

## Sensitive Area Determination Checklist

<b>WPX Energy Rocky Mountain, LLC (WPX)</b>		
<b>Person(s) Conducting Field Inspection</b>	Finn Whiting Geologist	02/11/2014
<b>Site Information</b>		
Location:	Starkey Cuttings Trench	Time: 9:30
Type of Facility:	Proposed Cuttings Storage Facility	
<b>Environmental Conditions</b>	Overcast, ~4" of snow on ground, Frozen ground conditions.	
Temperature (°F)	28 °F	

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

☐ Yes ☒ No

### **SURFACE WATER**

- 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: Starkey Gulch, a USGS identified intermittent drainage tributary to Parachute Creek; and three (3) unnamed non USGS identified ephemeral drainage features.

If yes, describe location relative to facility:

Starkey Gulch is located 422 feet to the southeast of the proposed facility center. The three (3) unnamed non USGS identified ephemeral drainages are adjacent to the proposed facility center with defined channels entering the facility's boundary.

- 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. If a potential release were to migrate off of the facility, flow would be to the southeast into the access road bar ditch located adjacent to the southeastern side of the proposed facility

- 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): Cuttings trench.
  
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

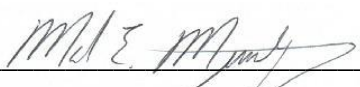
**Additional Comments:**

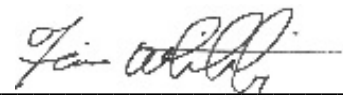
As stated in the surface water section of this sensitive area determination, there are three (3) unnamed non USGS identified ephemeral drainages and Starkey Gulch, a USGS identified intermittent drainage, located within a ¼ mile radius of the proposed facility. The facility, as it is currently proposed, limits the direction of a potential release to the southeastern side. If a potential release were to migrate off of the facility on the southeastern side, flow would be directly into the access road bar ditch. During facility construction, Best management Practices (BMPs) should be installed in the form of an earthen perimeter berm and raised entrance point on the fill slope sides of the proposed facility. Due to the close proximity of the access road and location of the soil stockpiles, construction of a diversion ditch will most likely not be feasible. 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 revealed no water wells are located within a ¼ mile of the proposed facility. The vegetative cover in the immediate vicinity of the facility which is dominated by xeric vegetation typical of the elevation and location (sage brush, juniper, and bunch grasses) does not suggest the presence of shallow groundwater. The nearest permitted water well (permit number 278414) is located 2,005 feet northeast of the proposed facility in very close proximity to Parachute Creek. The depth to groundwater is noted to be 25 feet. However, Parachute Creek is documented as a losing stream in many areas making the depth to groundwater greater at distances further from the creek. This can be confirmed by previous investigative work at a nearby compressor station located to the northeast of the proposed facility. Depth to groundwater at that facility was approximately 45 feet. In addition, the topographic setting of the proposed facility places it out of the fluvial/alluvial sediments of Starkey Gulch and Parachute Creek and in the colluvial sediments of the nearby hillside to the northwest. With the close proximity of the proposed facility to the adjacent hillside; bedrock (Wasatch Fm.) could be relatively shallow and would most likely be devoid of groundwater. If groundwater were to be present in the vicinity of the proposed facility, it would likely be at a depth of 40 feet or greater.

Based on the information collected during the site visit and desktop review, the potential to impact groundwater has been deemed as being low. The greatest potential for impacts would be storm water run on from the drainages located to the northwest of the proposed facility. All three noted drainages can carry significant flow during periods of precipitation. During facility construction it will be imperative to divert any flow from these drainages around the facility and into Starkey Gulch. This will be especially warranted in the summer months during the annual monsoon precipitation patterns typically experienced from mid to late summer. As the proposed facility will not be utilized for storing fluids, the potential to impact any surface water features (Starkey Gulch) will be relatively low. If a potential release were to impact the access road bar ditch, it would have to migrate 840 feet before encountering a culvert which diverts flow under the road into a well-defined ephemeral drainage on the south side of the road. From this point,

flow would have to migrate an additional 420 feet and through three (3) rock check dams before converging with Starkey Gulch. Best management practices can also be installed where the assess road bar ditch crosses under the road to further prevent any fluid migration from reaching Starkey gulch. By COGCC decision the facilities close proximity to Starkey Gulch would classify it as being located in a sensitive area. However, as noted above, with the materials being stored on-site (cuttings) and if adequate (BMPs) are installed and maintained the potential for impacts to the surface water features and actual flowing surface water would be deemed to be low. With the potential for impacts to groundwater, surface water features, and actual flowing surface water being deemed as low, the facility can be designated as being in a non-sensitive area.

Inspector Signature(s):  Date: 2/12/2014  
 Mark E. Mumby, *Project Manager/RPG*  
 HRL Compliance Solutions, Inc.

Inspector Signature(s):  Date: 02/11/2014  
 Finn Whiting, *Geologist / Environmental Inspector*  
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