

FORM NO. 22 R 10/09		SUBMIT IN QUADRUPPLICATE TO:		ARM 36.22.307 ARM 36.22.601		Lease Name: Graham	
MONTANA BOARD OF OIL AND GAS CONSERVATION 2535 ST. JOHNS AVENUE, BILLINGS, MONTANA 59102						Lease Type (Private/State/Federal): Private	
						Application for Permit To:	
Drill <input checked="" type="checkbox"/>		Deepen <input type="checkbox"/>		Re-enter <input type="checkbox"/>		Well Number: 13-12-1-2H	
Oil <input checked="" type="checkbox"/>		Gas <input type="checkbox"/>		Other <input type="checkbox"/>			
Operator: Black Dog Operating, LLC Address: 6110 Clarkson Ln City: Houston State: TX Zip: 77055 Telephone Number: 832-541-8334						Field Name or Wildcat: Elm Coulee, Northeast	
Surface Location of Well (quarter-quarter and footage measurements): SWSE, 340' FSL, 2299' FEL Section 13, T29N, R57E						Unit Name (if applicable): NA	
						Objective Formation(s): Bakken	
Proposed Total Depth and Bottom-hole Location(s) if directional or horizontal well: 10021' TVD; 25825' MD BHL - 220 FSL, 1980 FEL, NWNE, Section 1, T29N, R57E Order 104-2025						Township, Range, and Section: T29N, R57E, Section 13	
						County: Roosevelt	
						Elevation (indicate GL or KB): 2136' GL	
Size and description of drilling/spacing unit and applicable order, if any: 1920 Acres (Sections 1, 12, & 13; T29N, R57E)				Formation at total depth: Bakken		Anticipated Spud Date: 6/1/2025	

Hole Size	Casing Size	Weight / Foot	Grade (API)	Depth	Sacks of Cement	Type of Cement
12-1/4"	9-5/8"	36.0 lbs/ft	J-55	2000'	549	Class C (Type III)
8-3/4"	7"	32.0 lbs/ft	P-110	10388'	660	Class G
6"	4-1/2"	13.5 lbs/ft	P-110	25805'	972	Class G

Describe Proposed Operations:
Describe or attach labeled diagram of blowout preventer equipment. Indicate if air drilled or describe mud program.
Drill 12-1/4" surface hole to 2000' with fresh water. Run 9-5/8" surface casing and cement to surface. Drill 8-3/4" intermediate hole to 10388' with oil based (invert) mud. Run 7" intermediate casing and cement to 2000' from surface. Drill 6" lateral to 25825' with inhibited fresh water mud. Run 4-1/2" liner and cement to liner top at 9455'. Cement bond log and pressure test 7" intermediate casing. Hydraulically fracture stimulate well with approximately 21250400 lbs of sand in 370400 bbls at 90 bbls/min over 79 intervals. Clean out lateral, and flow test well. Install artificial lift, and construct surface facility. Please refer to the attached supplemental information for additional operational details.

BOARD USE ONLY			
Approved (date) OCT 31 2025	Permit Fee \$1500	The undersigned hereby certifies that the information contained on this application is true and correct: Signed (Agent) <u>Tammy Green</u> Title <u>Petroleum Engineering Consultant</u> Date <u>3/25/2025</u> Telephone Number <u>406-855-6208</u>	
By <u>Barbara J Davis</u>	Check Number 1086		
Title <u>Technical Program Coordinator</u>	Permit Expires APR 30 2026		
	Permit Number 33081		
THIS PERMIT IS SUBJECT TO THE CONDITIONS OF APPROVAL STATED ON THE BACK		API Number: 25 - 085 - 22098	

Samples Required: NONE ☒ 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

08522098

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SUPPLEMENTAL INFORMATION

MAR 25 2025

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

MONTANA BOARD OF OIL &
GAS CONSERVATION • BILLINGS

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:

SEE ATTACHED
CONDITIONS OF APPROVAL

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

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	7/1/2025 (proposed)
Job End Date	7/20/2025 (proposed)
State	Montana
County	Roosevelt
API Number	25-085-XXXX-00-00
Operator Number	Black Dog Operating, LLC
Well Name/ID Number	Graham 13-12-1-2H
Fracture Well	No
Injection Well	No
Latitude	48.259926
Longitude	-104.247407
Permit	NAD83
True Vertical Depth (TVD)	10,021
Total Base Water Volume (gall)	15,556,800
Total Base Nitrogen Volume	0



Address	Specific Gravity	Additive Quantity	Mass (lbs)
Water	8.33	15,556,800	129,588,144
ASP FSC200	3.111		31,098
Product 6191	8.20	6,222	51,580
BIOC11139W	9.34	3,589	26,433
FFR4100	10.00	23,333	233,330
Crystalline Silica, Quartz Sand		21,250,400	217,590,400
			131,190,875

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MAR 25 2025

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration (% by mass)**	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments																																																																																																																																																									
Water	Operator	Carrier	Water	7732-18-5	100.00%	129,588,144	85.7162%																																																																																																																																																										
ASP FSC200	ChampionX	Scale Inhibitor	Water	7732-18-5	60.00%	18,659	0.01234%																																																																																																																																																										
			Ethylene Glycol	107-21-1	15.00%	4,865	0.00309%																																																																																																																																																										
			2-Propenoic Acid, Polymer with Sodium Phosphinate, Sodium Salt	129899-01-7	15.00%	4,665	0.00309%																																																																																																																																																										
			Sodium Chloride	7647-14-5	4.00%	1,244	0.00082%																																																																																																																																																										
			Calcium Chloride	10043-52-4	4.00%	1,244	0.00082%																																																																																																																																																										
			Diethylene Glycol	111-46-6	0.50%	155	0.00010%																																																																																																																																																										
			Sodium Hydroxide	1310-73-2	0.50%	155	0.00010%																																																																																																																																																										
			Potassium Chloride	7447-40-7	0.10%	31	0.00002%																																																																																																																																																										
Product 6191	ChampionX	Surfactant	Water	7732-18-5	70.00%	36,106	0.02389%																																																																																																																																																										
			Foam (Oxy-1,2-Ethanedyl), Alpha-Isodecyl-Omega-Hydroxy	61827-42-7	20.00%	10,316	0.00682%																																																																																																																																																										
			Quaternary Ammonium Compounds, Dicoo Alkylidimethyl Chlorides	61789-77-3	1.00%	516	0.00034%																																																																																																																																																										
			Isopropanol	67-53-0	1.00%	516	0.00034%																																																																																																																																																										
			Amines, Dicoo Alkylmethyl	61788-62-3	0.10%	52	0.00003%																																																																																																																																																										
			Hydrochloride	NA	0.10%	52	0.00003%																																																																																																																																																										
			Sodium Chloride	7647-14-5	0.10%	52	0.00003%																																																																																																																																																										
			Methane, Chloro-	74-87-3	0.10%	52	0.00003%																																																																																																																																																										
			Isopropanol	67-53-0	0.00%	10,897	0.00721%																																																																																																																																																										
			Water	7732-18-5	20.00%	7,265	0.00480%																																																																																																																																																										
BIOC11139W	ChampionX	Biocide	Ethylene Glycol	107-21-1	20.00%	7,265	0.00480%																																																																																																																																																										
			Quaternary Ammonium Compounds, Benzyl-C12-16-Alkylidimethyl Chlorides	69424-85-1	20.00%	7,265	0.00480%					Glutaraldehyde	111-30-8	4.50%	1,635	0.00108%					Ethanol	64-17-5	4.50%	1,635	0.00108%					Methanol	67-56-1	0.10%	36	0.00002%		FFR4100	ChampionX	Friction Reducer	Water	7732-18-5	40.00%	93,332	0.06173%					1-Propanesulfonic Acid, 2-Methyl-2-((1-Oxo-2-Propenyl) Amino), Monosodium Salt, Polymer with 2-Propanamide	38193-60-1	20.00%	46,666	0.03087%					Distillates (Petroleum), Hydrorefined		20.00%	46,666	0.03087%					Sodium Chloride	64742-47-8	20.00%	46,666	0.03087%					Alcohols, C11-14-iso-, C13-Rich, Ethoxylated	7647-14-5	5.00%	11,667	0.00772%					Sorbitan, C2-9-Octadecanoate (2:3)	78330-21-9	5.00%	11,667	0.00772%					Alcohols, C9-11-iso-, C10-Rich	8007-43-0	5.00%	11,667	0.00772%					Sorbitan, Monooleate, Polyoxyethylene Derivs	88526-85-2	1.00%	2,333	0.00154%					Acrylamide	9005-65-6	1.00%	2,333	0.00154%					Tetrasodium EDTA	79-06-1	0.10%	233	0.00015%					Acetic Acid, Potassium Salt	64-02-8	0.10%	233	0.00015%					Sulfuric Acid, Copper (2+) Salt (1:1)	127-08-2	0.10%	233	0.00015%					Acetic Acid	7758-98-7	0.10%	233	0.00015%		Crystalline Silica, Quartz		Proppant	Crystalline Silica in the form of Quartz	14808-60-7	100.00%	21,250,400	14.05535%	
			Glutaraldehyde	111-30-8	4.50%	1,635	0.00108%					Ethanol	64-17-5	4.50%	1,635	0.00108%					Methanol	67-56-1	0.10%	36	0.00002%		FFR4100	ChampionX	Friction Reducer	Water	7732-18-5	40.00%	93,332	0.06173%					1-Propanesulfonic Acid, 2-Methyl-2-((1-Oxo-2-Propenyl) Amino), Monosodium Salt, Polymer with 2-Propanamide	38193-60-1	20.00%	46,666	0.03087%					Distillates (Petroleum), Hydrorefined		20.00%	46,666	0.03087%					Sodium Chloride	64742-47-8	20.00%	46,666	0.03087%					Alcohols, C11-14-iso-, C13-Rich, Ethoxylated	7647-14-5	5.00%	11,667	0.00772%					Sorbitan, C2-9-Octadecanoate (2:3)	78330-21-9	5.00%	11,667	0.00772%					Alcohols, C9-11-iso-, C10-Rich	8007-43-0	5.00%	11,667	0.00772%					Sorbitan, Monooleate, Polyoxyethylene Derivs	88526-85-2	1.00%	2,333	0.00154%					Acrylamide	9005-65-6	1.00%	2,333	0.00154%					Tetrasodium EDTA	79-06-1	0.10%	233	0.00015%					Acetic Acid, Potassium Salt	64-02-8	0.10%	233	0.00015%					Sulfuric Acid, Copper (2+) Salt (1:1)	127-08-2	0.10%	233	0.00015%					Acetic Acid	7758-98-7	0.10%	233	0.00015%		Crystalline Silica, Quartz		Proppant	Crystalline Silica in the form of Quartz	14808-60-7	100.00%	21,250,400	14.05535%										
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			Sodium Chloride	64742-47-8	20.00%	46,666	0.03087%					Alcohols, C11-14-iso-, C13-Rich, Ethoxylated	7647-14-5	5.00%	11,667	0.00772%					Sorbitan, C2-9-Octadecanoate (2:3)	78330-21-9	5.00%	11,667	0.00772%					Alcohols, C9-11-iso-, C10-Rich	8007-43-0	5.00%	11,667	0.00772%					Sorbitan, Monooleate, Polyoxyethylene Derivs	88526-85-2	1.00%	2,333	0.00154%					Acrylamide	9005-65-6	1.00%	2,333	0.00154%					Tetrasodium EDTA	79-06-1	0.10%	233	0.00015%					Acetic Acid, Potassium Salt	64-02-8	0.10%	233	0.00015%					Sulfuric Acid, Copper (2+) Salt (1:1)	127-08-2	0.10%	233	0.00015%					Acetic Acid	7758-98-7	0.10%	233	0.00015%		Crystalline Silica, Quartz		Proppant	Crystalline Silica in the form of Quartz	14808-60-7	100.00%	21,250,400	14.05535%																																																																
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			Sorbitan, C2-9-Octadecanoate (2:3)	78330-21-9	5.00%	11,667	0.00772%					Alcohols, C9-11-iso-, C10-Rich	8007-43-0	5.00%	11,667	0.00772%					Sorbitan, Monooleate, Polyoxyethylene Derivs	88526-85-2	1.00%	2,333	0.00154%					Acrylamide	9005-65-6	1.00%	2,333	0.00154%					Tetrasodium EDTA	79-06-1	0.10%	233	0.00015%					Acetic Acid, Potassium Salt	64-02-8	0.10%	233	0.00015%					Sulfuric Acid, Copper (2+) Salt (1:1)	127-08-2	0.10%	233	0.00015%					Acetic Acid	7758-98-7	0.10%	233	0.00015%		Crystalline Silica, Quartz		Proppant	Crystalline Silica in the form of Quartz	14808-60-7	100.00%	21,250,400	14.05535%																																																																																		
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