lupton, Colorado

Prepared for:



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Denver, CO 80202

*Prepared by:*



6899 Pecos Street, Unit C  
Denver, Colorado 80221

**February 2, 2018**

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## **1. Introduction**

This report summarizes the groundwater monitoring and remediation activities conducted during the fourth quarter 2017 at the County Road (CR) 20 and Highway (Hwy) 85 pipeline release (Site) in Fort Lupton, Colorado (Figure 1). Tasman Geosciences (Tasman) performed these activities on behalf of DCP Midstream, LP (DCP). The field activities were conducted with the purpose of monitoring groundwater flow and quality conditions. Current Site conditions were evaluated from field data and analytical laboratory results collected during the reporting period on November 1, 2017.

## **2. Site Location and Background**

The Site is located in the southwestern quarter of the southwestern quarter of Section 17, Township 2 North, Range 66 West (approximate coordinates 40.130908 degrees north and -104.806673 degrees west). It is approximately 0.20 miles east on CR 20 from the intersection with Hwy 85, Ft. Lupton, Colorado.

On May 28, 2014, a petroleum hydrocarbon release was discovered following pipeline repair activities. An initial Form 19 was submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on June 5, 2014. Quarterly groundwater monitoring activities were initiated during May 2015 at the Site.

## **3. Groundwater Monitoring**

This section describes the field and laboratory activities performed during the fourth quarter 2017 groundwater monitoring event. Quarterly monitoring activities were conducted on November 1, 2017, and included Site-wide groundwater gauging and sampling. Figure 2 illustrates the groundwater monitoring network locations utilized to monitor the Site.

### **3.1 Groundwater Elevation Monitoring**

Groundwater levels were measured to evaluate hydraulic characteristics and provide information regarding seasonal fluctuations in groundwater elevations at the Site. During the fourth quarter 2017, groundwater levels were measured at six (6) monitoring well locations (BH01-BH03 and BH05-BH07).

Groundwater levels were 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 later converted to elevation (feet above mean sea level [AMSL]). Measured groundwater levels and the calculated groundwater elevations are presented in Table 1.

A fourth quarter 2017 groundwater elevation map, included as Figure 3, indicates that the groundwater gradient in proximity to the Site is generally flat. The relatively small scale between the differences in groundwater elevation and spatial distances between monitoring locations at the Site do not allow for accurate gradient contouring. Observed variations in groundwater elevations are likely attributed to several factors including seasonal fluctuations, increased use of the irrigation ditch to the west of the Site, flooding or increased irrigation of the farm to the north of the Site, and/or shallow groundwater use for irrigation to the east of the Site. Groundwater elevations will continue to be monitored during subsequent events. The range of groundwater elevations, average elevation change from the previous monitoring

event, and the calculated average hydraulic gradient (using elevations from BH05 and BH06) at the Site are summarized in the table below.

#### Summary of Measured Hydraulic Parameters

|   | Fourth Quarter 2017 (11/1/17) |
|---|-------------------------------|
| Maximum Elevation (Well ID)                               | 4,863.20 (BH06)               |
| Minimum Elevation (Well ID)                               | 4,862.58 (BH05)               |
| Average Change from Previous Monitoring Event – All Wells | -1.79 feet                    |
| Average Hydraulic Gradient (ft/ft) / (Well IDs)           | 0.015 (BH05 to BH06)          |

### 3.2 Groundwater Quality Monitoring

Subsequent to recording groundwater level measurements at each monitoring well, groundwater samples were collected from the six Site monitoring wells using disposable polyethylene bailers.

A minimum of three well casing volumes of groundwater were purged from each monitor well prior to collecting groundwater samples. Groundwater samples were placed in clean laboratory supplied containers for the selected analytical methods, packed in an ice-filled cooler and maintained at approximately four degrees Celsius ( $^{\circ}\text{C}$ ) for transportation to the laboratory. Groundwater samples were then delivered under chain-of-custody procedures to Summit Scientific Laboratories (Summit) in Golden, Colorado for analysis.

Water quality samples were submitted for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX) by United States Environmental Protection Agency (USEPA) Method 8260B.

Table 2 summarizes BTEX concentrations in groundwater samples collected during the fourth quarter 2017 monitoring event. Historic analytical results up to and including the fourth quarter 2017 event are included in Appendix A and the laboratory analytical report for the fourth quarter 2017 is included in Appendix B. Analytical results are also displayed on Figure 4.

Analytical results/observations are summarized below:

- The benzene concentration at monitoring well BH07 (31 micrograms per liter [ $\mu\text{g/L}$ ]) was in exceedance of the COGCC Table 910-1 standard of 5  $\mu\text{g/L}$ . Toluene, ethylbenzene, and total xylenes concentrations at BH07 were reported below the COGCC Table 910-1 standards and/or laboratory detection limits during the fourth quarter 2017 monitoring event.
- BTEX concentrations at the five (5) other monitoring wells (BH01, BH02, BH03, BH05, and BH06) were reported below the COGCC Table 910-1 standards and/or laboratory detection limits during the fourth quarter 2017 monitoring event.

## **4. Remediation Activities**

This Section includes a description of the active remediation activities at the Site along with observations during remediation efforts.

### **4.1 Groundwater Remediation Activities**

As reported in previous quarterly monitoring reports, mobile, vacuum enhanced fluid recovery (EFR) groundwater remediation events were initiated at the Site during the third quarter 2015 and discontinued during the fourth quarter 2016 due to the absence of light non-aqueous phase liquid (LNAPL) as well as decreased dissolved phase BTEX concentrations. Supplemental groundwater remediation activities have not been conducted at the Site since November 2016.

## **5. Conclusions**

Comparison of the fourth quarter 2017 monitoring data and historic information provides the following general observations:

- Groundwater elevations and flow direction at the Site continue to fluctuate when compared to previous quarterly sampling events as indicated by the groundwater elevations depicted on Figure 3 and summarized on Table 1. During the fourth quarter 2017 monitoring event, groundwater elevations were generally flat, which is consistent with historic monitoring data. Groundwater elevation and flow directions will continue to be monitored during subsequent quarterly events.
- At BH07, concentrations of benzene and xylene have periodically fluctuated from below to above COGCC Table 910-1 standards since monitoring was initiated at this location in May 2015. Variability in concentrations is likely a result of residual impacts in soils coming into contact with fluctuating groundwater levels as a result of seasonal runoff and local irrigation practices.
- BTEX concentrations at the 5 other monitoring well locations were below COGCC standards and/or laboratory detection limits during the fourth quarter 2017 monitoring event.

## **6. Recommendations**

Based on evaluation of data from the fourth quarter 2017 and historic Site observations and monitoring results, recommendations for future activities include:

- Continue quarterly groundwater monitoring and sampling at the monitoring well locations illustrated on Figure 2.

## Tables

**TABLE 1**  
**FOURTH QUARTER 2017**  
**SUMMARY OF GROUNDWATER ELEVATION DATA**  
**DCP CR 20 AND HWY 85 RELEASE**  
**WELD COUNTY, COLORADO**

| Location  | Date      | Depth to Groundwater (feet) | Depth to Product (feet) | Free Phase Hydrocarbon Thickness (feet) | Total Depth (feet) | TOC Elevation (feet amsl) | Groundwater Elevation (feet amsl) | Change in Groundwater Elevation Since Previous Event (1) (feet) |
|---|-----------|-----------------------------|-------------------------|---|--------------------|---------------------------|-----------------------------------|---|
| BH01  | 2/28/2017 | 16.51                       |                         |   | 18.13              | 4,875.68                  | 4,859.17                          | -2.06   |
| BH01  | 5/8/2017  | 15.45                       |                         |   | 18.13              | 4,875.68                  | 4,860.23                          | 1.06  |
| BH01  | 8/1/2017  | 11.00                       |                         |   | 18.11              | 4,875.68                  | 4,864.68                          | 4.45  |
| BH01  | 11/1/2017 | 12.70                       |                         |   | 18.13              | 4,875.68                  | 4,862.98                          | -1.70   |
| BH02  | 2/28/2017 | 15.82                       |                         |   | 18.76              | 4,874.94                  | 4,859.12                          | -2.01   |
| BH02  | 5/8/2017  | 14.72                       |                         |   | 18.73              | 4,874.94                  | 4,860.22                          | 1.10  |
| BH02  | 8/1/2017  | 10.29                       |                         |   | 18.73              | 4,874.94                  | 4,864.65                          | 4.43  |
| BH02  | 11/1/2017 | 12.11                       |                         |   | 18.80              | 4,874.94                  | 4,862.83                          | -1.82   |
| BH03  | 2/28/2017 | 15.34                       |                         |   | 18.76              | 4,874.51                  | 4,859.17                          | -2.03   |
| BH03  | 5/8/2017  | 14.27                       |                         |   | 18.80              | 4,874.51                  | 4,860.24                          | 1.07  |
| BH03  | 8/1/2017  | 9.80                        |                         |   | 18.82              | 4,874.51                  | 4,864.71                          | 4.47  |
| BH03  | 11/1/2017 | 11.59                       |                         |   | 18.84              | 4,874.51                  | 4,862.92                          | -1.79   |
| BH05  | 2/28/2017 | 15.52                       |                         |   | 18.99              | 4,874.67                  | 4,859.15                          | -2.05   |
| BH05  | 5/8/2017  | 14.47                       |                         |   | 18.97              | 4,874.67                  | 4,860.20                          | 1.05  |
| BH05  | 8/1/2017  | 9.97                        |                         |   | 19.00              | 4,874.67                  | 4,864.70                          | 4.50  |
| BH05  | 11/1/2017 | 12.09                       |                         |   | 18.80              | 4,874.67                  | 4,862.58                          | -2.12   |
| BH06  | 2/28/2017 | 15.88                       |                         |   | 18.56              | 4,874.95                  | 4,859.07                          | -2.08   |
| BH06  | 5/8/2017  | 14.87                       |                         |   | 18.80              | 4,874.95                  | 4,860.08                          | 1.01  |
| BH06  | 8/1/2017  | 10.30                       |                         |   | 18.81              | 4,874.95                  | 4,864.65                          | 4.57  |
| BH06  | 11/1/2017 | 11.75                       |                         |   | 19.00              | 4,874.95                  | 4,863.20                          | -1.45   |
| BH07  | 2/28/2017 | 14.93                       |                         |   | 18.67              | 4,874.04                  | 4,859.11                          | -4.21   |
| BH07  | 5/8/2017  | 13.83                       |                         |   | 18.67              | 4,874.04                  | 4,860.21                          | 1.10  |
| BH07  | 8/1/2017  | 9.37                        |                         |   | 18.73              | 4,874.04                  | 4,864.67                          | 4.46  |
| BH07  | 11/1/2017 | 11.22                       |                         |   | 18.75              | 4,874.04                  | 4,862.82                          | -1.85   |
| Average change in groundwater elevation ( 8/1/2017 to 11/1/2017 ) |           |                             |                         |   |                    |                           |                                   | -1.79   |

Notes:

1- Changes in groundwater elevation calculated by subtracting the measurement collected during the previous monitoring event from the measurement

amsl = feet above mean sea level

TOC = top of casing

Groundwater elevation = (TOC Elevation - Measured Depth to Water)

NM = Not Measured

NA = Not Applicable

**TABLE 2**  
**FOURTH QUARTER 2017**  
**SUMMARY OF BTEX CONCENTRATIONS IN GROUNDWATER**  
**DCP CR 20 AND HWY 85 RELEASE**  
**WELD COUNTY, COLORADO**

| Location Identification       | Sample Date | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Total Xylenes (µg/L) | Comments |
|-------------------------------|-------------|----------------|----------------|---------------------|----------------------|----------|
| <b>COGCC Standards (µg/L)</b> |             | <b>5</b>       | <b>560</b>     | <b>700</b>          | <b>1,400</b>         |          |
| BH01                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | <2.0                 |          |
| BH02                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | 770                  |          |
| BH03                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | 110                  |          |
| BH05                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | <2.0                 |          |
| BH06                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | <2.0                 |          |
| BH07                          | 11/1/2017   | <b>31</b>      | <1.0           | 7.2                 | 890                  |          |

Notes:

1). The environmental cleanup standards for groundwater that are applicable to this site are the Colorado Oil and Gas Conservation Commission (COGCC) standards for contaminants in groundwater according to Table 910-1 of the COGCC 900 Series Rule for E&P Waste Management.

\* Monitoring well BH03 was sampled on May 17, 2016 subsequent to purging apparent LNAPL from the well.

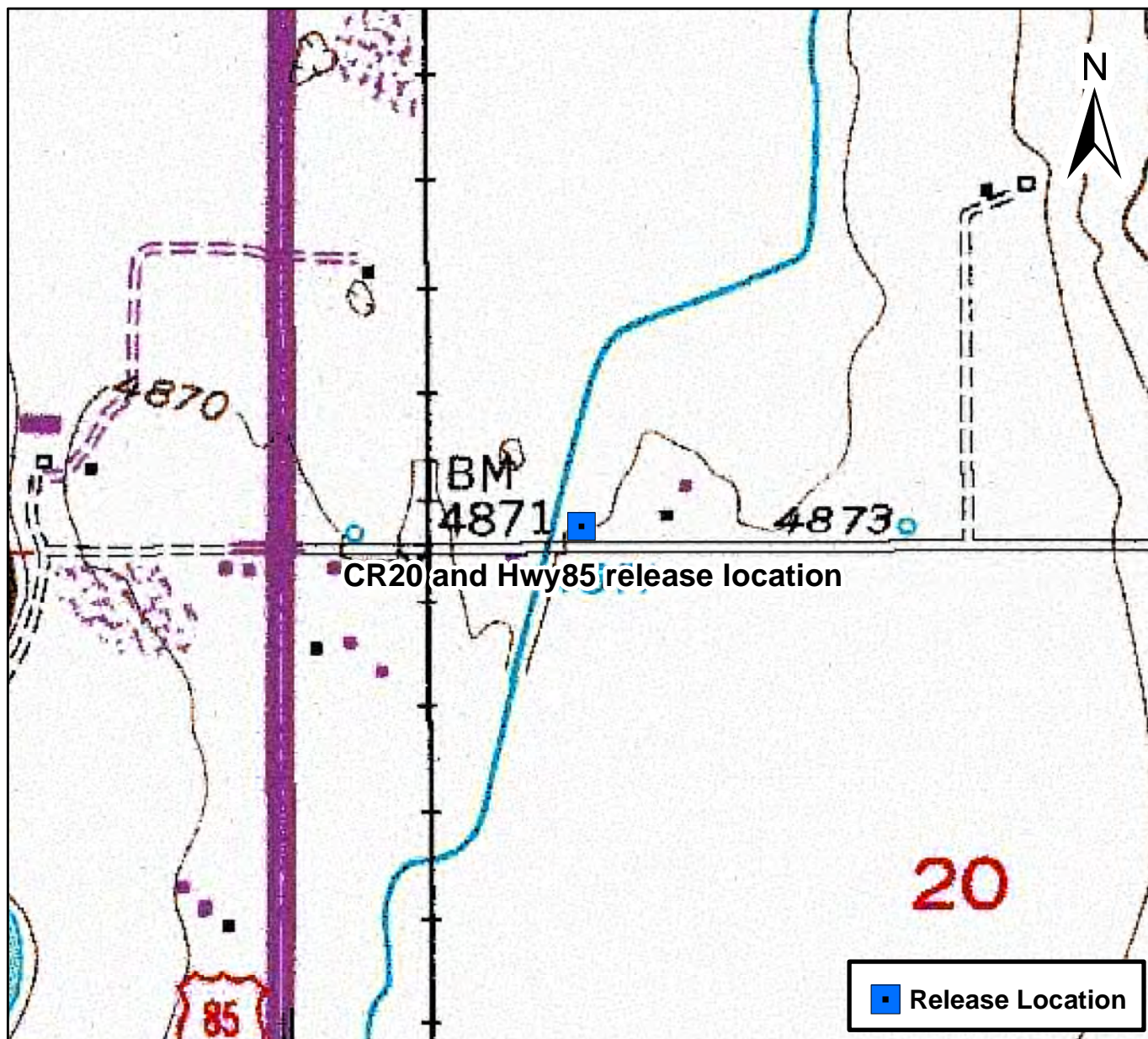
**Bold red values indicate an exceedance of the COGCC groundwater standards for the Site.**

NS = Not sampled.

µg/L = micrograms per liter.

LNAPL - Light non-aqueous phase liquid

## Figures



0 750 1,500 Feet



## Figure 1

Site Location Map  
CR20 and Hwy85 release location  
SWSW S17 T2N R66W  
Weld County, Colorado

Drawn By: DBA  
Date: 06/04/2014

  
Tasman Geosciences



|              |              |
|--------------|--------------|
| DATE:        | January 2018 |
| DESIGNED BY: | B. Humphrey  |
| DRAWN BY:    | D. Arnold    |



**TASMAN**  
GEOSCIENCES

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

**DCP Midstream**  
**County Road 20 and Highway 85 Release**  
SWSW Section 17, Township 2 North, Range 66 West  
Weld County, Colorado

Site Overview  
Map

Figure  
2



|              |              |
|--------------|--------------|
| DATE:        | January 2018 |
| DESIGNED BY: | B. Humphrey  |
| DRAWN BY:    | D. Cavinder  |



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

**DCP Midstream**  
**County Road 20 and Highway 85 Release**  
SWSW Section 17, Township 2 North, Range 66 West  
Weld County, Colorado

Groundwater Elevation  
Contour Map  
(November 1, 2017)

Figure  
3



|              |              |
|--------------|--------------|
| DATE:        | January 2018 |
| DESIGNED BY: | B. Humphrey  |
| DRAWN BY:    | D. Arnold    |



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DCP Midstream  
County Road 20 and Highway 85 Release  
SWSW Section 17, Township 2 North, Range 66 West  
Weld County, Colorado

Groundwater Analytical  
Results Map  
(November 1, 2017)

Figure  
4

## Appendix A

### Historic Analytical Groundwater Data

**APPENDIX A**  
**HISTORIC ANALYTICAL GROUNDWATER DATA**  
**DCP CR 20 AND HWY 85 RELEASE**  
**WELD COUNTY, COLORADO**

| Location Identification       | Sample Date | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Total Xylenes (µg/L) | Comments     |
|-------------------------------|-------------|----------------|----------------|---------------------|----------------------|--------------|
| <b>COGCC Standards (µg/L)</b> |             | <b>5</b>       | <b>560</b>     | <b>700</b>          | <b>1,400</b>         |              |
| BH01                          | 5/14/2015   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 9/24/2015   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 11/17/2015  | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 2/15/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 5/13/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 8/10/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 11/11/2016  | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 2/28/2017   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH01                          | 5/8/2017    | <1.0           | <1.0           | <1.0                | <2.0                 |              |
| BH01                          | 8/1/2017    | <1.0           | <1.0           | <1.0                | <2.0                 |              |
| BH01                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | <2.0                 |              |
|                               |             |                |                |                     |                      |              |
| BH02                          | 5/14/2015   | 120            | 5              | 210                 | 2,000                |              |
| BH02                          | 9/24/2015   | 20             | <1.0           | 48                  | 370                  |              |
| BH02                          | 11/17/2015  | 14             | <1.0           | 72                  | 490                  |              |
| BH02                          | 2/15/2016   | 2.4            | 1.4            | 260                 | 730                  |              |
| BH02                          | 5/13/2016   | 2.2            | <1.0           | 160                 | 1,100                |              |
| BH02                          | 8/10/2016   | <1.0           | <1.0           | 13                  | 340                  |              |
| BH02                          | 11/11/2016  | 1.5            | <1.0           | 17                  | 910                  |              |
| BH02                          | 2/28/2017   | <1.0           | <1.0           | <1.0                | 560                  |              |
| BH02                          | 5/8/2017    | <1.0           | <1.0           | <1.0                | 240                  |              |
| BH02                          | 8/1/2017    | <1.0           | <1.0           | 150                 | 700                  |              |
| BH02                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | 770                  |              |
|                               |             |                |                |                     |                      |              |
| BH03                          | 5/14/2015   | 220            | 130            | 400                 | 3,500                |              |
| BH03                          | 9/24/2015   | 1.8            | <1.0           | 7.0                 | 150                  |              |
| BH03                          | 11/17/2015  | <1.0           | <1.0           | 43                  | 400                  |              |
| BH03                          | 2/15/2016   | <1.0           | <1.0           | 42                  | 280                  |              |
| BH03*                         | 5/17/2016   | 5.3            | <1.0           | 79                  | 590                  |              |
| BH03                          | 8/10/2016   | 3.1            | <1.0           | 230                 | 1,400                |              |
| BH03                          | 11/11/2016  | <1.0           | <1.0           | <1.0                | 1,200                |              |
| BH03                          | 2/28/2017   | <1.0           | <1.0           | <1.0                | 410                  |              |
| BH03                          | 5/8/2017    | <1.0           | <1.0           | <1.0                | 130                  |              |
| BH03                          | 8/1/2017    | 4.6            | <1.0           | 97                  | 1,300                |              |
| BH03                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | 110                  |              |
|                               |             |                |                |                     |                      |              |
| BH05                          | 5/14/2015   | <1.0           | <1.0           | 3                   | 22                   |              |
| BH05                          | 9/24/2015   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH05                          | 11/17/2015  | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH05                          | 2/15/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH05                          | 5/13/2016   | NS             | NS             | NS                  | NS                   | Well was dry |
| BH05                          | 8/10/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH05                          | 11/11/2016  | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH05                          | 2/28/2017   | <1.0           | <1.0           | <1.0                | <1.0                 |              |
| BH05                          | 5/8/2017    | <1.0           | <1.0           | <1.0                | <2.0                 |              |
| BH05                          | 8/1/2017    | <1.0           | <1.0           | <1.0                | <2.0                 |              |
| BH05                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | <2.0                 |              |

**APPENDIX A**  
**HISTORIC ANALYTICAL GROUNDWATER DATA**  
**DCP CR 20 AND HWY 85 RELEASE**  
**WELD COUNTY, COLORADO**

| Location Identification       | Sample Date | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Total Xylenes (µg/L) | Comments              |
|-------------------------------|-------------|----------------|----------------|---------------------|----------------------|-----------------------|
| <b>COGCC Standards (µg/L)</b> |             | <b>5</b>       | <b>560</b>     | <b>700</b>          | <b>1,400</b>         |                       |
| BH06                          | 5/14/2015   | <1.0           | <1.0           | <1.0                | 5                    |                       |
| BH06                          | 9/24/2015   | <1.0           | <1.0           | <1.0                | <1.0                 |                       |
| BH06                          | 11/17/2015  | <1.0           | <1.0           | <1.0                | <1.0                 |                       |
| BH06                          | 2/15/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |                       |
| BH06                          | 5/13/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |                       |
| BH06                          | 8/10/2016   | <1.0           | <1.0           | <1.0                | <1.0                 |                       |
| BH06                          | 11/11/2016  | <1.0           | <1.0           | <1.0                | <1.0                 |                       |
| BH06                          | 2/28/2017   | <1.0           | <1.0           | <1.0                | <1.0                 |                       |
| BH06                          | 5/8/2017    | <1.0           | <1.0           | <1.0                | <2.0                 |                       |
| BH06                          | 8/1/2017    | <1.0           | <1.0           | <1.0                | <2.0                 |                       |
| BH06                          | 11/1/2017   | <1.0           | <1.0           | <1.0                | <2.0                 |                       |
|                               |             |                |                |                     |                      |                       |
| BH07                          | 5/14/2015   | <b>44</b>      | 310            | 200                 | <b>2,600</b>         |                       |
| BH07                          | 9/24/2015   | NS             | NS             | NS                  | NS                   | Trace amount of LNAPL |
| BH07                          | 11/17/2015  | <b>85</b>      | 1.1            | 210                 | <b>3,100</b>         |                       |
| BH07                          | 2/15/2016   | NS             | NS             | NS                  | NS                   | LNAPL - 0.03 ft       |
| BH07                          | 5/13/2016   | <b>52</b>      | <1.0           | 500                 | <b>3,300</b>         |                       |
| BH07                          | 8/10/2016   | 1.8            | <1.0           | <1.0                | 560                  | Trace amount of LNAPL |
| BH07                          | 11/11/2016  | DRY            |                |                     |                      |                       |
| BH07                          | 2/28/2017   | 4.1            | <1.0           | 90                  | <b>1,400</b>         |                       |
| BH07                          | 5/8/2017    | <1.0           | <1.0           | <1.0                | 730                  |                       |
| BH07                          | 8/1/2017    | 1.2            | <1.0           | 17                  | 210                  |                       |
| BH07                          | 11/1/2017   | <b>31</b>      | <1.0           | 7.2                 | 890                  |                       |

Notes:

1). The environmental cleanup standards for groundwater that are applicable to this site are the Colorado Oil and Gas Conservation Commission (COGCC) standards for contaminants in groundwater according to Table 910-1 of the COGCC 900 Series Rule for E&P Waste Management.

\* Monitoring well BH03 was sampled on May 17, 2016 subsequent to purging apparent LNAPL from the well.

**Bold** red values indicate an exceedance of the COGCC groundwater standards for the Site.

NS = Not sampled.

µg/L = micrograms per liter.

LNAPL - Light non-aqueous phase liquid

## Appendix B

### Laboratory Analytical Report

- Summit Scientific 1711013

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 08, 2017

Steve Weathers  
DCP Operating Company  
370 17th Street #2500  
Denver, CO 80202  
RE: CR20 + Hwy 85 Release

Enclosed are the results of analyses for samples received by Summit Scientific on 11/01/17 16:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury For Ben Shrewsbury  
Laboratory Manager



DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release

Project Number: [none]  
Project Manager: Steve Weathers

**Reported:**  
11/08/17 13:24

### ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled   | Date Received  |
|-----------|---------------|--------|----------------|----------------|
| BH01      | 1711013-01    | Water  | 11/01/17 12:20 | 11/01/17 16:45 |
| BH02      | 1711013-02    | Water  | 11/01/17 12:20 | 11/01/17 16:45 |
| BH03      | 1711013-03    | Water  | 11/01/17 12:45 | 11/01/17 16:45 |
| BH05      | 1711013-04    | Water  | 11/01/17 12:30 | 11/01/17 16:45 |
| BH06      | 1711013-05    | Water  | 11/01/17 12:40 | 11/01/17 16:45 |
| BH07      | 1711013-06    | Water  | 11/01/17 12:30 | 11/01/17 16:45 |

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.*





DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release

Project Number: [none]  
Project Manager: Steve Weathers

Reported:  
11/08/17 13:24

### Sample Receipt Checklist

S2 Work Order: 1711013

Client: DCP/Tasman

Client Project ID: CR20 + 85 Release

Shipped Via: P/V

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: \_\_\_\_\_

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

|           |            |  |  |  |  |
|-----------|------------|--|--|--|--|
| Cooler ID |            |  |  |  |  |
| Temp (°C) | <u>2.4</u> |  |  |  |  |

Thermometer ID: 61857155-K

|  | Yes                                 | No                                  | N/A                                 | Comments (if any) |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------|
| If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                   |
| NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun. |                                     |                                     |                                     |                   |
| Were all samples received intact <sup>(1)</sup> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                   |
| Was adequate sample volume provided <sup>(1)</sup> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                   |
| If custody seals are present, are they intact <sup>(1)</sup> ?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                   |
| Are short holding time analytes or samples with HTs due within 48 hours present?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                   |
| Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                   |
| Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                   |
| Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                   |
| Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                   |
| For volatiles in water – is there headspace present? If yes, contact client and note in narrative.                                       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                   |
| Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <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 <sup>(1)</sup> ?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                   |
| Record the pH in Comments.   |                                     |                                     |                                     |                   |
| If dissolved metals are requested, were samples field filtered?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                   |
| Additional Comments (if any):  |                                     |                                     |                                     |                   |

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

Nakita  
Custodian Printed Name

[Signature]  
Signature or Initials of Custodian

11/1/17 17:10  
Date/Time



DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release  
Project Number: [none]  
Project Manager: Steve Weathers

**Reported:**  
11/08/17 13:24

**BH01**  
**1711013-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **11/01/17 12:20**

| Analyte         | Result | Reporting<br>Limit | Units | Dilution | Batch   | Prepared | Analyzed | Method    | Notes |
|-----------------|--------|--------------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene         | ND     | 1.0                | ug/l  | 1        | 1711027 | 11/04/17 | 11/04/17 | EPA 8260B |       |
| Toluene         | ND     | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Ethylbenzene    | ND     | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Xylenes (total) | ND     | 2.0                | "     | "        | "       | "        | "        | "         |       |

Date Sampled: **11/01/17 12:20**

| Analyte                          | Result | Reporting<br>Limit | Units  | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|--------------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 |        | 77.9 %             | 37-154 |          | "     | "        | "        | "      |       |
| Surrogate: Toluene-d8            |        | 95.6 %             | 45-149 |          | "     | "        | "        | "      |       |
| Surrogate: 4-Bromofluorobenzene  |        | 97.6 %             | 45-146 |          | "     | "        | "        | "      |       |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release  
Project Number: [none]  
Project Manager: Steve Weathers

**Reported:**  
11/08/17 13:24

**BH02**  
**1711013-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **11/01/17 12:20**

| Analyte                | Result     | Reporting<br>Limit | Units | Dilution | Batch   | Prepared | Analyzed | Method    | Notes |
|------------------------|------------|--------------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene                | ND         | 1.0                | ug/l  | 1        | 1711027 | 11/04/17 | 11/04/17 | EPA 8260B |       |
| Toluene                | ND         | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Ethylbenzene           | ND         | 1.0                | "     | "        | "       | "        | "        | "         |       |
| <b>Xylenes (total)</b> | <b>770</b> | 2.0                | "     | "        | "       | "        | "        | "         |       |

Date Sampled: **11/01/17 12:20**

| Analyte                          | Result | Reporting<br>Limit | Units  | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|--------------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 |        | 80.1 %             | 37-154 |          | "     | "        | "        | "      |       |
| Surrogate: Toluene-d8            |        | 98.9 %             | 45-149 |          | "     | "        | "        | "      |       |
| Surrogate: 4-Bromofluorobenzene  |        | 97.8 %             | 45-146 |          | "     | "        | "        | "      |       |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release  
Project Number: [none]  
Project Manager: Steve Weathers

**Reported:**  
11/08/17 13:24

**BH03**  
**1711013-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **11/01/17 12:45**

| Analyte                | Result     | Reporting<br>Limit | Units | Dilution | Batch   | Prepared | Analyzed | Method    | Notes |
|------------------------|------------|--------------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene                | ND         | 1.0                | ug/l  | 1        | 1711027 | 11/04/17 | 11/04/17 | EPA 8260B |       |
| Toluene                | ND         | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Ethylbenzene           | ND         | 1.0                | "     | "        | "       | "        | "        | "         |       |
| <b>Xylenes (total)</b> | <b>110</b> | 2.0                | "     | "        | "       | "        | "        | "         |       |

Date Sampled: **11/01/17 12:45**

| Analyte                          | Result | Reporting<br>Limit | Units  | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|--------------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 |        | 82.0 %             | 37-154 |          | "     | "        | "        | "      |       |
| Surrogate: Toluene-d8            |        | 95.0 %             | 45-149 |          | "     | "        | "        | "      |       |
| Surrogate: 4-Bromofluorobenzene  |        | 98.2 %             | 45-146 |          | "     | "        | "        | "      |       |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release  
Project Number: [none]  
Project Manager: Steve Weathers

**Reported:**  
11/08/17 13:24

**BH05**  
**1711013-04 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **11/01/17 12:30**

| Analyte         | Result | Reporting<br>Limit | Units | Dilution | Batch   | Prepared | Analyzed | Method    | Notes |
|-----------------|--------|--------------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene         | ND     | 1.0                | ug/l  | 1        | 1711027 | 11/04/17 | 11/04/17 | EPA 8260B |       |
| Toluene         | ND     | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Ethylbenzene    | ND     | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Xylenes (total) | ND     | 2.0                | "     | "        | "       | "        | "        | "         |       |

Date Sampled: **11/01/17 12:30**

| Analyte                          | Result | Reporting<br>Limit | Units  | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|--------------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 |        | 79.4 %             | 37-154 |          | "     | "        | "        | "      |       |
| Surrogate: Toluene-d8            |        | 96.5 %             | 45-149 |          | "     | "        | "        | "      |       |
| Surrogate: 4-Bromofluorobenzene  |        | 95.2 %             | 45-146 |          | "     | "        | "        | "      |       |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release  
Project Number: [none]  
Project Manager: Steve Weathers

Reported:  
11/08/17 13:24

**BH06**  
**1711013-05 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **11/01/17 12:40**

| Analyte         | Result | Reporting<br>Limit | Units | Dilution | Batch   | Prepared | Analyzed | Method    | Notes |
|-----------------|--------|--------------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene         | ND     | 1.0                | ug/l  | 1        | 1711027 | 11/04/17 | 11/04/17 | EPA 8260B |       |
| Toluene         | ND     | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Ethylbenzene    | ND     | 1.0                | "     | "        | "       | "        | "        | "         |       |
| Xylenes (total) | ND     | 2.0                | "     | "        | "       | "        | "        | "         |       |

Date Sampled: **11/01/17 12:40**

| Analyte                          | Result | Reporting<br>Limit | Units  | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|--------------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 |        | 81.2 %             | 37-154 |          | "     | "        | "        | "      |       |
| Surrogate: Toluene-d8            |        | 98.2 %             | 45-149 |          | "     | "        | "        | "      |       |
| Surrogate: 4-Bromofluorobenzene  |        | 99.9 %             | 45-146 |          | "     | "        | "        | "      |       |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release  
Project Number: [none]  
Project Manager: Steve Weathers

**Reported:**  
11/08/17 13:24

**BH07**  
**1711013-06 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **11/01/17 12:30**

| Analyte                | Result     | Reporting<br>Limit | Units | Dilution | Batch   | Prepared | Analyzed | Method    | Notes |
|------------------------|------------|--------------------|-------|----------|---------|----------|----------|-----------|-------|
| <b>Benzene</b>         | <b>31</b>  | 1.0                | ug/l  | 1        | 1711027 | 11/04/17 | 11/04/17 | EPA 8260B |       |
| Toluene                | ND         | 1.0                | "     | "        | "       | "        | "        | "         |       |
| <b>Ethylbenzene</b>    | <b>7.2</b> | 1.0                | "     | "        | "       | "        | "        | "         |       |
| <b>Xylenes (total)</b> | <b>890</b> | 2.0                | "     | "        | "       | "        | "        | "         |       |

Date Sampled: **11/01/17 12:30**

| Analyte                          | Result | Reporting<br>Limit | Units  | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|----------------------------------|--------|--------------------|--------|----------|-------|----------|----------|--------|-------|
| Surrogate: 1,2-Dichloroethane-d4 |        | 79.4 %             | 37-154 |          | "     | "        | "        | "      |       |
| Surrogate: Toluene-d8            |        | 98.6 %             | 45-149 |          | "     | "        | "        | "      |       |
| Surrogate: 4-Bromofluorobenzene  |        | 106 %              | 45-146 |          | "     | "        | "        | "      |       |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release

Project Number: [none]  
Project Manager: Steve Weathers

Reported:  
11/08/17 13:24

## 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 1711027 - EPA 5030 Water MS

##### Blank (1711027-BLK1)

Prepared & Analyzed: 11/04/17

|                                  |      |     |      |      |  |      |        |  |  |  |
|----------------------------------|------|-----|------|------|--|------|--------|--|--|--|
| Benzene                          | ND   | 1.0 | ug/l |      |  |      |        |  |  |  |
| Toluene                          | ND   | 1.0 | "    |      |  |      |        |  |  |  |
| Ethylbenzene                     | ND   | 1.0 | "    |      |  |      |        |  |  |  |
| Xylenes (total)                  | ND   | 2.0 | "    |      |  |      |        |  |  |  |
| Surrogate: 1,2-Dichloroethane-d4 | 14.7 |     | "    | 13.3 |  | 110  | 37-154 |  |  |  |
| Surrogate: Toluene-d8            | 12.6 |     | "    | 13.3 |  | 94.4 | 45-149 |  |  |  |
| Surrogate: 4-Bromofluorobenzene  | 13.3 |     | "    | 13.3 |  | 99.6 | 45-146 |  |  |  |

##### LCS (1711027-BS1)

Prepared & Analyzed: 11/04/17

|                                  |      |     |      |      |  |      |        |  |  |  |
|----------------------------------|------|-----|------|------|--|------|--------|--|--|--|
| Benzene                          | 21.7 | 1.0 | ug/l | 33.3 |  | 65.1 | 51-132 |  |  |  |
| Toluene                          | 26.2 | 1.0 | "    | 33.3 |  | 78.5 | 51-138 |  |  |  |
| Ethylbenzene                     | 31.8 | 1.0 | "    | 33.1 |  | 96.3 | 58-146 |  |  |  |
| m,p-Xylene                       | 64.6 | 2.0 | "    | 66.5 |  | 97.0 | 57-144 |  |  |  |
| o-Xylene                         | 31.6 | 1.0 | "    | 32.7 |  | 96.6 | 53-146 |  |  |  |
| Surrogate: 1,2-Dichloroethane-d4 | 13.9 |     | "    | 13.3 |  | 104  | 37-154 |  |  |  |
| Surrogate: Toluene-d8            | 12.8 |     | "    | 13.3 |  | 95.9 | 45-149 |  |  |  |
| Surrogate: 4-Bromofluorobenzene  | 9.57 |     | "    | 13.3 |  | 71.8 | 45-146 |  |  |  |

##### Matrix Spike (1711027-MS1)

Source: 1711013-01

Prepared & Analyzed: 11/04/17

|                                  |      |     |      |      |    |      |        |  |  |  |
|----------------------------------|------|-----|------|------|----|------|--------|--|--|--|
| Benzene                          | 21.3 | 1.0 | ug/l | 33.3 | ND | 63.8 | 34-141 |  |  |  |
| Toluene                          | 26.2 | 1.0 | "    | 33.3 | ND | 78.7 | 27-151 |  |  |  |
| Ethylbenzene                     | 30.6 | 1.0 | "    | 33.1 | ND | 92.5 | 29-160 |  |  |  |
| m,p-Xylene                       | 62.2 | 2.0 | "    | 66.5 | ND | 93.5 | 20-166 |  |  |  |
| o-Xylene                         | 31.4 | 1.0 | "    | 32.7 | ND | 96.0 | 33-159 |  |  |  |
| Surrogate: 1,2-Dichloroethane-d4 | 11.0 |     | "    | 13.3 |    | 82.9 | 37-154 |  |  |  |
| Surrogate: Toluene-d8            | 12.6 |     | "    | 13.3 |    | 94.5 | 45-149 |  |  |  |
| Surrogate: 4-Bromofluorobenzene  | 12.2 |     | "    | 13.3 |    | 91.4 | 45-146 |  |  |  |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release  
Project Number: [none]  
Project Manager: Steve Weathers

Reported:  
11/08/17 13:24

**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 1711027 - EPA 5030 Water MS**

| Matrix Spike Dup (1711027-MSD1)  | Source: 1711013-01 |     |      | Prepared & Analyzed: 11/04/17 |    |      |        |       |    |  |
|----------------------------------|--------------------|-----|------|-------------------------------|----|------|--------|-------|----|--|
| Benzene                          | 21.8               | 1.0 | ug/l | 33.3                          | ND | 65.3 | 34-141 | 2.28  | 32 |  |
| Toluene                          | 26.1               | 1.0 | "    | 33.3                          | ND | 78.3 | 27-151 | 0.573 | 25 |  |
| Ethylbenzene                     | 30.2               | 1.0 | "    | 33.1                          | ND | 91.2 | 29-160 | 1.45  | 50 |  |
| m,p-Xylene                       | 60.9               | 2.0 | "    | 66.5                          | ND | 91.5 | 20-166 | 2.14  | 36 |  |
| o-Xylene                         | 30.8               | 1.0 | "    | 32.7                          | ND | 94.3 | 33-159 | 1.71  | 26 |  |
| Surrogate: 1,2-Dichloroethane-d4 | 12.1               |     | "    | 13.3                          |    | 90.5 | 37-154 |       |    |  |
| Surrogate: Toluene-d8            | 12.8               |     | "    | 13.3                          |    | 96.2 | 45-149 |       |    |  |
| Surrogate: 4-Bromofluorobenzene  | 12.6               |     | "    | 13.3                          |    | 94.2 | 45-146 |       |    |  |

Summit Scientific

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DCP Operating Company  
370 17th Street #2500  
Denver CO, 80202

Project: CR20 + Hwy 85 Release

Project Number: [none]  
Project Manager: Steve Weathers

**Reported:**  
11/08/17 13:24

### 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                          |