

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:(303)894-2109

FOR OGCC USE ONLY
Received 2/24/2016
Remediation Project
#9445

OGCC Employee:

Spill Complaint
 Inspection NOAV

Tracking No: 2615172

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): Possible natural gas in aquifer

OGCC Operator Number: <u>100322</u>	Contact Name and Telephone: <u>Curtis Rueter</u>
Name of Operator: <u>Noble Energy, Inc.</u>	No: <u>303 228 4048</u>
Address: <u>1625 Broadway, Suite 2200</u>	Fax: _____
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>	
API Number: <u>N/A</u> County: <u>Weld</u>	
Facility Name: <u>N/A</u> Facility Number: <u>754506</u>	
Well Name: <u>Sand Creek Monitoring Well</u> Well Number: <u>DWR Permit #297327</u>	
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SESE Sec 23 T6N R65W</u> Latitude: <u>40.46455</u> Longitude: <u>-104.62404</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Natural gas

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.): Irrigated cropland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: N/A

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Most likely 3 water wells within 1/4 mile based on water well permit data; roughly 6 wells within 1/2 mile radius; no impacts observed to date

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

Impacted Media (check):	Extent of Impact:	How Determined:
<input type="checkbox"/> Soils	_____	_____
<input type="checkbox"/> Vegetation	_____	_____
<input checked="" type="checkbox"/> Groundwater	<u>To be determined</u>	<u>Originally identified through monitoring well water sampling</u>
<input type="checkbox"/> Surface Water	_____	_____

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
Work to date has included providing geology structure maps, investigating the Sand Creek well with a downhole camera, sampling nearby water wells, and investigating wellbore integrity of nearby oil and gas wells.

Describe how source is to be removed:
See attachment for scope of work for re-completing Sand Creek monitoring well

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.:
See attachment for scope of work for re-completing Sand Creek monitoring well



Tracking Number: 2615172
Name of Operator: Noble Energy, Inc.
OGCC Operator No: 100322
Received Date: 2/24/2016
Well Name & No: _____
Facility Name & No: SandCreek MW

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REMEDIATION WORKPLAN (Cont.)

OGCC Employee: R. ALYSON

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
To be determined based on results of investigative work described on previous page.

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.

N/A

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:
To be determined

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

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: _____ Date Site Investigation Completed: _____ Date Remediation Plan Submitted: _____
Remediation Start Date: _____ Anticipated Completion Date: _____ 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: Curtis Rueter Signed: [Signature]
Title: LNG/CNG Development Manager Date: 2/24/2016

OGCC Approved: [Signature] Title: Northeast EPS Date: 2/26/2016

The attached Scope of Work is approved as an amendment to Remediation Project # 9445. (RTA)

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Denver, CO 80202



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February 24, 2016

Form 27 Amendment Request for Remediation Project 9445, Attachment 1

This attachment serves as an amendment request to the Form 27 submitted by Noble Energy, Inc. (Noble) on January 8, 2016, and approved by COGCC that same day. In the original Form 27, Noble had proposed to “Investigate the Sand Creek monitoring well with a downhole camera to determine if free gas is entering the wellbore and from what zone the gas might be entering.” After COGCC’s concurrence, the downhole camera investigation was completed on January 22, 2016.

The downhole camera video showed gas entering the wellbore at the bottom of the upper screen section in the monitoring well (the well has two screened sections: one from 60-120’ below ground surface and a second from 260-320’ below ground surface). The gas was entering as periodic bubbles and appeared to be rising up through the water column and venting out the top of the monitoring well. The video consistently showed the camera passing through gas bubbles from the water surface down to approximately 120’, where the gas was observed entering the monitoring well.

Noble is proposing that the monitoring well be re-completed, so that the alluvial aquifer (at a depth of approximately 60’) is sealed off from the lower aquifer and fully protected. Under this approach, the existing well would be drilled out and replaced. Blank PVC pipe would be installed down to ~115’; this would cover the alluvial aquifer and extend the blank pipe through the clay and shale seal (or cap) in the 90-115’ range at the top of the Laramie Fox Hills aquifer that was identified in the geophysical log of the borehole. Below the blank PVC pipe, a PVC screen would be set from ~115’ down to 260’, with the goal of being able to identify the location of the gas entering the wellbore. Finally, the bottom 80’ of the wellbore (from 260-340’) would be filled with bentonite chips, since this section of the monitoring well has been identified as non-water producing.

After discussions with several water well drillers, Noble has identified a water well driller (National Exploration, Wells, and Pumps) to undertake the recompletion of the monitoring well. Noble will proceed with this plan pending approval by COGCC.