

State of Colorado  
Oil and Gas Conservation Commission

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FOR OGCC USE ONLY

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Project 9879  
Spill 447504  
Document 2527065

**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**

<b>OGCC Operator Number:</b> 47120 <b>Name of Operator:</b> Kerr-McGee Oil and Gas Onshore, LP <b>Address:</b> 1099 18th Street, Suite 1800 <b>City:</b> Denver <b>State:</b> CO <b>Zip:</b> 80202		<b>Contact Name and Telephone</b> <b>Name:</b> Phil Hamlin <b>No:</b> 970-336-3500 <b>Fax:</b> 970-336-3656	
<b>API/Facility No:</b> 446413 <b>447504</b> <b>Facility Name:</b> LORENZ L30-3, 5#2-30 O SA <b>Well Name:</b> Lorenz Federal L <b>Location (QtrQtr, Sec, Twp, Rng, Meridian):</b> NWNW S30 T3N R66W		<b>County:</b> Weld <b>Facility Number:</b> 36149578 <b>Well Number:</b> 30-4, 30-3, and 30-5 <b>Latitude:</b> 40.199518 <b>Longitude:</b> -104.827126	

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Crude oil, condensate, and 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.): Non-crop land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Fat clay with some sand and gravel

Potential receptors (water wells within 1/4 mi, surface waters, etc.): No surface water is located within 1/4-mile of the release area.  
The nearest water well is located approximately 390' north of the release area.

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	20' (E-W) x 13' (N-S) x 5' bgs	Excavation, soil sampling, and laboratory analysis
<input type="checkbox"/> Vegetation		
<input checked="" type="checkbox"/> Groundwater	See attached data	Groundwater sampling and laboratory analysis
<input type="checkbox"/> Surface water		

**REMEDIATION WORKPLAN**

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

During routine operations, an operator discovered a release due to a corroded separator fire tube at the location associated with the Lorenz Federal L30-4, L30-3, and Lorenz L 30-5 wells. The facility was shut -in, associated underground infrastructure removed, and excavation activities commenced. Groundwater was encountered in the excavation area at approximately 5 feet below ground surface (bgs). An Initial/Supplemental Form 19 was submitted to the COGCC on August 26, 2016 (COGCC Document No. 401099740.) The COGCC has issued Spill Tracking number 447504 for this release.

Describe how source is to be removed:

On August 24, 2016, excavation activities commenced and approximately 50 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. Four (4) confirmation soil samples were collected from the sidewalls of the final extent of the excavation area at approximately 4 feet below ground surface (bgs). 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 constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were below the applicable COGCC Table 910-1 standards. Soils were excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current groundwater table due to seasonal fluctuations. Groundwater was encountered in the excavation at approximately 5 feet bgs. A groundwater sample (GW01) was collected and submitted to Origins Laboratory for analysis of BTEX by USEPA Method 8260. Groundwater analytical results indicated that the benzene and total xylenes concentrations in groundwater sample GW01 were above the applicable COGCC Table 910-1 groundwater standards. Approximately 80 barrels of groundwater were removed from the excavation via a vacuum truck. A second groundwater sample (GW02) was subsequently collected and submitted for analysis of BTEX. Analytical results indicated that the benzene concentration in sample GW02 remained above the COGCC Table 910-1 standard. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized in Table 2. Soil and excavation groundwater sample locations are illustrated on Figure 1 and 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.:

Impacted soil was excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Impacted groundwater was transported to a licensed injection facility for disposal. Prior to backfilling the excavation, 165 pounds of activated carbon were added to the groundwater within the excavation to mitigate remaining hydrocarbon impacts in the groundwater table. Additional proposed groundwater monitoring and remediation measures are described on the following page.



Tracking 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.): Temporary groundwater monitoring wells will be installed at the site to further assess the extent of groundwater impacts. 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. The excavation has been backfilled with clean soil and graded to match the adjacent topography. The separator and associated lines have 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? [X] Y [ ] N If yes, describe: Laboratory data indicate that impacted soils in the excavation have been remediated to below COGCC Table 910-1 standards. Temporary monitoring wells will be installed to further assess groundwater impacts. Groundwater samples will be collected from the temporary monitoring wells 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&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. Impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 8/24/2016 Date Site Investigation Completed: TBD Remediation Plan Submitted: \_\_\_\_\_ Remediation Start Date: 8/24/2016 Anticipated Completion Date: 12/31/2017 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: [Signature] Title: Senior HSE Representative Date: 10/13/16

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.