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

**Proposed Action:** Approve Drilling Permit (Form 22)
**Operator:** Kraken Operating LLC.
**Well Name/Number:** Fred 15-22 #1H
**Location:** SW SW Section 11 T27N R57E
**County:** Roosevelt **, MT; Field (or Wildcat)** W/C (Bakken Horizontal)

## Air Quality

(possible concerns)
Long drilling time: No, 15 to 20 days drilling time.
Unusually deep drilling (high horsepower rig): No, triple derrick rig to drill a single lateral horizontal Bakken Formation test, 21,133'MD/10,120'TVD.
Possible H2S gas production: Slight chance H2S gas from Mississippian Formations.
In/near Class I air quality area: Yes, nearest Class I air quality area is the Fort Peck Indian Reservation, about 14.5 miles to the northwest from this location.
Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:
X Air quality permit (AQB review)
__ Gas plants/pipelines available for sour gas
__ Special equipment/procedures requirements
__ Other:_____

Comments: No special concerns – using triple rig to drill a single lateral horizontal Bakken Formation test, 21,133'MD/10,120'TVD. If there is an existing gathering system for natural gas in the area, then associated gas can be gathered or if no gathering system nearby gas can be flared under Board Rule 36.22.1220.

## Water Quality

(possible concerns)
Salt/oil based mud: Yes to intermediate casing string hole to be drilled with oil based invert drilling fluids (oil/water ratio of 75/25 to 80/20). Horizontal lateral will be drilled with brine water. Surface casing hole will use freshwater and freshwater mud system (Rule 36.22.1001).
High water table: No high water table anticipated at this location.
Surface drainage leads to live water: No, nearest drainage is an unnamed ephemeral drainage located 1/10 of a mile to the southwest from this location..
Water well contamination: None, closest water well is located 4/5 of a mile to the southeast. Depth of this well is 80'. Surface hole will be drilled with freshwater and freshwater mud system, Rule 36.22.1001. Surface casing will be set at 1900' and cemented to surface.
Porous/permeable soils: No, silty sandy clay soils.
Class I stream drainage: Yes, The Missouri River is located 7/10 of a mile to the south.

Mitigation:
__ Lined reserve pit
X Adequate surface casing
__ Berms/dykes, re-routed drainage
X Closed mud system
X Off-site disposal of **liquids (in approved facility)**

X  Other: Lined cuttings pit (16 mil liner) will be used since this is a closed loop mud system to be employed. Cuttings will be buried on the wellsite.

Comments: 1900' of surface casing enough to cover the base of the Fox Hills and cemented to surface adequate to protect freshwater zones, Rule 36.22.1001.

**Soils/Vegetation/Land Use**

(possible concerns)
Steam crossings: No stream crossings anticipated.
High erosion potential: No high erosion potential on the cut and fill slope at this location. The location will require a small cut, up to 4.0' and small fill, up to 0.3', required.
Loss of soil productivity: No, location will be restored after drilling if unproductive. If productive, unused portion of this drilling location will be restored.
Unusually large wellsite: No a large wellsite, 410'X430' location size required for two wells.
Damage to improvements: Slight, surface use is appears to be grazing land.
Conflict with existing land use/values: Slight

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

Comments: Access will be over existing county road, 1012. A new access road of 6,995' will be built into location. Cuttings will be buried in the lined cuttings pit. Oil based drilling fluids will be recycled. Reserve pit fluids will be hauled to a commercial disposal. Pit will be allowed to dry and then closed by filling and mixing with clay subsoils. No special concerns.

**Health Hazards/Noise**

(possible concerns)
Proximity to public facilities/residences: No residences within a 1 mile radius of location. The town of Bainville, Montana is about 8.9 miles to the northeast from this location.
Possibility of H2S: Slight chance of H2S from Mississippian Formations.
Size of rig/length of drilling time: Triple drilling rig/short, 15 to 20 days drilling time.

Mitigation:
X Proper BOP equipment
__ Topographic sound barriers
__ H2S contingency and/or evacuation plan
__ Special equipment/procedures requirements
__ Other:_____

Comments: Adequate surface casing cemented to surface with an operational BOP stack (annular and double ram (pipe and blinds) rated for 5,000 psig) should mitigate any problems, Rule 36.22.1014.

**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, Red Knot, Northern Long-eared Bat, and Piping Plover. Candidate specie is the Sprague's Pipit. NH tracker website indicate eighteen (18) species of concern in this township and range they are the Hoary Bat, Little Brown Myotis, Sprague's Pipit, Golden Eagle, Piping Plover, Whooping Crane, Red-headed Woodpecker, Least Tern, Greater Short-horned Lizard, Northern Redbelly Dace, Blue Sucker, Iowa Darter, Shortnose Gar, Sturgeon Chub, Sicklefin Chub, Paddlefish, Sauger, and Pallid Sturgeon.

Mitigation:
__ Avoidance (topographic tolerance/exception)
__ Other agency review (DFWP, federal agencies BLM, DSL)
__ Screening/fencing of pits, drillsite
__ Other: _____
Comments: __Private grazing 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 are discovered at this location. No concerns.

**Historical/Cultural/Paleontological**

(possible concerns)
Proximity to known sites: __None identified._____
Mitigation
__ avoidance (topographic tolerance, location exception)
__ other agency review (SHPO, DSL, federal agencies BLM)
__ Other:_____
Comments: _Private grazing 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.

**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**

Kraken Operating LLC will drill a single lateral Bakken Formation horizontal well test, , 21,133'MD/10,120'TVD. No special concerns.

**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: January 27, 2016

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website
(Name and Agency)
Water wells in Roosevelt County
(subject discussed)
January 27, 2016

US Fish and Wildlife, Region 6 website
(Name and Agency)
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES
MONTANA COUNTIES, Roosevelt County
(subject discussed)

January 27, 2016
(date)

Montana Natural Heritage Program Website
(Name and Agency)
Heritage State Rank= S1, S2, S3 T27N R57E
(subject discussed)

January 27, 2016
(date)

Montana Cadastral Website
(Name and Agency)
Surface Ownership and surface use Section 11 T27N R57E
(subject discussed)

January 27, 2016
(date)

If location was inspected before permit approval:
Inspection date: _____
Inspector: _____
Others present during inspection: _____