MATERIALS MANAGEMENT PLAN

For

Drill Cuttings

Located at the

Sandridge 399-1-4

COGCC Location 316510

1058 County Road 215

Parachute, CO 81635-0370

May 1, 2015

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Tables

Attachments

1.0 Introduction

This Material Management Plan (Plan) provides a description of the management procedures for drill cuttings located at the Sandridge 399-1-4, which are generated as an exploration and production (E&P) waste stream from natural gas well drilling conducted by WPX Energy in the Piceance Basin of Colorado. Drill cuttings will be managed in accordance with Rules 907 and 1003 of the Colorado Oil and Gas Conservation Commission (COGCC) Rules, as amended April 1, 2009.

This Materials Management Plan is being prepared and submitted for COGCC approval to satisfy the COGCC Form 2A COA (Document # 400117921). The Plan incorporates the following key elements:

- Waste Generation and Identification
- Site Location
- Facility Design
- Spill Prevention and Response
- Cuttings Management
- Sampling Procedures
- Cuttings Treatment Methods
- Final Reclamation of the Site
- Recordkeeping

2.0 Waste Generation and Identification

Cuttings are generated during the drilling process when the drill bit grinds rock into smaller particles. Drill cuttings are continuously produced as downhole drilling advances, therefore, cuttings are continuously carried to the surface and discharged during the drilling process. The drill cuttings range in size from large particles centimeters (cm) in size to small particles less than a millimeter (mm) in size (fines).

Drilling mud is prepared and circulated through the drill string and the wellbore. The drilling mud is used to cool the bit, stabilize the sides of the borehole, control downhole pressure, and transport the cuttings from the bit to the surface for removal. This is accomplished as the drilling mud is circulated down through the drill pipe and bit, and then upward through the annular space between the drill pipe and formation wall. Upon return to the surface, the drill cuttings are separated from the drilling mud using solids control equipment (one or more shale shakers, centrifuges, desander/desilter, etc.). After passing through solids control equipment, the drilling mud is stored in mud tanks and then re-circulated down through the drilling pipe and bit. The solids control equipment, located either at the drilling rig or at a Centralized E&P Waste Management Facility, separates and then discharges the drill cuttings for collection and subsequent storage, management, and/or disposal in a cuttings trench, on the well pad surface adjacent to the drill rig, or at a centrally located cuttings management location, such as the Sandridge 399-1-4 trench location[1].

[1] http://web.ead.anl.gov/dwm/techdesc/sep/index.cfm

The Sandridge 399-1-4 trench will be utilized for storage and disposal of drill cuttings, including fine solids (i.e., fine drill cuttings) recovered during the drilling mud recycling process. Frac sand, tank bottoms, sludge, cement returns, or other exploration and production waste will not be managed or disposed of at this location.

At multi-well pad locations, where multiple wells are drilled from a single pad, the volume of drill cuttings generated may exceed the storage capacity of the trench located on the pad, especially where the pad footprint is limited due to topographic, environmental, or other physical factors. Where pad size is insufficient for the volume of cuttings generated, the excess cuttings will be transported to the Sandridge 399-1-4 where they can be properly managed and disposed of. The list of locations that might have an excess volume of cuttings needing to be transported to the Sandridge 399-1-4 is listed in *Table 1 – Waste Generation Locations*[2]. This list may be amended to include additional locations as needed.

3.0 Facility Location

The Sandridge 399-1-4 is located in LOT 4, of Section 1, Township 3S, Range 99W, 6th PM. The location coordinates are 39.823128 N and -108.459448 W. The area map is included in the Attachment A. The Sandridge 399-1-4 is located at an elevation of 7176 ft MSL. The NRCS identifies the dominate soil type within the boundary of the Sandridge 399-1-4 location as Rentsac channery loam. The Soil Map Unit Description is included in Attachment B.

There are two surface water features near this site. A USGS intermittent drainage; Wagonroad Gulch, tributary to Yellow Creek and one unnamed ephemeral drainage tributary to Wagonroad Gulch. Wagonroad Gulch is located 1,243 feet west and the unnamed ephemeral drainage is located approximately 552 feet to the northeast of the existing.

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 is dominated by xeric vegetation typical of the elevation and location (Piñon Juniper woodland, sage brush, and bunch grasses) and does not suggest the presence of shallow groundwater. There are no permitted groundwater wells within 2 miles of the facility however three permits were submitted and never drilled. According to the State Engineers Office, the wells were targeting water bearing zones in excess of 200 feet. In addition the facility is located approximately 250 feet higher than the alluvial valley floor of Wagonroad Gulch where groundwater could potentially be present. Therefore it could be assumed that groundwater, if present, in the immediate vicinity of the facility would be in excess of 250 feet. Hydrology map is included in Attachment C.

Average annual precipitation, based on precipitation records from Rifle, Colorado is 11.61 inches. Average annual gross evaporation, based on NOAA Technical Report NWS – 33 is estimated to be 45.0 inches. Monthly distributions are provided below.

[2] Table 1 is based on the current WPX drilling schedule

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Annual Prcipitation (in.)*	0.86	0.77	0.94	1.01	1.00	0.73	1.03	1.14	1.14	1.19	0.88	0.93	11.61
Average Annual Evaporation (in.)**	0.45	1.35	2.70	4.05	5.63	6.98	7.20	5.85	4.95	3.38	1.80	0.68	45.00

* Precipitation Data from Western Regional Climate Center - Rifle Weather Station

**NOAA Technical Report NWS 33 - Map 3 'Free Water Surface Evaporation 1956 - 1970'

This facility is located in a non-sensitive area; see Attachment D for the Sensitive Area Determination.

4.0 Facility Design

The Sandridge 399-1-4 is defined in the COGCC Rules 100 Series as an ancillary cuttings trench designated, at a location other than a well pad, for the purpose of disposing and/or managing cuttings. In accordance with the COGCC Rule 903 a.(3). an Earthen Pit Report/Permit, Form 15, is not required for drilling pits unless they are designed to hold fluids containing hydrocarbon concentrations exceeding 10000 ppm TPH or chloride concentrations at total well depth exceeding 15,000 ppm. The Sandridge 399-1-4 is designed to receive cuttings only; the Sandridge 399-1-4 trench will not be used to manage any free liquids or fluids of any type therefore Form 15 is not required. A Form 2A was submitted and approved by COGCC (#400112496) in accordance with Rule 303.d.(1) where surface disturbance will occur at a previously undisturbed site or surface disturbance occurs for the purpose of modifying or expanding an oil and gas location. Ancillary facilities are intended to provide short-term and localized support for the management of drill cuttings in the area where drilling is actively conducted. Ancillary facilities with trenches designated for cuttings management will not have an active lifespan of more than 3 years.

4.1 Construction

The Sandridge 399-1-4 trench capacity is estimated to be 6105 cubic yards. The construction layout and cross section are included in Attachment E. During construction of this site, topsoil was salvaged and stockpiled from all proposed disturbance areas. All surface vegetation stripped with topsoil was incorporated directly into the topsoil to augment organic matter content and seed source availability however large amounts of shrub materials might require separate handling. Stabilization seeding of topsoil and/or surface piles will occur during the first available seeding season. Runoff will be diverted around topsoil stockpiles to minimize loss of topsoil to erosion, and stockpiles will be located as close as possible to the future reclamation site. The subsoil materials will be stockpiled separately from topsoil stockpiles.

4.2 Best Management Practices

The entire perimeter of the Sandridge 399-1-4 trench location is fenced and locked to prevent public access, prevent unauthorized vehicular traffic and illegal dumping of wastes and to prevent access by

wildlife or livestock. The Sandridge 399-1-4 trench will not be used to manage any fluids of any type therefore netting of the trench is not necessary.

4.3 Infiltration Test

In accordance with the COGCC Rule 904 a.(1). liner is not required for drilling pits unless they are designed for use with fluids containing hydrocarbon concentrations exceeding 10000 ppm TPH or chloride concentrations at total well depth exceeding 15,000 ppm. The Sandridge 399-1-4 trench is designed to receive dry cuttings only. The Sandridge 399-1-4 will not be used to manage any free liquids or fluids of any type therefore a liner is not required. However to ensure that the trench subsurface is not impacted and to ensure that there is no threat to impact groundwater by managing cuttings at this location, an infiltration test was conducted during construction of the site. The infiltration test results are included in Attachment F.

4.4 Stormwater Management

Stormwater will be managed in accordance with the COGCC Rule 1000.f. and the Grand Valley Field Stormwater Management Plan (CDPHE permit #COR03A115).

The entire perimeter of the Sandridge 399-1-4 location is surrounded by an earthen berm to prevent run-on and runoff during and after stormwater events. Stormwater accumulation within the perimeter berm will either be allowed to evaporate or, if the safety and efficiency of cuttings management operations are compromised, may be recovered via a vacuum truck and disposed of at a centralized E&P waste management facility.

5.0 Spill Prevention and Response

The entire perimeter of the Sandridge 399-1-4 location will be surrounded by an earthen berm to prevent any potential releases from leaving the location. Since there will be no fluids managed at this location, the potential for a release is very low. In the unlikely event of a spill, it would tend to flow to the west towards Wagonroad Gulch or northeast towards the unnamed ephemeral drainage.

If the release migrated off the western edge of the facility, it would run down the hillside towards Wagonroad Gulch. However the potential to reach Wagonroad Gulch would be low due to the relatively thick vegetative cover, and the distance the release would have to migrate (1,243 feet) in order to reach Wagonroad Gulch. If a potential release were to migrate the entire 1,243 feet to Wagonroad Gulch, it would have to flow an additional 2.25 miles further to the northeast to potentially impact any live surface water (Yellow Creek) if flowing. If flow were to migrate off the northeastern side of the facility it would run down the hillside towards the unnamed ephemeral drainage which is tributary to Wagonroad Gulch. If a release were to reach the unnamed ephemeral drainage the potential to impact Wagonroad Gulch would be deemed to be low. The unnamed ephemeral drainage in the immediate vicinity of the facility has poorly defined channel, no ordinary high water mark (OHWM), and a fairly thick vegetated bottom indicating that the drainage does not flow majority of the time. In addition to the above mentioned

characteristics it is not anticipated that a potential release would reach and potentially impact Wagonroad Gulch due to the distance a release would have to travel (~3,800 ft).

In the unlikely event of a spill or release, the spill will be reported and remediated in accordance with the COGCC 900 Series Rules and the most current WPX Energy Spill Prevention and Response Plan.

6.0 Cuttings Management

Cuttings transported to the Sandridge 399-1-4 trench will be managed on the pad surface in batches of less than 1000 cubic yards. Batches will be separated into individual cells, and only one cell will be actively accepting cuttings at a given time. Cuttings brought to the Sandridge 399-1-4 will be generated from several geological formations which include shallow formations bearing little or no oil and/or gas and deeper, gas-bearing, Mesaverde (Williams Fork) formation. Cuttings brought on site will be placed on the pad surface within the currently active cell within the trench boundary until the content of the active cell approaches 1000 cubic yards of material. Prior to disposal of each batch of drill cuttings, sampling and analysis will be performed to demonstrate that the drill cuttings do not exceed COGCC Table 910-1 concentration levels for soils. If the batch of drill cuttings does not meet these Table 910-1 concentration levels, the cuttings will be treated within their designated cell until the allowable concentration levels are met (see Section 8.0 for cuttings treatment options). Cuttings brought to this location that exceed the requirements in Table 910-1 will be completely segregated from materials that meet the requirements in Table 910-1. Once a batch of cuttings meets Table 910-1 concentration levels, an appropriately sized portion of the cuttings trench will be excavated to dispose of the batch of cuttings within the trench boundary. Sampling and analytical methods applied to characterize drill cuttings are described below in section 7.0.

The Sandridge 399-1-4 trench will not be used to manage any free liquids or fluids of any type. Cement returns are not allowed at the Sandridge 399-1-4 trench and will be managed at the well pad at which they originated. Although storm water BMPs are in place to control both storm water run-on and run-off at the Sandridge 399-1-4, storm water that falls directly onto the location may occasionally accumulate and need to be pumped/removed as needed.

7.0 Field Sample Methods and Procedures

Cuttings samples will be collected in accordance with solid waste sampling methodologies, environmental sampling and monitoring protocols, and quality assurance practices developed and prepared by the Environmental Protection Agency's (EPA) Office of Solid Waste; specified in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* 3rd Edition, Update IV.

7.1 Drill Cuttings Sampling

Cuttings stored within the permitted cuttings trench boundary will be characterized prior to disposal at the Sandridge 399-1-4 trench. Cuttings managed in separate cells containing no more than 1000 cubic yards of material, will be sampled prior to disposal. Prior to each disposal event, composite samples composed of four grab samples from separate locations within each cell will be collected using a shovel, track hoe or

rubber tired backhoe. The grab samples will be stockpiled in an area adjacent to the pile and mixed. The mixed materials will comprise the composite sample which will then be placed directly into laboratory specified sample containers and labeled according to the relevant COGCC Table 910-1 analytes. For transport, sample containers will be placed inside a cooler, and cooled to 4°C or less to preserve sample integrity.

Samples will be submitted according to the laboratory's Chain of Custody (COC) protocol unless otherwise specified. The attached *Table 2: Soil Sample Collections, Handling and Analysis Summary* identifies the laboratory sampling specifications including parameters, analytical methods, and sample handling information (i.e., bottles and holding times).

7.2 Storage Area Sampling

It is anticipated that most, if not all, of the surface area within the trench perimeter will ultimately be utilized for cuttings disposal. However, any cuttings storage area that is not eventually used for cuttings disposal will be sampled for the COGCC Table 910-1 analytes. Depending on the size of the area, up to four grab samples will be collected to verify no hydrocarbon impacts are present. Samples will be placed into laboratory specified sample containers and labeled according to the relevant COGCC Table 910-1 analytes. The attached Table 2 summarizes sampling specifications including parameters, analytical methods, and sample handling information (i.e., bottles and holding times).

7.3 Background Sampling

At least three background grab samples from nearby, non-impacted native soil will be collected and analyzed for arsenic concentrations. Analytical results of background soil samples will be compared against those from the drill cutting samples. The attached Table 2 summarizes sampling specifications including parameters, analytical methods, and sample handling information (i.e., bottles and holding times).

For transport, sample containers will be placed inside a cooler, and cooled to 4°C or less to preserve sample integrity. GPS coordinates will be collected of each sampling location for future reference and identification. Samples will be submitted following a Chain of Custody protocol to an accredited analytical laboratory.

7.4 Equipment Decontamination

Pre-cleaned, wide mouth, glass sampling containers will be used to collect the cuttings sampled as described in Table 2.

7.5 Sampling Analysis

Sampling parameters for drill cuttings can be categorized into three types of contaminants of concern: organics, inorganics, and metals. Cuttings samples will be analyzed in accordance with the EPA methods specified in latest version of "Test Methods for Evaluating Solid Waste, Physical/Chemical

Methods" (SW-846) and Rule 910 of COGCC Rules and Regulations. The analytical parameters in these three categories include:

Organic compounds – *TEPH (DRO - diesel), TVPH (GRO - gas), BTEX, and PAHs (Polycyclic Aromatic Hydrocarbons)*

Inorganic properties – *pH, Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR)*

Metals – *Total metals*

The specific analytical test methods and chemical constituents in these categories and their allowable concentration levels, as specified in COGCC Table 910-1, are summarized in Table 2.

7.6 Quality Control and Quality Assurance

Samples submitted to the laboratory will be subject to their standard quality assurance/quality control (QA/QC) measures to satisfy a Level II Standard Analytical Result package from an accredited laboratory, which includes:

- Level I Data Summary Package
- Surrogate Recoveries with QC limits
- Sample matrix, units, effective dilutions, prep batch number if available (for tracking prep QC) and percent moisture, if appropriate.
- Batch QC Summary Reports of:
  - Method Blanks
  - Laboratory Control Spike Recoveries
  - Matrix Spike/Duplicate Recoveries and RPDs.

8.0 Cuttings Treatment Methods

WPX Energy has several options to treat drill cuttings that exceed Table 910-1 contaminant concentration levels; however, even after treatment most drill cuttings may still exceed the Table 910-1 acceptable concentration levels for arsenic and select inorganic parameters (pH, SAR, and EC).

(1) **Moisture control for transportation and reclamation.** Cuttings are often blended first with sawdust and/or excess clean soil (not topsoil) excavated and stockpiled during pad/trench construction. Blending has an added benefit of reducing slightly elevated organic contaminant concentrations in the cuttings. Blending with clean soil dilutes and reduces elevated concentrations to acceptable levels before the cuttings/soil mix is disposed of in a cuttings trench at depths below the major rooting zone for plants. [3]

(2) **Arsenic.** Drill cuttings that exceed Table 910-1 concentration levels for arsenic will be evaluated by comparison to site-specific background analytical data. Data collection, data analysis, and

[3]Bansal and Sugiarto 1999

documentation of cuttings that exceed Table 910-1 concentrations for arsenic will be reported to the COGCC environmental staff via Sundry Notice Form 4 prior to the final reclamation of the site.

(3) **Inorganics**. Cuttings that exceed Table 910-1 concentration levels for inorganics (pH, SAR, and EC), which were established to be protective of vegetative growth, are allowed to be buried in cuttings pits or trenches at depths of at least three (3) feet below the ground surface to avoid potential adverse impacts to the growth of vegetation.

(4) **Organic Compounds.** Organic compounds in cuttings will be treated either by adding clean soil, as described in section 8.0(1), and/or by the use of microorganisms (i.e., bacteria and nutrients), also known as bioremediation, biological treatment, or biotreatment, which is a natural treatment process whereby microorganisms in, or added to, the soil to breakdown residual petroleum hydrocarbons into carbon dioxide and water. Any residual hydrocarbons that may be detected in the cuttings above Table 910-1 concentration levels will be treated by adding bacteria to the cuttings to degrade hydrocarbons and reduce TPH concentrations. The objective of biotreatment is to accelerate the natural decomposition process by adding or cultivating bacterial populations and controlling certain parameters such as oxygen, temperature and moisture in the cuttings.

9.0 Final Reclamation of the Site

The Sandridge 399-1-4 trench will be closed and reclaimed in accordance with the COGCC Rule 905. a. and 1003. d. Cuttings stored in the trench will meet the concentration levels of Table 910-1 as described above and will be sufficiently dry prior to backfilling and recontouring activities. The backfilling of the Sandridge 399-1-4 will consist of returning the subsoil and topsoil to their original relative positions so that cuttings will be confined to the trench area underneath a native soil cover and not incorporated into surface materials.

A minimum of three (3) feet of clean cover will be backfilled over all cuttings. During the two (2) year period following drilling trench closure, if subsidence occurs over the closed location, additional topsoil will be added to the depression and the land will be re-leveled as close to the intended contour as practicable. See Attachment G for a more detailed Reclamation Plan.

10.0 Recordkeeping

WPX Energy will maintain the following records related to the management of drill cuttings transported to the Sandridge 399-1-4 for a period of 5 years from their date of generation:

- Approved Form 2A that authorizes surface disturbance for a drill cuttings trench
- Field sampling records and laboratory analytical reports for disposed drill cuttings and background soils
- Variance requests for exceeding COGCC Table 910-1 concentration levels for arsenic and inorganic parameters in soil and drill cuttings and the accompanying Form 4 Sundry Notice

- A spreadsheet that summarizes pad locations where the cuttings where generated and the volumes transported to the Sandridge 399-1-4

Records will be maintained at the WPX Energy Parachute, Colorado field office. Upon written request from the COGCC, WPX Energy will provide copies of the records requested within a 5 year record retention period following their generation.

Table 1. Waste Generation Locations[4]

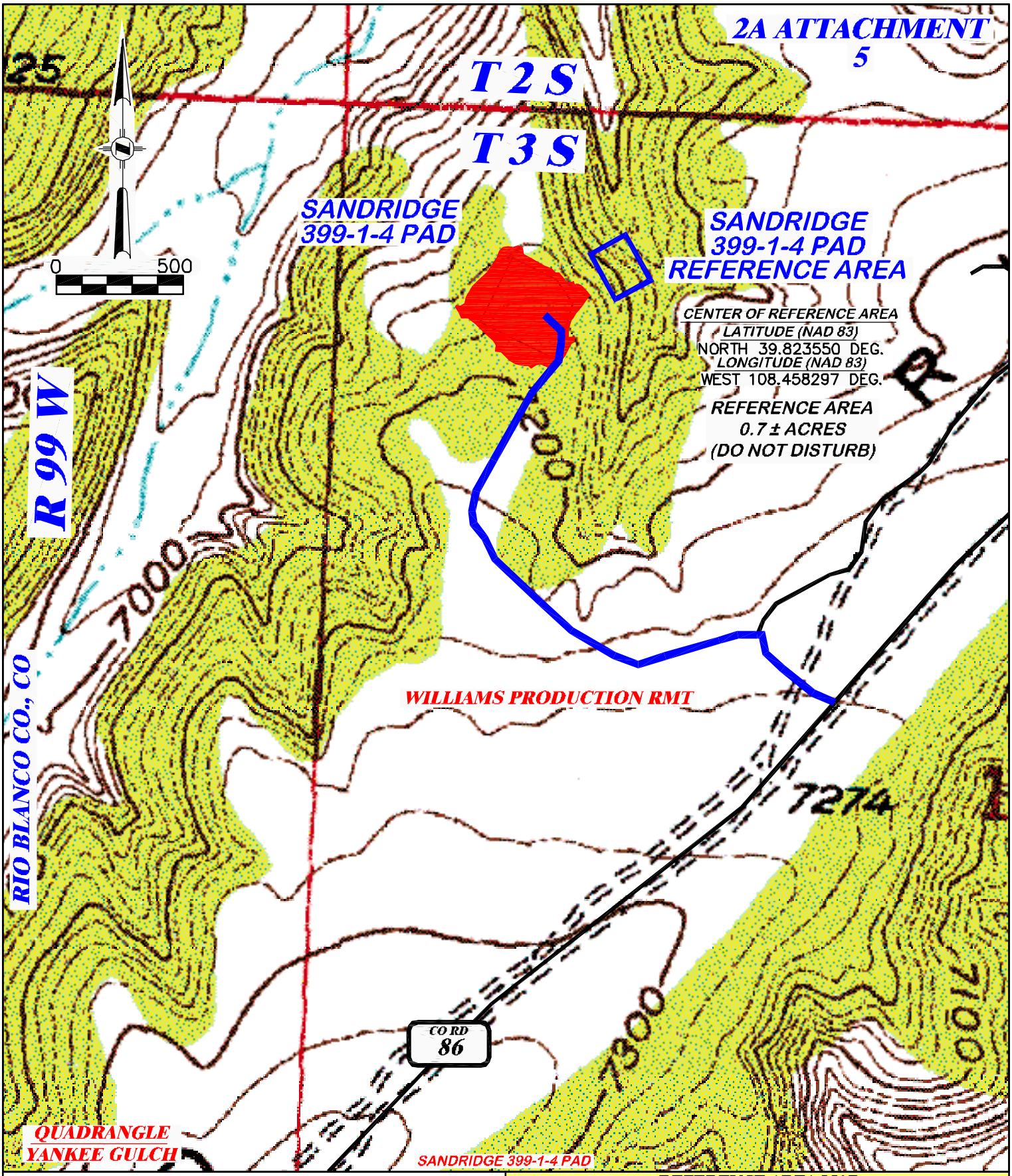
Pad_Name	Town,Range,Section,QRT/QRT
NRG 13-13-198	T1S R98W, Section 13, NWSW
RG 11-13-298	T2S R98W, Section 13, NWNW
RG 11-7-397	T3S R97W, Section 7, NWNW
RG 13-13-298	T2S R98W, Section 13, NWSW
RG 14-13-298	T2S R98W, Section 13, SWSW
RG 24-13-398	T3S R98W, Section 13, SESW
RG 31-22-298	T2S R98W, Section 22, NWNE
RG 43-15-298	T2S R98W, Section 15, NESE
RGU 11-26-198	T1S R98W, Section 26, NWNW
RGU 12-1-298	T2S R98W, Section 1, SWNW
RGU 12-35-198	T1S R98W, Section 35, SWNW
RGU 13-36-198	T1S R98W, Section 36, NWSW
RGU 22-26-198	T1S R98W, Section 26, SENW
RGU 22-27-198	T1S R98W, Section 27, SENW
RGU 31-2-298	T2S R98W, Section 2, NWNE
RGU 31-34-198	T1S R98W, Section 34, NWNE
RGU 32-35-198	T1S R98W, Section 35, SWNE
RGU 32-36-198	T1S R98W, Section 36, SENE
RGU 33-25-198	T1S R98W, Section 25, NWSE
RGU 34-27-198	T1S R98W, Section 27, NWSW
RGU 41-23-198	T1S R98W, Section 23, NENE
RGU 41-8-298	T2S R98W, Section 8, NENE
RGU 42-26-198	T1S R98W, Section 26, SENE

[4] Based on the current WPX drilling schedule. Locations might be added as the drilling schedule changes.

Table 2. Soil Sample Collections, Handling and Analysis Summary

Analyte Class	Analysis	COGCC Table 910-1 Concentrations Standard	Holding Time	Method
Organics	TEPH (DRO)	500 mg/kg	14 days	SW 8015 mod
	TVPH (GRO)	500 mg/kg		
	Benzene	0.17 mg/kg	14 days	SW 8021
	Toluene	85 mg/kg		
	Ethylbenzene	100 mg/kg		
	Xylenes (total)	175 mg/kg		
	Acenaphthene	1,000 mg/kg	14 days	SW 8270
	Anthracene	1,000 mg/kg		
	Benzo (A) anthracene	0.22 mg/kg		
	Benzo (B) fluoranthene	0.22 mg/kg		
	Benzo (K) fluoranthene	2.2 mg/kg		
	Benzo (A) pyrene	0.022 mg/kg		
	Chrysene	22 mg/kg		
	Dibenzo(A,H)anthracene	0.022 mg/kg		
	Fluoranthene	1,000 mg/kg		
	Fluorene	1,000 mg/kg		
	Indeno(1,2,3,C,D)pyrene	0.22 mg/kg		
	Napthalene	23 mg/kg		
	Pyrene	1,000 mg/kg		
Inorganics	Electrical Conductivity	< 4 mmhos/cm or 2x background	28 days	USDA Hdbk
	Sodium Adsorption Rate	< 12	180 days	
	pH	6-9	< 24	SW 9045
Total Metals	Arsenic	0.39 mg/kg	28 days for Hg & 180 days for remaining	SW 6010, 6020, 7470
	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 (inorganic)	400 mg/kg		
	Mercury	23 mg/kg		
	Nickel (soluble salts)	1,600 mg/kg		
	Selenium	390 mg/kg		
	Silver	390 mg/kg		
	Zinc	23,000 mg/kg		

Attachment A



DRG RIFFIN & ASSOCIATES, INC.
(307) 362-5028
1414 ELK ST., ROCK SPRINGS, WY 82901

DRAWN: 7/29/10 - DEH	SCALE: 1" = 500'
REVISED: 9/20/10 - RAB	DRG JOB No. 17958
ADDED REFERENCE AREA	EXHIBIT 4C

REFERENCE AREA MAP

WILLIAMS PRODUCTION RMT COMPANY
SANDRIDGE 399-1-4 MULTI WELL PIT
NWNW, SECTION 1, T3S, R99W, 6th P.M.
RIO BLANCO COUNTY, COLORADO

EXISTING ACCESS ——— EXISTING ROAD ———

Attachment B

Soil Map—Rio Blanco County Area, Colorado
(Sandridge 399-1-4)

Map Scale: 1:815 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rio Blanco County Area, Colorado
Survey Area Data: Version 10, Sep 22, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

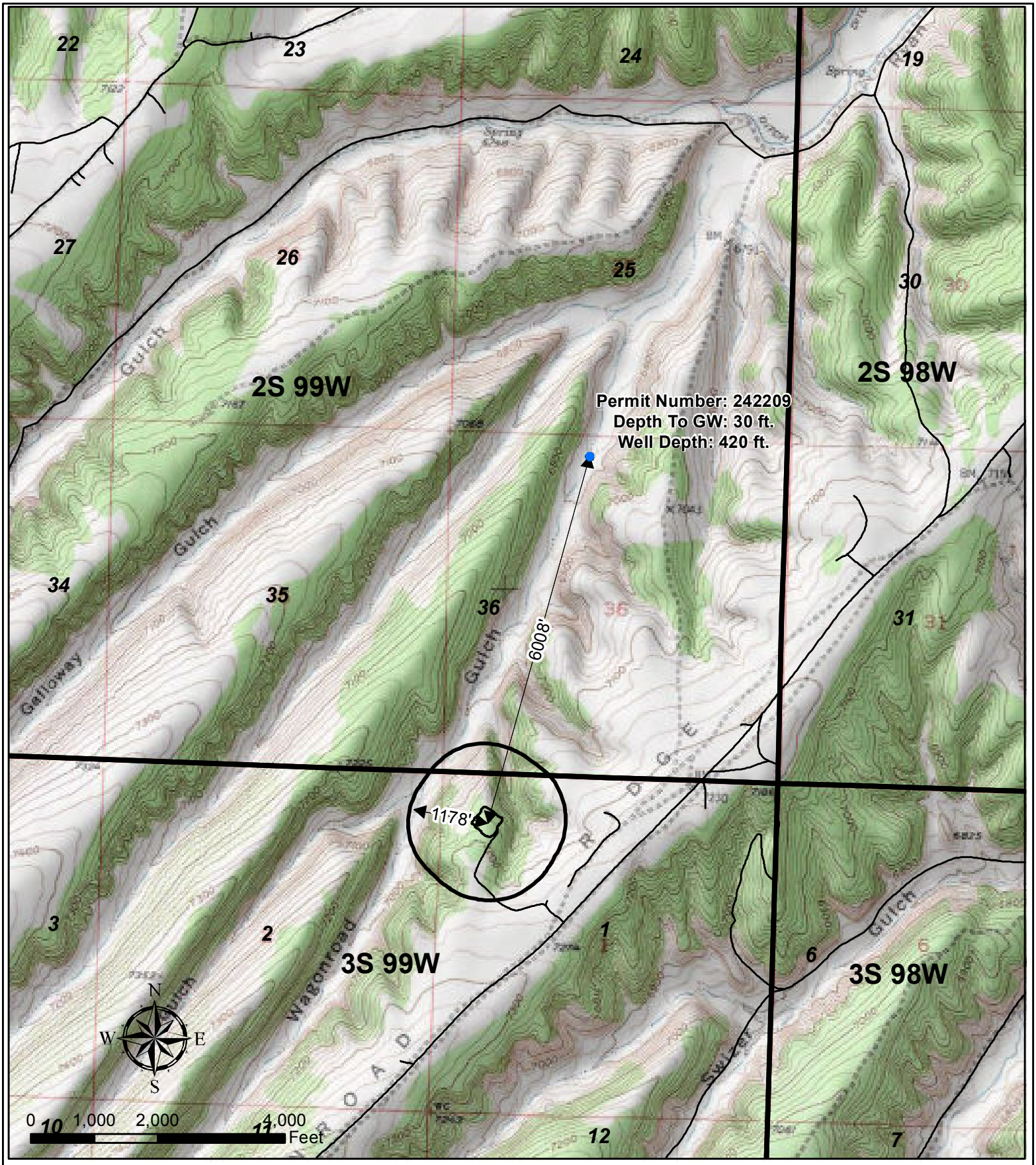
Date(s) aerial images were photographed: Jun 22, 2010—Sep 2, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Rio Blanco County Area, Colorado (CO685)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
73	Rentsac channery loam, 5 to 50 percent slopes	1.7	100.0%
Totals for Area of Interest		**1.7**	**100.0%**

Attachment C



Legend

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

WPX Energy Rocky Mountain, LLC

Plat 5C

Federal 399-1-4 Pad Hydrology Map
T3S R99W, Section 1

WPXENERGY

T:\Projects\PIC\RyanGulch\15\0430_399-1-4_Hydrology\399-1-4 Hydrology Map.mxd mreynold 4/30/2015 1:27:12 PM

Attachment D

Sensitive Area Determination Checklist

WPX Energy Rocky Mountain, LLC (WPX)			
Person(s) Conducting Field Inspection		Ashlee Lane 10/12/2010 *Biologist*	Revised 4/30/2015
Site Information			
Location:	Federal 399-1-4		Time: 1200
Type of Facility:	Existing Well Pad w/Proposed Cuttings Trench		
Environmental Conditions	Clear and calm		
Temperature (°F)	70°		

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: Wagonroad Gulch a USGS identified intermittent drainage and one unnamed ephemeral drainage which was identified during the site visit.

   If yes, describe location relative to facility: Wagonroad Gulch is located 1,243 feet to the west and the unnamed ephemeral drainage is located approximately 530 feet to the northeast 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 potential release, if it were to migrate off the facility, would flow to the northeast towards the unnamed ephemeral drainage.

3. Is the potential to impact surface water from a facility release high or low?
   ☒ Moderate to High to actual surface water features ☒ Low to any flowing surface water

WPXENERGY

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): Cuttings Trench

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 $\leq 1.0x10^{-7}$ 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.

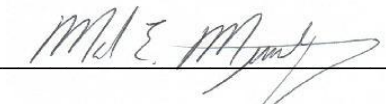
7. Is the potential to impact ground water from the facility in the event of a release high or low?
   ☐ High ☒ Low

Additional Comments:

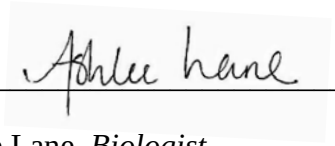
As stated in the surface water section of this sensitive area determination; Wagonroad Gulch, a USGS identified intermittent draining and one ephemeral drainage, identified during the site visit, are located within a ¼ mile radius of the existing facility. The facility, as it is currently constructed, limits the direction of a potential release to the northeastern side. If a potential release were to migrate off the facility on the above mentioned side, flow would directly towards and into the unnamed ephemeral drainage. During facility construction, Best Management Practices (BMP's) should be installed along any fill slope sides especially on the northeastern side of the facility. The BMP's should be in the form of an perimeter berm on the graded edge of the facility itself and a diversion ditch along any fill slope sides as well. All installed BMP's should be monitored and maintained to ensure site containment.

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 is dominated by xeric vegetation typical of the elevation and location (Piñon Juniper woodland, sage brush, and bunch grasses) and does not suggest the presence of shallow groundwater. There are no permitted groundwater wells within 2 miles of the facility however three permits were submitted and never drilled. According to the State Engineers Office, the wells were targeting water bearing zones in excess of 200 feet. In addition the facility is located approximately 250 feet higher than the alluvial valley floor of Wagonroad Gulch where groundwater could potentially be present. Therefore it could be assumed that groundwater, if present, in the immediate vicinity of the facility would be in excess of 250 feet.

Based on the information collected during the site investigation and desktop review, the potential to impact groundwater has been deemed as being low due to the topographical location of the facility. The greatest potential for impacts would be to the unnamed ephemeral drainage located to the northeast. It should be noted that the drainage is ephemeral and exhibits a poorly defined channel, no ordinary high water mark (OHWM), and a fairly thick vegetated bottom indicating that it does not flow a majority of the time. In addition, the facility will not be utilized to store fluids making the potential to impact any surface water features low. By COGCC decision, the close proximity of the drainage feature to the northeast would classify the facility as being in a sensitive area. However, as noted above, with the materials being stored on-site (cuttings) and if adequate BMP's are installed and maintained, the potential for impacts to surface water features and actual flowing surface water would be deemed to be low. With the potential for impacts to groundwater, surface water features, and actual flowing surface water being deemed as low, the facility can be designated as being in a non-sensitive area

Inspector Signature(s):  Date: 4/30/2015

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

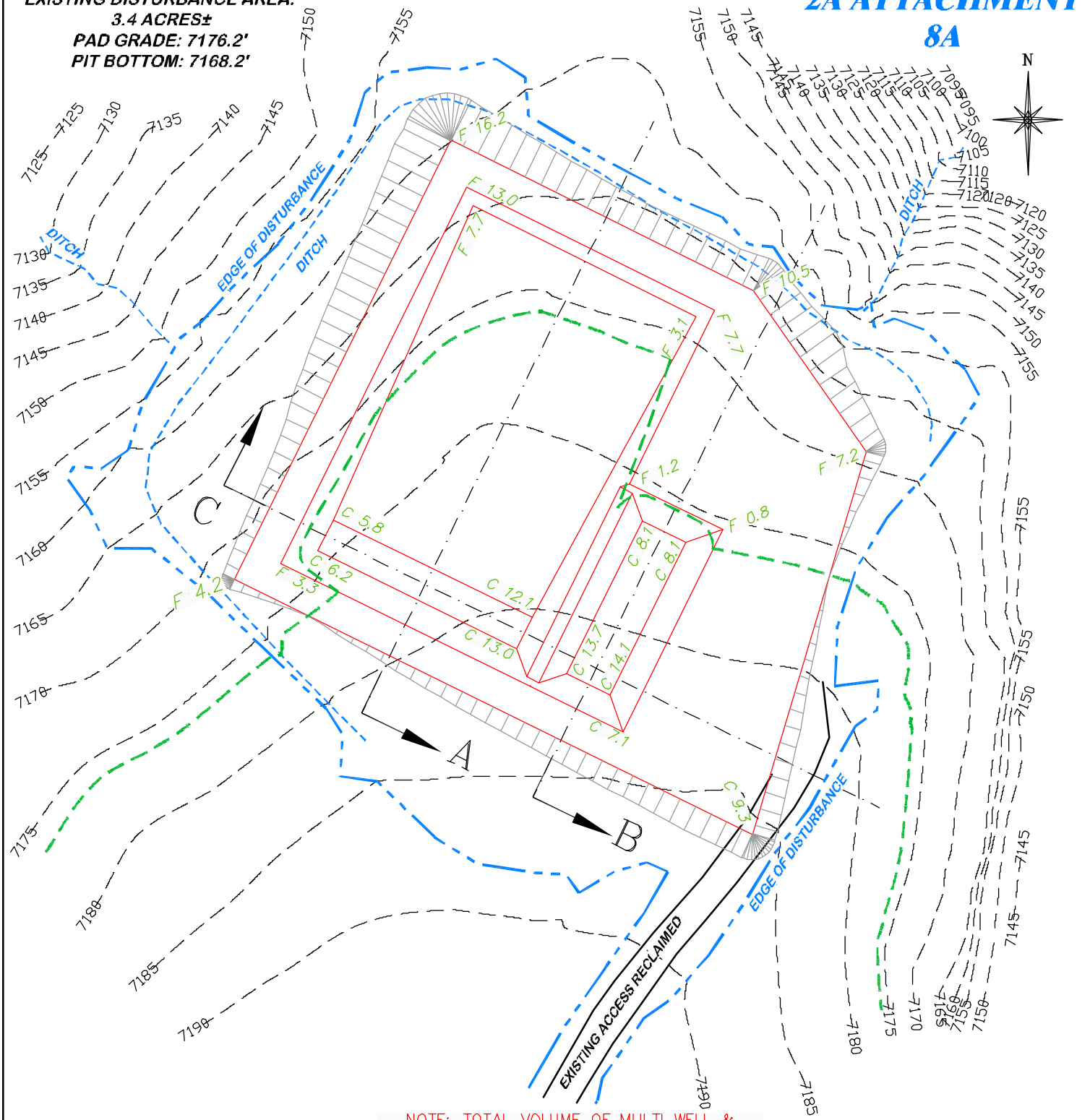
 Date: 10/15/2010

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

Attachment E

EXISTING DISTURBANCE AREA:
3.4 ACRES±
PAD GRADE: 7176.2'
PIT BOTTOM: 7168.2'

2A ATTACHMENT 8A



NOTE: TOTAL VOLUME OF MULTI WELL & TREATED STORAGE PITS BELOW 2' FREEBOARD:
29,358 Bbls
6,105 CY

BEFORE DIGGING
CALL FOR
UTILITY LINE LOCATION

NOTE: THE EARTH QUANTITIES ON THIS DRAWING ARE ESTIMATED AND THE USE OF THIS IS AT THE RESPONSIBILITY OF THE USER.

SANDRIDGE 399-1-4 PAD

80 0 80
SCALE FEET

GRIFFIN & ASSOCIATES, INC.
1414 ELK ST., ROCK SPRINGS, WY 82901
(307) 362-5028

DRAWN: 7/29/10 - DEH	SCALE: 1" = 80'
REVISED: N/A	DRG JOB No. 17958
	EXHIBIT 2

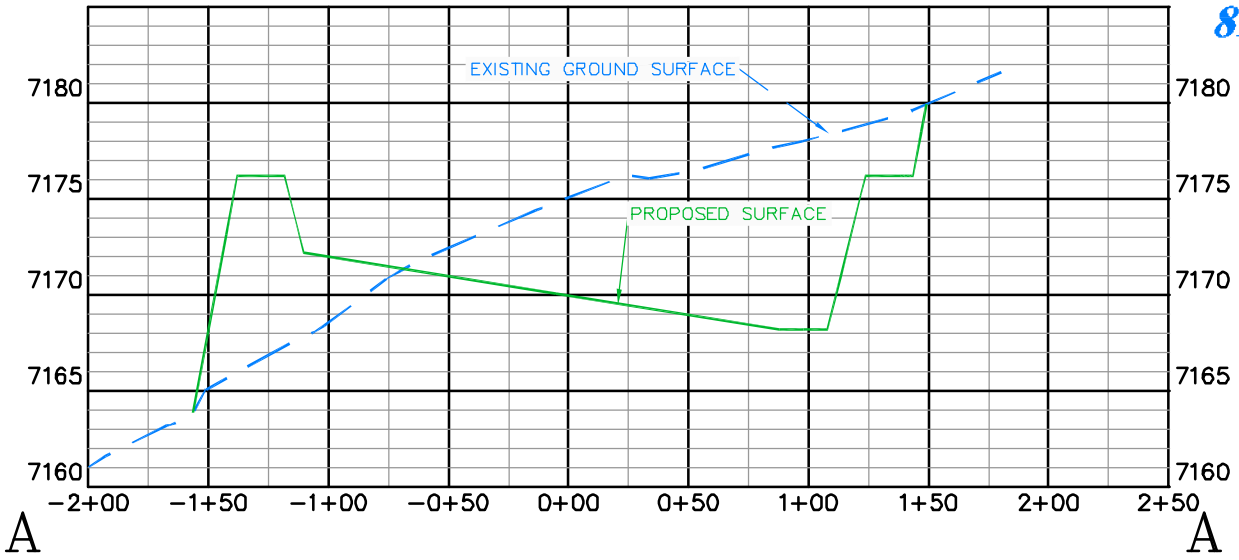
CONSTRUCTION LAYOUT DRAWING 1 OF 2
WILLIAMS PRODUCTION RMT COMPANY
SANDRIDGE 399-1-4 MULTI WELL PIT
NWNW, SECTION 1, 13S, R99W, 6th P.M.
RIO BLANCO COUNTY, COLORADO

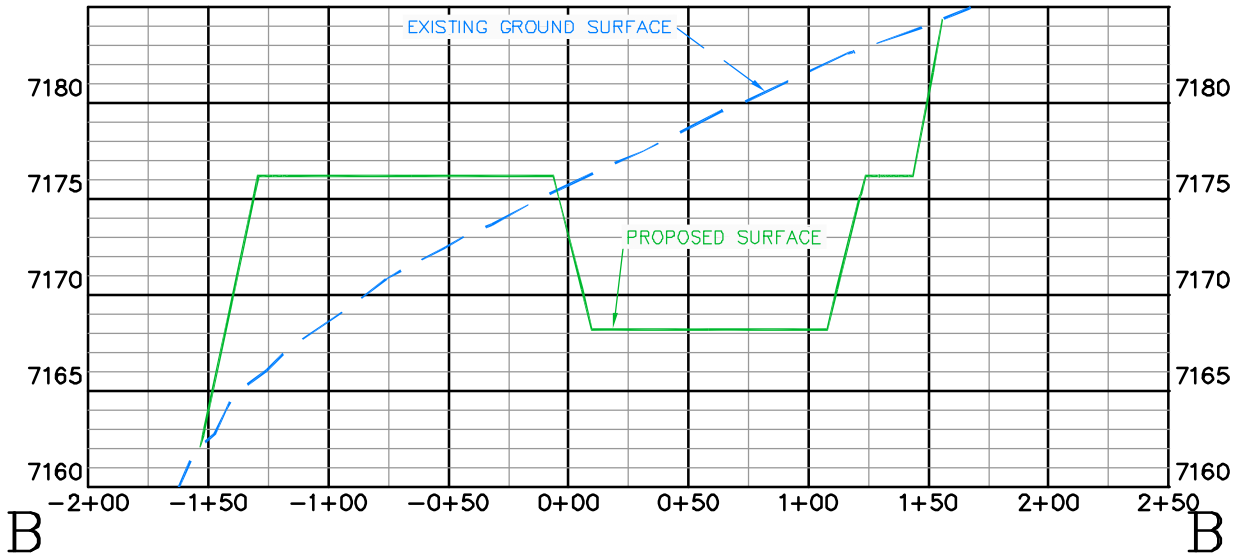
PAD GRADE: 7176.2'
PIT BOTTOM: 7168.2'

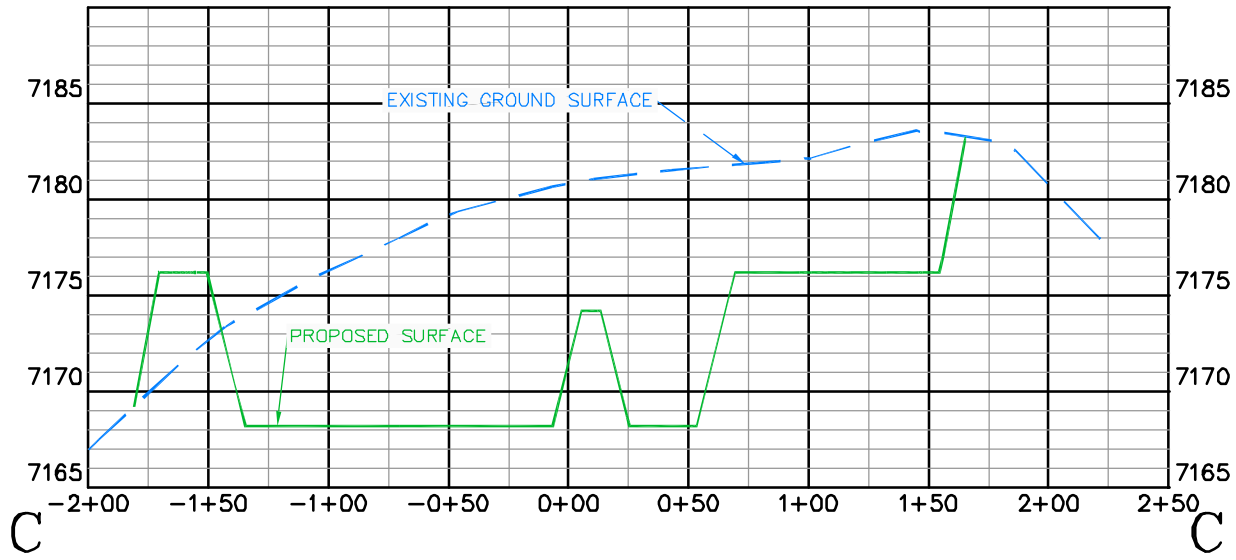
ESTIMATED EARTHWORK

ITEM	CUT	FILL	TOPSOIL	EXCESS
TOTALS	11,360 CY	9,200 CY	1,882 CY	278 CY

2A ATTACHMENT
8B







SANDRIDGE 399-1-4 PAD

GRIFFIN & ASSOCIATES, INC. 1414 ELK ST., ROCK SPRINGS, WY 82901 (307) 362-5028	**CONSTRUCTION LAYOUT DRAWING 2 OF 2** **WILLIAMS PRODUCTION RMT COMPANY** **SANDRIDGE 399-1-4 MULTI WELL PIT** **NWNW, SECTION 1, T3S, R99W, 6th P.M.** **RIO BLANCO COUNTY, COLORADO**
DRAWN: 7/29/10 - DEH	HORZ. 1" = 80' VERT. 1" = 10'
REVISED: N/A	DRG JOB No. 17958
	EXHIBIT 3
	PAD GRADE: 7176.2' PIT BOTTOM: 7168.2'

Attachment F

Huddleston-Berry
Engineering & Testing, LLC

640 White Avenue
Grand Junction, CO 81501
Phone: 970-255-8005
Fax: 970-255-6818
HuddlestonBerry@bresnan.net
www.HBET-GJ.com

November 4, 2014
Project #01106-0009

WPX Energy Rocky Mountain, LLC
1058 County Road 215
Parachute, Colorado 81635

Attention: Ms. Karolina Blaney

Subject: Infiltration Testing
Sandridge 399-1-4 Multi Well Pit
Rio Blanco County, Colorado

Dear Ms. Blaney,

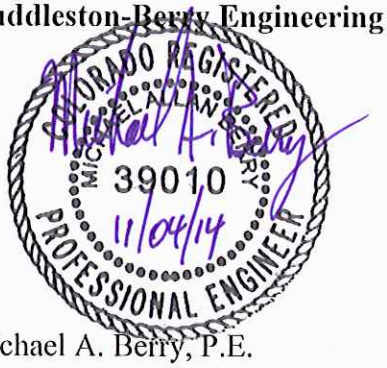
At your request, Huddleston-Berry Engineering and Testing, LLC (HBET) conducted infiltration testing at the Sandridge 399-1-4 Multi Well Pit in Rio Blanco County, Colorado. The purpose of the work was to evaluate the infiltration rate of the bottom of the proposed cuttings trench.

Field infiltration testing was conducted at the site on October 6, 2014. Testing was conducted at six locations as shown on the attached site plan. The testing was completed in sandy clay soils that comprise the pad.

The infiltration rate in the clay soils ranged from 2.5 to 6.0 inches per hour. The infiltration testing data is attached.

We are pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

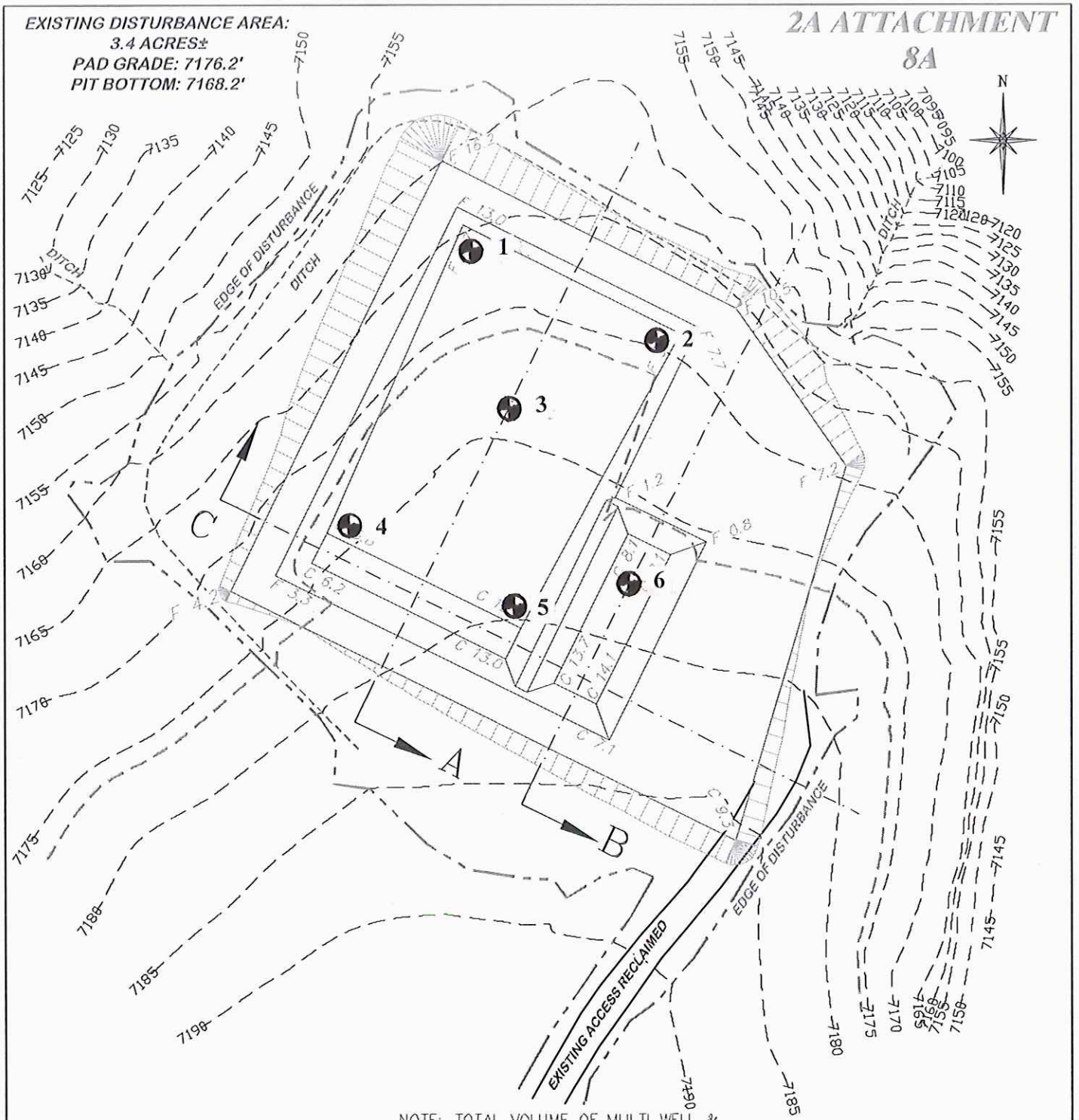
Respectfully Submitted:
Huddleston-Berry Engineering and Testing, LLC



Michael A. Berry, P.E.
Vice President of Engineering

ATTACHMENTS

2A ATTACHMENT
8A



BEFORE DIGGING
CALL FOR
UTILITY LINE LOCATION

NOTE: THE EARTH QUANTITIES ON THIS DRAWING ARE ESTIMATED AND THE USE OF THIS IS AT THE RESPONSIBILITY OF THE USER.

NOTE: TOTAL VOLUME OF MULTI WELL & TREATED STORAGE PITS BELOW 2' FREEBOARD:
29,358 Bbls
6,105 CY

80 0 80
SCALE FEET

SANDRIDGE 399-1-4 PAD

DRG RIFFIN & ASSOCIATES, INC.
1414 ELK ST., ROCK SPRINGS, WY 82901
(307) 362-5028

CONSTRUCTION LAYOUT DRAWING 1 OF 2
WILLIAMS PRODUCTION RMT COMPANY
SANDRIDGE 399-1-4 MULTI WELL PIT
NWNW, SECTION 1, T3S, R99W, 6th P.M.
RIO BLANCO COUNTY, COLORADO

PAD GRADE: 7176.2'
PIT BOTTOM: 7168.2'

DRAWN: 7/29/10 - DEH	SCALE: 1" = 80'
REVISED: N/A	DRG JOB No. 17958
	EXHIBIT 2

ESTIMATED EARTHWORK

ITEM	CUT	FILL	TOPSOIL	EXCESS
TOTALS	11,360 CY	9,200 CY	1,882 CY	278 CY

INFILTRATION TESTING
Sandridge 399-1-4 Multi Well Pit
10/6/2014

Test Number: 1
Top Depth: 0 ft
Diameter: 4 in.
Hole Depth: 9 in.

Time (min.)	Water Depth (in.)	Change (in.)
0	1.25	
10	3.5	2.25
20	4.625	1.125
30	5.25	0.625
40	6.25	1
50	7.125	0.875
60	8	0.875
Rate (in/hour)		5

Test Number: 2
Top Depth: 0 ft
Diameter: 4 in.
Hole Depth: 10 in.

Time (min.)	Water Depth (in.)	Change (in.)
0	1.5	
10	4	2.5
20	5.75	1.75
30	6.375	0.625
40	7.375	1
50	8	0.625
60	9	1
Rate (in/hour)		5

Test Number: 3
Top Depth: 0 ft
Diameter: 4 in.
Hole Depth: 10 in.

Time (min.)	Water Depth (in.)	Change (in.)
0	2.25	
10	4.5	2.25
20	5.5	1
30	6.5	1
40	7.375	0.875
50	8.375	1
60	9.25	0.875
Rate (in/hour)		5.5

Test Number: 4
Top Depth: 0 ft
Diameter: 4 in.
Hole Depth: 12 in.

Time (min.)	Water Depth (in.)	Change (in.)
0	2	
10	4.875	2.875
20	6	1.125
30	7.5	1.5
40	8.25	0.75
50	9.375	1.125
60	10	0.625
Rate (in/hour)		6

Test Number: 5
Top Depth: 0 ft
Diameter: 4 in.
Hole Depth: 10 in.

Time (min.)	Water Depth (in.)	Change (in.)
0	1.625	
10	4	2.375
20	5.25	1.25
30	6.5	1.25
40	7.25	0.75
50	7.875	0.625
60	8.5	0.625
Rate (in/hour)		4

Test Number: 6
Top Depth: 0 ft
Diameter: 4 in.
Hole Depth: 8 in.

Time (min.)	Water Depth (in.)	Change (in.)
0	2.25	
10	3.5	1.25
20	4.25	0.75
30	5	0.75
40	5.5	0.5
50	5.875	0.375
60	6.25	0.375
Rate (in/hour)		2.5

Attachment G

RECLAMATION PLAN

WPX ENERGY ROCKY MOUNTAIN, LLC
1058 CR 215
Parachute, CO 81635

DATE PREPARED:
April 2014

1.0 Introduction

This Reclamation Plan (Plan) describes procedures necessary for the reclamation of an Oil and Gas location. The Plan includes final reclamation for a site which is no longer in operation and has been taken out of service and removed. Re-contouring, reseeding, noxious weed treatment, storm water mitigation and monitoring of the site will be addressed.

The reclamation of disturbed land is a critical component when creating a system where ecological functions and values are restored once ground disturbance activities have ceased. Rehabilitation of the disturbed area assists the natural ecological processes to move towards a self-promoting condition. Once a self-supporting environment has been established, the natural processes of the location can take over and continue the rehabilitation processes with minimal intervention from outside parties. The costs associated with the rehabilitation process will be minimized to the operator if proper treatments are applied initially to ensure the best environment possible for rehabilitation treatments to succeed.

Bonding is required for oil and gas lease operations (43 CFR 3104, 36 CFR 228 E). The operator must identify which bond will be utilized to provide the coverage. The bond will cover the activities the operator performs including, but not limited to: plugging leasehold wells, pit closures, surface reclamation, and cleanup of abandoned operations. The Colorado Oil and Gas Conservation Commission (COGCC) 1000 Series Reclamation Regulations declare that reclamation activities will take place no later than twelve (12) months after operations stop on non-crop lands. This Plan is designed to provide guidance concerning reclamation activities for WPX Energy Rocky Mountain, LLC (WPX) land and environmental managers once the site of concern is no longer utilized for operations. The area to be reclaimed shall be kept as weed free as practicable of all undesirable noxious weed species. Weed control measures shall be conducted in compliance with the Colorado Noxious Weed Act (C.R.S. 35-5.5-101.et.seq). Storm water mitigation will be in compliance with the Colorado Department of Health and Environment (CDPHE) Water Quality Division General Permit Series COR-030000 and COGCC 1002.f regulations.

Procedures identified in this plan apply only to the defined area of the Sandridge 399-1-4 Trench location. Personnel working on this project should be familiar with the Plan and its contents prior to commencing reclamation activities.

2.0 Final Reclamation

The final reclamation process has three (3) stages to be completed in sequential order. Reclamation processes will occur no later than twelve (12) months after activity ends and reclamation activities will be in compliance with COGCC Rules 1000 Series. Dust suppression measures are required under the Colorado Department Public Health and Environment (CDPHE) fugitive dust, and will be implemented as applicable. Each stage will be applied to the reclamation of the well pad.

2.1 Stage One (Removal and Disposal)

All manmade structures and equipment will be removed from the site by means of backhoe, bulldozer, skidsteer or other appropriate heavy machinery. WPX will remove all safety and stormwater BMPs, and other surface objects from the premises. All access roads shall be closed, graded and recontoured. Culverts and any other obstructions that were part of the access road(s) shall be removed. Well locations, access road and associated production facilities shall be reclaimed. Pits shall be backfilled. As applicable, compaction alleviation, restoration, and revegetation of sites and access roads shall be performed to the same standards as established for interim reclamation under COGCC Rule 1003. Wooden stakes used to secure wattles and straw bales and other temporary BMPs and/or waste associated with operations on site will be disposed of properly. This includes any trash left behind on location such as pipe fittings, used lumber, and miscellaneous items that have been discarded. Gravel, road base and large cobbles installed on site for surface stabilization controls will be removed. . Temporary fencing put in place during operations will be removed. Existing fence lines or historic fence lines within the designated area of the site will be repaired, replaced, or removed as agreed to by WPX.

2.2 Stage Two (Substrate Preparation)

The condition of the soil is important for the establishment of a healthy self-sustaining environment. Soil samples will be collected to determine the salinity and solidity of the soil. Amendments will be utilized, as applicable.

Stained/contaminated soils will be removed. Locations where the soil has visible spills will have the contaminated soil removed or remediated, and disposed of in accordance with CDPHE and COGCC waste management regulations. Once the substrate is void of chemical presence, and gravel that was applied to the location during operation has been removed, reclamation work associated with the soil may commence.

To alleviate soil compaction, the substrate will be cross ripped to a depth of 18 inches. Cross ripping will take place when the soil moisture is below 35 percent of field capacity. The cross ripping is specified by the COGCC Rules under the 1000 Series. The substrate

shall be contoured to emulate the surrounding lands topography. The soil used to contour the landscape will be applied in accordance to the order it was removed (i.e. first off, last on). This practice will ensure that the soil is applied to the appropriate horizon from which it was taken from initially. Salvaged topsoil will be distributed across the entire disturbed area at a depth of six (6) to twelve (12) inches, as applicable.

2.3 Stage Three (Planting/Timing)

Seedbed preparation will consist of scarifying, tilling or harrowing seedbed to a depth of three (3) to four (4) inches post ripping. This will occur just prior to seeding. Drill seeding will be performed at a depth of 0.5 inches, seed will be covered with soil and lightly compacted to ensure good seed to soil contact. Seed will be applied using a rangeland seed drill with a seed release and agitation mechanism sufficient to allow seeds of various size and density to be planted at the proper seeding depth.

If possible, planting should occur in juncture with a predicted precipitation event. By positioning the seed below the snow fall or rain, the seed will receive contact with the soil and utilize the benefits of the precipitation. Spring planting can be conducted after the frost line is gone from the soil.

3.0 Storm Water Mitigation

3.1 Best Management Practices (BMPs)

To avoid erosion of topsoil and seed transport from storm events, Best Management Practices (BMPs) will be installed where applicable on the perimeter of the location. Given the location of the site, surface roughening, and pocking will reduce storm water impact and capture and retain precipitation. This will aid in the germination of the seed and increase seedling survival.

3.2 Reclamation Monitoring

Monitoring of the vegetative progress is vital to ensure that proper procedures were implemented on the location. Monitoring will allow for early response to potential problems encountered during the reclamation process. Identifying challenges to the reclamation goals at an early stage will allow for adequate time to formulate a response to the situation. By identifying potential complications early in the process, the future costs associated with rehabilitation will be minimized for the operator.

If the treatments do not show the desired outcome, additional actions will be taken to reach reclamation goals. After the source of the problem is identified, careful attention will be paid to the timing of the supplemental treatment. If treatments such as seeding are not carried out at the proper time, the treatment will not be effective and the operator will effectively increase rehabilitation costs.

Monitoring activities will examine several parameters including: the condition of implemented BMPs, growth state and success rate of areas seeded, presence and location of noxious weeds, and possible sources of failure for reclamation processes. Photo documentation is required for all the above parameters for high-quality progress tracking.

After the initial reclamation amendments are applied, and CDPHE requirements of 70 percent (%) pre-disturbance levels have been met as well as COGCC requirements of 80 percent (%) vegetative cover are met, a tri-annual monitoring scheme will be implemented. Monitoring activities will occur in the spring, summer and fall. Qualified individuals will carry out visual surveys. Monitoring will occur until COGCC requirements of 80 percent (%) desired vegetation has been reached.

4.0 References

Colorado Oil and Gas Conservation Commission (COGCC). Rule 1000 series. 2008.

Natural Resources Conservation Service. USDA. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/ February 17, 2012.