

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

Informational only

Do Not Enter

Remediation #4209

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.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

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

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

GENERAL INFORMATION

OGCC Operator Number: 69175		Contact Name and Telephone	
Name of Operator: Petroleum Development Corporation		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: 05-123-10634		County: Weld	
Facility Name: Great Western Sugar #2		Facility Number:	
Well Name: Great Western Sugar		Well Number: #2	
Location (Qtr, Sec, Twp, Rng, Meridian): NENW Sec 9 T4N R67W 6th PM		Latitude: Longitude:	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.):		Condensate and Produced Water	
Site Conditions: Is location within a sensitive area (according to Rule 901e)?		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, attach evaluation. Groundwater <20 feet below ground surface.	
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:		Kim loam, 1 to 3 percent slopes	
Potential receptors (water wells within 1/4 mi, surface waters, etc.):		Surface water is located 350' northeast of the site; a building is located 600' northwest of the site; a water well is located 200' northeast of the site; and depth to groundwater is 8' below ground surface (bgs).	
Description of Impact (if previously provided, refer to that form or document):			
Impacted Media (check):		Extent of Impact:	
<input checked="" type="checkbox"/> Soils		60' NE-SW x 20' NW-SE x 10' bgs	
<input type="checkbox"/> Vegetation		See attached data	
<input checked="" type="checkbox"/> Groundwater		See attached data	
<input type="checkbox"/> Surface water		See attached data	
		How Determined:	
		Laboratory analysis and field screening of soil samples	
		Laboratory analysis of groundwater samples	

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
A Form 19 was submitted on November 29, 2007 (Spill #1982076) and a Form 27 was submitted on April 17, 2008 (Remediation #4209).
Describe how source is to be removed:
During a limited site investigation related to the historical operation of a "tinhorn" near the former produced water tank, groundwater impacts were discovered. The tinhorn was found to have released an unknown volume of condensate and produced water to the subsurface. A soil boring was advanced downgradient of the produced water tank and the suspected tinhorn location in 11/07, where a soil sample was collected immediately above groundwater. The soil sample was submitted for analysis of TPH-GRO, TPH-DRO, and TPH-ORO by EPA Method 8015. Lab results indicate TPH concentrations in soil were in compliance with COGCC standards (Table 910-1 prior to 4/1/09). A monitoring well (MW01) was also completed in the boring, where a groundwater sample was collected and submitted for analysis of BTEX by EPA Method 8260B. Lab results indicate the benzene and total xylenes concentrations in groundwater were not in compliance with CDPHE WQCC Regulation 41 (Reg. 41) standards. As a result, three additional monitoring wells (MW02-MW04) were installed the following quarter to help better define groundwater impact. After attempting remediation by monitoring natural attenuation for seven quarters, PDC initiated excavation activities in 9/09 in order to remove remaining soil and groundwater impacts. Soil samples were collected from the sidewalls of the excavation and were submitted for analysis of BTEX and TPH-GRO by EPA Method 8260B and TPH-DRO by EPA Modified Method 8015. Lab results indicate BTEX, TPH-GRO, and TPH-DRO concentrations along the excavation perimeter were in compliance with Table 910-1 Concentration Levels. Before backfilling the excavation, activated carbon was applied to the groundwater and exposed smear zone soil. A topographic map and a site map are provided as Figures 1 and 2. Soil and groundwater analytical results are summarized in Tables 1 and 2. The laboratory analytical reports are included as an attachment.
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.:
Approx. 444 cubic yards of soil exceeding COGCC Table 910-1 Concentration Levels was transported to the Waste Management landfill in Ault, CO for disposal.

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REMEDATION WORKPLAN (CONT.)

OGCC Employee: _____

Tracking Number: _____

Name of Operator: Petroleum Development CorporationOGCC Operator No: 69175

Received Date: _____

Well Name & No: Great Western Sugar #2Facility Name & No.: Great Western Sugar #2

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

Monitoring well MW01 was installed in November 2007. To define the downgradient extent of groundwater impacts, monitoring wells MW02 through MW04 were installed in January 2008. Following installation, each well was developed and purged. Monitoring well MW01 was destroyed by excavation activities and was replaced by MW01R on December 3, 2009. Groundwater samples were collected on a quarterly basis from November 2007 through October 2010 and were submitted for laboratory analysis of BTEX by EPA Method 8260B. Laboratory analytical results indicate four consecutive quarters of BTEX concentrations in compliance with Reg. 41 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 site was restored to pre-release grade. PDC's production facility remains at the site.

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:

Laboratory results indicate BTEX, TPH-GRO, and TPH-DRO concentrations in soil are in compliance with COGCC Table 910-1 concentration levels. Laboratory results also indicate the BTEX concentrations in groundwater have been in compliance with Reg. 41 standards for four consecutive quarters (12/3/09, 4/2/2010, 7/22/2010, and 10/21/2010). Based on the laboratory analytical results, the former soil and groundwater impacts have been remediated and PDC is requesting a No Further Action determination for this site.

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

Approx. 444 cubic yards of soil exceeding COGCC Table 910-1 Concentration Levels was transported to the Waste Management landfill in Ault, CO for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: <u>11/20/2007</u>	Date Site Investigation Completed: <u>10/21/2010</u>	Remediation Plan Submitted: <u>12/30/2010</u>
Remediation Start Date: <u>11/27/2007</u>	Anticipated Completion Date: <u>-</u>	Actual Completion Date: <u>10/21/2010</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 FergusonSigned:  Title: Environmental Supervisor Date: 12/30/2010OGCC Approved: _____ Title: EPS Date: 12/30/2010