

## Sensitive Area Determination Checklist

<b>WPX Energy Rocky Mountain, LLC (WPX)</b>		
<b>Person(s) Conducting Inspection</b>	<b>Field</b>	Finn Whiting
		08/06/2013
		Geologist
<b>Site Information</b>		
Location:	Riley Gulch Tank Pad	Time: 11:30
Type of Facility:	Production Fluids Storage	
<b>Environmental Conditions</b>	Sunny, dry ground conditions, slight breeze	
Temperature (°F)	88°	

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

Yes       No

### **SURFACE WATER**

1. Are there any surface water features or SWSAs adjacent to or within ¼ mile of the proposed/new or existing facility?

Yes       No

If yes, list type of surface water feature(s), i.e. rivers, creeks, streams, seeps, springs, wetlands: Parachute Creek, a USGS identified perennial stream; Riley Gulch, a USGS identified intermittent drainage; one (1) unnamed USGS identified intermittent drainage both of which are tributary to Parachute Creek.

If yes, describe location relative to facility: Parachute Creek is located 624 feet to the north northeast, Riley Gulch is located 67 feet to the east southeast, and the unmaed USGS identified intermittent drainage is located approximately 1,048 to the northwest of the proposed facility

2. Could a potential release from the facility reach 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. A potential release, if it were migrate off the facility, would tend to flow to the northeast and enter Riley Gulch.

3. 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 Area*)       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?  
 Moderate       Low

**Additional Comments:**

As stated in the surface water section of this sensitive area determination, there are three (3) surface water features within ¼ mile of the proposed facility; the closest being Riley Gulch which is located 67 feet to the east. The proposed facility will be constructed on a relatively flat lying area. This would allow a release to potentially migrate of any of the four sides. The greatest potential for impacts would be if a release were to migrate off the northern or eastern sides, as flow would be directly towards Riley gulch. The noted drainage to the northwest of the proposed facility would not be impacted by a potential release as it is separated from the facility by a ridgeline to the west. During facility construction, Best Management Practices (BMPs) should be installed in the form of an earthen perimeter berm along the graded edge. If not feasible to berm the entire facility, it is recommended that, at a minimum, the northern and eastern sides be bermed to contain a potential release on the facility and prevent it from entering Riley Gulch. All installed BMPs should be monitored and maintained to ensure site containment in the event of a potential release.

The State Engineers Office and USGS records were reviewed and they revealed one permitted monitoring well approximately 1,773 feet to the east of the proposed facility. The well is located in a similar geologic setting and is at a similar elevation to that of the proposed facility. The noted depth to groundwater is 31 feet. However, the hydric vegetative cover (including tamarisk) in the immediate vicinity of the proposed facility and the close proximity of Riley Gulch suggests groundwater may be less than 31 feet as noted in the above mentioned monitoring well.

Based on the information collected during the site investigation and desktop review, the greatest potential for impacts is to Riley Gulch, mainly due to its very close proximity to the proposed facility. By COGCC decision the close proximity of Riley Gulch and the fact Riley Gulch is tributary to Parachute creek would classify the facility as being in a sensitive area. However, the potential for impacts to surface water are diminished to some degree as the tanks will be placed in a steel lined containment structure designed to hold a greater volume of fluids than that of the tanks. In addition, if the recommended BMP's are installed along the northern and eastern sides, it will further lessen the potential for impacts to Riley Gulch. As noted above, the vegetative cover in the immediate vicinity of the proposed facility suggests the possibility of shallow groundwater as well. However the potential for impacts to groundwater are somewhat lower due to the fact a potential release, outside of the containment, would be relatively short in duration, would tend to spread out over a large area, and would only infiltrate into the underlying soil a short distance. The greater potential for impacts to groundwater would be a release that occurred over a longer period of time such as a leaking tank and a compromised liner. With the new liner technologies currently being implemented, the potential for a leaking liner would be greatly reduced. With the close proximity of Riley Gulch and the fact Riley Gulch is tributary to Parachute Creek, the potential for impacts to surface water would be deemed as high. The potential for impacts to groundwater would be deemed to be moderate based on the explanations

