

**Montana Board of Oil and Gas Conservation  
Environmental Assessment**

**Proposed Action:** Approve Drilling Permit (Form 22)  
**Operator:** Whiting Oil and Gas Corporation  
**Well Name/Number:** Hay Creek Federal 24-31-4H  
**Location:** SE SW Section 31 T25N R58E  
**County:** Richland, MT; Field (or Wildcat) W/C (Bakken Horizontal)

**Air Quality**

(possible concerns)

Long drilling time: No, 25 to 35 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick drilling rig to drill a single lateral Bakken Formation well, 21,803'MD/10,447'TVD.

Possible H2S gas production: Yes possible H2S gas, slight chance from Mississippian Formations.

In/near Class I air quality area: No Class I air quality area in the area of review.

Air quality permit for flaring/venting (if productive) Yes, DEQ air quality permit required under rule 75-2-211.

Mitigation:

- Air quality permit (AQB review)
- Gas plants/pipelines available for sour gas
- Special equipment/procedures requirements
- Other: \_\_\_\_\_

Comments: No special concerns – using triple derrick drilling rig to drill a single lateral horizontal Bakken Formation well, 21,803'MD/10,447'TVD. If existing gas gathering system for natural gas in the area, associated gas can be gathered or if no gathering system nearby, associated gas can be flared under Board Rule 36.22.1220.

**Water Quality**

(possible concerns)

Salt/oil based mud: Yes, oil based invert mud system will be used for drilling the mainhole from 1700' to 10,744' (oil/water ratio 70/30 invert mud) and saltwater for drilling the horizontal lateral from 10,744' to 21,803'. Freshwater and freshwater mud system will be used for drilling the surface hole from 0 to 1700', Rule 36.22.1001.

High water table: Yes, possible high water table at this well location.

Surface drainage leads to live water: Yes, closest drainage is an ephemeral drainage to North Fork First Hay Creek, about 1/10 of a mile to the northwest, North Fork First Hay Creek there is located about 1/5 of a mile to the northeast. A stock pond exists about 1/5 of a mile to the northwest.

Water well contamination: None, closest water wells are two about 3/5 of a mile to the east, 7/10 of a mile to the northeast, about 1/4 of a mile to the south, and 2/5 of a mile to the southwest. Depths of these wells range from 65' to 195'. Surface hole will be drilled with freshwater and freshwater mud to 1700', rule 36.22.1001. Steel surface casing will be run and cemented from 1700' to surface.

Porous/permeable soils: No, sandy silty clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

- Lined reserve pit
- Adequate surface casing
- Berms/dykes, re-routed drainage
- Closed mud system
- Off-site disposal liquids (in approved facility)**
- Other: Lined cuttings pit, 14 mil impervious synthetic pit liner.

Comments: 1700' of surface casing cemented to surface adequate to protect freshwater zones and will cover the base of the Fox Hills Formation, Rule 36.22.1001.

### Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No, stream crossings anticipated.

High erosion potential: No high erosion potential on this location, small cut, up to 8.9' and small fill, up to 8.1', required.

Loss of soil productivity: None, location to be restored after drilling well, if well is nonproductive. If productive unused portion of the drillsite will be reclaimed.

Unusually large wellsite: No, a large location, 500'X540' location size required for 4 well locations Hay Creek Federal 24-31-4H, Hay Creek 24-31-1H, Hay Creek 24-31-2H, and Hay Creek 24-31-3H.

Damage to improvements: Slight, surface use is hay land.

Conflict with existing land use/values: Slight

Mitigation

- Avoid improvements (topographic tolerance)
- Exception location requested
- Stockpile topsoil
- Stream Crossing Permit (other agency review)
- Reclaim unused part of wellsite if productive
- Special construction methods to enhance reclamation
- Other \_\_\_\_\_

Comments: Access to location will be over existing state highway #201. An access road of 88' will be built off the state highway #201 into this location. Oil based invert drilling fluids will be recycled. Pit fluids will be recycled for use on other Whiting wells or hauled to North Dakota for use on other Whiting wells or hauled to a Class II Disposal. Cuttings will be solidified with fly ash and buried in the lined cuttings pit. No special concerns.

### Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Nearest residences is about 3/10 of a mile to the southwest. The town of Fairview, Montana is about 10 miles to the east southeast from this location.

Possibility of H2S: Slight possibility of H2S from Mississippian Formations.

Size of rig/length of drilling time: Triple drilling rig/short 25 to 35 days drilling time.

Mitigation:

- Proper BOP equipment
- Topographic sound barriers
- H2S contingency and/or evacuation plan

Special equipment/procedures requirements  
 Other: Standard H2S safety equipment, crew training and certification should be adequate for this well.  
Comments: Adequate surface casing and operational BOP equipment should mitigate any problems. (BOP's 5,000 psig annular, pipe and blind rams) rule 36.22.1014. No concerns.

### Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.  
Proximity to recreation sites: None identified  
Creation of new access to wildlife habitat: No  
Conflict with game range/refuge management: No  
Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Least Tern, Whooping Crane and Piping Plover. Candidate species are the Greater Sage-Grouse and the Sprague's Pipit. MTFWP Natural Heritage Tracker website indicates three (3) species of concern is the Whooping Crane, Northern Redbelly Dace and Iowa Darter.

Mitigation:

Avoidance (topographic tolerance/exception)  
 Other agency review (DFWP, **federal agencies**, DSL)  
 Screening/fencing of pits, drillsite  
 Other: \_\_\_\_\_

Comments: Private hay surface lands. There may be species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

### Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites: None identified.

Mitigation

avoidance (topographic tolerance, location exception)  
 other agency review (SHPO, DSL, **federal agencies**)  
 Other: \_\_\_\_\_

Comments: Private hay surface lands. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

### Social/Economic

(possible concerns)

Substantial effect on tax base  
 Create demand for new governmental services  
 Population increase or relocation  
Comments: Wildcat well, no concerns.

**Remarks or Special Concerns for this site**

Whiting Oil and Gas to drill a wildcat single lateral horizontal Bakken Formation well, 21,803'MD/10,447'TVD.

**Summary: Evaluation of Impacts and Cumulative effects**

No significant long term impacts expected, some short term impacts will occur.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/ John Gizicki  
(title:) Compliance Specialist  
Date: December 15, 2014

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website  
(Name and Agency)  
Water wells in Richland County  
(subject discussed)  
December 15, 2014  
(date)

US Fish and Wildlife, Region 6 website  
(Name and Agency)  
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES  
MONTANA COUNTIES, Richland County  
(subject discussed)  
December 15, 2014  
(date)

Montana Natural Heritage Program Website (FWP)  
(Name and Agency)  
Heritage State Rank= S1, S2, S3, T25N R58E  
(subject discussed)  
December 15, 2014  
(date)

Montana Cadastral Website  
(Name and Agency)  
Surface Ownership and surface use Section 31 T25N R58E  
(subject discussed)  
December 15, 2014  
(date)

If location was inspected before permit approval:

Inspection date: \_\_\_\_\_

Inspector: \_\_\_\_\_

Others present during inspection: \_\_\_\_\_