

State of Colorado
Oil and Gas Conservation Commission

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FOR OGCC USE ONLY

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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: 200437785

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>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>05-123-13481</u> | County: <u>Weld</u> | | |
| Facility Name: <u>Jerke Up 8-7</u> | Facility Number: <u>323755</u> | | |
| Well Name: <u>Jerke Up 8-7</u> | Well Number: <u>Jerke Up 8-7</u> | | |
| Location (QtrQtr, Sec, Twp, Rng, Meridian): <u>SENE S7 T4N R65W</u> | | Latitude: <u>40.329094</u> | Longitude: <u>-104.701236</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.

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: Julesburg sandy loam, 0 to 1 percent slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water is located approximately 695' southeast of the tank battery, a residence is located approximately 1,155' east, the nearest water wells are approximately 650' east and west. The depth to shallowest groundwater is approximately 5' 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 November 6, 2013, a historical release was discovered during the removal of the buried produced water vessel at the Jerke Up 8-7 (API # 05-123-13481) tank battery. A Form 19 was submitted to the COGCC but a spill tracking number has not been assigned for this location. An aerial 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 19, 2013, six temporary monitoring wells (BH01 through BH06) were installed using direct push drilling for monitoring and remediation purposes. On January 10, 2014, groundwater samples were collected at the six temporary well locations and were submitted to Summit Scientific Laboratories in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using USEPA Method 8260B. Analytical results indicate that BTEX concentrations are in exceedance of COGCC Table 910-1 groundwater standards at four of the six sample locations. Groundwater analytical results are summarized in Table 2 and temporary well locations and corresponding analytical results are illustrated on Figure 3. The analytical reports are included as Attachment A. PDC will initiate vacuum enhanced fluid recovery (EFR) and air sparge (AS) events to address residual petroleum hydrocarbon impacts to groundwater. PDC will conduct quarterly groundwater monitoring at the six temporary monitoring 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: Jerke UP 8-7 Facility Name & No.: Jerke UP 8-7

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.): Groundwater was encountered during excavation activities at approximately 5 feet below ground surface (bgs). PDC will conduct quarterly groundwater sampling at the six monitoring wells to assess dissolved BTEX 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 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. Temporary monitoring locations are illustrated on Figure 3. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized in Table 2. The analytical reports are included in Attachment A.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): Waste was disposed of at the Buffalo Ridge Waste Management Landfill in Keenesburg, Colorado under PDC waste manifests.

IMPLEMENTATION SCHEDULE

Table with implementation schedule details: Date Site Investigation Began: 11/6/2013, Date Site Investigation Completed: 12/19/2013, Remediation Plan Submitted: , Remediation Start Date: 2/1/2014, 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: Brandon Bruns

Signed: [Signature] Title: EHS Professional Date: 2/26/14

OGCC Approved: Title: EPS Date: 10/19/2015