

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
Date 07/21/15
REM 9185
Doc 2495188

OGCC Employee:

| | |
|------------|-----------|
| Spill | Complaint |
| Inspection | NOAV |

Tracking No:

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 Operator Number: _____ | Contact Name and Telephone: _____ |
| Name of Operator: _____ | _____ |
| Address: _____ | No: _____ |
| City: _____ State: _____ Zip: _____ | Fax: _____ |

| | |
|--|----------------------------------|
| API Number: _____ | County: _____ |
| Facility Name: _____ | Facility Number: _____ |
| Well Name: _____ | Well Number: _____ |
| Location: (QtrQtr, Sec, Twp, Rng, Meridian): _____ | Latitude: _____ Longitude: _____ |

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): _____

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.): _____

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

Potential receptors (water wells within 1/4 mi, surface waters, etc.): _____

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

| | | |
|-------------------------|-------------------|-----------------|
| Impacted Media (check): | Extent of Impact: | How Determined: |
| Soils | _____ | _____ |
| Vegetation | _____ | _____ |
| Groundwater | _____ | _____ |
| Surface Water | _____ | _____ |

REMEDATION WORKPLAN

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

Describe how source is to be removed:

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.:



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

REMEDIATION WORKPLAN (Cont.)

OGCC Employee: _____

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

Depth to groundwater at this locaiton is expected to be deeper than 50 feet.

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 document

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 document

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

See attached document

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: TBD Date Site Investigation Completed: TBD Date Remediation Plan Submitted: 7/19/15
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: 7/19/15

OGCC Approved: _____ Title: EPS Northwest Date: 7/21/15

Form 15

Doc # 1631042

State of Colorado
Oil and Gas Conservation Commission



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EARTHEN PIT REPORT/PERMIT

This form is to be used for both reporting and permitting pits. Rule 903 describes when a Permit with prior approval, or a Report within 30 days, is required for pits. Submit required attachments and forms.

Complete the Attachment Checklist

FORM SUBMITTED FOR:
 Pit Report Pit Permit

| | Oper | OGCC |
|-----------------------------|------|------|
| Detailed Site Plan | ✓ | |
| Topo Map w/ Pit Location | ✓ | |
| Water Analysis (Form 25) | | |
| Source Wells (Form 26) | | |
| Pit Design/Plan & Cross Sec | ✓ | |
| Design Calculations | ✓ | |
| Sensitive Area Determ. | ✓ | |
| Mud Program | | |
| Form 2A | | |

OGCC Operator Number: 96850
 Name of Operator: Williams Production RMT Company
 Address: 1058 CR 215
 City: Parachute State: CO Zip: 81635

Contact Name and Telephone:
Karolina Blaney
 No: 970-683-2295
 Fax: 970-285-9573

API Number (of associated well): N/A OGCC Facility ID (of other associated facility): PARACHUTE 67350
 Pit Location (QtrQtr, Sec, Twp, Rng, Meridian): NW SE S28 T6S R95W 6th PM *Location ID 335358*
 Latitude: 39° 29' 36.87" N 108.00258 Longitude: 108° 00' 09.29" W County: Garfield
 Pit Use: Production Drilling (Attach mud program) Special Purpose (Describe Use): MULTI-WELL
 Pit Type: Lined Unlined Surface Discharge Permit: Yes No
 Offsite disposal of pit contents: Injection Commercial Pit/Facility Name: COTTONWOOD GULCH Pit/Facility No: _____
Attach Form 26 to identify Source Wells and Form 25 to provide Produced Water Analysis results.

Existing Site Conditions

Is the location in a "Sensitive Area?" Yes No *270* Attach data used for determination.
 Distance (in feet) to nearest surface water: 153 ft ground water: > 6.5 ft water wells: 1,161 ft
LAND USE (or attach copy of Form 2A if previously submitted for associated well) Select one which best describes land use:
 Crop Land: Irrigated Dry Land Improved Pasture Hay Meadow CRP
 Non-Crop Land: Rangeland Timber Recreational Other (describe): _____
 Subdivided: Industrial Commercial Residential
SOILS (or attach copy of Form 2A if previously submitted for associated well)
 Soil map units form USNRCS survey: Sheet No: N/A Soil Complex/Series No: 29
 Soils Series Name: Heldt Clay Loam Horizon thickness (in inches): A: 0-6 ; B: 6-60 ; C: _____
 Soils Series Name: _____ Horizon thickness (in inches): A: _____ ; B: _____ ; C: _____
Attach detailed site plan and topo map with pit location.

Pit Design and Construction

Size of pit (feet): Length: 246 Width: 71 Depth: 17
 Calculated pit volume (bbls): 70,100 Daily inflow rate (bbls/day): Variable
 Daily disposal rates (attach calculations): Evaporation: N/A bbls/day Percolation: N/A bbls/day
 Type of liner material: Synthetic polypropylene Thickness: 36 mil
Attach description of proposed design and construction (include sketches and calculations).
 Method of treatment of produced water prior to discharge into pit (separator, heater treater, other): N/A
 Is pit fenced? Yes No Is pit netted? Yes No

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: 12/5/2008
 OGCC Approved: _____ Title: OGLA SUPERVISOR Date: 3/22/11

CONDITIONS OF APPROVAL IF ANY:
 - OPERATOR WILL CONDUCT AND DOCUMENT TO OGCC A HYDROSTATIC TEST OF PIT LINER BY 5/31/2011.
 - OPERATOR WILL PROVIDE ANALYTICAL DATA FOR GRAB SAMPLE COLLECTED FROM PIT WATER WITH FORM 4.
FACILITY NUMBER: 414567

Handwritten notes:
 5780
 5710
 230

Form 27 Attachment

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).
- 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.

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 bermed containment cell pending remediation or disposal as 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 the Parachute Centralized E&P Waste Management Facility (COGCC Location # 149015).

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 bermed containment cell pending an on-site landfarming/bioremediation,

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 COGCC approval.
- The anticipated depth to ground water is expected to be deeper than 20 feet.

Describe reclamation plan:

- The pit will be reclaimed in accordance with the COGCC 1000 Series Rules in addition to any SUA/COAs defined by the surface owner.
- The pit will be reclaimed to the present grade of the location or to the approximate original contour of the landscape
- Seeding of the disturbed area will be performed in accordance with its' intended use. The seed mix will be prescribed by the landowner.
- As a preventative measure, WPX Energy seeds all disturbed areas as soon as practicable with temporary or sterile annual seed mixes to provide soil stability, and

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.
- 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 which may include, but is not limited to, the following facilities:
- Any soils requiring treatment that, once treated, fall below the allowable concentrations and levels provided in Table 910-1 will be reused as fill material during pit reclamation activities.

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 | |
|---------------|-------------------------|-------------------------------|------------------------------|-------------|
| Organics | TVPH (GRO) | SW8015 mod | 500 mg/kg | |
| | TEPH (DRO) | | | |
| | Benzene | SW8021 | 0.17 mg/kg | |
| | Toluene | | 85 mg/kg | |
| | Ethylbenzene | | 100 mg/kg | |
| | Xylenes (total) | | 175 mg/kg | |
| | Acenaphthene | | SW8270 | 1,000 mg/kg |
| | Anthracene | | | 0.22 mg/kg |
| | Benzo(A)anthracene | | | |
| | Benzo(B)fluoranthene | | | |
| | 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 | | | |
| Naphthalene | | | | |
| Pyrene | 1,000 mg/kg | | | |
| Inorganics | Electrical Conductivity | USDA Hdbk | <4 mmhos/cm or 2x background | |
| | Sodium Adsorption Rate | USDA Hdbk 60 Method 20B or 3A | <12 | |
| | pH | SW9045 | 6-9 | |
| Total Metals* | Arsenic | SW 6010, 6020, 7470 | 0.39 mg/kg | |
| | Barium | | 15,000 mg/kg | |
| | Cadmium | | 70 mg/kg | |
| | Chromium (III) | | 120,000 mg/kg | |
| | Chromium (VI) | | 23 mg/kg | |
| | Copper | | 3,100 mg/kg | |
| | Lead | | 400 mg/kg | |
| | Mercury | | 23 mg/kg | |
| | Nickel | | 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.*

Sensitive Area Determination

Sensitive Area Determination Checklist

| WPX Energy Rocky Mountain, LLC (WPX) | | |
|--|---|-------------------|
| Person(s) Conducting Field Inspection | Ashlee Lane 11/3/2011 <i>Biologist</i> | Revised 7/18/2015 |
| Site Information | | |
| Location: | PA 33-28 (Cottonwood Frac Pad) | Time: 1230 |
| Type of Facility: | Hydraulic Fracturing (Frac) Pad | |
| Environmental Conditions | Clear and calm; soil conditions dry. | |
| | | |
| Temperature (°F) | 58° | |

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: Cottonwood Gulch, a USGS identified intermittent drainage; and two (2) USGS indented unnamed intermittent drainages.

If yes, describe location relative to facility: Cottonwood Gulch is located 144 feet south, one of the unnamed intermittent drainages is located 250 feet to the northwest and the other unnamed intermittent drainage is located 500 feet to the east 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. A release, if it were to migrate off the facility, would likely flow to the south, southeast towards Cottonwood Gulch.

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): Hydraulic fracturing (frac) 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.

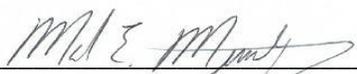
7. Is the potential to impact ground water from the facility in the event of a release high or low?
 Moderate Low

Additional Comments:

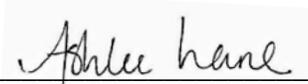
As stated in the surface water section of this sensitive area determination, Cottonwood Gulch, a USGS identified intermittent drainage is located 144 feet south of the facility. Cottonwood Gulch experiences seasonal flows from early spring until early winter. Cottonwood Gulch flows directly into the Colorado River. The other two (2) intermittent drainages to the east and west of the facility flow into Cottonwood Gulch. The facility as it is currently constructed, limits the direction of a potential release to the southeastern and southwestern sides. A potential release, if it were migrate off the facility, would flow directly towards and most likely into Cottonwood Gulch. However there are currently adequate Best Management Practices (BMPs) in the form of an earthen berm surrounding southwestern southeastern sides of the facility. In addition, WPX has installed a gate valve downstream of the Cottonwood Frac Pad in Cottonwood Gulch to stop live water flows to the Colorado River in the event a release was to migrate off of the location impact Cottonwood Gulch.

The State Engineer's Office records were reviewed for depth to ground water and no ground water wells are located within the immediate vicinity of the location. The nearest permitted water well is located 1,301 feet south of the existing facility. This ground water well has a noted depth to groundwater at 130 feet. However due to the proximity of the facility to Cottonwood Gulch, there is potential for shallow groundwater in the fluvial sediments in the immediate vicinity of Cottonwood Gulch during periods of no surface flow. Based on the topographical setting of the facility and past remediation activities, groundwater was not encountered above 20 feet. However that does not preclude the potential that shallow groundwater may still be present at a depth greater than 20 feet. Therefore the assumption could be made that groundwater, if present, would most likely be at a depth greater than 20 feet.

Based on the information collected during the site investigation and desktop review, the potential to impact surface water has been deemed high especially during periods of intermittent flow. In addition, by COGCC rule the close proximity of all the identified drainages would classify the facility as being in a sensitive area. With the close proximity of Cottonwood Gulch, the potential to impact shallow groundwater, if present, would be deemed moderate as well. With the potential for impacts to surface water, potentially shallow groundwater, and by COGCC rule the facility should be classified as being in a sensitive area.

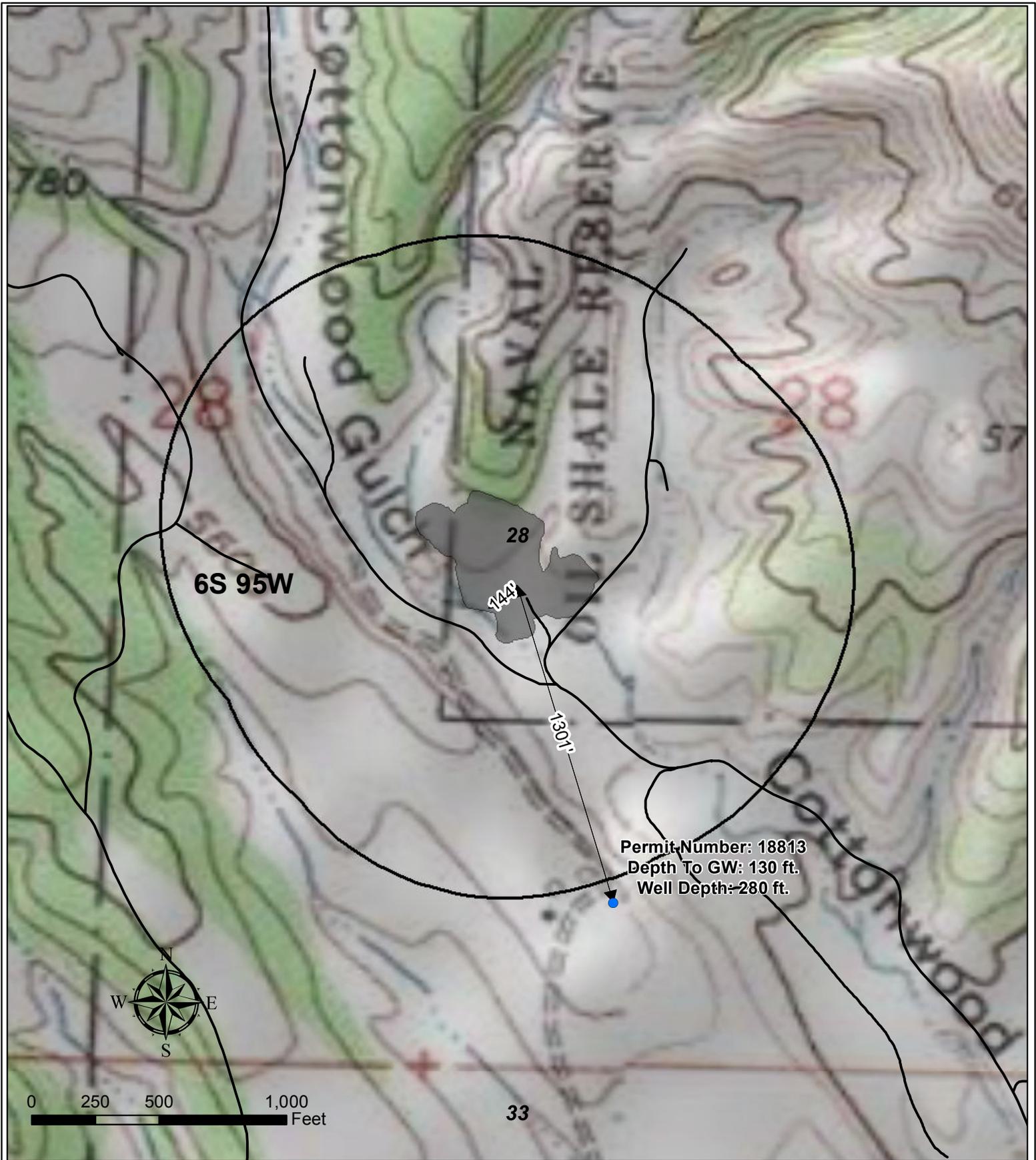
Inspector Signature(s):  Date: 7/18/2105

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

 Date: 11/4/2011

Ashlee Lane, *Biologist*

Hydrology Map



Legend

- Water Well
- Existing Road
- Pad
- 1000' Buffer (from edge of pad)

WPX Energy Rocky Mountain, LLC

Plat 5C

Cottonwood Frac Pit Hydrology Map
T6S R95W, Section 28

