

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

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): Pit Closure

OGCC Operator Number: <u>96850</u>	Contact Name and Telephone: <u>Karolina Blaney</u>
Name of Operator: <u>Williams Production RMT Company</u>	No: <u>970-683-2295</u>
Address: <u>1058 County Road 215</u>	Fax: <u>970-285-9573</u>
City: <u>Parachute</u> State: <u>CO</u> Zip: <u>81635</u>	

API Number: _____	County: <u>Garfield</u>
Facility Name: <u>Chevron TR 13-25-597</u>	Facility Number: <u>277099</u>
Well Name: <u>Chevron TR 13-25-597</u>	Well Number: <u>N/A</u>
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>NWSW, SEC 25, T5S, R97W, 6 PM</u> Latitude: <u>39.583696</u> Longitude: <u>-108.233885</u>	

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, Non Crop Land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Parachute Irigul-Complex, 5-30% slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Bear Run Creek lies approximately 1450 ft to the north and Crystal Creek lies approximately 2000 ft to the southwest.

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	<u>The purpose of this Investigation Form 27 is to determine</u>	<u>Visual observations, field screening, and analytical analysis</u>
<input type="checkbox"/> Vegetation	<u>whether or not there are any impacts to the</u>	_____
<input type="checkbox"/> Groundwater	<u>surrounding environment.</u>	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDATION 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.

FORM
27
Rev 6/99

State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 901, Denver, Colorado 80203
(303)894-2100 Fax: (303)894-2109



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: TBD Date Site Investigation Completed: TBD Date Remediation Plan Submitted: TBD
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: 7/12/2011

OGCC Approved: [Signature] Title: FOR Chris Camfield Date: 07/26/2011
EPS NW Region

Sensitive Area Determination Checklist

Williams Production RMT Company		
Person(s) Conducting Field Inspection	Ashlee Lane <i>Biologist</i>	9/8/10
Site Information		
Location:	TR 13-25-597	Time: 0900
Type of Facility:	Existing Well Pad	
Environmental Conditions	Raining, soils are saturated.	
Temperature (°F)	60°	

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: Bear Run a spring fed intermittent/perennial stream tributary to the West Fork of Parachute Creek, one unnamed intermittent drainage tributary to Bear Run, and one unnamed intermittent/perennial drainage tributary to Willow Creek.

If yes, describe location relative to facility: The intermittent section of Bear Run is located 1,009 feet to the west northwest of the facility, the unnamed intermittent drainage which is tributary to Bear Run is located 1,438 feet east of the facility and the unnamed intermittent/perennial stream is located 1,226 feet to the south of the existing 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 release were to migrate off the eastern, western, and southern edges of the facility, flow would be to the south towards the headwaters of the unnamed intermittent drainage.

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): Multi-well 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, Bear Run is a spring fed intermittent/perennial stream located 1,009 feet to the west northwest of the facility. Bear Run in the immediate vicinity of the facility is identified as intermittent and does not appear to flow a majority of the time. The unnamed intermittent drainage to the east of the facility has no defined stream channel within the quarter mile buffer and beyond. The unnamed intermittent drainage to the south of the facility has no defined channel until it intersects the spring fed perennial portion of the drainage approximately 2,022 feet further to the east. The facility as it is currently constructed, limits the flow directions of a potential release to the southern edge of the facility. If a release were to migrate off the facility it would run down the hillsides towards the above mentioned drainages. However the potential for fluids to reach any of the drainages would be low due to the thick vegetative cover consisting of service berry, oak brush, sage brush, grasses, and the moderate to high infiltration rates of the underlying soils. In addition the fluids from a potential release would have to flow over 1,500 feet to impact the perennial portions of Bear Run and the unnamed intermittent/perennial drainage south of the facility. There are currently minimal Best Management Practices (BMPs) installed along the perimeter of the facility. These BMPs should be re-worked in the form of a larger perimeter berm along the southern, western and eastern edges of the facility to further ensure site containment in the event of a release. With modification of the current BMPs, the topographical setting of the facility, the thick vegetation surrounding the facility and the moderate to high infiltration rates of the underlying soil, the potential to impact the above mentioned drainages would be deemed low.

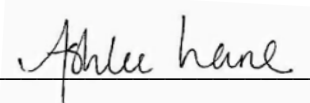
The State Engineer's Office and USGS records were reviewed and no records were revealed that would provide additional information pertaining to the depth to groundwater. The vegetative cover in the immediate vicinity of the facility, service berry, oak brush, and, sage brush does not suggest the presence of shallow groundwater. However, there is one spring identified on the USGS topographic map north of the existing well pad approximately 1,320 feet northwest of the existing facility (NWNW Sec 25). This spring forms the head water source for Bear Run which is tributary to the West Fork of Parachute Creek. The second spring is located approximately 2,500 feet to the southeast of the facility (SESW Sec 25). This spring forms the unnamed tributary to Willow Creek which is tributary to Bear Run. The facility resides in the Uintah formation, which like the Green River Formation, tends to be fractured both vertically and horizontally allowing fluids to migrate in the subsurface over large distances. Based on the topographical setting of the facility, it is not anticipated that an overland release would impact groundwater and thus potentially the springs to the northwest and southeast due to the short duration time involved and the fact it would spread out over a large area. The greatest potential for impact to groundwater would be from a release that occurred over a longer period of time such as a leaking pit, due to the close proximity of the subject pit to the spring and the likelihood of fractured bedrock. Therefore it would be highly recommended that the pit be lined in accordance to COGCC criteria and tested prior to placement of any materials into it.



Based on the information collected during the site investigation and desktop review, the potential to impact surface water has been deemed low. The greatest potential for impacts from the facility would be to groundwater due to the geologic conditions in the area and the relatively close proximity of the both springs noted above. With this potential to impact groundwater, the facility should be designated as being in a sensitive area.

Inspector Signature(s):  Date: 9/9/2010

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

 Date: 9/8/2010

Ashlee Lane, *Biologist*
HRL Compliance Solutions, Inc.

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, Wray Gulch 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 Trail Ridge 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 (e.g. 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);
 - or the Wray Gulch Landfill (103-LFL-020; Meeker, 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.

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		1,000 mg/kg		
	Anthracene	SW8270	0.22 mg/kg	14 days	4 oz. wide mouth jar
	Benzo (A) anthracene				
	Benzo (B) flouranthene				
	Benzo (K) fluoranthene				
	Benzo (A) pyrene		0.022 mg/kg		
	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		23 mg/kg		
	Naphthalene	1,000 mg/kg			
	Pyrene				
	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 # _____
 OGCC # _____

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 # _____
 OGCC # _____