



## **RECLAMATION PLAN**

**Bohrer 19H Pad  
T3N, R68W, Section 19  
Weld County, Colorado**

Apex Project No. 125-001

Prepared for:



**CRESTONE PEAK**  
RESOURCES

**370 17th St, Denver, Suite 2170  
Denver, CO 80202**

**October 2016**

## Overview and Background

The Crestone Peak Resources (Crestone) Bohrer 19H well pad and facility is located in the southwest ¼ of the northwest ¼, Section 19, Township 3N, Range 68W, in Weld County, Colorado (COGCC ID # 435070). The reclamation area includes ground immediately adjacent to (surrounding) the access road and pad. The perimeter of the reclamation area encompasses approximately 16.1 acres. The pad area within this perimeter encompasses approximately 3.9 acres, thus the actual area to be reclaimed is approximately 12.2 acres (Figure 1). *Note: On-site assessment and instruction at time of reclamation activities may affect the acreages in Figure 1.*

In 2015, reclamation was conducted at the site, presumably under the auspices of Colorado Oil and Gas Conservation Commission Series 1000 Reclamation Regulations, including 1003.a-c and 1003.e(2). In 2016, the property owner expressed a desire to reclaim the area toward a smooth brome (*Bromus inermis*) monoculture. Crestone contracted Apex Companies, LLC (Apex) to inspect the site and provide a reclamation plan to achieve the landowner's request and reclamation goals.

Visual inspection of the site on 10/14/2016 revealed significant variation in the success of vegetative reclamation across the site resulting from the 2015 effort, with partial establishment of native and introduced pasture grasses in some areas, and only invasive/non-native species or relict wheat (*Triticum* spp.) in others (Photos 1-3, 5-7). Visual inspection of the soil and seedbed, together with hand-excavation across the site to 16-18" confirm that the seedbed was sufficiently prepared in 2015; therefore, seedbed preparation in the form of rippling, disking, or tilling is not prescribed for any of the Reclamation Areas in the reclamation plan.

Due to the variations in current vegetation across the site, as well as one non-vegetated area with added manure/compost, this reclamation plan recognizes 3 distinct areas to be reclaimed at the site, and prescribes separate treatments for each area.

## Summary of Concerns and Reclamation Prescriptions

### **Reclamation Area 1**

Area 1 shows very little sign of effective or successful vegetative reclamation. Kochia (*Kochia scoparia* L.) and Russian thistle (*Salsola tragus* L.) dominate Area 1, with relict rows of wheat, interspersed with Canada thistle (*Cirsium arvense*), bindweed (*Convolvulus arvensis*), and common mallow (*Malva neglecta*) (Photos 1, 2). Only small patches of western wheatgrass (*Pascopyrum smithii*) and blue grama (*Bouteloua gracilis*) are evident from the previous reclamation. Very little vegetation in Area 1 is in active photosynthesis currently (seasonally dormant). For this reason, chemical suppression of the invasive species would be ineffective until the next growing season.

Area 1 should be drill-seeded to ¼' to ½' with (20-25 lbs. PLS/acre) in November to minimize the time between seeding and heavy frost and winter moisture, both of which will aid in securing the new seed. Concurrent with drill seeding, apply 50 lbs/acre of 18-46-0 (N+P205+K20) fertilizer, as bromes (*Bromus* spp.) will more aggressively compete with the small patches of native grasses at higher nitrogen levels.

In May - June of 2017, monitor the area for weed growth. If there are signs of kochia regrowth (there will be), mow entire area to 4-6" to provide an early competitive advantage to the smooth

brome. Additional mowing in July - August to 6-8" will further suppress kochia and Russian thistle, and aid in prohibiting late-season flowering, which will also favor smooth brome establishment in 2018.

## **Reclamation Area 2**

Area 2 has recently been covered with approximately 4-5" of manure (Photo 4), which is suppressing current growth, and will likely suppress effective establishment of smooth brome unless spread, and thinned to a maximum depth of 2". Excess manure in Area 2 can be applied over areas 1 or 3, below, so long as it does not exceed 2" in depth.

In November, after thinning the manure layer, and in areas where excess manure was applied, drill seed with 20-25 lbs./acre PLS to a depth of ¼" to ½" *below the manure layer*. No additional soil amendment is necessary in Area 2.

Mowing in July - August to 6-8", as needed, will suppress kochia and Russian thistle, and aid in prohibiting late-season flowering, which will also favor smooth brome establishment in 2018.

## **Reclamation Area 3**

Area 3 shows the most significant reclamation vegetation growth of the 3 areas (Photos 5-6) with the establishment of. Blue grama, western wheatgrass, crested wheatgrass (*Agropyron cristatum*), and fescue (*Festuca* spp.). However, large portions of Area 3 also have significant encroachment of kochia, and Russian thistle, which are dominating available water uptake and rapidly decreasing the reclamation grasses toward the western portion (Photo 7).

Because much of the grass in Area 3 is still green and in active photosynthesis, application of glyphosate ("Roundup") is recommended as soon as possible (October), before the grasses become dormant. Once dormant, the application of herbicide would not be physiologically effective until the following (warm-season) growing season, and the establishment of smooth brome may take significantly longer.

In November, drill seed with 20-25 lbs./acre PLS to a depth of ¼" to ½", without removing remaining dead vegetation. Concurrent with drill seeding, apply 50 lbs/acre of 18-46-0 (N+P205+K20) fertilizer.

In May - June of 2017, monitor the area for weed growth. If there are signs of kochia regrowth, especially on the west end of Area 3 (there will be), mow entire area to 4-6" to provide an early competitive advantage to the smooth brome. Additional mowing in July-August to 6" will further suppress kochia and Russian thistle, and aid in prohibiting late-season flowering, which will also favor smooth brome establishment in 2018.

### Proposed Reclamation Tasks – Cost Estimates

Apex proposes the following tasks for vegetative reclamation at the Bohrer 19H site.

Item #	Item Description	Qty	Unit	Price
1	APPLY GLYSOPHATE – AREA 3 ONLY	270,072	Sq. ft.	\$4,862
2	DRILL SEED AND FERTILIZE – AREAS 1-3* (FERTILIZE IN 1, 3 ONLY.)	12.2	ACRE	\$3,580
2	SPRING MOWING AS NEEDED – AREAS 1, 3	10.3	ACRE	\$431
3	SUMMER MOWING AS NEEDED – AREAS 1-3	12.2	ACRE	\$402
<b>TOTAL (BASE BID)**</b>				<b>\$9,275</b>


\*Based on 25 lbs. PLS/acre

\*\*Cost estimates are provided based on known providers to Apex Companies at the time this reclamation plan was prepared, and are based upon the specific prescription for each of the Bohrer 19H reclamation areas described and mapped herein. Costs may vary with time and provider(s).



## Bohrer 19H-E368 Reclamation Areas

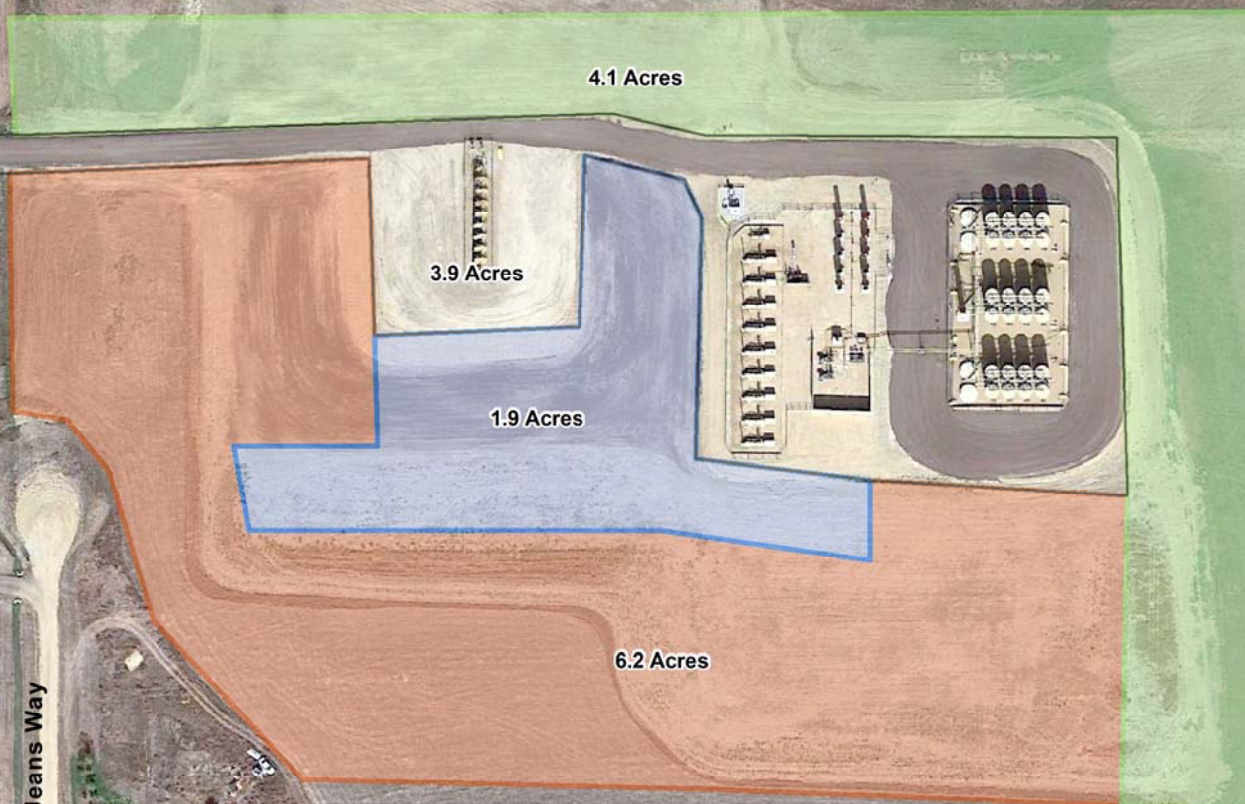
### Legend

 Stabilized Surface  
(not to be reclaimed)

 Reclamation Area 1

 Reclamation Area 2

 Reclamation Area 3



**Figure 1.**

### Site Characteristics

Legal Location: NW Qtr, Sec 19, T3N R68W  
 County: Weld  
 Land Use: Agriculture  
 Pre-Construction Vegetation Coverage: NA  
 Pre-Construction Vegetation Cover: Cropland  
 Topography: 3-5% Slopes  
 Runoff Risk: Low  
 Total Disturbed Area: ~16.07 Acres  
 Soil Type: Heldt silty-clay  
 Receiving Waters: Unnamed Ditch  
 775-ft East-Southeast

REVISED	BY	COMMENT
10/17/2016	DSC	Map Updated





*Photo 1. Reclamation Area 1. From access road looking north.*



*Photo 2. Reclamation Area 1. North of access road looking west.*





*Photo 3. Reclamation Area 1. East side of pad looking north.*



*Photo 4. Reclamation Area 2 manure application. Note depth in pit, approximately 4-6".*





*Photo 5. Reclamation Area 3. Active wheatgrass, fescue.*



*Photo 6. Reclamation Area 3. South-center of pad looking east.*





*Photo 7. Reclamation Area 3. West end, south of pad.*