

# DE BEQUE WATER STATION REUSE AND RECYCLING PLAN

PREPARED FOR:



**BLACK HILLS PLATEAU PRODUCTION**  
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APRIL 2015

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## INTRODUCTION

The De Beque Water Station project is a proposed production water reuse and raw water facility for Black Hills Plateau Production (Black Hills) that will conserve water by recycling flow-back and produced water for re-use in well stimulations or drilling. The De Beque Water Station will generally consist of a site enclosed by security fence that contains three lined storage ponds, a pump station, an office building, a laydown yard, and storm water facilities. The project is located in the SE ¼ of the SW ¼ of Section 29, Township 8 South, Range 97 West, 6th P.M. A Form 2A Permit Application was submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on February 27, 2014 and approved on September 19, 2014. A Form 15 Permit Application for Pond 1 was submitted to the COGCC on July 7, 2014 and conditionally approved on October 7, 2014.

One of the Conditions of Approval for the Form 2A (Document # 400556701) and Form 15 (Document # 400639898) states that “the operator shall submit, and receive approval of, a reuse and recycling plan per Rule 907.a.(3), prior to any offsite reuse/recycling of pit fluids”. Rules 907.a.(3) is provided below:

**Reuse and Recycling.** To encourage and promote waste minimization, operators may propose plans for managing E&P waste through beneficial use, reuse, and recycling by submitting a written management plan to the Director for approval on a Sundry Notice, Form 4, if applicable. Such plans shall describe, at a minimum, the type(s) of waste, the proposed use of the waste, method of waste treatment, product quality assurance, and shall include a copy of any certification or authorization that may be required by other laws and regulations. The Director may require additional information.

The relatively remote nature of Black Hills’ operations necessitates the construction of this facility so that water produced during the drilling, completion and production of natural gas wells in the area may be collected and stored in a central location for reuse in operations. This facility is designed to provide a consolidated system of water storage impoundments (ponds) and a pump station that Black Hills will use to efficiently and safely transport water around their field(s). The construction of the water impoundments facility and associated pipeline infrastructure at this location will enhance Black Hills’ ability to reuse produced water in its operations and will minimize the need for trucking water thereby increasing the safety of both the company’s operations and reducing their impact on neighboring properties and the environment. The proposed storage capacity will enable Black Hills to store water during low demand days and reduce or eliminate trucking water to a commercial disposal site.

## **TYPE OF WASTE**

Per the COGCC 100 Series rules, the De Beque Water Station will be a non-commercial centralized E&P waste management facility. According to the COGCC, a Centralized E&P Waste Management Facility shall mean a facility, other than a commercial disposal facility regulated by the Colorado Department of Public Health and Environment, that (1) is either used exclusively by one owner or operator or used by more than one operator under an operating agreement; and (2) is operated for a period greater than three (3) years; and (3) receives for collection, treatment, temporary storage, and/or disposal of produced water, drilling fluids, completion fluids, and any other exempt E&P wastes that are generated from two or more production units or areas or from a set of commonly owned or operated leases. Black Hills intends to use the lined storage ponds at this facility to temporarily store produced water that flows back from wells developed in their Homer Deep, Horseshoe Canyon, or Winter Flats units. The facility will also store raw water pumped from the Colorado River to the facility.

## **PROPOSED USE OF THE WASTE**

As allowed and encouraged by COGCC Rule 907.a.(3), the produced water stored at this facility will be managed for beneficial use, reuse, and recycling to promote waste minimization. The water stored at the facility will be reused for subsequent well developments in combination with raw water from the Colorado River. The volume of produced water received by the facility will be variable based on the frequency at which Black Hills develops new wells. Black Hills anticipates using approximately 500,000 barrels of water per well development and anticipates recovering 20% to 30% of this volume as produced water that will be stored at the facility for the next subsequent well development. If additional water is required to develop new wells, Black Hills will use raw water obtained from the Colorado River.

## **METHOD OF TREATMENT**

Produced water will undergo primary separation from oil and condensate on the well pads before produced water is piped to the De Beque Station. When produced water is returned to the facility it will run through a secondary oil skimming chamber located within the proposed pump station before it will be stored in the lined Ponds. The oil skimming system will consist of a three part system within a cast-in-place concrete tank. The first tank chamber will contain a diffuser to reduce the velocity and kinetic energy of the produced water. An overflow weir will allow the water to flow into the second tank chamber that will provide sufficient detention time to allow the oil and water to separate. An oil skimming system will collect any hydrocarbons from the water surface and store the hydrocarbons in an underground tank located outside the building. Produced water

will then flow through an undershot weir into the third tank chamber from where it will be pumped to one of three ponds for storage. Hydrocarbons collected at the facility will be transported off-site by trucks from the facility on an as-needed basis. The produced water will be stored within the lined ponds and subsequently reused for enhanced recovery, drilling, and other approved uses.

The pump station also provides a truck loading/unloading station in the event that water will be transported to or from a well site that is not accessible via Black Hills' water pipelines. The loading/unloading station will be located adjacent to the pump station and contain a catch basin for any leaks that could potentially occur while operations personnel are connecting or disconnecting hoses. Trucks will not be allowed to directly discharge into or collect water from the lined ponds to prevent hoses from damaging the pond liners. Produced water unloaded from a truck will flow into the secondary oil skimming chamber located within the pump station to remove hydrocarbons that could potentially be present prior to the water being pumped to and stored in the lined ponds.

Odor mitigation will be accomplished by installing a floating cover on the water surface of the ponds that will limit sunlight reaching the water and the growth of bacteria. As the water level fluctuates, the cover will raise or lower with the water level. This cover will also deter birds from landing on the pond surface. The ponds will also contain aeration equipment that will keep the water aerobic and limit the potential for odors. Biocide treatments will be utilized if needed to control bacteria or algae growth and any associated odors.

## **PRODUCT QUALITY ASSURANCE**

The water in Ponds 1, 2 and 3 will be sampled on a regular basis and analyzed for the constituents listed in Table 910-1 in the COGCC regulations. Initially water samples will be collected on a monthly basis and can be adjusted to a more or less frequent basis if conditions warrant.

The facility's produced water levels and leak detection will be monitored daily by Black Hills personnel (or their operator). A pond pressure transducer will automatically report water level depth in each pond.

A leak detection system will be installed in the corner of each pond to monitor for any leaks. The leak detection system consists of a PVC pipe that is perforated at the bottom and will be placed between the primary 60-mil HDPE liner and the secondary 60-mil HDPE liner. The presence of fluid in the PVC pipe would indicate to the operator that a leak has occurred in the primary liner. If a leak is discovered the leak in the pond liner will be located and repaired.

A water level monitor will be used to ensure a minimum of two (2) feet of freeboard below the spillway is provided in each pond at all times. An additional one foot of freeboard is provided between the spillway and the minimum crest elevation. Black Hills will use a submersible pressure transducer that will be linked to a tracking system. Alarms will be set to notify operators of unscheduled fluid fluctuations and levels.

During normal operations, weekly inspections will be performed by a Black Hills operator or designated representative. Weekly inspections will involve visual inspections of the facilities, assessment of the water levels, visual inspection for sheen on the water, recording flow meter valves, visual inspection of storm water BMPs, visual inspection of wildlife fencing and floating hextile cover, and performance of general housekeeping activities. The operator will ensure that all equipment is in proper working order and that the inspection is documented. If there are any irregularities noted during the inspection, a supervisor shall be notified (if required) and an appropriate response plan will be coordinated to resolve the irregularities.

## **OTHER REQUIRED CERTIFICATIONS OR AUTHORIZATIONS**

This facility has received approval of a Conditional Use Permit (CUP) from Mesa County dated June 10<sup>th</sup>, 2014. The CUP contained 15 conditions of approval covering a range of topics, most of which are not specific to reuse and recycling (see Appendix A). Condition 15 states that “odors will be controlled through the best available technology.” This condition is being addressed as previously described in this reuse and recycling plan.

Pond 1 is classified by the Colorado State Engineer’s Office (SEO) Division of Water Resources as a non-jurisdictional pond. Pond 1 has been inspected by the SEO and confirmed with field measurements that it constructed as a non-jurisdictional water impoundment. A copy of the SEO letter with their verification of construction is provided in Appendix B.

# **APPENDIX A**

## **MESA COUNTY CONDITIONAL USE PERMIT**



**BOCC 2014-147**

RESOLUTION NO. \_\_\_\_\_  
Planning Department No. 2014-0032 CUP

**APPROVAL OF A CONDITIONAL USE PERMIT FOR BLACK HILLS DEBEQUE  
STATION WATER REUSE FACILITY**

**WHEREAS**, Shawn Higley of WWC Engineering, representative for Black Hills Plateau Production, LLC, requested approval to operate a centralized oil and gas produced water reuse facility; and

**WHEREAS**, The Black Hills Debeque Station Water Reuse Facility will be located on a parcel of 39.3 acres in size, located at 4325 V 2/10 Rd., 1.5 miles west of DeBeque, as described on attached Exhibit "A", Legal Description and for 4325 V 2/10 Rd., DeBeque, located as shown on attached Exhibit "B", Location Map; and

**WHEREAS**, Black Hills Debeque Station Water Reuse Facility is proposed to be located on the same parcel that the Red Rock Gathering Company LLC, Debeque Processing Plant is located; and

**WHEREAS**, attached Exhibit "C" is the proposed site plan for the facility; and

**WHEREAS**, the staff recommendation was contained in a staff report dated April 15, 2014 (Revised May 5, 2014); and

**WHEREAS**, the Planning Commission recommended approval of this project by a vote of 6 to 1 at their public hearing April 24, 2014; and

**WHEREAS**, the public hearing before the Mesa County Board of County Commissioners was held on May 13, 2014.

**NOW, THEREFORE, THE BOARD OF COUNTY COMMISSIONERS OF THE  
COUNTY OF MESA FINDS AS FOLLOWS:**

**THAT** public notice requirements of Section 3.1.8 of the Mesa County Land Development Code (2000, as amended) have been met; and

**THAT** the application for a Conditional Use Permit for the Black Hills Debeque Station Water Reuse Facility located at 4325 V 2/10 Rd., DeBeque, can meet (with compliance with conditions) the applicable Approval Criteria for a Conditional Use Permit (Section 3.8.7) and the General Approval Criteria (Section 3.1.17) of the Mesa County Land Development Code (2000,

as amended) and the Approval Criteria of Section 5.2.22, Oil and Gas Support Services including consistency with intergovernmental agreements.

**THAT** this request is in accordance with the health, safety and welfare of the residents of Mesa County.

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS IN THE COUNTY OF MESA, STATE OF COLORADO:**

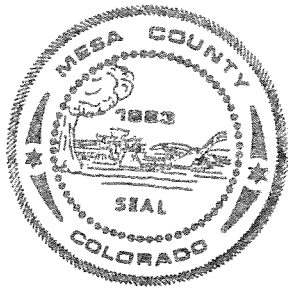
**THAT** the Conditional Use Permit for Concord Produced Water Services is approved with the following conditions:

1. Prior to the construction of the impoundments and other structures, the applicant shall submit and obtain approval of a site plan application to the Mesa County Public Works, Planning Division addressing compliance with these conditions of approval, addressing comments from review agencies and additional information as required in the site plan application checklist.
2. All applicable Federal, State, Local and County permits shall be obtained and maintained by the applicant and/or operator.
3. Compliance with the Development Standards of Chapter 7 of the Mesa County Land Development Code is continually required.
4. All review agency comments not in conflict with the conditions of approval shall be addressed.
5. The applicant shall use wildlife proof trash receptacles.
6. An emergency management plan and spill prevention and response plan shall be developed by the applicant's engineer and submitted for review and approval by the Mesa County Emergency Manager and the DeBeque Fire Department. Standard operating procedures dealing with occurrences shall be covered within the plan. Employees shall be trained in the procedures.
7. Regular maintenance of access road for emergency access and dust suppression.
8. The applicant, owner and operator shall not significantly deviate from the site plan and documents submitted with this application. Any modification or expansion of this facility, not including minor modifications as determined by the Planning Director, shall require an amendment of the Conditional Use Permit.
9. The applicant shall enter into a maintenance agreement with Mesa County as required for maintenance of 44 Rd. and V2/10th Rd with strong consideration to maintain local access.
10. Upon completion of the construction of the facility the applicant and the closest resident will evaluate the visual impacts to the nearest residence and provide additional screening

by landscaping, fencing or berming as needed to comply with Section 5.2.22B(11) of the Mesa County Land Development Code.

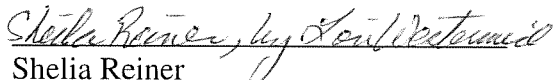
11. Noise levels on the site will adhere to the COGCC regulations for noise levels in residential and agricultural areas.
12. Prior to final site plan approval, the applicant shall provide a final drainage report meeting the specifications of the Development Engineering Division.
13. Full cutoff lighting with automatic shutoff will be used at this facility.
14. Conditional Use Permit approvals for support services facilities are valid for a period of three (3) years. The operator may submit a request for an extension of time before the end of the first three-year (3) period as an application for amendment.
15. Odors will be controlled through best available technology.

**PASSED AND ADOPTED THIS 10<sup>th</sup> DAY OF JUNE, 2014.**



ATTEST:

  
\_\_\_\_\_  
John Justman, Chair  
Board of Mesa County Commissioners

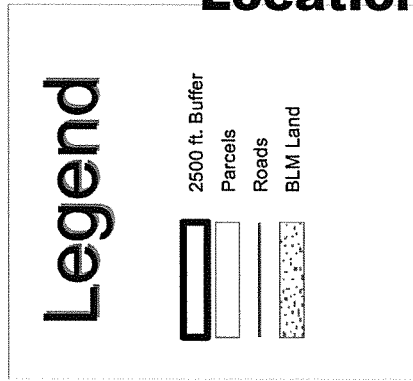
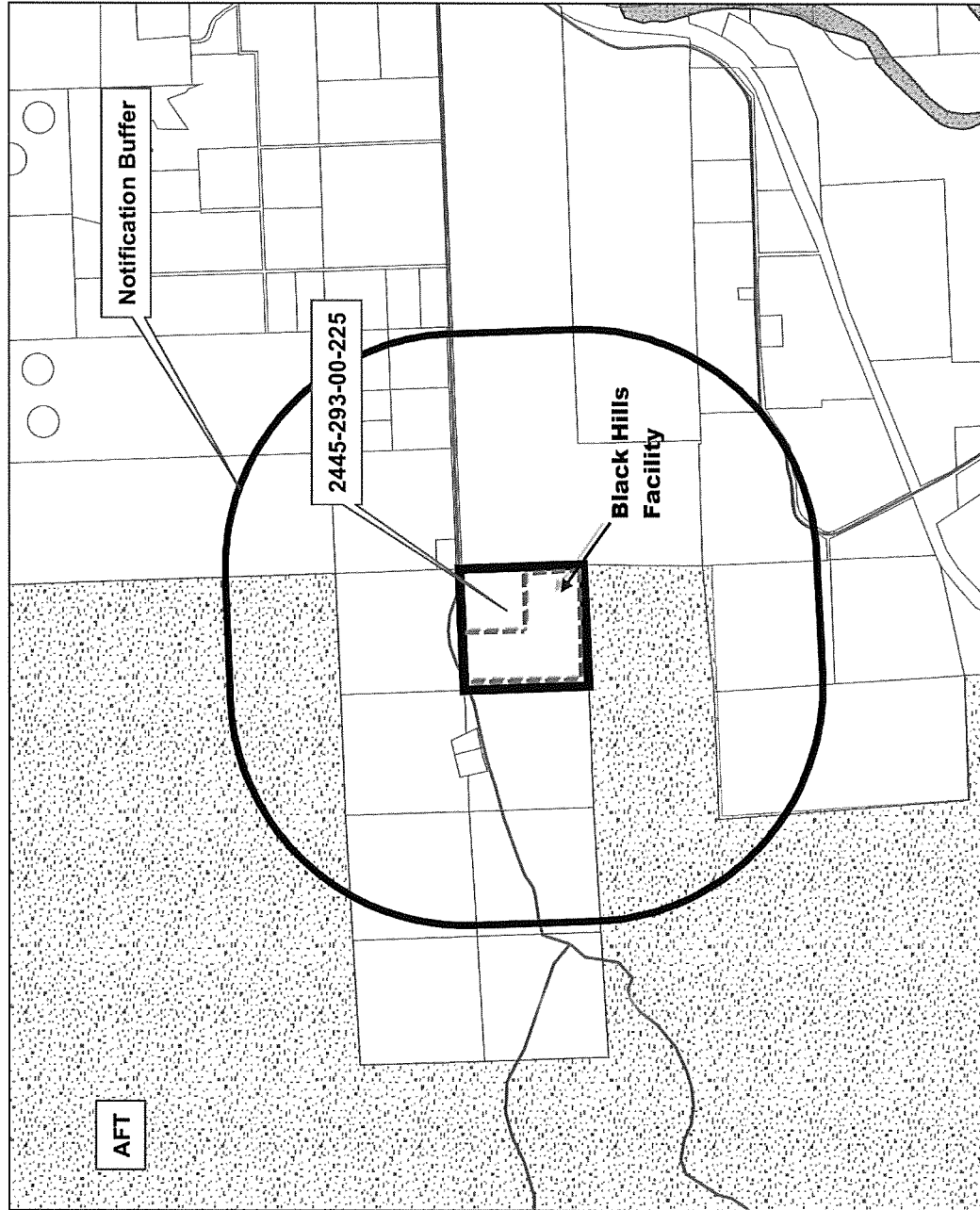
  
Shelia Reiner  
Mesa County Clerk and Recorder

## **Exhibit A**

### **Legal Description for 4325 V 2/10 Rd, DeBeque, CO 81630**

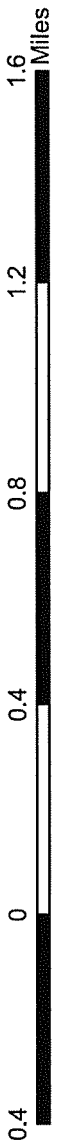
SE  $\frac{1}{4}$  SW  $\frac{1}{4}$  of Section 29, Township 8 South, Range 97 West of the 6<sup>th</sup> Principal Meridian, County of Mesa, State of Colorado, also known by street and number as 4325 V 2/10 Road, DeBeque, CO 81506.

# Zoning/Parcel Map

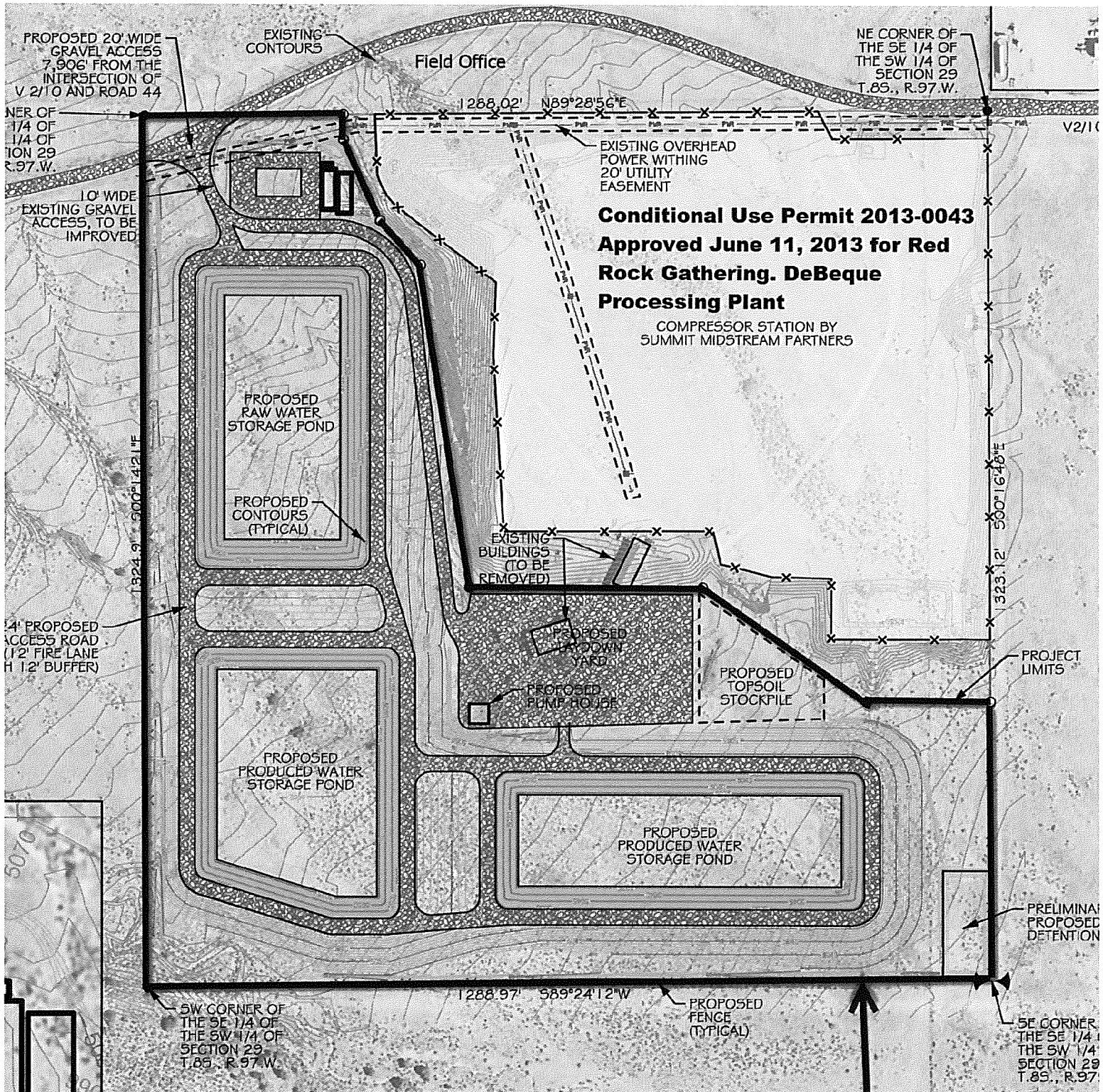


## Location Map

## Exhibit B



# Exhibit C



**Permit area for The Black Hills Debeque Station Water Reuse Facility**

RECORDER NOTE: POOR QUALITY DOCUMENT  
 PROVIDED FOR REPRODUCTION

# **APPENDIX B**

## **SEO VERIFICATION OF CONSTRUCTION LETTER**



**COLORADO**  
Division of Water Resources  
Department of Natural Resources

Dam Safety Branch

March 26, 2015

Mr. Shawn T. Higley, P.E.  
WWC Engineering  
1275 Maple Street, Suite F  
Helena, MT 59601  
[shigley@wwcengineering.com](mailto:shigley@wwcengineering.com)

VIA email

When replying, please refer to:  
**DEBEQUE POND #1 dam, DAMID 700110**  
Water Division 5, Water District 70

**SUBJECT:** Verification of construction

Dear Mr. Higley,

As requested by Mr. Drew Pearson of your office, I have observed the completed construction of the DeBeque Pond #1 dam. I confirmed by field measurements that the dam was constructed as a non-jurisdictional water impoundment according to our Rules and Regulations for Dam Safety and Dam Construction.

Please do not hesitate to call if you have any questions.

Sincerely,

Garrett Jackson, P.E.  
Design Review Engineer

ec: Bill McCormick, Dam Safety Branch Chief  
Alan Martellaro, Division Engineer  
Erin Gleason, Dam Safety Engineer  
Alex Fischer, Colorado Oil and Gas Conservation Commission [alex.fischer@state.co.us](mailto:alex.fischer@state.co.us)

