

# Arco Deep 1-27 Drill Pad Sensitive Area Determination Checklist



TEP Rocky Mountain, LLC	
<b>Person (s) Conducting Field Inspection</b>	
Name: Dean Goebel	Date: September 8, 2022
Comment: Desktop analysis	
<b>Site Information</b>	
Location Name: Arco Deep 1-27 Drill Pad	COGCC Location ID: 322539
Type of Facility: Well Pad	
<b>Environmental Conditions</b>	
Temperature (°F): NA	
<b>Comments</b>	

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 surface water supply areas adjacent to or within ¼ mile of the proposed or existing facility?

Yes       No

If yes, describe location relative to facility:

- Are there any surface water features within 500 feet 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: intermittent drainages

If yes, describe location relative to facility: Unnamed intermittent drainages located: 230 feet south and 305 feet west of existing/proposed expanded drill pad.

- 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

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):.

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 the proposed expansion of an existing well pad. Hydrologic mapping has identified seven hydrologic features within the approximately 1/2-mile radius buffer of the well pad. Three of the six intermittent drainages within 1/4-mile of the site include unnamed drainages located 230 feet south, 305 feet west, and 739 feet east. The two nearest intermittent drainages bracket the outer flanks of the potential flow path oriented southeast of the well pad. Potential spill release from the pad does not have a defined pathway to these drainages located within 1/4 mile of the site due to potential fluid flow being diffused by vegetation, soil, and rocks. The remaining four hydrologic features are unnamed drainages and are located 1,399 feet north, 1,945

feet south, 2,239 feet north. These four unnamed drainages are located outside the potential flow path of the well pad and distant enough to not receive flow from a potential site release. Intermittent drainage ways discharge to the East Fork, a perennial stream, in the bottom of Bakers Gulch located approximately 0.9 to 1.3 miles south of the well pad and eventually to Conn Creek and the Colorado River. Site grading will provide control measures minimizing potential fluid migration off site. Best management practices (BMPs) slated during 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.

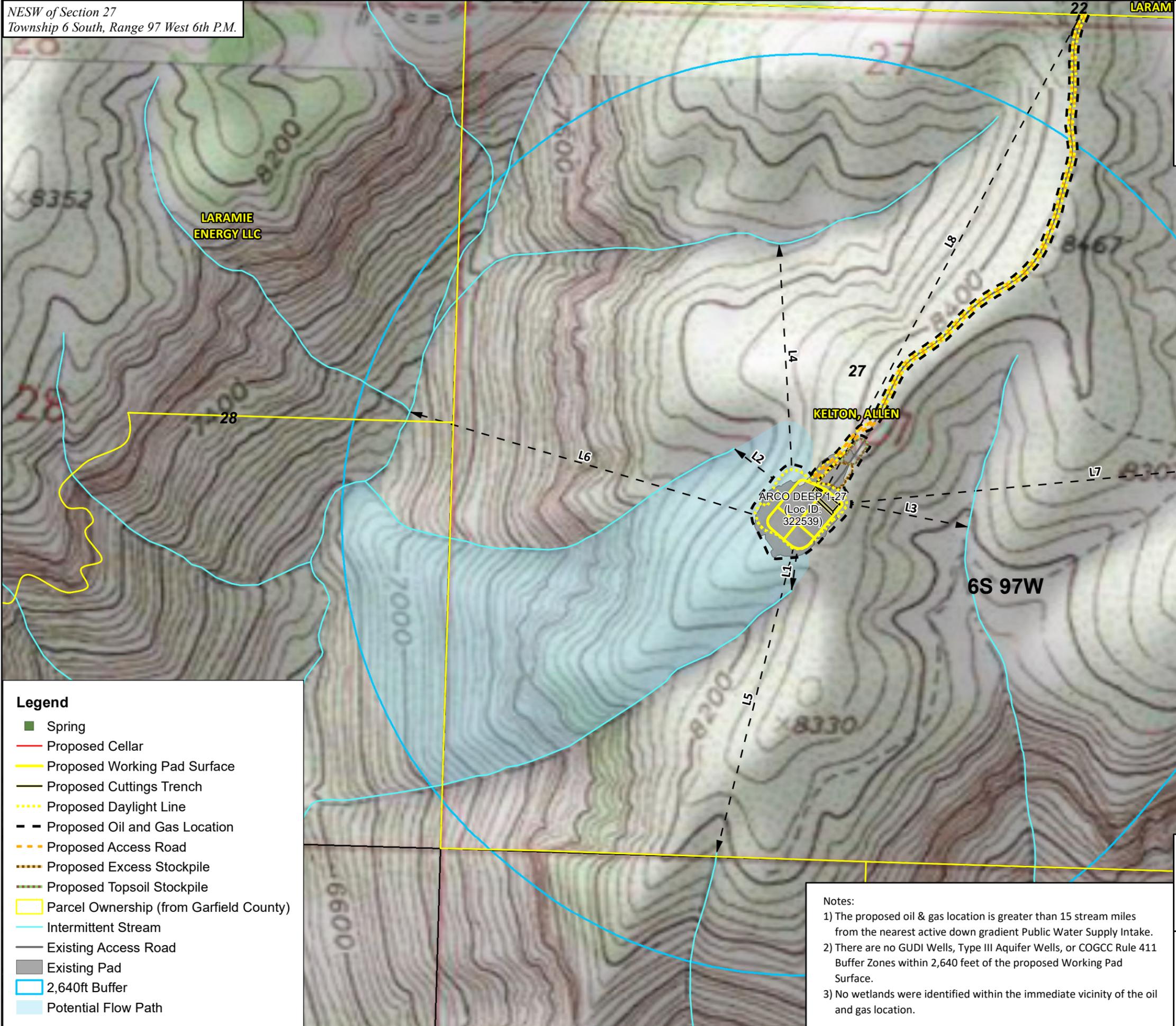
State Engineers Office and USGS records were reviewed indicating only one identified permitted stock well (Permit No. 233234) located 9,775 feet 28°NE of the drill pad. The hand-dug stock well is a developed, shallow spring approximately 2 feet deep plumbed to a cabin approximately 1,280 feet downgradient of the spring. The developed spring was backfilled with a 3-foot soil cap and covered with plastic sheeting for well head protection from potential surface contamination. Static depth to groundwater was not provided in the State well records search. Visual observations of the site gleaned from available aerial photography and the Biological Survey Report indicates mountain shrublands, sagebrush shrublands, and aspen woodlands. 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 Parachute-Rhone loams mapped soil unit occurring at the site. Typical soil profile for this mapped soil unit indicate soil profiles ranging approximately 25 to 59 inches (2-5 feet) comprised of loam overlying very channery loam. Saturated hydraulic conductivity (Ksat) for this soil is greater than  $1.0 \times 10^{-7}$  cm/sec.

Dominant upland vegetation indicates unsaturated soil conditions without hydric indicators of shallow groundwater conditions. There was no evidence of springs or seeps depicted on USGS mapping or encountered 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, as depth to groundwater is greater than 50 feet and possibly greater than 100 feet. The greater than 50 feet depth to groundwater was determined during well pad construction where the maximum well pad cut and completed pit was dug to 50 feet without encountering groundwater.

Based on the information collected during the desktop review, the potential for impacts to surface water, and groundwater are deemed to be low if properly mitigated with control measures implemented when expanding the well pad. The close proximity ( $\leq 1/4$  mile) to unnamed intermittent drainages results in this pad being designated as a sensitive area.

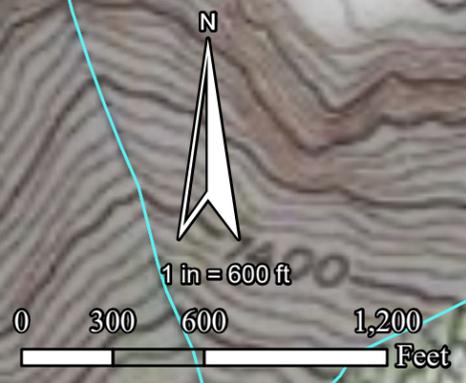
NESW of Section 27  
Township 6 South, Range 97 West 6th P.M.

LID	Description	Distance (ft.)	Direction
L1	Nearest Downgradient Surface Water Feature, Intermittent Drainage (USGS)	230	188° (S)
L2	Intermittent Drainage (USGS)	305	307° (NW)
L3	Intermittent Drainage (USGS)	739	100° (E)
L4	Intermittent Drainage (USGS)	1,399	356° (N)
L5	Intermittent Drainage (USGS)	1,945	197° (S)
L6	Intermittent Drainage (USGS)	2,239	286° (W)
L7	Nearest Spring (USGS)	3,048	84° (E)
L8	Nearest Permitted Domestic Stock Well (233234)	9,775	28° (NE)



**Legend**

- Spring
- Proposed Cellar
- Proposed Working Pad Surface
- Proposed Cuttings Trench
- ⋯ Proposed Daylight Line
- - Proposed Oil and Gas Location
- - Proposed Access Road
- - Proposed Excess Stockpile
- - Proposed Topsoil Stockpile
- Parcel Ownership (from Garfield County)
- Intermittent Stream
- Existing Access Road
- Existing Pad
- 2,640ft Buffer
- Potential Flow Path



Notes:

- 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) No wetlands were identified within the immediate vicinity of the oil and gas location.

**Arco Deep 1-27 Drill Pad  
Hydrology Map**

TEP ROCKY MOUNTAIN, LLC  
Exhibit prepared by: TB  
Date prepared: December 9, 2022

