

FORM NO. 22 R 10/09		SUBMIT IN QUADRUPPLICATE TO:		ARM 36.22.307 ARM 36.22.601	Lease Name: Higgins 13-24	
MONTANA BOARD OF OIL AND GAS CONSERVATION 2535 ST. JOHNS AVENUE, BILLINGS, MONTANA 59102					Lease Type (Private/State/Federal): Private	
Application for Permit To:					Well Number: #4H	
Drill <input checked="" type="checkbox"/>	Deepen <input type="checkbox"/>	Re-enter <input type="checkbox"/>				
Oil <input checked="" type="checkbox"/>	Gas <input type="checkbox"/>	Other <input type="checkbox"/>				
Operator: Kraken Operating LLC Address: 9821 Katy Freeway Suite 460 City: Houston State: TX Zip: 77024 Telephone Number: 281-658-4048				Field Name or Wildcat: Wildcat		
				Unit Name (if applicable): N/A		
Surface Location of Well (quarter-quarter and footage measurements): NWNE Sec 13 T27N R57E, 340' FNL 1719' FEL				Objective Formation(s): Bakken		
Proposed Total Depth and Bottom-hole Location(s) if directional or horizontal well: TD 20,756' MD, 10,257' TVD SESE Sec 24 T27N R57E, 205' FSL, 550' FEL				Township, Range, and Section: Sec 13 T27N R57E		
				County: Roosevelt County, MT		
				Elevation (indicate GL or KB): 2174' 2714' GL		
Size and description of drilling/spacing unit and applicable order, if any:			Formation at total depth:		Anticipated Spud Date:	
1280 acres (Sections 13 & 24, T27N-R57E)/Order Hearing in April			Bakken		5/4/2019	
<i>Docket 116-2019</i>						
Hole Size	Casing Size	Weight / Foot	Grade (API)	Depth	Sacks of Cement	Type of Cement
13 1/2	9 5/8	36	J-55	2150	682	See Attached
8 3/4	7	29# and 32#	P-110	10615	671	See Attached
6	4 1/2	11.6#	P-110	20756	565	See Attached
Describe Proposed Operations: Describe or attach labeled diagram of blowout preventer equipment. Indicate if air drilled or describe mud program. See attachments for details Kraken Operating, LLC requests variance to not run open hole logs on the subject well. Offset logs can be found for the Seven Sisters 4-13 (API# 25-085-21644).						
BOARD USE ONLY						
Approved (date) <u>APR 12 2019</u>		Permit Fee <u>\$150.00</u>		The undersigned hereby certifies that the information contained on this application is true and correct:		
By <u>[Signature]</u>		Check Number <u>27773</u>		Signed (Agent) <u>[Signature]</u>		
Title <u>Petroleum Engineer</u>		Permit Expires <u>OCT 12 2019</u>		Title <u>Sr. Regulatory Analyst</u>		
		Permit Number <u>32397</u>		Date <u>3/25/2019</u>		
THIS PERMIT IS SUBJECT TO THE CONDITIONS OF APPROVAL STATED ON THE BACK		API Number: 25 - <u>085</u> - <u>22002</u>		Telephone Number <u>713-360-7705 EXT. 156</u>		
Samples Required: NONE <input checked="" type="checkbox"/> ALL _____ FROM _____ feet to _____ feet Core chips to address below, full cores to USGS, Core Laboratory, Arvada, CO. Required samples must be washed, dried and delivered prepaid to: Montana Board of Oil and Gas Conservation 2535 St. Johns Avenue Billings, MT 59102						

SUPPLEMENTAL INFORMATION

Note: Additional information or attachments may be required by Rule or by special request.

1. Attach a survey plat certified by a registered surveyor. The survey plat must show the location of the well with reference to the nearest lines of an established public survey.
2. Attach an 8 1/2 x 11" photocopy of that portion of a topographic map showing the well location, the access route from county or other established roads, residences, and water wells within a 1/2 mile radius of the well.
3. Attach a sketch of the well site showing the dimensions and orientation of the site, the size and location of pits, topsoil stockpile, and the estimated cut/fill at the corners and centerstake. (Note: the diagram need not be done by an engineer or surveyor). Attach a sketch of a top view and two side views of the reserve pit(s), if utilized. The reserve pit sketch must show the length, width, depth, cut and fill, amount of freeboard, area of topsoil stockpile, and the height and width of berms.
4. Describe the type and amount of material or liner, if any, to be used to seal the reserve pit. If a synthetic liner is used, indicate the liner thickness (mils), bursting strength, tensile strength, tear strength, puncture resistance, hydrostatic resistance, or attach the manufacturer's specifications.
5. Describe the proposed plan for the treatment and/or the disposal of reserve pit fluids and solids after the well is drilled. If the operator intends to dispose of or treat the reserve pit contents off-site, specify the location and the method of waste treatment and disposal. (Note: The operator must comply with all applicable federal, state, county, and local laws and regulations with regard to the handling, transportation, treatment, and disposal of solid wastes.)
6. Does construction of the access road or location, or some other aspect of the drilling operation require additional federal, state, or local permits or authorizations? If yes, indicate the type of permit or authorization required:
 - No additional permits needed
 - Stream crossing permit (apply through county conservation district)
 - Air quality permit (apply through Montana Department of Environmental Quality)
 - Water discharge permit (apply through Montana Department of Environmental Quality)
 - Water use permit (apply through Montana Department of Natural Resources and Conservation)
 - Solid waste disposal permit (apply through Montana Department of Environmental Quality)
 - State lands drilling authorization (apply through Montana Department of Natural Resources and Conservation)
 - Federal drilling permit (specify agency)
 - Other federal, state, county, or local permit or authorization: (specify type) _____

NOTICES:

1. Date and time of spudding must be reported to the Board verbally or in writing within 72 hours after the commencement of drilling operations.
2. The operator must give notice of drilling operations to the surface owner as required by Section 82-10-503, MCA, before the commencement of any surface activity.

BOARD USE ONLY

CONDITIONS OF APPROVAL

The operator must comply with the following condition(s) of approval:

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WARNING: Failure to comply with conditions of approval may void this permit.

Kraken Operating, LLC Proposed Well Stimulation

Total Clean Fluid – 235,000 bbls

Maximum Anticipated Treating Pressure – 9,800 psi

Hydraulic Fracturing Fluid Components Information Disclosure:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass)**
Water	Operator	Carrier	Carrier	7732-18-5	100.00%	82,315,800.00	84.06572%
Surr-Flo 430	Innospec	Flowback Additive	MSDS and Non-MSDS Ingredients Listed Below			7,435.80	0.00759%
FRP-1S	Liberty Oilfield Services	Friction reduction	MSDS and Non-MSDS Ingredients Listed Below			2,528,533.79	0.25823%
DVA-75	Liberty Oilfield Services	Diversing Agent	MSDS and Non-MSDS Ingredients Listed Below			469.00	0.00048%
Biolear 5000	Lubrizol	Biocide	MSDS and Non-MSDS Ingredients Listed Below			8,387.32	0.00857%
ScaleCease 7103	Innospec	Scale Inhibitor	MSDS and Non-MSDS Ingredients Listed Below			15,850.17	0.01619%
HCL-15	Liberty Oilfield Services	Solvent	MSDS and Non-MSDS Ingredients Listed Below			17,295.26	0.01766%
ACI-300	WST	Corrosion Inhibitor	MSDS and Non-MSDS Ingredients Listed Below			67.43	0.00007%
WA-100	WST	Wetting Agent	MSDS and Non-MSDS Ingredients Listed Below			34.79	0.00004%
IC-50S	WST	Iron Control	MSDS and Non-MSDS Ingredients Listed Below			125.74	0.00013%
Liberty Clean Out	Liberty Oilfield Services	Cleanup Solution	MSDS and Non-MSDS Ingredients Listed Below			74.86	0.00008%
Crystalline Silica	Liberty Oilfield Services	Sand	MSDS and Non-MSDS Ingredients Listed Below			15,300,000.00	15.62526%
The trade name(s) of the additive(s) used, supplier(s), and the purpose(s) of the additive(s) are listed below. The ingredient(s) for the above additive(s) are listed below.							
	Liberty Oilfield Services	Sand	Crystalline Silica (quartz)	14808-60-7	99.90%	15,284,700.00	15.60963%
	Liberty Oilfield Services	Sand	Aluminum Oxide	1344-28-1	1.00%	153,000.00	0.15625%
	Liberty Oilfield Services	Friction reduction	Petroleum distillates, hydrotreated light	64742-47-8	45.00%	113,784.20	0.11620%
	Liberty Oilfield Services	Sand	Iron Oxide	1309-37-1	0.10%	15,300.00	0.01563%
	Liberty Oilfield Services	Sand	Titanium Oxide	13463-67-7	0.10%	15,300.00	0.01563%
	Innospec	Scale Inhibitor	Water	7732-18-5	95.00%	15,057.66	0.01538%
	Liberty Oilfield Services	Solvent	Water	7732-18-5	85.00%	14,700.97	0.01501%
	Liberty Oilfield Services	Friction reduction	Poly(oxy-1,2-ethanediy)l, a-tridecyl-w-hydroxy-, branched	69011-36-5	3.00%	7,585.61	0.00775%
	Innospec	Flowback Additive	Water	7732-18-5	95.00%	7,064.01	0.00721%
	Liberty Oilfield Services	Solvent	Hydrochloric Acid	7647-01-0	15.00%	2,594.29	0.00265%
	Lubrizol	Biocide	2,2-dibromo-3-nitropropionamide	10222-01-2	10.00%	838.73	0.00086%
	Innospec	Scale Inhibitor	BHMT Phosphonate	Proprietary	5.00%	792.51	0.00081%
	Innospec	Scale Inhibitor	Proprietary Ingredient	Proprietary	5.00%	792.51	0.00081%
	Innospec	Flowback Additive	Benzenesulfonic Acid, dodecyl-, compd. with 2-aminoethanol	26836-07-7	10.00%	743.58	0.00076%
	Innospec	Flowback Additive	Dodecylbenzene sulfonate, triethanolamine salt	27323-41-7	10.00%	743.58	0.00076%
	Liberty Oilfield Services	Diversing Agent	Polyacide Resin	9051-89-2	100.00%	469.00	0.00048%
	Innospec	Flowback Additive	Sodium Alpha Olefin Sulfonate	68439-57-6	5.00%	371.79	0.00038%
	WST	Iron Control	2-hydroxypropane-1,2,3-tricarboxylic acid	77-92-9	60.00%	75.45	0.00008%
	Liberty Oilfield Services	Cleanup Solution	Oxygenate and paraffinic stream	876065-86-0	99.00%	74.11	0.00008%
	WST	Wetting Agent	Ethoxylated Decyl Alcohol	78330-20-8	40.00%	13.92	0.00001%
	WST	Corrosion Inhibitor	2-Propyn-1-ol compound with methoxirane	38172-91-7	15.00%	10.11	0.00001%
	Liberty Oilfield Services	Cleanup Solution	C.I. Solvent Yellow 33	8003-22-3	1.00%	0.75	0.00000%
	Innospec	Flowback Additive	Triethanolamine	103-71-6	0.01%	0.67	0.00000%
	Innospec	Flowback Additive	Ethanolamine	144-43-5	0.01%	0.67	0.00000%

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