

BEFORE THE INDUSTRIAL COMMISSION
OF THE STATE OF NORTH DAKOTA

CASE NO. 7167
ORDER NO. 8365

IN THE MATTER OF A HEARING
CALLED ON A MOTION OF THE
COMMISSION TO CONSIDER THE
APPLICATION OF ARMSTRONG
RESOURCES, L.L.C. FOR AN ORDER
EXTENDING THE FIELD LIMITS OF THE
AMBROSE FIELD TO INCLUDE ALL OF
SECTION 16, T.163N., R.99W., DIVIDE
COUNTY, NORTH DAKOTA, AND
ESTABLISH A SPACING UNIT FOR THE
AMBROSE-DUPEROW POOL CONSISTING
OF ALL OF SAID SECTION 16, AND
ALLOWING A HORIZONTAL WELL TO BE
DRILLED AT ANY LOCATION THEREON
NOT CLOSER THAN 500 FEET TO THE
BOUNDARY OF SAID SECTION 16, OR
FOR SUCH OTHER AND FURTHER
RELIEF AS THE COMMISSION DEEMS
APPROPRIATE.

ORDER OF THE COMMISSION

THE COMMISSION FINDS:

(1) This cause came on for hearing at 9:00 a.m. on the 21st day of October, 1998.

(2) Order No. 3215 entered in Case No. 2856, established proper spacing for the development of the Ambrose-Duperow Pool at one well per 160 acres.

(3) Armstrong Resources, L.L.C. (Armstrong) made application to the Commission for an order extending the limits of the Ambrose Field to include all of Section 16, Township 163 North, Range 99 West, Divide County, North Dakota (Section 16), to establish a spacing unit for the Ambrose-Duperow Pool consisting of all of Section 16, and allowing a horizontal well to be drilled at any location thereon, not closer than 500 feet to the boundary of the section, or for such other and further relief as the Commission deems appropriate.

(4) Armstrong desires to utilize technology to drill horizontally through the Duperow Pool. Utilization of this technology may result in the well being completed at a location or locations not in compliance with current applicable spacing orders for the Ambrose-Duperow Pool.

(5) Flexibility with respect to spacing unit size and the location of wells in the Ambrose-Duperow Pool is essential to efficiently produce as much recoverable oil and gas as economically possible.

(6) Pursuant to North Dakota Century Code Section 38-08-07, spacing units must be of uniform size and shape for the entire pool, except when found necessary to prevent waste, avoid the drilling of unnecessary wells, or to protect correlative rights, the Commission is authorized to divide any pool into zones and establish spacing units for each zone, which units may differ in size and shape from those established in any other zone.

(7) Zones of different spacing within the Ambrose-Duperow Pool will

allow the flexibility needed for utilization of horizontal drilling.

(8) Granting maximum flexibility in spacing unit size and in locating and drilling horizontal wells will result in economic and efficient development of the oil and gas resources in a manner that prevents waste and protects correlative rights.

(9) There were no objections to this application.

(10) Approval of this application will prevent waste, avoid the drilling of unnecessary wells, and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) Section 16, Township 163 North, Range 99 West, Divide County, North Dakota, is hereby established as a 640-acre spacing unit for the Ambrose-Duperow Pool and Zone II of such pool is hereby created.

(2) Armstrong Resources, L.L.C., its successor and assigns, is hereby given exclusive authority to apply for a permit to drill a horizontal well upon said spacing unit created in paragraph (1) above. Such exclusive authority shall terminate on February 4, 1999.

(3) 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 determine whether a horizontal well proposed or drilled upon the 640-acre spacing unit herein established, has justified the creation of such unit.

(4) The Ambrose Field is hereby redefined as the following described tracts of land in Divide County, North Dakota:

TOWNSHIP 163 NORTH, RANGE 99 WEST, 5TH PM
ALL OF SECTIONS 13, 14, 15, 16, 22, 23 AND 24,

together with those additional quarter sections or governmental lots corresponding thereto as may be proven productive by wells drilled on lands within one mile of the boundaries of the field as set forth above, provided further that such extensions of the field boundaries shall include only sufficient acreage to form a spacing unit for such wells, and any intervening lands.

(5) The Ambrose-Duperow Pool is hereby redefined as the following described tracts of land in Divide County, North Dakota:

ZONE I

TOWNSHIP 163 NORTH, RANGE 99 WEST, 5TH PM
ALL OF SECTIONS 13, 14, 15, 22, 23 AND 24,

together with those additional quarter sections or governmental lots corresponding thereto as may be proven productive by wells drilled on lands within one mile of the boundaries of the field as set forth above, provided further that such extensions of the field boundaries shall include only sufficient acreage to form a spacing unit for such wells, and any intervening lands.

ZONE II

TOWNSHIP 163 NORTH, RANGE 99 WEST, 5TH PM
ALL OF SECTION 16.

(6) The Ambrose-Duperow Pool be, and the same is hereby redefined as that accumulation of oil and gas found in the interval from below the base of the Birdbear Formation to above the top of the Souris River Formation within the limits of the field as set forth above.

(7) The proper spacing for the Ambrose-Duperow Pool in Zone I shall be one well per 160 acres and spacing units shall consist of a governmental quarter section or governmental lots corresponding thereto.

(8) All wells hereafter drilled in the Ambrose-Duperow Pool in Zone I shall be located not less than 500 feet from a spacing unit boundary nor closer than 1650 feet to a well permitted to or producing from the pool.

(9) The proper spacing for the development of the Ambrose-Duperow Pool in Zone II is hereby set at one horizontal well to each 640 acres. Spacing units shall consist of a governmental section.

(10) Zone II shall not be extended except by further order of the Commission after notice and hearing.

(11) All portions of the well bore not isolated by cement of any horizontal well hereafter drilled in Zone II shall be no closer than 500 feet to the boundary of the spacing unit. Measurement inaccuracies in the directional survey equipment shall be considered when determining compliance with the 500-feet setback.

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

(13) The operator of any horizontally drilled well in the Ambrose-Duperow Pool shall cause to be made a directional survey of the well bore. The survey shall be filed with the Commission within 30 days after completion of the well and shall be of sufficient quality to enable the Commission to determine the entire completion location of the well and its terminus.

(14) 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 Ambrose-Duperow 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 Ambrose-Duperow Pool as the Commission deems appropriate.

(15) The following rules concerning the casing, tubing and equipping of wells shall apply to the subsequent drilling and operation of wells in the Ambrose-Duperow 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 North Dakota Administrative Code (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 as to adequately 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 2000 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 and all flowing wells shall be equipped with tubing and tubing packer; 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.

(16) The gas-oil ratio of each well shall be measured during the months of May and November, and the reservoir pressure of flowing wells shall be measured in the months of May and November, and in pumping wells when the rods are pulled but at least once annually and reported to the Director within 15 days following the end of the month in which they are determined. Pressure measurements shall be made at or adjusted to a subsea datum of 6340 feet after the well has been shut in for 48 hours. All gas-oil ratio and reservoir pressure determinations shall be made by methods approved by the Director. The Director is authorized to waive these requirements if the necessity therefore can be demonstrated to his satisfaction.

(17) No salt water shall be stored in pits in this field, except in an emergency, and approved by the Director.

(18) In accordance with Commission Order No. 3215, the Dakota-Lakota Series in and under the Ambrose Field is hereby designated Field is hereby designated a disposal reservoir, and the Director is authorized to approve requests to utilize wells in the field, as herein defined, for saltwater disposal purposes.

(19) All wells in the Ambrose-Duperow Pool shall be allowed to produce at an unrestricted rate for a period of 60 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, oil production from such wells shall not exceed an average of 200 barrels per day for a period of 60 days; after that, oil production from such wells shall not exceed an average of 150 barrels per day for a period of 60 days, 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.

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

(21) This order shall cover all of the Ambrose-Duperow Pool common source of supply of crude oil and/or natural gas as herein defined, and 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 November, 1998.

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA

/s/ Edward T. Schafer, Governor

/s/ Heidi Heitkamp, Attorney General

/s/ Roger Johnson, Commissioner of Agriculture