FORM 27 Rev 6/99

State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109

received 05/02/2016
Project 9644
Spill 444847
Document 2526168

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: 47120
Name of Operator: Kerr-McGee Oil and Gas Onshore LP
Address: P.O. Box 173779
City: Denver State: CO Zip: 80217-3779

Contact Name and Telephone
Name: Phillip Hamlin
No: (970) 336-3500
Fax: (970) 336-3656

API/Facility No: 326972 444847
Facility Name: HSR-63N66W/13SENW
Well Name:
Location (QtrQtr, Sec, Twp, Rng, Meridian): SENW Sec 13-T3N-R66W

County: Weld
Facility Number:
Well Number:
Latitude: 40.225381 Longitude: -104.727598

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Produced Water
Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☒ Y ☐ N If yes, attach evaluation. *Groundwater < 20 ft.*
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Cropland
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Silty, fine-grained sand
Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water approximately 100' northeast, water well approximately 875' northeast, livestock approximately 980' northeast, building approximately 510' east, and excavation groundwater approximately 7' below ground surface (bgs).

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):		Extent of Impact:	How Determined:
☒	Soils	25' N-S x 35' E-W x 8' bgs (maximum extent)	Collected soil samples for laboratory analysis
☐	Vegetation		
☒	Groundwater	See attached data	Collected groundwater samples for laboratory analysis
☐	Surface water		

REMEDIATION WORKPLAN

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

A negative trend on the produced water vessel was detected by the operator during a site visit at the HSR-63N66W/13SENW tank battery. Upon examination, a corrosion hole in the water dumpline was discovered. The volume of the release is unknown. The petroleum hydrocarbon impacted soil was excavated. Impacted groundwater was encountered in the excavation. A topographic Site Location Map depicting the geographic setting of the release is provided as Figure 1.

Describe how source is to be removed:

Impacted soil was excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current water table due to past seasonal fluctuations. On February 8, 2016, five sidewall soil samples (N01@5', E01@5', S01@5', W01@5', and W02@5') were collected from the excavation and submitted for laboratory analysis of total petroleum hydrocarbons (TPH) by United Stated Environmental Protection Agency (USEPA) Methods 8015C and 8260C, benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260C, pH by USEPA Method 9045D, and specific conductivity (EC) by USEPA Method 9050D. Laboratory analytical results indicated that soil sample N01@5', which was collected from the northern sidewall of the excavation, exceeded the COGCC Table 910-1 allowable levels for TPH and benzene at 3,430 milligrams per kilogram (mg/kg) and 19.1 mg/kg, respectively. TPH, BTEX, pH, and EC concentrations/levels in the remaining soil samples were compliant with COGCC allowable levels. An excavation groundwater sample (GW01) was collected for BTEX analysis. Laboratory analytical results for the GW01 groundwater sample indicated the benzene, toluene, and total xylene concentrations exceeded the Colorado Groundwater Quality Standards (CGWQS) at a concentrations of 3,630 micrograms per liter (µg/L), 6,090 µg/L, and 3,200 µg/L, respectively.

On February 9, 2016, one excavation sidewall soil sample (N02@5') was collected following the removal of additional impacted soil from the northern sidewall. Laboratory analytical results indicated that TPH, BTEX, pH, and EC levels were in compliance with COGCC allowable levels. On February 10, 2016, following the removal of impacted groundwater, a second groundwater sample (GW02) was collected from the excavation for BTEX analysis. Laboratory analytical results for sample GW02 indicated benzene, toluene, and total xylene concentrations continued to exceed the CGWQS at concentrations of 603 µg/L, 1,930 µg/L, and 3,040 µg/L, respectively. Approximately 31 barrels of impacted groundwater were removed from the excavation and transported to a licensed injection facility for disposal.

On March 17, 2016, two additional excavation sidewall soil samples (N03@5' and E02@5') were collected after removing the produced water sump that was left in place during the initial excavation activities. Laboratory analytical results indicated that TPH, BTEX, pH, and EC levels were in compliance with COGCC allowable levels at the excavation extent.

Approximately 190 cubic yards of impacted soil were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. Prior to backfilling, 800 pounds of COGAC®, an activated carbon-based bioremediation product, was applied to the groundwater and clean backfill in a series of lifts to ensure distribution through the phreatic and capillary zones. The general site layout, excavation dimensions, and soil and groundwater sample locations are depicted on the Excavation Site Map provided as Figure 2. The excavation soil and groundwater sample analytical results are summarized in Tables 1 and 2, respectively. The laboratory analytical reports are attached.

Submit Page 2 with Page 1.

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Page 2

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Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No.: _____

REMEDIATION WORKPLAN (CONT.)

OGCC Empbyeee:

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.:
The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The impacted groundwater was transported to a licensed injection facility for disposal.

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the dissolved-phase groundwater impact. The monitoring wells will be surveyed to determine the groundwater flow direction. Quarterly groundwater monitoring activities will be conducted and samples will be submitted for laboratory analysis of BTEX.

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 tank battery will be deconstructed and the site will be restored to its pre-release grade.

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:
After installing the monitoring wells and establishing points of compliance, groundwater monitoring will be conducted.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):
The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began:	2/9/2016	Date Site Investigation Completed:	Active	Remediation Plan Submitted:	
Remediation Start Date:	2/9/2016	Anticipated Completion Date:	TBD	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 Representative Date: 4/29/2016

OGCC Approved: Peter Gintautas Title: _____ Date: _____

Digitally signed by Peter Gintautas
DN: cn=Peter Gintautas, o=OGCC, ou=Environmental Protection Specialist, email=peter.gintautas@state.co.us, c=US
Date: 2016.05.04 09:02:18 -06'00'

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.