

FORM NO. 22 R 10/09		SUBMIT IN QUADRUPPLICATE TO:		ARM 36.22.307	Lease Name:
				ARM 36.22.601	Snyder 1918
<b>MONTANA BOARD OF OIL AND GAS CONSERVATION</b> <b>2535 ST. JOHNS AVENUE, BILLINGS, MONTANA 59102</b>				Lease Type (Private/State/Federal):	
				Private	
Application for Permit To:				Well Number:	
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"/>	1H		
Operator: Heritage Energy Operating, LLC				Field Name or Wildcat:	
Address: 2448 E. 81st Street, Suite 2036				Wildcat	
City: Tulsa State: OK Zip: 74137				Unit Name (if applicable):	
Telephone Number: 405-202-3874					
Surface Location of Well (quarter-quarter and footage measurements):				Objective Formation(s):	
SW/4 SE/4 of Section 19-T29N-R57E (390' FSL & 2,225' FEL)				Middle Bakken	
Proposed Total Depth and Bottom-hole Location(s) if directional or horizontal well:				Township, Range, and Section:	
TD: 20,661' MD, 10,238' TVD				19-T29N-R57E	
<i>NENW Section 18 T29N R57E</i> <i>200' FWL, 1400' FWL</i>  <i>Statewide Temp Spacing Order 380-2011</i>				County:	
				Roosevelt	
				Elevation (indicate GL or KB):	
				2,220 KB	
Size and description of drilling/spacing unit and applicable order, if any:			Formation at total depth:	Anticipated Spud Date:	
1,280 acre spacing per Board Order 232-2010			Middle Bakken	07/10/2023	

Hole Size	Casing Size	Weight / Foot	Grade (API)	Depth	Sacks of Cement	Type of Cement
13 1/2	9 5/8	36#	J-55	1900	649	See Attached
8 3/4	7	32#	P-110	10723	687	See Attached
6	4 1/2	13.5#	P-110	20661	550	See Attached

Describe Proposed Operations:  
Describe or attach labeled diagram of blowout preventer equipment. Indicate if air drilled or describe mud program.  
Heritage Energy Operating, LLC requests to drill a horizontal well to complete and produce the Bakken formation situated in drilling and spacing unit encompassing Sections 19 & 18 of T29N-R57E, Roosevelt County, Montana.

See attachments for details.

Heritage Energy Operating, LLC requests variance to not run open hole logs on the subject well. Offset logs can be found for the Olson 31-28 Sec. 28-T29N-R57E

<b>BOARD USE ONLY</b>		The undersigned hereby certifies that the information contained on this application is true and correct:  Signed (Agent) <u><i>Joshua C. Ch...</i></u> Title <u>Chief Executive Officer</u>  Date <u>02/24/2023</u> Telephone Number <u>405-202-3874</u>
Approved (date) <u>APR 26 2023</u>	Permit Fee <u>\$150<sup>00</sup></u>	
By <u><i>Benjamin J Davis</i></u>	Check Number <u>1039</u>	
Title <u>Tech Program Coordinator</u>	Permit Expires <u>OCT 26 2023</u>	
Permit Number <u>32813</u>		
THIS PERMIT IS SUBJECT TO THE CONDITIONS OF APPROVAL STATED ON THE BACK API Number: 25 - <u>085 - 22031</u>		

Samples Required: NONE X 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

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

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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
  - 310 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:

Any Changes to Approved Frac plan in APD needs to be submitted via Sundry Notice to MBOGC prior to stimulation of the well.

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

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Heritage Energy Operating, LLC

Total Clean Fluids - 235000 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%
Surf-Flo 430	Innospec	Flowback Additive	MSDS and Non-MSDS Ingredients Listed Below			7,435.80	0.00759%
FRP-15	Liberty Oilfield Services	Friction reduction	MSDS and Non-MSDS Ingredients Listed Below			252,853.79	0.25823%
DVA75	Liberty Oilfield Services	Diverting Agent	MSDS and Non-MSDS Ingredients Listed Below			469.00	0.00048%
Bioclear 5000	Lubrizol	Biocide	MSDS and Non-MSDS Ingredients Listed Below			8,384.32	0.00856%
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-505	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 above. 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-ethanediyl), 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-nitrioproprionamide	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	Diverting Agent	Poly lactide 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	Oxydenate and paraffinic stream	876065-86-0	99.00%	74.11	0.00008%
	WST	Wetting Agent	Ethoxylated Decyl Alcohol	78330-20-8	40.01%	13.92	0.00011%
	WST	Corrosion Inhibitor	2-Propyn-1-ol compound with methyloxirane	38172-91-7	14.99%	10.11	0.00011%
	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	141-43-5	0.01%	0.67	0.00000%