

State of Colorado  
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109



FOR OGCC USE ONLY

#9365

## SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

☒ Spill ☐ Complaint  
☐ Inspection ☐ NOAV

## CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☒ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☐ Other (describe) \_\_\_\_\_

Tracking No 1631206

## GENERAL INFORMATION

<b>OGCC Operator Number:</b> 69175		<b>Contact Name and Telephone</b>	
Name of Operator: PDC Energy, Inc.		Name: Randall Ferguson	
Address: 1775 Sherman Street, Suite 3000		No: (303) 860-5800	
City: Denver State: CO Zip: 80203		Fax: (303) 860-5838	
API/Facility No: 05-123-11685		County: Weld	
Facility Name: Dechant 1-31A		Facility Number: 322584	
Well Name: Dechant 1-31A		Well Number: Dechant 1-31A	
Location (QtrQtr, Sec, Twp, Rng, Meridian) SWSW S31 T3N R64W		Latitude: 40.180174 Longitude: -104.602614	

## TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.):		Crude Oil / Produced Water	
<b>Site Conditions:</b> Is location within a sensitive area (according to Rule 91) <input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, attach evaluation. ** Please see 'Potential Receptors' section b			
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.):		Cropland	
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan Valent sand, 0 to 3 percent slopes			
Potential receptors (water wells within 1/4 mi, surface waters, etc.): A residence is located approximately 2,850' south of the location. The nearest surface is 2,023' southeast and the nearest water well is 550' northwest. 4 water wells are located within a 1/4-mile radius. Depth to shallow groundwater is a			
<b>Description of Impact</b> (if previously provided, refer to that form or document):			
Impacted Media (check):	Extent of Impact:	How Determined:	
<input checked="" type="checkbox"/> Soils	Refer to the attached Figure 2 and Table 1	Excavation and soil sampling	
<input type="checkbox"/> Vegetation			
<input checked="" type="checkbox"/> Groundwater	Refer to the attached Figure 3 and Table 2	Drilling and groundwater sampling	
<input type="checkbox"/> Surface water			

## REMEDIATION WORKPLAN

<p>Describe initial action taken (if previously provided, refer to that form or document)</p> <p>On November 24, 2009, historic impacts were discovered below the produced water vessel at the Dechant 1-31A production facility. Excavation activities were completed by LT Environmental, Inc. (LTE), as described in the Form 19 submitted on December 4, 2009 (Spill Tracking # 1631206). A topographic map of the site is included on Figure 1.</p>
<p>Describe how source is to be removed</p> <p>Approximately 900 cubic yards of impacted material were removed and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal under PDC waste manifests. The excavation extent measured approximately 62 ft. N-S by 39 ft. E-W by 10 ft. bgs. Excavation oversight, soil screening, and sampling were performed by LTE; however due to an internal oversight, no data was provided to the COGCC. Groundwater was not encountered during excavation activities. The excavation extent and former tank locations are illustrated on Figure 2.</p>
<p>Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:</p> <p>Between December 2009 and August 2012, LTE installed sixteen (16) temporary monitoring wells (MW01- MW05, MW07-MW10, MW10R, and MW11-MW16) for monitoring and remediation purposes. Groundwater was encountered during drilling activities at approximately 14 feet below ground surface (bgs). Quarterly groundwater monitoring was initiated on December 16, 2009. In March 2013, remediation and monitoring responsibilities were transferred to Tasman Geosciences, Inc. (Tasman). However, only three (MW07, MW10R, and MW13) of the sixteen (16) existing monitoring wells could be located and sampled during the June 2013 monitoring event. Consequently, six (6) additional temporary monitoring wells (MW17 - MW22) were installed on January 21, 2014. Temporary monitoring well locations are illustrated on Figure 3. PDC initiated mobile enhanced fluid recovery (EFR) and air sparging (AS) activities during the third quarter 2015 to address remaining dissolved phase hydrocarbon impacts on site. A summary of the EFR/AS operational data is provided in Table 2.</p> <p>PDC will install seven (7) additional wells for monitoring and remediation purposes, as illustrated on Figure 4. PDC will conduct quarterly groundwater monitoring at the final sixteen (16) monitoring well locations until constituent concentrations are in compliance with COGCC Table 910.1 groundwater standards for four consecutive quarters.</p>

Submit Page 2 with Page 1.

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## REMEDIATION WORKPLAN (CONT.)

OGCC Employee: \_\_\_\_\_

Tracking Number: \_\_\_\_\_  
Name of Operator: PDC Energy, Inc.  
OGCC Operator No: 69175  
Received Date: \_\_\_\_\_  
Well Name & No: Dechant 1-31A  
Facility Name & No.: Dechant 1-31A

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Groundwater was encountered during drilling activities at approximately 14 feet below ground surface (bgs). Quarterly groundwater monitoring was initiated at sixteen (16) temporary monitoring locations on December 16, 2009. In January 2014, six (6) additional monitoring wells (MW17 - MW22) were installed to expand the well network, as thirteen (13) of the initial sixteen (16) well locations were destroyed during first quarter 2013. Groundwater sampling is completed on a quarterly basis at the remaining nine (9) temporary monitoring locations (MW07, MW10R, MW13, and MW17 - MW22). Groundwater monitoring locations and analytical results for the second and third quarter 2015 are illustrated on Figure 3. In addition, PDC will install seven (7) new monitoring and remediation wells, as illustrated on Figure 4. These seven (7) wells will be incorporated into the quarterly monitoring network. PDC will continue quarterly groundwater sampling to monitor dissolved phase petroleum hydrocarbon impacts using USEPA Method 8260. Groundwater monitoring will continue until four consecutive quarters of BTEX concentrations in compliance with COGCC Table 910-1 groundwater standards are achieved.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The excavation was backfilled and compacted with clean material and the ground surface was re-contoured to match pre-existing conditions. Subsequent to attainment of closure, temporary monitoring wells will be plugged and abandoned.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☒ N If yes, describe:

Based on groundwater analytical results, the lateral extent of remaining dissolved phase hydrocarbon impacts has been delineated.

Consequently, PDC feels that no further site investigation is required. The excavation extent is illustrated on Figure 2. Temporary monitoring well locations are illustrated on Figure 3. Groundwater analytical results are summarized in Table 1 and laboratory analytical reports are included as Attachment A.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

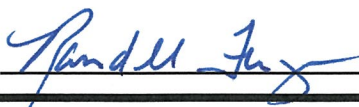
Impacted soil was disposed of at the Buffalo Ridge Landfill in Keenesburg, Colorado under PDC waste manifests.

## IMPLEMENTATION SCHEDULE

Date Site Investigation Began: <u>11/24/2009</u>	Date Site Investigation Completed: <u>1/21/2014</u>	Remediation Plan Submitted: _____
Remediation Start Date: <u>7/8/2015</u>	Anticipated Completion Date: <u>NA</u>	Actual Completion Date: <u>TBD</u>

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name Randall Ferguson

Signed:  Title: EHS Senior Compliance Specialist Date: 11/20/2015

OGCC Approved: \_\_\_\_\_ Title: EPS Date: 11/23/2015