

State of Colorado  
Oil and Gas Conservation Commission

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FOR OGCC USE ONLY

#7693

RECEIVED  
3/26/2013

**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

Tracking No: 2231641

**CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED**

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

**GENERAL INFORMATION**

<b>OGCC Operator Number:</b> 69175		Contact Name and Telephone	
Name of Operator: <u>PDC Energy, Inc.</u>		Name: <u>Brandon Bruns</u>	
Address: <u>1775 Sherman Street, Suite 3000</u>		No: <u>(303) 831-3971</u>	
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80203</u>		Fax: <u>(303) 860-5838</u>	
API/Facility No: <u>05-123-12297</u>	County: <u>Weld</u>		
Facility Name: <u>Becker 5-1, 2, 14, 15</u>	Facility Number: <u>244502</u>		
Well Name: <u>Becker 5-1, 2, 14, 15</u>	Well Number: <u>Becker 5-1, 2, 14, 15</u>		
Location (QtrQtr, Sec, Twp, Rng, Meridian): <u>SE 1/4 S5 T3N R64W</u>		Latitude: <u>40.247358</u>	Longitude: <u>-104.573303</u>

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Condensate

Site Conditions: Is location within a sensitive area (according to Rule 901e)?  Y  N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Oil and gas production, Agriculture

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Vona loamy sand, 0 to 3 percent slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water is located approximately 2,700' west of the Tank Battery, a residence is approximately 475' north, a water well is approximately 685' northwest, and depth to shallowest groundwater is approximately 16 ft bgs.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>Refer to the attached Figure 2 and Table 1</u>	<u>Excavation, direct push drilling, and soil sampling</u>
<input type="checkbox"/> Vegetation	_____	_____
<input checked="" type="checkbox"/> Groundwater	<u>Refer to the attached Figure 3 and Table 2</u>	<u>Groundwater sampling</u>
<input type="checkbox"/> Surface water	_____	_____

**REMEDIATION WORKPLAN**

Describe initial action taken (if previously provided, refer to that form or document):

A Form 19 was submitted on January 14, 2013 and the COGCC issued spill # 2231641 for this project. A topographic map of the site is included on Figure 1.

Describe how source is to be removed:

The source area was previously excavated and impacted material was transported and disposed of as described in the Form 19.

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.:

On December 13, 2012, three temporary monitoring wells were installed using direct push drilling, as illustrated on Figure 3. Soil samples were collected using continuous sampling techniques to determine the lateral and vertical extents of petroleum hydrocarbon impacts in the subsurface. Soil samples were collected and submitted for laboratory analysis from two borehole locations that exhibited elevated field screened volatile organic compound (VOC) concentrations measured by a photoionization detector (PID). The soil samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons - gasoline range organics (TPH-GRO), total petroleum hydrocarbons - diesel range organics (TPH-DRO), and naphthalene by applicable USEPA methods. Analytical results and PID readings are summarized in Table 1. On December 20, 2012, groundwater sampling was conducted at the three monitoring locations. Each The groundwater analytical results are summarized in Table 2 and illustrated on Figure 3. Each of the groundwater samples were analyzed for BTEX using USEPA Method 8260. The soil and groundwater analytical results are included as Attachment A. PDC was not able to obtain access to install additional monitoring wells adjacent to the site. Due to elevated constituent concentrations in soil and groundwater, PDC plans to initiate bi-weekly, 8-hour vacuum enhanced fluid recovery (EFR) and air sparge (AS) events to address residual petroleum hydrocarbon impacts. In addition to completing EFR and AS, PDC will conduct quarterly groundwater monitoring at the three temporary well locations until BTEX concentrations meet COGCC groundwater standards for four consecutive quarters.



REMEDIATION WORKPLAN (CONT.)

OGCC Employees:

Tracking Number: Name of Operator: PDC Energy, Inc. OGCC Operator No: 69175 Received Date: Well Name & No: Becker 5-1, 2, 14, 15 Facility Name & No.: Becker 5-1, 2, 14, 15

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.): PDC will continue to sample the three monitoring wells on a quarterly basis to assess the dissolved phase petroleum hydrocarbon impacts in groundwater using USEPA Method 8260. Groundwater sampling will continue until four consecutive quarters of groundwater monitoring data indicate that BTEX concentrations are in compliance with the COGCC Table 910-1 groundwater standards.

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 area where the excavation is located is used as an equipment access area to the tank battery location and consists of road base. The excavation has been backfilled and compacted with clean material and the ground surface was contoured to match pre-existing conditions.

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 [x] N If yes, describe: PDC feels that no further Site investigation is required at this time. The excavation extent and soil and groundwater sample locations are illustrated on Figure 2. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized in Table 2 and illustrated on Figure 3. Monitoring phase.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): impacted soil was transported to the Waste Management Facility in Ault, CO for disposal.

IMPLEMENTATION SCHEDULE

Table with 4 columns: Date Site Investigation Began, Date Site Investigation Completed, Remediation Plan Submitted, Remediation Start Date, Anticipated Completion Date, Actual Completion Date. Values include 11/27/2012, 11/29/2012, 3/26/13, 12/13/2012, NA, TBD.

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

Print Name: Brandon Bruns

Signed: [Signature] Title: EHS Professional Date: 3/26/13

OGCC Approved: Title: EPS Date: 4/1/2013