

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

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: _____

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

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

GENERAL INFORMATION

OGCC Operator Number: 69175		Contact Name and Telephone	
Name of Operator: <u>PDC Energy, Inc.</u>		Name: <u>Charity Fleenor</u>	
Address: <u>1775 Sherman Street, Suite 3000</u>		No: <u>(303) 860-5800</u>	
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80203</u>		Fax: <u>(303) 860-5838</u>	
API/Facility No: <u>05-123-14085</u>	County: <u>Weld</u>		
Facility Name: <u>Miller GJ 33-24</u>	Facility Number: <u>327058</u>		
Well Name: <u>Miller GJ 33-24</u>	Well Number: <u>Miller GJ 33-24</u>		
Location (QtrQtr, Sec, Twp, Rng, Meridian): <u>NWSE S24 T6N R65W</u>		Latitude: <u>40.468682</u>	Longitude: <u>-104.606833</u>

TECHNICAL CONDITIONS

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

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation. ** Please see 'Potential Receptors' section below.

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

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Nunn clay loam, 0 to 1 percent slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): A residence is located approximately 1,405' northeast of the location. The nearest surface water is 2,230' east and the nearest water well is 1,050' southeast. 2 water wells are located within a 1/4-mile radius. Depth to shallow groundwater is about 11 feet 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 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>Drilling and groundwater sampling</u>
<input type="checkbox"/> Surface water	_____	_____

REMEDIATION WORKPLAN

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

On October 27, 2014, a historic release was discovered during routine pressure testing of the Miller GJ 33-24 well flow line. Excavation activities were summarized in a Form 19 submitted on October 29, 2014 (Document # 400719289). A topographic map of the site is included on Figure 1.

Describe how source is to be removed:

Excavation activities were conducted between October 27 - October 29, 2014, and approximately 360 cubic yards of impacted material were removed and transported to the Waste Management Facility in Ault, Colorado for disposal under PDC waste manifests. Soil samples collected from the sidewalls of the final excavation extent exhibited constituent concentrations below COGCC Table 910-1 soil standards. Groundwater was encountered during excavation activities at approximately 11 feet below ground surface (bgs). Between October 27 - November 3, 2014, approximately 640 barrels of groundwater were removed from the excavation using a vacuum truck and transported to a licensed water disposal facility. The groundwater sample (GW01) collected from the excavation area exhibited benzene concentrations in exceedance of COGCC Table 910-1 groundwater standards. Soil analytical data is summarized in Table 1 and groundwater analytical data is summarized in Table 2. Laboratory analytical reports are included as Attachment A.

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.:

Prior to backfilling, approximately 265 pounds of activated carbon were introduced to the excavation area to address remaining dissolved phase petroleum hydrocarbon impacts. In addition, a perforated horizontal pipe was installed below the potentiometric surface for subsequent remedial activities. On March 30, 2015, PDC installed five temporary wells (BH01 - BH05) using direct push drilling methods for monitoring and remediation purposes. Groundwater was encountered during drilling activities at approximately 10 feet bgs. Monitoring well locations are illustrated on Figure 3 and well completion logs are included as Attachment B. PDC will initiate monitored natural attenuation (MNA) to assess dissolved phase hydrocarbon concentrations at the site. Additional remedial strategies will be evaluated should constituent concentrations in groundwater increase above COGCC Table 910-1 standards. PDC will conduct quarterly groundwater monitoring at the five temporary monitoring locations until BTEX concentrations are in compliance with COGCC groundwater standards for four consecutive quarters.



REMEDIATION WORKPLAN (CONT.)

OGCC Employee: _____

Tracking Number: _____
Name of Operator: PDC Energy, Inc.
OGCC Operator No: 69175
Received Date: _____
Well Name & No: Miller GJ 33-24
Facility Name & No.: Miller GJ 33-24

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
Groundwater was encountered during excavation and drilling activities at approximately 10 - 11 feet below ground surface (bgs). Quarterly groundwater sampling at the five temporary monitoring locations commenced in April 2015. 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. Temporary monitoring wells will be plugged and abandoned subsequent to attainment of closure.

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:
Based on soil and groundwater analytical results, PDC feels that no further site investigation activities are required. The excavation extent and soil sample locations are illustrated on Figure 2. Temporary monitoring well locations are illustrated on Figure 3. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized on Table 2. The 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.):
Waste soil was disposed of at the Waste Management Facility in Ault, Colorado under PDC waste manifests. Impacted groundwater was transported to a licensed water disposal facility.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 10/27/2014 Date Site Investigation Completed: 3/30/2015 Remediation Plan Submitted: _____
Remediation Start Date: 3/30/2015 Anticipated Completion Date: NA Actual Completion Date: TBD

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

Print Name: Charity Fleenor

Signed: _____ Title: EHS Director Date: _____

OGCC Approved: _____ Title: _____ Date: _____