

State of Colorado  
Oil and Gas Conservation Commission

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



#7995

FOR OGCC USE ONLY

## 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: 2145726

OGCC Operator Number: 10103

Name of Operator: Rocky Mountain Natural Gas, LLC

Address: 600 12th Street, Suite 300

City: Golden

State: CO Zip: 80401

Contact Name and Telephone:

Nathan Knell

No: 303-243-3584

Fax: N/A

API Number: 05-097-05067

County: Pitkin

Facility Name: Wolf Creek Unit-Govt-69S90W1SWNE

Facility Number: 314165

Well Name: Wolf Creek Unit-Govt

Well Number: #5

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SWNE Sec 1 T9S R90W

Latitude: 39.304106N Longitude: -107.386001W

39.304106N

-107.386165W

## TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Very old and extremely weathered hydrocarbons

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.): National Forest Service Land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Very organic silty clay/clayey silt

Potential receptors (water wells within 1/4 mi, surface waters, etc.): One USGS identified intermittent drainage is located approx. 710 feet to the north and one marshy area is located approx. 270 feet to the northeast of the facility. There are no water wells within 1/4 mile of the facility

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

Impacted Media (check):



Soils



Vegetation



Groundwater



Surface Water

Extent of Impact:

Immediate vicinity of Piezometers # 3 &amp; # 9

Immediate vicinity of Piezometers # 3 &amp; # 9

How Determined:

Finger print analysis

Initial sampling and finger print analysis

## REMEDIAL WORKPLAN

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

Refer to previously submitted Form 19.

## Describe how source is to be removed:

The source of the low level hydrocarbon impact has been determined to be primarily petrogenic based on the "Finger Print Analysis" of the groundwater collected from Piezometers # 3 & # 9 and, the soil samples collected in the immediate vicinity of Piezometers # 3 & # 9. The "Finger Print Analysis" laboratory forensic summary indicates that the observed hydrocarbons are very old, extremely weathered, and have been in place for many years. At this time, RMNG has not identified the source; however, potential sources include: 1) the dehydration equipment and tankage that was removed and replaced last year or, 2) a mud/reserve pit previously located (1965) and presumed to be adjacent to the northeast side of the pad.

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 "Finger Print Analysis" results from piezometers # 3 & # 9 indicate low level petrogenic hydrocarbon impacts below COGCC regulatory standards. After discussions with the USFS and BLM and in response to the BLM's Notice Of An Order Of The Authorized Officer (WRNF-WC-2012-1), RMNG proposes quarterly monitoring (as weather allows) all piezometers for a period of two years. Sample results will be submitted to the COGCC quarterly. If residual hydrocarbons are still present in piezometers # 3 & # 9 after the two year period, remedial options will then be evaluated.

Submit Page 2 with Page 1



Tracking Number: \_\_\_\_\_  
Name of Operator: \_\_\_\_\_  
OGCC Operator No: \_\_\_\_\_  
Received Date: \_\_\_\_\_  
Well Name & No: \_\_\_\_\_  
Facility Name & No: \_\_\_\_\_

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

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

During the on-going seep investigation, it has been determined that groundwater in the immediate vicinity of the pad is very shallow (approx 1-1.5 feet). The "Finger Print Analysis" has confirmed that there are very low level petrogenic hydrocarbon impacts (TPH) in Piezometers # 3 & # 9. Although very low, they still exceed the COGCC Table 910-1 standard for liquid hydrocarbons in water. Therefore, as described in the remediation work plan (Page 1), it has been proposed that quarterly monitoring of the piezometers continue for a period of two years under the assumption the hydrocarbon numbers will decrease over time through natural attenuation. The piezometers will be sampled for the analytical suite requested in the approved US Forest Service and BLM 2013 Sampling and Analysis plan.

**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.

None are currently planned as the facility is a working facility.

**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:

The US Forest Service and BLM have requested an additional 5 piezometers be installed on the northern side of the facility to further delineate the extent of contamination in groundwater. The additional 5 sampling locations are included as Attachment A

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

No E&P waste is expected to be generated at this facility.

**IMPLEMENTATION SCHEDULE**

Date Site Investigation Began: May 2013 Date Site Investigation Completed: July 2013 Date Remediation Plan Submitted: September 13, 2013  
Remediation Start Date: N/A at current time 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: Nathan Knell

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

Title: Manager, EHS&T

Date: 09/13/13

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

Title: Env. Sup.

Date: 9/25/13

*Please see attached COAs and comments.*

**Document Number: 2145726**

**Source Gas**

**Wolf Creek Unit – Govt #5, Site Investigation Remediation Workplan**

**Form 27 Conditions of Approval (COAs)**

- Please provide an accurate Lat/Long and site diagram for the location.
- Please provide a copy of the analytical reports
- Please provide a copy of the analytical results of the Finger Print analysis
- Please provide a copy of the October 23, 2012, Notice of an Order Of The Authorized Officer (WRNF-WC-2012-1)
- Please provide an approximate date for the installation of the five additional piezometers
- At least one soil sample shall be collected and analyzed for the full suite in Table 910-1

**Form 27 Comments**

- Based on the shallow depth to groundwater, the COGCC conducted a desktop review of the site to identify the potential presence of jurisdictional wetlands within the vicinity of the release area. Upon review of the National Wetland Inventory (NWI) map of that area, as prepared by the US Fish and Wildlife Service (USFWS) (<http://www.fws.gov/wetlands/Data/Mapper.html>), a potential jurisdictional wetland may be located within or adjacent to the release. The wetland is depicted as a Palustrine Scrub-Shrub, Saturated (PSSB), as defined by the USFWS. A copy of the NWI map is attached for your review.

The COGCC suggests that the operator verify the presence and jurisdiction of the wetland. The Sacramento District of the US Army Corps of Engineers (USACE) contact information for the Grand Junction field office is provided below.

400 Rood Avenue, Room 224  
Grand Junction, Colorado 81501-2563  
Phone: (970) 243-1199  
Fax: (970) 241-2358

- Based on the review of the Sensitive Area Determination Checklist, a determination of “No” was applied to Question 2) could a potential release from the facility reach surface water features? Further review of the NWI map and the USGS topographic map determined the proximal down-gradient locations of two surface water features, one wetland and one ephemeral stream. Based on these locations, a potential release from the facility to surface water features is possible. A copy of the NWI map and USGS topographic map are attached for your review.
- Upon receipt and review of the requested information and subsequent forthcoming information from the installation of additional piezometers, the COGCC reserves the right to modify the seeps/springs, and piezometer/groundwater monitoring well schedule.

Document Number: 2145726, Source Gas

Wolf Creek Unit – Govt #5, Site Investigation Remediation Workplan: Location ID: 314165





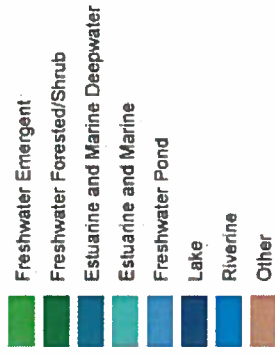
U.S. Fish and Wildlife Service

## National Wetlands Inventory

Wolf Creek Unit -  
Govt #5

Sep 24, 2013

### Wetlands



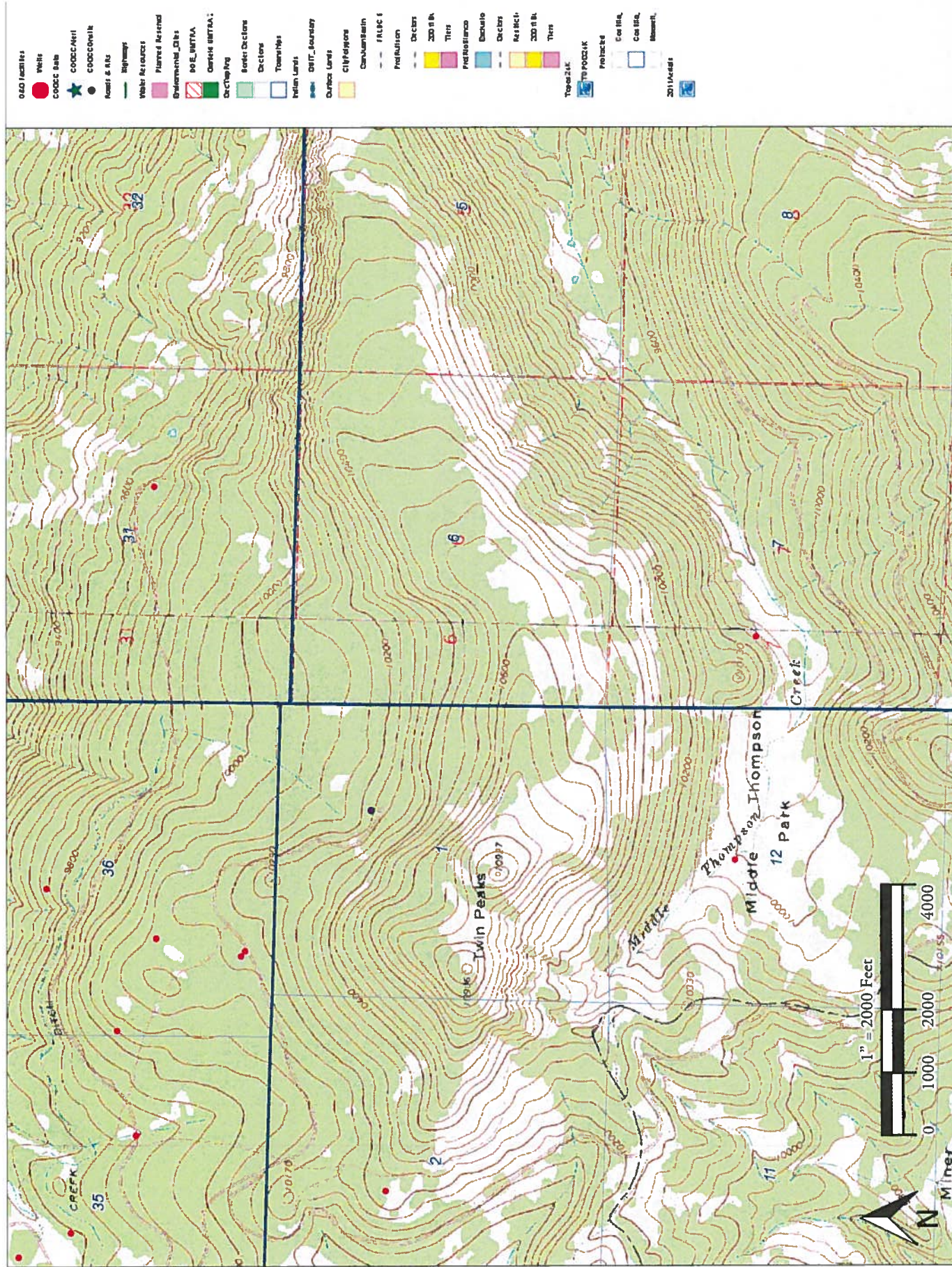
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

Spill/Release Tracking #2145726



**Wolf Creek Unit - Govt #5**





SourceGas  
600 12th Street  
Suite 300  
Golden, CO 80401  
303 243 3400  
303 243 3602 Fax  
www.SourceGas.com



September 13, 2013

Mr. Alex Fisher, P.G.  
Environmental Supervisor, Western Colorado  
1120 Lincoln Street, Suite 801  
Denver, Colorado 80203

RE: Rocky Mountain Natural Gas, LLC  
Form 27, Site Investigation and Remediation Work Plan  
Tracking Number 2145726

Mr. Fisher

Please find enclosed a Form 27, Site Investigation and Remediation Work Plan for Rocky Mountain Natural Gas, LLC, tracking number 2145726. Additionally, please find a Sensitive Area Determination Checklist.

If you have questions, please contact me at 303.243.3584 or, [nathan.knell@sourcegas.com](mailto:nathan.knell@sourcegas.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'Nathan Knell'.

Nathan Knell  
Manager, EHS&T

Cc: Mark Mumby (HCSI)  
Steve Ficklin (BLM)  
Karla Mobley (USFS)

## Sensitive Area Determination Checklist

<b>Rocky Mountain Natural Gas, LLC</b>		
<b>Person(s) Conducting Inspection</b>	<b>Field</b>	None Conducted
<b>Site Information</b>		
Location:	Wolf Creek #5	Time: N/A
Type of Facility:	Existing Gas Storage Well Pad	
<b>Environmental Conditions</b>		
Temperature (°F)		

Has the proposed, new or existing location been designated as a sensitive area?

☒ Yes      ☐ No

### **SURFACE WATER**

1. Are there any surface water features or SWSAs adjacent to or within ¼ mile of the proposed/new or existing facility?

☒ Yes      ☐ No

If yes, list type of surface water feature(s), i.e. rivers, creeks, streams, seeps, springs, wetlands: Eleven (11) non-USGS identified small seeps.

If yes, describe location relative to facility: The non-USGS identified seeps are located to the northeast and southeast of the existing facility at distances up to 500 feet.

2. Could a potential release from the facility reach surface water features?

☐ Yes      ☒ No

If yes, describe the pathway a release from the facility would likely follow to determine if the potential to impact surface water is high or low.

3. Is the potential to impact surface water from a facility release high or low?

☐ High      ☒ Low

**GROUNDWATER**

1. Will the proposed/new or existing facility have any pits which will contain hydrocarbons and chlorides or other E&P wastes?

☒ Yes      ☐ No

If yes, List the pit type(s): There is one presumed mud/reserve pit.

2. Is the site of the proposed facility underlain by an unconfined aquifer or recharge zone?

☒ Yes      ☐ No

3. Is the hydraulic conductivity of the underlying soil or geologic material  $\leq 1.0 \times 10^{-7}$  cm/sec?

☐ Yes      ☒ No

4. Is the proposed facility located within 1/8 mile of a domestic water well or 1/4 mile of a public water supply well which would use the same aquifer?

☐ Yes      ☒ No

5. Is the proposed facility located within a 100 year floodplain?

☐ Yes (*Sensitive Area*)      ☒ No (*If no, proceed to question #6.*)

6. Is the depth to groundwater known?

☒ Yes (*If yes, follow instructions provided in 6(a) of this section.*)

☐ No (*If no, follow instructions provided in 6(b) of this section.*)

- (a) If yes, could a potential release from the proposed/existing facility reach groundwater?

☒ Yes      ☐ No

If yes, explain: See additional comments section

- (b) If no:

(i) Evaluate surrounding soils, topography, and vegetation which may suggest the presence of shallow groundwater.

(ii) Gather information from surrounding well data in order to determine a depth to groundwater, i.e. State Engineers Office.

7. Is the potential to impact ground water from the facility in the event of a release high or low?

☒ High      ☐ Low



**Additional Comments:**

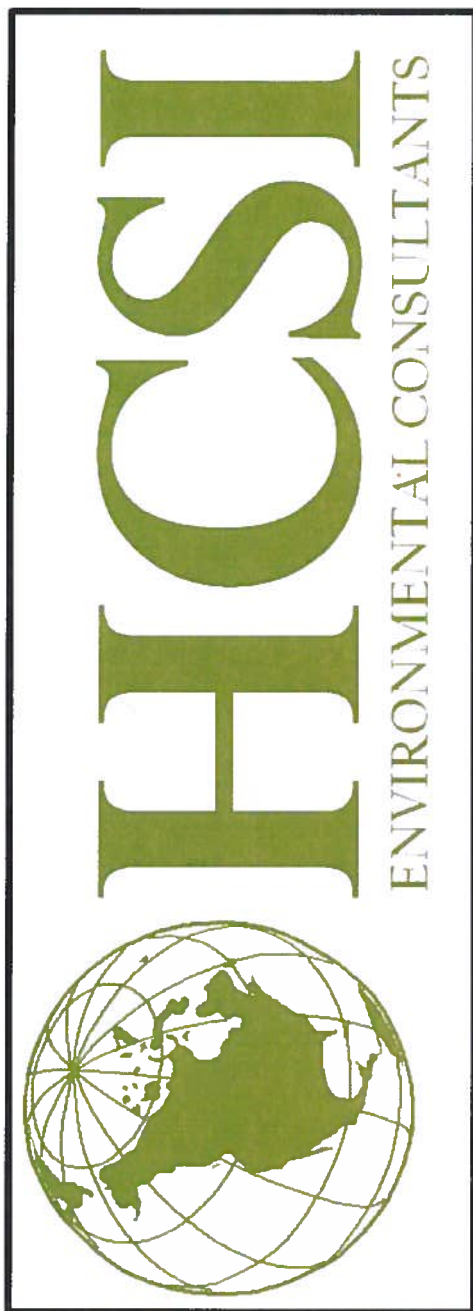
As stated in the surface water section of this sensitive area determination, eleven (11) non-USGS identified seeps have been identified within 500 feet of the existing facility ten (10) of which are located to the northeast and one (1) located adjacent to the southeastern side of the existing facility. The facility, as it has been upgraded, will contain all potential releases in a catchment basin located on the northern side of the well pad.

The State Engineer's Office and USGS records were reviewed and no records were revealed which would provide additional information pertaining to the depth to groundwater. However, the vegetative cover in the immediate vicinity of the facility pine, mountain grasses, marshy areas, and the presence of the seeps to the northeast, confirm the depth to groundwater is less than 1 foot in many areas adjacent to and in the immediate vicinity of the existing facility.

Based on the information gathered during this desktop review and the recently completed site investigation, the greatest potential for impacts is to the non-USGS identified seeps located to the northeast and southeast of the existing facility. The seeps noted to the northeast and southeast of the facility exhibit perennial flow a majority of the time. By COGCC decision, the close proximity of the facility to the non-USGS identified seeps would classify the facility as being in a sensitive area. In addition, by COGCC decision, the very shallow depth to groundwater (<40 feet) would also classify the facility as being in a sensitive area.

Inspector Signature(s):  Date: 9/9/2013

Mark E. Mumby, *Project Manager/RPG*  
HRL Compliance Solutions, Inc.



**Sampling and Analysis Plan**  
Rocky Mountain Natural Gas, LLC  
Wolf Creek Well #5 Seep(s)

HCSI Job No. 13-195

Prepared for:

**Bureau of Land Management**  
Colorado River Valley Interagency Team  
2300 River Frontage Road  
Silt, Colorado 81652

Prepared by:

**HRL Compliance Solutions, Inc.**  
2385 F ½ Road  
Grand Junction, CO 81505  
Phone: 970-243-3271

Prepared: November 2012

Final April 2013

Revised September 2013

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Figure 1:       Wolf Creek Storage Unit

Figure 2:       Seep Investigation Map



## **1.0 INTRODUCTION**

Rocky Mountain Natural Gas LLC, (RMNG) retained HRL Compliance Solutions, Inc. (HCSI) to conduct a hydrogeological investigation at the Wolf Creek Storage Field well #5 (well #5). This investigation was requested by Steve Ficklin, Bureau of Land Management (BLM) in a *Notice Of An Order Of The Authorized Officer* (WRNF-WC-2012-1) dated October 23, 2012.

This Sampling and Analysis Plan (SAP) is a guidance document for the hydrogeological investigation and delineation of the potential historical groundwater contamination at well #5.

## **2.0 BACKGROUND**

The following sections report information regarding the site location and background for well #5. A brief historical background is also presented.

### **2.1 Site Location**

The Wolf Creek Storage Unit is located in Pitkin County, Colorado. The seep investigated is associated with well #5. The well pad is located at an elevation of approximately 10,000 feet above mean sea level. The well is located within the Sopris Ranger District of the White River National Forest (See Figure 1-Wolf Creek Storage Unit Map).

#### **2.1.1 Well Pad #5**

Well #5 is located on a working well pad, with a metal building on location housing separator units. E&P waste streams generated on-site are stored in steel ASTs placed in plastic lined secondary containment. Methanol and glycol used in the production process are also stored in steel ASTs on site.

### **2.2 Historical Background**

Well #5 is a gas depleted well that was originally drilled in the mid 1960's and is now used to store natural gas. Natural gas is transported to well #5 via underground pipelines during low demand summer months, and then withdrawn during high demand winter months to supply the communities in the Roaring Fork Valley of Colorado.

Removal of the water during withdrawal is completed via the use of on-site dehydrators and separators. The dehydrators and separators use both physical and chemical methods, including the use of methanol and glycol. The processes used to remove water have the potential to generate E&P waste. These wastes are exempt from RCRA hazardous waste regulation, but are subject to Colorado Oil and Gas Conservation Commission (COGCC), and Colorado Department of Public

Health and Environment (CDPHE) rules and regulations. Fluids generated during separation processes are temporarily stored on-site in ASTs prior to off-site disposal.

### 3.0 SAMPLING LOCATIONS

The purpose of the investigation and delineation is to identify the nature and extent of potential historical ground water contamination at well #5. The investigation is also part of a follow-up investigation conducted in 2012 as requested by the BLM in the October 23, 2012, *Notice Of An Order Of The Authorized Officer* (WRNF-WC-2012-1).

Water and soil samples will be collected for laboratory analysis at the various seep and spring piezometer/groundwater monitor well locations. Figure 2 illustrates well pad configuration and the proposed sample locations. Exact Sample locations will be surveyed using a Trimble GeoXT GPS unit and placed on the sample location map for future reference. The following table identifies and explains water and soil sample locations for well #5.

Well #5		
Sample ID	Matrix	Description
WC5-SS1	soil	soil sample collected from the downslope side of the well pad
WC5-SS2	soil	soil sample collected from the downslope side of the well pad
WC5-SS3	soil	soil sample collected from the downslope side of the well pad
WC5-SS4	soil	soil sample collected from the downslope side of the well pad
WC5-SS5	soil	soil sample collected from the downslope side of the well pad
WC5-SS6	soil	soil sample collected from the upslope side of the well pad
SS07	soil	soil sample collected from the downslope side of the well pad
SS08	soil	soil sample collected from the downslope side of the well pad
SS09	soil	soil sample collected from the downslope side of the well pad
SS10	soil	soil sample collected from the downslope side of the well pad
SS11	soil	soil sample collected from the downslope side of the well pad
SS12	soil	soil sample collected from the downslope side of the well pad
SS13	soil	soil sample collected from the downslope side of the well pad
WC5-Piez1	water	water sample collected from the downslope side of the well
WC5-Piez2	water	water sample collected from the downslope side of the well pad
WC5-Piez3	water	water sample collected from the downslope side of the well pad
WC5-Piez4	water	water sample collected from the downslope side of the well pad
WC5-Piez5	water	water sample collected from the downslope side of the well pad
WC5-Piez6	water	water sample collected from the upslope side of the well pad
Piez07	water	water sample collected from the downslope side of the well pad
Piez08	water	water sample collected from the downslope side of the well pad
Piez09	water	water sample collected from the downslope side of the well pad
Piez10	water	water sample collected from the downslope side of the well pad
Piez11	water	water sample collected from the upslope side of the well pad
Piez12	water	water sample collected from the downslope side of the well pad
Piez13	water	water sample collected from the downslope side of the well pad
Piez14	water	water sample collected from the downslope side of the well pad
Piez15	water	water sample collected from the downslope side of the well pad
Piez16	water	water sample collected from the downslope side of the well pad
Thompson Creek Ditch (TCD) 1,2,3,4	water	water sample collected downgradient of well pad

Surface water samples will be collected from any downgradient and upgradient seep(s) that are flowing during site visits and analyzed for the analytical suite described in Section 4.0.

## 4.0 SAMPLING PROCEDURES

Soil and water samples will be collected and placed in laboratory supplied containers, placed on ice in a sample cooler and shipped overnight delivery to ALS Environmental, in Holland, Michigan. All samples will be shipped following laboratory chain-of-custody protocol. The samples will be analyzed for the following parameters using the indicated test method:

### Soil

Non-Halogenated Alcohols (Methanol)	EPA Method SW8015M
Non-Halogenated Glycols	EPA Method SW8015M
Total Extractable Petroleum Hydrocarbons (diesel range)	EPA Method SW8015M
Total Volatile Petroleum Hydrocarbons (gasoline range)	EPA Method SW8015
Total metals (COGCC Table 910-1)	EPA Method SW6020A
pH	EPA Method SW9045
Total mercury	EPA Method SW7471
Benzene-Toluene-Ethylbenzene-Xylenes (BTEX)	EPA Method SW8260

### Water

Non-Halogenated Alcohols (Methanol)	EPA Method SW8015M
Non-Halogenated Glycols	EPA Method SW8015M
Total Extractable Petroleum Hydrocarbons (diesel range)	EPA Method SW8015M
Total Volatile Petroleum Hydrocarbons (gasoline range)	EPA Method SW8015
Total metals (COGCC Table 910-1)	EPA Method SW6020A
Total mercury	EPA Method SW7470
Benzene-Toluene-Ethylbenzene-Xylenes (BTEX)	EPA Method SW8260
Total Dissolved Solids	Field Measurement YSI
pH	Field Measurement YSI
Dissolved Oxygen	Field Measurement YSI
Oxygen Reduction Potential	Field Measurement YSI
Temperature	Field Measurement YSI
Electrical Conductivity	Field Measurement YSI
Salinity	Field Measurement YSI

Soil samples will be collected using a hand auger to depths from 0"-6" below ground surface (bgs). Soil from the 0"-6" profile will be placed into a plastic tub and homogenized to ensure a representative sample is collected. Field parameters **will not** be collected on soil samples.

Prior to collection of groundwater, piezometers will be installed to depths that ensure groundwater and soil interface is achieved. Piezometers will be installed using a hand auger, conditions allowing.



Water samples from the surface seeps will be collected by immersing the sample container into the flowing water until the container is full. If sufficient water is not flowing to allow for immersing the sample container, a low flow submersible pump will be utilized. Pump head tubing, as well as sample collection tubing will be replaced between samples to ensure the potential for cross contamination is minimized.

Water samples from piezometers/groundwater monitor wells will be collected utilizing a low flow submersible pump. Pump head tubing, as well as sample collection tubing will be replaced between samples to ensure the potential for cross contamination is minimized. Water level measurements will be collected from the piezometers/groundwater monitor wells, and casing volumes calculated to determine the amount of water required to purge prior to sample collection. Water quality parameters, listed above, will be collected utilizing a YSI water quality meter.

Soil and water samples will be collected using hand tools (auger), low flow pumps, and lab provided cleaned sample containers. All sampling equipment will be decontaminated prior to use.

As of September 2013, an additional five (5) soil and groundwater sample locations were proposed by the U.S. Forest Service and BLM. These new sample locations (both soil and water) are to include the analysis of benzene-toluene-ethylbenzene-xylenes (BTEX) along with the existing parameters found under the 'Sampling Procedure 4.0' heading. The proposed sample locations are depicted in Figure 2.

The analysis of BTEX shall also be added to the existing parameters found under the 'Sampling Procedure 4.0' heading for piezometers #3 and #9.

Additionally, a soil sample shall be collected at piezometer #9 location and analyzed for all of the parameters listed under the 'Sampling Procedures 4.0', including BTEX.

## **5.0 DECONTAMINATION PROCEDURES**

All equipment that comes into contact with potentially contaminated soil or water will be decontaminated prior to re-use. Decontamination of hand tools will consist of brushing off visible soil, washing with a mixture of deionized (DI) water and Alconox soap, and rinsing with DI water.

## **6.0 SCHEDULE**

- Seeps/springs, and piezometers/groundwater monitor wells will be sampled in the spring and fall beginning spring 2013 through 2015 or as indicated by the authorized officer.
- Soil samples will be collected during the same sample event(s) as the seep(s) and piezometer/groundwater sample event(s).
- The USFS and BLM will be notified 48 hours prior to each sample event.
- Summary reports will be provided to the USFS and BLM as soon as practical upon completion of the sample event.

## 7.0 FIELD QUALITY CONTROL

- One field duplicate sample will be collected simultaneously with a standard sample from the same source under identical conditions into separate sample containers. The duplicate sample is used to assess laboratory performance through comparison of lab results.
- One trip blank will be collected and shipped with each sample event that water is collected. The trip blank is used to assess any potential cross contamination during shipment.
- Field equipment will be calibrated prior to each sample event.

## 8.0 LABORATORY QUALITY CONTROL

The analytical laboratory will perform Quality Control (QC). The QC will consist of method blank results, laboratory control spikes, and matrix spike results.

1. Method Blank Results – A method blank is a laboratory generated sample that assesses the degree to which laboratory operations and procedures cause false-positives analytical results. The method blank results associated with the samples will be included in the final lab report.
2. Laboratory Control Spike – A laboratory control spike is a sample that is spiked with known analyte concentrations, and analyzed at approximately 10 percent of the sample load in order to establish method specific control limits.
3. Matrix Spike Results – A matrix spike is a sample that is spiked with known analyte concentrations and analyzed at approximately 10 percent of the sample load in order to establish method specific control limits.
4. Trip Blank – A clean sample of a matrix that is taken from the laboratory to the sampling site and transported back to the laboratory without having been exposed to sampling procedures. Typically, analyzed only for volatile compounds. The trip blank assesses contamination introduced during shipping and field handling procedures.

## 9.0 FIELD NOTES

A field log book will be used to document the vital project and sample information. At a minimum, the following sample information will be recorded.

- Sample ID
- Location (GPS)
- Date and Time
- Ambient temperature
- Purging volume and time (water)
- Depth to groundwater
- Total depth of piezometer
- Depths of sample collection (soil)

- Field investigator will document all personnel on location, including both contractor and regulating agency personnel
- Any other field comments by field personnel

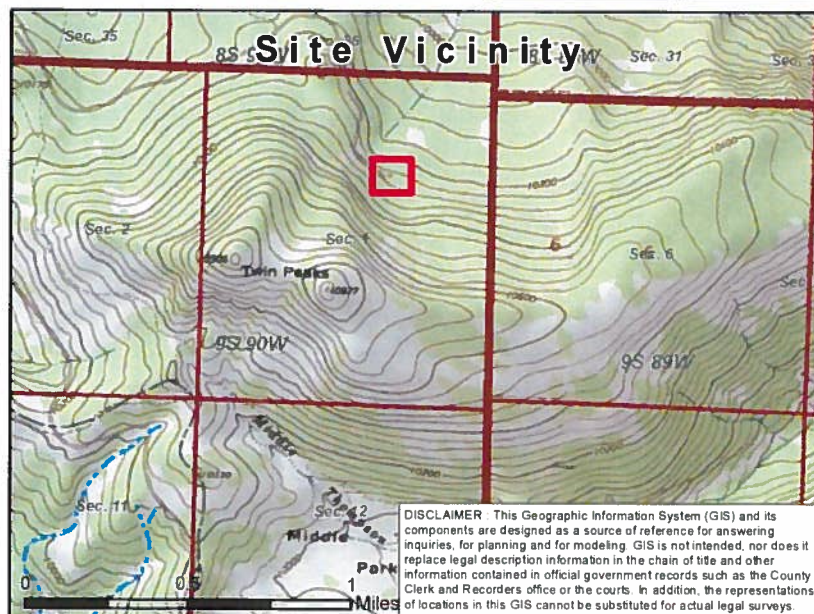
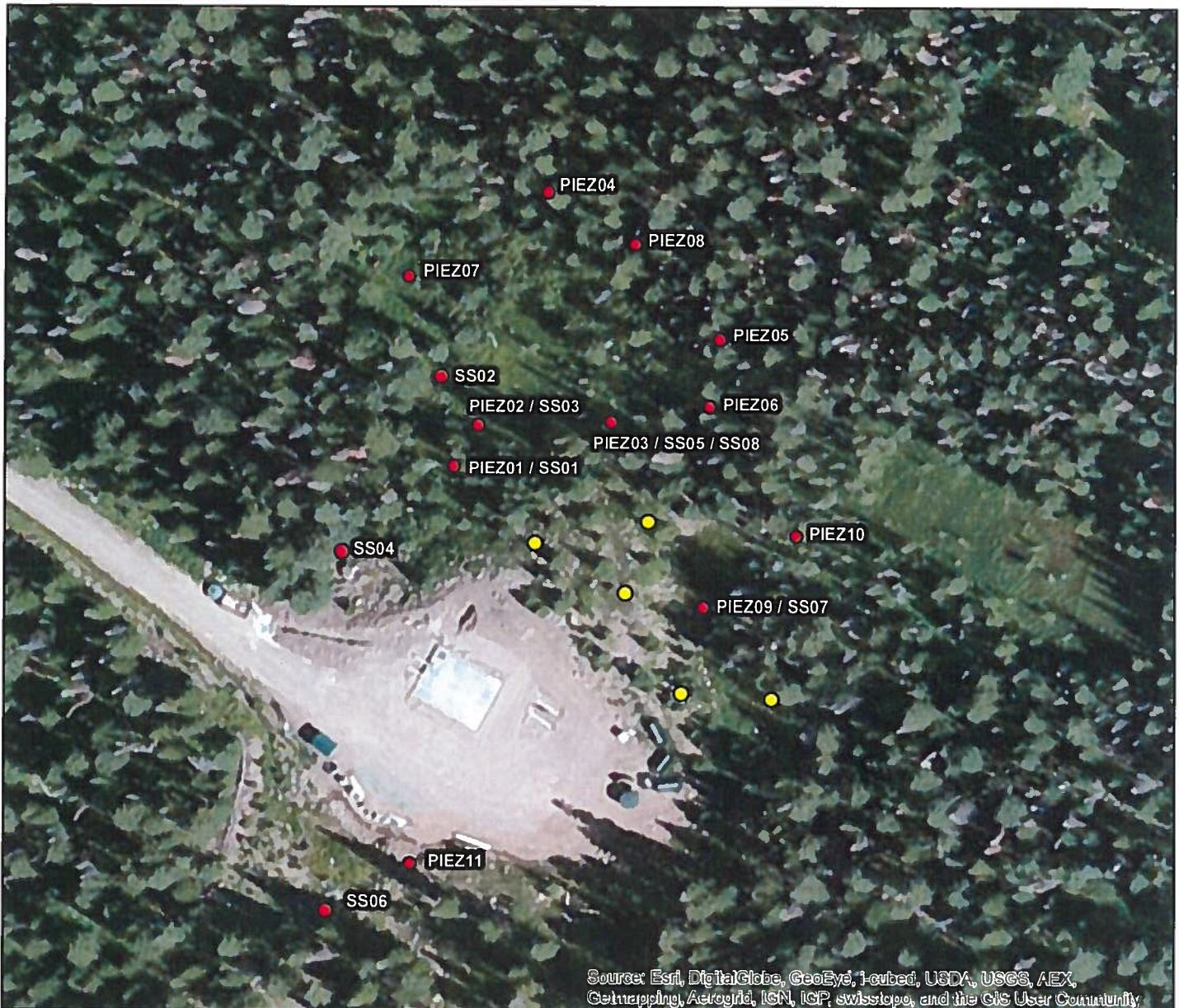
## **10.0 PHOTOGRAPHS**

Photographs will be taken at the sample location and at surrounding areas. The photographs will verify information entered into the field log book. Each photograph taken will be documented in the field log book with the approximate time, location, and date.

## **11.0 REPORTING**

Following receipt of the final analytical report, HCSI staff will review, evaluate and summarize project data/information onto appropriate figures and tables.





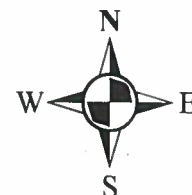
### Piezometer/Sample Location Map

Location: Wolf Creek Well 5

Rocky Mountain Natural Gas, LLC

### Legend

- Piezometer / Sample
- Proposed Sample Locations



0 50 100 Feet



**HCSI**  
ENVIRONMENTAL CONSULTANTS



Figure 1  
 Wolf Creek Storage Unit  
 Sopris Ranger District  
 White River National Forest

