

## Sensitive Area Determination Checklist

WPX Energy Rocky Mountain, LLC (WPX)		
<b>Person(s) Conducting Field Inspection</b>	Finn Whiting	10.23.13
	Geologist	
<b>Site Information</b>		
Location:	PA 341-35	Time: 0800
Type of Facility:	Proposed Well Pad Expansion	
<b>Environmental Conditions</b>	Clear Skies, Sunny, Light Breeze, Dry ground conditions	
Temperature (°F)	50°	

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: One (1) unnamed USGS identified intermittent drainage; One (1) unnamed non-USGS identified ephemeral drainage, and The Colorado River.

If yes, describe location relative to facility: One (1) unnamed USGS identified intermittent drainage is located 720ft to the east, the unnamed non-USGS identified ephemeral drainage is located adjacent to the southwest corner, and the Colorado River is located 937ft south southeast of the existing 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 to migrate off the facility, would tend to flow to the southwest following the natural topography into the unnamed non-USGS identified ephemeral drainage adjacent to the southwest corner of the existing facility.

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

☒ High to actual surface water features      ☒ Low to actual flowing surface water.

## 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: cutting will be managed on the surface  
 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?  
☐ High      ☒ Low

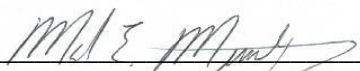
**Additional Comments:**

As stated in the surface water portion of this sensitive area determination, there is one (1) unnamed USGS identified intermittent drainage, one (1) unnamed non-USGS identified ephemeral drainage, and The Colorado River located within a ¼ mile of the existing facility. The facility, as it is currently constructed and proposed to be expanded, limits the direction of a potential release to the southeastern and a portion of the southwestern sides. If a potential release were to migrate off these sides, flow would be to the southwest following the natural topography of the area directly into the unnamed non-USGS identified ephemeral drainage adjacent to the southwest corner. It is not anticipated that the unnamed intermittent drainage located 724 feet to the east of the facility would be impacted by a potential release as it is separated from the facility by a natural topographic high thus preventing flow from impacting this drainage feature. During facility expansion, it is recommended that Best Management Practices BMP's be installed in the form of an earthen perimeter berm along the graded edge of any fill slope sides. Due to the relatively flat topography a small diversion ditch should be installed along the toe of any fill slope sides. All installed BMP's should be monitored and maintained to ensure site containment in the event of a potential release.

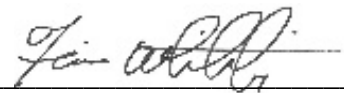
The State Engineer's Office and USGS records were reviewed and no records were revealed that would provide additional information pertaining to the depth to groundwater. The vegetative cover in the immediate vicinity of the facility which consists of typical upland xeric vegetation (sage brush, juniper, & bunch grasses) would not suggest the presence of shallow groundwater. The closest permitted well is located 1,992 feet to the south outside the ¼ mile buffer and is adjacent to a standing body of water which is in very close proximity to the Colorado River. Depth to water in the well is noted to be 12 feet. Based on the surveyed elevation of the facility, the elevation of the permitted well, and the depth to groundwater in the well, it is estimated that the depth to groundwater may be in the range of 35 to 40 feet in the immediate vicinity of the existing facility. As there will be no pits for long term storage of fluids on the facility, the potential for impacts to groundwater are substantially lower as an overland release would tend to be short in duration, would tend to spread out or migrate a substantial distance, and would only infiltrate into the underlying soils a very short distance. Therefore, the potential to impact groundwater in the immediate vicinity of the facility would be deemed as low.

Based on the information collected during the site visit and desktop review, the greatest potential for impacts would be to the non-USGS identified ephemeral drainage located adjacent to the southwestern corner of the facility. If a potential release were to impact this drainage, it would tend to migrate to the southwest encountering several straw bale check dams which would capture and contain a majority of any fluids released. If a potential release were to migrate past the above mentioned check dams, it would eventually encounter a culvert located approximately 475 feet to the southwest. From there it would migrate under I-70 and exit on the south side where it would disperse and dissipate into a heavily vegetated low-lying area to the north of the railroad tracks. This low lying area has no hydraulic connectivity to the Colorado River.

Although the potential to impact surface water features would be deemed as high, the potential to impact actual flowing surface water (Colorado River) would be deemed to be low. With the potential for impacts to groundwater and surface water both being deemed as low, the facility can be designated as being in a non-sensitive area.

Inspector Signature(s):  Date: 11/4/2013

Mark E. Mumby, *Project Manager/RPG*  
HRL Compliance Solutions, Inc.

Inspector Signature(s):  Date: 10/23/2013

Finn Whiting, *Geologist*  
HRL Compliance Solutions, Inc.