

CHECKLIST ENVIRONMENTAL ASSESMENT

Proposed Action: Approve Drilling Permit (Form 22)

Project/Well Name: Fletch 5-8 #2H

Operator: Kraken Operating LLC

Location: SESW Section 32 T26N R59E

County: Richland **MT;** **Field (or Wildcat):** Wildcat

Proposed Project Date: 11/10/2018

I. DESCRIPTION OF ACTION

Kraken Operating LLC plans to drill a horizontal oil well in the Bakken Formation 20,924' MD, 10,343' TVD. Three other oil wells will be drilled on this pad, the Fletch 5-8 #4H, Fletch 5-8 #3H, Fletch 5-8 #5H.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED

Montana Bureau of Mines and Geology, GWIC website (Richland County Wells).

US Fish and Wildlife, Region 6 website

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA COUNTIES, Richland County

Montana Natural Heritage Program Website (FWP)

Heritage State Rank= S1, S2, S3, T26N R59E

Montana Cadastral Website

Surface Ownership and surface use Section 32 T26N R59E

Montana Department of Natural Resources MEPA Submittal

2. ALTERNATIVES CONSIDERED

No Action Alternative: The proposed well would not be drilled.

Action Alternative: Kraken Operating LLC would have permission to drill the well.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

3. AIR QUALITY

Long drilling time: 25-35 days drilling time.

Unusually deep drilling (high horsepower rig): Triple derrick drilling rig to drill a single lateral horizontal Bakken Formation test, 20,924' MD, 10,343' TVD.

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

In/near Class I air quality area: No Class I air quality area nearby.

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

Comments: No special concerns – using triple derrick rig to drill to 20,924' MD, 10,343' TVD. If there isn't any gas gathering systems nearby, associated gas can be flared under Board Rule 36.22.1220.

4. WATER QUALITY

Salt/oil based mud: Yes, will drill with oil based invert drilling fluids for the intermediate casing hole.

Horizontal hole will be drilled with saltwater. Surface casing hole will be drilled with freshwater and freshwater mud system, Rule 36.22.1001.

High water table: No high water table anticipated at this surface location.

Surface drainage leads to live water: No, closest drainage is an unnamed ephemeral drainage about 1/10 of a mile to the west from this drilling location. North Fork Fourmile Creek is located 7/10 of a mile to the southwest. The Missouri River is about 3.3 miles to the northeast from this location.

Water well contamination: None, surface hole will be drilled with freshwater and freshwater drilling fluids to 1,875', steel surface casing will be run and cemented to surface from 1,875' to protect any ground and surface waters. Closest water well from this location is an injection well 2/5 of a mile to the west with a depth of 140'. Another injection well is located about 420' to the northeast and is 240' deep. two domestic/stockwater wells exist just over 1/2 a mile to the south with depths of 110' and 60', an industrial well is 2/5 of a mile to the southeast with a depth of 145'. (information from GWIC).

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

Class I stream drainage: Closest Class I stream drainage is the Missouri River, about 3.3 miles to the northeast from this location.

Groundwater vulnerability area: NA.

Mitigation:

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

Comments: Steel surface casing will be run to 1,875' and cemented to surface to protect ground water. (Rule 36.22.1001).

5. SOILS/VEGETATION/LAND USE

Vegetation: Grassland.

Stream crossings: No stream crossings anticipated. Crossing only ephemeral drainages over existing county roads.

High erosion potential: No, a small cut of 7.3' and a small fill of 9.7', required.

Loss of soil productivity: No, location to be restored after drilling, if nonproductive. If productive, unused portion of this drillsite will be reclaimed.

Unusually large wellsite (Describe dimensions): A large well site 509' X 540' required for a four well pad, the Fletch 5-8 #2H, Fletch 5-8 #3H, Fletch 5-8 #4H, Fletch 5-8 #5H.

Damage to improvements: Slight surface use appears to be mix of cultivated and grass lands.

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

Access Road: Access will be over existing county road, #142. A new access of 99' will be built into location.

Drilling fluids/solids: A closed loop system will be used for this well. The liquids will be hauled to a commercial disposal site and disposed. The cuttings will also be hauled to a commercial disposal site and disposed.

6. HEALTH HAZARDS/NOISE

Proximity to public facilities/residences: No residences within a 1/2-mile radius.

Possibility of H2S: Yes, slight from Mississippian Formations.

Size of rig/length of drilling time: Triple derrick rig. 25-35 days drilling time.

Mitigation:

- Proper BOP equipment (Adequate surface casing cemented to surface, Rule 36.22.1001, with working BOP stack should mitigate any problems, (5,000 psi annular and double ram), Rule 36.22.1014.)
- Topographic sound barriers
- H2S contingency and/or evacuation plan
- Special equipment/procedures requirements
- Other:

7. WILDLIFE/RECREATION

Sage Grouse: NA

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, Piping Plover, and the Northern Long-eared Bat. The Montana Natural Heritage Program lists seventeen (17) species of concern: Northern Myotis, Great Blue Heron, Veery, Piping Plover, Black-billed Cuckoo, Whooping Crane, Red-headed Woodpecker, Least Tern, Northern Redbelly Dace, Blue Sucker, Iowa Darter, Shortnose Gar, Sturgeon Chub, Sicklefin Chub, Paddlefish, Sauger, Pallid Sturgeon.

Mitigation:

Avoidance (topographic tolerance/exception)

Other agency review (DFWP, federal agencies, DNRC Trust Lands)

Screening/fencing of pits, drillsite

Other:

Comments: Private cultivated 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. No concerns.

IV. IMPACTS ON THE HUMAN POPULATION

8. HISTORICAL/CULTURAL/PALEONTOLOGICAL

Proximity to known sites: None identified.

Mitigation

avoidance (topographic tolerance, location exception)

other agency review (SHPO, DNRC Trust Lands, federal agencies)

Other:

9. SOCIAL/ECONOMIC

Substantial effect on tax base

Create demand for new governmental services

Population increase or relocation

Comments: No concerns.

IV. SUMMARY

No long term impacts expected. Some short term impacts will occur, but can be mitigated. 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.

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| EA Checklist Prepared By: | Name: John Gizicki Title: Compliance Specialist | Date: 10/09/18 |
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