

BEFORE THE INDUSTRIAL COMMISSION
OF THE STATE OF NORTH DAKOTA

CASE NO. 27047
ORDER NO. 29493

IN THE MATTER OF A HEARING CALLED ON A MOTION OF THE COMMISSION TO CONSIDER THE APPLICATION OF WHITING OIL AND GAS CORP. FOR AN ORDER AMENDING THE APPLICABLE ORDERS FOR THE DUTCH HENRY BUTTE AND DICKINSON-BAKKEN POOLS TO ESTABLISH TWO 2560-ACRE SPACING UNITS DESCRIBED AS SECTIONS 9, 10, 15, AND 16; AND SECTIONS 15, 16, 21, AND 22, T.140N., R.97W., STARK COUNTY, ND, AND AUTHORIZE ONE HORIZONTAL WELL TO BE DRILLED ON EACH SUCH UNIT, AND FOR SUCH OTHER RELIEF AS MAY BE APPROPRIATE.

ORDER OF THE COMMISSION

THE COMMISSION FINDS:

- (1) This cause came on for hearing at 9:00 a.m. on the 14th day of November, 2018.
- (2) The witnesses for Whiting Oil and Gas Corporation (Whiting) provided telephonic testimony in this matter pursuant to North Dakota Administrative Code (NDAC) Section 43-02-03-88.2. Telephonic Communication Affidavits were received on November 16, 2018; therefore, such testimony may be considered evidence.
- (3) Whiting made application to the Commission for an order amending the applicable orders for the Dutch Henry Butte and Dickinson-Bakken Pools to establish two 2560-acre spacing units described as Sections 9, 10, 15, and 16; and Sections 15, 16, 21, and 22, Township 140 North, Range 97 West, Stark County, North Dakota (Sections 9, 10, 15, 16, 21, and 22), and authorize one horizontal well to be drilled on each such unit, and for such other relief as may be appropriate.
- (4) Sections 15 and 22 are currently a standup 1280-acre spacing unit in Zone III in the Dickinson-Bakken Pool.
- (5) Sections 16 and 21; Section 9 and Section 4, Township 140 North, Range 97 West (Section 4); and Section 10 and Section 3, Township 140 North, Range 97 West (Section 3), Stark County, North Dakota, are currently standup 1280-acre spacing units in Zone V in the Dutch Henry Butte-Bakken Pool, which allows up to five horizontal wells.

(6) In 2560-acre spacing units for lease-line horizontal wells, which necessarily overlap into two fields, the Commission should establish the 2560-acre spacing unit in the first field alphabetically.

(7) Order No. 26257 entered in Case No. 23915, the most recent spacing order for the Dickinson-Bakken Pool, established proper spacing for the development of Zone I at one horizontal well per 1280 acres, Zone II at up to four horizontal wells per 1280 acres, and Zone III at up to five horizontal wells per 1280 acres.

(8) Whiting's idealized development plan for the 2560-acre spacing unit described as Sections 9, 10, 15, and 16 is to drill one horizontal well in the first bench in the Three Forks Formation approximately down the east-west section lines between Sections 9 and 10; and Sections 15 and 16.

Whiting's idealized development plan for the 2560-acre spacing unit described as Sections 15, 16, 21, and 22 is to drill one horizontal well in the first bench in the Three Forks Formation approximately down the north-south section lines between Sections 15 and 22; and Sections 16 and 21.

Utilization of horizontal drilling technology as proposed would result in the wells being completed at a location or locations not in compliance with current applicable spacing orders for the Dickinson or Dutch Henry Butte-Bakken Pool. The horizontal well designs proposed may be preliminary and could be changed for various reasons which is permissible as long as the horizontal well design still justifies the spacing unit.

(9) The Commission believes that lease-line wells should be located approximately on the section lines with some allowance for local reservoir conditions and existing Bakken Pool wells. Current setback requirements in Bakken Pools for standup 1280-acre spacing units require a 500-foot setback from the east and west boundaries, and a 50-foot, 100-foot, or 150-foot setback from the north and south boundaries depending on the well bore construction. These setback requirements leave a minimum 100-foot, 150-foot, 200-foot, 250-foot, 300-foot, or 1000-foot window between adjacent horizontal wells in adjacent spacing units. The purpose of a lease-line horizontal well is to recover the reserves from these 100-foot, 150-foot, 200-foot, 250-foot, 300-foot, or 1000-foot windows without unfairly encroaching on an existing horizontal well completed in a spacing unit or unfairly encroaching on the mineral or leasehold interest if the acreage is undeveloped or underdeveloped.

(10) The Commission believes the closer the lateral is to the interior north-south or east-west section lines in a lease-line 2560-acre spacing unit, the more likely it is to drain reserves equally from the adjoining spacing units.

(11) The Commission must balance its duty to prevent waste and its duty to protect correlative rights. The Commission must weigh all factors and then issue a decision which best protects the correlative rights of all interested parties.

(12) The Commission understands not all development on both sides of a north-south or east-west lease-line will be symmetrical in all cases; therefore, the Commission should allow this

lease-line development to take place within a 500-foot corridor to best protect the correlative rights of all interested parties.

(13) The Commission has established a consistent well location corridor for all lease-line horizontal wells.

(14) There are three horizontal wells completed in the Dickinson-Bakken Pool in the standup 1280-acre spacing unit described as Sections 15 and 22. There are three horizontal wells completed in the Dutch Henry Butte-Bakken Pool in each standup 1280-acre spacing unit described as Sections 3 and 10; Sections 4 and 9; and Sections 16 and 21.

(15) There were no objections to this application.

(16) If Whiting's activities are successful, greater ultimate recovery of oil and gas from the pool will be achieved which will prevent waste and the drilling of unnecessary wells in a manner which will not have a detrimental effect on correlative rights.

IT IS THEREFORE ORDERED:

(1) Sections 15, 16*, 21*, and 22, Township 140 North, Range 97 West, Stark County, North Dakota, are hereby established as a 2560-acre spacing unit for the exclusive purpose of drilling one lease-line horizontal well on a north-south orientation within said spacing unit within the Dickinson-Bakken Pool and Zone IV is hereby created to include said spacing unit. Existing and future vertical and directional wells drilled within the spacing unit herein established shall not be subject to this order.

*Sections 16 and 21 are within the Dutch Henry Butte Field.

(2) Sections 9*, 10*, 15, and 16*, Township 140 North, Range 97 West, Stark County, North Dakota, are hereby established as a 2560-acre spacing unit for the exclusive purpose of drilling one lease-line horizontal well on an east-west orientation within said spacing unit within the Dickinson-Bakken Pool and Zone V is hereby created to include said spacing unit. Existing and future vertical and directional wells drilled within the spacing unit herein established shall not be subject to this order.

*Sections 9, 10, and 16 are within the Dutch Henry Butte Field.

(3) The Director is hereby authorized to exercise continuing jurisdiction in this matter to determine whether a horizontal well proposed or drilled upon the 2560-acre spacing units herein established has justified the creation of such unit, to require amendments or modifications to the permit to drill for such horizontal well, and to deny a permit to drill in the event a well is proposed to be drilled in a manner inconsistent with the evidence that justified such spacing unit.

(4) Provisions established herein for the Dickinson-Bakken Pool are for the exclusive purpose of drilling horizontal wells. Existing and future vertical and directional wells drilled within the area defined in paragraph (5) below shall not be subject to this order.

(5) The Dickinson Field is hereby defined as the following described tracts of land in Stark County, North Dakota:

TOWNSHIP 140 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 13, 14, 15, 22, 23, 24, 25, 26, 27, 33, 34, 35 AND 36,

TOWNSHIP 140 NORTH, RANGE 96 WEST, 5TH PM

ALL OF SECTIONS 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33 AND 35,

TOWNSHIP 139 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 1, 2*, 3* AND 10*, AND THE NE/4 OF SECTION 4,

*The SW/4 SE/4, the S/2 SW/4, and the S/2 NW/4 SW/4 of Section 2, the E/2 SE/4 of Section 3, and the E/2 E/2 of Section 10 are also within the Eland Field.

TOWNSHIP 139 NORTH, RANGE 96 WEST, 5TH PM

ALL OF SECTIONS 5 AND 6.

(6) The Dickinson-Bakken Pool is hereby redefined as the following described tracts of land in Stark County, North Dakota:

ZONE I (1280H-STANDUP)

TOWNSHIP 140 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 25, 26, 27, 34, 35 AND 36,

TOWNSHIP 140 NORTH, RANGE 96 WEST, 5TH PM

ALL OF SECTIONS 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26 AND 35,

TOWNSHIP 139 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 3* AND 10*.

*The E/2 SE/4 of Section 3, and the E/2 E/2 of Section 10 are also within the Eland Field.

ZONE II (4/1280H-STANDUP)

TOWNSHIP 140 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 13, 14, 23 AND 24,

TOWNSHIP 140 NORTH, RANGE 96 WEST, 5TH PM

ALL OF SECTIONS 6 AND 7.

ZONE III (5/1280H-STANDUP)

TOWNSHIP 140 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 15 AND 22,

TOWNSHIP 140 NORTH, RANGE 96 WEST, 5TH PM

ALL OF SECTIONS 5 AND 8.

ZONE IV (2560H-NORTH/SOUTH ORIENTATION-LEASE-LINE)

TOWNSHIP 140 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 14, 15, 16*, 21*, 22 AND 23.

*Sections 16 and 21 are within the Dutch Henry Butte Field.

ZONE V (2560H-EAST/WEST ORIENTATION-LEASE-LINE)

TOWNSHIP 140 NORTH, RANGE 97 WEST, 5TH PM

ALL OF SECTIONS 9*, 10*, 15 AND 16*.

*Sections 9, 10, and 16 are within the Dutch Henry Butte Field.

(7) The Dickinson-Bakken Pool is hereby defined as that accumulation of oil and gas found in the interval from below the base of the Lodgepole Formation to 100 feet below the top of the Three Forks Formation within the limits of the field as set forth above.

(8) All portions of the well bore not isolated by cement of any horizontal well in the Dickinson-Bakken Pool shall adhere to the following requirements unless specifically provided for in the respective zone below unless granted an exception by the Commission after due notice and hearing:

- (a) Measurement inaccuracies in the directional survey equipment need not be considered except when deemed necessary by the Director.
- (b) The lateral, heel portion of the lateral, or toe portion of the lateral in horizontal well bores shall be no closer than 500 feet to the most nearly parallel spacing unit boundary.
- (c) The Director is hereby authorized to reduce the setback from 500 feet to 200 feet for horizontal well bores where the angle of the heel portion of the lateral and the respective spacing unit boundary is less than 45° through the issuance of permit stipulations, whenever, in his opinion, the applicant has demonstrated that correlative rights will be protected.
- (d) The heel portion of the lateral in horizontal well bores where the angle of such is greater than 45° from the respective most nearly perpendicular spacing unit boundary, shall be no closer than 150 feet to said boundary.
- (e) The lateral or toe portion of the lateral in horizontal well bores where the angle of such is greater than 45° from the respective most nearly perpendicular spacing unit boundary, shall adhere to the following:
 - (i) For horizontal wells completed open hole, the total depth of the well bore shall be no closer than 150 feet to the boundary of the spacing unit;
 - (ii) For horizontal wells completed with the production liner or casing cemented in the lateral, the total depth of the well bore shall be no closer than 50 feet to

the boundary of the spacing unit, unless the horizontal well is stimulated through the shoe at the toe of the lateral whereby the total depth of the well bore shall be no closer than 150 feet to the boundary of the spacing unit; and

- (iii) For horizontal wells completed with the production liner or casing externally isolated in the lateral by the use of packers, the total depth of the well bore shall be no closer than 100 feet to the boundary of the spacing unit unless the horizontal well is stimulated through the shoe at the toe of the lateral whereby the total depth of the well bore shall be no closer than 150 feet to the boundary of the spacing unit.

(9) The Application for Permit to Drill (Form 1) for a horizontal well to be completed in the Dickinson-Bakken Pool shall include a well schematic which depicts the:

- (a) Proposed production casing setting depth at the heel relative to the spacing unit boundary;
- (b) Proposed completion style as open hole lateral, cemented liner or casing in the lateral, liner or casing externally isolated in the lateral by the use of packers, or other completion style; and
- (c) Proposed toe of the lateral including the location of the deepest perforation, completion sleeve, and/or external isolation packer.

(10) The Completion Report (Form 6) for a horizontal well completed in the Dickinson-Bakken Pool shall include a well schematic which depicts the:

- (a) Production casing setting depth at the heel relative to the spacing unit boundary;
- (b) Completion style as open hole lateral, cemented liner or casing in the lateral, liner or casing externally isolated in the lateral by the use of packers, or other completion style; and
- (c) Toe of the lateral including the location of the deepest perforation, completion sleeve, and/or external isolation packer.

(11) The proper spacing for the development of Zone I in the Dickinson-Bakken Pool is hereby set at one horizontal well per standup 1280-acre spacing unit.

(12) Sections 25 and 36; Sections 26 and 35; Sections 27 and 34, Township 140 North, Range 97 West; Sections 14 and 23; Sections 15 and 22; Sections 16 and 21; Sections 17 and 20; Sections 18 and 19; Sections 26 and 35, Township 140 North, Range 96 West; and Sections 3* and 10*, Township 139 North, Range 97 West, Stark County, North Dakota, are hereby designated standup 1280-acre spacing units in Zone I in the Dickinson-Bakken Pool.

*The E/2 SE/4 of Section 3, and the E/2 E/2 of Section 10 are also within the Eland Field.

(13) Spacing units hereafter created in Zone I in the Dickinson-Bakken Pool shall be standup spacing units consisting of two adjacent governmental sections.

(14) Zone I in the Dickinson-Bakken Pool shall not be extended except by further order of the Commission after due notice and hearing.

(15) The proper spacing for the development of Zone II in the Dickinson-Bakken Pool is hereby set at up to four horizontal wells per standup 1280-acre spacing unit.

(16) Sections 13 and 24; and Sections 14 and 23, Township 140 North, Range 97 West; and Sections 6 and 7, Township 140 North, Range 96 West, Stark County, North Dakota, are hereby designated standup 1280-acre spacing units in Zone II in the Dickinson-Bakken Pool.

(17) Spacing units hereafter created in Zone II in the Dickinson-Bakken Pool shall be standup spacing units consisting of two adjacent governmental sections.

(18) Zone II in the Dickinson-Bakken Pool shall not be extended except by further order of the Commission after due notice and hearing.

(19) The proper spacing for the development of Zone III in the Dickinson-Bakken Pool is hereby set at up to five horizontal wells per standup 1280-acre spacing unit.

(20) Sections 15 and 22, Township 140 North, Range 97 West; and Sections 5 and 8, Township 140 North, Range 96 West, Stark County, North Dakota, are hereby designated standup 1280-acre spacing units in Zone III in the Dickinson-Bakken Pool.

(21) Spacing units hereafter created in Zone III in the Dickinson-Bakken Pool shall be standup spacing units consisting of two adjacent governmental sections.

(22) Zone III in the Dickinson-Bakken Pool shall not be extended except by further order of the Commission after due notice and hearing.

(23) The proper spacing for the development of Zone IV in the Dickinson-Bakken Pool is hereby set at one lease-line horizontal well per 2560-acre spacing unit drilled on a north-south orientation.

(24) All portions of the well bore not isolated by cement of any horizontal well in Zone IV in the Dickinson-Bakken Pool shall be located approximately down the north-south axis and comply with paragraph (8) above.

(25) Sections 14, 15, 22, and 23; and Sections 15, 16*, 21*, and 22, Township 140 North, Range 97 West, Stark County, North Dakota, are hereby designated 2560-acre spacing units in Zone IV in the Dickinson-Bakken Pool.

*Sections 16 and 21 are within the Dutch Henry Butte Field.

(26) Spacing units hereafter created in Zone IV in the Dickinson-Bakken Pool shall consist of four adjacent governmental sections designated by the Commission.

(27) Zone IV in the Dickinson-Bakken Pool shall not be extended except by further order of the Commission after due notice and hearing.

(28) The proper spacing for the development of Zone V in the Dickinson-Bakken Pool is hereby set at one lease-line horizontal well per 2560-acre spacing unit drilled on an east-west orientation.

(29) All portions of the well bore not isolated by cement of any horizontal well in Zone V in the Dickinson-Bakken Pool shall be located approximately down the east-west axis and comply with paragraph (8) above.

(30) Sections 9*, 10*, 15, and 16*, Township 140 North, Range 97 West, Stark County, North Dakota, are hereby designated a 2560-acre spacing unit in Zone V in the Dickinson-Bakken Pool.

*Sections 9, 10, and 16 are within the Dutch Henry Butte Field.

(31) Spacing units hereafter created in Zone V in the Dickinson-Bakken Pool shall consist of four adjacent governmental sections designated by the Commission.

(32) Zone V in the Dickinson-Bakken Pool shall not be extended except by further order of the Commission after due notice and hearing.

(33) The operator of any horizontally drilled well in the Dickinson-Bakken Pool shall cause to be made a directional survey of the well bore. The directional survey contractor shall file a certified survey with the Commission within 30 days after completion of the well in accordance with NDAC Section 43-02-03-25. The survey shall be of sufficient quality to enable the Commission to determine the entire completion location of the well and its terminus.

(34) The Director is hereby authorized to exercise continuing jurisdiction to determine whether any well proposed or drilled upon any spacing unit herein established has justified the creation of such unit, to require amendments or modifications to the permit to drill for such well, and to deny a permit to drill in the event a well is proposed to be drilled in a manner inconsistent with the evidence that justified the spacing requirements in the Dickinson-Bakken Pool.

(35) The Commission shall have continuing jurisdiction in this matter and specifically reserves the authority, upon its own motion or the motion of any interested party, to: (1) review the spacing requirements for the Dickinson-Bakken Pool; (2) determine whether the separate zones of spacing established herein are warranted; and, (3) make such further amendments or modifications to the spacing requirements for the Dickinson-Bakken Pool as the Commission deems appropriate.

(36) No well shall be hereafter drilled or produced in the Dickinson-Bakken Pool, as defined herein, except in conformity with the regulations above without special order of the Commission after due notice and hearing.

(37) The following rules concerning the casing, tubing and equipping of wells shall apply to the subsequent drilling and operation of wells in the Dickinson-Bakken Pool:

- (a) The surface casing shall consist of new or reconditioned pipe that has been previously tested to 1000 pounds per square inch. The casing shall be set and cemented at a point not less than 50 feet below the base of the Fox Hills Formation. Sufficient cement shall be used to fill the annular space outside the pipe to the surface of the ground or the bottom of the cellar, and sufficient scratchers and centralizers shall be used to assure a good cement job. Cement shall be allowed to stand a minimum of 12 hours before drilling the plug or initiating tests. The quality of cement shall conform to the standards provided under NDAC Section 43-02-03-21. After cementing, the casing shall be tested by application of pump pressure of at least 1000 pounds per square inch. If, at the end of 30 minutes this pressure has dropped 100 pounds per square inch or more, the casing shall be repaired. Thereafter, the casing shall again be tested in the same manner. Further work shall not proceed until a satisfactory test has been obtained;
- (b) The producing or oil string shall consist of new or reconditioned pipe that has been previously tested to 2000 pounds per square inch. Casing shall be set and cemented at a point not higher than the top of the producing formation, or at a point approved by the Director. Sufficient cement shall be used and applied in such manner to protect and isolate all formations containing oil and/or gas, protect the pipe through salt sections encountered, and to isolate the Dakota-Lakota Series. The cement shall be allowed to stand a minimum of 15 hours before drilling the plug or initiating tests. The quality of cement shall conform to the standards provided under NDAC Section 43-02-03-21. After cementing, the casing shall be tested by application of pump pressure of at least 1500 pounds per square inch. If, at the end of 30 minutes this pressure has dropped 150 pounds per square inch or more, the casing shall be repaired. Thereafter, the casing shall again be tested in the same manner. Further work shall not proceed until a satisfactory test has been obtained;
- (c) All well-head fittings and connections shall have a working pressure in excess of that to which they are expected to be subjected; and,
- (d) All wells shall be equipped with tubing; a tubing packer must also be utilized in flowing wells unless a waiver is obtained from the Director after demonstrating the casing will not be subjected to excessive pressure or corrosion; all tubing shall be of sufficient internal diameter to allow the passage of a bottom hole pressure gauge for the purpose of obtaining bottom hole pressure measurements.

(38) The gas-oil ratio of all wells not connected to a gas gathering system shall be measured annually during the month of May. The reservoir pressure shall be measured in any well completed in the Dickinson-Bakken Pool if deemed necessary by the Director. Drill stem test pressures are acceptable for determining reservoir pressure. Pressure measurements shall be made at or adjusted to a subsea datum of 7450 feet. All gas-oil ratio and reservoir pressure determinations shall be made by methods approved by the Director and reported to the Director within 15 days following the end of the month in which they are determined. The Director is authorized to waive these requirements if the necessity therefor can be demonstrated to his satisfaction. All additional gas-oil

ratio and reservoir pressure determinations conducted on any well, but not specially required herein, shall be reported to the Director within 15 days following the end of the month in which they are determined.

(39) No saltwater, drilling mud, crude oil, or waste oil shall be stored in pits in this field, except in an emergency, and approved by the Director.

(40) The first horizontal well completed in each Dickinson-Bakken Pool non-overlapping spacing unit shall be allowed to produce at a maximum efficient rate.

(41) All wells completed in the Dickinson-Bakken Pool that have received an exemption to North Dakota Century Code Section 38-08-06.4 shall be allowed to produce at a maximum efficient rate.

(42) All infill horizontal wells, including overlapping spacing units, completed in the Dickinson-Bakken Pool, shall be allowed to produce at a maximum efficient rate for a period of 90 days commencing on the first day oil is produced through well-head equipment into tanks from the ultimate producing interval after casing has been run; after that, such wells shall be allowed to continue to produce at a maximum efficient rate if the well or operator meets or exceeds the Commission approved gas capture goals. The gas capture percentage shall be calculated by summing monthly gas sold plus monthly gas used on lease plus monthly gas processed in a Commission approved beneficial manner, divided by the total monthly volume of associated gas produced by the operator. The operator is allowed to remove the initial 14 days of flowback gas in the total monthly volume calculation. The Commission will accept compliance with the gas capture goals by well, field, county, or statewide by operator. If such gas capture percentage is not attained at maximum efficient rate, the well(s) shall be restricted to 200 barrels of oil per day if at least 60% of the monthly volume of associated gas produced from the well is captured, otherwise oil production from such wells shall not exceed 100 barrels of oil per day.

The Commission will recognize the following as surplus gas being utilized in a beneficial manner:

- (a) Equipped with an electrical generator that consumes surplus gas from the well;
- (b) Equipped with a system that intakes the surplus gas and natural gas liquids volume from the well for beneficial consumption by means of compression to liquid for use as fuel, transport to a processing facility, production of petrochemicals or fertilizer, conversion to liquid fuels, separating and collecting the propane and heavier hydrocarbons; and
- (c) Equipped with other value-added processes as approved by the Director which reduce the volume or intensity of the flare by more than 60%.

(43) If the flaring of gas produced with crude oil from the Dickinson-Bakken Pool is determined by the North Dakota Department of Health as causing a violation of the North Dakota Air Pollution Control Rules (NDAC Article 33-15), production from the pool may be further restricted.

(44) This order shall cover all of the Dickinson-Bakken Pool, common source of supply of crude oil and/or natural gas as herein defined, and continues in full force and effect until further order of the Commission or until the last well in the pool has been plugged and abandoned.

Dated this 19th day of February, 2019.

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA

By the Director, on behalf of the Commission

/s/ Lynn D. Helms, Director