

March 1, 2016

Mr. Rick Allison, P.G.  
Environmental Protection Specialist, Northeast Region  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203

**Re: 2015 Annual Groundwater Monitoring Report  
Ryan 23-25U & 25BU, 14-25U / Scott 24-25U / MVS #1 Tank Battery  
SESW Section 25 T5N R68W  
Larimer County, Colorado  
Facility #: 307148  
Spill Tracking #: 2224259  
Remediation #: 7239**

Dear Mr. Allison,

On behalf of PDC Energy, Inc. (PDC), Tasman Geosciences, Inc. (Tasman) is submitting this 2015 Annual Groundwater Monitoring Report for quarterly groundwater monitoring activities conducted at the Ryan 23-25U & 25BU, 14-25U / Scott 24-25U / MVS #1 tank battery (Site). This report documents the results of groundwater gauging, groundwater sampling, and remediation activities conducted at the Site during 2015. As per discussions with COGCC staff, PDC is providing this summary annual report to assist in updating the COGCC on the progress and status of this open remediation Site.

A historic release was discovered at the Site on March 23, 2012, during equipment upgrades. Following excavation and well installation activities, groundwater monitoring was initiated during the second quarter 2012. The monitoring well network at the Site consists of 5 temporary monitoring and remediation wells (BH01 and BH02R – BH05R), as shown in Figure 1. Historic groundwater monitoring results are presented in Table 1. Groundwater monitoring results for 2015 are summarized below.

| Sampling Event | Wells Exceeding COGCC Standards | Maximum Benzene Concentration (µg/L) |
|----------------|---------------------------------|--------------------------------------|
| 1Q 2015        | None                            | 2.4                                  |
| 2Q 2015        | None                            | 1.7                                  |
| 3Q 2015        | BH04R                           | <b>130</b>                           |
| 4Q 2015        | BH04R                           | <b>25</b>                            |

Tasman initiated enhanced fluid recovery (EFR) and air sparge (AS) events at the site during the second quarter 2012. EFR/AS events were discontinued after the second quarter 2013, and monitored natural attenuation (MNA) was implemented as the selected remediation strategy during the third quarter 2013. Once BTEX concentrations are below applicable COGCC Table 910-1 groundwater standards, four quarters of compliance groundwater monitoring will be conducted.

Please contact me at (720) 409-8791 if you have any questions regarding this report.

Sincerely,



Christine Wasko  
Project Manager  
Tasman Geosciences, Inc.



0 ft 28 ft 56 ft

#### Facility Diagram

PDC Energy – DJ Basin  
Ryan 23-25U & 25BU, 14-25U/ Scott 24-25U/ MVS #1  
Tank Battery  
SESW S25 T5N R68W  
Larimer County, CO



6899 Pecos St., Unit C  
Denver CO 80221

#### LEGEND



Excavation Extent



Monitoring Well Location



Monitoring Well Location –  
Well Destroyed



Point of Release



Groundwater  
Flow Direction

All locations are  
approximate unless  
otherwise noted

**FIGURE 1**  
GROUNDWATER  
MONITORING  
SITE MAP

**TABLE 1**  
**RYAN 23-25U, 25BU, 14-25U/SCOTT 24-25U/MVS 1 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

| Sample ID   | Date Sampled | Benzene<br>(µg/L) | Toluene<br>(µg/L) | Ethylbenzene<br>(µg/L) | Total<br>Xylenes<br>(µg/L) | Depth to<br>Water<br>(feet) |
|---|--------------|-------------------|-------------------|------------------------|----------------------------|-----------------------------|
| <b>COGCC Table 910-1 Groundwater<br/>Standard (µg/L) <sup>(1)</sup></b> |              | <b>5</b>          | <b>560</b>        | <b>700</b>             | <b>1,400</b>               |                             |
| GW01-BH01   | 4/13/2012    | <b>320</b>        | <b>810</b>        | 44                     | 490                        | NM                          |
| BH01  | 7/17/2012    | <1.0              | <1.0              | <1.0                   | <1.0                       | 14.39                       |
| BH01  | 10/1/2012    | <1.0              | <1.0              | <1.0                   | <1.0                       | 14.67                       |
| BH01  | 1/28/2013    | <1.0              | <1.0              | <1.0                   | <1.0                       | 14.90                       |
| BH01  | 5/3/2013     | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.50                       |
| BH01  | 7/25/2013    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.29                       |
| BH01  | 10/31/2013   | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.90                       |
| BH01  | 1/24/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.53                       |
| BH01  | 4/28/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.26                       |
| BH01  | 7/25/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.59                       |
| BH01  | 10/22/2014   | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.25                       |
| BH01  | 1/13/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.00                       |
| BH01  | 4/9/2015     | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.38                       |
| BH01  | 7/27/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.01                       |
| BH01  | 10/5/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.53                       |
| GW02-BH02   | 4/13/2012    | <b>7,100</b>      | <b>14,000</b>     | 420                    | <b>4,400</b>               | NM                          |
| BH02  | 7/17/2012    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH02  | 10/1/2012    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH02  | 1/28/2013    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH02  | 5/3/2013     | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH02  | 7/25/2013    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH02  | 10/31/2013   | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH02  | 1/24/2014    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH02R   | 4/28/2014    | 1.0               | <1.0              | <1.0                   | <1.0                       | 17.06                       |
| BH02R   | 7/25/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 17.38                       |
| BH02R   | 10/22/2014   | <1.0              | <1.0              | <1.0                   | <1.0                       | 17.01                       |
| BH02R   | 1/13/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.74                       |
| BH02R   | 4/9/2015     | <1.0              | <1.0              | <1.0                   | <1.0                       | 17.13                       |
| BH02R   | 7/27/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 18.05                       |
| BH02R   | 10/5/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 18.66                       |
| GW03-BH03   | 4/13/2012    | <b>11,000</b>     | <b>13,000</b>     | 300                    | <b>3,500</b>               | NM                          |
| BH03  | 7/17/2012    | <b>1,400</b>      | <b>710</b>        | 20                     | 250                        | 13.82                       |

**TABLE 1**  
**RYAN 23-25U, 25BU, 14-25U/SCOTT 24-25U/MVS 1 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

| Sample ID   | Date Sampled | Benzene<br>(µg/L) | Toluene<br>(µg/L) | Ethylbenzene<br>(µg/L) | Total<br>Xylenes<br>(µg/L) | Depth to<br>Water<br>(feet) |
|---|--------------|-------------------|-------------------|------------------------|----------------------------|-----------------------------|
| <b>COGCC Table 910-1 Groundwater<br/>Standard (µg/L) <sup>(1)</sup></b> |              | <b>5</b>          | <b>560</b>        | <b>700</b>             | <b>1,400</b>               |                             |
| BH03  | 10/1/2012    | 41                | 47                | 3.0                    | 32                         | 14.20                       |
| BH03  | 1/28/2013    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH03  | 5/3/2013     | <1.0              | <1.0              | <1.0                   | <1.0                       | 14.81                       |
| BH03  | 7/25/2013    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH03  | 10/31/2013   | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH03  | 1/24/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 14.82                       |
| BH03R   | 7/25/2014    | 3.4               | <1.0              | <1.0                   | <1.0                       | 15.43                       |
| BH03R   | 10/22/2014   | 7.3               | <1.0              | 1.2                    | <1.0                       | 15.40                       |
| BH03R   | 4/28/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.08                       |
| BH03R   | 7/25/2014    | 3.4               | <1.0              | <1.0                   | <1.0                       | 15.43                       |
| BH03R   | 10/22/2014   | 7.3               | <1.0              | 1.2                    | <1.0                       | 15.40                       |
| BH03R   | 1/13/2015    | <1.0              | <1.0              | 1.3                    | <1.0                       | 15.15                       |
| BH03R   | 4/9/2015     | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.47                       |
| BH03R   | 7/27/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.21                       |
| BH03R   | 10/5/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.41                       |
| GW04-BH04   | 4/13/2012    | 3,100             | 3,900             | 150                    | 1,700                      | NM                          |
| BH04  | 7/17/2012    | 1,500             | 490               | <1.0                   | 1,900                      | 13.21                       |
| BH04  | 10/1/2012    | 2,400             | 66                | 53                     | 1,800                      | 13.58                       |
| BH04R   | 1/28/2013    | 26                | <1.0              | <1.0                   | 77                         | 14.53                       |
| BH04R   | 5/3/2013     | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.22                       |
| BH04R   | 7/25/2013    | 2.0               | <1.0              | <1.0                   | <1.0                       | 16.12                       |
| BH04R   | 10/31/2013   | <1.0              | <1.0              | 4.1                    | <1.0                       | 15.77                       |
| BH04R   | 1/24/2014    | <1.0              | <1.0              | 3.3                    | <1.0                       | 15.24                       |
| BH04R   | 4/28/2014    | <1.0              | <1.0              | 4.1                    | <1.0                       | 15.03                       |
| BH04R   | 7/25/2014    | <1.0              | <1.0              | 1.1                    | <1.0                       | 15.17                       |
| BH04R   | 10/22/2014   | 13                | <1.0              | <1.0                   | <1.0                       | 15.01                       |
| BH04R   | 1/13/2015    | 2.4               | <1.0              | 1.5                    | 4.0                        | 14.81                       |
| BH04R   | 4/9/2015     | 1.7               | <1.0              | 1.5                    | 7.4                        | 15.11                       |
| BH04R   | 7/27/2015    | 130               | <1.0              | 1.0                    | 18                         | 15.73                       |
| BH04R   | 8/4/2015     | 76                | <1.0              | 3.1                    | 46                         | 16.07                       |
| BH04R   | 10/5/2015    | 25                | <1.0              | 15                     | 45                         | 15.99                       |



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|---|--------------|-------------------|-------------------|------------------------|----------------------------|-----------------------------|
| COGCC Table 910-1 Groundwater<br>Standard (µg/L) <sup>(1)</sup> |              | 5                 | 560               | 700                    | 1,400                      |                             |
| GW05-BH05   | 4/13/2012    | <b>510</b>        | <b>3,400</b>      | 190                    | <b>2,200</b>               | NM                          |
| BH05  | 7/17/2012    | <1.0              | <1.0              | <1.0                   | <1.0                       | 13.30                       |
| BH05  | 10/1/2012    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.60                       |
| BH05  | 1/28/2013    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.74                       |
| BH05  | 5/3/2013     | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.45                       |
| BH05  | 7/25/2013    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH05  | 8/31/2013    | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH05  | 10/31/2013   | DRY               | DRY               | DRY                    | DRY                        | DRY                         |
| BH05  | 1/24/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.49                       |
|   |              |                   |                   |                        |                            |                             |
| BH05R   | 4/28/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.89                       |
| BH05R   | 7/25/2014    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.15                       |
| BH05R   | 10/22/2014   | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.90                       |
| BH05R   | 1/13/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.65                       |
| BH05R   | 4/9/2015     | <1.0              | <1.0              | <1.0                   | <1.0                       | 15.94                       |
| BH05R   | 7/27/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 16.80                       |
| BH05R   | 10/5/2015    | <1.0              | <1.0              | <1.0                   | <1.0                       | 17.22                       |

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

DRY = Well contained insufficient volume to collect sample.

NM = Not Measured

**BOLD** = Analytical result is in exceedance of COGCC groundwater standards.