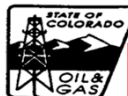


State of Colorado  
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

received 11/30/2016  
REM 9925  
SPILL 447087  
Document 2527325

## 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): \_\_\_\_\_

☐ Spill ☐ Complaint  
☐ Inspection ☐ NOAV

Tracking No: \_\_\_\_\_

## GENERAL INFORMATION

<b>OGCC Operator Number:</b> 47120		<b>Contact Name and Telephone</b>	
<b>Name of Operator:</b> Kerr-McGee Oil and Gas Onshore, LP		<b>Name:</b> Phil Hamlin	
<b>Address:</b> 1099 18th Street, Suite 1800		<b>No:</b> 970-336-3500	
<b>City:</b> Denver <b>State:</b> CO <b>Zip:</b> 80202		<b>Fax:</b> 970-336-3656	
<b>API/Facility No:</b> 447087		<b>County:</b> Weld	
<b>Facility Name:</b> ADAMSON ERNIE F GU		<b>Facility Number:</b> 62N65W21SWSW	
<b>Well Name:</b> ADAMSON ERNIE F GU		<b>Well Number:</b> 1X	
<b>Location (Qtr, Sec, Twp, Rng, Meridian):</b> SESW S21 T2N R65W		<b>Latitude:</b> 40.120121 <b>Longitude:</b> -104.674624	

## TECHNICAL CONDITIONS

<b>Type of Waste Causing Impact (crude oil, condensate, produced water, etc.):</b> Crude oil, condensate, and produced water	
<b>Site Conditions:</b> Is location within a sensitive area (according to Rule 901e)? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, attach evaluation.	
<b>Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.):</b> Non-crop land	
<b>Soil type, if not previously identified on Form 2A or Federal Surface Use Plan:</b> Silty sand to silty clay.	
<b>Potential receptors (water wells within 1/4 mi, surface waters, etc.):</b> The nearest water well is located 223 feet north of the release area. No surface water is located within 1/4-mile of the site.	
<b>Description of Impact (if previously provided, refer to that form or document):</b>	
<b>Impacted Media (check):</b>	<b>Extent of Impact:</b>
<input checked="" type="checkbox"/> Soils	40' (E-W) x 52' (N-S) x 32-35' bgs
<input type="checkbox"/> Vegetation	
<input checked="" type="checkbox"/> Groundwater	See attached data.
<input type="checkbox"/> Surface water	
<b>How Determined:</b>	
Excavation, soil sampling, and laboratory analysis.	
Groundwater sampling and laboratory analysis.	

## REMEDIAL WORKPLAN

<b>Describe initial action taken (if previously provided, refer to that form or document):</b> <p>On July 19, 2016, a corroded dumphine was encountered during plugging and abandonment activities at the Ernie F Adamson Gas Unit-62N65W21SWSW production facility. The facility was shut-in, associated underground infrastructure removed, and excavation activities commenced. Groundwater was not encountered within the initial excavation. An initial Form 19 was submitted to the COGCC on August 1, 2016 (COGCC Document No. 401086657), and a supplemental Form 19 was submitted to the COGCC on August 8, 2016 (COGCC Document No. 401089844.) The COGCC has not yet issued a Spill Tracking number for this release.</p>
<b>Describe how source is to be removed:</b> <p>On July 29, 2016, excavation activities commenced and approximately 540 cubic yards of impacted material were removed and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Excavation activities were guided in the field using a photoionization detector (PID) to measure volatile organic compound (VOC) concentrations in soil. Soil samples were collected from the sidewalls and base of the excavation area at approximately 12-18 feet bgs and 15-20 feet bgs, respectively. The soil samples were submitted to Origins Laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260C, TPH - diesel and oil range organics (DRO and ORO) by USEPA 8015, electrical conductivity (EC), and pH. Laboratory analytical results indicated that benzene and TPH concentrations in soil sample B05@20' were above the applicable COGCC Table 910-1 standards. Due to the depth of impacts and unstable sidewalls, further excavation activities were not conducted. To further assess the extent of soil impacts, exploratory excavations were advanced within the excavation area at five locations in the vicinity of the failed base sample B05@20'. Exploratory excavations were advanced from 20 feet bgs to between 32 and 36 feet bgs. Soil was screened using a PID and soil samples were collected from the final vertical extent of the five exploratory excavations and submitted to Origins Laboratory for analysis of BTEX, TPH - GRO by USEPA Method 8260C, TPH - DRO and ORO by USEPA 8015, EC, and pH. Laboratory analytical results indicated that benzene and/or TPH concentrations in three soil samples collected from the final vertical extent of the exploratory excavations were above the applicable COGCC Table 910-1 standards. To further assess the extent of hydrocarbon impacts, three boreholes were advanced adjacent to the excavation area. Soil samples were collected from above the water table from each borehole and submitted to Origins Laboratory for analysis of BTEX, TPH-GRO by USEPA Method 8260C, TPH - DRO and ORO by USEPA 8015. Constituent concentrations in soil samples collected from the three boreholes were below the applicable COGCC Table 910-1 standards. Groundwater was encountered at approximately 32 to 35 feet bgs in the soil borings. Temporary monitoring wells were installed in the boreholes and groundwater samples (BH01 - BH03) were collected and submitted to Origins Laboratory for analysis of BTEX. Analytical results indicated that benzene, ethylbenzene, and total xylenes concentrations in groundwater samples BH01 and BH02 were above the applicable COGCC Table 910-1 standards. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized in Table 2. Soil sample locations are presented on Figure 1 and groundwater sample locations are presented on Figure 2. Laboratory analytical reports are provided as Attachment A and borehole logs are provided as Attachment B. The remedial approach to address remaining impacts is provided in the following sections.</p>
<b>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.:</b> <p>Impacted soil was excavated and transported to the Buffalo Ridge landfill in Keenesburg, Colorado. Remaining soil and groundwater impacts will be addressed using on-site chemical oxidation (chemox) to remediate impacts to below COGCC Table 910-1 standards. Additional proposed groundwater monitoring measures are described on the following page.</p>

State of Colorado  
Oil and Gas Conservation Commission1120 Lincoln Street, Suite 801, Denver, Colorado  
(303) 894-2100 Fax 894-2109Tracking Number: \_\_\_\_\_  
Name of Operator: \_\_\_\_\_  
OGCC Operator No: \_\_\_\_\_  
Received Date: \_\_\_\_\_  
Well Name & No: \_\_\_\_\_  
Facility Name & No.: \_\_\_\_\_

## REMEDIATION WORKPLAN (CONT.)

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

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

Three temporary groundwater monitoring wells were installed adjacent to the excavation area to assess the extent of impacted soil and groundwater. Based on the areal extent of the proposed on-site treatment area, the three existing temporary monitoring wells (BH01 - BH03) may be destroyed/abandoned during treatment activities. Following completion of the on-site soil and groundwater treatment, additional temporary monitoring wells will be installed at the site to assess the extent of groundwater impacts post-treatment. These wells will be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain below COGCC groundwater standards for four consecutive quarters.

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.

Upon completion of remediation activities, the excavation will be backfilled with clean soil and graded to match the adjacent topography. The Ernie F Adamson Gas Unit-62N65W21SWSW production facility has been removed and will not be replaced. Reclamation activities at the site will be compliant with COGCC regulations.

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:

Soil and groundwater analytical results indicate that hydrocarbon impacts remain at the site. Remediation activities will be completed to treat impacted soil and groundwater at the site. Following remediation activities, temporary groundwater monitoring wells will be installed to further assess groundwater impacts. Groundwater samples will be collected from the temporary monitoring wells on a quarterly basis until BTEX concentrations remain below the applicable COGCC standards for four consecutive quarters. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. The analytical laboratory reports are included as Attachment A.

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

Impacted soil was transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Remaining impacted material will be treated in place.

## IMPLEMENTATION SCHEDULE

Date Site Investigation Began:	<u>7/19/2016</u>	Date Site Investigation Completed:	<u>TBD</u>	Remediation Plan Submitted:	_____
Remediation Start Date:	<u>7/29/2016</u>	Anticipated Completion Date:	<u>8/31/2018</u>	Actual Completion Date:	_____

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

Print Name: Phillip Hamlin

Signed: \_\_\_\_\_

Title: Senior HSE RepresentativeDate: 11/23/2016

OGCC Approved: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Submit reports of site investigation and progress of remediation including results of sampling and analysis on an annual basis or more often until remediation is closed.