

BEFORE THE INDUSTRIAL COMMISSION
OF THE STATE OF NORTH DAKOTA

CASE NO. 13342
ORDER NO. 15619

IN THE MATTER OF A HEARING CALLED ON A MOTION OF THE COMMISSION TO CONSIDER THE APPLICATION OF CONTINENTAL RESOURCES, INC. FOR AN ORDER AUTHORIZING THE DRILLING, COMPLETING, AND PRODUCING OF HORIZONTAL INCREASE DENSITY WELLS ON EACH 1280-ACRE SPACING UNIT WITHIN THE SADLER-BAKKEN POOL, DIVIDE COUNTY, ND, NOT TO EXCEED A TOTAL OF SEVEN HORIZONTAL WELLS ON EACH SUCH SPACING UNIT, ELIMINATING ANY TOOL ERROR REQUIREMENTS, AND SUCH OTHER RELIEF AS IS APPROPRIATE.

ORDER OF THE COMMISSION

THE COMMISSION FINDS:

- (1) This cause came on for hearing at 9:00 a.m. on the 16th day of September, 2010.
- (2) Continental Resources, Inc. (Continental) provided exhibits and testimony in this matter by sworn affidavits.
- (3) Continental made application to the Commission for an order authorizing the drilling, completing and producing of horizontal increase density wells on each 1280-acre spacing unit within the Sadler-Bakken Pool, Divide County, North Dakota, not to exceed a total of seven horizontal wells on each such spacing unit, eliminating any tool error requirements, and such other relief as is appropriate.
- (4) Order No. 15193 entered in Case No. 12926, the most recent spacing order for the Sadler-Bakken Pool, established proper spacing for the development of Zone I at one well per 160 acres, Zone II at one horizontal well per 640 acres, Zone III at one horizontal well per 1280 acres, and Zone IV at up to two horizontal wells per 1280 acres.
- (5) Continental operates the following 1280-acre spacing units in Zone III in the Sadler-Bakken Pool: Sections 2 and 11; Sections 3 and 10; Sections 4 and 9; Sections 5 and 8; Sections 6 and 7; Sections 14 and 23; Sections 16 and 21; and Sections 28 and 33, Township 161

North, Range 95 West, Divide County, North Dakota. Continental operates the following 1280-acre spacing units in Zone IV in the Sadler-Bakken Pool: Sections 15 and 22; Sections 26 and 35; and Sections 27 and 34, Township 161 North, Range 95 West, Divide County, North Dakota. These 1280-acre spacing units comprise Zones III and IV in their entirety.

The Continental #1-11H Spooner well (File No. 17650) is a single-lateral horizontal well completed in the upper Three Forks Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 2 and 11, from a surface location 160 feet from the south line and 1320 feet from the east line of said Section 11 to a bottom hole location in the NE/4 NE/4 of said Section 2. The Continental #1-10H Rossow well (File No. 17428) is a single-lateral horizontal well completed in the middle member of the Bakken Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 3 and 10, from a surface location 150 feet from the south line and 1060 feet from the west line of said Section 10 to a bottom hole location in the NW/4 NW/4 of said Section 3. The Continental #1-4H Tanberg well (File No. 17651) is a single-lateral horizontal well completed in the middle member of the Bakken Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 4 and 9, from a surface location 325 feet from the north line and 1470 feet from the west line of said Section 4 to a bottom hole location in the SE/4 SW/4 of said Section 9. The Continental #1-8H Freddy well (File No. 19966) is a horizontal well permitted in the Sadler-Bakken Pool in the spacing unit described as said Sections 5 and 8, at a surface location 170 feet from the south line and 1980 feet from the east line of said Section 8. The Continental #1-7H Joanne well (File No. 18864) is a single-lateral horizontal well completed in the upper Three Forks Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 6 and 7, from a surface location 325 feet from the south line and 900 feet from the west line of said Section 7 to a bottom hole location in the NE/4 NW/4 of said Section 6. The Continental #1-14H Melgaard well (File No. 18683) is a single-lateral horizontal well completed in the middle member of the Bakken Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 14 and 23, from a surface location 230 feet from the north line and 1320 feet from the east line of said Section 14 to a bottom hole location in the SE/4 SE/4 of said Section 23. The Continental #1-15H Shonna well (File No. 17235) is a single-lateral horizontal well completed in the middle member of the Bakken Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 15 and 22, from a surface location 150 feet from the north line and 1050 feet from the west line of said Section 15 to a bottom hole location in the SE/4 SW/4 of said Section 22. The Continental #2-15H Shonna well (File No. 18879) is a single-lateral horizontal well completed in the upper Three Forks Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 15 and 22, from a surface location 375 feet from the north line and 630 feet from the west line of said Section 15 to a bottom hole location in the SW/4 SW/4 of said Section 22. The Continental #1-16H Bliss well (File No. 16869) is a single-lateral horizontal well completed in the middle member of the Bakken Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 16 and 21, from a surface location 135 feet from the north line and 1680 feet from the west line of said Section 16 to a bottom hole location in the SE/4 SW/4 of said Section 21. The Continental #1-35H Bratlien well (File No. 17666) is a single-lateral horizontal well completed in the upper Three Forks Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 26 and 35, from a surface location 420 feet from the south line and 1320 feet from the west line of said Section 35 to a bottom hole location in the NE/4 NW/4 of said Section 26. The Continental #2-35H Bratlien well (File No. 19749) is a single-lateral horizontal well completed in the middle member of the Bakken Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 26 and 35, from a surface location 400 feet from the south line and 1037 feet from the west line of said Section 35 to a bottom hole location in the NW/4 NW/4 of said Section 26. The Continental #1-34H Arvid well (File No.

17283) is a single-lateral horizontal well completed in the upper Three Forks Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 27 and 34, from a surface location 375 feet from the south line and 1625 feet from the east line of said Section 34 to a bottom hole location in the NW/4 NE/4 of said Section 27. The Continental #2-34H Arvid well (File No. 18370) is a single-lateral horizontal well completed in the middle member of the Bakken Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 27 and 34, from a surface location 250 feet from the south line and 2025 feet from the east line of said Section 34 to a bottom hole location in the NW/4 NE/4 of said Section 27. The Continental #1-33H Elveida well (File No. 17275) is a single-lateral horizontal well completed in the upper Three Forks Formation in the Sadler-Bakken Pool in the spacing unit described as said Sections 28 and 33, from a surface location 220 feet from the south line and 1450 feet from the east line of said Section 33 to a bottom hole location in the NW/4 NE/4 of said Section 28.

(6) Continental's idealized development plan for each standup 1280-acre spacing unit in the Sadler-Bakken Pool described as Sections 2 and 11; Sections 3 and 10; Sections 4 and 9; Sections 5 and 8; Sections 6 and 7; Sections 14 and 23; Sections 15 and 22; Sections 16 and 21; Sections 26 and 35; Sections 27 and 34; and Sections 28 and 33, Township 161 North, Range 95 West, Divide County, North Dakota, is to drill seven single-lateral horizontal wells, four in the middle member of the Bakken Formation and three in the upper Three Forks Formation. The horizontal wells will be located 660 feet apart, alternating between the middle member of the Bakken Formation and the upper Three Forks Formation, starting with a horizontal well in the middle member of the Bakken Formation at 660 feet from the west spacing unit boundary. 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 Sadler-Bakken Pool. The horizontal well designs proposed may be preliminary and could be changed for various reasons which is permissible.

(7) Continental requested any tool error in the directional survey equipment when calculating the bottom hole location of any horizontal lateral drilled in the spacing units be waived.

(8) The Commission enforces a policy which requires measurement inaccuracies in the directional survey equipment be considered when the angle between the horizontal lateral and the corresponding spacing unit boundary is ten degrees or less.

(9) Waiving potential tool error in the directional survey equipment when calculating the bottom hole location of any horizontal lateral in spacing units which allow multiple horizontal wells will allow said spacing units to be more efficiently developed.

(10) There were no objections to this application.

(11) If Continental'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 2 and 11; Sections 3 and 10; Sections 4 and 9; Sections 5 and 8; Sections 6 and 7; Sections 14 and 23; Sections 15 and 22; Sections 16 and 21; Sections 26 and 35; Sections 27 and

34; and Sections 28 and 33, Township 161 North, Range 95 West, Divide County, North Dakota, are hereby established as standup 1280-acre spacing units for the exclusive purpose of drilling up to seven horizontal wells within each said spacing unit within the Sadler-Bakken Pool and Zone III is hereby redefined to include said spacing units. Existing and future vertical and directional wells drilled within the spacing units herein established shall conform to the applicable spacing requirements providing for the orderly development of Zone I in the Sadler-Bakken Pool.

(2) The Director is hereby authorized to exercise continuing jurisdiction in this matter to determine whether a horizontal well proposed or drilled upon the 1280-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.

(3) The Sadler Field is hereby defined as the following described tracts of land in Divide County, North Dakota:

TOWNSHIP 161 NORTH, RANGE 95 WEST, 5TH PM
ALL OF SECTIONS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 21, 22, 23, 26, 27, 28, 33, 34 AND 35, AND THE N/2 OF SECTION 20.

(4) The Sadler-Bakken Pool is hereby redefined as the following described tracts of land in Divide County, North Dakota:

ZONE I (160)

TOWNSHIP 161 NORTH, RANGE 95 WEST, 5TH PM
ALL OF SECTIONS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 21, 22, 23, 26, 27, 28, 33, 34 AND 35, AND THE N/2 OF SECTION 20*.

*Note Section 20 is part of a 1280-acre spacing unit consisting of Sections 17 and 20, Township 161 North, Range 95 West, Divide County, North Dakota, in the Dolphin-Bakken Pool.

ZONE II (640H)

TOWNSHIP 161 NORTH, RANGE 95 WEST, 5TH PM
ALL OF SECTION 17.

ZONE III (7/1280H-STANDUP)

TOWNSHIP 161 NORTH, RANGE 95 WEST, 5TH PM
ALL OF SECTIONS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 21, 22, 23, 26, 27, 28, 33, 34 AND 35.

(5) The Sadler-Bakken Pool is hereby defined as that accumulation of oil and gas found in the interval from 50 feet above the top of the Bakken Formation to 50 feet below the top of the Three Forks Formation within the limits of the field as set forth above.

(6) The proper spacing for the development of Zone I in the Sadler-Bakken Pool is hereby set at one well per 160-acre spacing unit.

(7) All wells in Zone I in the Sadler-Bakken Pool shall be located not less than 500 feet from a spacing unit boundary. Wells presently permitted to or producing from the pool that do not conform to this spacing pattern shall be considered exceptions.

(8) Spacing units in Zone I in the Sadler-Bakken Pool shall consist of a governmental quarter section or governmental lots corresponding thereto.

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

(10) Provisions established herein for Zone II in the Sadler-Bakken Pool are for the exclusive purpose of drilling horizontal wells. Existing and future vertical and directional wells drilled within the area defined as Zone II in paragraph (4) above shall conform to the applicable spacing requirements for the orderly development of Zone I in the Sadler-Bakken Pool.

(11) The proper spacing for the development of Zone II in the Sadler-Bakken Pool is hereby set at one horizontal well per 640-acre spacing unit.

(12) All portions of the well bore not isolated by cement of any horizontal well in Zone II in the Sadler-Bakken Pool shall be no closer than 500 feet to the boundary of the spacing unit the lateral is most nearly parallel to and 200 feet to the boundary of the spacing unit the lateral is most nearly perpendicular to. Measurement inaccuracies in the directional survey equipment need not be considered except when deemed necessary by the Director.

(13) Section 17, Township 161 North, Range 95 West, Divide County, North Dakota, is hereby designated a 640-acre spacing unit in Zone II in the Sadler-Bakken Pool.

(14) Spacing units in Zone II in the Sadler-Bakken Pool shall consist of a governmental section or governmental lots corresponding thereto.

(15) Sections 17 and 20, Township 161 North, Range 95 West, Divide County, North Dakota, are also designated a 1280-acre spacing unit in the Dolphin-Bakken Pool.

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

(17) Provisions established herein for Zone III in the Sadler-Bakken Pool are for the exclusive purpose of drilling horizontal wells. Existing and future vertical and directional wells drilled within the area defined as Zone III in paragraph (4) above shall conform to the applicable spacing requirements for the orderly development of Zone I in the Sadler-Bakken Pool.

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

(19) All portions of the well bore not isolated by cement of any horizontal well in Zone III in the Sadler-Bakken Pool shall be no closer than 500 feet to the east or west boundary and 200 feet to the north or south boundary of the spacing unit. Measurement inaccuracies in the directional survey equipment when calculating the bottom hole location in a horizontal well need not be considered.

(20) Sections 2 and 11; Sections 3 and 10; Sections 4 and 9; Sections 5 and 8; Sections 6 and 7; Sections 14 and 23; Sections 15 and 22; Sections 16 and 21; Sections 26 and 35; Sections 27 and 34; and Sections 28 and 33, Township 161 North, Range 95 West, Divide County, North Dakota, are hereby designated standup 1280-acre spacing units in Zone III in the Sadler-Bakken Pool.

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

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

(23) The operator of any horizontally drilled well in the Sadler-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 North Dakota Administrative Code (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.

(24) 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 Sadler-Bakken Pool.

(25) 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 Sadler-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 Sadler-Bakken Pool as the Commission deems appropriate.

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

(27) The following rules concerning the casing, tubing and equipping of wells shall apply to the subsequent drilling and operation of wells in the Sadler-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;

- (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 shall have 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.

(28) 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 Sadler-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 6280 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 therefore 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.

(29) 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.

(30) All wells in the Sadler-Bakken Pool shall be allowed to produce at a maximum efficient rate for a period of 30 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; thereafter, oil production from such wells shall not exceed an average of 100 barrels of oil per day; if and when such wells are connected to a gas gathering and processing facility the foregoing restrictions shall be removed, and the wells shall be allowed to produce at a maximum efficient rate. The Director is authorized to issue an administrative order allowing unrestricted production at a maximum efficient rate for a period not to exceed 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, if the necessity therefor can be demonstrated to his satisfaction.

(31) If the flaring of gas produced with crude oil from the Sadler-Bakken Pool causes, or threatens to cause, degradation of ambient air quality, production from the pool shall be further restricted.

(32) This order shall cover all of the Sadler-Bakken Pool common source of supply of crude oil and/or natural gas as herein defined, and all provisions of the pool shall continue 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 4th day of August, 2011.

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA

By the Director, on behalf of the Commission

/s/ Lynn D. Helms, Director