

**Terra Energy Partners, LLC  
WMC 24-17  
Vegetation and Special Status Species of Plants Habitat Assessment  
&  
Wetlands Evaluation/Delineation**



*Cover photograph: View of potential SSS Plant habitat in the project area*

**Prepared for:  
Terra Energy Partners, LLC  
1058 County Road 215  
Parachute, CO**

**Prepared by:  
WestWater Engineering, Inc.  
2516 Foresight Circle #1  
Grand Junction, CO 81505  
Phone: (970) 241-7076**

**March 2021**

## **INTRODUCTION**

Terra Energy Partners, LLC (TEP) requested that WestWater Engineering (WestWater) conduct a wetlands and Special Status Species (SSS) of Plants habitat assessment as well as a wetland delineation/wetland verification for three National Wetlands Inventory (NWI) mapped wetland features near their proposed WMC 24-17 well pad, access road, and pipelines, which are located approximately six miles south of Rifle, Colorado above Flatiron Mesa. TEP has identified a pad location, approximately 1.5 miles of new pipeline infrastructure, and approximately 1 mile of new access road. The proposed well pad location and access road would be new construction, while the pipeline alignment would follow an existing pipeline right-of-way (ROW) along most of its length, with the exception of approximately 500 meters of ROW that would be constructed cross-country from the existing ROW to the well pad. The majority of the project would be constructed on Bureau of Land Management (BLM) surface managed by the Colorado River Valley Field Office (CRVFO). The proposed infrastructure would be located in Sections 7, 17, and 18 of Township 7 South, Range 93 West, 6<sup>th</sup> Principal Meridian (Figure 1).

The wetland evaluation and habitat assessment for Special Status Species (SSS) of Plants was conducted August 20, 2020. This is late in the growing season for SSS plants with potential to occur in the project area. Due to the late timing of the surveys, a habitat assessment was completed to help identify potential habitat areas for SSS plants and to evaluate potentially jurisdictional Waters of the U.S. within the project disturbance area for planning purposes. Figures 1 through 3 depict the findings of the habitat assessment for all proposed disturbance, as well as a “route uncertainty buffer,” where a more generous area was surveyed to account for a pipeline alignment that has not yet been finalized.

A second visit was made to the project area on October 16, 2020 to conduct a wetland delineation/verification for three NWI mapped wetland features occurring within the general project area.

## **PROJECT AREA DESCRIPTION**

### **Land Use Description**

The proposed well pad, gas and water pipelines, and the majority of the proposed access road and frac line route would be located on lands within Garfield County Zone District PL (Public Land). According to Article 3 of the Garfield County Land Use Code, Oil and Gas Drilling and Production is use by right or Exempt from Land Use Regulation within the Public Land Zone District (Table 3-403). The portion of the proposed access road and frac line route located on private land, and the frac pad (RU 44-7 Pad) would be located on lands within Garfield County Zone District R (Rural). According to Article 3 of the Garfield County Land Use Code, Hydraulic Fracturing and Remote Surface Facility are use by right or Exempt from Land Use Regulation at the site (Garfield County Land Use Development Code 2013). According to Article 9 of the Garfield County Land Use Code, the proposed frac lines do not meet the Applicability standards listed in Section 9-101 and therefore Garfield County approval of the proposed activity is not required.

### **Terrain**

Access to the proposed project is available via Garfield County Road 317 and private lease roads southwest of Rifle. Terrain surrounding the proposed project includes the hilly slopes above the relatively flat top of Flatiron Mesa. The project is located at an elevation range of approximately 8,000 feet to 8,800 feet.

### **Soils**

Soils in the survey area are described in Table 1 (Natural Resources Conservation Service [NRCS] 2020). None of the soils in the project area are classified as hydric, nor are they classified as prime farmland.

**Table 1. Soils found in the survey area.**

Map Unit	Soil Series	Additional Information
12	Bucklon-Inchau complex, 25 to 50 percent slopes	Mountain slopes; Non-saline colluvium over residuum weathered from sandstone and shale.
17	Cochetopa loam, 9 to 50 percent slopes	Mountain slopes; Non-saline colluvium derived from volcanic and sedimentary rock. Not prime farmland.
45	Morval-Tridell complex, 6 to 25 percent slopes	Mesas, alluvial fans; non-to-slightly saline reworked alluvium derived from sandstone and/or reworked alluvium derived from basalt. Not prime farmland.
71	Villa Grove-Zoltay loams, 15 to 30 percent slopes	Alluvial fans, mountainsides; very slightly-to-moderately saline. Parent material is mixed alluvium. Not prime farmland.

### **Vegetation**

Vegetation communities in the survey area are comprised of mixed mountain shrublands, aspen woodlands, and reclaimed areas. Existing disturbances in the area include several reclaimed pipeline rights-of-way (ROW) and producing well pads.

Vegetation throughout the project area varies and is dependent on multiple factors, including elevation, aspect, soils, rainfall, and hydrology. The three major vegetation types classified within the greater survey area are described below. A comprehensive list of plant species observed in the project area is included in Table 2.

**Mixed Mountain Shrublands:** The majority of the project would occur in a mixed mountain shrub community comprised mainly of Gambel oak (*Quercus gambelii*), serviceberry (*Amelanchier utahensis*), snowberry (*Symphoricarpos oreophilus*), mountain mahogany (*Cercocarpus ledifolius*), and sagebrush (*Artemisia tridentata*). Portions of the mixed mountain shrublands are composed primarily of mountain snowberry. The understory is composed of native grasses and forbs.

**Aspen Woodlands:** Higher elevation portions of the proposed water and frac line would run through a small aspen stand that has an understory of chokecherry (*Prunus virginiana*), mountain snowberry, and Rocky Mountain maple (*Acer glabrum*), along with native grasses and forbs.

**Reclaimed areas:** Where previous disturbances associated with oil and gas development have been reseeded, a mix of seeded species as well as non-native invasive species make up the vegetation community. Though most disturbances were reseeded with native grasses, most also include some degree of colonization by noxious weeds or non-desirable weedy species.

**Table 2. Common plant species occurring in the project area.**

Common Name	Scientific Name	Abundance*	Habitat Type
<b>Grasses</b>			
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	xx	Mountain shrublands, reclaimed areas
Kentucky bluegrass	<i>Poa pratensis</i>	xx	Mountain shrublands, aspen woodlands
Muttongrass	<i>Poa fendleriana</i>	xx	Mountain shrublands

**Table 2. Common plant species occurring in the project area.**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Abundance*</b>	<b>Habitat Type</b>
Needle and thread	<i>Hesperostipa comata</i>	xx	Mountain shrublands
Prairie Junegrass	<i>Koeleria macrantha</i>	x	Mountain shrublands
Slender wheatgrass	<i>Elymus trachycaulus</i>	xx	Mountain shrublands
Smooth brome	<i>Bromus inermis</i>	xx	Disturbed areas, aspen woodlands
Squirreltail	<i>Elymus elymoides</i>	xx	Mountain shrublands
Western wheatgrass	<i>Pascopyrum smithii</i>	x	Mountain shrublands, reclaimed areas
<b>Forbs</b>			
American vetch	<i>Vicia americana</i>	xx	Mountain shrublands, aspen woodlands
Arizona mule-ears	<i>Wyethia arizonica</i>	xxx	Mountain shrublands
Arrowleaf balsamroot	<i>Balsamorhiza sagitta</i>	xx	Mountain shrublands
Aspen fleabane	<i>Erigeron speciosus</i>	xx	Mountain shrublands
Bastard toadflax	<i>Comandra umbellata</i>	xx	Mountain shrublands
Bigleaf lupine	<i>Lupinus polyphyllus</i>	x	Mountain shrublands
Blue-eyed Mary	<i>Collinsia parviflora</i>	xx	Mountain shrublands
Brittle pricklypear	<i>Opuntia fragilis</i>	xx	Mountain shrublands
Common dandelion	<i>Taraxacum officinale</i>	x	Mountain shrublands
Common yarrow	<i>Achillea millefolium</i>	xxx	Mountain shrublands
Drummond's rockcress	<i>Arabis drummondii</i>	xx	Mountain shrublands
Dusty penstemon	<i>Penstemon comarrhenus</i>	xx	Mountain shrublands
Fendler's sandwort	<i>Arenaria fendleri</i>	xx	Mountain shrublands
Lesser rushy milkvetch	<i>Astragalus convallarius</i>	xx	Mountain shrublands
Lewis flax	<i>Linum lewisii</i>	xx	Mountain shrublands
Littleflower alumroot	<i>Heuchera parviflora</i>	x	Mountain shrublands
Lobeleaf groundsel	<i>Packera multilobata</i>	xx	Mountain shrublands
Longleaf phlox	<i>Phlox longifolia</i>	xx	Mountain shrublands
Louisiana sagewort	<i>Artemisia ludoviciana</i>	x	Mountain shrublands
Mat penstemon	<i>Penstemon caespitosus</i>	x	Mountain shrublands
Mountain deathcamas	<i>Zigadenus elegans</i>	xx	Mountain shrublands
Nineleaf biscuitroot	<i>Lomatium triternatum</i>	x	Mountain shrublands
Pale agoseris	<i>Agoseris glauca</i>	xx	Mountain shrublands
Pearly pussytoes	<i>Antennaria anaphaloides</i>	x	Mountain shrublands
Porter's licorice-root	<i>Ligusticum porteri</i>	xx	Aspen woodlands

**Table 2. Common plant species occurring in the project area.**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Abundance*</b>	<b>Habitat Type</b>
Rocky Mountain Iris	<i>Iris missouriensis</i>	xxx	Mountain shrublands
Rosy pussytoes	<i>Antennaria rosea</i>	xx	Mountain shrublands
Scarlet gilia	<i>Ipomopsis aggregata</i>	xx	Mountain shrublands
Silvery lupine	<i>Lupinus argenteus</i>	xx	Mountain shrublands, aspen woodlands
Slender cinquefoil	<i>Potentilla gracilis</i>	xx	Mountain shrublands
Sulphur flower buckwheat	<i>Eriogonum umbellatum</i>	xx	Mountain shrublands
Sweetcicely	<i>Osmorhiza berteroi</i>	xx	Aspen woodlands
Tapertip onion	<i>Allium acuminatum</i>	x	Mountain shrublands
Twolobe larkspur	<i>Delphinium nuttallianum</i>	x	Mountain shrublands
Twolobe speedwell	<i>Veronica biloba</i>	xx	Mountain shrublands
Wooly cinquefoil	<i>Potentilla hippiana</i>	xx	Mountain shrublands
Wyoming Indian paintbrush	<i>Castilleja linariifolia</i>	xx	Mountain shrublands
<b>Shrubs/Trees</b>			
Antelope bitterbrush	<i>Purshia tridentata</i>	xx	Mountain shrublands
Black sagebrush	<i>Artemisia nova</i>	x	Mountain shrublands
Chokecherry	<i>Prunus virginiana</i>	xx	Aspen woodlands
Gambel oak	<i>Quercus gambelii</i>	xxx	Mountain shrublands
Longflower rabbitbrush	<i>Chrysothamnus depressus</i>	xx	Mountain shrublands
Mountain mahogany	<i>Cercocarpus montanus</i>	xxx	Mountain shrublands
Mountain snowberry	<i>Symphoricarpos oreophilus</i>	xxx	Mountain shrublands, Aspen woodlands
Quaking aspen	<i>Populus tremuloides</i>	xxx	Aspen woodlands
Rocky Mountain maple	<i>Acer glabrum</i>	xx	Aspen woodlands
Saskatoon serviceberry	<i>Amelanchier alnifolia</i>	xxx	Mountain shrublands, Aspen woodlands
Woods' Rose	<i>Rosa woodsii</i>	xx	Mountain shrublands, Aspen woodlands
Yellow rabbitbrush	<i>Chrysothamnus viscidiflorus</i>	xx	Mountain shrublands
<p>*Abundance:  xxx= High frequency; with uniform distribution across project area.  xx= Moderate frequency; occurrence scattered throughout project area.  x= Infrequent; only a small number of individuals noted within project area.</p>			

### **Vegetation Assessment and Reference Area**

A vegetation assessment will be conducted during the spring of 2021, prior to the initiation of any construction activities. Quantitative data will be collected following the methodology described in *The Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems* (Herrick 2015) at a suitable reference location (Figure 2). The line-point intercept method will be utilized to collect percent foliar and basal cover data for the reference location. The start and end point for the transect will be recorded utilizing a GPS unit. The transect location will be representative of the vegetation community type in which TEP's well pad location is situated. Five color photographs of the Reference Area, including 4 taken from each cardinal direction, and 1 taken from above the Reference Area. Each photograph will be identified by date taken, Oil and Gas Location name, and direction of view. The photographs will be taken during the peak growing season and will clearly depict vegetation cover and diversity.

### **SPECIAL STATUS PLANTS HABITAT ASSESSMENT**

#### **Methods**

Due to drought conditions in the area persisting throughout the spring and summer of 2020, growing conditions for the SSS plants with potential to occur in the area were poor. As such, SSS plant surveys conducted in August of 2020 would likely not have produced an accurate assessment of occupied habitat within the proposed project's footprint. Therefore, an SSS habitat assessment was conducted to identify areas that, in a growing season with more typical precipitation patterns, have the potential to be occupied by the SSS plants that could occur in the survey area. Photographs were taken of the habitat, terrain, and biological features found during the survey. Biologists assessed all areas for potential habitat within 30 meters of all proposed new disturbance. Species identification was aided using published field guides (Ackerfield 2015; Spackman et al. 1997; Weber & Wittmann 2012). The SSS plants that could potentially be found within the survey area are included in Table 3, below.

**Table 3. SSS Plants with potential to occur in survey area.**

<b>Common Name</b>	<b><i>Scientific Name</i></b>	<b>Species Code</b>	<b>Status</b>
Harrington's beardtongue	<i>Penstemon harringtonii</i>	PEHA	BLM Sensitive

#### **Observations**

Harrington's beardtongue – occurs in open sagebrush or, less commonly, pinyon-juniper habitats. Preferred soils are rocky loams and rocky clay-loams derived from coarse calcareous parent materials from elevations of 6,800 feet to 9,200 feet.

Three potential habitat areas were identified in the areas of proposed new disturbance. Along the proposed access road alignment, a small open slope within the otherwise dense mountain snowberry and mountain shrubland was identified and is depicted on Figure 3.

Two larger areas of potential habitat were identified in the area of the proposed well pad. These areas are rocky openings in the mountain shrublands that contain grasses and widely scattered small shrubs. In one of the two areas, a single occurrence of a plant belonging to the genus *Penstemon* was observed, though while it is suspected to be *P. harringtonii*, its condition did not allow for conclusive identification. The suitable habitat areas and penstemon plant location are depicted on Figure 3.

## **Recommendations**

It is recommended that surveys by qualified biologists are conducted during the Harrington's beardtongue flowering season (June) to confirm occupancy and population distribution. If Harrington's penstemon plants are found, the BLM may choose to apply mitigation measures such as dust abatement, requiring that project construction occur outside the flowering period, and stockpiling topsoil separately in areas occupied by Harrington's penstemon.

## **WETLANDS AND WATERS OF THE U.S. ASSESSMENT**

WestWater biologists conducted a wetland evaluation to determine the presence/absence of potentially jurisdictional wetlands within the project area (Figure 4). A follow-up wetland assessment was completed to determine the jurisdiction of wetlands identified on the NWI map database. The NWI is a database of potential wetlands that have not necessarily been field-verified. Once field verification has occurred and supporting data has been collected which either confirms the presence or absence of the wetland, the project can move forward with appropriate ACOE permitting. If no wetlands are present, no permitting with the ACOE will be required.

Waters of the U.S. (WoUS) include wetlands and drainages under the jurisdiction of the U.S. Army Corps of Engineers (ACOE). Perennial, intermittent, and ephemeral streams and drainages, as indicated on U.S. Geological Survey mapping, are considered WoUS if they exhibit evidence of flow (i.e. ordinary high water mark (OHWM) and are hydrologically connected to a perennial stream. In addition to hydrology, a jurisdictional wetland will also demonstrate the unique soil and vegetation characteristics that result from inundation or saturation.

## **METHODS**

Wetland characteristics were assessed on the basis of the vegetation, soils, and hydrologic characteristics present at each site in accordance with ACOE standards included in the "Corps of Engineers Wetland Delineation Manual, January 1987" (ACOE 1987) and Regional Supplement to the ACOE Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0, May 2010). The wetland boundary delineation included identification of plant species, species composition, and soil structure. Wetland indicator status for plant species was verified using the National Wetland Plant List (ACOE 2016) to determine areas dominated by hydrophytic vegetation. Soil borings (up to 24 inches deep) were taken with an auger for observation of wetland soil characteristics and hydrology indicators to aid in the delineation of wetland boundaries. Wetland boundary points were marked in the field and located using a Spectra SP-20 sub-meter accuracy GPS unit.

Due to the ongoing drought conditions in the area, special consideration was given to vegetation and soils where potential wetlands could be abnormally dry.

## **Observations**

Based on WestWater's evaluation of the project area, no jurisdictional wetlands were found, nor were there any perennial streams or springs present in the project area. Several points along the proposed access road and pipeline ROW exhibited hydrophytic vegetation, including Rocky Mountain iris (*Iris missouriensis*), various species of sedges (*Carex* spp.), and redtop (*Agrostis gigantea*); however, there were no hydric soils or evidence of prolonged saturated soils present. It is believed these areas are only saturated during spring runoff for a short period of time. These potential wetland areas are situated topographically to collect runoff, therefore supporting vegetation adapted to periods of moist conditions. No physical surface connectivity to drainages in the area was linked to these points. The soil sample locations are displayed as DP-1 through DP-3 on Figure 4.

Based on WestWater's evaluation of the NWI-mapped wetland features (as well as the areas WestWater believes to be the intended locations of the NWI-mapped wetland features, which are just east of the

mapped locations), jurisdictional wetlands are not present where shown by NWI mapping (Figure 5). The only hydrophytic vegetation observed was Rocky Mountain iris (*Iris missouriensis*). Western snowberry, woods' rose, and mule's ears made up the primary vegetation community. Soil borings were limited to 15 inches, 24 inches, and 22 inches at PEM1B, PABF, and PABF3, respectively, due to rock refusal. No hydric soils or evidence of prolonged saturated soils was present. Topsoil was generally dry, black, silty-sand loam alpine soil with high organic matter. Subsoils were very dark brown silty clay or silty fine/very fine sand with high clay content. No redox features were observed. The topography at PEM1B and PABF3 would not support the retention of snowmelt or surface water to lead to saturation or inundation. It is believed these areas are only saturated during spring runoff for a short period of time. No physical surface connectivity to drainages in the area was linked to these points. The soil sample locations are displayed as NWI DP-1 through NWI DP-6 on Figure 5.

In order to be considered a jurisdictional wetland, the site must meet the following three parameters: hydric soils, hydric vegetation, and hydraulic connectivity to a Water of the U.S. Due to the lack of hydric soils and connectivity, these wet depression areas and these NWI-mapped wetland features were determined by WestWater biologists to not meet the requirements for jurisdictional wetland status.

One ephemeral drainage was observed in the field and is described as WOUS-1 on Figure 4. This drainage was found to be an ephemeral drainage with no ordinary high-water mark, no hydrophytic vegetation, and no hydric soils, and is therefore not a jurisdictional Water of the U.S.

### **Recommendations**

Best Management Practices (BMPs), including adequate barriers and filtration methods, should be used to prevent soil erosion and sedimentation of streams and riparian areas. The disturbance area should be minimized to the extent possible to reduce impacts to downstream waterways.

### **REFERENCES**

- Ackerfield, Jennifer. 2015. Flora of Colorado, Colorado State University Herbarium. Botanical Research Institute of Texas Press. Fort Worth, Texas.
- ACOE. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers Waterways Experiment Station. Vicksburg, MS.
- ACOE. 2010. Regional Supplement to the ACOE Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0. U.S. Army Corps of Engineers Environmental Laboratory. Vicksburg, MS.
- COGCC. 2021. Colorado Oil and Gas Conservation Commission. GIS Online. Available online: [https://cogccmap.state.co.us/cogcc\\_gis\\_online/](https://cogccmap.state.co.us/cogcc_gis_online/)
- Garfield County Land Use Development Code. 2013. Article 3. Available online: <https://www.garfield-county.com/community-development/filesgcco/sites/12/Article-3.pdf>
- Herrick, J.E., J.W. Van Zee, S.E. McCord, E.M. Courtright, J.W. Karl, and L.M. Burkett. 2015. Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Second Edition, Volume 1: Core Methods. USDA-ARS Jornada Experimental Range, Las Cruces, NM.
- NRCS. 2020 Natural Resources Conservation Service Web Soil Survey. Available online: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.html>
- Spackman, S., B. Jennings, J. Coles, C. Dawson, M. Minton, A. Kratz, and C. Spurrier. 1997. Colorado Rare Plant Field Guide. Prepared for the U.S. Bureau of Land Management, the U.S. Forest Service and the U.S. Fish and Wildlife Service by the Colorado Natural Heritage Program.



Weber, W. A. and R.C. Wittmann. 2012. Colorado Flora – Western Slope; a field guide to the vascular plants. 4th Ed. University Press of Colorado. Boulder.



















