

Federal RG 11-13-298 Pad

Sensitive Area Determination Checklist



TEP Rocky Mountain, LLC	
Person (s) Conducting Field Inspection	
Name: Dean Goebel	Date: August 17, 2021
Comment: Desktop analysis	
Site Information	
Location Name: RG 11-13-298 Pad	COGCC Location ID: New Location
Type of Facility: Well Pad	
Environmental Conditions	
Temperature (°F): NA	
Comments	

Sensitive Area: A sensitive area is an area vulnerable to potential significant adverse groundwater impacts, due to factors such as the presence of shallow groundwater or pathways for communication with deeper groundwater; proximity to surface water, including lakes, rivers, perennial or intermittent streams, creeks, irrigation canals, and wetlands. Additionally, areas classified for domestic use by the Water Quality Control Commission, local (water supply) wellhead protection areas, areas within 1/8 mile of a domestic water well, areas within 1/4 mile of a public water supply well, ground water basins designated by the Colorado Ground Water Commission, and surface water supply areas are sensitive areas.

Has the proposed, new, or existing location been designated as a sensitive area?

☐ Yes ☒ No

SURFACE WATER

- Are there any intermittent surface water features or Surface Water Supply Areas (SWSAs) adjacent to or within 1/4 mile of the proposed or existing facility?

☐ Yes ☒ No

If yes, list type of surface water feature(s), i.e. rivers, creeks, streams, seeps, springs, wetlands:

If yes, describe location relative to facility:

- Could a potential release from the facility reach intermittent 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.

Is the potential to impact surface water from a facility release high or low?

☐ High ☒ Low

GROUNDWATER

- 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):.

2. Is the site of the proposed facility underlain by an unconfined aquifer or recharge zone?
☐ Yes ☒ No
3. Is the hydraulic conductivity of the underlying soil or geologic material $\leq 1.0 \times 10^{-7}$ cm/sec?
☒ Yes ☒ No
4. Is the proposed facility located within 1/8 mile of a domestic water well or 1/4 mile of a public water supply well which would use the same aquifer?
☐ Yes ☒ No
5. Is the proposed facility located within a 100-year floodplain?
☐ Yes (Sensitive) ☒ 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:

Potential surface water impacts are deemed low for the sensitive area determination for this proposed expanded well pad. The two identified intermittent streams are greater than a 1/4 mile of the proposed facility. Offsite migration of a potential release to the intermittent streams located 1,679 feet southwest of proposed site and 1,497 feet to the east. Flow along these pathways would be most likely sheet flow which has limited potential travel distance than concentrated flow contained in a defined drainage. Both drainages have designated Water of the United States (WOUS) defined as a riverine aquatic resources with a intermittent flow regimes tied to a seasonally flooded stream beds. The drainages flow to the intermittent drainage in Ryan Gulch which discharges to perennial Piceance Creek. Site grading will provide control measures minimizing potential fluid migration off site. Best Management Practices (BMPs) slated during site construction will eliminate preferential pathways for offsite depression flow using earthen berms and diversion ditches. All newly constructed BMPs will be closely monitored and maintained to ensure complete on-site containment of a potential release.

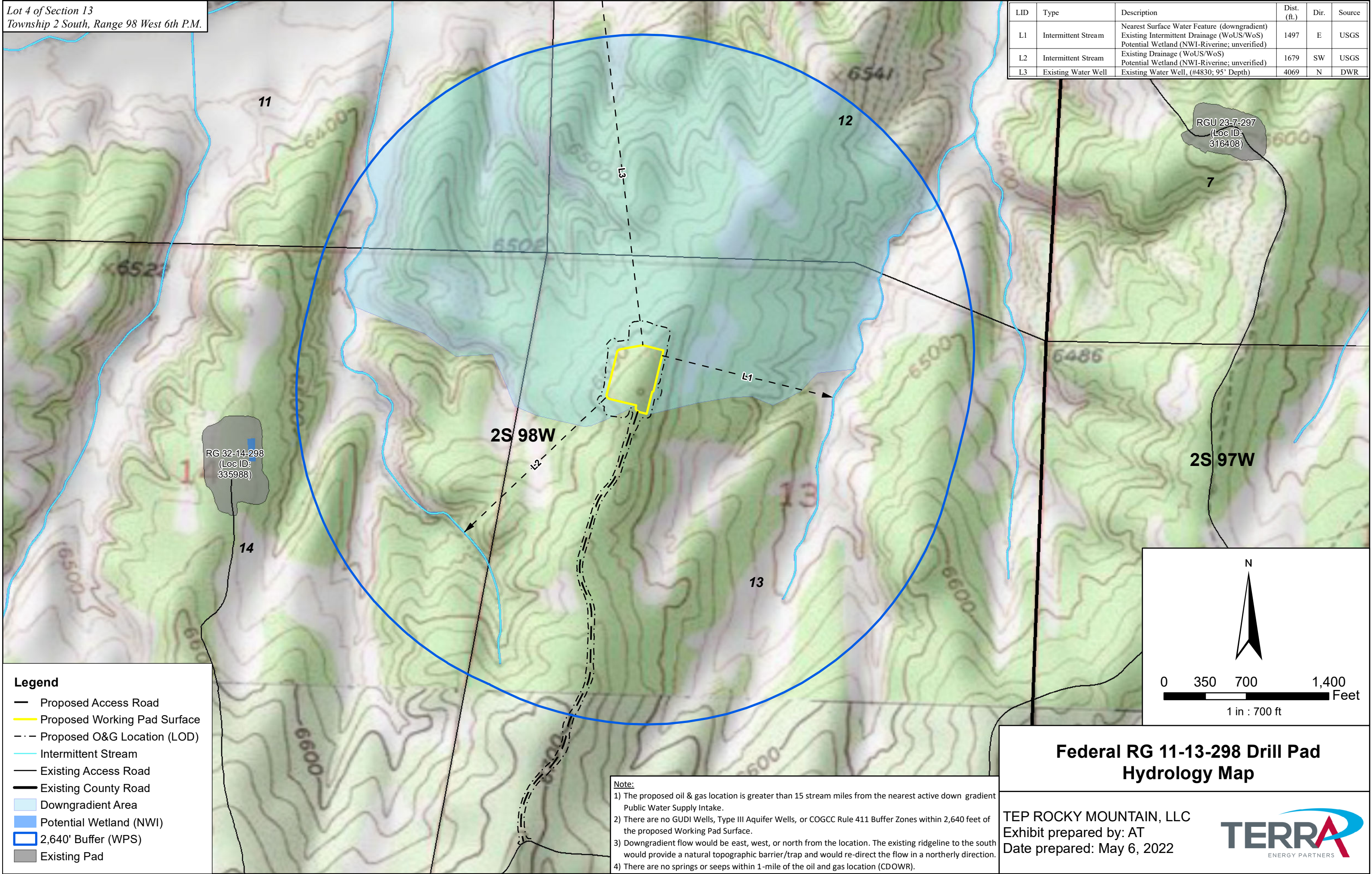
State Engineers Office and USGS records were reviewed indicating only one permitted water well (permit no. 4830) drilled in 1960 in an alluvial aquifer adjacent to Ryan Gulch and located 4,069 feet north of the proposed well pad. The well was drilled to 95 feet and screened from 80 to 95 feet with a well yield of 10 gallons per minute and static water level of 50 feet permitted as a livestock water well. Based on the static water level of this well and subsurface geology in vicinity of proposed well pad, shallow groundwater does not occur at the site. Visual observations of the site based on site photos taken during the biological survey and aerial photography indicates upland vegetation including scrub pinyon and juniper vegetation and sagebrush shrublands. Depth to shallow groundwater residing in the local flow system is greater than 80 inches (6.67 feet) based on NRCS soil properties and qualities for Rentsac channery loam and Redcreek-Rentsac complex mapped soil units occurring at the site. Typical soil profiles for these mapped soils indicate bedrock subcrops 5 to 22 inches below ground surface. The saturated hydraulic conductivity (Ksat) for the mapped soils is less than 1.0×10^{-7} cm/sec for the Rentsac channery loam but greater than for the Redcreek-Rentsac complex soils.

Dominant upland vegetation indicates pervasive dry antecedent soil conditions conducive with thin soil horizons overlying shallow bedrock not in hydraulic connection with the local groundwater flow system. Evidence of springs or seeps in project vicinity were not detected during site reconnaissance and vegetation assessment conducted for the Biological Survey Report. Hydrogeological indicators do not support the occurrence of shallow groundwater at the site, depth to groundwater is probably greater than 100 feet in the underlying bedrock. Potential impact to groundwater resources at the site is deemed to be low based on the site hydrogeology.

Based on the information collected during the desktop review, the potential for impacts to surface water, and groundwater would be deemed to be low. Therefore, the proposed expanded well pad should be designated as being in a non-sensitive area.

Lot 4 of Section 13
Township 2 South, Range 98 West 6th P.M.

LID	Type	Description	Dist. (ft.)	Dir.	Source
L1	Intermittent Stream	Nearest Surface Water Feature (downgradient) Existing Intermittent Drainage (WoUS/WoS) Potential Wetland (NWI-Riverine; unverified)	1497	E	USGS
L2	Intermittent Stream	Existing Drainage (WoUS/WoS) Potential Wetland (NWI-Riverine; unverified)	1679	SW	USGS
L3	Existing Water Well	Existing Water Well, (#4830; 95' Depth)	4069	N	DWR



Legend

Proposed Access Road

Proposed Working Pad Surface

Proposed O&G Location (LOD)

Intermittent Stream

Existing Access Road

Existing County Road

Downgradient Area

Potential Wetland (NWI)

2,640' Buffer (WPS)

Existing Pad

Note:

1) The proposed oil & gas location is greater than 15 stream miles from the nearest active down gradient Public Water Supply Intake.

2) There are no GUDI Wells, Type III Aquifer Wells, or COGCC Rule 411 Buffer Zones within 2,640 feet of the proposed Working Pad Surface.

3) Downgradient flow would be east, west, or north from the location. The existing ridgeline to the south would provide a natural topographic barrier/trap and would re-direct the flow in a northerly direction.

4) There are no springs or seeps within 1-mile of the oil and gas location (CDOWR).

Federal RG 11-13-298 Drill Pad
Hydrology Map

TEP ROCKY MOUNTAIN, LLC
Exhibit prepared by: AT
Date prepared: May 6, 2022

TERRA

ENERGY PARTNERS