

CASE 3243: Application of MONSANTO
CO. for pool rules for DAGGER
DRAW-STRAN & DAGGER DRAW MORROW.

Cartier & P. Co. Corp.

Carle

Atlantic

~~Atlantic~~

Reopen on

Feb. 1967

CASE No.
2243

Application,
TRANSCRIPTS,
SMALL Exhibits
ETC.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3243
Order No. R-2919-A

APPLICATION OF MONSANTO COMPANY
FOR SPECIAL POOL RULES, EDDY
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on February 21, 1967,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 23rd day of February, 1967, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

- (1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.
- (2) That by Order No. R-2919, dated June 8, 1965, temporary
Special Rules and Regulations were promulgated for the Dagger Draw-
Morrow Gas Pool, Eddy County, New Mexico, for a period of one year
from the date of first pipeline connection.
- (3) That pursuant to the provisions of Order No. R-2919,
this case was reopened to allow the operators in the subject pool
to appear and show cause why the Dagger Draw-Morrow Gas Pool
should not be developed on 320-acre spacing units.
- (4) That the evidence establishes that one well in the
Dagger Draw-Morrow Gas Pool can efficiently and economically
drain and develop 640 acres.
- (5) That the Special Rules and Regulations promulgated by
Order No. R-2919 have afforded and will afford to the owner of

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CASE No. 3243

Order No. R-2919-A

each property in the pool the opportunity to produce his just and equitable share of the gas in the pool.

(6) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Order No. R-2919 should be continued in full force and effect until further order of the Commission.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Dagger Draw-Morrow Gas Pool, promulgated by Order No. R-2919, are hereby continued in full force and effect until further order of the Commission.


(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


DAVID F. CARGO, Chairman


GUYTON B. HAYS, Member


A. L. PORTER, Jr., Member & Secretary

S E A L

esr/

State of New Mexico
Oil Conservation Commission



STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

February 23, 1967

Re: Case No. 3530
3243 ✓
 Order No. R-3198 & R-2919-A
 Applicant: Atlantic & Monsanto

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

A. L. PORTER, Jr.
Secretary-Director

Carbon copy of order also sent to:

Hobbs OCC %
 Artesia OCC R-2919-A
 Aztec OCC R-3198
 Other

Case 3243

Heard 2-21-67

Rec 2-21-67

Grant a permanent 640 Acre spacing
order for the Dagger Draw - Monow Gas
pool.

Testimony shows 1 well will drain
640 Acre

Thos. G. [Signature]

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3243
Order No. R-2919

APPLICATION OF MONSANTO COMPANY
FOR SPECIAL POOL RULES, EDDY
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on April 28, 1965, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 8th day of June, 1965, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Monsanto Company, seeks the promulgation of special pool rules for the Dagger Draw-Strawn Gas Pool and the Dagger Draw-Morrow Gas Pool in Eddy County, New Mexico, including provisions for 640-acre spacing and fixed well locations.

(3) That the Monsanto Dagger Draw Well No. 1, located 660 feet from the South line and 1980 feet from the East line of Section 6, Township 20 South, Range 25 East, NMPM, Eddy County, New Mexico, is the only well presently completed in the subject pools.

(4) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling

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CASE No. 3243

Order No. R-2919

of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 640-acre spacing should be promulgated for the Dagger Draw-Morrow Gas Pool.

(5) That the temporary special rules and regulations for the Dagger Draw-Morrow Gas Pool should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(6) That in order to protect correlative rights, a well location in the NW/4 NE/4 of Section 7, Township 20 South, Range 25 East, NMPM, Eddy County, New Mexico, no nearer than 660 feet to the North line of said Section 7 and no nearer than 330 feet to any other boundary of said quarter-quarter section should be authorized.

(7) That the temporary special rules and regulations for the Dagger Draw-Morrow Gas Pool should be established for a temporary period to expire one year from the date that a pipeline connection is first obtained for a well in the pool in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(8) That this case should be reopened at an examiner hearing one year from the date that a pipeline connection is first obtained for a well in the Dagger Draw-Morrow Gas Pool, at which time the operators in the subject pool should appear and show cause why the Dagger Draw-Morrow Gas Pool should not be developed on 320-acre spacing.

(9) That the first operator to obtain a pipeline connection for a well in the Dagger Draw-Morrow Gas Pool should notify the Commission in writing of such fact, and that the commission should thereupon issue a supplemental order designating an exact date for reopening this case.

(10) That the applicant has not established that the proposed temporary special rules and regulations for the Dagger Draw-Strawn Gas Pool would prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling of an excessive number of wells, prevent reduced recovery which might result from the drilling of too few wells, or otherwise prevent waste.

(11) That the applicant's request for special rules and regulations governing the Dagger Draw-Strawn Gas Pool should be denied.

IT IS THEREFORE ORDERED:

(1) That the applicant's request for special rules and regulations governing the Dagger Draw-Strawn Gas Pool in Eddy County, New Mexico, is hereby denied.

(2) That temporary special rules and regulations for the Dagger Draw-Morrow Gas Pool are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
DAGGER DRAW-MORROW GAS POOL

RULE 1. Each well completed or recompleted in the Dagger Draw-Morrow Gas Pool or in the Morrow formation within one mile thereof, and not nearer to or within the limits of another designated Morrow gas pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 640 acres, more or less, consisting of a governmental section.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit and the unorthodox size or shape of the unit is necessitated by a variation in the legal subdivision of the United States Public Lands Survey, or the following facts exist and the following provisions are complied with:

- (a) The non-standard unit consists of quarter-quarter sections or lots that are contiguous by a common bordering side.
- (b) The non-standard unit lies wholly within a governmental section and contains less acreage than a standard unit.
- (c) The applicant presents written consent in the form of waivers from all offset operators and

from all operators owning interests in the section in which the non-standard unit is situated and which acreage is not included in said non-standard unit.

- (d) In lieu of paragraph (c) of this rule, the applicant may furnish proof of the fact that all of the aforesaid operators were notified by registered or certified mail of his intent to form such non-standard unit. The Secretary-Director may approve the application if no such operator has entered an objection to the formation of such non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located no nearer than 1650 feet to the outer boundary of the section and no nearer than 330 feet to any governmental quarter-quarter section line.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to or completed in the Dagger Draw-Morrow Gas Pool or in the Morrow formation within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Artesia District Office of the Commission in writing of the name and location of the well on or before July 1, 1965.

(2) That as an exception to the Special Rules and Regulations governing the Dagger Draw-Morrow Gas Pool, a well may be drilled in the NW/4 NE/4 of Section 7, Township 20 South, Range

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CASE No. 3243

Order No. R-2919

25 East, NMPM, Eddy County, New Mexico, no nearer than 660 feet to the North line of said Section 7 and no nearer than 330 feet to any other boundary of said quarter-quarter section.

(3) That each well presently drilling to or completed in the Dagger Draw-Morrow Gas Pool or in the Morrow formation within one mile thereof shall receive a 320-acre allowable until a Form C-102 dedicating 640 acres to the well has been filed with the Commission.

(4) That this cause shall be reopened at an examiner hearing one year from the date that a pipeline connection is first obtained for a well in the Dagger Draw-Morrow Gas Pool, at which time the operators in the subject pool may appear and show cause why the Dagger Draw-Morrow Gas Pool should not be developed on 320-acre spacing units.

(5) That the first operator to obtain a pipeline connection for a well in the Dagger Draw-Morrow Gas Pool shall notify the Commission in writing of such fact, and that the Commission will thereupon issue a supplemental order designating an exact date for reopening this case.

(6) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


Jack M. Campbell
JACK M. CAMPBELL, Chairman

Guyton B. Hays
GUYTON B. HAYS, Member

A. L. Porter, Jr.
A. L. PORTER, Jr., Member & Secretary

esr/

Monsanto
C O M P A N Y

MAIN OFFICE 000

FEB 10 1966 HYDROCARBONS DIVISION

101 North Mariefeld
Midland, Texas 79704
(915) MUtual 3-3308

February 15, 1966

RECEIVED

FEB 17 1966

O. C. C.
ARTESIA, OFFICE

New Mexico Oil Conservation Commission
Drawer DD
Artesia, New Mexico

Re: Case No. 3243
Order No. R-2919

Gentlemen:

As required by the above subject order, please be advised that the Monsanto #1 Dagger-Draw Morrow Gas zone was connected to Natural Gas Pipeline Company of America and went on stream February 12, 1966.

Yours very truly,

A. W. Wood

A. W. WOOD
District Production
Superintendent

AWW:CLF:lp

DOCKET MAILED

Date 2-9-67
h

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 2083
SANTA FE

June 8, 1965

Mr. George Hunker
Attorney at Law
Post Office Box 2086
Roswell, New Mexico

Re: Case No. 3243
Order No. R-4919
Applicant:

DOCKET MAILED

Date 2-9-67

MONSANTO COMPANY

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x

Artesia OCC x

Aztec OCC

OTHER Mr. John Russell

DOCKET MAILED

Date 2-9-67

DOCKET: EXAMINER HEARING - TUESDAY - FEBRUARY 21, 1967

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 3530: Application of Atlantic Richfield Company for suspension of cancellation of underproduction, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order suspending the cancellation of underproduction attributable on July 31, 1966, to its State "A" Gas Com. Well No. 1 located in Unit G, Section 36, Township 29 North, Range 11 West, and to its State "B" Gas Com. Well No. 1 located in Unit N of Section 16, Township 29 North, Range 10 West, Basin-Dakota Gas Pool, San Juan County, New Mexico, said underproduction not having been made-up during the 6-month period ending January 31, 1967, due to said wells having been shut-in November, 1966, upon the transfer of the connecting pipeline from an intrastate status to an interstate status and subsequent unavoidable delay in obtaining FPC approval for the sale of gas from said wells in interstate commerce.

CASE 3531: Application of Texas Pacific Oil Company for two water-flood projects, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute two water-flood projects in the South Eunice Pool by the injection of water into the Seven Rivers-Queen formations through one well in Unit N of Section 7, and one well in Unit N of Section 9, both in Township 22 South, Range 36 East, Lea County, New Mexico.

CASE 3243: (Reopened)

In the matter of Case No. 3243 being reopened pursuant to the provisions of Order No. R-2919, which order established 640-acre spacing for the Dagger Draw-Morrow Gas Pool, Eddy County, New Mexico, for a period of one year after first pipeline connection in the pool. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

CASE 3532: Application of Henry S. Birdseye for a waterflood project, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Menefee zone of the Mesaverde formation through one well located in Unit P of Section 21, Township 20 North, Range 9 West, Chaco Wash-Mesaverde Oil Pool, McKinley County, New Mexico. Applicant further seeks an administrative procedure for expansion of said project and for the drilling of injection wells and producing wells at unorthodox locations.

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PAGE 1

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 28, 1965

EXAMINER HEARING

IN THE MATTER OF: Application of Monsanto
Company for special pool rules, Eddy County,
New Mexico. Applicant, in the above-styled
cause, seeks the promulgation of special
pool rules for the Dagger Draw-Strawn Gas
Pool and the Dagger Draw-Morrow Gas Pool,
Eddy County, New Mexico, including a
provision for 640-acre gas well spacing
units.

Case No. 3243

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 28, 1965

EXAMINER HEARING

IN THE MATTER OF: Application of Monsanto)
Company for special pool rules, Eddy County,)
New Mexico. Applicant, in the above-styled)
cause, seeks the promulgation of special pool) Case 3243
rules for the Dagger Draw-Strawn Gas Pool and)
the Dagger Draw-Morrow Gas Pool, Eddy County,)
New Mexico, including a provision for 640-)
acre gas well spacing units.)

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case 3243.

MR. DURRETT: Application of Monsanto Company for
special pool rules, Eddy County, New Mexico.

MR. HUNKER: Mr. Examiner, for the record, I am George
Hunker, Roswell, New Mexico, representing Monsanto Company. I
have two witnesses, Mr. Percy Anderson, and Mr. William B.
Ellis. I would like to have them sworn at this time.

(Witnesses sworn.)

MR. HUNKER: If the Examiner please, I would like for
you to take notice of the fact that the Conservation Commission

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has, by Order R-2785, approved a dual completion of the Mansanto Dagger Draw Well Number 1, and that by Order R-2833 the Commission has established two gas pools covering the two formations, the Strawn and the Morrow in this particular well.

MR. NUTTER: What order was that, 2833?

MR. HUNKER: 2833.

MR. NUTTER: Thank you, Mr. Hunker.

WILLIAM B. ELLIS, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HUNKER:

Q Mr. Ellis, will you state your name, position and present occupation for the record, please?

A William B. Ellis, Senior Geologist, Monsanto Company, located in Midland, Texas presently. Education, B. S. Degree in Geology, University of California, at Los Angeles.

Q When did you graduate from the University of California?

A In 1949, at which time I started practicing geology as an employee of Carlton Behl and Associates, an independent oil producing firm, which is now doing business as BTA Oil Producers. I worked for them for twelve years in West Texas and New Mexico, approximately equally. My work was approximately equal, distributed between West Texas and New Mexico for that

12 years, and I have now been employed as Senior Geologist for three years.

MR. HUNKER: Are the qualifications of the witness satisfactory?

MR. NUTTER: Yes, sir, they are.

(Whereupon, Applicant's Exhibits 1 through 11 marked for identification.)

Q (By Mr. Hunker) Mr. Ellis, I will hand you Exhibit Number 1 and ask you to explain to the Examiner what this exhibit shows.

A Mr. Examiner, Exhibit Number 1 is a structure map prepared and contoured on top of the first Morrow sand. With the Examiner's permission I think it would be a convenience for reference in looking at this exhibit and future ones, if we can open the large scale electrical log to the very lower portion of it, where the detailed scale has some marks on it, that would be convenient.

The Exhibit 1 structure map is contoured on a marker which is at a depth of 9284 on the log on Monsanto Number 1 Dagger Draw Well, which you are presently looking at. This is the first sand development in the upper portion of the Morrow; and is also for effective purposes, the top of the pay zone in this well.

The structure map, Exhibit 1 shows a trend, a striked trend

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of this Morrow sand, with a north south alignment tilted slightly to the northeast by southwest. The regional relationships which this map ties into include the Atoka Field, which is seven miles north and slightly east of the Monsanto Dagger Draw Well; and does produce from this same Morrow sand interval and the Indian Basin Field which is approximately equal distance, seven miles to the south and slightly west.

These three producing areas from the same pay horizon, Morrow sand, have almost straight line alignment between them on a trend which is essentially the structural strike of the Morrow sand. In this immediate area we are dealing with a situation that's on the west flank of the Basin, and this particular rock formation dipping to the east, southeast at a rate of slightly less than a hundred feet per mile.

Q What did the area that you have colored in yellow show?

A That is an area which has been identified by detailed sub-surface work to be the indicated limits of a porous sand which is the pay zone in Monsanto's Number 1 Dagger Draw well, and which will be described in greater detail in the subsequent exhibits. But the yellow shaded area is an equivalent stratigraphic position to the pay zone in the two fields just mentioned, the Atoka Field to the north and the Indian Basin Field to the south, and is also the projected limits of the pay in the Dagger Draw-Morrow Field.

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Q I'll hand you now what has been marked Exhibit 2 and ask you to explain to the Examiner what this exhibit shows.

A Mr. Nutter, Exhibit 2 is related closely to Exhibit 1. It is an isopac map of the total upper portion of this Morrow. On the reference log that we're using for our purpose, this interval that is isopacked on this map is from the top of the pay, which is the structural horizon upon which Exhibit 1 was prepared, from that point down to the base of sand, which is pay in the Dagger Draw Well, and that is at a depth of 9330 in the Monsanto Number 1 Dagger Draw Well.

The gross interval includes some sand lithology, which is pay, gas production pay, and some shale lithology, which is in the form of stringers of shale interbedded with the sand. The configuration as shown on Exhibit 2 is fairly rigidly controlled by seven sub-surface points, or seven sub-surface datums on the seven wells in the vicinity, which did drill deep enough to penetrate the base of this Morrow sand interval.

The primary purpose of the exhibit is to show that this rock unit which encompasses the pay, extends for an appreciable distance south and southwest of the producing well. The rock unit is present to the north and east in the three wells in fairly close proximity in which the sand was present, but not of productive quality, due to lack of porosity and permeability. I believe that will suffice for that exhibit.

Q I'll hand you now what has been marked Exhibit Number 3 and ask you to explain to the Examiner what this exhibit shows.

A Exhibit 3 is, in effect, a further refinement of the picture developed by Exhibit 2, in that this is an isopac map covering the thickness of net sand lithology within the gross interval that was isopacked for Exhibit 2.

Again referring to the reference log that we're using on Monsanto Number 1 Dagger Draw Well, the gross interval which is marked on the log as 46 feet, and the number 46 used is the isopac interval on Figure 2, that 46 foot interval includes 26 feet of net sand lithology derived from the gamma ray curve of that log. This sand lithology within that gross interval is 26 feet thick, which is divided between two sandy stringers, which for convenience I have shaded yellow on that type log to see how the sand relates to the total pay interval.

All three of these sand intervals are indicated to be gas productive by drillstem test and by subsequently having been perforated and produced. The surrounding wells, again seven wells that did furnish data for the construction of this map with one exception, have some sand present and developed within this interval.

I was rather careful to take all three of these seven electrical logs and correlate them, and work through them with detail, to confirm that the total interval used for Exhibit 2

is the same stratigraphic interval on all the seven wells, and that all sand within that total interval was counted to add up to the numbers used for isopacing Exhibit 3.

The well to the far south edge of the plat, Exhibit Number 3, is Humble Number 1 Hobbs, a well drilled quite some time ago, and though this well tested in the lower part of the Morrow, it did not test in the stratigraphic interval equivalent to the pay in the Dagger Draw Well, which had 40 feet of sand lithology rather clearly displayed on the electrical log in a 66 foot gross interval.

This is the thickest amount of sand of any of the seven wells in this immediate area. The electrical log on the wells suggest the possibility of some porosity. It does not appear particularly porous, or particularly conducive to being pay; that may be a factor why Humble did not test the well in the upper interval. However, the thick sand and the thick total interval indicates that reservoir conditions as encountered in the Mansanto Dagger Draw Well are lined up in the direction of greater thickness of sand to the south, which fits in with the regional alignment of the Atoka Field and Indian Basin Field, respectively seven miles north and seven miles south.

Would you care to comment on the configuration as between Exhibits 2 and 3 for the Examiner?

A That's a pertinent point, thank you. The total interval

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within which sand lithology is developed has an almost identical configuration to the sand itself when it is extracted from a total interval and isopached as a separate data, showing that sand lithology is developed as a fairly uniform percentage of the total upper Morrow interval; and therefore, reservoir properties and reservoir conditions can reasonable be anticipated to extend over an area, and to have a configuration and alignment of the total sand interval that has been isopached on that map.

I might point out on the log that we're using for reference here, there is a well developed sand below the base of the isopached interval which is within the Morrow, and was tested to be wet and water productive in the Dagger Draw Well; and this sand is not in the isopac interval, and is not part of the gross isopac for this Exhibit 2 at any time having been pay.

Q Turning now to Exhibit Number 4, Mr. Ellis, I would like for you to explain to the Examiner what this exhibit will show.

A Mr. Examiner, our subsequent witness is a petroleum engineer and will go into this exhibit in more detail; but primary purpose of the exhibit is to put available test data from Morrow sand, regardless of where in the Morrow sand the test occurred, on all pertinent wells onto one piece of paper for a convenient reference, and as a part of the record.

Several of these seven wells that appear on this plat and are the only wells on the plat that penetrated sufficiently deep to test the Morrow took drillstem tests. Several of these drillstem tests recovered some gas in sub-commercial amounts. Some of them had significant shows and several of these tests, as I mentioned before in referring to the type log, were taken in stratigraphic intervals below the zone that is in the pay in the Mansanto Number 1 Dagger Draw Well, so the purpose that they serve for our investigation here today would be to show that there is other potential pay in the Morrow stratigraphically below the pay in the Dagger Draw Well, and potential productive distribution of it is an unknown factor in the absence of any completions beneath other sand lenses.

Q I would like to turn to Exhibit Number 5 and ask you to tell the Examiner what this shows, and be sure to explain what sand we are talking about in this exhibit.

A Mr. Nutter, Exhibit 5 is a plat covering the same area as the previous exhibits upon which test data for the Strawn sand has been placed. The Strawn sand is the second pay in the Mansanto Number 1 Dagger Draw Well, and it was mentioned in Mr. Hunker's introductory remarks where he made reference to a previous dual completion in this Mansanto Well.

The Strawn pay zone is a depth of 8670, 8688, 8699 is the perforated interval in this well. This Strawn pay is a thin

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sand stringer, very, very limited and narrow geographical distribution. No other wells are completed from the zone in the area, and the amount of data available is rather limited because very few other wells have encountered shows or tested.

The well was being drilled by a conventional method and a gas show and a drilling break was encountered at this depth, and an operator elected to take a drillstem test which recovered a significant amount of gas with what resulted in identification of this discovery zone.

About the only general geological insight we can get into this upper pay in the Strawn sand is that in all probability it is an elongated band of sand probably trending north or south, or north northeast, or south southwest, paralleling the edge of the basin, and possibly being a rather narrow sinuous in configuration, but because of the quality of the drillstem test and the limited amount of testing that has been done on the well since it has been perforated, we feel that the Strawn reservoir potentially covers a significant area, without being able to at this point to define that area with any high degree of precision.

Q In connection with the seven wells that you spoke of earlier, did any of those wells encounter the Strawn?

A Some of the wells had the rock unit present, but not in a development, as far as porosity or permeability is

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sufficient to indicate productivity; and that's one of the reasons why we don't have a clear-cut idea of what the configuration is.

Q So your information on the Strawn in this area is very limited?

A It is very limited. The Strawn, in contrast to the Morrow that we have been speaking of before, is a relatively new producing horizon in this area, and the data is recently acquired and not, doesn't tie in with any substantial amount of data from other wells in the same horizon, while the Morrow does produce seven miles to the north and seven miles to the south and on a trend alignment that extends up exactly on this well, which aided to furnish a great deal of insight into the nature and predictability of the Morrow, that we don't have on the Strawn.

MR. NUTTER: Mr. Ellis --

A Yes, sir.

MR. NUTTER: The Atoka Pennsylvanian Pool is the one to the north?

A Yes, that's seven miles.

MR. NUTTER: That is producing from the Morrow?

A Yes, the Atoka field produces from Morrow sand and was named Atoka not because -- If I understand correctly, because of the geological name of Atoka, which is a rock name overlying

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the Morrow, but its proximity to the community named Atoka, which is a post office location. That also has Grayburg-San Andres production.

MR. NUTTER: The pay in the Atoka is the Morrow?

A It is the Morrow.

MR. NUTTER: Down to the southwest the pay is Cisco and Morrow?

A In the Indian Basin are Cisco and Canyon lumped together, and underlying that is Morrow sand pay, which is stratigraphically identical to the pay that has been developed in this Monsanto Dagger Draw Well.

MR. NUTTER: What about the Cisco in this particular area?

A Cisco in this particular area has not been proved to be attractive. Present indications doesn't show it to be an attractive location, though some tests have been taken and an effort made to produce a well, it is an oil producing horizon of limited capacity, and at this point unknown areal extent or configuration.

MR. NUTTER: I see. That's all.

Q (By Mr. Hunker) Do you have any further information with regard to these five exhibits, Mr. Ellis?

A I believe that should suffice.

MR. HUNKER: That completes my direct examination of this witness.

MR. NUTTER: Are there any questions of Mr. Ellis?

MR. RUSSELL: I am John F. Russell, Roswell, New Mexico. I would like to enter an appearance on behalf of Texas Pacific Oil Company in protest to this application, and I have a couple of questions of this witness.

CROSS EXAMINATION

BY MR. RUSSELL:

Q Mr. Ellis, I'm referring to this Exhibit Number 2.

A Yes, Mr. Russell.

Q Was that available, or prepared prior to the drilling of this initial well?

A It is extracted from a large regional map which includes the area extensively to the north, including the Atoka Field, and the Indian Basin Field to the south. The configuration of the isopac contours on Exhibit 2 you are asking about --

Q Yes.

A -- have been modified by data acquired since it was originally prepared as a large regional map. Two of the nearby wells, Monsanto Number 1 Hondo and Monsanto Number 1 Foster, which are the closest wells in proximity to this Dagger Draw Well, have been drilled since the Dagger Draw Well was drilled and completed, and therefore they furnished two control points or two locations for data that did not exist at the time the

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Dagger Draw Well was drilled; so the configuration has changed as additional data has been acquired, yes.

Q I am not, and strangely enough don't profess to be a geologist, or understand geology, but from my limited understanding, it would appear that in drilling the initial well your chances of success or a better well would have been enhanced if you moved to the west and to the north of your present well location, is that correct?

A This is possible, yes.

Q Was that information available to you at the time the initial location was selected?

A No, it was not. I might put in this added bit of insight. The Monsanto Number 1 Dagger Draw Well was scheduled and the location selected primarily as a Cisco Canyon oil objective test; secondarily as a Strawn test and as a third objective in the original AFE scheduling and programming of the well as a Morrow sand test. The hoped for Cisco Canyon oil development as a rock lithology unit did not develop and the Strawn was developed somewhat differently than anticipated, and the third objective Morrow sand was the objective that the well was completed in and was the --

Q You intended to go to the Morrow sand?

A Yes, the well was originally scheduled to go to the Morrow and a location was selected primarily on the geology



located to the Cisco Canyon, which is the main pay horizon to the Indian Basin Field to the south.

Q And the initial location was selected as a standard location for a 320-acre allowable, is that correct?

A I would prefer not to answer the question because I'm not familiar with spacing or requirements on the Cisco Canyon.

Q I'm referring to the Morrow-Strawn.

A The location was selected, I'll say this, the location was selected entirely to my knowledge on geological ideas related to where the maximum amount of pay might be anticipated in the immediate vicinity of this lease with the Cisco Canyon being the primary objective that was given consideration in selection of that location.

Q This may be out of your area, but if not I would appreciate your advising me. When you drilled this initial well you intended, did you not, to ask that 640 acres be attributed to it if it was in the Morrow or the Strawn?

A I really would have to say that I just don't know. That's my honest answer. I would anticipate that would have been the intent, to ask for a fairly large spacing on the Morrow unless an exceptionally thick pay section had been encountered, which was not the case.

Q Then that being true, why did you not locate the well at a standard 640-acre location?

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A Because of the thinning I recited before, that the geological information available at the time that the location was selected pointed rather strongly towards concept of the maximum Cisco Canyon development lying to the south of this.

Q In other words, your selection of the well location was based upon information other than as shown in these exhibits?

A That's right, because these exhibits pertain only to the Morrow, which is the producing pay and the formation in which this well was completed, even though it was not the primary objective upon which the well location was selected, or where the well was scheduled to be drilled originally.

Q Would you say that Section 7, which is immediately to the south may be more reasonably anticipated to be productive of gas than the northern portion of Section 6?

A Yes, because all data points very conclusively towards increasing thickness from well to well, starting -- Let's just look at Exhibit 2, and looking two miles to the north of the Monsanto Dagger Draw well, Newburg and Inghram drilled a well which Carper subsequently deepened to the Morrow Vanhook well in Section 30. This well had 26 feet of total rock unit which included the producing pay sand, even though it was not developed as a porous entity in that well. This same isopac interval was increased to 46 feet in thickness at the Monsanto

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well and the subsurface indicates that it will be thickened even further on the south in Section 7; so I would predict a greater thickness of pay section in Section 7 than would have occurred in the north part of Section 6 in answer to your question.

MR. RUSSELL: I think I have no further questions at this time.

REDIRECT EXAMINATION

BY MR. HUNKER:

Q Were Exhibits 1 through 5 prepared by you or under your supervision, Mr. Ellis?

A Yes. Exhibits 1, 2 and 3 were prepared entirely and specifically by myself, and Exhibits 4 and 5 were prepared under my supervision.

Q In connection with the last question asked by Mr. Russell in connection with the possibility of obtaining gas production in Section 7, would you like to give the Examiner the benefit of your geologic thinking with regard to that area, as shown by the information that you've previously testified about?

A Yes, be glad to. Making reference again to the Atoka Field to the north which does produce from the same stratigraphic interval within the total Morrow section; the field is elongated north and south parallel to the structural contours, which we have a small segment of on this plat, and the same type of

configuration is anticipated to exist in this area. The total sand present in the wells is thickening in a direction south from Monsanto Dagger Draw well, and the quality of the sand very obviously has improved. In taking the relationship, for instance between the Monsanto Foster, the well one mile north and slightly east of the Dagger Draw Well, and located in Section 5, this well has just been drilled within the last few weeks and encountered a thin type Morrow sand section; and just visualizing a line between that well and the Dagger Draw Well, the sand has rapidly increased to the south in thickness and quality; it has become porous and permeable and gas bearing, as exhibited on this Figure 2, which is thicker and therefore can be anticipated to include more sand. Does that answer the question?

Q That answers my question. Just a moment. If the oil Conservation Commission should, by special rule, provide for 640-acre spacing and should provide that no well in this pool would be located less than 1,650 feet from any side line, is it your opinion that an operator drilling a well in Section 7, if he encountered production, would be able to recoup his equitable share of the gas in the Morrow Pool?

A My answer is conclusively yes, based on the fact that all data indicates improving reservoir conditions in a direction south from the existing well, increasing thickness of

the pay zone, and therefore, the geological evidence points toward the maximum reservoir thickness lying south of the developed area, and that access to reserves and favorable drainage position would be obtained by such a location.

Q You wouldn't guarantee that they would get a well, productive well, however, if they drilled?

A Unfortunately, no.

MR. HUNKER: I have no further questions.

MR. RUSSELL: Those questions lead me to another one.

RECROSS EXAMINATION

BY MR. RUSSELL:

Q If I understood you correctly, what you were saying was that there's more gas, in all probability, under Section 7 than there is under Section 6.

A That is, unfortunately, what the data points to very strongly.

Q Which means, assuming that your Number 1 Well is the only well drilled, it will produce more gas from Section 7 than it will from Section 6 eventually?

A I believe that if my concept of a gas reservoir is correct, that it would have the capacity to produce a specific amount of gas, based on the thickness of pay in that bore hole and that, in effect, this well is like a straw in a bucket of water, which is withdrawing, or a bottle of Coke which is

withdrawing Coke at a given rate, but the Coke coming through the straw has, shall we say, no preferential awareness of what part of the bottle it came from.

Q You mean it doesn't have section lines or lease lines in the bottle of Coke?

A Right. But even if there were section lines or lease lines, the amount of Coke going through the straw would not be any different in the presence or absence of lease lines or section lines.

Q Well, let's get back to the gas well. Assuming again that this is the only well drilled, in your opinion as a geologist, since there is more gas in 7 than there is in 6, that it would eventually produce more gas from Section 7 than it would from Section 6?

A I believe this, if it is the only well drilled, it would eventually drain the entire reservoir, because we have evidence that there is a fairly high degree of porosity and permeability, and if no other wells are drilled, given enough time, the well would eventually produce all of the available gas to that borehole, which is all of the gas that can be economically removed from the reservoir.

Q Which would necessarily mean it would produce more gas from Section 7 than it would from Section 6 if there's more gas in 7, which you have said.

A Yes, this is an arithmetic fact.

MR. RUSSELL: I think that's all.

BY MR. NUTTER:

Q I note here on your plat that you have a drilling well out in the west part of Section 1. What is the status of that well?

A The well was drilled by Yates and several other people who are partners in the well, and the last information I have the well was attempting a completion in the Cisco Canyon. It definitely had not been drilled sufficiently deep to encounter Morrow sand, and is not projected to go to the Morrow sand. They ran a string of casing, I believe five and a half inch casing to a depth, and this is approximate, I had better not even say a depth, but the other depth was approximately equivalent to the base of the Cisco Canyon section, and had not, and I would assume by the mechanical status of the well will not ever drill the well to a depth sufficiently deep to penetrate or encounter the Morrow.

Q You haven't attempted on any of these exhibits to draw any kind of an isopac, either gross or net, for your Strawn because you just don't have sufficient information on the Strawn?

A That's right. We feel the data is insufficient to make a valid well substantiated areal concept or configuration of the

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Strawn.

Q Several times, in your opinion, Mr. Ellis, you mentioned that the data indicates sufficient permeability and porosity that one well would drain the entire reservoir, and one well would drain 640 acres. Just what evidence is there that one well would do this?

A I did use one qualifying remark there I think when I said that; I said "Given enough time", because both porosity and permeability are units of measurement, permeability being the ability of the rock formation to transmit fluid, and the limited testing that has been done on Monsanto Dagger Draw Well indicates it is capable of producing at reasonably high rates. I would prefer to leave the majority of testimony of that nature to our engineer who is really better qualified to answer it. However, this is a quality of sand and the physical nature of the sand is such that gas is transmitted quite readily, the producing formation does not have to be stimulated by huge frac treatments in order to achieve productivity; the indicator of the effective drainage area being large without having to artificially achieve a greater drainage area.

MR. NUTTER: Are there further questions of Mr. Ellis?

MR. DURRETT: I have a question, please.

BY MR. DURRETT:

Q Your well in Section 6 was the discovery well, is that

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correct?

A That's correct.

Q What is that, the Dagger Draw Number 1, is that what you call it?

A Yes.

Q Is it the only well in the pool?

A Yes.

Q What is it's footage location, 1986, 660?

A Yes, 660 south, 1980 east.

Q You are proposing 640-acre spacing which would be the entire section. What are you proposing as far as rules for well locations?

A This part of the testimony again, if you'll excuse me, I would prefer to leave for the engineer.

Q He will cover that?

A He's more conversant with that part of the project, and I have somewhat limited my efforts to the geological phase of it.

MR. DURRETT: Fine, that's all.

MR. NUTTER: If there are no further questions the witness will be excused.

(Witness excused.)

PERCY G. ANDERSON, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HUNKER:

Q For the record, Mr. Anderson, will you state your name and position, and where you are located?

A My name is Percy Anderson, District Petroleum Engineer for Monsanto in Midland, Texas.

Q Have you previously testified before this Commission as an expert?

A Yes, I have.

MR. HUNKER: Are the qualifications of Mr. Anderson acceptable?

MR. NUTTER: Yes, sir.

Q (By Mr. Hunker) I'll hand you what has been marked Exhibit Number 6, and ask you to tell the Examiner what this exhibit shows, what it is and what it shows.

A Exhibit Number 6 is a Welex induction electrical log of the Dagger Draw Number 1 Well located in Section 6, Township 20 South, Range 25 East, Eddy County, New Mexico. Denoted on this log are completion intervals in the Strawn reservoir, and in the Morrow reservoir.

Q Will you give those intervals?

A The Strawn perforations are 8688 to 86.

perforations are from 9246 -- No, excuse me, 9260 to 9326. Also denoted on this exhibit is the existing packer which separates the two horizons located at 8706. The Commission has previously approved a dual completion for this well. Also transcribed on this exhibit are the drillstem tests in both the Strawn and Morrow reservoirs. It will be noticed that commercial gas quantities were recovered from the Strawn, and the well, of course, was subsequently completed.

Also in the Morrow several pre-tests were taken, one from 9280 to 9314; gas to surface in four minutes, and it flowed at the rate of 2200 MCF per day. An additional test was taken at 9312 to 9350. In this, gas was produced to the surface at the rate of 3,000 MCF per day. This test encountered some water. The third test in the Morrow, 9354 to 9395, recovered substantial amounts of water with some show of very weak blow of gas.

In all cases substantial or essentially pressures which would be expected for the depth in which the well was tested to, encountered indicating access to a substantial reservoir. I believe that consists of about everything I have to say about this exhibit.

Q Has the Dagger Draw Well Number 1 been produced, Mr. Anderson?

A Yes, it has.

Q To what extent?

A It, of course, on the initial it was initially tested in order to obtain the multi-point back pressure test, also it was produced, the Morrow formation was produced in which gas was used to drill the Monsanto Number 1 Hondo, and the Monsanto Number 1 Foster.

Q I'll hand you now Exhibit Number 7, and ask you to explain this exhibit.

A Exhibit Number 7 is a copy of the Form C-122 of the New Mexico Oil Conservation Commission, which is a multi-point back pressure test of the Dagger Draw Number 1 Strawn formation. This indicates the capability and the potential of the well to produce.

Q Turning to Exhibit Number 8, I'll ask you to tell us what that is.

A Exhibit Number 8 is also a copy of Form C-122, multi-point back pressure test of the Morrow formation in the Dagger Draw Number 1. This indicates the ability of the Morrow formation to produce, and its capability.

Q Were these multi-point back pressure tests taken by your company, or by someone for your company?

A They were taken by consulting petroleum engineers that specialize in well testing, under my direction.

Q I hand you now what has been marked Exhibit Number 9

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and ask you to give us the information that's shown on that exhibit.

A Exhibit Number 9 is a summary of average reservoir characteristics for both the Strawn and Morrow, which we have determined, based on drillstem test, logs and these back pressure tests, and all available data that we have at this time.

Strawn zone is, the depth as mentioned before is 8688, has a reservoir temperature of 165 degrees; average porosity of 13 percent; connate water saturation of 20 percent; average permeability of three millidarcies; original reservoir pressure 3700 psi; gas gravity, .671; condensate gravity, 46.46 degrees API, and a gas condensate ratio of 500,000 cubic feet per barrel.

The Morrow depth is 9296 depth; reservoir temperature of 176 degrees Fahrenheit; average porosity of 15 percent; average connate water saturation, 30 percent; average permeability, 10 to 20 millidarcies; original reservoir pressure, 3,777 psig.; separated or gas gravity, .656; condensate gravity of 52 degrees; gas condensate ratio of 250,000 cubic feet per barrel.

This exhibit indicates two different reservoirs that produce from this well, that there is a definite difference in the two reservoirs, that there is vertical separation.

Q From the information that you have been able to obtain in connection with your Dagger Draw Well Number 1, and the

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reservoir study that you have made based on the data that you've had before you, is it your opinion that the Dagger Draw Well will drain 640 acres, in both the Morrow and the Strawn?

A Based on the knowledge that we have today, I would expect the Dagger Draw Number 1 to drain in excess of 640 acres.

Q I'll hand you now Exhibit Number 10 and ask you to give the Examiner an explanation of that exhibit.

A Exhibit Number 10 are the reserves and economic data for 640-acre development in the Dagger Draw-Strawn and Morrow Pools. Our Dagger Draw Number 1 cost \$200,000.00. We have just recently drilled a Foster Number 1, which was a dry hole. It was drilled through the Morrow, and the Morrow tested on our lease log and evaluated, and it was determined to be a dry hole. This cost was \$140,000.00. These costs represent the investment Monsanto and its associates are having to spend in this area to develop commercial hydrocarbon production.

The reserves that we anticipated for the Strawn would be a million MCF, and associated condensate production of 2,000 barrels. For the Morrow, three and a half million MCF with an associated condensate production of 14,000 barrels, bringing the total reserves to the well, four and a half million MCF and 16,000 barrels.

Our estimated net pay for the Strawn is three feet, and for the Morrow was ten feet. Our gross income from such sales we

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estimate to be \$646,000.00. Our direct expenses and severance taxes are estimated at \$80,300.00: this leaves us an operating income of \$566,300.00, deducting our investment of \$200,000.00 for a well and the Federal income tax of \$94,300.00 leaves us an estimated profit of \$272,000.00. Payout of this investment, not including the dry holes that have been drilled is going to be in the order of 15 years, based on our current contractual, our current contract that we now have with the pipeline, based on a 100,000 MCF per day per eight billion cubic feet, this would allow us to produce at 560 MCF a day.

Our rate of return on this investment is 6.8 percent, and the ratio of profit to investment is 1.36 to one. I think it's obvious that if these reserves were cut in half due to 320-acre spacing, that this would be an uneconomical operation or venture.

Q Have you prepared a set of proposed rules for the Strawn reservoir and for the Morrow reservoir?

A Yes, I have.

Q Are these recommended rules shown on Exhibit 11?

A Yes, they are.

Q Would you just summarize for the Examiner these proposed rules with respect to the size of the spacing unit and the recommended location for future wells in the two pools?

A Yes. For the Strawn reservoir we recommend that

Section 6, all of Section 6, Township 20 South, Range 25 East, should be spaced and that the proration unit should consist of 640 acres, more or less, consisting of a single governmental section. Exceptions are provided for this rule. This is Rule Number 2 on this exhibit. These exceptions are provided as a specified in Rule Number 3.

Rule Number 4 is that each well completed or recompleted in the Dagger Draw-Strawn Gas Pool shall be located no nearer than 1650 feet to the outer boundary of the section, and no nearer than 330 feet to any governmental quarter-quarter section line. Exceptions to Rule Number 4 are covered under Rule Number 5 for topographical conditions, and recompletion of a well previously drilled to another horizon.

Rule Number 6 provides for an exception to any presently drilling or completed well in the Strawn formation.

Rule Number 7 is a request that this matter be reopened at an Examiner Hearing one year from the date of the initial pipeline sales.

For the Morrow reservoir the recommended area to be spaced is all of Section 6, Township 20 South, Range 25 East, The rules for the Morrow reservoir are identical to the ones suggested for the Strawn, 640-acre spacing and a well located no nearer than 1650 to the outer boundary of the section and no nearer than 330 feet to any governmental section line.

Q Were Exhibits 6 through 11 prepared by you or at your direction?

A Exhibit 6 through --

Q Eleven?

A Yes, they were. I would like to point out that with regard to Exhibit Number 11, that these rules are similar to rules that the Commission has already granted to the Indian Basin, Upper Pennsylvanian and Morrow reservoirs, and that a precedent has been set in this matter with regard to 640-acre spacing for gas well development of formations of this depth.

Q As an engineer, would you be in a position to comment with regard to whether or not an operator drilling a well in Section 7 at the locations that you propose would recover his equitable share of the gas from this source of supply in both the Morrow and the Strawn Pools?

A Let me see if I understand you correctly. That is a well is drilled in accordance with the rules that we have proposed here --

Q Yes.

A -- would it recover its equitable share of the reserves in that section?

Q No, not in the section, in the pool, assuming they get a well.

A Assuming they get a well, I see no reason why they

should not recover their equitable share.

Q Have you contacted other operators in this area, and if you have, will you tell the Examiner what the results of your contact has been?

A Yes, sir, we have advised all offset operators to Section 6 of our intent to request special pool rules for both the Strawn and Morrow reservoirs, and we have had concurrence from either, either concurrence or no objection from all operators, or at least the ones that that have reported to us there has been no objection, except T. P. We have concurrence from Atlantic, from Yates Brothers, from Newburg and from Inghram.

Q In connection with the prevention of waste and conservation, would you care to express an opinion with regard to the proposed rules that you have suggested to the Examiner?

A Well, these rules are temporary. That is, I think we have indicated to govern, I mean to regulate in a systematic and equitable manner the future development and production for these pools. They also provide an economic, or would provide for an economic development; whereas from the information that we presently have, development on smaller spacing would not be economic, and I believe they are fair and equitable at this time, until additional data may be derived through the exploration by the drillbit to prove otherwise.

MR. HUNKER: I have no further questions.

MR. NUTTER: Are there any questions of Mr. Anderson?

CROSS EXAMINATION

BY MR. RUSSELL:

Q Referring to your Exhibit 3, Mr. Anderson, it is probably Mr. Ellis's, but Exhibit 3; direct your attention to the bottom of Section 6; there's a figure there, 26, what is that?

A Let's see, 26, this is apparently the amount of net sand that Mr. Ellis has denoted for the Dagger Draw Number 1.

Q And not the estimated net pay?

A No, sir.

Q How did you get your figure of ten feet shown on your Exhibit 10?

A My estimation of ten foot was based on log analyses.

Q You have stated that there is very limited information in this pool at this time?

A No, sir, I have not stated that exactly.

Q I believe you said the information was limited.

A Mr. Ellis may have indicated that the geology of the Strawn reservoir was limited. On the Morrow there seems to be sufficient data to indicate at this time a fairly significant area of possible production.

Q But there has only been one well drilled in the pool,

is that correct?

A There has been only one well completed in the pool.

Q Right. And the only information available in the pool itself is from that one well in the pool?

A Of course, the information that we have presented here today, it consists to a great deal from the Dagger Draw Number 1, but certain, as Mr. Ellis has testified, there are seven other wells, or six other wells which have been, the data from these wells have been incorporated.

Q Which are wells outside the pool?

A Yes.

Q And yet you are asking the Commission to make an exception to the standard rules for the development of a gas pool at this depth, and ask that 640 acres be --

A An exception to the statewide rule.

Q Yes.

A Yes, sir, that's the whole purpose of the hearing.

Q I beg your pardon?

A I said, that's the whole purpose of our being here today.

Q Let's take a look at your Exhibit Number 2.

A Yes.

Q I direct your attention to the location of your Dagger Number 1 Well. You say that will drain 640 acres in the Morrow

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and the Strawn, right?

A Based on the information presently available to me, yes.

Q Well, it isn't limited information, is it?

A The information that we have today is available and based on it, I have concluded that a well, that this well can drain 640 acres. I am not saying that there cannot be some additional information obtained because that always can be the case.

Q As additional wells are drilled you will obtain additional information?

A Certainly.

Q Either to justify your exception or to carry it forward under the statewide rules as established now?

A Either justify it or not to justify it.

Q Now, this well of yours, at this location is going to drain gas from Section 7, is it not?

A If the reservoir exists under Section 7, yes, it will.

Q Well, your geologist has indicated that there's more probability and there's more gas under 7 than there is 6; so wouldn't it drain gas from 7 under those circumstances?

A Unless there's some barrier existing on the section line.

Q Do you know of any barrier?

A I do not know.

Q This well does not know that section line is there, does it?

A That's correct.

Q So, it is going to drain gas from Section 7, right?

A Yes, it probably will drain gas -- If no other well is drilled it will probably drain gas from Section 7 and possibly 18 also, and Section 8 and Section 5, Section 1; if the reservoir lies underneath these sections.

Q From the information which you have available at this time, will not your well at its present location drain more gas from Section 7 than it will from Section 6?

A Probably it would if the information, the configuration of the reservoir is as we have it here pictured here, it probably would.

Q Under your proposed rules in Section 7, T. P. could not drill a well any closer to the section line between 6 and 7 than 1650 feet, right?

A That's correct.

Q That's two and a half times away from the section line that your well is?

A Well, I suppose, I haven't -- You want me to stop and figure it out?

Q Well, approximately. You know its approximate, I think.

A All right.

Q So if your rules were promulgated, and Texas Pacific had to drill their wells 1650 feet from that section line, and you are only 650 feet from them, how do you base your conclusion that those rules will enable Texas Pacific to recover its just and equitable share of the gas, when you are closer to the section line draining it?

A By the same token that if you drill a well in Section 7 in accordance with these rules, there's nothing in those rules to prevent a well in Section 7 from draining gas from underneath Section 8 or Section 18, or actually from Section 6.

Q I agree with you, but under your proposed rule you don't want anybody as close to the section line as you are?

A I think that that's quite right. There's little sense in us being here today to ask for 640-acre spacing if we aren't going to allow development on 640-acre spacing. If you allow 660 foot to the lease line you are then advocating 160 spacing.

Q 320, isn't it?

A 660, you could locate wells 660 from the corners.

Q But we have to go 1650 from the outer boundaries of the section?

A Yes, but you are suggesting that you be allowed to come within 660 feet of the section line, are you not?

Q Well, I'm just saying that since you went within 660, why do you object to the direct offset doing the same; wouldn't

that put them in an equitable position with you, as far as compensating for drainage is concerned?

A It would neither aid nor hinder you. That is on the MCF produced out of the reservoir is an MCF whether it's produced 660 from the line or 1650 from the line.

Q But yours is 660, right?

A Yes.

Q Are you saying that if Texas Pacific was allowed to drill a well 660 feet offsetting your well that they would not then be protecting themselves from drainage by your well more so than going two and a half times that distance from your well?

A No. I see that Texas Pacific could just as sufficiently protect themselves if they are going to, with a location 1650 from the lease line, as well as one 660 from the lease line.

Q Let me put it this way. What is your objection to their putting it 660 from the section line offsetting your well?

A As I previously pointed out, if you allow 660 locations, that then you are then essentially advocating or approving development on 160, which is not the reason we're here today. We are here --

Q I realize that, but I'm just talking about protecting one's self from drainage by another well?

A Well, if you allow one exception, should you not allow other exceptions?

dearney-meier

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Q That may be, and you are here asking for an exception?

A I am here to request reasonable rules and regulations to govern the development of these reservoirs. And the fact that we drilled this well 660 feet from the line, we did meet the existing statewide rules at that time.

Q For 320-acre spacing?

A Certainly.

Q But that isn't what you are after, you are after 640?

A Certainly. We have tried to explain today why we are here.

MR. RUSSELL" I have no further questions.

BY MR. NUTTER:

Q Mr. Anderson, based on the Monsanto Foster Well being a dry hole, it did go to the Morrow, did it not?

A Yes.

Q Based on it being a dry hole and being located 660 feet from the boundary line of Section 6, do you feel confident that all of Section 6 is productive from the Morrow?

A Yes, sir, I would have to conclude that I think that all of Section 6 is productive from the Morrow, based on our geology that we have presented.

Q And that yellow fades out between Section 6 ^{and} in the Foster Well in Exhibit Number 1 just in time to include all of Section 6?

A Well, it apparently does so.

Q What is the difference between the net pay and the net sand, we have ten feet on one exhibit and 26 on the other?

A Yes, sir. Mr. Ellis has pictured on his isopac of net sand what he considers all sand that he was able to -- He can correct me on this if I'm wrong, all sand that he could see on the various wells which logged the Morrow by extracting all shale, and other lithology that was not sand, and summing up these sand thicknesses to arrive as a net sand.

My estimation of the net pay is based on what I could see was productive from the log, and it consisted of suitable permeability and porosity within this net sand of his. Needless to say, a lot of sand that may be logged in the well, possibly the tops and bottoms of it may be tight or relatively low permeability and low porosity, which I would not consider to be pay, yet it is a sand body.

MR. NUTTER: Mr. Ellis, are you still here?

MR. ELLIS: Yes, sir.

MR. NUTTER: What did you state -- I am sure it is in the record. What did you state the yellow represented in the gamma ray curve?

MR. ELLIS: Sand lithology as indicated by the log itself.

MR. NUTTER: Is this sand that has porosity and

permeability?

MR. ELLIS: No, it is total sand, regardless of whether it has reservoir properties or not, and as is shown on Exhibit 3, Exhibit 3 is an isopac of sand without defining that sand as necessarily being productive sand, and this is indicated by the fact that numbers are assigned to the Number 1 Foster Well, as an example, the Monsanto Number 1 Foster did have sand lithology, did have rock present, as sand, it was drillstem tested and it was not commercially productive of gas.

MR. NUTTER: Now, your gross isopac is from top to bottom of the pay and includes the shale intervals?

MR. ELLIS: It includes the shale.

MR. NUTTER: Your net sand removes the shale, and it's all sand, but it may not be porous or permeable?

MR. ELLIS: It's all sand, that's right. These are geologic maps without regard to the existence of pay within these intervals or not.

Q (By Mr. Nutter) Mr. Anderson, how do you take 26 feet of sand and determine which ten feet is permeable and porous?

A Well, if you would, the log that you have in front of you is a saturation log or would give saturations. If you would like I can present you with the porosity logs on this well and if you want -- I didn't bring them as an exhibit, but I have some with me, if you wanted to go over the log

calculations and look at these other logs on this Dagger Draw Well.

Q Incidentally, is that unit this Dagger Draw unit?

A It's a, we call it, the unit is mentioned on this log. I've always referred to it as the Dagger Draw Number 1. Maybe Mr. Hunker could answer that question better than I could. He may have worked on the land situation involved in this.

MR. HUNKER: There is no unit in the usual sense.

MR. NUTTER: At the most the section is the unit.

MR. HUNKER: I will say this, that we communitized the south half of Section 6 as to the Morrow and associated liquid hydrocarbons producible therefrom.

MR. NUTTER: The unit does not extend beyond the boundaries of Section 6 then?

MR. HUNKER: No.

MR. DURRETT: It does include the north half of Section 6?

MR. HUNKER: The communitized area does not include the north half of Section 6.

MR. DURRETT: Who owns that acreage?

MR. HUNKER: That acreage is owned, according to the best information that I have, it's owned substantially all by Monsanto. Let me just check my map here. That is correct.

MR. DURRETT: Okay.

Q (By Mr. Nutter) So your ten feet of net pay is calculated from your porosity log, is that correct?

A Yes, sir.

Q On your reserves exhibit of the various items that are shown there, would it be a correct statement, Mr. Anderson, to say that the depth, reservoir temperature, reservoir pressures, gravity of the gas, gravity of the condensate and the GOR are all measured items and that the other three items being the porosity, saturation and permeability are either calculated or estimated?

A Yes, sir, that is correct.

Q Because you have no cores available of this well?

A No, sir.

Q What is the connate water saturation based on?

A It's based on log calculations and evaluations.

Q Interpretation of the log, permeability is the interpretation of the logs?

A Interpretation of the logs and drillstem test.

Q And porosity is computed from the log?

A Yes.

Q You say that you actually have executed a contract with a gas pipeline for the purchase of this gas?

A Yes, sir.

Q And that the contract specifically provides for a

million MCF per eight billion cubic feet of reserve?

A Yes, sir.

Q You expect that the takes from the well will be limited to 560 MCF a day?

A Well, this I am not, I do not have available to me at this time the reserves which have been agreed upon between our company and the pipeline company. This wasn't done by me and I haven't-- I haven't talked to the pipeline company. That's done by other people in our organization. They execute these contracts and agree upon a reserve. This is merely to show you that with these reserves existing what the payout would be, based on our present contract.

Q Then these are not necessarily the reserves that would be agreed upon between the producer and the purchaser?

A No, sir. I would have to call the Houston Office to get that figure; but I would expect that the reserves which I show here would not appreciably differ from what our company and the pipeline have agreed upon.

MR. NUTTER: I see. Are there any further questions of the witness?

MR. HUNKER: Mr. Examiner, I would like to offer in evidence Exhibits 1 through 11, in case I didn't do it before.

MR. NUTTER: Applicant's Exhibits 1 through 11 are admitted in evidence.

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(Whereupon, Applicant's Exhibits 1 through 11 were admitted in evidence.)

MR. NUTTER: Does anyone have any further questions of Mr. Anderson?

MR. DURRETT: I have a question or two.

BY MR. DURRETT:

Q Am I correct that this well is not connected to a pipeline?

A That's correct.

Q Are you awaiting FPC approval?

A I suppose that in an indirect manner we are. We are contracting to Natural Gas Pipeline and --

Q I'm familiar with that situation.

A If you are familiar with that situation, just for the record I had a conversation with Mr. --

Q Burns?

A The man in Amarillo for Natural Gas.

MR. NUTTER: Ramsey.

A -- Mr. Ramsey just the other day, and I asked him specifically if this well could be expected to be connected on the same date as the Indian Basin area, and he told me that he expected it would be the same date.

Q I don't have a copy of your proposed rules in front of me, but I believe that you provide for exception for wells

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drilling to or completed in the pool involved, is that correct?

A Yes, sir.

Q Would Monsanto have an objection to including in that a well location exception for any direct offset to a well that's presently located 660 feet from the line?

A Mr. Durrett, I am not authorized at this time to say what Monsanto's position would be on that question.

MR. DURRETT: All right, thank you. That's all I have.

MR. NUTTER: I would like to interject this thought at this point in this hearing. The application, as filed for this case, was for 640-acre spacing. The advertisement for the case was for 640-acre and normally when we advertise, or normally when the request is for a given spacing and fixed well locations the item, fixed well locations, is included in the notice of the case. It was not included here. I don't know what ramification this might have on your application.

MR. HUNKER: The Commission has had before it a similar case where they considered the entire matter, called the Pure Case.

MR. NUTTER: Was that case advertised for 640 and fixed well locations?

A No, not the fixed well locations. The latter part was omitted from it, too.

MR. RUSSELL: If the Examiner please, I would like to

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make a short statement for the record, and advise that Texas Pacific Oil Company is not opposed to 640-acre spacing, but they are opposed to the applicant's request for well locations as it will not permit Texas Pacific to protect itself from drainage and recover its just and equitable share of the gas in the pool.

For brevity I will ask Mr. Hunker if he will stipulate for the record that Texas Pacific Oil Company is the owner of a leasehold estate covering the northwest quarter, the west half of the northeast quarter, and the northwest quarter of the southwest quarter of Section 7, Township 20 South, Range 25 East; and will advise you that it's recorded in Book 86, Page 369 of the County --

MR. HUNKER: We will so stipulate.

MR. RUSSELL: I have no witness.

MR. NUTTER: Does anyone by any chance know who owns the rest of Section 7?

MR. HUNKER: Yes. My map shows that Franco Western owns the east half of the northeast, and the east half of the southwest under a Federal lease, and that Gulf Oil Corporation owns the southeast quarter of the section. Monsanto and its associates own the southwest quarter of the southwest quarter.

MR. NUTTER: Are there any further questions of this witness? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Hunker?

MR. HUNKER: Nothing further.

MR. NUTTER: Does anyone have anything further they wish to offer in this case?

MR. DURRETT: I would like to state for the record that the Commission has received a telegram from Monsanto, a telegram from Atlantic and a letter from Yates concurring with the applicant.

MR. HUNKER: Did you say Monsanto sent a telegram concurring with the applicant?

MR. DURRETT: That's an error, that's Carper Drilling Company.

MR. NUTTER: If there's nothing further in this case we will take the case under advisement and recess the hearing to 1:45.

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STATE OF NEW MEXICO)
) ss.
 COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 18th day of May, 1965.

Ada Dearnley
 Notary Public, Court Reporter.

My Commission Expires:
 June 19, 1965.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3243 heard by me on 8/28, 1965.
[Signature] Examiner
 New Mexico Oil Conservation Commission

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OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

CASE

3243

Date June 2, 1965

Hearing Date 9am April 28, 1965
DSN DSF

My recommendations for an order in the above numbered cases are as follows:

Enter an order approving temporary 640-acre spacing for the Dagger Draw Morrow Gas Pool in Eddy Co N.M. for a period of one year after initial pipeline completion. Use Standard 640-acre rules (Indian Basin) including well locations at least 1650 feet from outer boundary.

Include provision that the Secretary Director, in addition to the usual non standard location authority, may also approve the location of a Morrow well in the NW/4 NE/4 of Section 7, T20S, R25E provided that said well shall be no closer than 660 feet to the ~~boundary~~ north line of said Section 7 nor closer than 330 feet to any other boundary of said quarter section.

On applicant's request for 640 acre spacing for the Dagger Draw ~~Morrow~~ Draw Gas Pool on the grounds that due to apparent reservoir conditions no useful purpose would be served by a temporary 640 order

Examiner Hearing - April 28, 1965

- CASE 3243: Application of Monsanto Company for special pool rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Dagger Draw-Strawn Gas Pool and the Dagger Draw-Morrow Gas Pool, Eddy County, New Mexico, including a provision for 640-acre gas well spacing units.
- CASE 3003: In the matter of Case No. 3003 being reopened pursuant to the provisions of Order No. R-2685, which order established temporary 80-acre proration units for the Tobac-Pennsylvanian Pool, Chaves County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.
(Reopened)
- CASE 2997: In the matter of Case No. 2997 being reopened pursuant to the provisions of Order No. R-2677, which order established 80-acre spacing units for the Vacuum-Lower Pennsylvanian Pool, Lea County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.
(Reopened)
- CASE 3244: Application of James E. Logan for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Rain Spring Unit Area comprising 10,542.00 acres, more or less, of State, Federal and Fee lands in Townships 22 and 23 South, Ranges 24 and 25 East, Eddy County, New Mexico.

DOCKET: EXAMINER HEARING - WEDNESDAY - APRIL 28, 1965

9 A. M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or
Elvis A. Utz, Alternate Examiner:

- CASE 3217: (Continued from the March 10, 1965 examiner hearing)
In the matter of the hearing called by the Oil Conservation Commission upon its own motion to permit S. S. Sutton, dba Eddy Oil Company and all other interested parties to show cause why the Eddy Oil Company Stanolind-State Wells Nos. 1 and 2, located in Units G and J, respectively, of Section 36, Township 19 South, Range 30 East, Eddy County, New Mexico, should not be plugged in accordance with a Commission approved plugging program.
- CASE 3240: Application of Gulf Oil Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Central Drinkard Unit Area comprising 2,600 acres, more or less, of State and Fee lands in Township 21 South, Range 37 East, Lea County, New Mexico.
- CASE 3241: Application of Gulf Oil Corporation for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Drinkard Pool, Lea County, New Mexico, in its Central Drinkard Unit Area by the injection of water into the Drinkard formation through six wells in Sections 28, 29, and 32, Township 21 South, Range 37 East.
- CASE 2676: In the matter of the application of Gulf Oil Corporation to
(Reopened) reopen Case No. 2676 to reconsider applicant's request that a full 80-acre proration unit comprising the S/2 NW/4 of Section 23, Township 24 South, Range 37 East, Fowler Ellenburger Pool, Lea County, New Mexico, be approved for applicant's Lillie Well No. 3 located 2310 feet from the North line and 330 feet from the West line of said Section 23.
- CASE 3242: Application of Austral Oil Company Incorporated, for an unorthodox location, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the well location requirements for the Blanco-Mesaverde Gas Pool for its Bunny et al Well No. 1 at an unorthodox location 1040 feet from the South line and 1190 feet from the East line of Section 10, Township 27 North, Range 9 West, San Juan County, New Mexico.

file
Case 3243
[Signature]

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO

May 19, 1965

C
O
P
Y

Mr. George H. Hunker, Jr.
Attorney at Law
418 Hinkle Building
P. O. Box 2086
Roswell, New Mexico

Re: Case No. 3243 - Monsanto Company
Dagger Draw Gas Well Spacing

Dear George:

I have your letter of May 17, 1965, suggesting language that could be used to authorize a well to be located in Section 7. If the Examiner recommends authorizing an offset well in Section 7, I will take your letter of May 11 and your letter of May 17 into consideration in drafting the order. An order should be issued in the very near future.

Best personal regards.

Very truly yours,

J. M. DURRETT, Jr.
Attorney

JMD/esr

LAW OFFICES
GEORGE H. HUNKER, JR.
418 HINKLE BUILDING
ROSWELL, NEW MEXICO

505 622-3405

Post Office Box 2088

May 17, 1965

Mr. James M. Durrett, Jr., Attorney
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Re: Case No. 3243 - Monsanto Company
Dagger Draw Gas Well Spacing

Dear Mr. Durrett:

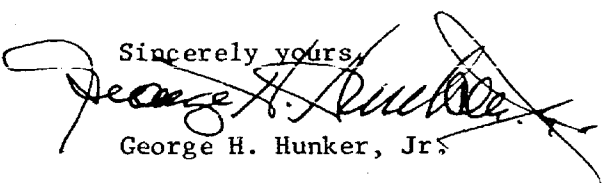
Monsanto Company, in the foregoing matter, introduced as Exhibit 11, certain proposed field rules. These field rules cover both the Strawn reservoir and the Morrow reservoir and each Rule 6 provides for an exception with respect to wells which have been drilled to or completed in the respective formations.

On May 11, 1965, I wrote you with regard to an amendment for a well to be located in Section 7. We have further reviewed this matter and as a possible alternative, we would like to give you some other language which could be used in lieu of the language previously submitted. This would permit a specific exception insofar as the acreage in Section 7 is concerned. The following could be added as a part of numbered paragraph 6 of the proposed rules:

"An exception is also granted to the requirements of Rule 4 for a well location in Section 7, Township 20 South, Range 25 East. A well in Section 7, Township 20 South, Range 25 East may be located no nearer than 660 feet to the north boundary and no nearer than 1,650 feet to the other boundaries of said Section 7 and no nearer than 330 feet to any governmental quarter-quarter section line."

I hope that you have an opportunity to review this case at an early date and if you have any questions with regard to it, please do not hesitate to call me.

Sincerely yours,


George H. Hunker, Jr.

GHH:cd

cc: Mr. Norman Abbott
Monsanto Company
P. O. Box 1829
Midland, Texas

LAW OFFICES
GEORGE H. HUNKER, JR.
418 HINKLE BUILDING
ROSWELL, NEW MEXICO

505 622-3405

POST OFFICE BOX 2086

May 11, 1965

Mr. Daniel S. Nutter,
Hearing Examiner
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Re: Case No. 3243 - Monsanto Company
Dagger Draw Gas Well Spacing

Dear Mr. Nutter:

At the time Monsanto Company's Application for Special Pool Rules was heard by you in Santa Fe on April 28, 1965, the attorney for the Commission (referring to the well location requirements of proposed Rule 4) asked Monsanto's witness, Percy G. Anderson, if Monsanto Company had any objection to the granting, in addition to drilling wells or completed wells, of an exception for any well which directly offset the drilling well or completed well. The witness stated that this was a management decision and that he could not answer the question at that time.

The foregoing question has been reviewed by Monsanto management and as the attorney of record for Monsanto, I have been instructed to advise the Examiner, for the record, that Monsanto Company has no objection to the inclusion of an additional exception. If the Examiner sees fit to do so, Paragraph 6 of the proposed rules may be amended by adding thereto the following sentence.

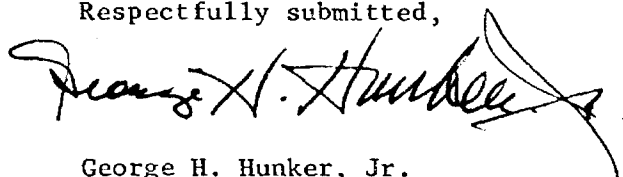
"Any well directly offsetting a well drilling to or completed in the Morrow formation within the Dagger Draw Morrow Gas Pool or within one mile of the Dagger Draw Morrow Gas Pool (Strawn formation within the Dagger Draw Strawn Gas Pool or within one mile of the Dagger Draw Strawn Gas Pool) that will not comply with the well location requirements of Rule 4 is granted an exception to the requirements of Rule 4; provided, however, such offset well shall not be drilled closer to the closest section line than the well being offset was drilled to the closest section line."

Mr. Daniel S. Nutter
Page 2

May 11, 1965

You may incorporate this letter into the record.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "George H. Hunker, Jr.", with a stylized flourish at the end.

George H. Hunker, Jr.

GHH:cd

cc: Mr. James M. Durrett, Jr.
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

cc: Mr. Norman Abbott
Monsanto Company
P. O. Box 1829
Midland, Texas

cc: Mr. John F. Russell
P. O. Box 640
Roswell, New Mexico

BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION OF MONSANTO COMPANY TO
CREATE AND ESTABLISH TEMPORARY
SPECIAL FIELD RULES AND REGULATIONS
WITHIN THE DAGGER DRAW-MORROW GAS
POOL AND THE DAGGER DRAW-STRAWN
POOL FOR 640 ACRE GAS WELL SPACING
UNITS, SECTION 6, TOWNSHIP 20 SOUTH,
RANGE 25 EAST.

CASE NO. 3213

Comes now Monsanto Company, by its attorney, and applies to the New Mexico Oil Conservation Commission for an Order establishing temporary special field rules and regulations for the Dagger Draw-Morrow Gas Pool and Dagger Draw-Strawn Pool, Eddy County, New Mexico, and in support of its application, Monsanto Company states:

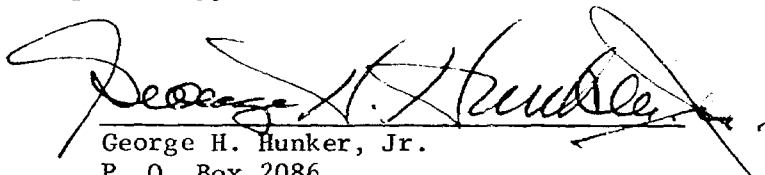
1. Monsanto Company is the Operator and a Working Interest Owner in the Monsanto Dagger Draw Well No. 1 located 660 feet from the south line and 1,980 feet from the east line of Section 6, Township 20 South, Range 25 East, N.M.P.M., Eddy County, New Mexico.
2. That the New Mexico Oil Conservation Commission, by Order R-2785 dated October 21, 1964, Case No. 3108, has heretofore approved and authorized the dual completion (conventional) of the Monsanto Dagger Draw Well No. 1 to produce gas from the Strawn Gas Pool through casing-tubing annulus and to produce gas from the Morrow Gas Pool through 2 3/8" tubing with separation of zones by a packer set at approximately 8,706 feet.
3. That the Monsanto Dagger Draw Well No. 1 has tested and found productive, gas in the Morrow formation and gas from the Strawn formation. The New Mexico Oil Conservation Commission, by Order R-2833 dated January 1, 1965, established the two gas pools covering these two formations and described the pools as the (1) "Dagger Draw-Morrow Gas Pool"

and (2) "Dagger Draw-Strawn Pool". Monsanto Company proposes the establishment of temporary special rules and regulations in the said gas pools, including a provision in said special rules and regulations for 640 acre gas well spacing units.

4. As a result of tests taken in the Morrow and Strawn formations in the Monsanto Dagger Draw Well No. 1, the applicant states that in its opinion, one well can efficiently and economically drain an area of 640 acres.

5. The approval of this application will prevent waste and will not adversely affect correlative rights.

WHEREFORE, Monsanto Company requests that this matter be set for hearing before one of the Commission's duly appointed Examiners at the second Examiner Hearing during the month of April, 1965 and that the Commission enter its Order approving this application.


George H. Hunker, Jr.
P. O. Box 2086
Roswell, New Mexico

Attorney for Monsanto Company - Applicant



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ARTESIA, NEW MEXICO - 88210

23 April 1965

S. F. YATES
PRESIDENT
HARVEY E. YATES
VICE PRESIDENT
MARTIN YATES, III
VICE PRESIDENT
JOHN A. YATES
SECRETARY
HUGH W. PARRY
TREASURER

RE: Strawn & Morrow reservoirs
in area of Monsanto's Dagger
Draw #1;
Sec 6, T20S., R25E., NMPM,
Eddy County, New Mexico.

Monsanto Company
602 West Missouri Avenue
Midland, Texas 79701

Attention: Mr. A. W. Wood
District Production Superintendent

Gentlemen:

Yates Petroleum Corporation concur that the Strawn and Morrow reservoirs in the area of the Dagger Draw #1 well in Section 6, Township 20S., Range 25E., Eddy County, New Mexico, should be developed on not less than 640 acres per well. We have considerable acreage in the area and are familiar with the problems of these reservoirs and agree that temporary operating rules on this basis should be issued.

If convenient, we would appreciate a copy of your application to the New Mexico Oil Conservation Commission.

Very truly yours,


Hugh W. Parry

dp

cc: New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS

DL=Day Letter

NL=Night Letter

LT=International Letter Telegram

The time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination.

LA123 SSM327

1965 APR 27 PM 3:42

L RWA065 PD=ROSWELL NMEX 27 325P EST=

THE NEW MEXICO OIL CONSERVATION COMMISSION=
SANTA FE NMEX=

MONSANTO CO HAS APPLIED FOR TEMPORARY 640 ACRES SPACING
FOR THE STRAWN AND MORROW RESERVOIR PRODUCING IN ITS
BAGGAR DRAW WELL NUMBER 1 LOCATED IN SECTION 6 TOWNSHIP
20 SOUTH RANGE 25 EAST EDDY COUNTY NEW MEXICO ATLANTIC
REFINING CO IS A WORKING INTEREST OWNER OF LEASES IN THE
AREA WE CONCUR WITH MONSANTO REQUEST FOR TEMPORARY
640 ACRES SPACING=

W P TOMLINSON ATLANTIC REFINING CO==

640 1 6 20 25 640=

APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS

DL = Day Letter
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The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA096 SSA213

1965 APR 27 3 01 PM • 11 40

L ARA010 PD=ARTESIA NMEX 27 128P MST=

NEW MEXICO OIL CONSERVATION COMMISSION=

NEW LAND OFFICE BLDG ATTENTION A L PORTER

SANTA FE NMEX=

WE SUPPORT THE MONSANTO COMPANY IN THEIR APPLICATION FOR
TEMPORARY 640- ACRE SPACING FOR GAS PRODUCTION FROM
THE STRAWN AND MORROW FORMATIONS IN THE DAGGER DRAW
AREA, CASE NO. 3243=

CARPER DRILLING COMPANY INC MARSHALL ROWLEY=

27 11 40

640 3243

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

505 622-3405

LAW OFFICES
GEORGE H. HUNKER, JR.
418 HINKLE BUILDING
ROSWELL, NEW MEXICO

March 29, 1965

POST OFFICE BOX 2086
Can 2243

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Re: Monsanto Dagger Draw 640 acre
Gas Well Spacing Application
Township 20 South, Range 25 East
Eddy County

Attention: Mr. Elvis Utz

Gentlemen:

Pursuant to the request of Monsanto Company, Midland, Texas, I have prepared and enclose herewith Monsanto's Application to Establish Special Temporary Field Rules and Regulations within the above area, including a provision for 640 acre gas well spacing.

I ask that you please file this Application and that you set the matter down for Hearing before the Examiner during the latter part of April. If possible, I would like to have the matter heard at an earlier date. If any earlier Hearing is scheduled, please advise.

Respectfully submitted,

George H. Hunker, Jr.
George H. Hunker, Jr.

GHH:cd
Encl.

cc: Mr. A. W. Wood
Monsanto Company
P. O. Box 1829
Midland, Texas

DOCKET MAILED

Date 4-15-65
R

dearnley-meier reporting service, inc.

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REPORT OF
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 21, 1967

IN THE MATTER OF:

In the matter of Case No. 3243 being
reopened pursuant to the provisions
of Order No. R-2919, which order
established 640-acre spacing for
the Dagger Draw-Morrow Gas Pool,
Lea County, New Mexico, for a
period of one year after first
pipeline connection in the pool.

Case No. 3243

REPORT:

ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Next case will be Case 3243.

MR. HATCH: Case 3243: In the matter of Case No. 3243 being reopened pursuant to the provisions of Order No. R-2919, which order established 640-acre spacing for the Dagger Draw-Morrow Gas Pool, Eddy County, New Mexico, for a period of one year after first pipeline connection in the pool.

MR. COX: I am Lewis Cox with Hinkle Bondurant & Christy in Roswell, New Mexico, representing the Applicant.

(Whereupon, Applicant's Exhibits
1-6 marked for identification)

MR. COX: I have one witness, Mr. Paul Harryman,
from Monsanto.

(Witness sworn)

MR. UTZ: Are there other appearances? You may proceed.

PAUL HARRYMAN, a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. COX:

Q State your name, please.

A Paul Harryman with Monsanto Company out of Midland,
Texas.

Q What is your position with Monsanto?

A I am a Petroleum Engineer.

Q Have you previously testified before this Commission?

A No, sir, I have not.

Q What is your educational background?

A I graduated in August of 1958 from Oklahoma State University with a degree in Mechanical Engineering.

Q Have you been continuously employed in engineering since your graduation?

A Yes, sir. I went to work for Monsanto in August of 1958 in their Production Research Department and worked in this capacity until September of 1965 when I moved to Midland, Texas, in the Midland District Production Department and I have resumed the responsibilities of Petroleum Engineer for the West Texas and New Mexico area.

MR. COX: We offer the witness as an expert.

MR. UTZ: He is qualified to testify.

Q (By Mr. Cox) What is the main purpose of this application?

A We hope or wish to obtain permanent rules for 640-acre spacing in the Dagger Draw Gas Pool.

Q I hand you an instrument which is marked as Applicant's Exhibit 1 and ask you to state to the Commission what this exhibit reflects, please, sir.

A Exhibit 1 shows the location of the Dagger Draw

No. 1 in Section 6 outlined in black there and also cornered that with a red arrow. Also on this exhibit all oil wells that have been drilled to the Morrow formation are circled in red and you will notice that about two miles north of the Dagger Draw there is the Carper dry hole. It was drilled to the Morrow and it was not completed in the Morrow. In Section 31 to the north of Section 6 is Monsanto Hondo Well. This well was drilled to the Morrow. It was not considered productive in the Morrow. It was produced for some time from the Cisco as an oil well. It has now been plugged and abandoned. In Section 5 to the east of Section 6 is Monsanto Foster Well, which was a dry hole and it was drilled to the Morrow and one of the most recent wells drilled has been in Section 7 to the south of Section 6. This was Texas Pacific Buchanan Well. Monsanto also participated in this well. It was drilled to the Morrow and tested through drillstem test and was plugged and abandoned as being nonproductive from the Morrow. And further to the south about three miles south and west of Section 6 is the Humble Hobbs which was also drilled to the Morrow and plugged and abandoned as a dry hole. It was never completed, I'm sure. Section 17 to the south and east is G.R. Brown Humble Federal Well. It is completed in the Morrow, however, in a different zone. It is in another pool. I believe we call it the Cemetery

Gas Pool. It and also the Phillips Royal are also in the same pool. They are in a different pool than the Dagger Draw and finally, there is one more Morrow test in the area. It's up to the north and east in Section 34, Pan American Werthiem Morrow. It is not in the same pool as the Dagger Draw either.

MR. UTZ: It's a Morrow completion?

A It is a Morrow completion, yes, sir.

MR. UTZ: Is that a Wildcat?

A I don't know for sure. I could not determine from looking at the field rules or anything. I did not call the operator, but I could not determine if this well is in a field or in a pool.

Q (By Mr. Cox) Have you reviewed the testimony in the previous hearing in connection with the temporary 640-acre spacing?

A Yes, I have.

Q Have you made a study of the production history of this well since it was placed on production?

A Yes, sir.

Q I hand you an instrument marked Applicant's Exhibit 2 and ask you to state what that is, please, sir.

A Exhibit No. 2 shows the production from the Dagger Draw No. 1 Well. It started producing to the pipeline in

February of 1966 and, as you can see, it has produced at a rate of in the order of thirty to thirty-one, thirty-two million cubic feet per month, in the order of about a million cubic feet per day. The well had previously produced in 1964 and 1965 an accumulative amount of 98 million cubic feet. This was produced and sold to drilling contractors in the area for drilling wells.

At the bottom of the page is a well test on the Dagger Draw No. 1 taken in January of 1967. It produced at a rate of 1.1 million cubic feet per day, condensate 1.2 barrels per day and water .4 barrels per day, with a flowing tubing pressure of 2163 PSIA.

Q I hand you Applicant's Exhibit 3 and ask you to state what this exhibit reflects, please, sir.

A Exhibit No. 3 presents the performance of the -- production performance of the well up to date. It is a plot of the bottom hole pressure over the compressibility of gas versus accumulative gas production. This has been extrapolated out to an abandonment BHP/Z of 1,000 and from this extrapolation I estimate that the well will ultimately produce 4.8 billion cubic feet of gas.

Q I hand you further an instrument marked Applicant's Exhibit 4 and ask that you explain to the Examiner the purpose of this exhibit.

A Exhibit 4 is a copy of the average reservoir characteristics of the Dagger Draw No. 1 Well. It presents data that can be used to calculate a volumetric estimate of gas in place. It can be further used to estimate recoverable gas from the well by volumetric calculations.

Q Does this indicate that one well will effectively and efficiently drain 640 acres?

A We might go to the next exhibit, I believe we can show that.

Q That's the instrument which is marked Exhibit 5?

A Yes, sir. Exhibit 5, first of all, presents the well cost of drilling the Dagger Draw No. 1, \$200,000.00. Following is ultimate recovery and as we explained earlier, on Exhibit 3, the pressure decline curve indicates ultimate recovery of 4.8 billion cubic feet of gas. Going further, in using the reservoir characteristics as presented in Exhibit 4 I calculated a volumetric estimated recovery of 3.8 billion cubic feet of gas for 640 acres.

Since the performance of the well indicates that the well will recover more than the volumetric estimate I conclude that the well will drain at least 640 acres, and the volumetric calculations show that 320 acres would recover 1.9 billion cubic feet. Further on down I have made an economic evaluation comparing a well drilled on 640-acre

spacing to one drilled on 320-acres and in the evaluation I used the pressure decline ultimate recovery value of 4.8 billion cubic feet of gas for 640 and half of this for 320. The income from sales would be \$682,000.00 for 640 versus \$342,000.00 for 320. After deducting operating expenses and severance taxes the operating income for a well drilled on 640 acres would be \$588,000.00 compared to \$265,000.00 for a well drilled to 320-acre spacing, an investment of \$200,000.00 for each well and allowing for income tax, the profit per well would be \$288,000.00 for a well drilled on 640-acre spacing compared to \$80,000.00 for a well drilled on 320-acre spacing. The rate of return would be 7.2 for 640 versus 2 per cent for 320. Profit-investment ratio is 1.44 and 1.4 respectively for 640 and 320 spacing. The payout time would be 4.3 years for 640 and 9.2 years for a well drilled on 320-acre spacing. The payout was based on the production, the average production rate that has been presented in Exhibit 2, in the order of 1 million cubic feet a day. This was for 640-acre spacing. A well drilled on 320-acre spacing, the payout was based on half a million cubic feet a day. The life for each well was estimated to be twenty years.

Q Based on these figures, is it your opinion that it would be uneconomic and inefficient to drill on 320-acre spacing?

A That is true. The economics would not justify drilling on 320-acre spacing.

Q I hand you an instrument marked Applicant's Exhibit No. 6 and ask you to tell the Examiner what this exhibit is intended to present.

A Exhibit No. 6 presents a list of Morrow Gas Pools that was taken from the Commission Field Rule Book as a cursory review and it shows gas pools, county that they are in, and the spacing that these pools have been allowed. The "P" at the edge of the pool indicates permanent spacing rules; the "T" indicates temporary. As the exhibit demonstrates, 640-acre spacing for Morrow is not unusual. In fact, it is more the general rule in New Mexico.

Q You would urge that the 640 acres for this pool be made permanent?

A Yes, sir.

MR. COX: I offer the exhibits in evidence, Mr. Examiner.

MR. UTZ: Without objection Exhibits 1 through 6 will be entered into the record of this case.

(Whereupon, Applicant's Exhibits
1-6 admitted in evidence)

MR. COX: I have no further questions.

CROSS EXAMINATION



BY MR. UTZ:

Q According to your Exhibit 1, this structure has been pretty well proven, is that a correct interpretation?

A Yes, sir, I think that is correct.

Q How about to the east?

A East?

Q West.

A Well, this might be the only direction that you might say it has not been proven. The well in Section 1 to the west was not drilled to the Morrow. So we have no indication of what the Morrow sand might be in that section. We do feel like the reservoir is limited in extent.

Q You don't plan to drill any more wells, I presume?

A To my knowledge, we do not plan to drill any more wells. Of course, all of our drilling is management's decision but this is our purpose of obtaining permanent spacing of 640 acres, to prevent us from having to drill another well in Section 6 to hold the entire lease.

Q Do you know of any consideration for a well in Section 32?

A Section 32?

Q Yes, sir.

A No, sir, I do not know of any.

Q Who owns that acreage or remaining acreage in that

section, do you know?

A Not right offhand. On this land map -- would you like to have that?

MR. COX: We can offer this as an exhibit.

MR. UTZ: That would be all right as No. 7.

MR. COX: Yes.

(Whereupon, Applicant's Exhibit 7 marked for identification)

MR. COX: We offer Exhibit 7 which is a land map of the area.

MR. UTZ: It will be accepted.

A As reflected on this land map. T. J. Sivley has an interest in Section 32, Gulf, I believe, Sinclair, and Ramapo Oil has an interest in that section.

Q You don't know of any interest in drilling Morrow wells?

A I have no knowledge of any interest in drilling Morrow wells in this section, no, sir.

Q This is a one-well pool, right?

A That is true.

Q Do you have a pipeline connection for the well?

A Yes, sir.

Q Who is your purchaser?

A Natural Gas Pipeline Company of America.

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1205 FIRST NATIONAL BANK BLDG. • PHONE 235-1294 • ALBUQUERQUE, NEW MEXICO 87108



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Q This pool is not a prorated pool, is that correct?

A That is true, it is not prorated.

Q Referring to Exhibit No. 5 your payout times of 4.3 versus 9.2 years, how did you arrive at the 9.2 years for 320 acres? Do you have some kind of reserve contract?

A This is true, take is based on reserves.

Q But actually, there is nothing to prevent them from taking 640 acre allowable here, as you term allowables?

A I think this is what the contract states. They are required to take a certain amount, but this does not prevent them from taking more, so it is possible that they could take a 640-acre allowable from 320-acre spacing or they could take a million a day, I believe. The payout could be decreased in this case.

Q Yes, sir.

MR. UTZ: Are there other questions of the witness?

Witness may be excused.

(Witness excused)

MR. UTZ: Other statements in this case?

The case will be taken under advisement.

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PAGE 13

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, KAY EMBREE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

Kay Embree
Court Reporter

I do hereby certify that the foregoing is a true and correct record of the proceedings in the hearing of Case No. 3243, heard by me on Feb. 21, 1967.

Thos. L. [Signature] Secretary
New Mexico Oil Conservation Commission

BEFORE EXAMINER UTZ	
OIL CONSERVATION	ADJUDICATION
EXHIBIT NO.	2
CASE NO.	3243

DAGGER DRAW MORROW GAS POOL
EDDY COUNTY, NEW MEXICO

DAGGER DRAW NO. 1 PRODUCTION

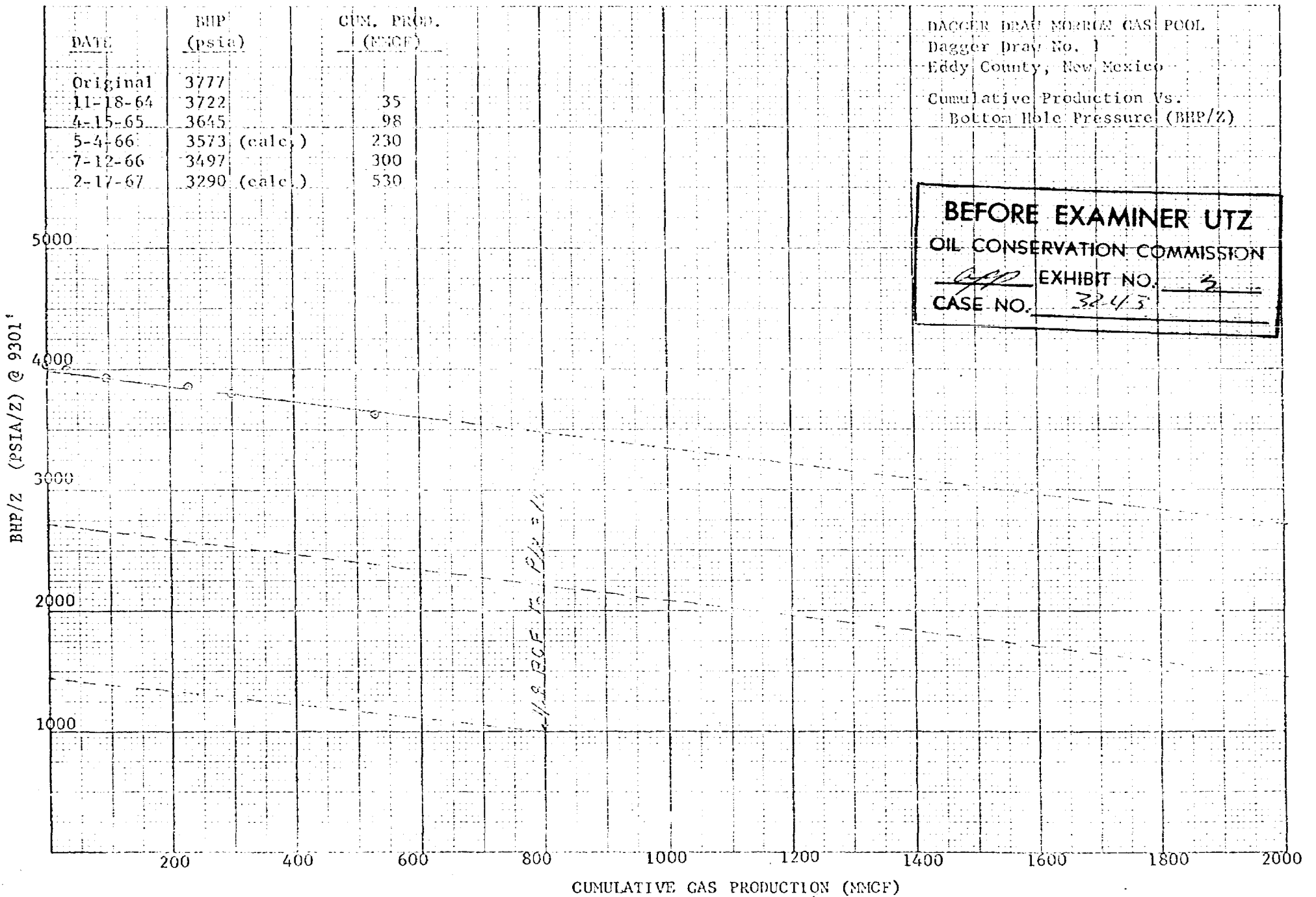
<u>DATE</u>	<u>PRODUCTION OIL (Bbls)</u>	<u>CUMULATIVE OIL PROD.</u>	<u>PRODUCTION GAS (MCF)</u>	<u>CUMULATIVE GAS PROD.</u>
1-1-66		43		98,275
Jan. 1966	0		0	
February	29		23,809	122,084
March	66		53,417	175,501
April	68		54,498	229,999
May	36		28,642	258,641
June	35		30,397	289,038
July	37		30,672	319,710
August	42		33,926	353,636
September	26		30,229	383,865
October	38		33,070	416,935
November	37		34,349	451,284
December	37		31,049	482,333
Jan. 1967	36		32,357	514,690
February (-15)	15	545	15,000	529,690

1-30-67 Well Test

Gas	1.1 MMCFPD
Condensate	1.2 BPD
Water	.4 BPD
Flowing Tubing Pressure	2163 psia

DAGGER DEAN MORRIS GAS POOL
Dagger Dray No. 1
Eddy County, New Mexico
Cumulative Production Vs.
Bottom Hole Pressure (BHP/Z)

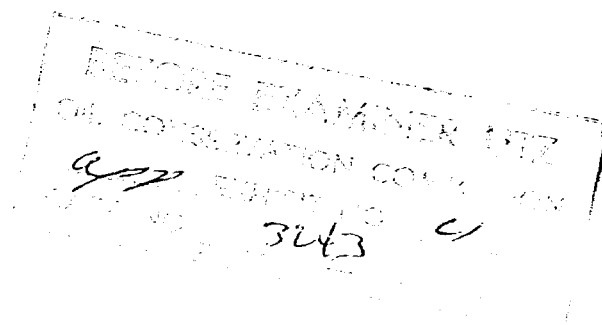
BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 3245



DAGGER DRAW MORROW GAS POOL
EDDY COUNTY, NEW MEXICO

AVERAGE RESERVOIR CHARACTERISTICS

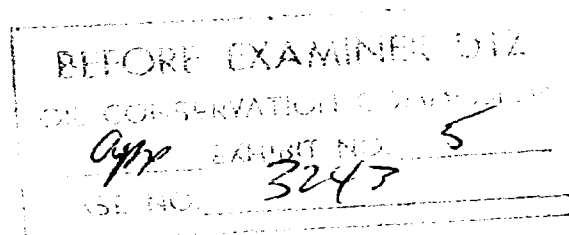
Depth	9296 Feet
Reservoir Temperature	176°F
Average Porosity	15%
Average Connate Water Saturation	30%
Average Permeability	10-20 md.
Original Reservoir Pressure	3777 psia
Separator Gas Gravity	.592
Condensate Gravity, API	52°
Gas-Condensate Ratio	860,000 CF/Bbl



DAGGER DRAW MORROW GAS POOL
EDDY COUNTY, NEW MEXICO

RESERVES & ECONOMIC DATA COMPARING 640 & 320 ACRE DEVELOPMENT

WELL COST	DAGGER DRAW NO. 1	\$200,000	
		<u>640 Ac.</u>	<u>320 Ac.</u>
ULTIMATE RECOVERY:			
Pressure Decline Curve, Gas		4.8 BCFG	-
Condensate		5600 Bbls.	-
Volumetric Calculation, Gas		3.8 BCFG	1.9 BCFG
Condensate		4400 Bbls.	2200 Bbls.
Recovery = 592 MCF/AF			
Thickness = 10'			
ECONOMICS:			
Ultimate Recovery, Gas		4.8 BCFG	2.4 BCFG
Condensate		5600 Bbls.	2800 Bbls.
Income from Sales		\$682,000	\$342,000
Direct Operating Expense & Sev. Tax		94,000	77,000
Operating Income		\$588,000	\$265,000
Investment		200,000	200,000
Federal Income Tax		100,000	(15,000)
Profit		\$288,000	\$ 80,000
Rate of Return on Initial Investment		7.2%	2.0%
Ratio of Profit to Investment		1.44	.40
Payout		4.3 Yrs.	9.2 Yrs.
Life		20 Yrs.	20 Yrs.



NEW MEXICO MORROW GAS POOLS

<u>GAS POOL</u>	<u>COUNTY</u>	<u>SPACING (Acres)</u>
Antelope Ridge Morrow (P)	Lea	320
Cinta Roja Morrow (P)	Lea	640
Dos Hermanos Morrow (T)	Eddy	640
Grama Ridge Morrow (T)	Lea	640
Indian Basin Morrow (T)	Eddy	640
Indian Hills Morrow North (T)	Eddy	640
Lusk Morrow (P)	Lea	640
McMillan Morrow (T)	Eddy	640

(P) Permanent
(T) Temporary

BEFORE EXAMINING
OIL CONSERVATION COMMISSION
app. REPORT NO. 6
3243

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION NEW MEXICO OIL CONSERVATION COMMISSION

EXHIBIT NO. 7

CORRECTED COPY

Form C-122

CASE NO. _____

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Revised 12-1-55

Pool Wildcat Formation Strawn County Eddy

Initial X Annual _____ Special _____ Date of Test 9-5-64

Company Monsanto Company Lease Dagger Draw Well No. 1-C

Unit 0 Sec. 6 Twp. 20S Rge. 25E Purchaser None

Casing 4 1/2 Wt. 11.6 I.D. 4.000 Set at 9611 Perf. 8683 To 8699
O.D. _____

Tubing 2 Wt. 4.7 I.D. 2.375 Set at 9100 Perf. Below To Packer

Gas Pay: From 8683 To 8706 L 8683 xG .671 -GL 5830 Bar.Press. 13.2

Producing Thru: Casing X Tubing _____ Type Well G. G. Dual
Single-Bradenhead-G. G. or G.O. Dual

Date of Completion: 8-21-64 Packer 8706 Reservoir Temp. _____

OBSERVED DATA

Tested Through (Proven) (Shokey) (Meter) Type Taps Flange

No.	Flow Data					Tubing Data		Casing Data		Duration of Flow Hr.
	(Proven) (Line) Size	(Shokey) (Orifice) Size	Press. psig	Diff. h _w	Temp. °F.	Press. psig	Temp. °F.	Press. psig	Temp. °F.	
SI						Packer		2745	80	
1.	3"	1.250	262	12	94	Packer		2535	74	1.00
2.	3"	1.250	298	20	87	Packer		2402	74	1.00
3.	3"	1.250	247	43	86	Packer		2286	74	1.00
4.	3"	1.250	202	69	78	Packer		2137	74	1.00
5.										

FLOW CALCULATIONS

No.	Coefficient (24-Hour)	$\sqrt{h_w P_f}$	Pressure psia	Flow Temp. Factor F _t	Gravity Factor F _g	Compress. Factor F _{pv}	Rate of Flow Q-MCFPD @ 15.025 psia
1.	9.781	70.382	275.2	.9638	.9456	1.023	645
2.	9.781	93.347	311.2	.9750	.9456	1.027	865
3.	9.781	105.776	260.2	.9759	.9456	1.023	977
4.	9.781	121.856	215.2	.9831	.9456	1.020	1,130
5.							

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio - cf/bbl.

Gravity of Liquid Hydrocarbons None Produced deg.

F_c 3.355 (1-e^{-s}) .330

Specific Gravity Separator Gas .671

Specific Gravity Flowing Fluid .671

P_c 2759.2 P_c² 7,613.2

No.	P _w P _t (psia)	P _t ²	F _c Q	(F _c Q) ²	(F _c Q) ² (1-e ^{-s})	P _w ²	P _c ² -P _w ²	Cal. P _w	P _w P _c
1.	2543.2	6,493	2,167	4.7	1.6	6,494.6	1,118.6	2543.5	92.4
2.	2415.2	5,833	2,902	8.4	2.8	5,835.8	1,777.4	2415.7	87.6
3.	2299.2	5,286	3,273	10.7	3.5	5,289.5	2,323.7	2299.9	83.4
4.	2150.2	4,623	3,795	14.4	4.8	4,627.8	2,985.4	2151.2	78.0
5.									

Absolute Potential: 1,925 MCFPD; n .571

COMPANY Monsanto Company

ADDRESS Box 1829 - Midland, Texas

AGENT and TITLE R. H. Harrington - Field Petroleum Engineer

WITNESSED _____

COMPANY West Texas Engineering Service, Inc.

REMARKS _____

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION MEXICO OIL CONSERVATION COMMISSION

EXHIBIT NO. 8

CORRECTED COPY

Form C-122

CASE NO.

Revised 12-1-55

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Well Wildcat Formation Morrow County Eddy
 Initial X Annual _____ Special _____ Date of Test 9-4-64
 Company Monsanto Company Lease Dagger Draw Well No. 1-T
 Unit 0 Sec. 6 Twp. 20S Rge. 25E Purchaser None
 Casing 4 1/2 Wt. 11.6 I.D. 4.000 Set at 9611 Perf. 9296 To 9326
 Tubing 2 Wt. 4.7 I.D. 1.995 Set at 9100 Perf. Open To Ended
 Gas Pay: From 9294 To 9386 L 9311 xG _____ -GL _____ Bar. Press. 13.2
 Producing Thru: Casing _____ Tubing X Type Well G. G. Dual
 Single-Bradenhead-G. G. or G.O. Dual
 Date of Completion: 8-21-64 Packer 8706 Reservoir Temp. _____

OBSERVED DATA

Tested Through (Prover) (Choke) (Meter) Type Taps Flange

Flow Data					Tubing Data		Casing Data		Duration of Flow Hr.
(Prover) (Line) Size	(Choke) (Orifice) Size	Press. psig	Diff. h _w	Temp. °F.	Press. psig	Temp. °F.	Press. psig	Temp. °F.	
					3030	80	Packer		
3"	2.00	232	4.5	86	2860	73	Packer		1.00
3"	2.00	222	13.0	75	2590	75	Packer		1.00
3"	2.00	320	14.0	75	2405	75	Packer		1.00
3"	2.00	350	15.5	75	2265	75	Packer		1.00

FLOW CALCULATIONS

Coefficient (24-Hour)	$\sqrt{h_{wPF}}$	Pressure psia	Flow Temp. Factor F _t	Gravity Factor F _g	Compress. Factor F _{pv}	Rate of Flow Q-MCFPD @ 15.025 psia
27.52	33.217	245.2	.9750	.9567	1.020	371
27.52	55.255	235.2	.9905	.9567	1.022	1,474
27.52	66.259	333.2	.9905	.9567	1.031	1,835
27.52	79.054	403.2	.9905	.9567	1.033	2,140

PRESSURE CALCULATIONS

Liquid Hydrocarbon Ratio 195,000 cf/bbl.
 Gravity of Liquid Hydrocarbons 52.0 deg.
 (1-e^{-s})

Specific Gravity Separator Gas .6556
 Specific Gravity Flowing Fluid _____
 P_c 3777.2 P_c 14,267

No.	P _w P _t (psia)	P _t ²	F _c Q	(F _c Q) ²	(F _c Q) ² (1-e ^{-s})	P _w ²	P _c ² -P _w ²	Cal. P _w	P _w P _c
1.	3510.2					12,322	1,243	3510.2	92.9
2.	3362.2					10,842	3,025	3262.2	36.3
3.	3036.2					9,219	5,043	3036.2	88.3
4.	2936.2					8,544	6,223	2936.2	75.0
5.									

Absolute Potential: 3,900 MCFPD; n .726

COMPANY Monsanto Company

ADDRESS Box 1329 - Midland, Texas

AGENT and TITLE R. W. Harrington - Field Petroleum Engineer

WITNESSED

COMPANY West Texas Engineering Service, Inc.

REMARKS

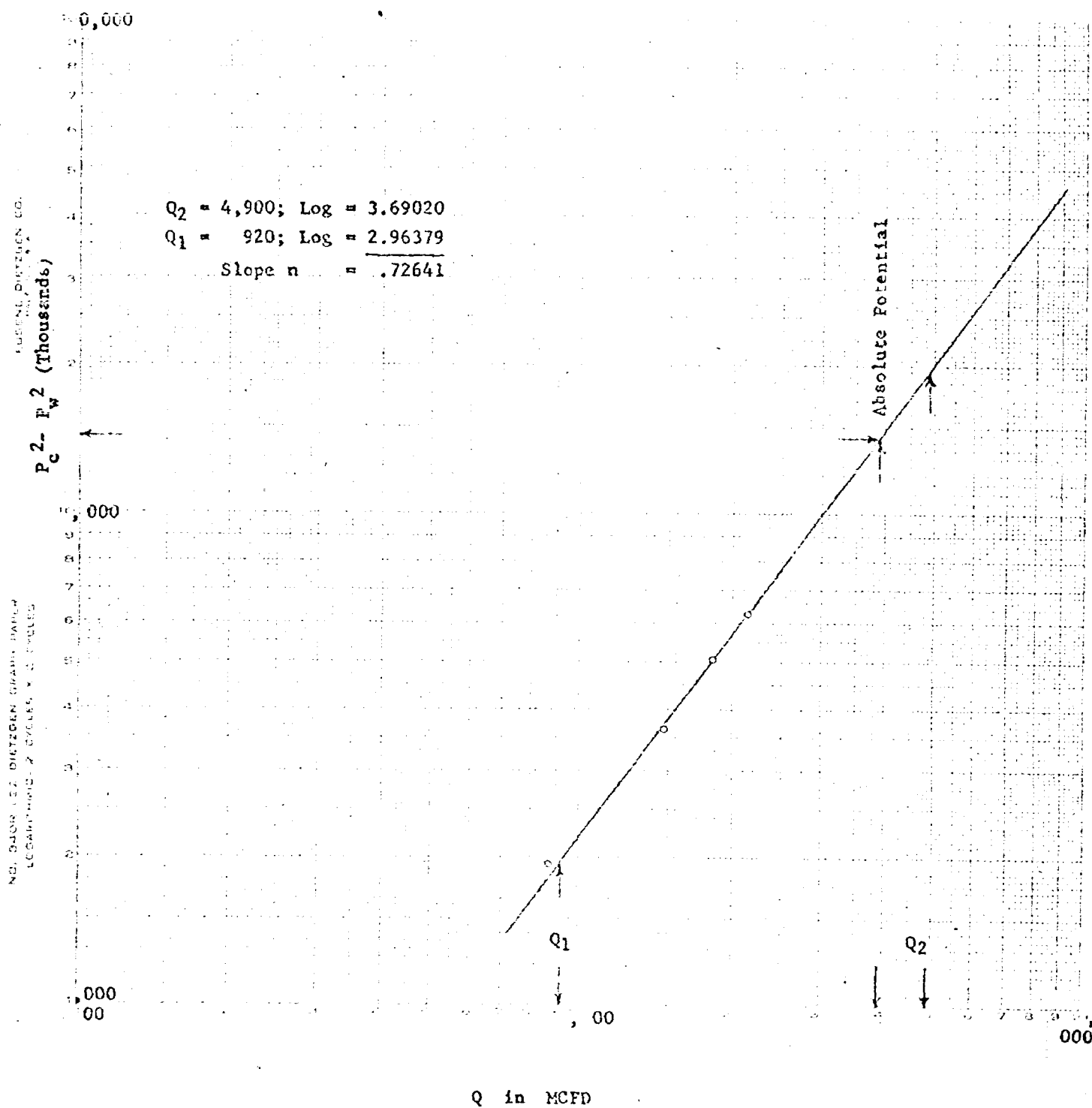
P_c and P₀ as shown are P_f and P₀ as measured with an Amerada RFG-3 Instrument at 9311', Mid-Point of Casing Perforations. The instrument was run out of the open ended tubing to the perforation level.

XERO COPY

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COMPANY Monsanto Company
 WELL Barrett Draw No. 1-T
 LOCATION C6-20S-25E
 COUNTY Eddy
 DATE 9-4-64

CORRECTED COPY



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BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 9
CASE NO. 2742

DAGGER DRAW STRAWN & MORROW POOLS
Eddy County, New Mexico

AVERAGE RESERVOIR CHARACTERISTICS

Strawn Zone

Depth
Reservoir Temperature
Average Porosity
Average Connate Water Saturation
Average Permeability
Original Reservoir Pressure
Separator Gas Gravity
Condensate Gravity, API
Gas - Condensate Ratio

8688 Feet
165° F
13 %
20 %
3 md
3700 psia
.671
46.6°
500,000 CF/Bbl.

Morrow Zone

Depth
Reservoir Temperature
Average Porosity
Average Connate Water Saturation
Average Permeability
Original Reservoir Pressure
Separator Gas Gravity
Condensate Gravity, API
Gas - Condensate Ratio

9296 Feet
176° F
15 %
30 %
10 - 20 md
3777 psia
.656
52°
250,000 CF/Bbl.

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION

EXHIBIT NO. 10CASE NO. 224RESERVES & ECONOMIC DATA FOR 640 ACRE DEVELOPMENT
DAGGER DRAW STRAWN & MORROW POOLS
Eddy County, New Mexico

Dagger Draw No. 1	Actual Cost	\$200,000
Foster No. 1 (Dry Hole)	Actual Cost	\$140,000
Reserves:		
Strawn - gas		1,000,000 MCF
condensate		2,000 Bbls.
Morrow - gas		3,500,000 MCF
condensate		14,000 Bbls.
Total Well - gas		4,500,000 MCF
condensate		16,000 Bbls.
Estimated Net Pay :		
Strawn	3 Feet	
Morrow	10 Feet	
Gross Income from Sales		\$646,000
Direct Operating Expenses & Severence Taxes		80,300
Operating Income		\$566,300
Investment		200,000
Federal Income Tax		94,300
Profit		\$272,000
Payout @ 560 MCFPD		15 yrs.
Rate of Return on Initial Investment		6.8 %
Ratio of Profit to Investment		1.36 to 1

BEFORE EXAMINER NUTTER	
OIL CONSERVATION COMMISSION	
EXHIBIT NO. <u>11</u>	
CASE NO. <u>2243</u>	
<u>Strawn Reservoir</u>	

DAGGER DRAW STRAWN AND MORROW POOLS
EDDY COUNTY, NEW MEXICO
PROPOSED POOL RULES

Recommended area to be spaced - Township 20 South, Range 25 East, Section 6: all.

1. Each well completed or recompleted in the Dagger Draw Strawn Gas Pool, or in the Strawn formation within one mile of the Dagger Draw Strawn Gas Pool, and not nearer to or within the limits of another designated Strawn Pool shall be spaced, drilled, operated and produced in accordance with the special rules and regulations hereinafter set forth.
2. Each well completed or recompleted in the Dagger Draw Strawn Gas Pool shall be located on a standard unit containing 640 acres, more or less, consisting of a single governmental section.
3. The Secretary-Director may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit and the unorthodox size or shape of the unit is necessitated by a variation in the legal subdivision of the United States Public Lands Survey, or the following facts exist and the following provisions are complied with:
 - (a) The non-standard unit consists of quarter-quarter sections or lots that are contiguous by a common bordering side.
 - (b) The non-standard unit lies wholly within a single governmental section and contains less acreage than a standard unit.
 - (c) The applicant presents written consent in the form of waivers from all offset operators and from all operators owning interests in the section in which the non-standard unit is situated and which acreage is not included in said non-standard unit.
 - (d) In lieu of Paragraph (c) of this rule, the applicant may furnish proof of the fact that all of the aforesaid operators were notified by registered or certified mail of his intent to form such non-standard unit. The Secretary-Director may approve the application if no such operator has entered an objection to the formation of such non-standard unit within 30 days after the Secretary-Director has received the application.
4. Each well completed or recompleted in the Dagger Draw Strawn Gas Pool shall be located no nearer than 1650' to the outer boundary of the section and no nearer than 330' to any governmental quarter-quarter section line.
5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon.

6. That any well presently drilling to or completed in the Strawn formation within the Dagger Draw Strawn Gas Pool or within one mile of the Dagger Draw Strawn Gas Pool that will not comply with the well location requirements of Rule 4 be granted an exception to the requirements of Rule 4.

7. That this case be reopened at an examiner hearing one year from the date that a pipeline connection is first obtained for a well in the Dagger Draw Strawn Gas Pool, at which time the operators in the subject pool may appear and show cause why the Dagger Draw Strawn Gas Pool should not be developed on 320 acre spacing units.

Morrow Reservoir

Recommended area to be spaced - Township 20 South, Range 25 East, Section 6: all.

1. Each well completed or recompleted in the Dagger Draw Morrow Gas Pool, or in the Morrow formation within one mile of the Dagger Draw Morrow Gas Pool, and not nearer to or within the limits of another designated Morrow Pool shall be spaced, drilled, operated and produced in accordance with the special rules and regulations hereinafter set forth.

2. Each well completed or recompleted in the Dagger Draw Morrow Gas Pool shall be located on a standard unit containing 640 acres, more or less, consisting of a single governmental section.

3. The Secretary-Director may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit and the unorthodox size or shape of the unit is necessitated by a variation in the legal subdivision of the United States Public Lands Survey, or the following facts exist and the following provisions are complied with:

- (a) The non-standard unit consists of quarter-quarter sections of lots that are contiguous by a common bordering side.
- (b) The non-standard unit lies wholly within a single governmental section and contains less acreage than a standard unit.
- (c) The applicant presents written consent in the form of waivers from all offset operators and from all operators owning interests in the section in which the non-standard unit is situated and which acreage is not included in said non-standard unit.
- (d) In lieu of Paragraph (c) of this rule, the applicant may furnish proof of the fact that all of the aforesaid operators were notified by registered or certified mail of his intent to form such non-standard unit. The Secretary-Director may approve the application if no such operator has entered an objection to the formation of such non-standard unit within 30 days after the Secretary-Director has received the application.

4. Each well completed or recompleted in the Dagger Draw Morrow Gas Pool shall be located no nearer than 1650' to the outer boundary of the section and no nearer than 330' to any governmental quarter-quarter section line.
5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon.
6. That any well presently drilling to or completed in the Morrow formation within the Dagger Draw Morrow Gas Pool or within one mile of the Dagger Draw Morrow Gas Pool that will not comply with the well location requirements of Rule 4 be granted an exception to the requirements of Rule 4.
7. That this case be reopened at an examiner hearing one year from the date that a pipeline connection is first obtained for a well in the Dagger Draw Morrow Gas Pool, at which time the operators in the subject pool may appear and show cause why the Dagger Draw Morrow Gas Pool should not be developed on 320 acre spacing units.