

March 1, 2016

Mr. Bob Chesson
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
Jacobucci 13-32, 23-32 Tank Battery
NWSW Section 32 T1N R67W
Weld County, Colorado
Facility #: 331008
Spill Tracking #: 2232473
Remediation #: 7952**

Dear Mr. Chesson,

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 Jacobucci 13-32, 23-32 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 February 11, 2013, during dump line replacement activities. Following excavation and well installation activities, groundwater monitoring was initiated during the second quarter 2013. The monitoring well network at the Site consists of 8 temporary monitoring and remediation wells (BH01 - BH08), 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	BH03, BH08	91
2Q 2015	BH08	40
3Q 2015	None	3.3
4Q 2015	None	1.3

Tasman initiated enhanced fluid recovery (EFR) and air sparge (AS) events at the site during the second quarter 2013. EFR/AS events were discontinued after the fourth quarter 2015, and monitored natural attenuation (MNA) was implemented as the selected remediation strategy for this site beginning in the first quarter 2016. Four additional quarters of compliance groundwater monitoring will be conducted to confirm that BTEX concentrations remain below applicable COGCC Table 910-1 groundwater standards.

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

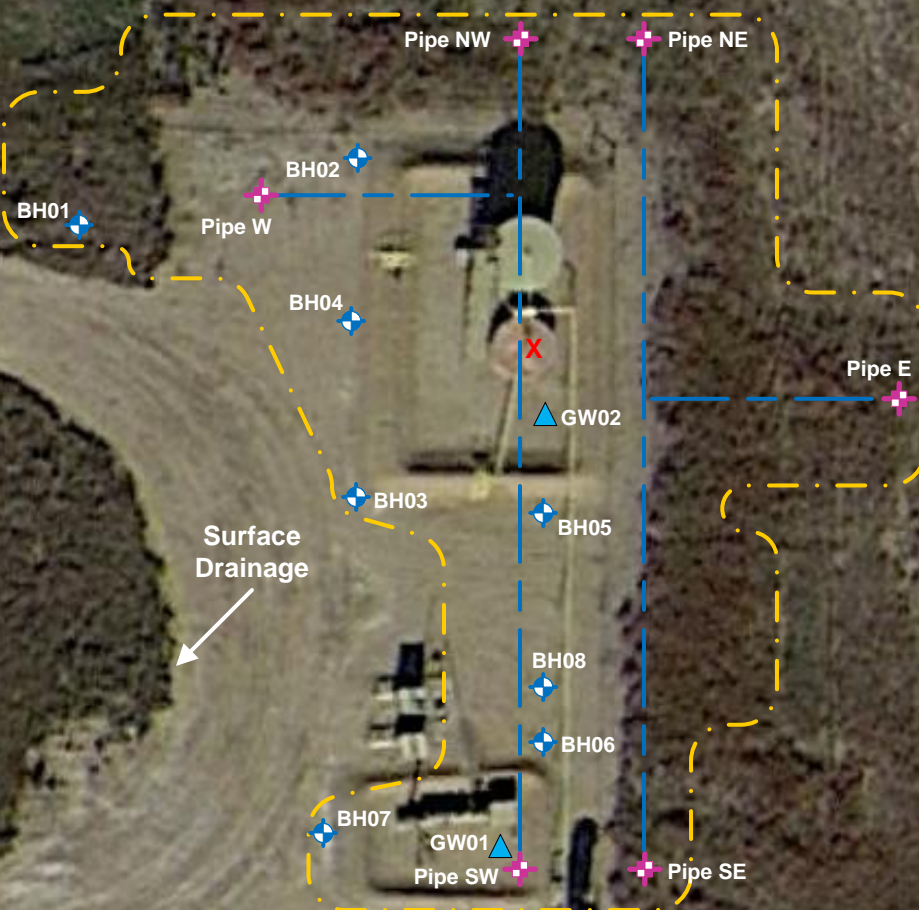
Sincerely,



Christine Wasko
Project Manager
Tasman Geosciences, Inc.



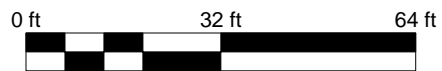
Weld County Road 15



Private Property

Surface Drainage

Note: Surface drainage direction is estimated based on site topography and is not related to regional topography.



DRAWN BY: ESS

DATE: 2/2/2016

Facility Diagram
PDC Energy – DJ Basin
Jacobucci 13-32, 23-32 Tank Battery
NWSW S32 T1N R67W
Weld County, CO



6899 Pecos Street
Unit C
Denver, CO 80221

LEGEND

- Excavation Extent
- Excavation Groundwater Sample Location
- Monitoring Well Location
- Horizontal Remediation Well Location
- Point of Release

All locations are approximate unless otherwise noted

FIGURE 1
GROUNDWATER MONITORING SITE MAP

TABLE 1
JACOBUCCI 13-32, 23-32 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
GW01	2/12/2013	510	3,400	190	3,000	~ 4
GW02	2/19/2013	690	2,800	94	1,500	~ 4
BH01	4/15/2013	<1.0	<1.0	<1.0	<1.0	NM
BH01	7/25/2013	<1.0	<1.0	<1.0	<1.0	6.04
BH01	10/30/2013	<1.0	<1.0	<1.0	<1.0	5.66
BH01	1/22/2014	<1.0	<1.0	<1.0	<1.0	4.32
BH01	4/28/2014	<1.0	<1.0	<1.0	<1.0	4.52
BH01	7/24/2014	<1.0	<1.0	<1.0	<1.0	6.02
BH01	10/27/2014	<1.0	<1.0	<1.0	<1.0	4.44
BH01	1/19/2015	<1.0	<1.0	<1.0	<1.0	4.16
BH01	4/21/2015	<1.0	<1.0	<1.0	<1.0	3.14
BH01	7/20/2015	<1.0	<1.0	<1.0	<1.0	4.03
BH01	10/15/2015	<1.0	<1.0	<1.0	<1.0	4.05
BH02	4/15/2013	12	1.6	5.3	130	NM
BH02	7/25/2013	7.7	<1.0	7.1	16	6.00
BH02	10/30/2013	<1.0	<1.0	<1.0	<1.0	4.33
BH02	1/22/2014	31	<1.0	<1.0	<1.0	4.50
BH02	4/28/2014	<1.0	<1.0	<1.0	<1.0	4.54
BH02	7/24/2014	<1.0	<1.0	<1.0	<1.0	5.68
BH02	10/27/2014	<1.0	<1.0	<1.0	<1.0	4.52
BH02	1/19/2015	<1.0	<1.0	<1.0	<1.0	4.10
BH02	4/21/2015	<1.0	<1.0	<1.0	<1.0	3.29
BH02	7/20/2015	<1.0	<1.0	<1.0	<1.0	3.49
BH02	10/15/2015	<1.0	<1.0	<1.0	<1.0	2.09
BH03	4/15/2013	3.1	<1.0	<1.0	<1.0	NM
BH03	7/25/2013	<1.0	2.2	<1.0	5.0	6.37
BH03	10/30/2013	<1.0	<1.0	<1.0	<1.0	4.52
BH03	1/22/2014	<1.0	<1.0	<1.0	<1.0	4.74
BH03	4/28/2014	<1.0	<1.0	<1.0	<1.0	4.88
BH03	7/24/2014	<1.0	<1.0	<1.0	<1.0	6.35
BH03	10/27/2014	<1.0	<1.0	<1.0	<1.0	4.72
BH03	1/19/2015	6.5	<1.0	<1.0	<1.0	4.48

TABLE 1
JACOBUCCI 13-32, 23-32 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
BH03	4/21/2015	<1.0	<1.0	<1.0	<1.0	3.10
BH03	7/20/2015	<1.0	<1.0	<1.0	<1.0	4.07
BH03	10/15/2015	<1.0	<1.0	<1.0	<1.0	3.87
BH04	4/15/2013	<1.0	<1.0	<1.0	<1.0	NM
BH04	7/25/2013	2.7	<1.0	<1.0	2.4	5.95
BH04	10/30/2013	<1.0	<1.0	<1.0	<1.0	3.99
BH04	1/22/2014	<1.0	<1.0	<1.0	<1.0	4.22
BH04	4/28/2014	<1.0	<1.0	<1.0	<1.0	4.81
BH04	7/24/2014	<1.0	<1.0	<1.0	<1.0	6.21
BH04	10/27/2014	<1.0	<1.0	<1.0	<1.0	4.38
BH04	1/19/2015	<1.0	<1.0	<1.0	<1.0	4.25
BH04	4/21/2015	<1.0	<1.0	<1.0	<1.0	3.41
BH04	7/20/2015	<1.0	<1.0	<1.0	<1.0	3.87
BH04	10/15/2015	<1.0	<1.0	<1.0	<1.0	4.25
BH05	4/15/2013	67	590	19	370	NM
BH05	7/25/2013	5.2	<1.0	<1.0	3.0	6.14
BH05	10/30/2013	<1.0	<1.0	<1.0	<1.0	4.51
BH05	1/22/2014	<1.0	<1.0	<1.0	<1.0	4.64
BH05	4/28/2014	1.9	<1.0	<1.0	<1.0	4.81
BH05	7/24/2014	<1.0	<1.0	<1.0	<1.0	6.29
BH05	10/27/2014	<1.0	<1.0	<1.0	<1.0	4.64
BH05	1/19/2015	<1.0	<1.0	<1.0	<1.0	4.41
BH05	4/21/2015	<1.0	<1.0	<1.0	<1.0	3.37
BH05	7/20/2015	<1.0	<1.0	<1.0	<1.0	4.06
BH05	10/15/2015	<1.0	<1.0	<1.0	<1.0	4.16
BH06	4/15/2013	10,000	31,000	950	14,000	NM
BH06	7/25/2013	1,500	61	150	5,900	6.77
BH06	10/30/2013	39	<1.0	<1.0	8.4	4.84
BH06	1/22/2014	64	<1.0	40	570	5.03
BH06	4/28/2014	65	<1.0	56	680	5.01
BH06	7/24/2014	35	<1.0	4.4	320	6.46
BH06	10/27/2014	8.8	<1.0	8.1	12	4.87

TABLE 1
JACOBUCCI 13-32, 23-32 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
BH06	1/19/2015	1.4	<1.0	4.0	13	5.55
BH06	4/21/2015	1.4	<1.0	1.8	13	3.74
BH06	7/20/2015	<1.0	<1.0	<1.0	<1.0	4.52
BH06	10/15/2015	<1.0	<1.0	<1.0	<1.0	4.35
BH07	4/15/2013	4.7	39	2.8	41	NM
BH07	7/25/2013	<1.0	<1.0	<1.0	<1.0	6.87
BH07	10/30/2013	<1.0	<1.0	<1.0	<1.0	4.67
BH07	1/22/2014	<1.0	<1.0	<1.0	<1.0	4.73
BH07	4/28/2014	<1.0	<1.0	<1.0	<1.0	4.95
BH07	7/24/2014	<1.0	<1.0	<1.0	<1.0	6.66
BH07	10/27/2014	<1.0	<1.0	<1.0	<1.0	5.02
BH07	1/19/2015	<1.0	<1.0	<1.0	<1.0	5.31
BH07	4/21/2015	<1.0	<1.0	<1.0	<1.0	4.18
BH07	7/20/2015	<1.0	<1.0	<1.0	<1.0	5.89
BH07	10/15/2015	<1.0	<1.0	<1.0	<1.0	4.95
BH08	7/24/2014	17	1.6	<1.0	61	6.97
BH08	10/27/2014	8.4	<1.0	1.9	19	5.26
BH08	1/19/2015	91	<1.0	18	110	4.89
BH08	4/21/2015	40	<1.0	2.7	8.5	4.04
BH08	7/20/2015	3.3	<1.0	<1.0	<1.0	4.74
BH08	10/15/2015	1.3	<1.0	<1.0	9.5	4.84

Notes:

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

COGCC = Colorado Oil and Gas Conservation Commission

2. Depth to water measured from top of well casing or ground surface for monitoring well samples and excavation samples, respectively.

µg/L = Micrograms per liter

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

NM = Not Measured

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