

State of Colorado  
**Oil and Gas Conservation Commission**

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



#6236

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:

OGCC Operator Number: 96850

Name of Operator: Williams Production RMT Company

Address: 1058 County Road 215

City: Parachute State: CO Zip: 81635

Contact Name and Telephone:

Karolina Blaney

No: 970 683 2295

Fax: 970 285 9573

API Number: N/A

County: Garfield

Facility Name: Juhan 14-26H

Facility Number: 414574

Well Name: Juhan 14-26H

Well Number: N/A

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SESW, Sec 26, T6S, R94W, 6th PM Latitude: 39.492069 Longitude: -107.859513

**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.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Nihill Channery Loam, 1 to 6 percent slope

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Water well located approximately 685 feet to the southeast, Porcupine Creek is located approximately 380 feet to the west.

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

Impacted Media (check):



Soils



Vegetation



Groundwater



Surface Water

Extent of Impact:

The purpose of this Investigation Form 27 is to determine whether or not there are any impacts to the surrounding environment.

How Determined:

**REMEDIAL WORKPLAN**

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

See attached and refer to COGCC document # 01175818 for details.

Describe how source is to be removed:

See attached and refer to COGCC document # 01175818 for details.

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 attached and refer to COGCC document # 01175818 for details.



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

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**REMEDIATION WORKPLAN (Cont.)**

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

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

See attached and refer to COGCC Document #01175818 for details.

**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.

See attached and refer to COGCC Document #01175818 for details.

**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:

See attached and refer to COGCC Document #01175818 for details.

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

See attached and refer to COGCC Document #01175818 for details.

**IMPLEMENTATION SCHEDULE**

Date Site Investigation Began: November 2011 Date Site Investigation Completed: November 2011 Date Remediation Plan Submitted: September 30, 2011  
Remediation Start Date: TBD Anticipated Completion Date: TBD Actual Completion Date: TBD

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

Print Name: Karolina Blaney

Signed: Karolina Blaney

Title: Environmental Specialist

Date: September 30, 2011

OGCC Approved: Chris Canfield

Title: FOR Chris Canfield

EPS NW Region

Date: 10/07/2011

## **FORM 27 ATTACHMENT:**

### **Describe initial Action taken:**

- At the location(s) of the pit which are the furthest downgradient, lowest in elevation and/or have the potential for pooling of liquid, field-screening will be performed and will utilize appropriate field equipment which may include, but is not limited to the following.
  - a PetroFlag unit,
  - a photoionization gas detector (PID),
  - or similar, for detection of volatile hydrocarbons, in the immediate area of the pit footprint.
- Confirmation sample(s), Rule 905.b.(4), will be collected and submitted for lab analysis and verification to confirm compliance with Rule 910 and Table 910-1 (reference to specific analytes is provided below) relative to the aforementioned field screen activity.
- Other areas of the pit walls and floor will be inspected for evidence of impact via field screening and visual observation. Grab samples will be collected, as appropriate, to demonstrate diligence and thoroughness of investigation activities performed as directed in Rule 905.b.(1). In addition, all field screening activities and results will be documented and compiled into a summary report, table and/or map to be provided with the Site Closure Plan.
- Grab sample(s) will be submitted for laboratory analysis to confirm field screening activities. Sub-liner sample analytes will include considerations identified by Rule 910 and all contaminants of concern for soils from Table 910-1 excluding boron (see attached analyte list in Table 1 of Annex A; and Williams Highlands Pit Closure Plan, COGCC document #01175818).
- A visual assessment will be performed throughout the entire investigation process and will be adequately documented (e.g. field notes, observations, photographs, etc.) by qualified personnel.
- For additional information and detail of the proposed initial actions to be taken refer to the Williams Highlands Pit Closure Plan (COGCC document #01175818).

### **Describe how source is to be removed:**

The presence of impact has not been determined at this point. No impacts have been observed to date or any other indication that would suggest there has been an event that would result in impact to the surrounding environment. However, should contamination be encountered the following actions will be taken:

- Any spill or release will be reported via a Form 19 and in accordance with Rule 906 and remediation shall be performed in accordance with requirements specified in Rules 909 and 910.
- Notification and consultation with the affected surface owner(s) shall be made with good faith effort and in accordance with Rule 906.c.
- Should a release be identified and attributed to the contents of the pit, the impacted area will be:

- excavated in which field screen instruments will guide the excavation and laboratory confirmation samples collected to demonstrate compliance with Table 910-1 of the COGCC 900-series rule; and
- placed within a lined and bermed containment cell pending remediation and disposal option described below.
- All pit contents will be evacuated and managed in accordance with all applicable local, state [i.e. Rule 905.b.(2)] and federal regulations. If disposal is required, the relevant media will be disposed of at an approved facility.
- The potential source - production pit - will be closed and reclaimed in accordance with the COGCC 900 and 1000 series rules, respectively.
- The synthetic liner will be removed either recycled/reused or disposed of at an approved facility as a solid waste and in accordance with Rule 905.b.(3). Williams personnel have no reason to suspect nor have they been informed of signs or conditions that would indicate past or present failure of the liner/containment system.
- For additional information and detail of how the potential sources is to be removed refer to the Williams Highlands Pit Closure Plan (COGCC document #01175818).

**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, in-situ bioremediation, burning of oily vegetation, etc.:**

The presence of impact has not been determined at this point. No impacts have been observed to date or any other indication that would suggest there has been an event that would result in impact to the surrounding environment. However, should contamination be encountered the following actions will be taken:

- Any area(s) determined to be impacted/contaminated will be excavated and managed in accordance with all applicable rules and regulations regarding solid waste including applicable portion of COGCC Rule 907.
- Field screen equipment will be used to guide the excavation to ensure compliance with Table 910-1 of the COGCC 900 series rule.
- The excavated material will be placed within a lined and bermed containment cell pending the following options. Remediation and disposal options may include:
  - on-site landfarming/bioremediation,
  - in-situ remediation,
  - and/or disposal at an approved waste, management facility; as consistent with Rule 907.
- Disposal of impacted media will occur at an approved waste facility (i.e. Garfield County Landfill,) further defined in the “Final disposition of E&P waste” below.
- Final disposition will be dependent upon identified contaminants, contaminant concentration, land availability, landowner approval and waste volume.
- For additional information and detail regarding the proposed approach to accomplish remediation of any impacts, if identified, refer to the Williams Highlands Pit Closure Plan (COGCC document #01175818).

**If groundwater has been impacted, describe proposed monitoring plan:**

- The presence of impact has not been determined at this point. No impacts have been observed to date or any other indication that would suggest there has been an event that would result in impact to the surrounding environment. However, should it be observed or determined that groundwater impacts exist an appropriate site specific monitoring and remediation plan will be developed and submitted for approval.
  - The monitoring and remediation plan will be developed to include, but is not limited to,
    - number of sample wells and/or points;
    - proposed location of sample wells and/or points;
    - sampling schedule;
    - analytical methods including analyte list(s);
    - monitoring scheme including end point; and
    - potential mitigation or remediation approaches if necessary [Rule 910 (4) E].

**Describe reclamation plan:**

- The pit will be reclaimed to the present grade of the location or to the approximate original contour of the landscape and consistent with the 1000-series Rule.
- Seeding of the disturbed area will be performed in accordance with its' intended use. The seed mix will be prescribed by the landowner.
- There are no known noxious weeds in the immediate area of the disturbance. A noxious weed survey is performed annually of the South Rulison field which includes this location.
- As a preventative measure, Williams seeds all disturbed areas as soon as practicable with temporary or sterile annual seed mixes to:
  - provide soil stability, and
  - serve as a nurse or cover crop for desired species; derived from the natural seed bank and/or the applied seed mix.
- Bare ground treatment is a common practice by Williams and any identified noxious weed species will be spot treated for immediate eradication and prevention of encroachment and dispersal.
- A plat of the location is attached for topographic and geographic reference.

**Attach samples and analytical results taken to verify remediation of impacts. Show location of samples on an onsite schematic or drawing. Is further site investigation required?:**

- The presence of impact has not been determined at this point; therefore, the need for further site investigation has not been determined at this time.
- A determination of whether further site investigation is required and is pending field assessments and screening, which are to be confirmed by analytical results from an accredited - NELAP - laboratory (i.e. Evergreen Analytical Laboratory).
- Final documentation of investigation and closure activities shall be submitted to the Division within thirty (30) days after conclusion of any and all remediation and

reclamation activity and in accordance with all applicable sections and subsections of Rule 909.

**Final disposition of E&P waste:**

- If the stockpiled volume is small enough to manage on-site, there is available area on location, concentrations are within a reasonable range to be remediated in a timely manner and the identified contaminants are conducive to bioremediation, landfarming or in-situ remediation may occur as approved and in accordance with Rule 907.
- Should the aforementioned attributes do not exist or concentrations are not conducive to bioremediation then off-site disposal will be the final disposition of all impacted materials.
- If the latter option is taken, disposal will occur at an approved treatment, storage or disposal facility (TSD) which may include, but is not limited to, the following facilities:
  - the West Garfield County Landfill (045-LFL-005; Parachute, CO);
- Any soils requiring treatment that, once treated, fall below the allowable concentrations and levels provided in Table 910-1 may be recycled and reused at Williams facilities as fill material.

Facility Name: Juhan 14-26H  
Facility ID # 414574

Name of Operator: Williams Production RMT Company  
Latitude: 39.492069 Longitude: -107.859513  
Location (QtrQtr, Sec, Twp, Rng, Meridian): SESW, Sec 26, T6S, R94W, 6 PM

COGCC Operator # 96850  
County: Garfield

## ANNEX A:

### **Confirmatory Analyte List for Potential Contaminants of Concern in Soil:**

Table 1 – Sample collection, handling and analysis summary

Analyte Class	Analysis	Method	COGCC Table 910-1 Standard	Holding Time	Container
Organics	TVPH (GRO)	SW8015 mod	500 mg/kg	14 days	4 oz. wide mouth jar
	TEPH (DRO)				
	Benzene	SW8021	0.17 mg/kg	14 days	4 oz. wide mouth jar
	Toluene		85 mg/kg		
	Ethylbenzene		100 mg/kg		
	Xylenes (total)		175 mg/kg		
	Acenaphthene	SW8270	1,000 mg/kg	14 days	4 oz. wide mouth jar
	Anthracene		0.22 mg/kg		
	Benzo (A) anthracene				
	Benzo (B) flouranthene				
	Benzo (K) fluoranthene		0.022 mg/kg		
	Benzo (A) pyrene				
	Chrysene		22 mg/kg		
	Dibenzo (A,H) anthracene		0.022 mg/kg		
	Fluoranthene		1,000 mg/kg		
	Fluorne		0.22 mg/kg		
	Indeno (1,2,3,C,D) pyrene				
	Naphthalene		23 mg/kg		
	Pyrene		1,000 mg/kg		
	Inorganics	Electrical Conductivity	USDA Hdbk	<4 mmhos/cm or 2x background	28 days
Sodium Adsorption Rate		USDA Hdbk 60 Method 20B or 3A	<12	180 days	1 gal. ziplock bag
pH		SW9045	6-9	< 24 hrs.	2 oz. wide mouth jar

Rem # \_\_\_\_\_  
COGCC # \_\_\_\_\_

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Table 1 Cont'd - Sample collection, handling and analysis summary

Analyte Class	Analysis	Method	COGCC Table 910-1 Standard	Holding Time	Container
Total Metals*	Arsenic	SW 6010, 6020, 7470	0.39 mg/kg	28 days for Hg & 180 days for remaining	4 oz. wide mouth jar
	Barium		15,000 mg/kg		
	Cadmium		70 mg/kg		
	Chromium (III)		120,000 mg/kg		
	Chromium (IV)		23 mg/kg		
	Copper		3,100 mg/kg		
	Lead (inorganic)		400 mg/kg		
	Mercury		23 mg/kg		
	Nickel (soluble salts)		1,600 mg/kg		
	Selenium		390 mg/kg		
	Silver		390 mg/kg		
	Chloride		15,000 mg/kg		

*General note: Preservation standards for organics and inorganics in soil are < 4°C as per EAL protocol. Of the above sample methods and procedures, none require a preservative to preserve sample integrity.*

*Note(\*): Boron (hot water soluble) has been excluded from this analyte list as no crops (citrus or nuts) or other vegetation which may be sensitive to boron are known or are expected to be encountered. Should the Director or COGCC EPS decide to, at his discretion, require a Boron analysis the above analyte list will be modified to reflect that change and requirement, at that point in time.*

Rem # \_\_\_\_\_  
O G C C # \_\_\_\_\_



## Sensitive Area Determination Checklist

Williams Production RMT Company		
<b>Person(s) Conducting Field Inspection</b>	Jennifer Belcastro	6/20/11
	<i>Environmental Scientist</i>	
<b>Site Information</b>		
Location:	Juhan 14-26H	Time: 1330
Type of Facility:	Frac Water Storage Pit	
<b>Environmental Conditions</b>	Overcast; soil conditions are dry.	
Temperature (°F)	65°	

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: Porcupine Creek, an intermittent stream, and three (3) unnamed USGS identified intermittent drainages.

If yes, describe location relative to facility: Porcupine Creek is located 249 feet to the west of the facility. The three USGS identified unnamed intermittent drainages are located 524 feet to the west, 294 and 325 feet to the northeast of the facility.

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. If a potential release were to migrate off the northeast corner of the facility it could potentially impact the unnamed intermittent drainage to the northeast.

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): Frac water storage 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 facility reach groundwater?  
☐ Yes      ☒ No  
If yes, explain:
  - (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, Porcupine Creek is an intermittent stream located 249 feet west of the facility. One of the three unnamed intermittent drainages is located 294 feet to the northeast of the facility. The facility, as it is currently constructed, limits the path of a potential release to the northeast corner of the facility. By COGCC decision this would classify the facility as being in a sensitive area. However the potential to impact surface water features is low due to the fact that the pit itself is located on the cut slope end of the facility and there are extensive Best Management Practices (BMPs) currently installed in the form of a large earthen perimeter berm that would prevent a release from reaching Porcupine Creek. The greatest potential for impacts would be to the unnamed intermittent drainage located to the northeast of the facility. However, to impact this drainage the release would have to be very large and would have to breach the perimeter berm on the northeast corner in order to impact this drainage. It is not anticipated that the intermittent drainage located to the west of the facility would be impacted by a potential release as it is isolated from the facility by Porcupine Creek stream channel. The third unnamed intermittent drainage located 325 feet to the northeast of the facility would not be impacted by a potential release due to its topographical location relative to that of the facility.

The State Engineers office and USGS records were reviewed and it was revealed that there is one permitted water well located 543 feet southeast of the facility with a known depth of 80 feet to groundwater. The well is located upgradient from the facility and would not be impacted by a potential release. Further review of the well records indicate that the actual pumping interval from the well is located at a depth of greater than 100 feet further reducing potential impacts to groundwater by a release from the facility.

Based on the information collected during the site investigation and desktop review, the potential to impact surface water has been deemed low. However with the close proximity of Porcupine Creek and the unnamed intermittent drainage there is the potential these surface water features could be impacted by a very large release. Based on the well records and soils data it is not anticipated that groundwater would be impacted by a potential release even one that occurred over a longer period of time such as a leaking pit. However based on the close proximity of the two surface water features the facility should be designated as being in a sensitive area.

Inspector Signature(s):  Date: 9/30/2011

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

 Date: 6/17/2011

Jennifer Belcastro, *Environmental Scientist*  
HRL Compliance Solutions, Inc.