

RECEIVED OF PHILLIPS  
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Case Number

4906

Application  
Transcripts.

Small Exhibits

ETC.

Dockets mailed to the following:

Mr. E. M. Gorence - Phillips - Odessa, Texas  
Mr. C. E. Childers - Carlsbad, N. M  
U. S. G. S. - Roswell (Fredrick  
U. S. G. S. - Artesia (Knauf)  
U. S. G. S. - Carlsbad (Mr. Fulton)  
Mr. Jason Kellahin - Santa Fe  
Mr. Bill Gressett - OCC - Artesia  
Mr. W. N. Stanley - Teledyne - Carlsbad

MATKINS AND MARTIN

ATTORNEYS AT LAW

601 NORTH CANAL STREET

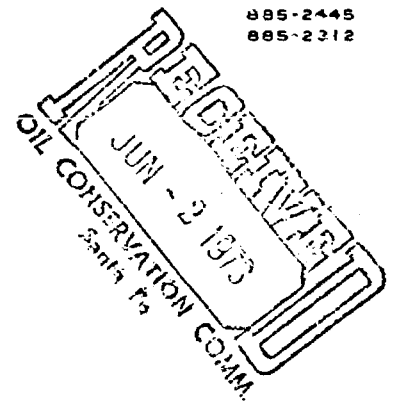
P. O. DRAWER N

CARLSBAD, NEW MEXICO 88220

JEROME D. MATKINS  
W. T. MARTIN, JR.

AREA CODE 505  
885-2445  
885-2312

June 1, 1973



Mr. Joe V. Peacock  
Attorney at Law  
Phillips Building  
Odessa, Texas 79760

Mr. Jason W. Kellahin  
Kellahin and Fox  
Attorneys at Law  
P. O. Box 1769  
Santa Fe, New Mexico 87501

Mr. William F. Carr  
Special Assistant Attorney General  
State of New Mexico  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Re: Phillips Petroleum Company v. Oil Conservation  
Commission, #28718, District Court Eddy County, NM

Gentlemen:

Enclosed herewith is a Motion to Intervene and Response of Intervenor International Minerals & Chemical Corporation to Petition for Review which we have filed for IMC in the referenced cause.

Although IMC was served with notice of Phillips' appeal as required by Section 65-3-22, N.M.S.A., 1953 Comp., it was not named as a respondent in the petition. For this reason Mr. Morris and I concluded that our proper procedure was probably a Motion to Intervene rather than a mere response. I have enclosed to appropriate parties copies of a Consent to Intervention on behalf of Phillips and the Oil Conservation Commission. If there is no objection to the intervention, I would appreciate the execution of the Consents by Mr. Kellahin for Phillips and Mr. Carr for the OCC. They may be returned to this office and I will see to their filing.



Mr. Joe V. Peacock  
Mr. Jason W. Kellahin  
Mr. William F. Carr

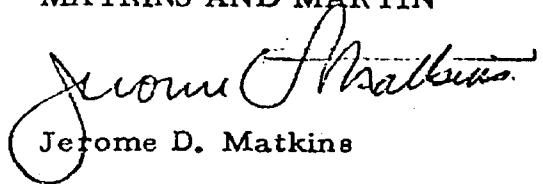
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June 1, 1973

If, on the other hand, there is objection to the intervention, I would appreciate your notifying me as promptly as possible. I will then obtain a hearing on the motion. Thank you for your attention to this matter.

Yours very truly,

MATKINS AND MARTIN

  
Jerome D. Matkins

ebg

Encs.

cc w/Encs.:

Mr. Richard S. Morris  
Montgomery, Federici, Andrews,  
Hanna & Morris  
Attorneys and Counselors at Law  
P. O. Box 2307  
Santa Fe, New Mexico 87501

Mr. James E. Wolber  
Patent Counsel  
IMCC  
Libertyville, Illinois 60048

Mr. C. E. Childers  
IMCC  
P. O. Box 71  
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STATE OF NEW MEXICO

IN THE DISTRICT COURT

COUNTY OF EDDY

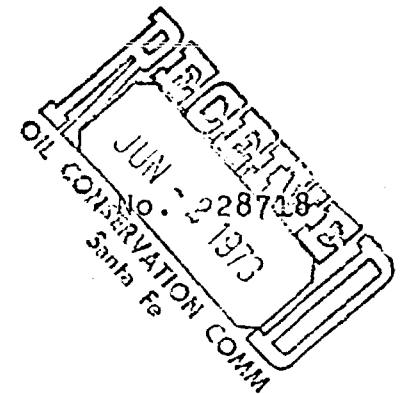
PHILLIPS PETROLEUM COMPANY,  
a corporation,

Petitioner,

vs.

OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO,

Respondent.



MOTION TO INTERVENE

Comes now International Minerals & Chemical Corporation pursuant to Rule 24 of the Rules of Civil Procedure and moves the Court to enter an Order permitting it to intervene in this Review proceeding, and in support of its Motion states:

1. Movant is the owner of potash mining leases in the immediate vicinity of a well which Phillips Petroleum Company has proposed to drill in Section 13, Township 23 South, Range 30 East, Eddy County, New Mexico. Movant participated as a party in Case No. 4906 before the New Mexico Oil Conservation Commission, which case resulted in Order No. R-4500 denying Phillips Petroleum Company permission to drill the said well.

2. Movant is so situated that the disposition of this Review proceeding may as a practical matter impair or impede its ability to protect its potash mining leases unless it is permitted to intervene in this proceeding, either as a matter of right or as a matter of permissive intervention.

3. Attached to this Motion is a copy of the Response to the Petition for Review for which intervention is sought.

WHEREFORE, movant prays the Court to enter an Order permitting movant to intervene in this Review proceeding and permitting

it to file a response in the form of the Response attached to this Motion.

MONTGOMERY, FEDERICI, ANDREWS,  
HANNAHS & MORRIS  
P.O. Box 2307  
Santa Fe, New Mexico 87501

MATKINS AND MARTIN

By *Jerome Matthews*  
P.O. Drawer N  
Carlsbad, New Mexico 88220

Attorneys for International  
Minerals & Chemical Corporation.

CERTIFICATE OF MAILING

I hereby certify that I caused to be mailed a true and correct copy of the foregoing Motion to Intervene to MR. JOE V. PEACOCK, Phillips Building Odessa, Texas 79760, and MR. JASON W. KELLAHIN, of KELLAHIN & FOX, P.O. Box 1769, Santa Fe, New Mexico 87501, Attorneys for Petitioner Phillips Petroleum Company, and to MR. WILLIAM F. CARR, Special Assistant Attorney General, P.O. Box 2088, Santa Fe, New Mexico 87501, this 1st day of June, 1973.

*Jerome Matthews*

STATE OF NEW MEXICO

IN THE DISTRICT COURT

COUNTY OF EDDY

PHILLIPS PETROLEUM COMPANY,  
a Corporation.

Petitioner,

vs.

OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO,

Respondent.

No. 28718

RESPONSE OF INTERVENOR INTERNATIONAL MINERALS  
& CHEMICAL CORPORATION TO PETITION FOR REVIEW

Comes now Intervenor International Minerals & Chemical Corporation and for its response to the Petition for Review states:

FIRST DEFENSE

1. Intervenor admits the averments contained in paragraphs 1 through 10 of the Petition for Review.

2. Intervenor denies the averments contained in paragraphs 11 and 12 of the Petition for Review and further denies the averments contained in Petitioner's Application for Rehearing before the New Mexico Oil Conservation Commission in connection with the said Order No. R-4500.

SECOND DEFENSE

The Petition for Review fails to state a claim upon which relief can be granted.

WHEREFORE, Intervenor prays that the Petition for Review be dismissed, that New Mexico Oil Conservation Commission Order No. R-4500 be affirmed and that the Court grant Intervenor such further relief as may be proper.

MONTGOMERY, FEDERICI, ANDREWS,  
HANNAHS & MORRIS  
P.O. Box 2307  
Santa Fe, N.M. 87501

MATKINS AND MARTIN

By \_\_\_\_\_  
P.O. Drawer N  
Carlsbad, N.M. 88220  
Attorneys for International  
Minerals & Chemical Corporation.

CERTIFICATE OF MAILING

I hereby certify that I caused to be mailed a true and correct copy of the foregoing Response of Intervenor International Minerals & Chemical Corporation to Petition for Review in Cause No. 28718 Eddy County District Court to MR. JOE V. PEACOCK, Phillips Building, Odessa, Texas 79760, and MR. JASON W. KELLAHIN, of KELLAHIN & FOX, P.O. Box 1769, Santa Fe, New Mexico 87501, Attorneys for Petitioner Phillips Petroleum Company; and to MR. WILLIAM F. CARR, Special Assistant Attorney General, P.O. Box 2088, Santa Fe, New Mexico 87501, this \_\_\_\_\_ day of \_\_\_\_\_, 1973.

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DOCKET: REGULAR HEARING - WEDNESDAY - FEBRUARY 21, 1973

OIL CONSERVATION COMMISSION - 9 A.M. - STATE LAND OFFICE  
CONFERENCE ROOM, STATE LAND OFFICE BUILDING,  
SANTA FE, NEW MEXICO**CASE 4906:**

Application of Phillips Petroleum Company for a drilling permit in the Potash-Oil Area, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its proposed Dunes-A well to test the Morrow formation at a location 660 feet from the South line and 1980 feet from the West line of Section 13, Township 23 South, Range 30 East, Eddy County, New Mexico, said location being within the boundaries of the Potash-Oil Area as defined by Commission Order No. R-111-A, and having been objected to by the owners of potash leases in the area.

*Jason - W. J. R. Black on behalf of PPO  
Matthew, D. Morris, Walker (PPO): IMC  
no other appearances*

*E.M. Lawrence Dist Landman - Odessa 1940  
propose 14,300 Morrow, wildcat (operation above,  
willing to move to any loc. in the 3 1/2 sec 34  
Joe workover - Production Only & mechanical string.  
propose 17 1/2" to 500' 13 3/8", cont to surf  
drill to 4000' (150' below base of sect) 10 3/4" cont to surf  
drill 6 1/2, 100' 7 5/8" into wellcamp cont to surf in 2 stages  
drill to 14300 5 1/2" liner 11800 to TD cont through hole.  
B.G. Largent - Geologist.*

DRAFT

DSN/dr

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. 4906  
Order No. R-

APPLICATION OF PHILLIPS PETROLEUM  
COMPANY FOR A DRILLING PERMIT IN  
THE POTASH-OIL AREA, EDDY COUNTY,  
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on February 21, 1973,  
at Santa Fe, New Mexico, before the Oil Conservation Commission  
of New Mexico, hereinafter referred to as the "Commission."

NOW, on this \_\_\_\_\_ day of \_\_\_\_\_, 1973, the Commission,  
a quorum being present, having considered the testimony presented,  
and the exhibits received at said hearing, and being fully  
advised in the premises,

FINDS:

(1) That the applicant, Phillips Petroleum Company, is the  
owner of certain oil and gas leases both within and adjacent to  
the Potash-Oil Area as defined by Commission Order No. R-111-A,  
as amended, a portion of which leases cover all of Section 13,  
Township 23 South, Range 30 East, Eddy County, New Mexico.

(2) That the applicant proposes to drill a well to test the  
Morrow formation underlying said section, the location for the  
proposed well being 660 feet from the South line and 1980 feet  
from the West line of said Section 13.

(3) That International Minerals & Chemical Corporation and  
Teledyne Potash are the owners of potash mining leases within  
one mile of the aforesaid proposed well location, and as owners  
of such leases were notified by Phillips Petroleum Company of its  
intent to drill the proposed well, such notification being given  
pursuant to the provisions of Commission Order No. R-111-A, as  
amended.

IMC EX 3

P. 6

Arbitration  
file

(4) That International Minerals and Chemical Corporation and Teledyne Potash both protested to the Commission the drilling of the proposed well at the proposed location, whereupon the Secretary-Director of the Commission, pursuant to the provisions of Commission Order No. R-111-A, as amended, sought a satisfactory settlement at an arbitration meeting at the Roswell, New Mexico, Area Offices of the United States Geological Survey.

(5) That no satisfactory settlement was forthcoming from said arbitration meeting, and on January 30, 1973, Phillips Petroleum Company made formal application for a hearing by the Commission of its proposed well at the location described in Finding No. (2) above.

(6) That due public notice having been given of said hearing, <sup>as required by law,</sup> the Commission has jurisdiction of this cause and the subject matter thereof.

(7) That appearances were made at said hearing by the applicant, Phillips Petroleum Company, and by International Minerals & Chemical Corporation.

(8) That the proposed location is in an area previously found by the Commission to contain potash deposits in commercial quantities. (Commission Order No. R-111-G, dated August 1, 1969.)

(9) That the commercial potash deposits underlying Section 13, Township 23 South, Range 30 East, NMPM, contain not only the relatively common form of potash ore known as sylvite but also the much more rare form of potash ore known as langbeinite,

<sup>deposits</sup>  
with the principal value of the ore being the langbeinite, the depth of the ore bed being approximately 1400 feet beneath the surface of the ground.

(10) That although International Minerals & Chemical Corporation is not conducting active mining operations in Section 13, Township 23 South, Range 30 East, NMPM, at the present time, the evidence indicates that the subject Section 13 lies in the heart of a substantial ore body which comprises nearly one-half of International's total ore reserves, and that the company definitely plans to mine said Section 13.



(11) That primary mining operations in the oil-potash area of Southeast New Mexico normally recover approximately 50 percent of the ore in place.

(12) That secondary mining operations in said area normally recover an additional 40 percent of the ore in place, after which the floor and the ceiling of the mine converge as subsidence of the overburden occurs.

(13) That said subsidence occurs not only immediately above the mined-out area, but also outward from said area at a 45-degree angle to the surface of the ground.

(14) That any well drilled within the aforesaid area of subsidence would be subjected to severe stresses as said subsidence occurs and could be sheared in two.

(15) That if such a well were sheared off below the surface of the ground, and if hydrocarbons were to escape from said well into the surrounding formations, there would be no practicable means of reentering said well to shut off said hydrocarbons.

(16) That such hydrocarbons would constitute a hazard to the safety of any potash-mining operation in the area.

(17) That to avert such hazard, the evidence indicates that no primary or secondary mining operations would be conducted closer than 150 feet to any well which produces or has produced hydrocarbons.

(18) That the evidence further indicates that primary mining operations would be conducted, but that secondary mining operations would not be conducted, in an area outside the 300 foot circle described in Finding No. (17) above, but within a 2800-foot circle (1400-foot radius) around any well which produces or has produced hydrocarbons.

(19) That according to the evidence, approximately 1,480,508 tons of ore having a value of \$9,947,339 would be left in the ground in the areas described in Findings No. (17) and (18) above if a well encountering hydrocarbons were to be drilled at the location proposed by the applicant and described in Finding No. (2) above.

(20) That approximately five years after primary and complete secondary mining operations have been conducted in a given area, subsidence in that area as well as outward from that area at a 45-degree angle to the surface of the ground will have been virtually completed, and a well could be safely drilled without danger of being subjected to the extreme stresses described in Finding No. (14) above.

(21) That a well could be located ~~at~~ at a surface location approximately 1400 feet southwest of the southwest corner of Section 13, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico, and drilled vertically to a point beneath the salt section at which point it could be directionally drilled in a northeasterly direction to be bottomed in the Morrow formation at a suitable location underlying said Section 13.

(22) That the directional drilling of a well at the location and in the manner described in Finding No. (21) above would not cause the waste of potash and would afford the applicant the opportunity to test the Morrow formation underlying Section 13, Township 23 South, Range 30 East, NMPM.

(23) That the drilling of a well at the location proposed by the applicant or at any alternative location in Section 12, Township 23 South, Range 30 East, NMPM, <sup>prior to completion of all mining operations inside Section 13</sup> would result in the waste of potash as defined in Section 65-3-3 F., NMSA 1953 Comp.

(24) That the application should be denied.

IT IS THEREFORE ORDERED:

Case No. 4906  
Order No. R-  
-5-

(1) That the application of Phillips Petroleum Company to drill a well to test the Morrow formation, the location of which well would be 660 feet from the South line and 1980 feet from the West line of Section 13, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico, be and the same is hereby denied.

(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.

dearnley, meier & mc cormick

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1210 FIRST NATIONAL BANK BLDG. EAST • ALBUQUERQUE, NEW MEXICO 87108

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BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
CONFERENCE ROOM, STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO

February 21, 1973

REGULAR HEARING

IN THE MATTER OF:

Application of Phillips  
Petroleum Company for a drilling  
permit in the Potash-Oil Area,  
Eddy County, New Mexico.

Case No. 4906

BEFORE: State Geologist, A. L. Porter, Jr.,  
Secretary-Director

Land Commissioner, Alex Armijo,

TRANSCRIPT OF HEARING

## NEW MEXICO OIL CONSERVATION COMMISSION

## REGULAR HEARING

SANTA FE, NEW MEXICOHearing Date FEBRUARY 21, 1973 TIME: 9 A.M.

NAME	REPRESENTING	LOCATION
E. M. Gorence	Phillips Petroleum Co.	Odessa, Tx.
JOE V. PEACOCK	" "	" "
JOE O. Woodson	" "	" "
B.C. Largent	" "	" "
Jon T. Edmonson	Skelly Oil Co.	Midland, Texas
Carl Traywick	USGS	Roswell
DON VANDICKLE	USGS	Roswell
Bob Fulton	USGS	Carlsbad
LUTHER A. GREEN	ARAY CHEMICAL CORP	CARLSBAD
James H. Russell	✓ ✓ ✓	Santa Fe
R.H. Blackman	Potash Co of America	Carlsbad
Jim Kraw	U.S.G.S.	Artesia, N.M.
J.W. Maynard	Duval Corp	Carlsbad N.M.
John T. Boyd	I.M.C. Management	Jattoburg, Va
Lindsay Brown	IMC	Libertyville, Ill.
R.H. Lane	Keck M'fee	Hobbs N.M.
James E. Walker	IMC	Libertyville, Ill.
James Matthews	IMC City	Carlsbad
Ch Childers	IMC	Carlsbad
Gene Daniel	USGS	Roswell

## NEW MEXICO OIL CONSERVATION COMMISSION

## REGULAR HEARING

SANTA FE, NEW MEXICO

Hearing Date FEBRUARY 21, 1973 TIME: 9 A.M.

NAME	REPRESENTING	LOCATION
N.O. Frederick	USGS	Roswell
W.B. Cronan	Shelly	Midland, Tex
Ray L. Williamson, Jr.	Sipes, Williams, Langston Associates, Inc.	Midland, Tex
T. Scott Hickman	"	Midland, Tex
Jason Kellahi	Kellahi & Fox	Santa Fe
John O. Roth	Kerr - McGee (Partners)	Albuquerque
Mark K. Adams	Kerr - McGee	Albuquerque
Dan S. Harroon	Self & Harroon & Harroon	Carlsbad
Nina DuHaine	RW Byram & Co.	Santa Fe
Ben Donegan	Leland A. Hodges, Trustee	Albuquerque
Richard S. Morris	Montgomery, Federici et al	Santa Fe

dearnley, meier &amp; mc cormick

209 SIMMS BLDG., P.O. BOX 1092, PHONE 243-6691, ALBUQUERQUE, NEW MEXICO 87103  
1216 FIRST NATIONAL BANK BLDG. EAST, ALBUQUERQUE, NEW MEXICO 87108

1 MR. PORTER: The hearing will come to order, please.  
2 The case to be heard this morning is the application by  
3 Phillips Petroleum Company for a location for a gas well.

4 The proposed gas well is in the described R-111-A  
5 area, which is generally known as the Oil-Potash Area. R-111-A  
6 establishes certain procedures for drilling in the area.

7 The delineated area also has a described procedure  
8 for objection to locations by potash companies who own leases  
9 within a mile of any proposed location. If such an objection  
10 is received, there is procedure for arbitration.

11 We did receive two objections, I believe, to Phillips  
12 proposed location, and we held a meeting down in Roswell on  
13 January 26th at 10:30 A.M. with the interested parties present.

14 Agreement could not be reached at that time, so we  
15 arranged for this hearing at that time.

16 I would like to call for appearances in this case.

17 MR. KELLAHIN: If the Commission please, Jason  
18 Kellahin, of Kellahin and Fox, Santa Fe, appearing in  
19 association with Mr. Joe V. Peacock, a member of the Texas bar.

20 MR. MATKINS: If the Commission please, Jerome D.  
21 Matkins, Carlsbad; Richard Morris, Santa Fe; and Mr. James  
22 Wolder, for International Mineral and Chemical, Libertyville,  
23 Illinois.

24 MR. PORTER: Are there other appearances in this case?

25 (No response)

dearnley, meier &amp; mc cormick

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1216 FIRST NATIONAL BANK BLDG. EAST ALBUQUERQUE, NEW MEXICO 87106

1 MR. PORTER: This proposed location is on Federal  
2 lands, and we have quite a few representatives from the United  
3 States Geological Survey present. Mr. Fredericks, I assume  
4 you do not desire to make a formal appearance?

5 MR. FREDERICKS: That's right.

6 MR. PORTER: We will start by hearing from the  
7 Applicant. Mr. Kellahin?

8 MR. KELLAHIN: If the Commission please, we will  
9 have three witnesses I would like to have sworn.

10 MR. PORTER: Let's have all three witnesses sworn,  
11 please.

12 MR. MORRIS: If the Commission please, do you want  
13 the I.M.C. witnesses sworn also?

14 MR. PORTER: We might as well.

15 (Whereupon the witnesses were sworn en masse.)

16 MR. KELLAHIN: We will call as our first witness  
17 Mr. E. M. Gorence.

18 E. M. GORENCE,

19 was called as a witness, and having been already duly sworn,  
20 testified as follows:

21 DIRECT EXAMINATION

22 BY MR. KELLAHIN:

23 Q Would you state your name, please?

24 A E. M. Gorence.

25 Q By whom are you employed and in what position, Mr. Gorence?



dearnley, meier &amp; mc cormick

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- 1 A I am with Phillips Petroleum Company, and I am District  
2 Landman of the Southwestern District, headquartered in  
3 Odessa, Texas.
- 4 Q How do you spell your last name?
- 5 A G-o-r-e-n-c-e.
- 6 Q Mr. Gorence, have you ever testified before the Oil  
7 Conservation Commission of New Mexico?
- 8 A No, sir.
- 9 Q For the benefit of the Commission, would you briefly  
10 outline your education and your experience as a landman?
- 11 A I have a B.S. degree in business administration from  
12 Kansas State College in Pittsburg, Kansas. I have been  
13 employed by Phillips Petroleum Company since 1940,  
14 except for a four-year period with the United States  
15 Navy. I have spent thirty-three years with Phillips.  
16 I have been the District Landman for eleven years.
- 17 Q In Odessa, Texas?
- 18 A In Midland and Odessa.
- 19 Q In your duties as District Landman, do you have anything  
20 to do with the area involved in this application?
- 21 A Yes.
- 22 Q Do you have anything to do with the particular lease  
23 involved in this application?
- 24 A Yes.
- 25 Q Are you familiar with it?

dearnley, meier &amp; mc cormick

209 SIMMS BLDG., P.O. BOX 1092, PHONE 243-6691, ALBUQUERQUE, NEW MEXICO 87103  
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- 1 A Yes.
- 2 Q Now, are you familiar with the application of Phillips
- 3 Petroleum Company in the case before the Commission?
- 4 A Yes.
- 5 Q What is proposed by the Applicant in this case?
- 6 A We propose to drill a 14,300 foot Morrow wildcat well
- 7 at the location stated in the docket, 660 feet from the
- 8 South line and 1980 feet from the West line of Section
- 9 13, Township 23 South, Range 30 East in Eddy County,
- 10 New Mexico.
- 11 Q Now, is that within the area known as the Oil-Potash
- 12 Area, as defined by Commission Order Number R-111-A?
- 13 A Yes.
- 14 Q And also in the area involved by the United States
- 15 Department of Interior circular defining the Oil-Potash
- 16 Area?
- 17 A Yes.
- 18 Q Did Phillips Petroleum Company apply for permission to
- 19 drill on this location?
- 20 A Yes.
- 21 Q And your location, as you stated, is 1980 feet from the
- 22 West line and 660 feet from the South line, is that
- 23 correct?
- 24 A That is correct.
- 25 Q And a protest was filed to your drilling?

dearnley, meier & mc cormick

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- 1 A Yes.
- 2 Q Did you participate in the hearing held in Roswell, the
- 3 arbitration hearing before representatives of the Oil
- 4 Conservation Commission and the United States Geological
- 5 Survey?
- 6 A Yes, sir.
- 7 Q And were you able to reach any agreement with the potash
- 8 company as a result of that hearing?
- 9 A No, sir.
- 10 Q Now, Mr. Gorence, referring you to what has been marked
- 11 as Phillips Petroleum Company Exhibit One, would you
- 12 identify that exhibit?
- 13 A That exhibit identifies our oil and gas lease on which
- 14 the well is to be located. Our oil and gas lease covers
- 15 1,000 acres. That is a Federal lease out of Section 13,
- 16 23, 24, 23 South, and 30 East.
- 17 Q And your location is shown in Section 13 on that exhibit?
- 18 A Yes, with the circle colored red.
- 19 Q That is your proposed location?
- 20 A Yes.
- 21 Q Does the exhibit also show the expiration date of your
- 22 lease?
- 23 A Yes, it expires on May 1st, 1974.
- 24 Q And that is a Federal lease?
- 25 A That's correct.

dearnley, meier &amp; mc cormick

209 SIMMS BLDG., P.O. BOX 1092, PHONE 243-6691, ALBUQUERQUE, NEW MEXICO 87103  
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1 Q Have you, or has Phillips Petroleum Company, done any  
2 work directed towards determining the proper location  
3 for a well in this area?

4 A Yes, we have done considerable geological work in the  
5 area over a period of years. We have expended  
6 approximately one and a half million dollars for the  
7 seismic work in an attempt to find a favorable location  
8 for the drilling of a wildcat well.

9 Q Have you spent a considerable amount of money acquiring  
10 leases?

11 A Yes, we have spent approximately three hundred thousand  
12 dollars for the acquisition of leases.

13 Q As a result of your seismic work, what did you determine  
14 as to a proper well location?

15 A In our seismic work and sub-surface interpretations of  
16 the area, we have determined the requested location to  
17 be the most favorable location for the drilling of the  
18 wildcat well.

19 Q And there will be further testimony along that line  
20 by a geological witness, is that correct?

21 A That's correct.

22 Q What is the estimated cost to drill this Morrow test?

23 A Our estimate on a well in this area to be drilled at  
24 a depth of 14,300 feet, is approximately \$625,000.

25 Q Is that based on the experiences of other operators in

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1 the same area?

2 A I must admit that the figure is less than most of the  
3 other wells in the area cost. We have knowledge that  
4 some of the wells cost in excess of \$900,000, however  
5 we feel that we will be benefiting from the experiences  
6 of the others, and that our well cost could be handled.

7 Q Now, you have stated that the proposed well location is  
8 1980 feet from the West line and 660 feet from the South  
9 line. Is Phillips willing to drill elsewhere in Section  
10 13?

11 A We would be willing to move the location to any location  
12 in the South half, Southwest quarter of Section 13,  
13 provided such a location is acceptable to the Oil  
14 Conservation Commission and the United States Geological  
15 Survey.

16 MR. PORTER: What was that location again?

17 THE WITNESS: We would agree to any location in  
18 the South half, Southwest quarter of Section 13, 23 South,  
19 30 East.

20 MR. PORTER: Thank you.

21 Q (By Mr. Kellahin) Mr. Gorence, was this exhibit prepared  
22 under your supervision?

23 A Yes.

24 MR. KELLAHIN: At this time, I would like to offer  
25 in evidence Exhibit Number One.

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1 MR. MORRIS: No objection.

2 MR. PORTER: If there is no objection, Exhibit One  
3 will be admitted.

4 (Whereupon Applicant's Exhibit One was admitted in  
5 evidence.)

6 MR. KELLAHIN: That's all I have on direct  
7 examination of this witness.

8 MR. PORTER: Are there any questions of the witness?

9 MR. MORRIS: Yes.

10 \* \* \* \*

11 CROSS EXAMINATION

12 BY MR. MORRIS:

13 Q Mr. Gorence, is this the first request Phillips has made  
14 for a location in this Section 13? Is this the first  
15 time you have ever proposed to drill a well in this  
16 section?

17 A There was a preliminary proposal, I believe, in the year  
18 1969 for a well in this section, yes.

19 Q Was it at the same location?

20 A I do not recall if it was the exact location.

21 Q As a matter of fact, it was not at the same location,  
22 was it?

23 A I do not know.

24 Q You do not know?

25 A No.

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- 1 Q What were the circumstances surrounding your decision  
2 not to pursue your 1969 drilling program?
- 3 A I think budgetary limitations would have to be the  
4 prime factor. Our headquarters management in  
5 Bartlesville, Oklahoma, would not follow through on our  
6 recommendation to drill a well. At the time, we were  
7 on a limited wildcat drilling budget.
- 8 Q Had you already accomplished your seismic work at that  
9 time?
- 10 A Yes, we had.
- 11 Q So your investment had already been made in your seismic  
12 work and your lease acquisitions, but your management  
13 determined at that time not to pursue the drilling  
14 program?
- 15 A That's correct.
- 16 Q Is there a procedure available to you, Mr. Gorence, for  
17 requesting suspension of this lease from the United  
18 States Geological Survey so it will not expire on May 1st,  
19 1974?
- 20 A I understand there is such a procedure, yes.
- 21 Q Do you have to go through the motions of trying to get  
22 the location approved by the N.M.O.C.C. and the U.S.G.S.  
23 before you make that request for suspension?
- 24 A I have not checked into that, but I would presume so.
- 25 Q At this point in time, you have made no such request

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1 for a suspension of your lease?

2 A No, sir.

3 Q Now, this particular lease that you referred to, this

4 1,000 acres, covers all of Section 13 and part of

5 Sections 23 and 24; is that correct?

6 A That's correct.

7 Q And you have stated that you would be willing to drill,

8 or move your location, anywhere in the South half of

9 the Southwest quarter of Section 13, is that correct?

10 A That's correct.

11 Q Would that include, say, one foot out of the Southwest

12 corner of Section 13?

13 A Well, I would have to say that would include that figure,

14 but I think I will just state yes.

15 Q Would you also be willing to drill one foot out of the

16 Northeast corner of Section 23?

17 A No.

18 Q That would be only moving it two more feet.

19 A There has to be a certain limit, in my opinion, as to

20 how far you can move to determine what is the most

21 favorable location.

22 Q If you moved right over in the corner of Section 23,

23 you will be outside of the R-111-A area, wouldn't you?

24 A Yes, sir.

25 Q But you are not willing to do that?



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1 A Not at this time, no.

2 Q You mentioned that your well cost was estimated to be  
3 \$625,000, and that you have knowledge that other wells  
4 in the area have cost more than that?

5 A Yes.

6 Q Is that due to blow-outs that have occurred in the area  
7 during drilling?

8 A I feel like I am not qualified to speak on this.

9 Q You don't know?

10 A That's right.

11 Q You don't know why these other wells cost more?

12 A I would rather not express my opinion because I think  
13 it might be incorrect in some respects.

14 MR. MORRIS: I think that is all I have on cross  
15 examination.

16 MR. PORTER: Are there any further questions?

17 MR. KELLAHIN: Yes.

18 \* \* \* \*

19 REDIRECT EXAMINATION

20 BY MR. KELLAHIN:

21 Q Mr. Gorence, there was some mention of an application  
22 filed by Phillips Petroleum Company in 1969, and why  
23 the well was not drilled. That well was projected as  
24 an Atoca well, was it not? Or do you recall?

25 A I do not recall, but I'm sure it was approximately

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1 the same depth.

2 Q Subsequent to that time, have there been other wells  
3 drilled in the area?

4 A Yes, there has been considerable drilling activity in  
5 the general area.

6 Q Has that drilling in any way affected Phillips'  
7 determination to drill in Section 13?

8 A Yes, sir.

9 Q Mr. Morris referred to the procedure for suspension  
10 which required you to go through the motion of getting  
11 the location approved. Is Phillips going through the  
12 motions in that sense?

13 A No. We are prepared to drill this well immediately. It  
14 is included in our current drilling budget, we have the  
15 money, and as soon as the location is approved, we are  
16 ready to commence drilling as soon as possible.

17 Q In addition to this well, does Phillips have plans for  
18 other wells in the area?

19 A It will depend on the outcome of the drilling of this  
20 well, which is a wildcat well.

21 Q Would a well in Section 23 fit your plans of development  
22 in that sense?

23 A In that sense, yes. It is very possible we would drill  
24 in Section 23 if the drilling of the well in Section 13  
25 would so justify it.

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1 Q But is Phillips willing to drill that as their first  
2 well?

3 A In Section 23?

4 Q Yes.

5 A No.

6 MR. KELLAHIN: That's all I have.

7 \* \* \* \*

8 CROSS EXAMINATION

9 BY MR. STAMETS:

10 Q Is there any legal reason or anything in the lease  
11 preventing Phillips from drilling a well in the North  
12 half of the Northeast of Section 23, and drilling  
13 directionally to the appropriate bottomhole location  
14 in Section 13 and producing a well and dedicating  
15 Section 13 to it?

16 A We have not checked into that possibility, and I cannot  
17 answer that question with certainty. I am sure there  
18 would be no objection subject to the approval of the  
19 United States Geological Survey and other regulatory  
20 bodies.

21 MR. STAMETS: That's all I have.

22 MR. PORTER: Are there any further questions?

23 MR. TRAYWICK: May I ask a question?

24 MR. PORTER: Yes.

25 \* \* \* \*

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CROSS EXAMINATION

BY MR. TRAYWICK:

Q Mr. Gorence, do you control the North half of Section 23?

A Yes, we own all of Section 23.

MR. TRAYWICK: That's all I have.

★ ★ ★ ★

RE-CROSS EXAMINATION

BY MR. MORRIS:

Q I have one question prompted by Mr. Kellahin's redirect.  
Mr. Gorence, you said that if you go ahead and proceed to drill this well, that you would have plans for drilling additional wells in the area. Is that correct?

A Only if the results of drilling the well in Section 13 would so justify it.

Q So if you get a commercial well here, it is your plan to embark upon a drilling program on your other leaseholds in this area?

A If this well so justifies it, that's correct.

Q How many acres of leases do you hold in the area?

A We have oil and gas leases covering approximately 8,700 acres.

Q How much of that, approximately, would be in the R-111-A area?

A I would have to check that, I can't say with certainty at this time.

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1 Q Most of it?

2 A I would say approximately fifty percent.

3 Q So if this well is permitted, and you do obtain  
4 commercial production, we can look forward to other  
5 applications by Phillips, and perhaps by others, to drill  
6 in the Potash-Oil Area?

7 A There is that possibility, yes.

8 Q Just one other question. I think you said you had a  
9 lease acquisition cost of some \$300,000. This did not  
10 all relate to this 1,000 acres, did it?

11 A No, that is correct.

12 Q What was your lease acquisition cost on this one  
13 particular lease?14 A Thirty-two and a half dollars an acre, which would total  
15 \$32,500. That lease was purchased by assignment.16 Q If a well was drilled on this lease in the Northeast  
17 quarter of Section 23, production there would hold the  
18 entire 1,000 acres including Section 13, would it not?19 A If it was drilled in the North half of the Northeast  
20 quarter of Section 23, yes.

21 MR. MORRIS: That's all I have.

22 MR. PORTER: Does anyone else have any questions?

23 (No response)

24 \* \* \* \*

25

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Q You indicated that you have 8,700 acres.

A Approximately 8,700 acres in the area.

Q Do you know how many different sections the acreage is located in?

A Approximately thirteen sections.

Q Would it be your plan to ask for wider spacing than the 320 acres that is prescribed by regulation at the present time?

A Yes, it would be our plan. At this time, it is our intention, in the event of Morrow gas production, that we would ask for 640-acre spacing.

MR. PORTER: Are there any further questions?

(No response)

MR. PORTER: If not, the witness may be excused.

(Witness excused.)

MR. KELLAHIN: At this time, we will call Mr.

Joe Woodson.

JOE O. WOODSON,

was called as a witness, and having been already duly sworn, testified as follows:

DIRECT EXAMINATIONBY MR. KELLAHIN:

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- 1 Q Would you state your name, please?
- 2 A Joe O. Woodson.
- 3 Q By whom are you employed and in what position, Mr.
- 4 Woodson?
- 5 A I am employed by Phillips Petroleum Company as a
- 6 Production and Mechanical Engineering Supervisor in the
- 7 Southwest District, Odessa.
- 8 Q Have you ever testified before the Oil Conservation
- 9 Commission?
- 10 A No, sir, I have not.
- 11 Q Would you briefly outline your education and experience
- 12 as a Mechanical Production Engineer?
- 13 A I received my B.S. degree in mechanical engineering
- 14 from the University of Tennessee in 1948, and I have
- 15 been employed by Phillips since that date as a Production,
- 16 Drilling, and Mechanical Engineer.
- 17 Q In connection with your work as a Production, Drilling
- 18 and Mechanical Engineer, do you have anything to do
- 19 with the casing and cementing program for wells drilled
- 20 by Phillips?
- 21 A Yes, sir.
- 22 Q Have you had anything to do with the casing and cementing
- 23 program as proposed by Phillips on this proposed well
- 24 in Section 13?
- 25 A Yes, sir.

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1 Q Would you briefly outline just what type of casing  
2 and cementing program you plan for this well?

3 A We plan to drill a 17 1/2 inch hole to 500 feet and  
4 set 13 3/8 surface casing. This casing will be cemented  
5 to the surface with approximately 600 sacks of cement.  
6 The casing will be tested to 600 pounds before drilling  
7 the shoe. After drilling the shoe, the well will be  
8 drilled down to approximately 4,000 feet, or 150 feet  
9 below the salt section.

10 The drilling fluids will comply with Rule R-111-A.  
11 The pipe that would be set at 4,000 feet, approximately,  
12 would be 10 3/4 inch 51-pound C-55. The hole would be  
13 calibrated for the cement job, and the casing will be  
14 cemented with Class C cement and with two percent  
15 calcium chloride and 19 1/2 pounds of salt per sack of  
16 cement.

17 The twelve-hour strength of this cement after  
18 setting twelve hours will be 2,430 pounds per square  
19 inch. After twenty-four hours, it will be 2,830 pounds  
20 per square inch. It will be tested to 1,000 pounds  
21 before drilling the shoe, and retested after drilling  
22 the shoe.

23 MR. NUTTER: What is the top of the cement going  
24 to be?

25 THE WITNESS: Circulated to the surface.



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1 A (Continuing) Our next string of casing will be at  
2 12,100 feet, and it will be 7 5/8-inch intermediate.

3 This string will be set in the Wolfcamp prior to  
4 drilling any abnormal pressure gas zones. This string  
5 will be cemented to the surface in two stages.

6 The first stage of cement will be Trinity lightweight  
7 with six pounds of salt in with 300 sacks of cement.

8 In the second stage, the stage collar will be set  
9 near, or just below, the casing shoe of the 10 3/4.  
10 From that point, it will be cemented to the surface with  
11 Trinity lightweight cement, followed by 300 sacks of  
12 net cement.

13 In the event the well is a producer from the Morrow,  
14 or in that area, a string of 5 1/2-inch liner will be  
15 set from approximately 11,800 feet to the total depth  
16 of 14,300 feet, and it will be cemented throughout from  
17 the bottom of the liner to the top of the liner.

18 Q Now, does the cementing and casing program comply in  
19 all respects with Commission Order R-111-A?

20 A Yes, it does.

21 Q In your opinion, is that an adequate casing and cementing  
22 program to protect the potash zone if one is encountered  
23 in the area?

24 A Yes.

25 Q Actually, as I understand your testimony, there would be

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1 two thicknesses of cement throughout the entire potash  
2 zone, would there not?

3 A Yes, sir.

4 Q And two strings of casing?

5 A Two strings of casing and two thicknesses of cement  
6 throughout the entire area.

7 MR. KELLAHIN: I have nothing further on direct  
8 examination.

9 MR. PORTER: Mr. Morris, if your client didn't object  
10 to the location, he wouldn't object to the cementing program,  
11 would he? I am just trying to save cross examination.

12 MR. MORRIS: I am going to have to cross examine.

13 \* \* \* \*

14 CROSS EXAMINATION

15 BY MR. MORRIS:

16 Q Mr. Woodson, is your proposed casing and cementing program  
17 that you have just described the same as was submitted  
18 on the United States Geological Survey form, as part of  
19 your application for a permit to drill?

20 A I believe so.

21 Q On your intermediate string of 7 5/8-inch casing, what  
22 is your weight per foot, and what is the grade of pipe?

23 A From the bottom to the top, we have 4,900 feet at 29.7  
24 pounds of S-95. We have 2,700 feet at 26.4 of S-95.  
25 Seventeen hundred feet at 26.4 pounds of 10-80.

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- 1 Twenty-five hundred feet at 26.4 pounds of K-55.
- 2 Three hundred feet at 29.7 pounds of S-95 at the top.
- 3 Q Do you have any estimate as to the total length of time
- 4 it would take to drill this well?
- 5 A I would estimate around ninety days.
- 6 Q How much of that time would be involved in performing
- 7 drilling operations within this 4,000-foot casing string,
- 8 the casing string set at 4,000 feet, and how much time
- 9 would be involved in the casing string at 12,100 feet?
- 10 A I don't have any figures with me, but going by other
- 11 wells, I would estimate that to drill to 4,000 feet,
- 12 it would take not more than fifteen days and
- 13 approximately twenty days, twenty-five days, let's say,
- 14 from 4,000 to 12,000.
- 15 Q Now, your procedure, as I understand it, would be that
- 16 you would set this 4,000 feet of casing, you would
- 17 cement it, and then you would come back and actually
- 18 be performing drilling operations through that cemented
- 19 string of casing, is that correct?
- 20 A That's correct.
- 21 Q During this time, do the stresses and strains of drilling
- 22 have any effect upon that casing or the cementing?
- 23 A The only detrimental effect that we would anticipate
- 24 would be on the casing from the drill pipe. In order
- 25 to prevent that, we would install protective rubbers

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1 on each section of drill pipe.

2 Q Does this procedure offer one hundred percent protection  
3 from banging against the side of the casing?

4 A I don't know if we could say one hundred percent  
5 protection, but we feel it does adequately protect the  
6 casing, because when these rubbers become worn, we  
7 replace them with new ones.

8 Q What do these rubbers consist of? They are just  
9 over-sized rubber bands around the tubing string to keep  
10 it from banging against the side, isn't that correct?

11 A There are different types. Yes, they are good quality  
12 hard rubber that are installed by stretching them and  
13 putting them over the drill pipe.

14 Q How many of those go on each joint of drill pipe?

15 A One.

16 Q Just one?

17 A One on each joint, yes.

18 Q And would the same be true as to your casing set at  
19 12,100 feet? It would be set, cement would be circulated  
20 on it, then, during the twenty days that you would be  
21 drilling within that the same situation that you have  
described would be the case, as on the 4,000-foot casing?

23 A Yes, we would have protectors.

24 Q Now, these casing strings get smaller as you go down,  
25 so on the 12,100-foot string, you are operating within

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- 1 a 7 5/8-inch casing size, is that correct?
- 2 A That's correct.
- 3 Q Do you use the same size rubber protectors on your
- 4 drilling string?
- 5 A No, the rubber protectors will be-- well, let me back up.
- 6 The rubber protectors are slightly larger than the
- 7 tool joints on the drill pipe, so I would anticipate
- 8 the drilling contractor would be using smaller drill
- 9 pipe inside the 7 5/8-inch casing, and therefore, he
- 10 would have protectors on this particular string.
- 11 Q Are you familiar-- first, let me ask this question.
- 12 In cementing your 1,100-foot casing string, are there
- 13 any problems in obtaining circulation of your cement?
- 14 A Yes, there would be if the entire string were cemented
- 15 in one stage because of loss of circulation below 4,000
- 16 feet.
- 17 Q How many stages would you anticipate using to cement
- 18 this string?
- 19 A Two stages.
- 20 Q Is there any way to check to determine whether you have
- 21 continuity of cement between your stages?
- 22 A Yes, sir.
- 23 Q How do you do that?
- 24 A If you can run a temperature survey within twenty-four
- 25 hours, you can pick the top of the cement.

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1 Q Are you familiar with the other wells that have been  
2 drilled in this area?

3 A In this area?

4 Q Yes, sir.

5 A Not really, except for some wells we have drilled  
6 several years ago in this area.

7 Q Are you familiar with any abnormally high pressure zones  
8 that have been encountered during the drilling of wells  
9 in this area?

10 A No, sir, I am not.

11 Q Are you familiar with the fact that there have been  
12 blow-outs in this area?

13 A No, sir.

14 Q You are not?

15 A I am not familiar with that, I must say.

16 Q Which wells in this area are you familiar with?

17 A The James Ranch Well.

18 Q Are you talking about the well in Section 36 in the  
19 township to the north?

20 MR. GORENCE: No, it's in Section 2 in that same  
21 township.

22 Q (By Mr. Morris) Are you familiar with the drilling of  
23 the Belco Petroleum Well in Section 1 of that same  
24 township?

25 A No, sir. Is that a recently-drilled well?

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1 Q Let me see, and I will give you an answer in just a  
2 minute.

3 A I am not familiar with it.

4 Q You are not?

5 A No, sir.

6 MR. KELLAHIN: To save time, we do have a witness  
7 here who is familiar with it.

8 MR. MORRIS: I was under the impression that Mr.  
9 Woodson was being offered as a drilling expert.

10 MR. KELLAHIN: He is the casing and cementing expert.

11 Q (By Mr. Morris) Mr. Woodson, should I talk to you or  
12 your next witness about directional drilling problems  
13 and the feasibility of directional drilling?

14 A I will be glad to answer any questions I can.

15 Q Has your company considered the feasibility of  
16 directional drilling in this area?

17 A Not to my knowledge.

18 Q Is there any reason to your knowledge that it would not  
19 be feasible?

20 A It may not be economical, however it is possible that  
21 a well could be directionally drilled.

22 Q Approximately how much more would it add to your well  
23 cost for directional drilling?

24 A That would depend on the number of times you had to  
25 run whip-stock to turn the hole back to the direction

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1 you want to go in. So it's almost impossible to  
2 estimate what it might cost.

3 Q It wouldn't run over a couple a hundred thousand dollars  
4 extra, would it?

5 A I don't know, but that might be a fair estimate.

6 Q But that couple of hundred thousand dollars would be  
7 the difference, as far as you can see, in whether this  
8 would be an economic venture or not?

9 A I would have to say it would be just an estimate because  
10 of the problems you might encounter in keeping the hole  
11 going in the direction you want it to go in.

12 Q Have you ever participated in the drilling of whip-stock  
13 wells?

14 A Yes, sir.

15 Q When Phillips would plug the well, whether it be  
16 immediately as a result of an uncommercial well or after  
17 production, are you prepared to say at this time what  
18 plugging program would be followed?

19 A We follow the program as outlined by the Commission,  
20 and I understand we would have a solid column of cement  
21 throughout the salt section.

22 Q When you say throughout the salt section, you don't mean  
23 however solidly to the total depth, do you?

24 A Not unless it was required. However, if it was required,  
25 we would do it, but normally we would not need to



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1 do that.

2 Q Even if a well is cemented solidly to the total depth.  
3 Mr. Woodson, does that make a perfect guarantee that  
4 there would not be the escape of gas from the reservoir,  
5 either through the casing or up around the cement  
6 outside of the casing?

7 A With this particular casing program that we have in  
8 this area, I feel like there is a perfect guarantee  
9 that we would not have this problem.

10 Q Would Phillips be willing to make a perfect guarantee  
11 to I.M.C. that in the event of the plugging of this  
12 well that no gas would ever escape into its mine?

13 A I don't think I am qualified to answer that.

14 Q Have you ever had any experience, Mr. Woodson, with  
15 wells that have been subjected to the shearing force  
16 connected with subsidence as a result of mining operations?

17 A No, not as a result of mining operations.

18 Q As a result of any other operations?

19 A I have had some experience with shallow subsidence due  
20 to the withdrawal of water from water-sand, and in this  
21 case, the casing in most cases was not damaged. Of  
22 course, this was shallow.

23 Q How shallow?

24 A Three or four hundred feet.

25 Q I see. What forces were at work there? Were there

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1 shearing forces at work?

2 A Yes, there were shearing forces, but due to the  
3 shallowness, I feel the reason was that there was not  
4 enough load imposed on the casing.

5 Q Was there any cementing involved in this situation?

6 A Yes.

7 Q Was the cementing cracked?

8 A I don't know. The earth simply subsided at the surface,  
9 and left the casing sticking up in its existing position.

10 Q How deep was the sub-surface subsidence in this case?

11 A Three or four hundred feet.

12 Q Was it just that one instance that you are referring to?

13 A That's one instance I am familiar with.

14 Q Well, are you saying, Mr. Woodson, that if a well, say,  
15 at the 1,400-foot level, was subjected to shearing  
16 forces that your cementing program would provide a  
17 one hundred percent guarantee that there would not be  
18 such a disruption of the casing and cement that would  
19 enable hydrocarbons to escape?

20 A No, I couldn't say that.

21 MR. MORRIS: That's all I have.

22 MR. PORTER: Mr. Kellahin, do you have anything  
23 on redirect?

24 MR. KELLAHIN: No, sir.

25 MR. PORTER: Are there any further questions?

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1 MR. TRAYWICK: Yes.

2 \* \* \* \*

3 CROSS EXAMINATION4 BY MR. TRAYWICK:5 Q Mr. Woodson, are you going to take-- make any effort  
6 in your casing program design in the 10 3/4-inch casing  
7 to remove the bulkheads from the potash zone before  
8 you submit the 10 3/4?9 A Yes, we will run centralizers to insure that, and we  
10 will have cement completely around the pipe.11 Q You also mentioned a temperature survey as a supplement  
12 to that. Would you also run a bond load to ascertain  
13 good cement bond to the critical areas, or is that  
14 included?15 A I don't know for sure if that's included as a definite  
16 proposal, but we feel that if the cement is circulated  
17 to the surface, and if we get good cement return, then  
18 we will already be insured of good bond throughout the  
19 area.

20 MR. TRAYWICK: That's all I have.

21 MR. PORTER: Thank you, Mr. Woodson.

22 (Witness excused.)

23 B. C. LARGENT,24 was called as a witness, and having been already duly sworn,  
25

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1 testified as follows:

2 DIRECT EXAMINATION

3 BY MR. KELLAHIN:

4 Q Will you state your name, please?

5 A B. C. Largent.

6 Q By whom are you employed and in what position, Mr.  
7 Largent?

8 A I am a geologist with Phillips Petroleum Company in  
9 Odessa, Texas.

10 Q Is that L-a-r-g-e-n-t?

11 A Yes, sir.

12 Q Mr. Largent, have you ever testified before the Oil  
13 Conservation Commission?

14 A No, I have not.

15 Q For the benefit of the Commission, would you briefly  
16 outline your education and experience as a geologist?

17 A I received a bachelor's degree in 1956 from Midwestern  
18 University, and I have been employed by Phillips since  
19 that time; seventeen years.

20 Q Where have you worked?

21 A I worked in Bartlesville, our main office, for twelve  
22 years, and was associated with outside areas including  
23 Alaska, California, Rocky Mountain, the Amarillo  
24 District, and the Mid-Continent District.

25 Q How long were you in Bartlesville?

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- 1 A Twelve years.
- 2 Q How long have you been in Odessa?
- 3 A Four and a half years.
- 4 Q In connection with your work in the Odessa District,
- 5 have you had anything to do with the area involved in
- 6 this application?
- 7 A Yes.
- 8 Q Did you have anything to do with the study of the
- 9 geological information in the area?
- 10 A Yes, sir.
- 11 Q You did not supervise any seismic work, or anything of
- 12 that nature, did you?
- 13 A No, that was before I arrived here.
- 14 Q But was that information made available to you?
- 15 A Yes, it was available and incorporated in the sub-surface
- 16 studies.
- 17 Q Did you supervise those sub-surface studies?
- 18 A Yes.
- 19 Q What type of work was done in the area to determine
- 20 the well location?
- 21 A We used the sub-surface control that we had, and have
- 22 continued to add to as subsequent wells were drilled,
- 23 and this was incorporated with our seismic control where
- 24 we did not have well control. We also made a regional
- 25 stratographic study of the entire north part of the

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1 Delaware Basin, which included this area.

2 Q Have you prepared a map showing the surface information?

3 A Yes, I have.

4 MR. MORRIS: If the Commission please, before the  
5 witness testifies with respect to this exhibit, there may be  
6 some question as to its admissibility into evidence, and we  
7 would like to have an opportunity to interpose an objection  
8 to the exhibit before he proceeds to testify to it.

9 MR. PORTER: How are you going to determine that,  
10 Mr. Morris?

11 MR. MORRIS: Well, ordinarily, Mr. Porter, Mr.  
12 Kellahin would offer the exhibit in evidence, and I would  
13 object to its admissibility, and would ask the permission  
14 of the Commission to ask a few questions just to determine  
15 its admissibility into evidence.

16 MR. PORTER: Prior to his testimony?

17 MR. MORRIS: Yes, sir. I am objecting to his  
18 testimony on the exhibit at this time on the grounds that  
19 insufficient foundation has been laid for the introduction  
20 of the exhibit or his testimony.

21 MR. KELLAHIN: We haven't laid any foundation yet,  
22 Mr. Morris.

23 MR. MORRIS: Mr. Kellahin has admitted my objection.

24 MR. KELLAHIN: We haven't had the opportunity to  
25 lay any foundation. I have no objection, however, to his

1 asking questions on voir dire, however, to expedite the  
2 matter.

3 MR. PORTER: Why don't you go ahead, Mr. Morris?

4 \* \* \* \*

5 CROSS EXAMINATION

6 BY MR. MORRIS:

7 Q Mr. Largent, does the interpretation shown on Phillips'  
8 Exhibit Number Two include geophysical interpretation?

9 A Yes, it does.

10 Q And you have not made this geophysical interpretation?

11 A No, I did not make the original interpretation, however  
12 that has been incorporated and tied into the sub-surface  
13 control that we have, and I did supervise that.

14 Q You supervised the preparation of this map, using  
15 geophysical information prepared by others?

16 A That's correct.

17 MR. MORRIS: If the Commission please, to the  
18 extent that this witness has admitted that he has based his  
19 opinion in part on information supplied by others, geophysical  
20 data that was not his work, and that he did not participate  
21 in it, we, of course, are put in the position of not being  
22 able to cross examine the witness on the geophysical data  
23 that forms the basis for the exhibit, and we object to it  
24 on the grounds previously stated, and we will object to its  
25 admissibility, and we will object to any testimony based

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1 on the exhibit.

2 MR. KELLAHIN: In response to that objection, the  
3 witness has testified that he prepared the exhibit based on  
4 geophysical data he examined and correlated to the sub-surface  
5 information available to him.

6 Now, historically, before the Oil Conservation  
7 Commission, geophysical work based upon such things as  
8 seismic surveys has uniformly been admitted by this Commission.  
9 I have yet to see a seismic survey expert ever appear before  
10 the Commission to support the underlying data. It has never  
11 been done, to my knowledge. It is a tool uniformly used  
12 by the oil industry that you accept the data available and  
13 put your interpretation on it, and we submit that the  
14 exhibit is admissible, as that is what this witness has done.

15 MR. PORTER: Mr. Morris, the Commission will  
16 overrule your objection.

17 Q (By Mr. Kellahin) Mr. Largent, referring to what has  
18 been marked as Phillips' Exhibit Two, would you identify  
19 that exhibit?

20 A Yes, sir. This is a plat outlining the area of the  
21 proposed well, including the sub-surface control within  
22 seven miles of the proposed location.

23 Q Now, by sub-surface control, are you referring to wells  
24 that have been drilled in this area?

25 A Yes.



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- 1 Q On the basis of that information, did you correlate  
2 that with any other information you examined?
- 3 A I correlated this with the seismic information that we  
4 had, and as wells are drilled, we have made what  
5 corrections are necessary in our seismic information.
- 6 Q Now, what controls did you have for the preparation of  
7 this exhibit?
- 8 A We have had seven wells drilled in the area, and we  
9 have electric logs and sub-surface stratigraphic data  
10 on each of these wells.
- 11 Q And you examined the sub-surface data on each of these  
12 wells?
- 13 A Yes, sir.
- 14 Q On the basis of this information, did you make any  
15 determination as to what areas were the most favorable  
16 for drilling a well on the Phillips leases?
- 17 A Yes, I did. We have outlined a broad stratigraphic  
18 area where we would anticipate seeing better development  
19 of carbonates, and this, incorporated with our seismic  
20 data, has brought us to the location that we are  
21 proposing in this application.
- 22 Q What makes this location more favorable than any other?
- 23 A Well, it's the proper location with respect to what we  
24 think may be the back bank limits correlated to the  
25 two wells to the north, and the high seismic area as

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1 indicated.

2 Q That then makes this the ideal location for Phillips?

3 A Yes, we feel it does at this time.

4 Q From a geological point of view, what type of reservoir  
5 is this?

6 A Our primary objective is the Atoca section, which is  
7 a carbonate reservoir. We do have a secondary objective  
8 which is the Morrow, which is a sand reservoir.

9 Q Is this reservoir similar to any other reservoir in  
10 Southeastern New Mexico?

11 A Yes, the carbonate that we have found in our two key  
12 wells, the Texas American Well and the El Paso Well to  
13 the north, the Texas American Well being five and a  
14 half miles to the east--

15 Q Give the locations of those wells.

16 A Section 26, 23 South, 31 East; that's the Texas American  
17 Number 26 Todd, which is five and a half miles to the  
18 east.

19 In the El Paso Number 1 James Ranch, which is  
20 three miles to the north, we have seen a carbonate  
21 development in the area that is called Ivanovia, which  
22 is similar to the development we see in the Lusk area,  
23 which is approximately twenty-five miles north.

24 Because of this development, we feel that this is  
25 the proper environment for development of Ivanovia.

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- 1 Q Would you explain what Ivanovia is?
- 2 A Yes. That is a green algae which is quite well-known
- 3 in our business as being quite a good porosity-producing
- 4 animal. The Four Corners area is another type of this
- 5 development.
- 6 Q Has this development been found in other wells in
- 7 the vicinity of the Phillips location?
- 8 A Yes, the Texas American Well has eighty-five feet of
- 9 this development that is porous. We have seen this
- 10 development in several other wells, but not with the
- 11 porosity of this well.
- 12 Q What type of porosity do you find in the other wells?
- 13 What degree of porosity?
- 14 A The porosity in this section averages from five to
- 15 seven percent.
- 16 Q And do you have good permeability?
- 17 A Yes, you do, in the two better wells we referred to.
- 18 Q Do you have any idea what the permeability is in those
- 19 wells?
- 20 A No, I do not. There have been no cores, and our logs
- 21 are not capable of that measurement.
- 22 Q What roughly is the thickness of the producing formation
- 23 here?
- 24 A The Texas American Well has approximately eighty-five
- 25 feet; the El Paso Well, which we consider near the up

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1 bank limits, has nine feet of pay. The recently  
2 completed Belco Well has approximately thirteen feet.

3 Q We are talking about net pay?

4 A Yes, as interpreted from the electric logs.

5 Q Have you made an estimate of the reserves you would  
6 encounter in a well in Section 13?

7 A Yes, when we released our proposed well to management,  
8 we assigned ten billion cubic feet of reserves to this  
9 well based on 640 acres. That estimate is based on  
10 the averages of the wells in the area and volumetrics.

11 Q The volumetrics are based on information available from  
12 other wells also, is that correct?

13 A Yes, sir.

14 Q Do you anticipate encountering a typical well here?

15 A Of course, you always hope to get a Utopian kind of well,  
16 but based on this average, we anticipate ten billion  
17 cubic feet.

18 Q Would that all be producible reserves?

19 A The ten billion is what we consider producible reserves.

20 Q What deliverability do these wells have?

21 A They are quite variable. Of course, the poorer wells  
22 have poorer deliverability, but the wells nearest our  
23 location, which would be the two wells to the north,  
24 the El Paso James Ranch and the Belco--

25 Q That is the Shell James Ranch, is it not?

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- 1 A The Shell Number 1 James Ranch is in Section 36, three  
2 miles north, and the recently completed Belco Well,  
3 which was completed in the Atoca section and has not  
4 produced, was completed for thirty-nine million, and  
5 we anticipate similar development.
- 6 Q Is there a ready gas market available in the area?
- 7 A Yes, sir.
- 8 Q How many pipe lines are there in the area?
- 9 A I believe there are three pipe lines available, at least  
10 two, and perhaps three.
- 11 Q Assuming deliverability you are discussing and the ten  
12 billion in reserves, what would be the life of a well  
13 in Section 13?
- 14 A If we had ten billion recoverable reserves and a well  
15 capable of delivering ten million feet a day, I would  
16 anticipate a life of five and a half to six years.  
17 If we go up to fifteen million a day, we anticipate  
18 a life of four years. Of course, this is something  
19 that certainly cannot be predicted, but we anticipate  
20 at least the deliverability of the Belco Well north,  
21 and obviously the Belco Well to the north would be  
22 capable of delivering considerably more, and in that  
23 case, we would anticipate a comparable deliverability,  
24 and we would anticipate a life as short as three years.
- 25 Q When you say a life of three years, do you mean you

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1 will have produced the reserves, and would be ready  
2 to plug and abandon that well?

3 A Yes, that's possible.

4 Q And you would be through with that area then?

5 A Yes, this spacing unit, that's correct.

6 Q This spacing unit?

7 A Yes.

8 Q Now, you are talking about a three to five-year life  
9 span. The James Ranch Number 1 Shell Well has been  
10 producing for a great deal longer, has it not?

11 A Yes, but there is a reason associated with that. In  
12 the gas business, as most of you know, there is  
13 considerable change in the market, and I have an  
14 exhibit that will indicate what may have transpired.

15 Q Referring you to what has been marked as Phillips'  
16 Exhibit Three, would you identify that exhibit?

17 A Yes, sir. This is the gas sales compiled from the  
18 New Mexico Production Bulletin, indicating the production  
19 found in the Shell Number 1 James Ranch Well. This  
20 well is three miles north of the proposed location.  
21 It was connected in May, 1958, and in the first ten  
22 years, accumulated slightly over four billion cubic  
23 feet of gas. In the last four years, it has accumulated  
24 slightly over eight billion, which would indicate the  
25 change in the market situation, and what we could

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1 anticipate in our area if we drill at this time.

2 Q You attribute this production history solely to market  
3 capability?

4 A Yes, sir.

5 Q The well has been capable of producing the gas?

6 A That's correct.

7 Q Has the well reached its peak of production?

8 A The indication from this curve would say yes. It  
9 started on a decline, and we anticipate it will be  
10 depleted within a few years.

11 MR. PORTER: While you are on that point, providing  
12 the market stays as it is, or improves, would you anticipate  
13 a decline as steep as the one shown in 1971?

14 THE WITNESS: I would show a decline from 1972, yes.  
15 Perhaps with the deliverability, I think we could actually  
16 anticipate a sharper decline, Mr. Porter.

17 Q (By Mr. Kellahin) Has the market demand, in your opinion,  
18 affected the production in Southeastern New Mexico  
19 generally?

20 A Yes.

21 Q Have you had experience in this elsewhere also?

22 A Yes, we are developing at this time an area known as  
23 the South Carlsbad Field, and on the release of our  
24 wells in that area, we give those wells a three-year  
25 life.

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1 Now, we are anticipating a total reserve of  
2 approximately five billion, and this would be  
3 approximately seven million cubic feet a day.

4 Q Are the wells capable of producing at that rate?

5 A Yes, they are-- some of them are, all of the Phillips  
6 wells to date are.

7 Q Now, going back to your Exhibit Number Two, would you  
8 take the completed wells there-- do you have deliverability  
9 information on each of those wells?

10 A Do you mean today or initially?

11 Q Initially or today, whatever information you have on  
12 them.

13 A The El Paso Number 1 James Ranch at this time is capable  
14 of producing approximately four and a half to five  
15 million per day.

16 Q Is that the Shell James Ranch?

17 A Excuse me, the Shell James Ranch.

18 Q In Section 36, Township 30, Range 22?

19 A Yes, that's correct. The Belco Well, which was just  
20 recently completed, had a calculated openflow of  
21 thirty-nine million, and we don't know at this time  
22 what it will produce, but certainly, it should be  
23 capable of a deliverability of twenty million, I would  
24 think.

25 Q That is the well in Section 1, 30 East, 23 South?



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1 A Yes, sir, that's correct; two miles north.

2 The Texas American Well, which I referred to in  
3 Section 26, five miles to the east, has an indicated  
4 openflow of seventy-five million, and that well produced  
5 for some time at approximately twenty to twenty-three  
6 million per day. However, it has some water problems  
7 at this time, and they are producing at around five  
8 million, I believe.

9 The other wells, although completed in the Atoca  
10 section, are not in the same formation or the same  
11 stratographic zone as this, and they have a production  
12 capability of from one to three million per day.

13 Q Mr. Largent, were Exhibits Two and Three prepared by  
14 you or under your supervision?

15 A Yes, sir.

16 MR. KELLAMIN: I would like to offer in evidence  
17 Exhibits Two and Three.

18 MR. PORTER: Is there any objection?

19 MR. MORRIS: We renew our objection to Exhibit  
20 Number Two, if the Commission please, on the grounds as  
21 stated previously.

22 MR. PORTER: The Commission will overrule your  
23 objection, Mr. Morris, and admit all three exhibits into  
24 the record.

25 (Whereupon Applicant's Exhibits Two and Three

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1 respectively were admitted in evidence.)

2 MR. PORTER: The witness is now available for  
3 cross examination, but before we begin, we will take a short  
4 recess.

5 (Whereupon a recess was taken.)

6 (Hearing continues.)

7 MR. PORTER: The hearing will come to order, please.

8 MR. KELLAHIN: Mr. Porter, could I ask a couple of  
9 more questions on direct before cross examination begins?

10 MR. PORTER: Yes, sir.

11 Q (By Mr. Kellahin) In connection with the testimony  
12 offered by Mr. Woodson, there was some question raised  
13 about drilling in Section 23, and drilling directionally  
14 to the bottomhole in Section 13. Have you had any  
15 experience with directional drilling?

16 A No, I have not, other than the results of what we have  
17 done, but not directly with the drilling part of it.

18 Q You are familiar with the results of Phillips' operations  
19 in the field?

20 A Yes, at least on two occasions.

21 Q Have you any estimate as to what the cost of directional  
22 drilling would be in the fashion proposed?

23 A Well, as was earlier testified to by Mr. Woodson, this  
24 is very difficult to project, but I would probably  
25 estimate in the range of thirty-five percent of

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1 additional cost.

2 Q But that is an estimate?

3 A Yes, it is.

4 Q Is there any certainty that you can control the direction  
5 that you are drilling wells in in this area?

6 A We had an occasion last year over on the eastern shelf  
7 to drill approximately a 9,000-foot well, which we  
8 attempted to do directional drilling in, and we were  
9 unsuccessful in this, due to the shortcomings of the  
10 service company involved in it.

11 So it is not a surety by any means that you can  
12 arrive at your location.

13 Q Was that problem with that particular service company,  
14 or is that common to all service companies?

15 A I think this is an additional risk that you take, and  
16 you expect in directional drilling.

17 MR. KELLAHIN: That's all I have.

18 MR. PORTER: I understand that directional drilling  
19 is quite successful over in East Texas, according to rumor.

20 Mr. Morris, do you have some questions?

21 MR. MORRIS: Yes, I do.

22 \* \* \* \*

23 CROSS EXAMINATION

24 BY MR. MORRIS:

25 Q Mr. Largent, you are a Petroleum Geologist?

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- 1 A That's correct.
- 2 Q Have you testified here today as a reservoir engineer?
- 3 A No, sir.
- 4 Q Or as a production specialist?
- 5 A No, sir.
- 6 Q Who made the reserve calculations? I think you gave a
- 7 figure of some ten billion cubic feet.
- 8 A We have a reserve group who are specialists in the
- 9 field, and to give us the reserve estimates in our
- 10 Odessa office.
- 11 Q So you didn't do that yourself?
- 12 A That's correct.
- 13 Q It's pretty hard for me to cross examine on this point,
- 14 Mr. Largent, but as I understood your testimony, I have
- 15 to ask you this. What is the basis for your statement
- 16 that there are ten billion in reserves here?
- 17 A As I earlier testified, our reserve estimates were
- 18 based on the average of the wells in the area and the
- 19 volumetric calculations.
- 20 Q You don't have any exhibit to present to the Commission
- 21 with respect to how those reserves were calculated?
- 22 A No, I do not.
- 23 Q I believe you stated that if you achieved a certain
- 24 deliverability in this well, that you could deplete
- 25 its recoverable reserves in some five and a half to

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1 six years. What assumed deliverability were you  
2 referring to?

3 A I believe I gave the number ten million deliverability  
4 per day, based on ten billion in reserves, and that this  
5 would give a life of approximately five and a half to  
6 six years.

7 Q So your statement in connection with the depletion and  
8 the time frame of the depletion is all based upon the  
9 assumption that you have made that there are ten billion  
10 in reserves here?

11 A That's correct, and the deliverability of that figure.

12 Q When you say deliverability, you actually mean producing  
13 rate, do you not?

14 A Yes, that's correct.

15 Q Does a well's producing rate, deliverability, remain  
16 constant over its life?

17 A Well, certainly not. As your pressure depletes, your  
18 deliverability goes down.

19 Q But for the purpose of your assumption, you have assumed  
20 a continuous rate?

21 A No, I have not.

22 Q You have not?

23 A Our reservoir people made the estimate, and they  
24 projected it with regular decline.

25 Q Your reservoir people did it? You didn't yourself?

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1 A That's correct.

2 Q Mr. Largent, my copy of Exhibit Two is colored, but I  
3 don't have a color code shown on my exhibit. Can you  
4 help me out a little bit on that?

5 A I believe you will find it just above the legend.

6 Q It's not on mine.

7 A Yes, it is.

8 Q Oh, I'm sorry. What is the significance of the big  
9 red and blue contours across the page? Does the red  
10 there-- that doesn't refer to a particular-- I mean,  
11 what is the significance of the red, as compared to  
12 the blue?

13 A If you will note the arrows, and those colored lines  
14 outline the area I referred to earlier, and the  
15 stratigraphic position within the basin that we feel  
16 is most likely to have this carbonate build-up, and  
17 as we get into the back bank area, we would anticipate  
18 a different facies within this zone than we would in  
19 the Atoca carbonate bank.

20 As you get to the fore bank area, we anticipate  
21 a different facies. This is taken from the original  
22 stratigraphic study that was made.

23 Q Now, in Section 13, what formation would you expect  
24 to find and complete?

25 A And complete in?

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1 Q Yes.

2 A Our primary objective is the Atoca carbonate area I  
3 discussed, and which is outlined on here. However,  
4 we hopefully will have Morrow sand capable of producing  
5 in this area also. That is our secondary objective.6 Q Your principal objective is the Atoca, is that the  
7 formation upon which the reserve calculations were  
8 based?

9 A That's correct.

10 Q Did that reserve calculation take into consideration  
11 any contribution from the Morrow?

12 A No, it did not.

13 Q Just the Atoca?

14 A Yes. We would anticipate producing those simultaneously  
15 if we did have Morrow production.16 Q Where is the best Atoca production in this whole area?  
17 Is that the Texas American Well that you referred to  
18 over here in Section 26?19 A Based on production history, and we have a considerable  
20 longer history on the Shell James Ranch in Section 26,  
21 I would say that that is probably the best total  
22 reserve well. We do not know at this time about the  
23 Belco Well, but it appears to be a good section.

24 Q What interval is the Belco Well completed in?

25 A The Belco Well in Section 26 is completed from the

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1 Atoca carbonate zone that I referred to.

2 Q Can you give me the perforations?

3 A Yes, I can.

4 MR. KELLAHIN: I think Mr. Morris referred to the  
5 Belco Well in Section 26. I don't believe there is a Belco  
6 Well in Section 26.

7 MR. MORRIS: Excuse me, I was referring to the  
8 Texas American Well over in Section 26. Now we are talking  
9 about the Belco Well in Section 1 of this same township.

10 THE WITNESS: I do not have perforations on that  
11 well. To my knowledge, it has not been officially completed.

12 Q (By Mr. Morris) Mr. Largent, you have stated here to  
13 the Commission that you believe it is completed in the  
14 Atoca, and frankly, we don't think it is, and we want  
15 to know what you base your opinion on.

16 A The Belco Well in Section 1 was completed earlier,  
17 approximately three to five months ago, in the Morrow  
18 section. That well since has been re-entered and  
19 perforated to the Atoca section and the Strawn section.

20 Q What information do you have upon which you are basing  
21 this? I want to know your current information that  
22 you are relying on.

23 A This completion, or this test, was listed in the Midland  
24 paper just last week, and I have talked to personnel  
25 with Belco. I do not have the exact perforations



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1 down, but I think I can give them to you within ten  
2 feet of where they are.

3 Q Give me the information upon which you are relying in  
4 making your statement that you believe it is completed  
5 in the Atoca.

6 A I talked directly with personnel with Belco, and they  
7 have told me they perforated their Atoca section.

8 Q To the best of your information, what is the interval  
9 which they perforated?

10 A Approximately 12,996 to approximately thirteen thousand  
11 nine.

12 Q Thirteen thousand nine?

13 A Yes, sir.

14 Q And how has that been opened up? Has that entire  
15 section been opened up?

16 A Yes, sir.

17 Q Do you have the test on that zone?

18 A Yes. That test was first reported at thirty-six million,  
19 and the newspaper report was at thirty-nine million per  
20 day calculated openflow.

21 Q And how long a test was that?

22 A I can't answer that, Mr. Morris. That was a four-point  
23 test, I believe, and it was taken and calculated from  
24 that.

25 Q Are the Strawn perforations still open in this well?

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1 A Yes, they have been perforated, but I do not know  
2 what they are doing with them. They had a calculated  
3 openflow from that zone of approximately sixteen million,  
4 but I do not know if they are producing. I do not  
5 think they are producing either zone at this time.

6 Q Has the well been placed on production?

7 A Not to my knowledge. The well was on production in  
8 the Morrow zone, but not the Atoca and the Strawn zones,  
9 to my knowledge.

10 MR. NUTTER: Mr. Porter, I believe that well, and  
11 we have Belco personnel present in the room, I believe that  
12 well was recently authorized for a dual completion after a  
13 hearing, and I think we have the file with us now for the  
14 dual completion for the well in another zone. So maybe the  
15 representatives of Belco could tell us what formation was  
16 recently approved, and what formation the present application  
17 is for.

18 MR. MORRIS: We might be able to keep this going  
19 in an orderly procedure if we know who the Belco representative  
20 is present, and perhaps he can be presented as a witness.

21 MR. KELLAHIN: If the Commission please, I think  
22 the Commission can take notice of its own file, and there  
23 is an application pending before the Commission at this time  
24 to complete the subject well in undesignated Strawn and  
25 Atoca pools. It was originally approved for completion

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1 in the Morrow, and, I believe, the Strawn.

2 MR. NUTTER: But the Morrow has now been abandoned.

3 MR. KELLAHIN: I don't think it has been abandoned.

4 They propose to temporarily abandon it, yes.

5 MR. NUTTER: And complete it in the Atoca and the  
6 Strawn?

7 MR. KELLAHIN: Yes. I filed the application, and  
8 it's in the Commission file.

9 MR. MORRIS: Mr. Kellahin, would it be possible  
10 for you to provide me with a copy of the application that  
11 I can look at at this time?

12 MR. KELLAHIN: It makes no mention of the completion.

13 Q (By Mr. Morris) Has it been possible for you, Mr.  
14 Largent, to make any material calculations, or any other  
15 accurate reserve calculations, with respect to the  
16 Atoca reserves in the Belco Well?

17 A No, our reservoir people have not really looked at that  
18 well. They will not do that until after the well is  
19 officially completed and on production.

20 Q So we still need quite a bit more information on the  
21 Belco Well before we can evaluate its reserves?

22 A That's probably true.

23 Q All right. I would refer you to the El Paso-Mobil  
24 Federal Well located in Section 29 of the adjoining  
25 township to the east; are you familiar with that well?

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- 1 A Yes, I am, to a degree.
- 2 Q Was that well tested in the Atoca?
- 3 A Yes, there was a drill stem test on that well, and it
- 4 did not recover a significant amount of gas.
- 5 Q Was that well completed in the Atoca?
- 6 A No, it was not. It is not completed officially at this
- 7 time, it's on a testing program in the Morrow sections.
- 8 Q It does not appear that the well will be completed in
- 9 the Atoca, does it?
- 10 A That's correct.
- 11 Q Now, the El Paso Well lies between your proposed
- 12 location and the Texas American Atoca producer in
- 13 Section 26 of that same township, does it not?
- 14 A That's correct.
- 15 Q So it would appear that the Atoca formation would be,
- 16 as well as the Morrow formation, would be highly
- 17 erratic in this area, would it not?
- 18 A Yes, that's a fact, I believe.
- 19 Q I am somewhat at a loss to understand from your map
- 20 why your particular location in Section 13 is such
- 21 an optimum location, and why you wouldn't have just as
- 22 good a location in Section 23 or Section 24. Can you
- 23 explain that?
- 24 A Yes, I think I can. As I testified earlier, this well
- 25 is approximately the same distance and in the same

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1 relationship to the wells to the north. We feel that  
2 it actually will be approximately flat to those wells.

3 We do indicate a slight build-up on our seismic  
4 in that area, and we have chosen the place which  
5 indicates the highest shot area. Whether or not this  
6 is the build-up, we can't be sure, but that is the  
7 hypothesis we are going on.

8 The other thing is that it would appear it's in  
9 the same relationship to the back bank as the two wells  
10 to the north.

11 Q If you shifted your location down into the Northeast  
12 quarter of Section 23, you could be at the same  
13 structural location as depicted on your plat, could  
14 you not?

15 A That's true, based on a one hundred foot contour. If  
16 you contour this at a fifty-foot interval, it would not  
17 be as high, and we would not have-- it would be  
18 crowding what we consider to be the back bank area  
19 somewhat, and as you can see from the map, we could  
20 have slight faulting through there. That's what we  
21 would be contending with if we went farther to the west,  
22 and that's the reason we are staying farther out to  
23 the east. There are enough hazards involved in drilling  
24 expensive wells without picking what we consider a  
25 secondary location.

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1 It's also closer to the wells to the north than  
2 Section 23 would be.

3 Q I believe you gave a calculated absolute openflow on  
4 the Belco Well of some thirty-nine million?

5 A Yes, sir.

6 Q Is that based on a drill stem test?

7 A No, that's based on the perforated interval as reported  
8 in the newspaper, and from the personnel of Belco.

9 MR. MORRIS: That's all I have.

10 \* \* \* \*

11 CROSS EXAMINATION

12 BY MR. PORTER:

13 Q Mr. Largent, what price did you assign to the gas?

14 A What price?

15 Q Yes.

16 A I believe that was 27.9-- just a moment, I think I have  
17 it here. Twenty-seven point 219.

18 Q What would be the value of the gas under that section,  
19 assuming that there is ten billion cubic feet of gas?

20 A The value of the gas, based on that price, would be  
21 \$421,000-- excuse me, I stand corrected. Pardon me,  
22 the total value that we have, based on that price,  
23 would be \$2,433,300.

24 MR. PORTER: Does anyone else have any questions?

25 \* \* \* \*

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CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Largent, we are making a lot of assumptions here today. You were assuming a while ago that you would have 640-acre spacing, which is an assumption. So going one further, assuming the Commission would approve 640-acre spacing, and assuming the Commission would approve a location that would be in the Southwest quarter of Section 13, and assuming further that the Southwest quarter of Section 13 and the Southwest quarter of Section 14 and the Northeast quarter of Section 23 and the Northwest quarter of Section 24 were dedicated to the well, that's all Phillips' acreage, is it not?

A I believe that's correct.

Q Assuming further that the U.S.G.S. would approve communitization, you would have a well located right in the center of a 640-acre unit, is this correct?

A Yes, that's correct.

Q Are you in agreement with Mr. Gorence that you would be willing to drill a well anywhere in the South half of the Southwest quarter of Section 13?

A Reluctantly, yes.

MR. NUTTER: Thank you.

MR. PORTER: Are there any further questions of the witness?

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1 MR. KELLAHIN: Yes.

2 \* \* \* \*

3 REDIRECT EXAMINATION

4 BY MR. KELLAHIN:

5 Q Mr. Largent, you said that you based your estimate on  
6 twenty-seven and a half cents per thousand, is that  
7 right?

8 A Yes, sir.

9 Q Is gas selling at that rate down there now?

10 A No, it is not. We anticipate getting considerably more.  
11 This was an analysis made in the middle of 1972.

12 Q This is a wildcat well, is it not?

13 A Yes, sir.

14 Q It's more than two miles from the nearest producing well?

15 A Yes, sir.

16 Q Under those circumstances, is it possible to do more  
17 than just make an estimate of what the reserves are?

18 A No, it's not.

19 Q And until you drill the well, you will not know what the  
20 reserves are, or the deliverability, is that correct?

21 A That's correct.

22 MR. KELLAHIN: That's all.

23 MR. PORTER: Right now, without further action by  
24 the Oil Conservation Commission, what would be the highest  
25 price that you could get for certain for the interstate



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1 shipment of gas?

2 THE WITNESS: I am not qualified to answer that,  
3 I'm just not that well up to date on gas prices. I would  
4 anticipate something in the range of thirty-five cents.

5 MR. PORTER: I know that the Examiner in the Permean  
6 case recommended prices that high, but I haven't seen any  
7 action taken by the Federal Power Commission, so I assume  
8 it would still be sixteen and a half cents. Are there any  
9 further questions?

10 (No response)

11 MR. PORTER: The witness may be excused.

12 (Witness excused.)

13 MR. KELLAHIN: That's all we have, Mr. Porter.

14 MR. PORTER: Mr. Morris, would you call your first  
15 witness, please?

16  
17 MR. MORRIS: If the Commission please, I will call  
18 Dr. Lindsay I. Brown.

19 DR. LINDSAY I. BROWN,

20 was called as a witness, and having been already duly sworn,  
21 testified as follows:

22 DIRECT EXAMINATION

23 BY MR. MATKINS:

24 Q Will you state your name and where you reside?

25 A Lindsay Brown, Winnetka, Illinois.

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- 1 Q What is your occupation?
- 2 A I am in the International Marketing Department of
- 3 International Mineral and Chemical.
- 4 Q Have you appeared before the Oil Conservation Commission
- 5 before?
- 6 A No.
- 7 Q Would you briefly outline your education and experience
- 8 in marketing?
- 9 A I have a bachelor's degree in biology, and a master's
- 10 degree in agriculture from Virginia Polytech, and a
- 11 Ph. degree also in agriculture from Michigan State
- 12 University. My area of experience has been in soil
- 13 and fertilizer, and I have been actively engaged in
- 14 fertilizer marketing for the last six years.
- 15 Q Does that include marketing in the potassium areas?
- 16 A Yes, sir.
- 17 Q Are you familiar with langbeinite and sylvite?
- 18 A Yes, sir.
- 19 Q In your marketing activities with I.M.C., do you market
- 20 a product which is in fact langbeinite?
- 21 A Yes, we do.
- 22 Q Showing you what has been marked as I.M.C. Exhibit One,
- 23 is that in fact the product specifications on your
- 24 pure langbeinite?
- 25 A Yes, it is.

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- 1 Q Do you also have, besides the standard, another  
2 product?
- 3 A Yes, we make a grade called granular, which varies only  
4 in particles.
- 5 Q What is the significance of the chemical specifications  
6 in langbeinite, as distinguished from other potash  
7 products?
- 8 A The thing that makes langbeinite unique is the source  
9 of water soluble magnesium for fertilizers. It happens  
10 that magnesium is one of the sixteen elements required  
11 by plants for growth, and it happens that langbeinite  
12 is the only domestic source of water soluble magnesium  
13 for fertilizers.
- 14 Q Why is langbeinite used?
- 15 A The need for the product would vary with the part of  
16 the country because there are certain natural magnesium  
17 levels in soil. There is a magnesium requirement all  
18 over the country, and the intensity varies from one  
19 part of the country to another.
- 20 Q To your knowledge then, is the langbeinite that is  
21 being produced in Southeastern New Mexico the primary  
22 source of water soluble magnesium?
- 23 A Yes.
- 24 Q Do you have personal knowledge of how many companies  
25 have access to this particular product, and who are

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1 marketing it at the present time?

2 A Yes, there are two.

3 Q Can you name them?

4 A International Mineral and Chemical and Duval Sales  
5 Corporation.

6 Q And both of their sources are down in Southeastern  
7 New Mexico?

8 A Yes, sir.

9 Q I hand you what will be marked, or identified, as  
10 I.M.C. Exhibit Two. Would you tell us if you prepared  
11 this information, and if so, the source of the  
12 information, and what the information reveals?

13 A I have participated in the preparation of the information.  
14 Most of it came from an outfit called the Potash  
15 Institute of North America, which is essentially an  
16 association of the potash producers in North America.

17 The figures are documented by tonnage, and the  
18 figures are furnished by member companies.

19 Q Does it contain actual figures as well as projected  
20 figures?

21 A Yes, it does.

22 Q I take it that the figures for 1969-'70, 1970-'71, and  
23 1971-'72 are actual reported tonnage?

24 A Yes, that's right.

25 Q And the following four years are projections?

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- 1 A That's right.
- 2 Q Can you tell us how those projections were arrived at?
- 3 A Essentially, they are linear projections from historic
- 4 usage of the product.
- 5 Q What has been your experience, or your company's
- 6 experience, in the growth of the use of the product?
- 7 A Over the period of the previous ten years, and this
- 8 particular chart doesn't go back that far, growth has
- 9 averaged nine percent a year.
- 10 Q Do you have any reason to believe that that growth
- 11 will not continue?
- 12 A No, I do not.
- 13 Q I assume that since you are in marketing, you are
- 14 familiar with the current prices being obtained for
- 15 both standard and granular langbeinite, is that correct?
- 16 A Yes, sir.
- 17 Q Would you tell the Commission what the prices are?
- 18 A The quoted F.O.B. price of processed langbeinite is
- 19 seventeen and a half dollars; granular is twenty dollars
- 20 and fifty cents.
- 21 Q Has that price been stable for the past number of years?
- 22 A That's right, with a slight increase, the maximum that
- 23 the price board would allow us over the last year.
- 24 MR. MATKINS: Pass the witness.
- 25 \* \* \* \*

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1216 FIRST NATIONAL BANK BLDG. EAST, ALBUQUERQUE, NEW MEXICO 87108CROSS EXAMINATIONBY MR. KELLAHIN:

Q Dr. Brown, on your Exhibit Number Two, I take it that "Ind" means industry, total for the entire industry?

A Yes, sir.

Q You gave us the price on langbeinite. Is there a different price for potash?

A Yes, there is. May I qualify your question?

Q You may.

A The point is that langbeinite is from a potash source, but its place in the market is not determined by the potash company, its place in the market is determined by its magnesium content.

Q Are langbeinite and sylvite competitive in any sense?

A No, sir.

Q In other words, you are telling us they are different products?

A Yes, sir.

Q Aren't they used for the same purpose?

A They are both used for fertilizer.

Q Could you give me the price of sylvite now?

A I can't give you the exact figure. Can I give you an approximate figure?

Q If that's all you can give me, yes.

A The price for sylvite right now is about thirty-five

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1 cents per unit of K<sub>2</sub>O, which is the standard way of  
2 pricing potash.

3 Q But you don't price langbeinite that way, do you?

4 A No.

5 Q Can you give me the price per ton of sylvite of the  
6 type used in the fertilizing product?

7 A It would be sixty times thirty-five cents; twenty-some  
8 dollars.

9 Q Actually, it runs a bit higher than langbeinite?

10 A It might at this time, I haven't done my arithmetic.

11 Q Well, langbeinite is not found in this area alone, is it?

12 A Yes, sir.

13 Q Isn't there a percentage of langbeinite ore and a  
14 percentage of sylvite ore in the same area?

15 A This is really out of my area of expertise.

16 Q You don't know whether you mine langbeinite and sylvite  
17 in the same mine?

18 A Saying the same mine, I can't say correctly. But the  
19 same area, yes.

20 Q Let's say your mine is open in Section 13. Would you  
21 principally mine langbeinite or langbeinite and sylvite?

22 A I don't know.

23 Q If the core samples show that there is a higher  
24 percentage of sylvite and a rather low percentage of  
25 langbeinite, your answer would be yes, you mine them

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1 both, isn't that correct?

2 A I can't answer that.

3 MR. KEJLAHIN: That's all I have.

4 MR. MATKINS: I move to introduce I.M.C. Exhibits  
5 One and Two.

6 MR. PORTER: Without objection, the exhibits will  
7 be admitted.

8 (Whereupon I.M.C. Exhibits One and Two respectively  
9 were admitted in evidence.)

10 MR. MATKINS: This witness needs to catch an  
11 airplane. May he be excused?

12 MR. PORTER: Are there any other questions?

13 (No response)

14 MR. PORTER: The witness may be excused.

15 MR. MATKINS: I will call Mr. Charles Childers.

16 \* \* \* \*

17 CHARLES E. CHILDERS,

18 was called as a witness, and having been already duly sworn,  
19 testified as follows:

20 DIRECT EXAMINATION

21 BY MR. MATKINS:

22 Q Will you state your name and where you reside, Mr.  
23 Childers?

24 A Charles Childers, Carlsbad, New Mexico.

25 Q What is your occupation?



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- 1 A General Superintendent in charge of mining and  
2 engineering for I.M.C.
- 3 Q And how long have you been employed by I.M.C.?
- 4 A Ten years.
- 5 Q Have you appeared before the New Mexico Oil Conservation  
6 Commission prior to today?
- 7 A For an Examiner Hearing, but not before the Commission.
- 8 Q Would you give us your education and training background  
9 and experience?
- 10 A I graduated from the University of Illinois in 1955  
11 with a B.S. degree in mining engineering. I came to  
12 work for Duval Corporation in Carlsbad, New Mexico, and  
13 worked there for seven years. I worked for about one  
14 year for Southwestern Potash, and then went to work  
15 for I.M.C. on February 1st, 1963.
- 16 Q What positions and jobs have you held with I.M.C.?
- 17 A I came with them as an Assistant Production Engineer;  
18 I was General Mine Foreman; Acting Mining Production  
19 Superintendent; Mine Maintenance Superintendent;  
20 Chief Mining Engineer; and General Superintendent in  
21 charge of engineering and maintenance.
- 22 Q So you have worked both underground and above the ground  
23 in the operations of I.M.C., is that correct?
- 24 A Yes, sir.
- 25 Q Briefly describe what operations I.M.C. are in in Eddy

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1 County, New Mexico.

2 A I.M.C. has multi-level potash ore being mined on three  
3 different levels. We mine sylvice and langbeinite ores  
4 primarily. We produce muriate of potash, langbeinite,  
5 which is known as sulpha-mag at I.M.C., and sulpha of  
6 potash.

7 Q How long has I.M.C. been producing?

8 A Since 1940. At the present time, we have some 450  
9 employees and an annual payroll of something over  
10 five million dollars.

11 Q I assume that the continuation of your operations  
12 depends on how much ore reserve the company has?

13 A Yes, sir.

14 Q Mr. Childers, have you prepared an exhibit in colored  
15 form showing I.M.C. leases in the vicinity of Section 13,  
16 and the Phillips' leases?

17 A Yes, I have.

18 Q This will be marked as I.M.C. Exhibit Three. Was this  
19 exhibit prepared under your direction and supervision?

20 A Yes, it was.

21 Q And I believe that probably can be read in connection  
22 with Phillips' Exhibit One as far as the relationship  
23 to the section is concerned?

24 A Yes, I believe it is the same scale.

25 Q Now, the code is on the exhibit, but would you briefly

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1 explain to the Commission what you have done here?

2 A Yes, sir. The general area around the proposed well  
3 location, I have colored with the color blue. The  
4 I.M.C. leases are cross-hatched with red. The Phillips'  
5 leases, oil and gas leases in the same area, are shown,  
6 and the outlines of the Phillips-A area is in yellow.

7 MR. MATKINS: I move for the introduction of  
8 Exhibit Three.

9 MR. KELLAHIN: If the Commission please, we have  
10 no objection to the admission of the exhibit, other than the  
11 right to correct it insofar as the Phillips' leases are  
12 incorrect.

13 MR. PORTER: Why don't we wait until the witness  
14 has been cross examined?

15 MR. MATKINS: Yes, sir.

16 Q (By Mr. Matkins) Now, Mr. Childers, what type of ore  
17 exists in the areas of Sections 13, 14, 15, 24, 18,  
18 and 25?

19 A You are covering quite a bit of territory. We have  
20 langbeinite ore and on the outskirts of the area, we  
21 have some mixed ore, as we refer to it.

22 Q Mr. Kellahin was inquiring earlier as to whether I.M.C.  
23 at the present time was mining mixed ore.

24 A Yes, they do.

25 Q You have a process by which you break down the sylvite

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1 from the langbeinite, do you not?

2 A Yes, we do.

3 Q In your judgment, is the value of this ore deposit  
4 principally langbeinite or principally sylvite?

5 A Principally langbeinite.

6 Q Have you, Mr. Childers, in your capacity with I.M.C.,  
7 made some evaluations of the ore body in question here,  
8 utilizing accepted methods by which such ore bodies  
9 are evaluated and delineated?

10 A Yes, sir.

11 Q Have you used more than one method?

12 A Yes, sir.

13 Q What methods have you used?

14 A Well, from the beginning, using a rough method of taking  
15 the holes in the general area and averaging those holes,  
16 just arithmetically, to using the polygon method, which  
17 is an accepted method of geologic evaluation of this  
18 type of ore. We went from that to a method known as  
19 the K20 foot method, where you take into consideration  
20 not only the value of the ore as far as the percent of  
21 K20 is concerned, but also the thickness of the bed.

22 Q Is the last method sometimes referred to as the contour  
23 method?

24 A Yes, sir.

25 Q Now, have you prepared exhibits demonstrating the

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1 polygon method first of all?

2 A Yes, sir.

3 Q Do you have those here?

4 A Yes, sir.

5 Q I will hand you what has been marked as I.M.C. Exhibit

6 Four, and ask you which method that-- first of all,

7 I will ask you whether that was prepared under your

8 direction and supervision.

9 A Yes, it was.

10 Q And now I will ask you which method that particular

11 diagram demonstrates.

12 A It's the polygon method.

13 Q Would you explain to the Commission how the polygon

14 method is used?

15 A Yes, sir. You begin by selecting two core well

16 locations, and draw a line between the two, and

17 intersect that line half-way between the two, and that

18 becomes a polygon side. Using each of the core holes,

19 you do the same thing drawing a line between each core

20 hole and intersecting that line with a line

21 perpendicular to it half-way between the two holes to

22 form another side of your polygon.

23 As you work around the hole, you form a polygon

24 around the core hole, which gives the area of influence

25 you can give to that particular core.

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1 Q Is the proposed location of the Phillips well indicated  
2 on the map?

3 A Yes, it is. There is a small circle, which is the  
4 proposed location. It is surrounded by a larger circle  
5 with a radius line indicating a 1,400-foot radius.

6 Q Do you have core test information on that exhibit?

7 A Yes, sir.

8 Q Can you explain to the Commission the meaning of those  
9 symbols by the cores?

10 A Yes, sir. If you will look in Section 13 on the west  
11 side, you see the number 370. That is an I.M.C. core  
12 hole number. The circle indicates the location of  
13 that hole, and the numbers immediately below the circle  
14 indicate, first, the bed thickness, and second, the  
15 percentage of K2O as langbeinite.

16 Below that figure is the percent of K2O as  
17 sylvite. So in that example, core hole 370 would read  
18 8.4 feet of 11.3 percent K2O as langbeinite, and 0.2  
19 percent K2O as sylvite.

20 Q And the same information follows for each hole?

21 A Yes.

22 Q Now, you have testified that you set up your polygon  
23 by drawing a line half-way between the various core  
24 tests, is that correct?

25 A Yes, sir.

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1 Q What data or information did you use from that point  
2 in evaluating the ore body?

3 A As you put down the perimeter of your polygon by  
4 drawing these normal lines to the lines in between the  
5 core holes, then the area that is included inside the  
6 perimeter of that polygon is given the influence of  
7 that hole, so you calculate the reserve information  
8 of that area, using that information.

9 Q Now, have you calculated these figures in these various  
10 polygons, and can you give us that information as to  
11 what your calculations are?

12 A Yes, sir. In Section 13, we have evaluated Section 13,  
13 using the polygon method, and it is calculated to be  
14 19,116,880 tons of ore.

15 Q That is in the entire section?

16 A Yes, sir.

17 Q How do you arrive at that figure? Is that the average  
18 of the polygons that exist within the section?

19 A Yes, sir. There were four polygons involved.

20 Q What do you mean by tons of ore?

21 A Those are tons of mineable economic ore that are lying  
22 in the ground under Section 13.

23 Q Am I correct in saying that whether you have sylvite  
24 or you have langbeinite, they are in salt, are they not?

25 A Yes, sir.

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1 Q And you must refine it out of that?

2 A Yes, sir.

3 Q Then in order to determine the amount of langbeinite,  
4 for example, in that tonnage, how do you proceed?

5 A By using the percent of langbeinite that is in each  
6 one of these core holes. That volume in that polygon  
7 is applied to the value of the langbeinite that is in  
8 that ore. For example, in the polygon for 370, which  
9 we have discussed, the ore grade K20 langbeinite is  
10 11.3 percent. So our product grade is twenty-two  
11 percent K20 as langbeinite. So that's just roughly  
12 over fifty percent of the ore in that polygon is  
13 langbeinite ore.

14 MR. PORTER: Does that conclude your answer to  
15 that question?

16 THE WITNESS: Yes.

17 MR. PORTER: I think we will take a recess for  
18 lunch at this time. The Legislature is in session, and  
19 places to eat are at a premium, so we will take a break at  
20 this time and come back at one o'clock.

21 (Whereupon a luncheon recess was taken.)

22

23

#### AFTERNOON SESSION

24 MR. PORTER: The hearing will come to order, please.  
25 Ask the witness to please take the stand and resume his



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1 testimony.

2 (Whereupon Charles E. Childers resumed the stand,  
3 and testified as follows:)

4 Q (By Mr. Matkins) You have demonstrated the polygon  
5 method, and you have mentioned also a contour method,  
6 which is in common use.

7 A Yes, sir.

8 Q Have you prepared an exhibit demonstrating the contour  
9 method?

10 A Yes, sir.

11 Q Do you have that with you?

12 A Yes, sir.

13 MR. MATKINS: Can we identify this as I.M.C.  
14 Exhibit Five, please?

15 Q (By Mr. Matkins) Mr. Childers, the exhibit that you have  
16 just distributed has been identified as I.M.C. Exhibit  
17 Five. I wish you would explain to the Commission what  
18 the markings on that exhibit mean in terms of  
19 identifying the ore body. Did you prepare this exhibit?

20 A It was prepared under my direction.

21 Q All right, sir.

22 A This is a method used to evaluate a body of ore in  
23 which you take into consideration the two most important  
24 features of that ore body. One of them is the percent  
25 of mineral, and the other is the bed thickness. So

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1 you multiply the thickness of the bed by the K20  
2 percentage, and in this case, this is a K20 foot  
3 contour with the K20 as langbeinite.

4 So using the same hole, hole 370, where we see  
5 8.4 feet of 11.3 K20 as langbeinite, you multiply the  
6 8.4 by the 11.3 and come up with K20 feet. Each core  
7 hole is done the same way, and the contour map is  
8 plotted using that information.

9 Q What do the numbers on the contour map, that you placed  
10 on the contours, what do they represent?

11 A The contour line number, let's pick the one here by  
12 number 370, right above it, we see the contour that  
13 has a value of 90. This means that the depth thickness  
14 of the ore bed times the K20 as langbeinite in that  
15 bed will result in a figure of 90.

16 You multiply those two figures.

17 Q In using this contour method, can you likewise make  
18 a projection as to the ore content under Section 13  
19 as you did under the polygon method?

20 A Yes, you can.

21 Q Did you make such a computation using this method?

22 A No, sir.

23 Q What then is the significance of this contour map?

24 A It just shows the value of the ore that is in Section 13.  
25 It shows what we would expect to reach. Obviously,

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1 if it is thicker ore and has a higher grade value,  
2 it is going to be of higher quality, and of more  
3 importance to us when we mine it.

4 For example, with the number 100 along that contour,  
5 we would expect ten feet of ten percent K2O, or the  
6 equivalent. If you had five percent of twenty percent  
7 K2O, it would result in the same thing. The higher  
8 the number, the more valuable the ore.

9 You can make a rough estimate of any area you  
10 would like to pick by just multiplying the area times  
11 the area of influence.

12 Q Does the method delineate the possible boundaries of  
13 commercial ore?

14 A Yes, sir. You get a better feel for what you might  
15 expect in this method between the two holes than you  
16 would in the polygon method. The polygon method  
17 assumes one area of influence around that particular  
18 hole to have the same value.

19 When you go from one polygon to the next, when  
20 you move from one line over into another polygon, you  
21 may be moving to something very much richer, or  
22 something very much poorer in value.

23 Q As a mining engineer, do you have an opinion as to  
24 which of these contours define the possible limits of  
25 commercial ore?

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1 A The value set by the United States Geological Survey  
2 for non-potash areas for langbeinite values is four  
3 feet of four percent K<sub>2</sub>O as langbeinite. Using those  
4 values, four times four is sixteen, so the contour  
5 line would indicate where the cut-off would be.

6 For that reason, a value of sixteen was placed  
7 on the contour line on this map.

8 Q Would you please tell the Commission what is meant  
9 in the potash industry by first mining and second mining?

10 A Yes, sir. When you mine a bedded deposit, it is  
11 obvious that you cannot go in and take one hundred  
12 percent of that bed out in first mining. You go through  
13 and mine what you can safely mine and recover, leaving  
14 enough of the ore to support the overlying strata.

15 When you second mine, you are making the decision  
16 that the area will not be-- you will not go back into  
17 it. In the room and pillar method of second mining,  
18 you go in and rock the pillars and--

19 Q What is meant by rock the pillars?

20 A To rock the pillars means to mine the ore that was left  
21 in the pillar room. The rooms indicate the area that  
22 you have mined out, and in mining terms, it is more  
23 commonly called a drift. In the pillar method, for  
24 example, in our mines, all drifts run north and south,  
25 and the rooms run east and west, and are called

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1 breakthroughs. The area we leave to support the  
2 back is called the pillar. When you second mine, you  
3 go back into an area and you mine the ore that is in  
4 that pillar and remove as much of that pillar as your  
5 mining plan calls for.

6 Q What are the sizes of your rooms as you first mine?

7 A In our mines, we have a standard of twenty-eight feet.  
8 Now, this is not standard for all room and pillar  
9 mining, but in our mines, we follow the twenty-eight  
10 foot rule.

11 Q What size pillars are left after first mining?

12 A This depends also on the amount of ore that you plan  
13 to extract on first mining.

14 Q What do you commonly extract on first mining, percentage-  
15 wise?

16 A Here again, it depends on the bed depth, and whether or  
17 not you are mining in an ore bed that happens to lie  
18 above the one you are mining right now. In this area  
19 down here (indicating), at this depth, we would plan  
20 on fifty percent extraction on first mining.

21 Q When you say this area, are you talking about Section 13,  
22 the area in controversy here?

23 A Yes, sir.

24 Q And if you did second mine in this area, how much  
25 additional ore would you expect to recover?

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1 A Forty percent additional ore for a total of ninety  
2 percent extraction.

3 Q Have you actually, in your duties as mining engineer,  
4 or while you have worked with I.M.C., have you actually  
5 engaged or been present during the second mining  
6 withdrawal of pit pillars?

7 A Yes, sir, not only at I.M.C., but with Southwest Potash  
8 and Duval.

9 Q Let me ask you this at this stage. In using these  
10 various methods, what is the significance to your in  
11 your experience of a dry hole or a hole that shows  
12 almost no commercial langbeinite or sylvite?

13 A You will have to qualify that. Of course, by taking  
14 a look at the information in your surrounding core  
15 holes, generally we can say that a barren hole cannot  
16 be relied upon to be barren.

17 If a bed has had other ore deposits with the  
18 langbeinite or sylvite, for example, then they will  
19 replace the langbeinite so you may find a place where  
20 the langbeinite or sylvite you see in the area-- there  
21 may be a smaller area where it didn't occur, and these  
22 are called salt horses. They may be large or small  
23 so that you can hit one of these salt horses with a  
24 core test which would indicate just from that that  
25 there is no ore there. However, if there are good

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1 holes around it, it becomes suspicious, and you may  
2 or may not have ore there.

3 If there is a core well hole that shows to have  
4 potash, sylvite, or langbeinite, then you can be  
5 pretty well assured that it is there.

6 As far as we know, there are no such things as  
7 ore horses.

8 Q During your actual mining development, do you mine  
9 through areas containing these so-called salt horses?

10 A Yes, sir.

11 Q Have you, on several occasions?

12 A Yes.

13 Q Have you ever mined through an area that actually  
14 contains a blank hole, and yet you mine through the  
15 entire area?

16 A Yes.

17 Q Now, when you are conducting second mining, you, of  
18 course, are withdrawing the support strength of the  
19 roof of the mine, are you not?

20 A Yes, sir.

21 Q And something occurs in that process which is called  
22 subsidence, is that correct?

23 A Yes, sir.

24 Q Mr. Childers, we have distributed what has been marked  
25 as I.M.C. Exhibit Six for identification. I ask you

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- 1 if that is a drawing prepared under your direction and  
2 supervision.
- 3 A Yes, it is.
- 4 Q Is it drawn to scale?
- 5 A No, sir.
- 6 Q Is there a reason why it is not drawn to scale?
- 7 A Because it is a diagramatic drawing showing only a  
8 general section. It is not meant to show the geology  
9 of the area specifically, but just in general.
- 10 Q In addition, you wouldn't have a large enough piece  
11 of paper to put in 1,400 feet, would you?
- 12 A The bed would appear rather small.
- 13 Q On the left-hand corner, the left-hand portion, you  
14 have indicated an area which would be classified as  
15 having been first mined, is that correct?
- 16 A Yes, these are supposed to be drawings of pillars  
17 starting from the left.
- 18 Q And then you have smaller pillars, is that an indication  
19 of second mining?
- 20 A Yes. You can see the size of the first two pillars,  
21 and you can see the size of what would be the third  
22 pillar, and that has been mined through and left as  
23 two small stubs or fenders, depending upon your  
24 terminology.
- 25 Q Then on past those smaller pillars, you have shown a



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- 1 collapsing of the mine area, is that correct? To the  
2 right of the drawing?
- 3 A Yes, sir. The drawing indicates pillars that have been  
4 crushed by the weight of the overlying rock.
- 5 Q And is this what is referred to as convergence?
- 6 A Yes, underground.
- 7 Q Subsidence is on the top and convergence is down below?
- 8 A Yes, sir.
- 9 Q Roughly, what type of material lies immediately above  
10 your ore bodies?
- 11 A Salt, with some stringers of polyhalite and hydride.
- 12 Q Then what is on above the salt and the other two?
- 13 A Limestone and dolomite and shales.
- 14 Q On this drawing, you have indicated a forty-five degree  
15 angle from a vertical position. What is the  
16 significance of that?
- 17 A That line is drawn in to show the subsidence angle,  
18 which is the angle that the subsidence will take. In  
19 other words, if you pull pillars up to the point as  
20 shown here in this diagramatic drawing, subsidence will  
21 then occur at an angle of forty-five degrees to the  
22 surface.
- 23 Q Have you actually observed convergence in mines?
- 24 A Yes, I have.
- 25 MR. MATKINS: If the Commission please, we want

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1 to put this exhibit in now, as it will be used by a later  
2 witness. We want to put it in now because Mr. Childers  
3 has prepared it.

4 Q (By Mr. Matkins) Mr. Childers, do you have in your  
5 possession some photographs taken at I.M.C., evidencing  
6 convergence and subsidence in your mine?

7 A Yes, I do.

8 Q Do you want this whole group? Maybe you can select a  
9 few of them and tell us what they demonstrate. Mr.  
10 Childers, I show you a picture identified as I.M.C.  
11 Exhibit Seven, and if you would tell the Commission  
12 what that picture demonstrates?

13 A This is a pillar that has been left in the mine. As  
14 you can see, the pillar did go from here on over to  
15 the original dimensions which would take us outside  
16 of the picture. This pillar is being robbed, and you  
17 can see we have excavated some of the ore as we were  
18 driving through the pillar.

19 This pillar has been crushed from the weight  
20 above it, and you can see it's beginning to fail along  
21 these shearing lines. These things normally would  
22 assume the position of a sort of hour glass as the  
23 pillar is crushed from the weight of the rock coming  
24 down on it.

25 Q Showing you what has been identified as I.M.C. Exhibit

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1 Eight, I ask you to tell us what that picture  
2 demonstrates.

3 A This is the floor here, and it shows the forces at  
4 work that are being transmitted through the pillars  
5 into the floor area, causing the upheaval of the floor.

6 Q Is there anything further significant about that  
7 photograph?

8 A No, sir.

9 Q And picture number nine. Would you tell us what that  
10 shows?

11 A This picture illustrates the forces moving in what is  
12 referred to as convergence. A while ago, these timber  
13 posts that were located in the mine-- these were not  
14 there to support the back, they were there for some  
15 other reason, but as the back and the floor have  
16 converged, begin to converge, they have broken out  
17 these timbers.

18 Some mines, a lot of mines, use timber for roof  
19 support, and this picture only illustrates the fact  
20 that no amount of timber we could put in here, no  
21 reasonable amount, is going to support the weight of  
22 the overlying strata.

23 Q Going back to Exhibits Four and Five, on each exhibit,  
24 you have indicated the location of the proposed  
25 Phillips well, have you not?

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- 1 A Yes, sir.
- 2 Q And on Exhibit Four, you indicated an additional circle
- 3 having a 1,400 foot radius from the hole, which I
- 4 believe is also shown on Exhibit Five.
- 5 A Yes, sir.
- 6 Q You have two circles, but in each case, I assume, the
- 7 circles are equal in size.
- 8 A Yes.
- 9 Q You have indicated on Exhibit Four a 1,400 foot radius
- 10 to the outer circle, would you tell the Commission
- 11 the significance of that radius and why it is there?
- 12 A Yes, sir. That is the circle radiating from the
- 13 proposed location of the Phillips well. If we follow,
- 14 which we would have to do, the forty-five degree
- 15 subsidence angle, we would not be able to pull pillars
- 16 within that circle for fear of causing failure of
- 17 the well.
- 18 Q In other words, within that entire circle, your second
- 19 mining would be precluded?
- 20 A Yes, sir.
- 21 Q How is the 1,400 feet arrived at?
- 22 A The depth of the bed in this area is 1,400 feet
- 23 approximately.
- 24 Q And so within that area, you lose approximately forty
- 25 percent of your ore?

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- 1 A Yes, sir.
- 2 Q You heard the testimony earlier, did you not, Mr.
- 3 Childers, particularly in questioning, I believe, by
- 4 Mr. Morris, relating to suspended leases?
- 5 A Yes, sir.
- 6 Q Have you made an investigation into lease suspensions
- 7 in this immediate area?
- 8 A Yes, sir.
- 9 Q Did you prepare what has now been marked as Exhibit Ten?
- 10 A Yes, sir.
- 11 Q And was it prepared under your supervision?
- 12 A Yes, it was.
- 13 Q Where did you obtain the information relative to this
- 14 exhibit that was put on the exhibit?
- 15 A The information on Federal leases that have been
- 16 suspended was received from the U.S.G.S. office in
- 17 Artesia. The information on State leases suspended
- 18 was received from Mr. Ray Graham.
- 19 Q You have indicated those areas that have been suspended
- 20 by shading them in, is that correct?
- 21 A Yes, sir.
- 22 Q Are any of those shaded areas in the vicinity of
- 23 Section 13 and the other leases in connection with the
- 24 langbeinite body?
- 25 A Yes, sir.

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1 Q Would you indicate which those are?

2 A Unfortunately, this map does not have section numbers  
3 on it, but you can follow the road map. You can follow  
4 State Road 126, and as we follow that road along, we  
5 see the turn-off going north up to the Duval shaft,  
6 and there is a cross-hatched area around there.

7 The section right here is Section 3, and the one  
8 to the left of it is Section 4, and the one south of  
9 Section 4 is Section 9. These are all in Township 23,  
10 Range 30.

11 Q Is the Duval Mine not adjacent to the ore body in which  
12 Section 13 is located?

13 A Yes, it is.

14 Q Mr. Childers, can you tell us whether the products  
15 known as sylvite and langbeinite have the same physical  
16 characteristics insofar as support strength is concerned?

17 A You are talking about the mineral sylvite and the  
18 mineral langbeinite?

19 Q Yes, sir.

20 A Sylvite has greater strength, langbeinite is somewhat  
21 weaker and is much more brittle.

22 Q What activities, if any, are in progress at I.M.C.  
23 with relation to the production of langbeinite?

24 A Well, as you noted from Mr. Brown's projections, the  
25 langbeinite, or our product sulpha-mag, made from

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1 langbeinite, has very good growth potential.

2 At the present time, we are in the process of  
3 building a system which will enable us to handle more  
4 langbeinite, and the value of the capital invested in  
5 the project is \$800,000. It is due to be completed  
6 April 1st.

7 The present growth of this market indicates that  
8 three years from now, we will be at capacity again,  
9 and we will have to make another capital investment  
10 in order to process the amount of langbeinite that it  
11 is projected we are going to need.

12 Q You have heard testimony that we are now producing  
13 langbeinite. Do you have any-- does the company have  
14 any projected time schedule as to when they will be  
15 required to be mining this ore in order to meet market  
16 requirements?

17 A At this time, our plans are not definite as to the  
18 exact time that we will move into this area. This area  
19 is part of a package that contains nearly half of our  
20 total ore reserves, and we definitely plan to mine  
21 Section 13, which is the heart of this ore body.

22 We cannot say exactly at what date we will be  
23 mining, but our plans indicate that we will have to  
24 be in there before a fifteen-year period is up. We  
25 think we probably are going to be in there within

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- 1 ten years, and there is a good possibility that we  
2 will be there within five years.
- 3 Q There are two methods by which you can get into that  
4 area, are there not?
- 5 A Yes.
- 6 Q Would you explain that to the Commission?
- 7 A Yes, sir. We can develop from our present mine down  
8 toward these ore reserves and process the ore through  
9 our present mine and hoist the ore through our present  
10 shaft, or we could choose to sink a new shaft and have  
11 a separate mine just to handle the high grade  
12 langbeinite ore in this area.
- 13 Q Has the decision been made at this time as to the  
14 method which will be employed?
- 15 A No, it has not.
- 16 Q But you do consider this particular deposit to be  
17 really the life blood of your continued mining in the  
18 basin, do you not?
- 19 A Yes, sir.
- 20 Q Mr. Childers, has there ever been, to your knowledge,  
21 any experience with gas in the I.M.C. Mine?
- 22 A No, sir, there has not-- if by gas, you mean methane?
- 23 Q Yes, sir.
- 24 A No, sir.
- 25 Q Is I.M.C. equipped presently to work that mine, if it



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1 contained a methane gas?

2 A No, sir.

3 Q Would you tell the Commission what changes would be  
4 required if methane were discovered in your mine?

5 A Yes, sir. The basic difference between a mine that  
6 is classified a gaseous mine containing methane, as  
7 all of the coal mines are now considered in the United  
8 States, is in your equipment and in your ventilation  
9 requirements.

10 For example, all equipment must be what is  
11 considered by the Bureau of Mines to be permissible,  
12 permissible meaning that it is permissible to be used  
13 in a mine that has gas.

14 It is much more expensive and much more difficult  
15 to keep up. The reasoning is that you have to be  
16 able to have the utmost confidence in your equipment  
17 that you are not going to have a spark or a flare that  
18 might ignite the gas. So our equipment is non-  
19 permissible. When you buy equipment, you have to  
20 specify if you want it to be permissible. All our  
21 distribution equipment would have to be permissible,  
22 and our equipment is not. And your ventilation  
23 requirements are more rigid.

24 Q Are you saying then that as far as your mining equipment  
25 is concerned that you would have to completely

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1 re-equip?

2 A Yes, sir.

3 Q Do you have any notion of what this might cost?

4 A In preparation for that question, I asked our mining  
5 superintendent, who made the rough estimate of three  
6 to four million dollars, in trying to get the equipment  
7 that we have now brought up to some sort of standard.

8 Q You have previously testified based upon your various  
9 methods of identifying this ore body and the amount  
10 of ore present, have you prepared reserve calculations  
11 in that area, and also a calculation of the value of  
12 the ore that might be lost as a result of this well?

13 A I wonder if you would ask me that question again?

14 Q You made calculations of ore reserves, and also the  
15 amount that would be lost by the forty percent--

16 A In Section 13?

17 Q Yes.

18 A And the area influenced by the proposed location?

19 Q Yes.

20 A Yes, sir.

21 Q All right. Did you make the calculations contained in  
22 Exhibit Eleven that is now being distributed?

23 A They were made under my direction, yes.

24 Q Would you tell the Commission what you believe to be  
25 the significant data as a result of your calculations

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1 as they appear on that exhibit?

2 A If you refer back to our map showing the polygon  
3 method, you can see the various areas of the section,  
4 and of the circle around the proposed location.

5 These calculations take that part of each polygon  
6 which is included in the two areas. For example, when  
7 you look at Section 13, you will see the area around  
8 number 369 having an area of 8,580,000 square feet,  
9 with a bed thickness of 11.8 percent, with K2O as  
10 langbeinite at 9.0 percent.

11 The sylvite is 4.8 percent K2O. The tons of ore  
12 in the polygon would be 7,499,550 with product tons  
13 of 3,089,000 of langbeinite, with product tons of  
14 sylvite 600,000.

15 Now, this is done for each segment of the polygon  
16 in Section 13, and the totals are listed. The same  
17 things were done for the area in the 1,400 foot radius  
18 circle around the proposed location.

19 Q You heard the testimony of Dr. Brown this morning,  
20 did you not?

21 A Yes, sir.

22 Q Relative to market prices on langbeinite?

23 A Yes, sir.

24 Q And did you, independent of that information, calculate  
25 the value as to the loss of ore in the 1,400 foot

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1 radius area if you don't have second mining?

2 A Yes, I have the calculations where we used an average  
3 figure, which is not included in the polygon method.  
4 If you prefer to discuss that, we can, or if you would  
5 like to use the information which is calculated using  
6 the polygon method, we can use that.

7 Q I would like for you to give us your calculations.

8 A This calculation was made some time ago, and we just  
9 rounded off the area and said we will use a bed thickness  
10 of eight feet and percent K20 of 9.4--

11 Q Just a moment. Let's identify this as Exhibit Twelve.  
12 Now, you have the tonnage and the calculation as to  
13 the value of the tonnage here. Would you explain to  
14 the Commission how you calculated the value of lost  
15 tonnage?

16 A Yes, sir.

17 Q The second heading says "one hundred fifty foot radius  
18 circle". This is the circle which would have to be  
19 left around the hole, around the well, without any  
20 mining.

21 So this calculates the tonnage of ore that would  
22 be in that circle.

23 The next section shows the 1,400 foot radius  
24 circle, and it shows the area and volume, assuming  
25 the eight-foot thick bed, and then the tons of ore.

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1 The tons that would be lost, since we are going to  
2 use forty percent of the large circle, that forty  
3 percent of the small circle will be included in that,  
4 and then we would also lose fifty percent of the small  
5 circle, for a total of ninety percent of the small circle.

6 We consider ninety percent the amount we can  
7 recover, ten percent is a loss at any rate. So within  
8 that circle, we will lose an additional fifty percent.

9 In the large radius circle, we are going to lose  
10 forty percent. We multiply that by a factor of .85,  
11 taking into consideration that recovery is not one  
12 hundred percent. We figure the ore grade over the  
13 product grade, and in this case, we use 9.4, and the  
14 product grade is 22.0.

15 Carrying that out, we are going to lose 537,694  
16 tons, and for this calculation, the average figure  
17 of \$18.50 per ton was used, and total amount would be  
18 \$9,947,339.

19 Q Mr. Childers, have you ever had an explosion, other  
20 than dynamiting, in your mine?

21 A No, sir.

22 Q And in spite of whatever new equipment that you might  
23 acquire, it is fairly common knowledge among miners  
24 that the presence of methane does create the hazard  
25 of explosion, does it not?

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1 A Yes, sir.

2 MR. MATKINS: I think that's all I have for now.

3 MR. PORTER: You may cross examine, Mr. Kellahin.

4 \* \* \* \*

5 CROSS EXAMINATION

6 BY MR. KELLAHIN:

7 Q Mr. Childers, on your Exhibit Number Four, the polygon  
8 method of computing reserves, actually the only  
9 information you are using on that is information from  
10 the various cores shown on the exhibit, is that correct?

11 A Pardon me?

12 Q The only information you have to prepare that exhibit  
13 is from the cores, isn't that correct?

14 A Yes, sir.

15 Q You have no other information-- how many cores did  
16 you have?

17 A Would you like for me to count them?

18 Q If you need to.

19 A In the entire map, Mr. Kellahin, or just in Section 13?

20 Q How many in Section 13?

21 A One hole.

22 Q And how many on the entire map?

23 A Nine.

24 Q That's the same number of core holes that you had  
25 available to you when you testified before the

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1 Commission or one of its examiners on July 23rd, 1969,  
2 isn't it?

3 A Yes, sir.

4 Q And you prepared an Exhibit Number Seven, which listed  
5 all those core holes, is that correct? Do you recall  
6 that exhibit?

7 A Yes, sir.

8 Q Have you assigned the same values to those core holes  
9 today that you assigned to them when you testified in  
10 1969?

11 A I would have to check. I think there was one hole,  
12 371, that we used a different value. Without having  
13 that exhibit in front of me, there is no way I can check  
14 it.

15 Q Here it is.

16 A With the exception of two holes, they are all the same.

17 Q What two holes are they?

18 A Hole number 369, which is in the middle of the section  
19 on the west side of Section 18 on this exhibit that you  
20 have from 1969, we show 11.3 feet, and the langbeinite  
21 grade was 9.2 on this exhibit that we have presented  
22 today. Bed thickness is 11.8, and the langbeinite is  
23 9.0 for hole number 371. This exhibit showed a  
24 thickness of 4.3, with 7.7 of langbeinite, and a sylvite  
25 grade of 2.1. We have shown on the exhibit presented

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- 1 today 7.3 of 6.3 percent langbeinite and 5.4 percent
- 2 as sylvite. The other holes that we have used are the
- 3 same.
- 4 Q So on the 371 core, you have increased the thickness
- 5 and increased both the langbeinite and sylvite percentages?
- 6 A No, sir.
- 7 Q Am I wrong?
- 8 A Yes, sir.
- 9 Q What did you do to it, then? I must have misunderstood
- 10 you.
- 11 A We increased the bed thickness and decreased the
- 12 percentage of langbeinite and increased the percentage
- 13 of sylvite.
- 14 Q Thank you. Now, you had one other core on there on
- 15 which you gave information, the D-5-A core. But on your
- 16 Exhibit Number Four, you did not use that figure.
- 17 A Yes, sir, there is a little circle on the map which
- 18 would indicate the location of that hole, but it was
- 19 not used in making these calculations.
- 20 Q But in your exhibit presented in 1969, you showed an
- 21 8.4 foot thickness-- I'm sorry, 5.9 foot thickness,
- 22 with twelve percent sylvite and 2.9 percent langbeinite.
- 23 Would you agree to that?
- 24 A Yes, sir.
- 25 Q Had those figures been used, it would have materially



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1 changed the figures given in your polygon, would it not?

2 A It would have changed the figure, yes.

3 Q Now, in connection with that same well, did you not

4 testify in response to a question in the 1969 hearing

5 that there could be considerable variation across

6 Section 13?

7 A What was the question?

8 Q Did you not testify that there could be considerable

9 variation in ore content across Section 13?

10 A I don't know for sure. Have you got a transcript?

11 Q Yes, sir, I do. Reading from page 48 of the transcript

12 in Case Number 4175, heard on July 23rd, 1969, do you

13 recall that you were asked this question: "There could

14 be quite a bit of variation across that area, could

15 there not?" Answer: "Across this area?" Question:

16 "The area you propose to include in the potash zone.

17 For example, I call your attention to the cores drilled,

18 I don't have the number of the cores, but the ones

19 in Section 11 and Section 13." You had two cores, as

20 I understand your testimony, your number 370 and your

21 D-5-A, one of which, according to your testimony, would

22 be commercial, and one which would not. Answer: "This

23 is partially correct and partially incorrect. There

24 are two holes, but they are both commercial." Was

25 that your testimony then?

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1 A Part of it.

2 Q I don't want to read all of it. You used the same  
3 figures, of course, in making your reserve calculations  
4 in this area, did you not, just the information from  
5 the core holes, both on your polygon computations and  
6 on your contour method computations?

7 A Was the question I used the same information, or did  
8 I use the same core holes?

9 Q You used the information from the cores?

10 A Yes, sir.

11 Q You had no other information available to you, did you?

12 A No, sir.

13 Q You had not taken any cores since 1969?

14 A No, sir.

15 Q Now, is it common practice, Mr. Childers, before you  
16 mine, to drill core samples on a much more dense basis  
17 than you have done here?

18 A Would you give me a definition for "common", sir?

19 Q Let's word it this way: Would your company be willing  
20 to go in and dig a shaft or extend their existing  
21 shaft to this area in Section 13 on the basis of two  
22 cores?

23 A Is the question would we be willing to do it on the  
24 basis of two cores, or would we be willing to do it  
25 on the basis of the information we have?

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- 1 Q Well, let's put it both ways. You say you have two  
2 cores in Section 13-- you have one core in Section 13.
- 3 A We have one, yes.
- 4 Q You are not using the other one?
- 5 A We have one core inside Section 13, and we have two  
6 cores right adjacent to Section 13.
- 7 Q Would you mine on the basis of that information?
- 8 A If we had no other information except that?
- 9 Q Yes, sir.
- 10 A I would say we would want another hole or two.
- 11 Q On the basis of the eight core holes, still disregarding  
12 the one core hole which you seem to just want to  
13 disregard, would you mine or dig a shaft or extend your  
14 existing shaft on the basis of that information?
- 15 A Yes, sir.
- 16 Q You would?
- 17 A Yes.
- 18 Q On your Exhibit Number Five, I don't quite understand  
19 your cut-off. Are you using the U.S.G.S. cut-off?
- 20 A The four feet times four percent K20, the product of  
21 those numbers being sixteen. The sixteen line is shown  
22 on there, and you can get whatever information you  
23 would like from it.
- 24 Q Actually, the thickness of the ore body has a great  
25 deal to do with it, regardless of value, does it not?

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- 1 Would you mine one foot if it were a high enough value?
- 2 A You mean if it were twenty-two percent?
- 3 Q Yes, would you mine one foot of it?
- 4 A Yes, we probably would take a lot of overbreak, but we
- 5 would take it.
- 6 Q But in general, wouldn't you say that the actual thickness
- 7 of the ore is a governing factor in the value of the ore?
- 8 A Yes, sir.
- 9 Q Now, getting to this ore value which you have given on
- 10 this 1,400 foot radius. Do you recall giving testimony
- 11 in the 1969 hearing of Case 4175 that the ore value
- 12 in the 6,800 acres you proposed be included under Order
- 13 R-111-A was \$250,000,000?
- 14 A I remember that figure.
- 15 Q Do you agree with it now?
- 16 A I agree that it was used, I'm not sure it was used in
- 17 exactly the way you are saying.
- 18 Q If you have a different version, I would be interested
- 19 in hearing it.
- 20 A There was a value, I don't remember exactly what was
- 21 said leading up to that, but I do remember a figure.
- 22 Q You will agree that you had no different information
- 23 then than you have now?
- 24 A Yes.
- 25 Q And would you agree if that was your testimony which

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- 1 is set out in page thirty-two of the transcript that  
2 \$250,000,000 would figure out to \$37,700 per acre. If  
3 that was a correct calculation, would you accept it?  
4 A If it's correct, I will accept it.  
5 Q On that basis, then, what figures have you used to  
6 determine you are going to lose \$9,000,000?  
7 A Whatever the exhibit was that was marked, those  
8 calculations.  
9 Q How many acres gross are you going to leave around that  
10 well if it is drilled?  
11 A Forty percent of the acres that are involved in the  
12 1,400 foot radius.  
13 Q And you are using an eight-foot ore thickness, is that  
14 right?  
15 A Are you talking about acres?  
16 Q Acre feet.  
17 A You have to multiply that by eight.  
18 Q I understood you to testify a moment ago that you are  
19 in the process of building a system at a cost of  
20 \$800,000, the purpose of which is to enable you to  
21 process both langbeinite and sylvite.  
22 A No, sir.  
23 Q What did you say then?  
24 A It's a system that will handle only langbeinite ore,  
25 the sylvite values would be lost.

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- 1 Q So if you are utilizing this system and you are  
2 mining in the area, wouldn't you lose all of the value  
3 of the sylvite ore?
- 4 A Yes, sir.
- 5 Q So on your gross figure on this \$9,000,000, were you  
6 calculating both langbeinite and sylvite?
- 7 A No, sir.
- 8 Q You are just talking about langbeinite?
- 9 A Yes.
- 10 Q No sylvite values whatever?
- 11 A No, sir.
- 12 Q Didn't you not testify in 1969 that you had a new  
13 system that would enable you to refine both products  
14 at the same time without losing either?
- 15 A Yes, sir.
- 16 Q But you are not utilizing that system?
- 17 A Yes.
- 18 Q But you don't propose to use it here?
- 19 A I don't think that can be answered with a yes or no,  
20 Mr. Kellahin.
- 21 Q Are your present plans to use it if you mine Section 13?
- 22 A The Lang-leach process is in addition to the plant we  
23 already have. Any high grade langbeinite ore, if there  
24 is a low sylvite value, would be put through the  
25 Lang-leach system.

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- 1 Q What do you call low sylvite value?
- 2 A Zero point one, 0.2.
- 3 Q If you have 4.4 feet with 4.8 percent sylvite, as was
- 4 shown in your core in number 384, would that be a low
- 5 sylvite value?
- 6 A "Low" is a difficult term.
- 7 Q It's not as low as what you said was low a moment ago.
- 8 A It's not as low as 0.1, no.
- 9 Q Would you call 5.9 feet at 12 percent sylvite low?
- 10 A No, sir.
- 11 Q But you are going to lose the sylvite under your
- 12 present plans?
- 13 A I beg your pardon, sir?
- 14 Q You are going to lose the sylvite out of this area if
- 15 you follow your present plans?
- 16 A I don't believe I testified that all of this ore is
- 17 going through the Lang-leach system. I merely testified
- 18 that we were adding the Lang-leach system.
- 19 Q I am asking you to testify as to what your plans are,
- 20 if you know.
- 21 A With the Lang-leach project, we have that much more
- 22 flexibility. Any ore coming from the mine that is
- 23 high langbeinite and low sylvite will be handled
- 24 through the Lang-leach process, any ore that is mixed
- 25 ore, that has a value of both sylvite and langbeinite

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1 will go through the present plant, and we will attempt  
2 to recover both values.

3 Q Now, in connection with your Exhibit Number Ten, which  
4 purports to show the leases that have been suspended,  
5 and I assume they have been, those leases are actually  
6 in close proximity or directly over existing mining  
7 operations, are they not?

8 A No, sir.

9 Q They are not?

10 A Not all of them.

11 Q Let's take the area closest to Section 13, which would  
12 be the Duval shaft as shown right in the middle there.  
13 That is their mine there, is it not?

14 A To my knowledge, yes.

15 Q Are you mining in the area south of that where the  
16 lease has been suspended?

17 A That's our lease.

18 Q Are you mining in there?

19 A No, sir, no one is mining under that.

20 Q But they are within a half a mile of the Duval Mine,  
21 or a mile?

22 A I don't know where the Duval Mine is located.

23 Q But you will agree that they are immediately north of  
24 that acreage?

25 A They are north of that acreage, yes.



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1 Q Now, in connection with this time schedule you  
2 discussed, you say your plans are not definite, but  
3 you are talking about probably fifteen years, is that  
4 right?

5 A I think I used probably in terms of ten years, and for  
6 sure, within fifteen years.

7 Q Certainly within fifteen years, probably within ten  
8 years; and how about five years?

9 A Possibly, I think we used possibly.

10 Q You have filed no five-year plan which would include  
11 this, have you?

12 A Yes, sir.

13 Q You have filed one?

14 A Yes, sir.

15 Q What does it say?

16 A To the effect-- can I say what it says to the effect?

17 Q Yes.

18 A I'm not sure I am quoting, but it says to the effect  
19 that we will be doing developing work from our present  
20 working ore well by mining within Section 13.

21 MR. KELLAHIN: I ask the Commission to take notice  
22 of the five-year plan filed by International Mining and  
23 Chemical.

24 MR. PORTER: We will take notice.

25 MR. KELLAHIN: In that connection, the map filed

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1 does not even show Section 13.

2 Q (By Mr. Kellahin) When you testified in 1969, I believe  
3 this same question came up, and do you recall testifying,  
4 and this is on page 47 of the transcript. You were  
5 asked that if you are mining in routine fashion, how  
6 long would it take you to get to Section 13, and you  
7 answered: "Well, let's say maybe up to three years."  
8 Do you recall saying that?

9 A If I can go back, I don't think we were talking about  
10 Section 13 at that time. You added Section 13, but  
11 I don't believe we were talking about Section 13.

12 Q The record will speak for itself.

13 MR. MATKINS: I will stipulate that Section 13  
14 was in the area, but what was brought into R-111-A at that  
15 time was five or six miles from Section 13.

16 Q (By Mr. Kellahin) In any event, do you recall saying  
17 three years?

18 A I recall it, yes.

19 Q Are you in the area at this time?

20 A No, sir.

21 Q So four years later, you are still not there?

22 A No, sir.

23 Q Is that any indication of the accuracy of your information  
24 in the case here today?

25 A I don't believe I was saying-- I think if you read

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1 the rest of the transcript, you would see that we  
2 had no plans at that time either.

3 MR. KELLAHIN: If the Commission please, I think  
4 page 47 of the transcript will speak for itself.

5 MR. MATKINS: I believe the Commission should take  
6 administrative notice of the entire transcript in Case 4175,  
7 and make it part of the record, and the order entered in  
8 the case as well.

9 MR. KELLAHIN: We will agree to that.

10 MR. PORTER: The Commission will take administrative  
11 notice of Case 4175.

12 Q (By Mr. Kellahin) On this subsidence, if Phillips were  
13 permitted to drill its well in there, is it still your  
14 testimony that you are going to lose the 300-foot  
15 pillar plus forty percent of what is left in that  
16 1,400 square foot radius?

17 A If the well is drilled?

18 Q Yes, and produced to abandonment before you get there.

19 A Yes, sir.

20 Q You still will leave those pillars in the 1,400 foot  
21 radius, is that right?

22 A Yes, sir.

23 Q Have you mined around oil wells or well shafts before?

24 A Personally?

25 Q Yes, your company, under your supervision.

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- 1 A No, sir.
- 2 Q So you have had no experience at all with this, have you?
- 3 A No, sir.
- 4 Q Well, let's assume on the other hand that Phillips
- 5 Petroleum Company had its lease suspended, and comes
- 6 back some time later. How much later would it be before
- 7 they could come in and drill after you finished mining?
- 8 A I don't know, sir.
- 9 Q You can't give us even an estimate?
- 10 A No, I'm not a petroleum engineer.
- 11 Q I am not talking about petroleum, I am talking about
- 12 your mining operations. When would they be completed
- 13 in such a fashion that Phillips could then move in and
- 14 drill?
- 15 A I'm sorry, but I can't answer that.
- 16 Q You don't know how long it is going to take you to
- 17 mine it then, is this your testimony?
- 18 A Not without more qualifications.
- 19 Q Now, Order R-111-A, you are familiar with it, are you not?
- 20 A Yes, sir.
- 21 Q It makes a provision that oil and gas wells must be
- 22 plugged in a specific manner in order to protect the
- 23 potash. Is there any such provision in there requiring
- 24 the potash miners to protect the oil reservoir or
- 25 permit it to be produced?

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- 1 A Not to my knowledge.
- 2 Q There is not, is there?
- 3 A Not to my knowledge.
- 4 Q Under those circumstances, would I.M.C. be willing to
- 5 guarantee Phillips that it will encounter no problem
- 6 on account of your operations if it came in after you?
- 7 A I am not qualified to answer that question either, Mr.
- 8 Kellahin.
- 9 Q How long does the subsidence continue after you pull
- 10 out of an area?
- 11 A That's an answer that needs some qualification also.
- 12 Do you mean after you pull the pillars?
- 13 Q Yes. Mr. Childers, you are a mining engineer, and
- 14 let's assume you have mined an area, and have done
- 15 everything you wanted to do, and you are getting out.
- 16 How long before all the problems in the strata stop?
- 17 A I can't testify from actual knowledge as to when
- 18 subsidence stops. Within a few months, you have six
- 19 to eight-tenths of your subsidence, and I have no
- 20 records that I have kept personally that showed how
- 21 many years movement continued, so I can't give you a
- 22 much better answer than that.
- 23 Q So this business of saying that Phillips could get
- 24 their lease suspended doesn't really mean anything,
- 25 does it? You don't know when they could go in there,

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- 1 and you don't know when you are going to get out, and  
2 after you do get out, you don't know how long it will  
3 take the ground to settle down before it can be drilled.
- 4 A All I know is they can have their lease suspended, and  
5 a potash company cannot.
- 6 Q You heard testimony this morning that Phillips can  
7 produce this gas in five years, and you are talking  
8 about coming in in fifteen years. Certainly you are  
9 not prohibited from mining the area as Phillips is  
10 prohibited from drilling it, are you?
- 11 A Mining around a gas well?
- 12 Q Yes, sir.
- 13 A The area not influenced by the hole, we can mine, yes.
- 14 Q On your exhibits, you show a core to the south of  
15 Section 13, number 386. That area is actually barren,  
16 as far as commercial ore is concerned, is it not?
- 17 A It is 8.7 feet thick and has a value of 0.2 percent  
18 as langbeinite and 0.1 percent as sylvite.
- 19 Q You wouldn't call that commercial ore then, would you?
- 20 A No, sir.
- 21 Q Now, on this \$9,000,000, you said that you will lose.  
22 If you will agree that you did testify that the entire  
23 area, some 6,800 acres included in R-111-A, had an ore  
24 value of \$250,000,000, that would figure out to be  
25 \$37,700 per acre. How many acres are you going to

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1 leave in this 1,400 square foot area, can you tell me?  
2 A If someone can divide 6,157,536 square feet in the  
3 circle by 43,580--

4 MR. WILLIAMSON: One hundred forty-one point  
5 thirty-six.

6 A Assuming the calculator is right--

7 Q Can you multiply that then by \$37,700-- \$36,700, I'm  
8 sorry.

9 MR. MATKINS: I think we need to object at this  
10 time because the questioning is based on false assumptions.  
11 The figure used by Mr. Kellahin is a figure for the entire  
12 body, and there are varying values within that large body  
13 of acreage. We are now restricting ourselves to values  
14 placed on one portion of one section, which does contain  
15 one of the hottest holes in the entire section, and I am  
16 certain that any calculations that Mr. Childers made in  
17 1969 were based on averaging across the entire section.  
18 There is not a hotter hole in the acreage than in Section 13,  
19 so you can't expect this to average out to the average you  
20 are going to have across your entire leasehold area.

21 MR. KELLAHIN: If the Commission please, Mr. Matkins  
22 objection assumes that the whole area is not of equal value,  
23 with which we agree. On the other hand, the witness has  
24 attempted to give a value to Section 13 based on one core  
25 hole. Sure, there is one in the offsetting section, but he

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1 has one in the south that has no value at all down in  
2 Section 24, which has not been taken into consideration.  
3 He has another core hole, D-5-A, which he has ignored  
4 completely, and it shows 5.9 percent of sylvite and 2.9  
5 percent of langbeinite, and that has been ignored.

6 So I think it's perfectly proper to take his own  
7 figures.

8 MR. PORTER: The Commission would like to know  
9 if the witness can give us an answer.

10 THE WITNESS: Yes, to the best of my ability.  
11 Any figures that were given in the hearing Mr. Kellahin is  
12 referring to were based on the entire area we were trying  
13 to bring into R-111-A at that time.

14 MR. PORTER: Do you recall how much that was at  
15 that time, or approximately? Did it consist of a number  
16 of sections or townships or a considerably larger area than  
17 you are talking about in Section 13?

18 THE WITNESS: Yes, sir. The information we are  
19 talking about today is based not on what Mr. Kellahin would  
20 suggest, one hole, but on the polygon method, which gives  
21 an area of influence to each hole.

22 I believe there were four holes that influenced  
23 the area, and that was the method used, as Mr. Matkins has  
24 pointed out. As I stated before, Section 13 is the heart  
25 of this ore body and has the highest grade ore running



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1 through it, and it's going to be of a much greater value  
2 than the average for the entire area.

3 Q (By Mr. Kellahin) In response to that, Mr. Childers,  
4 the D-5-A core is the closest one to the proposed  
5 Phillips well, is it not?

6 A It's a toss-up, I haven't measured them.

7 Q Well, it's just as close as any other core you have,  
8 is it not?

9 A It's just as close, yes.

10 Q But you have seen fit to ignore it because the figures  
11 do not jive with the rest of the cores, isn't that  
12 correct?

13 A No, it is not correct.

14 Q Why did you ignore it?

15 A Because the information from that hole-- D-5-A stands  
16 for the Duval 5-hole. This hole was drilled in the  
17 area and was cored long before Duval ever got into the  
18 potash business. The information we have on that hole  
19 from Duval and from the U.S.G.S. and from the file I  
20 used to compile the data showed the values for all the  
21 holes in that area. We had values for D-5-A from the  
22 U.S.G.S. of 10.1 feet of 15.5 percent K2O, which I  
23 would be more than happy to make a polygon for, but  
24 the information is not valid because we got information  
25 from two or three different places, and we have two

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1 or three different values. It is not our hole, and  
2 the hole information is not good, so it was left out.

3 Q Was the same method of core analysis used on that core  
4 as was used on all the other cores?

5 A I can't answer that.

6 Q Did you inquire into it and try to find out?

7 A Yes, sir.

8 Q But you didn't see fit to drill another hole when you  
9 saw this was invalid?

10 A We had our drill spacing, you will notice our drill  
11 spacing is the same all over, so we just ignored that  
12 hole from the beginning.

13 Q You didn't ignore it when you asked this area be brought  
14 into the potash area, did you?

15 A I listed the information we had.

16 Q But you didn't list it today?

17 A Because it's not valid.

18 MR. KELLAHIN: That's all I have.

19 MR. PORTER: Does anyone else have any questions?

20 MR. TRAYWICK: Yes.

21 \* \* \* \*

22 CROSS EXAMINATION

23 BY MR. TRAYWICK:

24 Q Mr. Childers, I am Carl Traywick from the U.S.G.S. in  
25 Roswell. We are somewhat involved here because this

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1 is a Federal lease, and without the benefit of your  
2 exhibits, there are things I didn't understand, which  
3 may be pretty obvious, but I need to know, because  
4 there is a question involved.

5 You are going to get to Section 13 either by  
6 drilling a shaft or by drilling down from your present  
7 mine?

8 A Yes.

9 Q Do you own all the potash leases between where you are  
10 mining now and Section 13?

11 A Yes.

12 Q Are there some unleased areas?

13 A No, they are continuous.

14 Q So you have the leases which will allow you to get to  
15 Section 13?

16 A Yes.

17 Q When you are first mining, about what size pillars do  
18 you use-- what size pillars do you leave?

19 A (No response)

20 Q What I am trying to say is how do your pillars compare  
21 in size to the pillar you are going to leave around  
22 this well, if there is in fact a well drilled there,  
23 and if there is in fact langbeinite there?

24 A Mr. Traywick, as you know, you have to have a mining  
25 plan laid out, and we do not.

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1 Q I am not a mining engineer.

2 A Yes, you have to have a mining plan made out. What  
3 we are saying is that the pillars that we leave would  
4 consist of fifty percent of the bed, and what we would  
5 mine would be fifty percent of the bed.

6 There are any number of configurations that you  
7 could have for your pillars. The dimension of the  
8 pillars depend on many things, but it would be fifty  
9 percent of the area.

10 Q Now, you computed this \$9,000,000 loss, and I don't  
11 know where the economic limit is. May I ask, in your  
12 present mining operation, if your economic limit  
13 agrees pretty well with the U.S.G.S. limit of four feet  
14 at four percent langbeinite or four feet at eight  
15 percent sylvite?

16 A Could you ask the question again?

17 Q I will rephrase it, if it will be clearer.

18 A Okay, would you please?

19 Q In your mining operations, do you conduct first mining  
20 to a cut-off point, a point where economics versus  
21 recovery, preclude you from going into any leaner ore,  
22 and then do you retreat back? Do you conduct second  
23 mining on a retreat method?

24 A We have. We are not at this present time, in any of  
25 our panels, working on the retreat method, but we have

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1 in the past.

2 Q Second mining then does not have to be retreating back  
3 from the economic limits?

4 A No, you could mine to the lease line.

5 Q This \$9,000,000 worth of ore is based on the 1,400  
6 foot radius figure, and the second mining pillar radius  
7 of 150 feet. I don't know where your economic limits  
8 are shown on your exhibits, but they obviously occur  
9 to the south of the proposed Phillips location, is that  
10 right?

11 A Yes.

12 Q And obviously, it's not far enough south that that  
13 circle would be appropriate. Wouldn't it be more like  
14 a half-circle or three-quarters of a circle? You are  
15 not going past the economic limits or the ore cut-off,  
16 are you?

17 A You are assuming that the line does not go south of  
18 the 1,400 foot circle?

19 Q Yes.

20 A I can only answer you by saying that if you are right,  
21 and it didn't, then we wouldn't mine it.

22 Q I just wondered, not having the benefit of the exhibits,  
23 if it's appropriate to use a full circle.

24 A I think I can answer your question in the polygon  
25 method. Part of that circle was given the influence

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1 of a hole that had very little in it, and no value  
2 was given for that part of the polygon.

3 Q One more quick question. If the well is there when  
4 you conduct first mining, and it was a producing gas  
5 well, but it's properly plugged and abandoned before  
6 you are in this area second mining, will your loss be  
7 decreased from the \$9,000,000?

8 A I would have to say no, right now. As long as there  
9 is the danger of our getting gas into the mine by  
10 rupturing that casing, it would be the same.

11 Q What you are saying is that whether it's a high pressure  
12 producing well, or whether it is a properly plugged  
13 dryhole, you are not going to approach any closer on  
14 second mining than 1,400 feet?

15 A I don't feel right now that I am in a position to speak  
16 for my company on that.

17 MR. TRAYNICK: That's all I have.

18 MR. PORTER: Mr. Childers, I have a question that  
19 you might give me your opinion on. Do you think you could  
20 ever safely drill a gas well to an area that had been mined  
21 out?

22 THE WITNESS: I feel that my opinion would not be  
23 very valid because I don't really know. I think there are  
24 people here that can answer that question for you.

25 MR. PORTER: All right, another question. Could

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1 you give me the extent of your mining operations in the  
2 last five years?

3 THE WITNESS: Do you mean right now, or could I  
4 prepare the information for you?

5 MR. PORTER: Well, does anyone here feel they are  
6 able to answer that question as to how much you have mined  
7 out in the last five years?

8 THE WITNESS: I can give it to you in tonnage  
9 roughly. Roughly, twenty million tons. We don't keep our  
10 records that way, sir, and I can only compute it from  
11 information I have in the office.

12 \* \* \* \*

13 CROSS EXAMINATION

14 BY MR. NUTTER:

15 Q You have revised your open mining operations on plats  
16 submitted to the Commission each year to show your  
17 open mining at the end of each year, is that correct?

18 A Yes.

19 Q So a comparison of the map five years ago with the map  
20 recently submitted would show where you have mined in  
21 the last five years?

22 A Yes.

23 MR. PORTER: Does anyone else have any questions  
24 of this witness?

25 (No response)

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1 MR. PORTER: I believe you haven't offered your  
2 exhibits.

3 MR. MATKINS: No, sir. I would like to offer  
4 Exhibits Three through Twelve.

5 MR. PORTER: There was some question as to one of  
6 them.

7 MR. KELLAHIN: If the Commission please, in  
8 connection with Exhibit Three, which shows the potash  
9 company's leases and the Phillips Petroleum Company leases,  
10 there have been several areas omitted that should be on  
11 there.

12 MR. PORTER: Is this the exhibit you are talking  
13 about (indicating)?

14 MR. KELLAHIN: Yes. In addition to those shown,  
15 Phillips holds all of Section 24, all of Section 25, all of  
16 Section 19, except for the north half of the northeast.

17 MR. PORTER: All of Sections 24 and 25?

18 MR. KELLAHIN: Yes, sir. All except for the north  
19 half of the northeast of Section 19, which Phillips holds  
20 jointly with El Paso Natural Gas. All of Section 30, which  
21 is also jointly owned with El Paso. The West half of  
22 Section 29 is jointly owned with El Paso, and all of Section  
23 31.

24 MR. PORTER: The Commission will accept Exhibits  
25 Three through Twelve with the corrections noted by Mr.



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1 Kellahin.

2 MR. KELLAHIN: If the Commission please, I do  
3 think the witness did not answer a question posed by Mr.  
4 Traywick. Mr. Traywick asked if he used the same cut-off  
5 as the U.S.G.S., 4.4 percent langbeinite, and I don't believe  
6 I heard an answer.

7 THE WITNESS: Do we use the same cut-off as they do?

8 MR. KELLAHIN: Yes, sir.

9 THE WITNESS: What do you mean by cut-off?

10 MR. KELLAHIN: I mean just what Mr. Traywick meant,  
11 what is commercial ore and what is not. Do you use the same  
12 figure as the U.S.G.S.?

13 THE WITNESS: Yes, sir.

14 MR. KELLAHIN: Thank you.

15 MR. PORTER: If there are no further questions,  
16 the witness may be excused.

17 (Witness excused.)

18 (Whereupon I.M.C. Exhibits Three through Twelve  
19 were admitted into evidence.)

20  
21 JOHN BOYD,

22 was called as a witness, and having been already duly sworn,  
23 testified as follows:

24 DIRECT EXAMINATION

25 BY MR. MATKINS:

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1 Q Mr. Boyd, please state your full name and where you  
2 reside.

3 A John T. Boyd. Pittsburgh, Pennsylvania.

4 Q What is your occupation?

5 A I am a Consulting Mining Engineer.

6 Q Do you have your own consulting company, of which you  
7 are President?

8 A Yes.

9 Q That is John T. Boyd Company in Pittsburgh?

10 A Yes, sir.

11 Q Have you appeared before this Commission previously?

12 A No, sir.

13 Q Would you please then give your background as a mining  
14 engineer and your experience over the years as a mining  
15 engineer?

16 A Yes, sir. In 1935, I graduated with a B.S. degree in  
17 mining from Ohio State University. I then spent nine  
18 months in Canada in gold mining in Southwestern Quebec.  
19 From there, I went to Pittsburgh, and went to work  
20 with the Pittsburgh Coal Company for three years. I  
21 then moved on to Ohio and worked for Anaco Company of  
22 Ohio for three years.

23 In 1943, I joined the firm of J. W. Womer and  
24 Associates, and from 1943 to 1964, I worked as Senior  
25 Associate. At that time, I took over the company and

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1 it became John T. Boyd and Associates. In 1967, Mr.  
2 Womer retired, and in 1968, I made it John T. Boyd  
3 Company.

4 Today I have twelve engineers and five draftsmen,  
5 a group of about twenty-five people altogether working  
6 for me.

7 Q What types of ore bodies, and what parts of the world  
8 do you have experience in mining, Mr. Boyd?

9 A Well, I worked in most all of the states of the United  
10 States; I worked in Australia in coal; Canada and Chile  
11 in coal and iron ore and limestone; France in iron ore;  
12 Greece in iron; Israel in copper; Mexico in coal and  
13 iron ore; the Philippines in coal; and the United  
14 Kingdom in coal; and Ethiopia in potash.

15 Q Now, you have had experience with potash, I believe you  
16 mentioned Ethiopia?

17 A Right. I have also had experience in potash here in  
18 the Carlsbad area of New Mexico. I have worked with  
19 Southwest potash operations since the beginning. I  
20 have worked for Freeport Sulphur Reserves in both Eddy  
21 and Lea Counties.

22 Q Do you also have experience in Canada in potash?

23 A Yes, in Canada in potash work there. I worked  
24 feasibility studies for Continental Minerals, evaluations  
25 for I.M.C. reserves, and the Consolidated Mining

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1 Company of Canada. I made feasibility studies for  
2 them, as well as for Canberry Reserves of Saskatchewan.

3 Q In these feasibility studies, would they include such  
4 activities as defining ore bodies and determining the  
5 proper mining processes to be employed?

6 A Underground mining methods. yes, sir.

7 Q Mr. Boyd, are the polygon and contour methods two  
8 accepted methods of defining ore bodies in the mining  
9 industry?

10 A Yes, sir.

11 Q Specifically, when was your experience with Southwest  
12 potash in Eddy County, New Mexico? What years were  
13 you there?

14 A Well, I have been in and out of the operations since  
15 they started with core drilling and the work with the  
16 mining plans, shaft locations, all the way through,  
17 and we still work on an assignment basis for them.

18 Q Were you called in early in the development of that  
19 particular ore body to assist in developing a pillar  
20 mining plan?

21 A Yes, sir, and I was project engineer on developing the  
22 pillar mining method in conjunction with W. R. Herbert  
23 of their engineering department. I did much research  
24 before the project was really started, because when  
25 you go into pillar mining, you have to take two things

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1 into consideration.

2 You have to know the strength of your ore, and  
3 how much you can mine on your first mining, because  
4 if you are going to pull pillars, you have got to  
5 keep your mine stability before you start retreating  
6 with your pillar work.

7 The second thing is in pulling pillars in the  
8 Carlsbad area, there has to be four to five hundred  
9 feet of salt let down subsequently so it would bend  
10 and flow and eventually hit the floor. By doing that,  
11 the size of the pillars had to be determined.

12 The experimental work started way back in 1936  
13 or 1937 when the Bureau of Mines worked with United  
14 States Potash in Carlsbad, and they did a lot in  
15 compressive strength, both of potash and also the roof  
16 salt, roof material, which sort of gave the guidelines  
17 of just how to go about it, because in your first  
18 mining, if you take too much ore, too high a percentage  
19 of ore, and load your pillars too high, they will  
20 compress, and before you get back out, chances are  
21 your equipment will be too high for your mining  
22 operation.

23 So the main thing we did was to more or less  
24 determine about fifty-eight percent on first mining.  
25 The rule of thumb is for every foot of <sup>Overburn</sup> overburn, you

*overburden*

1 have a pound of PSI pressure. The overburn lies  
 2 anywhere between 144 and 150 pounds per cubic foot.

3 In this case, you have 1,400 feet of overburn, *overburden*  
 4 or 2,800 PSI on your pillars. Then your salt roof will  
 5 run roughly 4,000 PSI, and if you have K20, it's down  
 6 around 28, but most of your ore is a combination of  
 7 your salt plus your mineral, and 34 or 35 hundred PSI  
 8 is a good operating range for the ore.

9 Then another thing that works with you in your  
 10 first mining is, say, you leave a fifty by fifty pillar,  
 11 I'm talking about feet, and say, you're mining a ten-  
 12 foot ore body, the Bureau of Mines found that in their  
 13 work, they used L over D, that's the shortest length  
 14 of any pillar divided by the height of the ore vein,  
 15 and it would give you a ratio to work with instead.

16 Say, like, you have fifty feet divided by ten,  
 17 which will give you five. Then if you take the square  
 18 root of five, which would be two-plus, your twenty-eight  
 19 would go up to as much as 6,000 pounds that your pillar  
 20 would hold without any subsidence.

21 Q Are these some of the factors that you take into  
 22 consideration in your developing a pillar mining plan?

23 A That's right.

24 Q And did you, subsequently throughout the following  
 25 years, periodically return to observe the result of

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1 your mining plan?

2 A Yes, sir.

3 Q And to observe the results of the pillar pulling and  
4 the subsidence that thereby occurred?

5 A Yes, sir.

6 Q And were you there in the mines of the Southwest and  
7 on the surface in 1957, in the spring of 1957?

8 A Yes. I can't give you the specific date, but I was  
9 in and out during that period.

10 Q And you observed both underground and surface subsidence?

11 A Right.

12 Q I hand you what has been marked as Exhibit Thirteen,  
13 and ask you if that is a typical portrayal of the type  
14 of surface cracking that occurred at Southwest during  
15 1957.

16 A Yes, that's very typical. Not only that, but potash  
17 mining results in the pulling apart of water pipe lines  
18 and the subsidence of roads, good subsidence, which is  
19 the result of good cover mining.

20 MR. MATKINS: I might point out that the numbers  
21 appearing on the front of the two previous exhibits are not  
22 to be used. It should be the numbers on the back.

23 THE WITNESS: I would like to stipulate that I  
24 did not take these pictures.

25 MR. MATKINS: I understand that, but you noted

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1 the date thereon and you did observe those types of  
2 conditions in 1957?

3 THE WITNESS: Right.

4 Q (By Mr. Matkins) Would you, in the course of your  
5 inspection of the mine, return to the same spot in  
6 the mine from time to time to observe the amount of  
7 subsidence and the rate of subsidence that was occurring?  
8 Perhaps I should say convergence?

9 A Yes. In pillar mining, you also develop up to the  
10 edge of your ore zone, or to a stipulated line, and  
11 start retreating, and from time to time as you retreat,  
12 you don't get back in to see the pillars that have  
13 been brought down to a stipulated size because it's  
14 a little bit too dangerous.

15 Q I am going to show you some other pictures made in  
16 1957, which reflect subsidence, and ask you if you did  
17 not observe this subsidence taking place at this rate  
18 and in this manner in 1957 at Southwest's mine. The  
19 first picture being Exhibit Fourteen.

20 MR. KELLAHIN: If the Commission please, the  
21 question states "at this rate", and I haven't heard any  
22 testimony as to any rate. I would like to have identified  
23 what rates we are talking about.

24 MR. MATKINS: Well, the exhibits are identified  
25 by pictures.



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- 1 MR. KELLAHIN: As compared to what?
- 2 MR. MATKINS: To subsequent pictures that have
- 3 been taken.
- 4 Q (By Mr. Matkins) Will you note the date on that picture?
- 5 A February 21st, 1957.
- 6 Q And I will hand you Exhibit Fifteen-- first of all,
- 7 in Exhibit Fourteen, does there appear to have been any
- 8 subsidence that had taken place?
- 9 A I would say no. There shows some flaking of the ribs,
- 10 but I would say the convergence would be minimal.
- 11 Q Now, Exhibit Fifteen, which is dated February 28th,
- 12 1957, and I believe indicates a 5.2 foot height, can
- 13 you observe signs of subsidence in that picture?
- 14 A Yes, sir.
- 15 Q You will note there is a marking on that pillar
- 16 (indicating).
- 17 A Right.
- 18 Q And there is a number appearing there, is there not?
- 19 A Yes, 558 is still visible.
- 20 Q Now, I hand you Exhibit Sixteen, dated March 7th, 1957,
- 21 which shows a height of 4.4 feet.
- 22 A Yes.
- 23 Q Can you see additional signs of cracking and convergence
- 24 in that picture?
- 25 A Yes, sir. In this picture, the 558 number has gone

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1 from the pillar, however it's marked on the bottom of  
2 the exhibit, and there is some spalling of the ribs,  
3 and some flaking of the roof.

4 Q Now, as to Exhibit Seventeen, the date thereon appears  
5 to be March 14th, 1957, and that shows a height of  
6 3.2 feet, and it also has a box with a number on it.  
7 I believe the number is on the left-hand corner.

8 A Right.

9 Q Can you see additional signs of convergence in that  
10 picture?

11 A Right.

12 Q Do these pictures typically represent the type of  
13 subsidence that you observed within the Southwest mine?

14 A Yes.

15 Q Did the subsidence, or convergence, often appear in  
16 the rapid period of time indicated by the dates  
17 appearing on the pictures?

18 A Yes, I would say that this is more or less the normal  
19 sequence of subsidence.

20 Q Now, I would like to refer you to what was previously  
21 introduced as Exhibit Six, which is a diagramatic  
22 drawing prepared by Mr. Childers. I believe you have  
23 a copy there?

24 A Yes, sir.

25 Q You heard his testimony, of course, that this is not

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to scale?

A Right.

Q But do you agree that it fairly depicts the methods in which the subsidence occurs as you withdraw your pillars insofar as there is a forty-five degree angle running out from your pillar-pulling activities?

A Right, this is just a picture drawing, it's not drawn to scale, and it shows the salt zone and also the shales and limestone and the dolomite that are above the salt zone, and it shows that the dolomite and limestones shear and break up as subsidence occurs, whereas in your salt, you get a bending action.

Q Again, will you clarify where the salt section is?

A Right next to the ore zone, and it extends approximately-- this picture is not to scale, but it is my understanding that the salt zone is about 450 feet thick.

Q Were you present during all of the testimony at this hearing?

A Yes, sir.

Q And you heard the testimony relative to the casing to be employed by Phillips in the event they are granted permission to drill?

A Yes, sir.

Q Can you take into account those details and indicate your opinion and why you reached that opinion as to

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1 the effect, particularly of the shifting salt, upon  
2 such casing, should an oil well be in existence, or  
3 a gas well be in existence on the left-hand side of  
4 this diagram. I think first you should tell us what  
5 might happen if it is a producing well, and what you  
6 believe might occur to a plugged well.

7 A If you had an oil or gas well on the extreme left-hand  
8 side of the diagram, and you quit mining at this  
9 particular spot (indicating), your oil and gas well  
10 should be stable, because the forces lie anywhere between  
11 forty-five and forty-eight degrees, depending on the  
12 area.

13 That is what Mr. Childers referred to that required  
14 a 1,400 foot radius to create that condition. However,  
15 if you said, "Well, we're going to mine nearer to the  
16 oil or gas well", this zone here moves toward your  
17 oil and gas well, and especially, if you say maybe a  
18 700 foot radius, you would be in a position where your  
19 casing would be indisturbable, and if you went nearer  
20 than a 700 foot radius, you would have your casing  
21 down into the salt material that would be flowing, and  
22 this salt, say, if you're mining a ten-foot section,  
23 is sort of homogeneous material, where it doesn't  
24 break, but it will flow, and it will elongate or move  
25 for as much as four or five feet, and if you have a

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- 1 casing in that zone, it will take-- well, something  
2 has to give, and it will take the casing with it.
- 3 Q Have you seen, in your experience, examples of  
4 subsidence and horizontal shifting, shearing off  
5 material placed in the earth by man?
- 6 A No, sir.
- 7 Q You haven't observed that personally?
- 8 A The only places I have observed casings sheared was  
9 around strip coal mining, where the whole hillside is  
10 blue, and the casing and gas well is taken right with it.
- 11 Q But it is your opinion that the force of the salt with  
12 lateral movement would take the casing right out?
- 13 A Yes, sir. You could depict it as more or less a slide,  
14 which is just going to move, and if you have some  
15 hard material-- well, the forces are just tremendous.
- 16 Q I would like to ask you whether your answer to that  
17 question is taking into consideration the type of casing  
18 and cementing described this morning.
- 19 A Yes. I am no expert on the strength of steel and  
20 concrete that goes in, but I know that, for example,  
21 that underground, you have places where the salt is  
22 twenty-eight feet wide, and they act as beams, and if  
23 you have salt flowing against a fixed object, you could  
24 have a lateral beam as much as twenty-eight foot wide,  
25 and you could have forces building up on the casing

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1 that would go anywhere from six to nine hundred tons.  
2 Q Based upon the testimony you have heard, and upon your  
3 experience, and you have worked coal mines and other  
4 mines which contain gas, can you conceive of problems  
5 caused by subsidence which might allow gas into the  
6 potash mine?

7 A Yes. Even if the well was plugged, you could shear  
8 the well, and then you would have to depend on how  
9 good the well was plugged. Or if you sheared an active  
10 well, you could get migrating gas. Just this past year,  
11 the United States Bureau of Mines put out regulations  
12 for non-metallic mines, and they stipulate in this  
13 that underground mines are comprised of metallic and  
14 non-metallic mines, and they stipulate under Section 57-  
15 21, gaseous mines are classified as containing two  
16 percent methane with a safety lamp, or if they find  
17 .5 percent in any return airway, the mine is considered  
18 gaseous.

19 The Health and Safety Act of 1969, which went into  
20 effect March 30th, 1970, classified all non-gaseous  
21 coal mines as gaseous, and the net result has been  
22 that the provisions specified the equipment to be used,  
23 and this has cut their production anywhere from twenty  
24 to thirty percent, and their overall mining costs have  
25 gone up anywhere from one dollar to two dollars and a

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1 half a ton.

2 Q Mr. Boyd, based on your experience in the Carlsbad  
3 potash basin, can you briefly tell us what precautions  
4 and what additional things would be required in order  
5 to continue mining in these mines, should methane  
6 appear?

7 A Well, this is quite lengthy.

8 Q I think that you could perhaps just go over the major  
9 requirements.

10 A There are about fifty-eight different items. Number  
11 one, they cut out smoking by the men in the mine.

12 Two, there would be no cutting with open torches  
13 unless it is in a fresh air current, and there is no  
14 evidence of methane. The mine intake and return would  
15 have to be located in a separate shaft.

16 Booster fans would operate with permissible  
17 molders, and not be anymore than one percent of methane.  
18 They would put on so-called fire bosses to examine  
19 the mines three hours prior to the men going to work.

20 Their cross-cuts would have to be made every one  
21 hundred feet. And the big thing that would really  
22 hamper production would be, taking the last open  
23 cross-cut where you have six thousand feet of air  
24 going through, you would have to hang curtains along  
25 one rib and take your air tool within thirty feet of

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1 the face, and that means that your shuttle cars have  
2 to travel through these canvas curtains, and it would  
3 really hamper production.

4 Then it goes on to say that any piece of equipment  
5 that you work beyond the last open cross-cut has to  
6 be permissible and maintained permissible, which adds  
7 to your maintenance and operating cost.

8 Q Mr. Boyd, based upon your experience in subsidence  
9 and convergence, can you tell us approximately how  
10 long it would be before a gas well could be drilled  
11 through a worked-out mine area?

12 A In my opinion, I would say that eighty-five percent  
13 of your subsidence takes place within a year and a half,  
14 two year period, and you have got to say that ninety-  
15 six, ninety-eight percent, is done within five years.

16 If you were drilling a well in an area that was  
17 completely pillared, the settlement should be such that  
18 you shouldn't have any trouble in five years.

19 Q In five years?

20 A Yes. I would have to stipulate that that would be in  
21 an area that was completely pillared.

22 MR. MATKINS: I believe that's all I have now, Mr.  
23 Porter.

24 I would like to offer these exhibits.

25 MR. KELLAHIN: No objection.



1 MR. PORTER: Exhibits Thirteen through Seventeen  
2 will be placed in the record.

3 (Whereupon I.M.C. Exhibits Thirteen through  
4 Seventeen, respectively, were entered in evidence.)

5 \* \* \* \*

6 CROSS EXAMINATION

7 BY MR. KELLAHIN:

8 Q Your last question and answer was based on the assumption  
9 that the mine had been completely pillared. Do you  
10 mean by that the type of pillarage that is common  
11 practice in the Carlsbad area?

12 A Yes, sir.

13 Q Do you mean also that the pillars are then removed on  
14 second mining?

15 A Yes.

16 Q No pillars are left?

17 A No. My stipulation there is that say they had a set  
18 of mine entries that they did not pillar. Well, I  
19 would advise not to put a well down through those  
20 entries because they would probably still be subsiding  
21 or compressing.

22 Q What size openings would those be?

23 A Well, I would say they would be twenty-eight to thirty  
24 feet wide, and they would be cross-cut on eighty-foot  
25 centers, which would be twenty-eight foot wide.

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- 1 Q About how high?
- 2 A Well, as high as the ore body, anywhere from eight to
- 3 ten or eleven feet.
- 4 Q Are the mine openings in the area generally the same
- 5 size as the ore bodies?
- 6 A Yes, except if it's not practical.
- 7 Q It might not be practical to mine just four feet, in
- 8 other words?
- 9 A Oh, yes, they have equipment that will work with four
- 10 feet, but if they are using mining cars, they might
- 11 want additional height which would permit them to use
- 12 higher mine cars.
- 13 Q Are any of the potash mines in Southeastern New Mexico
- 14 classified as gaseous?
- 15 A No, sir.
- 16 Q Do you know of any oil or gas wells that have been
- 17 drilled close to potash mines?
- 18 A Not to my knowledge, no.
- 19 Q You don't know of any?
- 20 A No, sir.
- 21 Q Now, at the outset of your testimony, you testified
- 22 that the polygon and contour methods were accepted
- 23 methods for determining reserves?
- 24 A Right.
- 25 Q How much information is required to come up with

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1 an actual determination of reserves?

2 A Well, number one, you drill what we call a primary  
3 grade, and you evaluate what you have there, and then  
4 you go to your second grade, where you put holes in  
5 between with 2,000 to 2,500 foot centers.

6 Q That would give you enough information to evaluate  
7 your reserves?

8 A Either that or the polygon method would tell you.

9 Q But could you make an accurate determination on one  
10 core hole?

11 A That's more or less your primary grade, and if you had  
12 your holes drilled, I would call your reserve  
13 calculation partially proven.

14 Q But it wouldn't be a complete determination?

15 A No.

16 Q In your opinion?

17 A No.

18 Q Now, you also mentioned in connection with the contour  
19 method that you used a foot percentage cut-off. What  
20 percentage cut-off are you talking about?

21 A The rules say you establish either a four-foot cut-off  
22 or a five-foot cut-off, depending on the overall nature  
23 of your ore body and what equipment you want to use.  
24 Say your interval between your four and five foot  
25 cut-off line would be maybe three or four percent of

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- 1 the total reserve. You would evaluate whether or not  
2 to cut off at five feet where you could use larger  
3 equipment, and consequently have larger tonnage.
- 4 Q With a smaller percentage overall?
- 5 A Yes.
- 6 Q What percentage would normally be used in a situation  
7 like that?
- 8 A Well, I would say it would have to be under five percent.
- 9 Q In other words, you would have over five percent  
10 before you mine it?
- 11 A What I mean is the difference between the four-foot  
12 cut-off and your total reserves.
- 13 Q You may go down to four feet, and then you may mine  
14 a little bit more?
- 15 A Right.
- 16 Q So your settling or convergence is at about five feet?
- 17 A Well, just to correct you, in the Carlsbad area, the  
18 method is they may have four feet, but to make sure  
19 they get the ore bed, they always send up overbreak  
20 that will go anywhere from three to six inches.
- 21 Q So they would be mining five feet or six feet?
- 22 A Yes.
- 23 Q And this is the subsidence that would occur, five or  
24 six feet?
- 25 A Yes, that's the area that would converge where the salt

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1 top would hit the salt floor.

2 Q I believe you testified that subsidence would be  
3 completed, would be ninety-seven percent complete, in  
4 five years.

5 A Right.

6 Q In your opinion, would it be safe to drill within five  
7 years, assuming you stay away from the open mine?

8 A Yes, sir.

9 Q Just as an example, Mr. Boyd, assume that Phillips  
10 Petroleum Company drilled their well in the south part  
11 of Section 13, and the potash company had completed  
12 their mining in the south part of the section, but they  
13 were still mining up in the north part. Would that  
14 pose any problems?

15 A It would depend on the pillaring.

16 Q Let's assume they were done pillaring within the whole  
17 area.

18 A I see no problem.

19 Q How far away would the pillars have to be pulled before  
20 it would be safe to drill a well in there?

21 A Well, I think the five-year lapse in time would more  
22 or less take care of that.

23 Q Well, that would also assume that the pillars had been  
24 pulled for a distance back to the well site.

25 A Right.

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1 Q What distance?

2 A Well, I would say, just offhand, fifteen hundred or  
3 two thousand feet.4 Q You were talking about the danger of gas in the mine.  
5 Actually, do you agree with Mr. Childers that they  
6 could leave the normal pillars in, taking fifty percent  
7 of the ore in a 1,400 foot radius?8 A Yes, if the fifty percent mining is done on an orderly  
9 basis, you would have stability.

10 MR. KELLAHIN: That's all I have.

11 MR. PORTER: Are there any further questions?

12 MR. TRAYWICK: Yes.

13 \* \* \* \*

14 CROSS EXAMINATION15 BY MR. TRAYWICK:16 Q Mr. Boyd, in your opinion, subsidence is virtually  
17 complete in five years, based on leaving ten percent  
18 of the ore in place?19 A That's based on ten percent left in and crushed down  
20 from your top.21 Q If you were mining at two different levels underneath  
22 or within 1,400 feet of the well location, would that  
23 affect your opinion as to that time period?24 A Well, you would have to scrutinize both levels, and  
25 both levels would have to be completely mined out.

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1 Q But it wouldn't compound it any if it were  
2 simultaneously done?

3 A No.

4 MR. TRAYWICK: That's all I have.

5 MR. PORTER: Are there any further questions?

6 (No response)

7 MR. PORTER: The witness may be excused.

8 MR. MATKINS: At this time, I will defer to my  
9 more learned associate, Mr. Morris, for the rest of our  
10 evidence.

11 MR. MORRIS: I will call Mr. Hickman.

12 \* \* \* \*

13 TROY SCOTT HICKMAN,

14 was called as a witness, and having been already duly sworn,  
15 testified as follows:

16 DIRECT EXAMINATION

17 BY MR. MORRIS:

18 Q Mr. Hickman, will you please state your name and where  
19 you reside?

20 A Troy Scott Hickman, I live in Midland, Texas.

21 Q How are you employed, Mr. Hickman?

22 A I am an engineer for the consulting firm of Sipes,  
23 Williamson, Runyan, and Aycock.

24 Q What position do you hold in that firm?

25 A Senior Evaluation Engineer.

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1 Q Would you briefly state your education and experience  
2 in the petroleum industry?

3 A I received a B.S. degree from Texas Tech in petroleum  
4 engineering in 1957. I received an M.S. degree in  
5 petroleum engineering from Louisiana Tech in 1968.

6 Upon graduation in 1957, I was employed as an  
7 engineer by Texaco. I worked approximately four years  
8 as a field engineer, and seven and a half years as a  
9 reservoir engineer for Texaco.

10 In December, 1968, I resigned my position with  
11 Texaco and moved to Midland with my present firm.

12 Q What have been your duties with your present firm since  
13 that time?

14 A Principally, the evaluation of oil and gas reserves,  
15 and the determination of fair market values, and the  
16 evaluation of development programs.

17 Q As part of your duties, do you advise clients as to  
18 whether to drill or not to drill particular locations?

19 A Yes, I do.

20 Q Have you been retained by I.M.C. to make a study in  
21 connection with the present application before the  
22 Commission?

23 A Yes, I have.

24 Q Specifically what have you been asked to study?

25 A To study the occurrence of hydrocarbons in the vicinity



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1 of the subject acreage as related to the Pennsylvanian  
2 Age rock, particularly the Atoca and Morrow as they  
3 are commonly called.

4 Q Have you been asked to determine the magnitude of  
5 reserves and the life of reserves that might be expected  
6 in the vicinity of the proposed location?

7 A Yes, I have evaluated all the existing wells in this  
8 area for that purpose.

9 Q Generally, what source material have you used in making  
10 this study?

11 A I have used material taken from the Commission files  
12 in the District Office and the Santa Fe Office. I have  
13 used data that we have in our own files in Midland,  
14 which is fairly extensive. I have utilized information  
15 from commercial data services. These are primarily  
16 our sources.

17 Q I will refer you first to Exhibit Number Eighteen,  
18 will you discuss the information shown on that exhibit?

19 A This shows a generalized geological section of the  
20 Delaware Basin area in the vicinity of the proposed  
21 location, and parallel to that section is an acoustic  
22 log taken from the El Paso Number 1 Arco State, a well

which is nearby this proposed location. Marked on  
there are the picks that I make for the Pennsylvanian  
rock, the top of the Strawn, which is carbonate

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1 in this area, and the top of the Atoca, which is  
2 pillar.

3 A witness discussed this as being a carbonate bank.  
4 I went down and chose the pick where I feel like the  
5 Morrow sand begins, and the actual interval between  
6 the Atoca and the Morrow includes what would be  
7 considered by most people as Upper Morrow, which is  
8 usually a carbonate, but it is sometimes difficult  
9 to pick, and I saw no reason to spend more time doing it.

10 Q Please refer to the next exhibit, Exhibit Nineteen,  
11 which is identified as a structure map on the top of  
12 the Strawn line.

13 A This is a large scale copy of what was furnished to  
14 the Commissioners. Some of this data is a little hard  
15 to see.

16 Q Go ahead, Mr. Hickman, if you will, with your description  
17 of the information shown on this exhibit. What exhibit  
18 is it, and what does it show?

19 A This exhibit covers an area of Southeast Eddy County  
20 and Southwest Lea County, with the acreage in question  
21 about centered in the middle of this map. There are  
22 imposed on this map contour lines which are contoured  
23 to the top of the Strawn line.

24 There is also my method of a coding system and  
25 a legend is included on the map showing the Atoca and

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1 Morrow compresses, or attempted compresses, within  
2 this area.

3 Q And you have Section 13 and the proposed location  
4 colored in yellow with a green dot, respectively, is  
5 that right?

6 A Yes, sir. It's not on mine, but I hope it's on everybody  
7 else's. Imposed on this also are two cross sections  
8 with lines labeled A to A Prime and B to B Prime.

9 Q Now, does this exhibit show all of the wells completed  
10 in the Pennsylvanian formation, the Pennsylvanian  
11 section?

12 A No, in this regard, that the Strawn is also a  
13 Pennsylvanian Age, and there are some Strawn completions  
14 particularly in the South Carlsbad area, which are not  
15 shown on this. Mainly because I did not judge it to  
16 be germane to the problem at hand.

17 Q Just for identification, where is your South Carlsbad  
18 area on the map?

19 A On the extreme left-hand side of the map, a little  
20 above the center of the map.

21 Q And while we are talking about it, how does it relate  
22 geologically to the area under consideration?

23 A It has, as you can see, a considerably higher structural  
24 position. Actually, at this point, I would say you  
25 are going up on your northwest shelf out of the

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1 Delaware Basin area.

2 Q You have some lines shown on this exhibit connecting  
3 wells, the lines being marked as A A Prime and B B  
4 Prime. What does that signify?

5 A Those are the structural cross sections which I have  
6 prepared, and which will be subsequent exhibits.

7 Q While we are talking about this exhibit, I note that  
8 the Belco in Section 1 of the township under consideration  
9 has been marked M.S. What does that signify?

10 A That's the index code for a Morrow sand completion.  
11 However, it was brought out in Mr. Gorence's testimony  
12 this morning, and in your cross examination of him,  
13 that subsequent to the knowledge that we had, and we  
14 tried to acquire the latest data available, but Belco  
15 is making application for a dual completion, and  
16 apparently have perforated up in the Strawn and up in  
17 the Atoca in addition to the Morrow sand completion.

18 Q So that designation should be changed accordingly, if  
19 that information is correct?

20 A Yes, it should be.

21 Q Would you move on now to your next exhibit, Exhibit  
22 Twenty, being the cross section A A Prime. Mr. Hickman,  
23 I would like for you to explain the exhibit, first,  
24 generally what it shows, and then, if you would please  
25 point out the pertinent information with respect to

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1 each well on this exhibit insofar as it is pertinent  
2 to show the nature of the various reservoirs that these  
3 wells seem to be completed in.

4 A We'll start-- first, let me say these are log sections,  
5 either gamma ray acoustic logs or gamma ray neutron  
6 logs. Throughout the Pennsylvanian Age rock, they are  
7 long structurally on a 10,000 foot reference line  
8 which appears a little bit above the middle of the  
9 cross section, and we have tied in with the correlation  
10 lines for the positions of the Strawn, the Atoca, and  
11 the Morrow sands, and the top of the Barnett shelf,  
12 which marks the beginning of the Mississippian Age  
13 rock.

14 On the left-hand side of the cross section is the  
15 Shell James Ranch United Number 1, and we have imposed  
16 on these log cross sections information concerning  
17 drill stem tests which were taken during the course  
18 of drilling and completion of the wells.

19 We have shown intervals which were perforated  
20 and either completions or attempted completions with  
21 the resulting test results.

22 Where we have the data available, we have imposed  
23 the mud weight used in the well at that particular  
24 depth.

25 Starting with the Shell James Ranch United Number 1,

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1 starting at the bottom on this one, if you will look  
2 down almost above your Barnett shelf, there are a  
3 series of perforations indicated in the margin in the  
4 center of the log, and these are marked out, and this  
5 indicates that these perforations are no longer open.

6 On the very bottom set of perforations, we have  
7 used brackets to try and enclose the various perforations,  
8 and we have attempted to delineate from the use of the  
9 brackets the procedure followed in this case.

10 The only interval at the bottom of the Morrow  
11 tested at a non-commercial gas rate of 100 MCF per  
12 day. They then opened three additional zones and got  
13 a total test rate of 175 MCF per day.

14 They have moved up their hole and opened up quite  
15 a large interval in the Morrow sand up through the  
16 Atoca-Morrow section. Here, they got a very low fluid  
17 recovery with no gas show.

18 They then moved up above the top of the Atoca  
19 carbonate bank, and completed a little stringer around  
20 12,920 feet.

21 For those of you who have real good eyes, you can  
22 perhaps make out that depth. They tested this zone  
23 on a four point test and got a calculated openflow of  
24 9,000,000, with an actual test rate of 7.4 million.

25 The well currently is producing at around 4.6

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1 million average per day.

2 It went on production in February, 1958, and  
3 accumulated almost twelve billion cubic feet of gas  
4 through November, 1972. In 1972, however, the bottom  
5 hole shut in pressure at the time the well was tested  
6 on the four point test was 8,230 pounds, this being  
7 abnormal pressure.

8 This is a grading of .64 per foot, and in oil  
9 field terminology, your normal grading is considered  
10 to be .46 PSI per foot.

11 Q What does the abnormal pressure indicate?

12 A Of course, you can get real technical here about  
13 deposition, but to a reservoir engineer, this quite  
14 often indicates a closed type of reservoir, one in which  
15 you would not expect to have water drive, or support,  
16 or drive mechanism, other than solution gas.

17 It is also usually the type of reservoir that is  
18 fairly limited.

19 Moving on to the recently drilled Belco Number 3  
20 Well, here is a situation where I do not have the  
21 latest perforations, and it is my understanding that  
22 the well is perforated both in the Strawn, I would  
23 assume in and around the interval of the drill stem  
24 test, which is 4.4 million feet per day, and then in  
25 the top of the Atoca. I do not know if the stringer

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1 which is productive in the Shell James Ranch Number 1,  
2 and which does not appear to be anywhere near as deep  
3 in this well, is the stringer which has been perforated  
4 or not.

5 The only drill stem test was the one up in the  
6 Strawn in the Pennsylvanian Age. They moved down for  
7 the completion test, moved down into the Morrow sand,  
8 and first opened a little stringer about in the middle  
9 of the interval, and got a fairly low gas rate, and  
10 then they opened up an additional interval and had a  
11 calculated openflow of 6.5 million and an actual test  
12 rate of 5.7 million.

13 The reported shut in bottom hole pressure there  
14 on seventy-two hours appears to be a little bit  
15 sub-normal, a little bit low. This could be an  
16 incomplete build-up or something of that nature, and  
17 I don't know how significant that is.

18 This well is still making application for  
19 completion, and it is not connected to the market, and  
20 there is no way to know, although they have apparently  
21 gotten some good initial rates on testing there.

22 There is no way of knowing the actual quality of  
23 this well in terms of reserves.

24 Moving on to the El Paso Number 1 Arco State 16,  
25 there were three drill stem tests conducted on this



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1 well. Starting with the top one, there was a gas  
2 flow of 6.4 million per day with an abnormally high  
3 shut in pressure given at 66 PSI per foot. This abnormal  
4 pressure, you will find, is common throughout the  
5 Strawn and Atoca and on to the Upper Morrow.

6 The actual Morrow sands themselves seem to be  
7 normally pressured with one or two exceptions.

8 The second drill stem test was expanded to the  
9 Upper Morrow and the Morrow sand, and they got a  
10 non-commercial gas flow rate. They then tested the  
11 bottom of the Morrow and got about 4,000 feet of gas  
12 cut drilling mud and 540 feet of salt water, and got a  
13 normal pressure grading on their bottom hole pressure.

14 They then came up to around 14,100 feet and  
15 perforated and ran a drill stem test in that little  
16 interval, and that shows .21 MCF per day-- that should  
17 be 21 MCF per day, and a non-commercial gas flow rate.

18 They then opened up an additional interval around  
19 14,000 feet-- well, around 13,900 feet, and made a  
20 completion at this point, with a calculated openflow  
21 of 3.8 million and an actual testing rate of 2.2 million.  
22 The bottom hole pressure gives a grading of .64, which  
23 we see quite often in these abnormally pressured zones.

24 This well went on production in December, 1971,  
25 and through November, 1972, it produced only 183 million

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1 feet of gas. It's current producing rate is 200 MCF  
2 per day.

3 We might note here a trend which you will see  
4 throughout this particular area of interest. You get  
5 a fairly decent flow in the drill stem test, in this  
6 case, they got 6.4 million feet per day indicated  
7 flow, and they came back on the subsequent completion,  
8 and they got an actual test rate of 2.2 million per day.  
9 Then when they actually put the well on the delivery  
10 line, the well was down and averaging around 200 MCF  
11 per day in less than a year's time.

12 This occurred in several other instances in this  
13 area.

14 The next well is the El Paso Mobil Federal Number  
15 1, and this is a recently drilled well which officially  
16 has not been completed. There were four drill stem  
17 tests conducted throughout the Pennsylvanian, as shown  
18 on the right-hand margin.

19 The upper test was through the Atoca carbonate  
20 bank, and this was a dry test. They just got their  
21 water blanket back with a slight gas cut to it.

22 This well, I think, is somewhat significant in  
23 that it lies between the Texas American Todd Federal  
24 26, which is a good producer in the Atoca, and has a  
25 good Atoca section in it, I think the Phillips

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1 geologist testified as to some 85 feet of net pay,  
2 and the proposed Phillips location. This well is  
3 situated about half-way in between there, and it was  
4 dry on the drill stem test.

5 They got down lower in the Atoca and ran a couple  
6 of more drill stem tests, and one of them had 4.5  
7 million per day indicated flow with the same abnormal  
8 pressure.

9 The last drill stem test was down in the Morrow  
10 sand, and they recovered 9,000 feet of gas and some  
11 gas cut water blanket with abnormally indicated pressure  
12 which is a little unusual normally in the Morrow.  
13 I think this points out the very limited extent of  
14 any reservoir in the Morrow. They come and go and are  
15 quite erratic, and the completion of this well was  
16 down in the Morrow sand, and at the time I prepared  
17 this data, the four point openflow test had not yet  
18 been filed, but there was a reported test rate of 1.2  
19 million over a three-hour period.

20 This well, as I say, at last check was still  
21 testing, and had a reported shut in bottom hole pressure  
22 of 6,461, which would be normal at this depth.

23 The last well on the cross section is the El Paso  
24 Number 1 Sundance Federal. There were three drill  
25 stem tests conducted on this well in the Pennsylvanian

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1 Age rock.

2 The upper test which straddles the Strawn-Atoca,  
3 and which really is a test of the Atoca core, would  
4 indicate about 900 MCF per day, once again getting  
5 abnormal pressure and giving about a .65 grade.

6 The second drill stem test was down in the Upper  
7 Morrow interval, and recovered 5.5 million per day--  
8 or produced at 5.5 million per day with the same  
9 abnormal pressure.

10 They made one other test down in the Morrow sand  
11 and it was a dry test, and they got back water bracket  
12 and ten feet of mud.

13 This well is closest to the El Paso Mobil Federal,  
14 which was completed in the Morrow sand, or at least,  
15 is testing at what appears to be a commercial rate,  
16 whereas this well in the Morrow sand had no recovery  
17 on the drill stem test.

18 I think this is common throughout the area, there  
19 is little correlation of the actual producing zones.

20 This well was completed throughout the Atoca and  
21 Upper Morrow interval, actually they first perforated  
22 a little interval right in the Atoca itself and got  
23 a half a million per day test rate. They then dropped  
24 down to the lower part of that zone and opened up a  
25 larger interval. It's an interesting situation in

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1 this well where the four point pressure test which  
2 was filed-- let's back up. These perforations covered  
3 two drill stem tests. They took the total flow from  
4 the two drill stem tests, which was 6.4 million if  
5 you add those two together.

6 They went in and perforated both intervals and  
7 tested, and submitted a four point openflow potential  
8 and a calculated openflow of 3.3 million. So the  
9 openflow was actually less, about half of what the  
10 drill stem test indicated.

11 Before this well was ever produced into the line,  
12 an adjusted openflow was submitted, the calculated  
13 openflow was only 449 MCF, down from 3,376 MCF per day.

14 This well went on production in November of 1972,  
15 and in November, 1972, it produced at an average rate  
16 of 386 MCF per day, which is quite a low rate for  
17 deep wells.

18 In December of 1972, it produced at an average  
19 rate of 174 MCF per day. It looks like we are having  
20 instant depletion of this well, and it must have a  
21 very limited reservoir.

22 I believe that covers everything.

23 Q If you will just go right on into your next cross  
24 section, B B Prime.

25 A These well locations are marked on the map, and we used

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1 the same symbols and what-not.

2 The first well is the Texas American Todd Federal  
3 14. This well had four drill stem tests, indicated in  
4 the Pennsylvanian Age series. The first test was in  
5 this Atoca carbonate bank, and this got a little gas  
6 to the surface, but it was too small a rate to measure.

7 They dropped down a little bit lower in the Atoca  
8 and they got a 1.2 million per day flow, with the  
9 abnormal pressure again.

10 They dropped down and ran two tests in the Morrow  
11 sand. The upper test was about the best drill stem  
12 test I have seen out of the Pennsylvanian rock, 14  
13 million per day indicated flow on the drill stem test.

14 They dropped down a little bit lower and got  
15 virtually a dry recovery, just a water blanket and some  
16 mud. They naturally came in and tried a completion  
17 opposite their best drill stem test, and opened up an  
18 interval actually in the Morrow sand and the Atoca and  
19 submitted a calculated openflow of 6.7 million, and  
20 an actual test rate of 4.3 million.

21 This well went on production in March, 1971, and  
22 as of November, 1972, had accumulated 87 million feet.  
23 The well currently will not produce into the gathering  
24 line system, so for all practical purposes, the well  
25 is depleted after only making 87 million feet, and

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1 having a drill stem test indication of 14 million  
2 feet per day.

3 The center well, the Texas American Todd Federal  
4 Number 26, had no drill stem tests run, and Phillips  
5 testified it was perforated in the Atoca and they got  
6 an openflow of 75 million, with an actual test rate  
7 of nearly 11 million.

8 The well went on production in March, 1970, and  
9 is currently averaging better than 5 million feet a day.  
10 It had accumulated through November, 1972, almost  
11 9 million feet. This, in comparison to the other  
12 completions in the area, shows it is a very good well.

13 The last well on the cross section, which you  
14 will probably be glad to hear, is the Texas American  
15 Todd State Number 36-- let me back up to the Todd 26.  
16 These wells are located fairly close together, as you  
17 can see from your map, and as you can see, I forgot  
18 to add on these cross sections a horizontal scale,  
19 however, we did place the wells in their relatively  
20 proportional distances from each other. So it bears  
21 some mentioning.

22 The Texas American Todd 14 and the Number 26 are  
23 located fairly close together. There is just one  
24 section between them.

25 The last well is the Number 36, and they ran four

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1 drill stem tests. All of them were, with the exception  
2 of the last one, all of them were either dry or had  
3 low gas rates. The last one had an indicated rate of  
4 4 million, with abnormally high pressure down into the  
5 Morrow sand, as compared to some areas where the pressure  
6 was normal, which indicates the definite lack of  
7 communication between these sands. This well had a  
8 calculated openflow of 2.5 million, and an actual test  
9 rate of 2.1 million.

10 The well has never been connected with the market,  
11 even though this gas was contracted for. However, the  
12 original contractor has, I guess the right word is,  
13 determined that the well was not commercial enough  
14 to warrant a pipe line connection, so the contract was  
15 broken.

16 As I understand it, Texas American is now  
17 negotiating for another contract on this well. They  
18 had a test rate of 2.1 million per day, and additionally,  
19 this well has abnormal pressure, although it's down  
20 in the Morrow sand where we usually have normal pressure.

21 I would tend to agree with the pipe line company,  
22 I doubt the commerciability of this well, once it's  
23 put in the gathering system.

24 Q Mr. Hickman, what conclusions can you draw from the  
25 information shown on these cross sections and the



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1 completion and testing procedures and production data  
2 that you have already referred to.

3 A I believe the principal conclusion is that I agree  
4 with Phillips that their proposed location is a wildcat.  
5 We see here an area with problems, problems both as  
6 to drilling the well due to the many, many abnormal  
7 pressure zones which tend to cut your drilling mud  
8 and cause problems, potential blow-outs.

9 The problem of not having any idea of what you are  
10 going to encounter in the way of reserves is more  
11 significant to me. There is hardly any correlation  
12 between producing intervals, and from a reservoir  
13 standpoint, there seems to be no correlation. Even  
14 when you make a good drill stem test, it doesn't seem  
15 you are going to make-- well, even when you make a  
16 completion and a good initial test, it doesn't mean  
17 you are going to have something in the area for any  
18 period of time. It's a very chancy area, and out of  
19 the eight wells in the immediate area which we have  
20 covered by cross sections, the Shell Well is a good  
21 well. It's producing what I call out of an abnormally  
22 developed stringer, and I would hate to bank on finding  
23 that again.

24 I do not agree with the Phillips geologist who  
25 indicated in his testimony that this was the Atoca

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1 carbonate bank. I disagree with that.

2 But regardless of where it is, it is a good well.  
3 The Texas American Todd Federal 26 in the Atoca  
4 carbonate bank is a good well. The El Paso Sundance  
5 Well was depleted before it ever produced in every  
6 sense of the word. The Texas American Todd Federal  
7 14 depleted before it did anything. The Texas American  
8 Todd 36 is an extremely doubtful well, and the pipe  
9 line company felt it was non-commercial.

10 In my opinion, the well will be non-commercial.  
11 The Belco Well, we don't know about yet, but it looks  
12 good at this time. We like Belco, and we hope they  
13 make a darn good well.

14 The other well, the El Paso Mobil Federal, is still  
15 testing, and we don't know what kind of quality well  
16 it is.

17 So this is a very chancy, risky area, an area of  
18 drilling problems and high costs.

19 Q Mr. Hickman, we have grouped together as Exhibit  
20 Twenty-two a series of accumulative plats followed by  
21 production history plats with respect to the area wells,  
22 and Exhibit Number Twenty-Three is a summary sheet.  
23 Would you, in the interest of time, summarize this  
24 Exhibit Twenty-Two and point out, if you will, without  
25 going through every well, well by well, the type of

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1 information that you have developed in the course of  
2 your study of this area?

3 A This composite exhibit contains three different types  
4 of data, one being bottom hole pressure divided by  
5 deliverability factors. This is used in a depletion  
6 type gas reservoir, as we are dealing with here, to  
7 indicate both the original gas that is in communication  
8 with the well bore, and also to determine recovery,  
9 what part of this gas will be recovered. Marked on  
10 each of these particular graphs is the original gas  
11 in place, my determination of the original gas in  
12 place for the various wells. The pressure points  
13 which were used in the determinations are shown on  
14 these graphs. The pressure point information comes  
15 from the Commission Form C-122, and the other points  
16 come from the annual shut in pressure forms, Commission  
17 Form C-125.

18 The second piece of data shown is the production  
19 graphs of the gas rate in millions of feet per month  
20 versus time as delineated in years and months. We  
21 have shown in the early years just the average rate  
22 for the years, and then in 1972, and in some cases 1971,  
23 we have actually plotted the individual months and  
24 imposed them on these graphs. We have also shown a  
25 projection line which is our projection of future

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1 performance on these wells.

2 There is one other piece of data which is present  
3 only on one well, the El Paso Arco State Well. We  
4 have, in addition to the rate times production graph,  
5 platted a rate-accumulative production graph. A rate-  
6 accumulative production graph can often be used to  
7 project the wells' performance.

8 Q Have you prepared the information here on all of the  
9 wells shown on the cross sections for which data was  
10 available?

11 A Yes, I have.

12 Q And in addition, have you presented some data on  
13 additional wells?

14 A Yes, I have. In addition, I have moved a little bit  
15 to the south of this immediate area in an effort to  
16 learn as much about the Atoca and Morrow as we could.  
17 We picked up three wells operated by Texaco in the  
18 Paduca Field. These three wells are all completed  
19 down in what I pick as the Morrow sand interval, and  
20 I have also included the producing curves, or producing  
21 history curves, on these three wells.

22 Q Would you go to Exhibit Twenty-Three, it being your  
23 summary sheet, and point out the information shown  
24 on there?

25 A We have listed by field, and then by operator, and then

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1 by well, the well which I have included in my study  
2 of reserves and future performance.

3 Next to that, I have the date of initial production,  
4 and as you can see, some of these wells are not yet  
5 connected.

6 Then we have accumulated production as of December  
7 1st. Next to that, we have reserves as of December 1st.

8 Now, these reserves being what, in my professional  
9 judgment, remains to be produced by these various  
10 wells. The next column is ultimate reserves, or  
11 ultimate recovery. This is simply a summation of  
12 accumulative production plus reserves to give what in  
13 my opinion would be the ultimate recovery of the  
14 various wells included in this study.

15 Then the last column is my calculations of what  
16 the total producing life of these various wells will be.  
17 This includes their remaining life plus the amount of  
18 time they have produced to date.

19 Q Can you summarize the situation as to what is shown  
20 on this exhibit, and how it relates to the proposed  
21 Phillips well?

22 A Yes, sir. I think we would have to do this kind of  
23 semi-statistically. On the Belco Well, we do not know  
24 the quality of it. It may turn out to be an excellent  
25 well. The El Paso Mobil Federal, we do not know the

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1 quality of. So excluding those two wells, we have  
2 nine wells, and out of those nine wells, three of  
3 them are economic successes, the Shell James Ranch,  
4 the Texaco well, and the Todd Federal 26. There is  
5 one well which came part-way toward returning the  
6 cost money, and that was the Texaco 67 Cotten Draw.  
7 You certainly wouldn't drill for this amount of reserves,  
8 but at least in comparison to the other wells, it made  
9 a few dollars. The rest of the wells were economic  
10 busts.

11 You can see we are producing out of, even in our  
12 good wells, a low porosity, fairly tight, either  
13 carbonate or sand, and I think, in my capacity of  
14 experience, you would expect long life out of these  
15 wells, and my subsequent calculations indicate that  
16 you will have long producing lives out of some, and  
17 the remainder of the wells will have very short lives,  
18 on the order of what Phillips testified to.

19 So in summary, we have a situation here where it  
20 is either feast or famine. There are a few good wells  
21 that have been made, and which will give a good return  
22 on the money, however, these wells do have long  
23 producing lives. There are others where you will not  
24 make good completions, you will make non-economic  
25 wells, and consequently, you won't have long producing

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1 lives, simply because there is nothing there worth  
2 producing.

3 MR. MORRIS: If the Commission please, we offer  
4 into evidence at this time I.M.C. Exhibits Eighteen through  
5 Twenty-Three.

6 MR. PORTER: Without objection, the exhibits will  
7 be admitted.

8 MR. KELLAHIN: No objection.

9 (Whereupon I.M.C. Exhibits Eighteen through  
10 Twenty-three, respectively, were admitted in evidence.)

11 MR. MORRIS: That's all we have on direct  
12 examination.

13 MR. PORTER: Did you say you had no objection, or  
14 no questions?

15 MR. KELLAHIN: I said that we have no objection,  
16 I'm sorry I do have a question or two.

17 \* \* \* \*

18 CROSS EXAMINATION

19 BY MR. KELLAHIN:

20 Q Admittedly, there is not too much information available  
21 to determine just what is under Section 13, is there?

22 A That's right, I agree.

23 Q The closest well is something over two miles away?

24 A I believe that's approximately right.

25 Q And I believe you were making some comparison to the

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1 El Paso Sundance Number 1. That is more than six  
2 miles from the proposed Phillips location, is it not?

3 A Well, it's not quite six miles, but it's in that range.

4 Q And the El Paso Mobil Number 1 Federal is about four  
5 miles from the proposed location?

6 A Well, it's a little closer than that. I will contest  
7 you on that. It's more like two miles, sir, two and a  
8 half miles, maybe.

9 A VOICE: Three miles.

10 A Okay, I'll go with the compromise figure of three miles,  
11 it's getting late.

12 Q Well, the important thing is there are no wells closer  
13 than two miles, is that a correct statement?

14 A That's a correct statement, yes.

15 Q So we are comparing the strata underlying Section 13,  
16 the South section of 13, to really an unknown factor,  
17 are we not?

18 A I would qualify that if I might, sir?

19 Q Yes, sir?

20 A We know it's an extremely rocky area, and we know that  
21 sand and carbonate reservoirs come and go, and most of  
22 them are very small. This much we know about the area,  
23 but I agree with you, specifically, what is under this  
24 one section, no.

25 Q If you will accept the fact that the Belco Well is a



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- 1 good producer, then two out of the three of the  
2 closest wells are good producing wells, are they not?
- 3 A I don't follow you on that statement.
- 4 Q Two out of the three closest wells are good producers,  
5 isn't that correct?
- 6 A Well, I couldn't concur on that. The Belco Well, which  
7 I hope does make a good well, based on other information,  
8 even these extremely good tests are not a guarantee  
9 that it will be a commercial success. The Shell Well,  
10 which is undoubtedly a commercial success, is out of  
11 this one little stringer, and this stringer does not  
12 appear to be developed in the Belco Well, and the  
13 Belco Well lies directly between the Shell Well and  
14 the proposed well.
- 15 Q By the same token, the Texas American Todd Federal and  
16 the other wells you are comparing are in a different  
17 stringer too, are they not, than say the Belco Well?
- 18 A No, sir.
- 19 Q They are in the same stringer?
- 20 A Well, whether the Belco Well is perforated in the Atoca  
21 carbonate bank, I could not testify to at this time,  
22 and this is the prime target for the Phillips well,  
23 and this is the zone that the Todd Federal 26, which  
24 Phillips testified to as being a significant well, is  
25 in. So the Belco Well would be in that zone, and so

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1 would the Todd Federal 26.

2 Q But the Todd 14 and the Todd 36 are not in that zone,  
3 are they?

4 A They are in the Atoca Upper Morrow, however, they might  
5 be perforated below.

6 A VOICE: They are.

7 A Then no, sir.

8 Q In your Exhibit Number Twenty-two, I only had a rather  
9 hazy look at it, but as I understood it, you are  
10 projecting a producing life of seventy-two years on  
11 the Shell James Ranch Number 1 Well?

12 A Yes, sir.

13 Q But your exhibit only shows production from 1966, is  
14 that correct?

15 A The exhibit, plus my other data on the cross section,  
16 indicates this well went on production in February,  
17 1953.

18 Q Are you basing that on total production or are you  
19 basing it on the exhibit, this seventy-two year life?

20 A That's on total production.

21 Q Over and above the fourteen years it has been on the  
22 line?

23 A Yes, sir.

24 Q Did you take into consideration the fact that in the  
25 past four years that well accumulated 8 billion cubic

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1 feet of gas as compared to 4 billion in the preceding  
2 ten years?

3 A Yes.

4 Q Did you give any weight to that in projecting this  
5 seventy-two year life?

6 A I believe in the last couple of years-- I agree with  
7 the testimony that Phillips put on that in the last  
8 couple of years, or the last year and a half or so,  
9 that this well has established a capacity decline.  
10 We could knock out the first fourteen years of it being  
11 under-produced due to proration, and this would knock  
12 it down to fifty-eight years.

13 Q Due to proration or due to pipe line takes?

14 A Well, pipe line, yes.

15 Q It isn't even a defined pool, is it?

16 A It carries a field name. There is information filed  
17 which shows when they moved in in 1959, they moved  
18 it from an undesignated field to a designated field.

19 Q But it is not a prorated pool?

20 A No, it is not.

21 Q On your reserve calculations, I believe you gave  
22 31 billion cubic feet to that well.

23 A Somewhere in that neighborhood.

24 Q My Exhibit Number Twenty-three has come apart, and I  
25 don't have that information.

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- 1 A Yes, that's correct, 31.5 billion.
- 2 Q If it produced during the last four years at a rate
- 3 of 8 billion, that would mean about a fifteen-year
- 4 lapse, would it not?
- 5 A If it held steady. These wells do not hold steady.
- 6 As Phillips testified to this morning, their pressure
- 7 depletes, and they drop off in deliverability. If
- 8 you refer to the production graph there, you can see
- 9 a decline in the last few years.
- 10 Q What reservoir pressure are you using?
- 11 A Around 1,000 pounds.
- 12 Q What well head pressure are you using?
- 13 A Maybe six hundred pounds.
- 14 Q Do you know what pipe line is taking that gas?
- 15 A I looked that up, and knew it. El Paso Natural Gas
- 16 pipe line is in there, but I'm not sure whether they
- 17 are taking it. I just don't recall.
- 18 Q Do you know what pressure that pipe line is being
- 19 operated at?
- 20 A We contacted Shell, and they indicated that there was
- 21 a 1,000 pound gathering pressure.
- 22 Q You are familiar with the energy crisis, are you not?
- 23 You have at least read about it?
- 24 A Yes, sir.
- 25 Q Would that affect the taking of gas in the State of

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1 New Mexico?

2 A It has affected the takes in New Mexico.

3 Q That could account for the production from this well  
4 in the past four years, could it not?

5 A I don't follow your question.

6 Q Admittedly, the takes were increased from the Shell  
7 James Ranch Number 1 in the last four years.

8 A Yes.

9 Q Was energy storage a factor in this increase, in your  
10 opinion?

11 A I would say quite probably.

12 Q Could you not anticipate further demand on a greater  
13 scale in the future which would result in lower pipe  
14 line pressure?

15 A Actually, increased demand loads your pipe line and  
16 runs your gathering pressure up.

17 Q They do use compressors in pipe lines, do they not?

18 A Once a particular well gets down to where they can't  
19 produce at a satisfactory rate, they will use compressors.

20 Q And that could shorten the producing life of this well,  
21 could it not?

22 A It could have some effect on the producing life, but  
23 not significant.

24 MR. KELLAHIN: I have no further questions.

25 MR. PORTER: Are there any further questions?

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1 (No response)

2 MR. PORTER: The witness may be excused.

3 (Witness excused.)

4 \* \* \* \*

5 ROY C. WILLIAMSON, JR.,

6 was called as a witness, and having been already duly sworn,  
7 testified as follows:

8 DIRECT EXAMINATION

9 BY MR. MORRIS:

10 Q Mr. Williamson, will you state your name and where you  
11 reside?

12 A My name is Roy C. Williamson, Jr., and I live in  
13 Midland. Texas.

14 Q How are you employed, Mr. Williamson?

15 A I am President of the consulting firm of Sipes,  
16 Williamson, Runyan and Aycock.

17 Q Is that the firm that Mr. Hickman is associated with?

18 A That's correct.

19 Q Would you briefly outline your education and experience  
20 in the petroleum industry?

21 A I was graduated from the University of Oklahoma in  
22 1956 with a degree in petroleum engineering and  
23 geological engineering. I was in the Air Force for a  
24 couple of years, and then joined Gulf Oil Corporation  
25 in West Texas in 1959. I remained with Gulf for

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1 approximately nine years, at which time I left and  
2 joined the predecessor firm to our current firm.  
3 Since that time, I have been actively engaged in  
4 evaluation work, primarily in the West Texas and New  
5 Mexico area.

6 Q Mr. Williamson, have you made a study concerning the  
7 drilling and cementing and other operating problems  
8 in connection with the proposed Phillips well?

9 A Yes, I have.

10 Q First, concerning the drilling problems in connection  
11 with this proposed well, would you outline some of  
12 the problems that you have studied and give us the  
13 conclusions that you have reached in that connection?

14 A Yes. I think we have had testimony already presented  
15 that we are dealing with some abnormally high pressure  
16 zones in the Strawn, Atoca, and Upper Morrow zones.

17 This fact in itself requires abnormal mud weight  
18 to hold these pressures. This problem is further  
19 compounded by the fact that Morrow sand is proven to  
20 be very susceptible to damage, and it's common practice  
21 for operators to try and drill in an underbalanced  
22 condition. This underbalanced condition will then  
23 allow the formation to flow, and will not allow any  
24 filtrate to enter the formation and possibly damage it.

25 So you can see by drilling on the razor's edge,

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1 so to speak, that it is possible for a potential  
2 blow-out to occur, or for the hole to unload, requiring  
3 the bringing in of surface equipment. High mud weights  
4 could cause loss of circulation problems also.

5 This is further complicated by the fact if the  
6 well does begin to get out of control, and by that, I  
7 mean if the pressures encountered in the reservoir  
8 begin to unload, the column of mud in the hole would  
9 require shutting in at the surface. A high pressure  
10 gas bubble at the bottom of the well due to density  
11 difficulties could rise through the mud column and  
12 indeed impart the high pressure on the surface  
13 equipment.

14 Of course, these can be designed for this, and I  
15 am sure all prudent operators would take this into  
16 account, but these are problems unique to this area,  
17 and they do show the need for special programs to  
18 control them.

19 Q Have there been blow-out problems in the immediate area?

20 A I would not say that any well has lost control and  
21 blown wild to the atmosphere, but I do know several  
22 cases where wells had to be shut in to balance this  
23 lost circulation.

24 Q Should a blow-out occur, what could happen-- what does  
25 happen in a typical situation that could pose a



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1 continuing hazard to the potash mining operations,  
2 should that happen to the Phillips well in this case?  
3 A Well, just for an example, we all know wells do get  
4 loose, and they could catch on fire. I realize this  
5 is an extreme case, but it could happen. The well  
6 could unload the surface equipment that is trying to  
7 maintain control of the well, and which could be  
8 adequate, or might not be adequate, to maintain this  
9 pressure. The well could catch on fire in such a  
10 case and damage the hole or the casing in the hole,  
11 and it's possible the hole could be lost by that.

12 I mean lost where it could not be properly plugged or  
13 controlled for any future pressure leak from the well.

14 Q Is blow-out danger a significant factor in this  
15 immediate area?

16 A It's more likely to occur in this area than you might  
17 have in other areas because of these abnormal pressure  
18 zones that you do incur.

19 Q Were pressure control problems present to some extent  
20 in the drilling of the Belco Well immediately north  
21 of the proposed location?

22 A We understand that this was the case.

23 Q Have you analyzed the casing and cementing and drilling  
24 program that has been proposed by Phillips in this  
25 area?

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1 A Yes, I have.

2 Q And were you present here today when the Phillips'  
3 witnesses gave their estimates of well costs?

4 A Yes.

5 Q Do you have any comment to make concerning that program,  
6 or those costs?

7 A Well, I think that certainly the program as presented,  
8 although I have not won out the calculations, is very  
9 adequate for the pressures that are anticipated being  
10 encountered.

11 In our experience with well costs, I would expect  
12 the well cost presented by Phillips to be somewhat low,  
13 and that would indicate no problems would occur and  
14 no expensive mud problems would be anticipated, nor  
15 would any blow-out problems occur.

16 I will agree that later operators do have an  
17 advantage, and they might be able to control this, but  
18 there are some additional hazards because of the  
19 pressure zones.

20 Q Would you comment concerning the problems of adequately  
21 cementing the well for drilling and production purposes  
22 and also for plugging purposes?

23 A As Phillips has indicated, because of the depth, you  
24 are going to have to stage your cement job. You would  
25 not be able to move a complete column of cement from

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1 the deep string to the surface. You would have to  
2 have a second stage procedure.

3 When you do have a deep hole, you have to stage  
4 your cementing, and you have a chance for additional  
5 problems as to effective cementing jobs. I have an  
6 example of this.

7 In visiting with two companies, Burton and Western,  
8 who have been quite active in cementing and treating  
9 these wells in this area, one of their main problems  
10 has been communication between perforations. They have  
11 treated one set of perforations, and they do have  
12 adjacent problems to another set. So even in the area  
13 of the producing zone, there have been cases where  
14 the best cement jobs have not been achieved.

15 I believe you asked me to discuss the plugging  
16 of the well?

17 Q Yes.

18 A Of course, plugging could naturally occur when the well  
19 is depleted, and plugging could occur if an uneconomical  
20 well is obtained. We all know there are recommended  
21 techniques and procedures for adequately plugging wells.  
22 We know they have been approved by the Commission,  
23 and supposedly, this does prevent any escape of  
24 hydrocarbon to the surface, but I will say this, that  
25 any time a man-made hole is made to some depth,

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1 naturally the chance of communication from some deeper  
2 formation to the surface is much greater than if that  
3 hole was not there.

4 So even though we do have accepted risks that we  
5 take in petroleum industry, in my opinion, we are  
6 dealing with a situation here in this case of a potash  
7 mine where we cannot stand any contamination from gas.

8 We do have the chance for some contamination with  
9 a well there than if we didn't have a well there. With  
10 a well there, gas could in some manner escape from  
11 the lower formation and find its way to the mine.

12 Q Would you comment concerning the feasibility of  
13 drilling at the proposed location at such time as the  
14 potash has been mined from the area and subsidence and  
15 convergence has ceased?

16 A In my opinion, after the subsidence has ceased as you  
17 have stipulated, the hazard of drilling a well through  
18 the zone would not be any greater, and we have seen  
19 this overcome by the drilling industry in other areas  
20 of the country. Naturally, you would have some void  
21 space in the mine, but at the same time, there are  
22 many examples of wells that are drilled in caverns,  
23 Pecos County being the prime example, and there are  
24 methods where this can be controlled, and successful  
25 drilling operations can be conducted.

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1 Q Would you please comment on the engineering and cost  
2 feasibility of drilling directionally from somewhere  
3 in the Northeast quarter of Section 23 into the  
4 Southwest quarter of Section 13?

5 A Of course, I have not made a specific cost study, and  
6 as pointed out by one of the Phillips' witnesses, the  
7 problems of cost would be rather dependent upon how  
8 many times you had to set a whipstock, and how much  
9 you did whipstock the hole.

10 But in my opinion, I would estimate the cost  
11 should not be more than fifteen percent over the normal  
12 well cost.

13 As to feasibility, there have been many cases  
14 in the industry where the bottom of a hole has been  
15 moved much more than we are looking at here. Here,  
16 we are looking at a long section where you have fourteen  
17 thousand feet in which to connect, and I cannot see  
18 where this would be an operational impossibility.

19 Q Mr. Williamson, one more question. If shearing of  
20 the casing or damage to the casing should occur after  
21 the well is plugged, would there be any way of  
22 re-plugging the well once that had occurred and problems  
23 then developed?

24 A In my opinion, there would not be. This would be a  
25 case where you would have a deep plug if you have a

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1 competent casing program to the surface, and if that  
2 plug leaked, or if you wanted to enter the well, of  
3 course, you could always do that. If you change or  
4 shear or move the casing near the top of the hole,  
5 of course, you destroy the ability to re-enter the  
6 same well bore, and there would be no way to go in and  
7 seal off any zone that was found to be leaking.

8 MR. MORRIS: That's all we have on direct.

9 MR. PORTER: Are there any questions?

10 MR. TRAYWICK: Yes.

11 \* \* \* \*

12 CROSS EXAMINATION

13 BY MR. TRAYWICK:

14 Q Mr. Williamson, do you expect pressure above or below  
15 the ten thousand foot casing?

16 A I think normally we expect them below it.

17 Q I don't know what you mean by abnormal pressure.

18 A As we talked about a little while ago, we are looking  
19 at a normal grade of .42. Here we are looking at .65.  
20 Mr. Hickman pointed this out, and he pointed out we  
21 have pressures lower in the deep zones, which is not  
22 normal.

23 Q What would it take to control these abnormal pressures?

24 A I have not made that calculation.

25 MR. TRAYWICK: That's all.

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1216 FIRST NATIONAL BANK BLDG. EAST • ALBUQUERQUE, NEW MEXICO 87108CROSS EXAMINATIONBY MR. KELLAHIN:

Q Mr. Williamson, you encounter a similar situation in the South Carlsbad pool, do you not?

A Yes.

Q They do have a similar situation?

A Yes.

Q Do you know of any blow-outs that have occurred over there?

A Not to my knowledge.

Q And I understand that you don't know of any blow-outs in this area?

A No, if you define a blow-out as a wild well blowing to the atmosphere without control.

Q You have been talking about blow-outs. The term was your choice, you define it.

A I would say loss of control is where you have shut in surface equipment to maintain control of the well, and if the well vents to the atmosphere uncontrolled, then that is a blow-out.

Q Is that the type of blow-out that you say would cause possible damage to the potash zone?

A Yes.

Q The type you are talking about?

A The one where it is vented to the atmosphere, this

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- 1 would create hole damage.
- 2 Q That's the type of blow-out you were talking about, and
- 3 you don't know of any here?
- 4 A That's right.
- 5 Q Now, you said you understand that Belco had some
- 6 problems. What is your source of information on that?
- 7 A We have done consulting work for Belco, and we do have
- 8 information on their wells from time to time.
- 9 Q Did they have a blow-out?
- 10 A No.
- 11 Q Did they have anything that occurred which would be
- 12 a potential danger to the potash?
- 13 A As the situation occurred, no.
- 14 Q Now, you have testified that you could see no reason
- 15 Phillips couldn't drill after subsidence had occurred.
- 16 A That's correct.
- 17 Q You are not prepared to say what date that might be,
- 18 are you?
- 19 A No, sir.
- 20 Q Have you ever had any experience in drilling over an
- 21 abandoned potash mine, or any other kind of mine?
- 22 A No, sir.
- 23 Q So you don't know from your own experience what problems
- 24 might be encountered?
- 25 A No, other than the cavern type of problem you have



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- 1 here drilling through and embedded formation.
- 2 Q That would be the same as a lost circulation zone?
- 3 A Yes.
- 4 Q You don't think there would be any other problem if
- 5 overburden has occurred?
- 6 A If we make the assumption that subsidence has terminated,
- 7 no.
- 8 Q When would you say subsidence would have terminated?
- 9 A I'm not qualified to comment on that. I would have to
- 10 take the word of the mine expert.
- 11 Q You are talking about drilling a well now.
- 12 A I didn't say when.
- 13 Q You don't know at what stage of subsidence you could
- 14 drill a well?
- 15 A No, sir.
- 16 Q You just assume there has been complete subsidence?
- 17 A Right.
- 18 Q One hundred percent?
- 19 A No. If you are talking about ninety-five percent
- 20 completion of subsidence, and if we can define the
- 21 motion, whether it's vertical motion or shearing
- 22 motion, I think that would have to be a factor.
- 23 Q So there is more than just the fact of subsidence
- 24 involved here?
- 25 A You have circulation problems and potential subsidence.

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- 1 Q And also shearing action?
- 2 A If there is any remining.
- 3 Q So you could have five percent that could cause damage,
- 4 is that right?
- 5 A I don't know.
- 6 Q Now, in connection with directional drilling, have you
- 7 had any experience with that yourself?
- 8 A I have not had direct control in setting up a directional
- 9 drilling program, no.
- 10 Q You are a reservoir engineer?
- 11 A Yes.
- 12 Q You are not a drilling engineer.
- 13 A No, sir.
- 14 Q Are you at all familiar with directional drilling
- 15 problems?
- 16 A Generally, yes.
- 17 Q Do you encounter any damage to the casing when you are
- 18 directionally drilling?
- 19 A Certainly, you are drilling a hole at an angle.
- 20 Q Could that be a potential danger to the potash zone?
- 21 A Not if it were directionally drilled outside of the
- 22 potash zone.
- 23 Q But you are drilling into the potash area.
- 24 A No, my assumption was the well would be set out of the
- 25 area of potash mining.

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- 1 Q But you are drilling into Section 13, which is in the
- 2 potash zone.
- 3 A You are drilling under Section 13, below the potash zone.
- 4 Q And you say damage to the casing above that point would
- 5 cause no damage to the potash zone?
- 6 A If it were well outside of the potash zone, no.
- 7 Q How would you define the potash area?
- 8 A I am not qualified to describe the presence of ore, I
- 9 have not made a study of it.
- 10 Q Then you do not know whether they could economically
- 11 directionally drill the well or not.
- 12 A What I am going on is what has been testified to here
- 13 today.
- 14 Q You are talking about directionally drilling outside
- 15 of the mine now?
- 16 A Yes.
- 17 Q Not outside of the potash zone.
- 18 A Well, I would presume the mine and the potash zone are
- 19 coincidental.
- 20 Q Is there anything in the record to support that?
- 21 MR. MORRIS: If the Commission please, I think
- 22 counsel is badgering the witness.
- 23 MR. KELLAHIN: I certainly am. He said we can
- 24 directionally drill the well, and I am trying to find out
- 25 on what basis we could directionally drill this well. My

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1 question to the witness was clearly limited to the  
2 assumption I asked him to make, and that was that he was  
3 drilling in the Northeast quarter of Section 23 into Section  
4 13.

5 MR. MORRIS: I think there has been evidence  
6 presented here as to where the lines are, and Phillips could  
7 go over to Section 23, and we would have no stand to object  
8 to their drilling the well over there. It certainly seems  
9 that would be the most feasible thing to do from both their  
10 standpoint and our standpoint.

11 Now, I don't know what counsel can hope to  
12 accomplish by continuing this line of questioning.

13 MR. PORTER: Let's ask the witness. Do you think  
14 you could successfully directionally drill to a location,  
15 a bottom location, as requested by Phillips?

16 THE WITNESS: In my opinion, yes.

17 MR. PORTER: Without danger to the potash?

18 THE WITNESS: Yes, sir, sticking to the assumption  
19 that the well bore went through the mine level outside of  
20 the potash zone, outside of the mining zone.

21 MR. PORTER: Does that answer your question?

22 MR. KELLAHIN: No, because he keeps referring to  
23 the potash zone, and I want to know where it is.

24 THE WITNESS: I don't know.

25 Q (By Mr. Kellahin) Let's assume for a moment that there

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1 is potash under Section 23, and we are drilling  
 2 through that. My question is would damage to the casing  
 3 in that zone be a potential hazard to the mine in  
 4 Section 13?

5 A As you ask that question, I can say yes.

6 Q It would be?

7 A Yes.

8 Q On the same assumption, would there be a danger of  
 9 getting a bad cement job?

10 A Under what condition?

11 Q On whipstocking, on directional drilling.

12 A Through the mine?

13 Q I am talking about drilling in Section 23 through the  
 14 potash ore under Section 13.

15 A Under those conditions, a bad cement job could present  
 16 a hazard to the potash mine.

17 MR. KELLAHIN: That's all I have.

18 MR. PORTER: Are there any further questions?

19 (No response)

20 MR. PORTER: The witness may be excused.

21 (Witness excused.)

22 MR. PORTER: Does that conclude all the testimony?

23 MR. MORRIS: Yes.

24 MR. KELLAHIN: Yes.

25 MR. PORTER: Gentlemen, in the interest of time,

1 I have another meeting, the Commission will allow you  
2 fifteen days to file your closing arguments, if you so  
3 desire.

4 The Commission will take this case under  
5 advisement. This hearing is adjourned.

6 (Hearing adjourned.)  
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1 STATE OF NEW MEXICO )  
 2 COUNTY OF BERNALILLO } ss  
 3

4 I, RICHARD E. McCORMICK, a Certified Shorthand  
 5 Reporter, in and for the County of Bernalillo, State of  
 6 New Mexico, do hereby certify that the foregoing and attached  
 7 Transcript of Hearing before the New Mexico Oil Conservation  
 8 Commission was reported by me; and that the same is a true  
 9 and correct record of the said proceedings to the best of  
 10 my knowledge, skill and ability.  
 11

12 Richard E. McCormick  
 13 CERTIFIED SHORTHAND REPORTER  
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<u>Phillips</u>				
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# Memo

From  
D. S. NUTTER  
CHIEF ENGINEER

To

IMC Exhibits  
1 through 23 (complete)

By 4906

2/21/73

# Standard SUL-PO-MAG

2772

COMPUTERIZED  
Quality Control System

## chemical specifications

	RANGE	TYPICAL	GUARANTEE
K <sub>2</sub> O, %	22.0 — 22.9	22.3	22.0
MgO, %	18.0 — 18.8	18.5	18.0
S, %	22.3 — 22.6	22.4	
Cl, %	1.0 — 2.3	1.5	maximum 2.5 %
H <sub>2</sub> O, %	0.12— 0.15	0.14	

physical specifications, % cumulative  
(Tyler standard sieve sizes)

+ 8 Mesh	0—3	2
+10 Mesh	3—16	10
+14 Mesh	16—38	27
+20 Mesh	39—63	51
+28 Mesh	60—83	71
+35 Mesh	75—92	83
+48 Mesh	85—96	90
+65 Mesh	94—100	97

Typical bulk density, 88-92 lbs/ft<sup>3</sup>

Angle of repose, 32-34 degrees

## typical chemical analysis

	Percent
K	18.5
Mg	11.1
Ca	0.05
Na	0.76
SO <sub>4</sub>	67.4
Br	0.005
Insol.	0.33

5255 8/68

IMC # 1 4906 2/21/73

INTERNATIONAL MINERALS &amp; CHEMICAL CORPORATION



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**NORTH AMERICAN POTASSIUM MAGNESIUM SULFATE SHIPMENTS TRENDS**  
(Thousand Short Tons of Product, 22% K<sub>2</sub>O and 18.5% MgO Content)

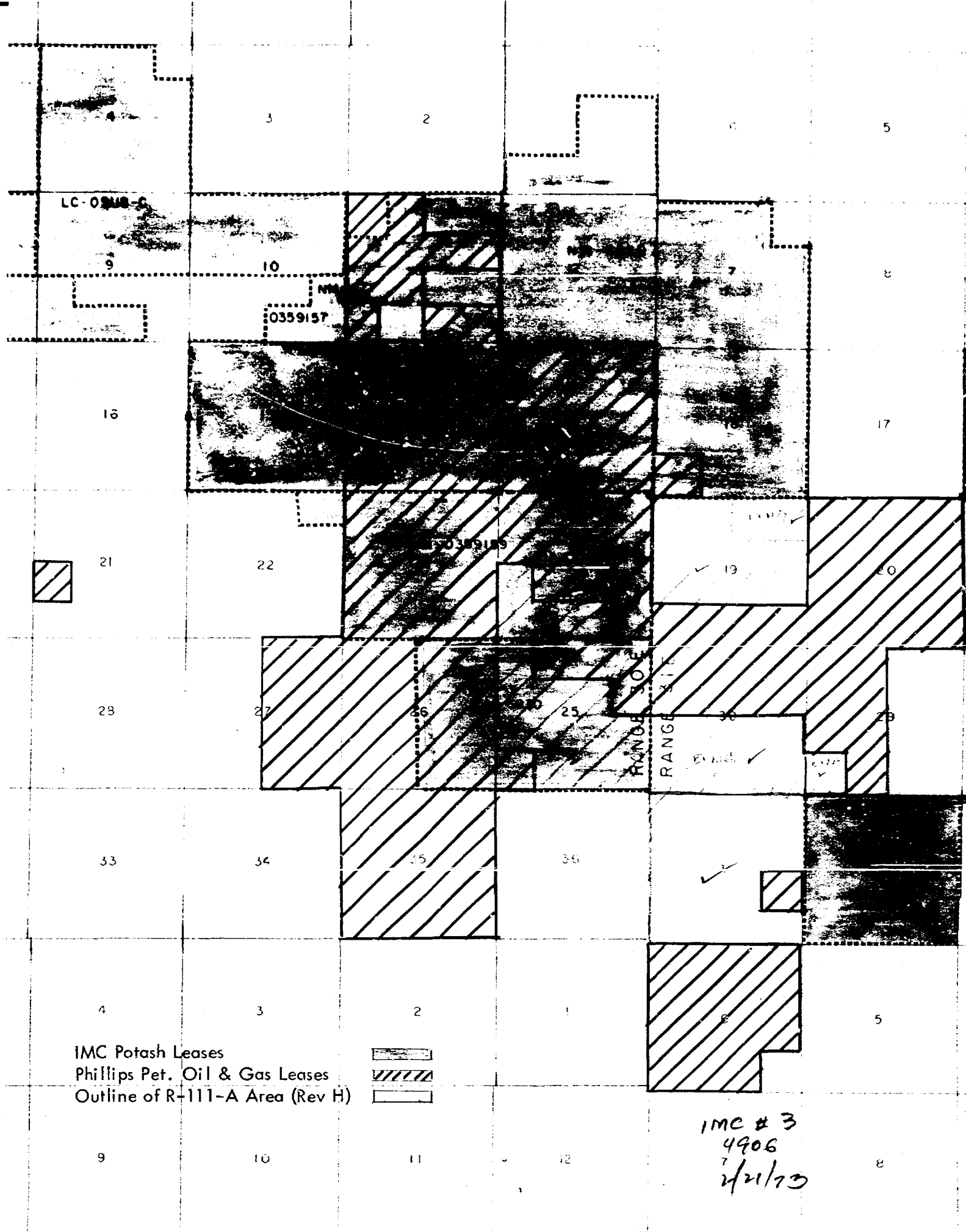
Fiscal Year	Shipments to U.S. & Canada				Overseas Exports				Total Shipments			
	Ind. <sup>1</sup> (tons)	Duval (tons)	IMC (tons)	Imc Share (%)	Ind. <sup>2</sup> (tons)	Duval (tons)	IMC (tons)	IMC Share (%)	Ind. (tons)	Duval (tons)	IMC (tons)	IMC Share (%)
1969/70	360	170	190	53%	35	10	25	71%	395	180	215	54%
1970/71	354	171	183	52%	49	6	43	88%	403	177	226	56%
1971/72	391	185	206	53%	66	18	48	73%	457	203	254	56%
1972/73 <sup>3</sup>	430	179	251	58%	70	19	51	73%	500	198	302	60%
1973/74 <sup>4</sup>	470	205	265	56%	80	25	55	69%	550	230	320	59%
1974/75 <sup>4</sup>	510	226	284	56%	80	19	61	76%	590	245	345	58%
1975/76 <sup>4</sup>	550	244	306	56%	80	16	64	80%	630	260	370	59%

- 1 Domestic wholesale demand has grown at a rate of 8.0% per year from 63/64 to 71/72. If stimulated by IMC's feed grade S-P-M and agronomic programs, the growth rate should be about 9% per year from 1971/72 to 1975/76.
- 2 Exports have responded to IMC promotional programs in the past and now Duval is aggressive in the Singapore area. The Texada venture in Australia, will, however, reduce U.S. exports to the Asia/Pacific area.
- 3 Based on D. Teleki market estimate and sales divisional IMC tonnage estimates as of 12-12-72.
- 4 Based on D. Teleki market estimate and preliminary Three Year Plan IMC sales estimates as of 12-12-72.

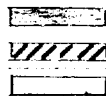
Source: Historical data based on IMC sales records and PINA potash shipments reports.

DT  
12-13-72

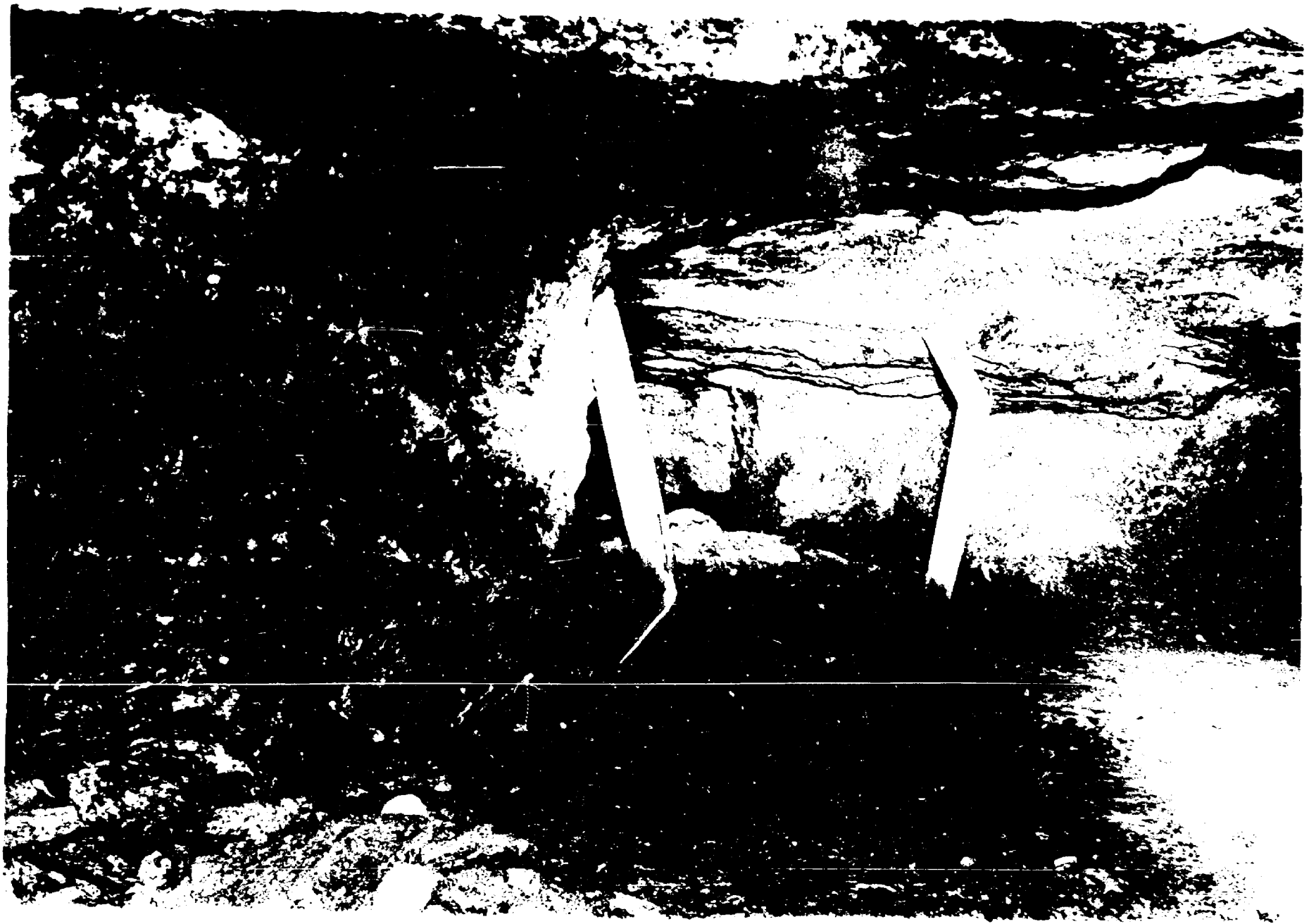
IMC # 2  
4906  
2/21/73



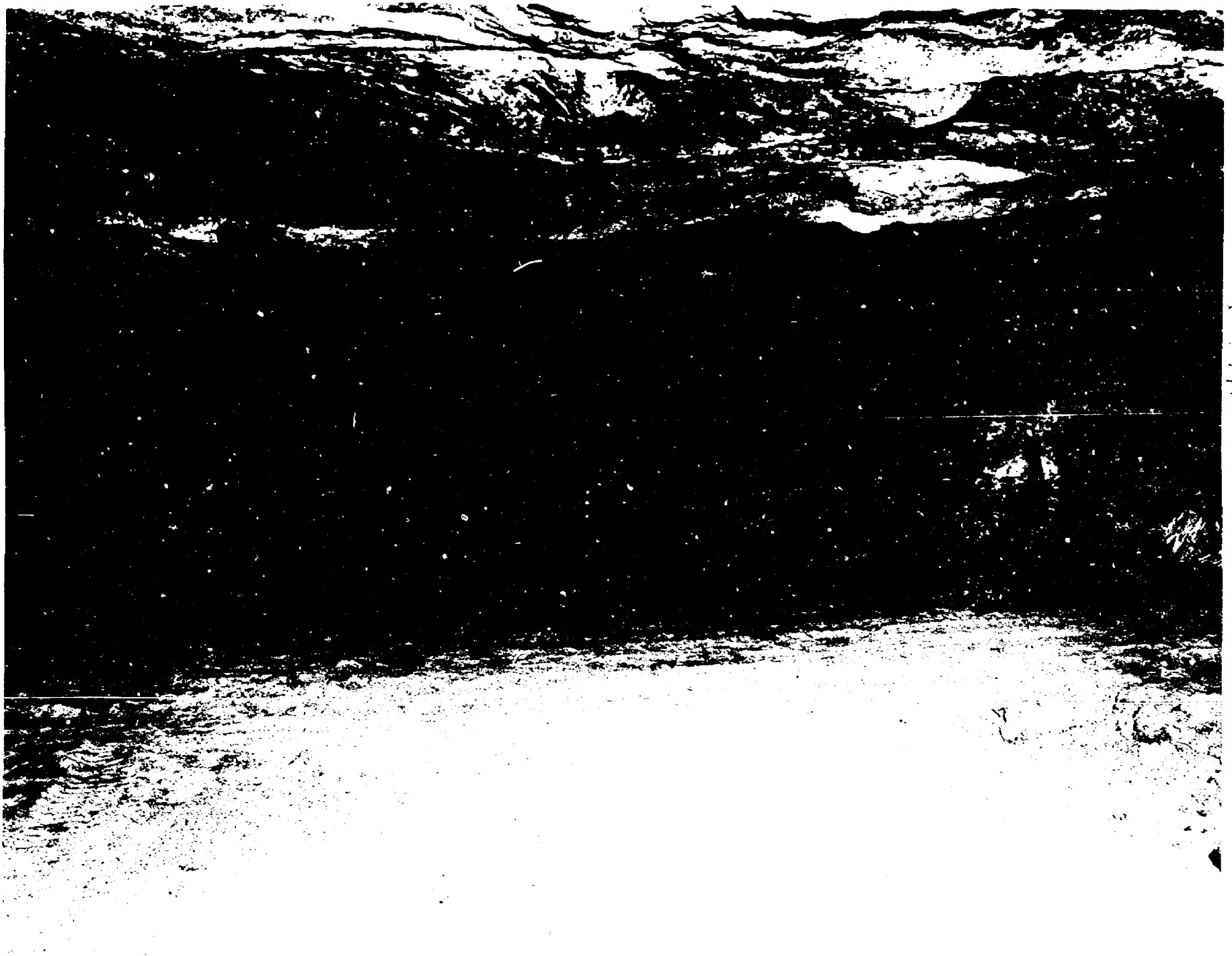
IMC Potash Leases  
Phillips Pet. Oil & Gas Leases  
Outline of R-111-A Area (Rev H)



IMC # 3  
4906  
4/21/73









7. 10. 11

RESERVE CALCULATIONS  
USGS 4th ORE ZONE (NO. 3 BED)

Section 13		<u>Area *</u>	<u>Thickness</u>	<u>% Lang</u>	<u>% Syl.</u>	<u>Tons Ore</u>	<u>Prod Tons Lang</u>	<u>Prod Tons Syl.</u>
Polygon around	#369	8.58	11.8	9.0	4.8	7,499,550	3,068,000	600,000
	#370	15.18	8.4	11.3	0.2	9,445,330	4,851,450	31,500
	#371	3.86	7.3	6.3	5.4	2,087,260	597,730	18,800
	#384	0.26	4.4	8.8	4.8	84,740	33,910	6,800
Total		27.88				19,116,880	8,551,090	657,100

1400 Ft. Radius Circle Around Proposed Location of Phillips Well

Segment around	#369	0.05	11.8	9.0	4.8	43,700	17,860	3,500
	#370	3.80	8.4	11.3	0.2	2,364,440	1,214,450	7,880
	#371	1.75	7.3	6.3	5.4	946,300	270,990	85,170
	#386	0.56	8.7	0.2	0.1	360,900	3,280	600
Total		6.16				3,715,340	1,506,580	97,150

Note ( \* ) Area x 10<sup>6</sup> = ft<sup>2</sup>

1MC 11

## TONNAGE & VALUE CALCULATIONS

### SECTION 13

$$\text{Area} = 640 \text{ acres} = 27,878,400 \text{ ft}^2 \quad (\text{one acre} = 43,560 \text{ ft}^2)$$

$$\text{Volume} = \text{Area} \times \text{Thickness} = 223,027,200 \text{ ft}^3 \quad (\text{for 8' thickness})$$

$$\text{Tons Ore} = \text{Volume} \div 13.5 = 16,520,533 \text{ tons}$$

### 150' RADIUS CIRCLE

$$\text{Area} = 70,686 \text{ ft}^2$$

$$\text{Volume} = 565,488 \text{ ft}^3 \quad (\text{for 8' thick bed})$$

$$\text{Tons Ore} = 41,888 \text{ tons}$$

### 1400' RADIUS CIRCLE

$$\text{Area} = 6,157,536 \text{ ft}^2$$

$$\text{Volume} = 49,260,288 \text{ ft}^3 \quad (\text{for 8' thick bed})$$

$$\text{Tons Ore} = 3,648,910 \text{ tons}$$

$$\text{TONS LOST} = (50\% \text{ Small Circle} + 40\% \text{ Large Circle}) \cdot 85 \times \frac{\text{Ore Grade}}{\text{Prod. Grade}}$$

$$\text{TONS LOST} = (20,944 + 1,459,564) \cdot 85 \times \frac{9.4}{22.0} = \underline{537,694 \text{ Tons}}$$

$$\text{VALUE} = 537,694 \times \$18.50 = \underline{\underline{\$9,947,339.00}}$$

IMC 12-



4/2/57 25' EAST OF POINT R6, S13

Ex. "II"

11/16  
12



# 558

2/21/97

5.7'

Exhibit "M"



#558 2/28/57

5.2'

Exhibit "N"

1146  
15



#558 3/7/57 44'

Exhibit "O"





# 558

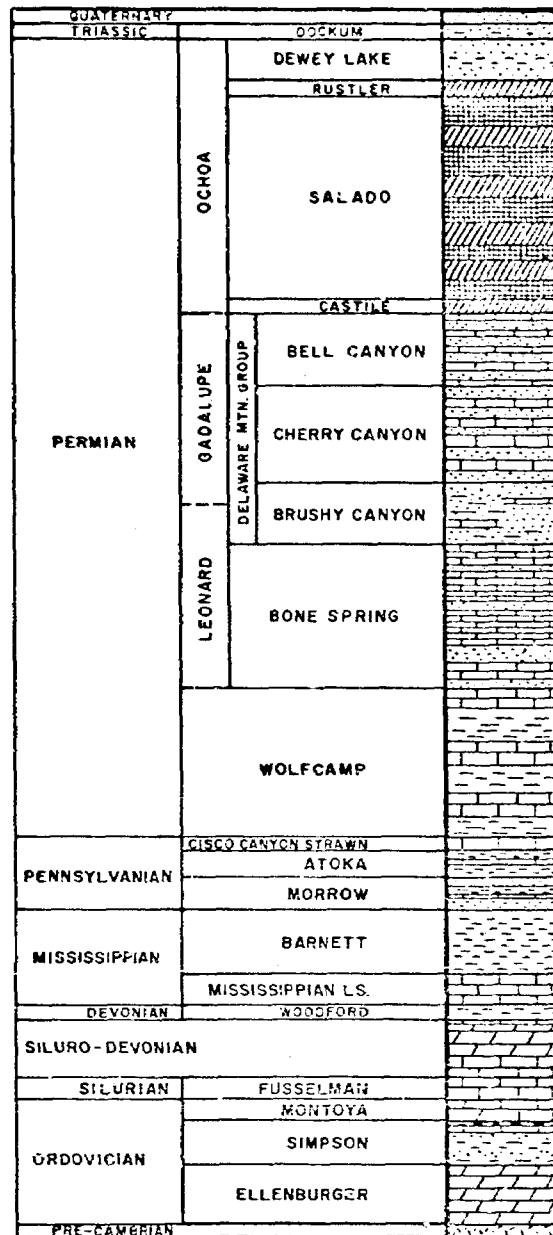
3/14/57

3.2'

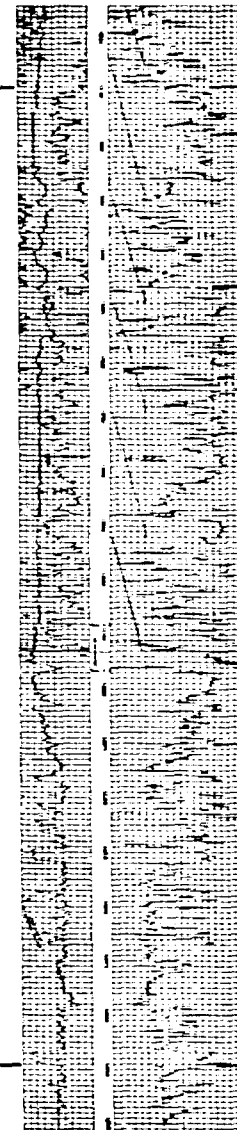
Exhibit "P"

MC  
17

GENERALIZED SECTION - DELAWARE BASIN



EL PASO  
No. 1  
Arco - St.



Top of STRAWN

ATOKA

MORROW SAND

Top of BARNETT SHALE

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
Case No. 4906 Exhibit No. 18  
Submitted by IMC  
Hearing Date 2-21-73

TYPE LOG

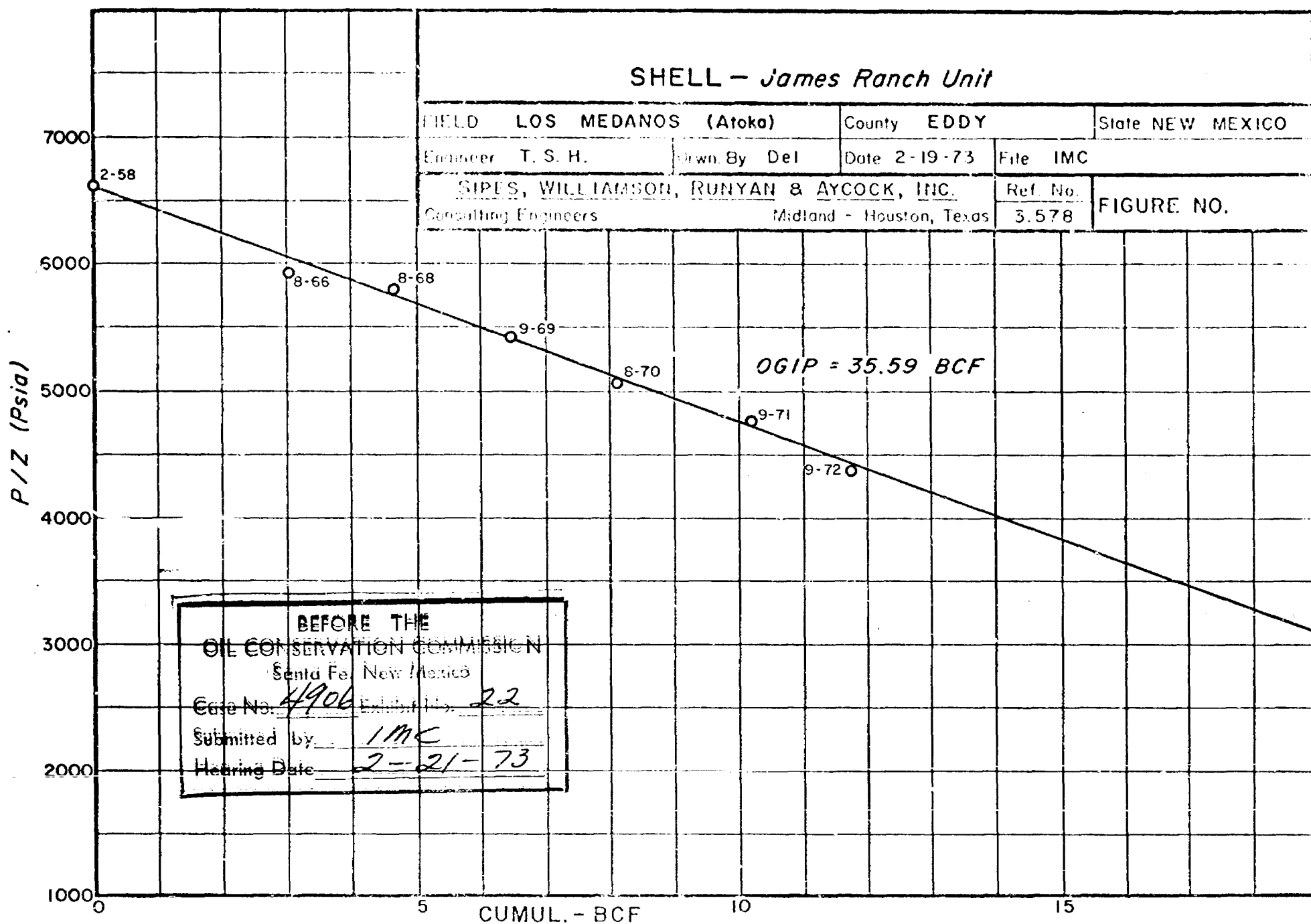
IMC 18

FIELD SAND DUNE		County EDDY		State NEW MEX.	
Engineer T. S. H.	Drwn. By Del	Date 2-19-73	File IMC		
SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.			Ref. No.	FIGURE NO.	
Consulting Engineers		Midland - Houston, Texas	3.578		

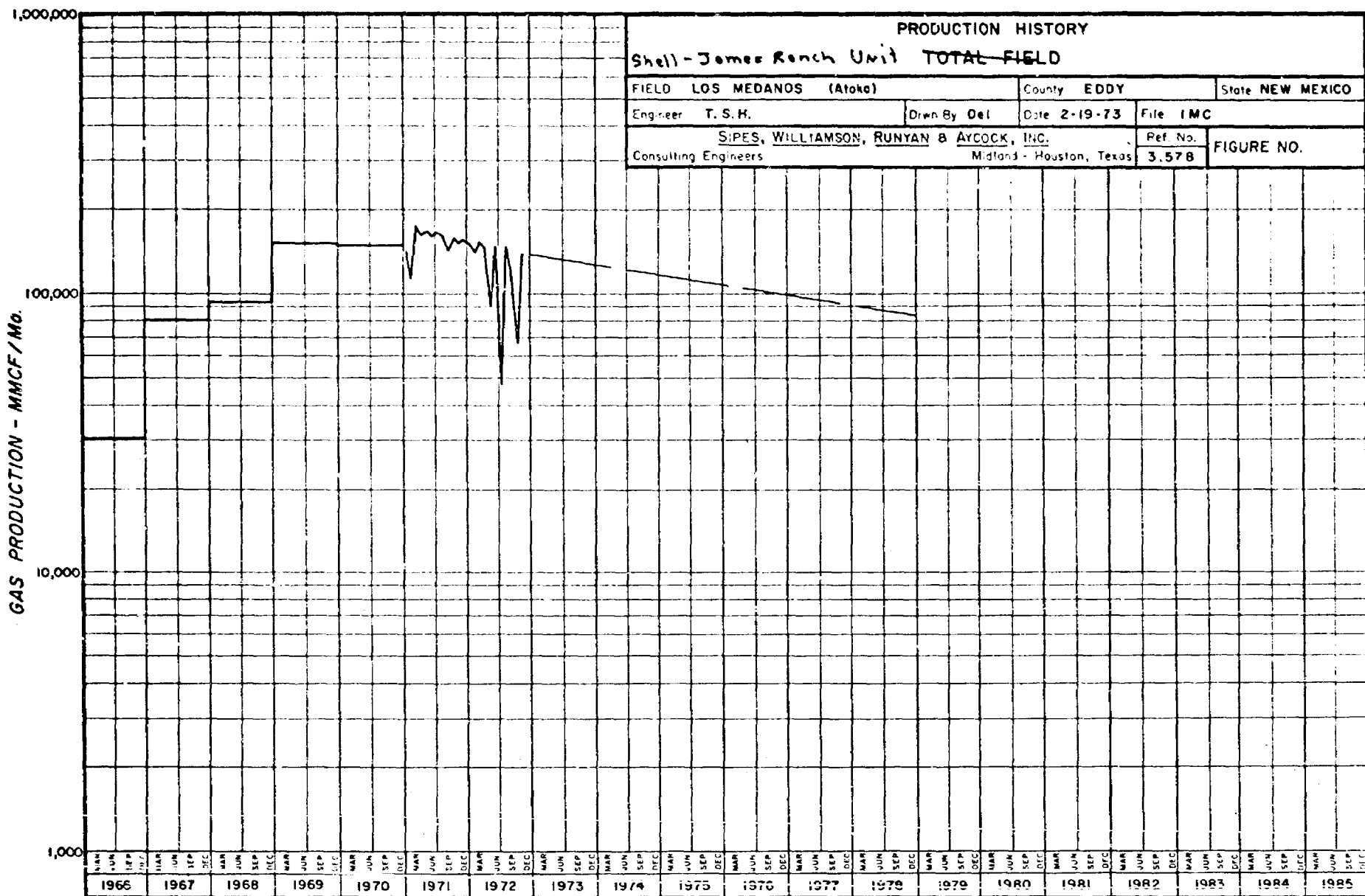
1MC22

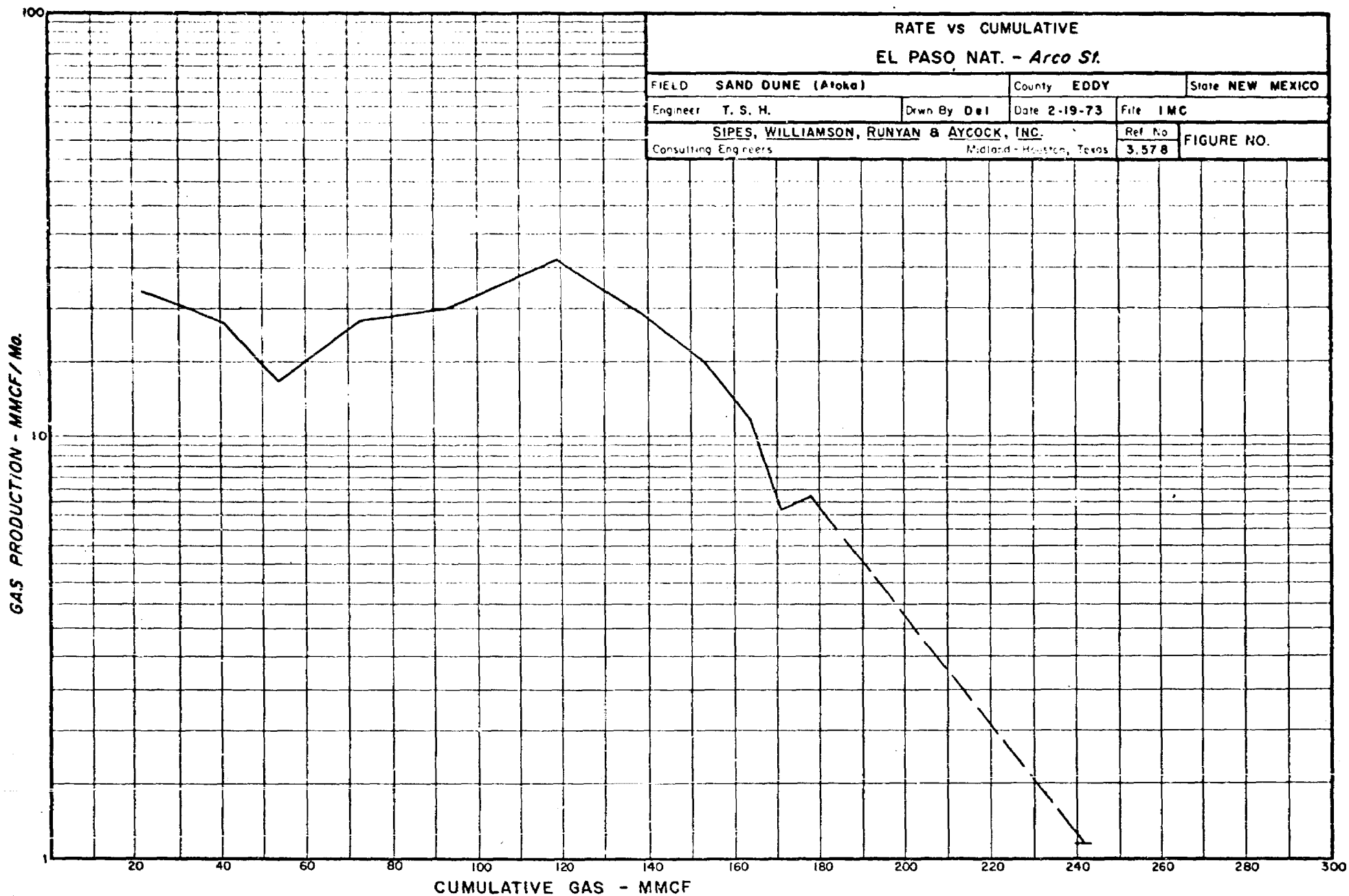
# SHELL - James Ranch Unit

FIELD	LOS MEDANOS (Atoka)	County	EDDY	State	NEW MEXICO
Engineer	T. S. H.	Drawn By	Del	Date	2-19-73
SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.				Ref. No.	3.578
Consulting Engineers				Midland - Houston, Texas	FIGURE NO.

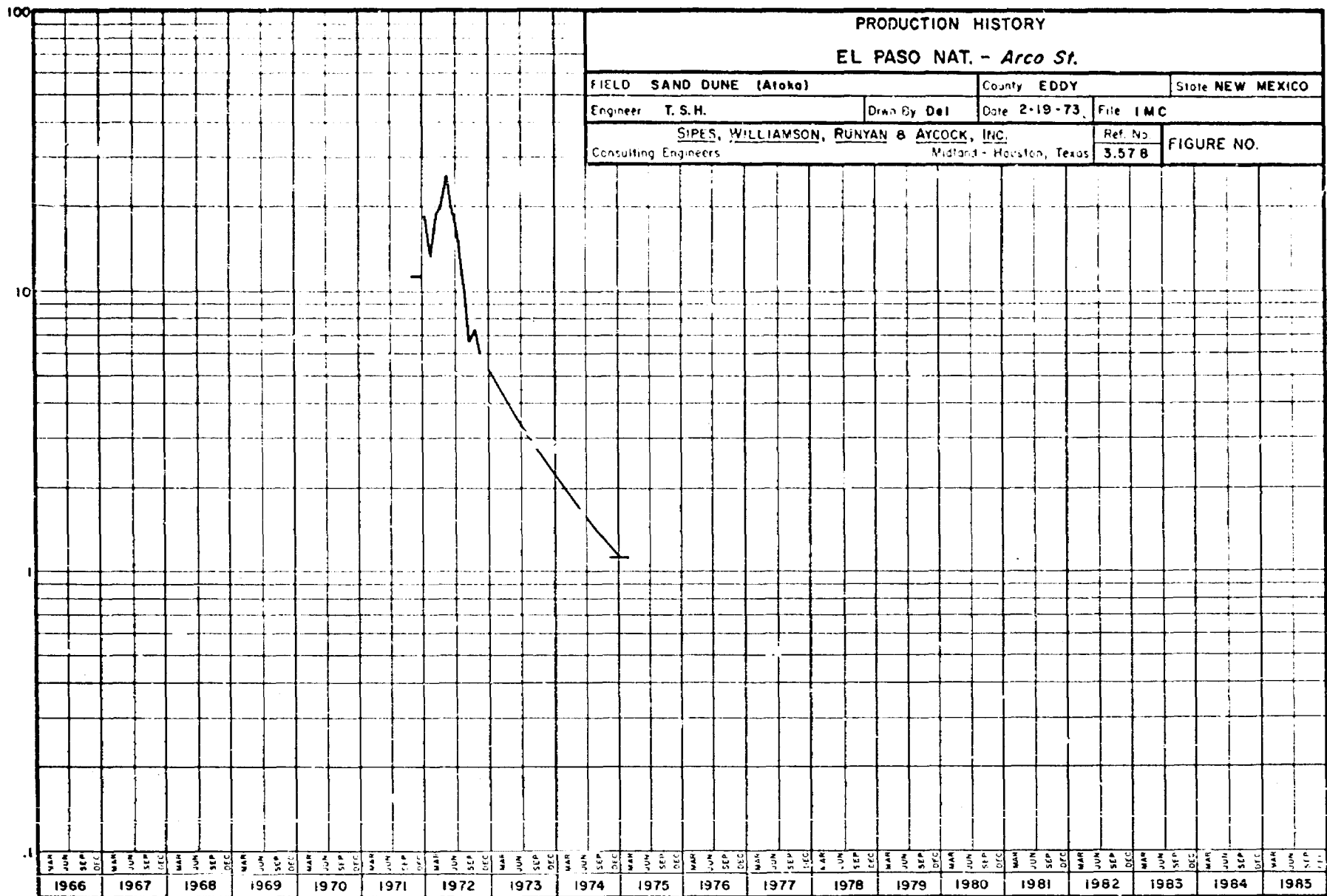


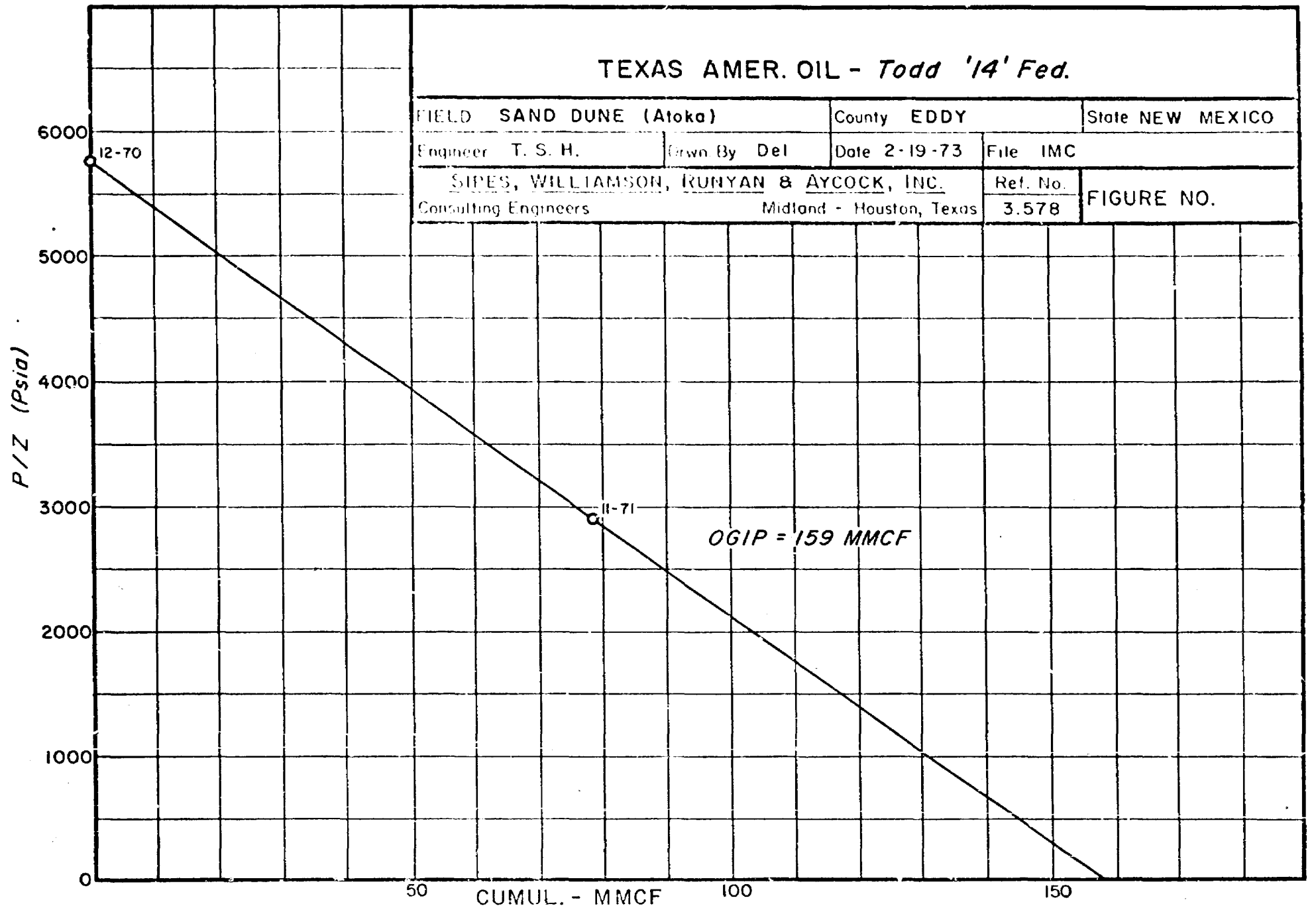
BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
Case No. 4906 Exhibit No. 22  
Submitted by IMC  
Hearing Date 2-21-73



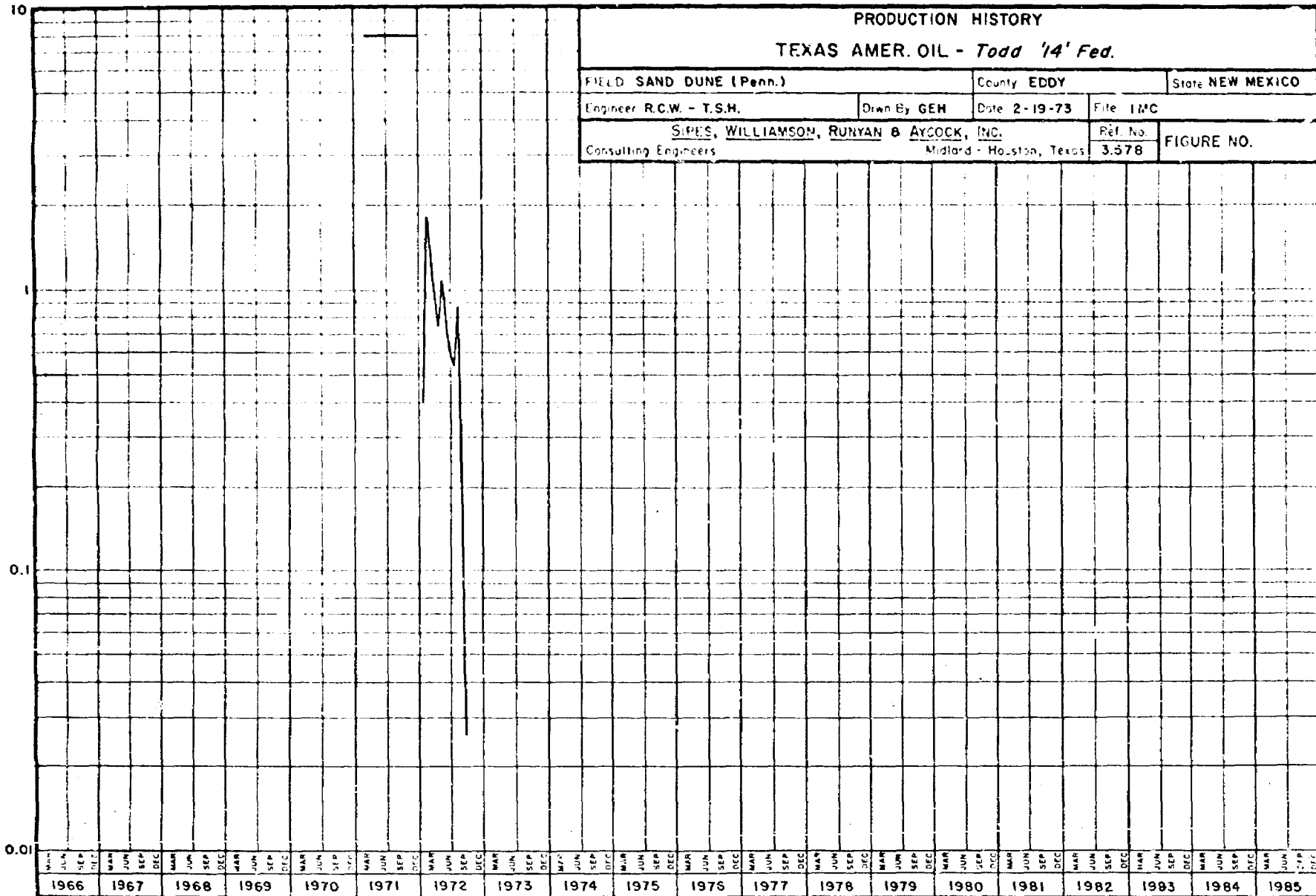


GAS PRODUCTION - MMCF/Mo.





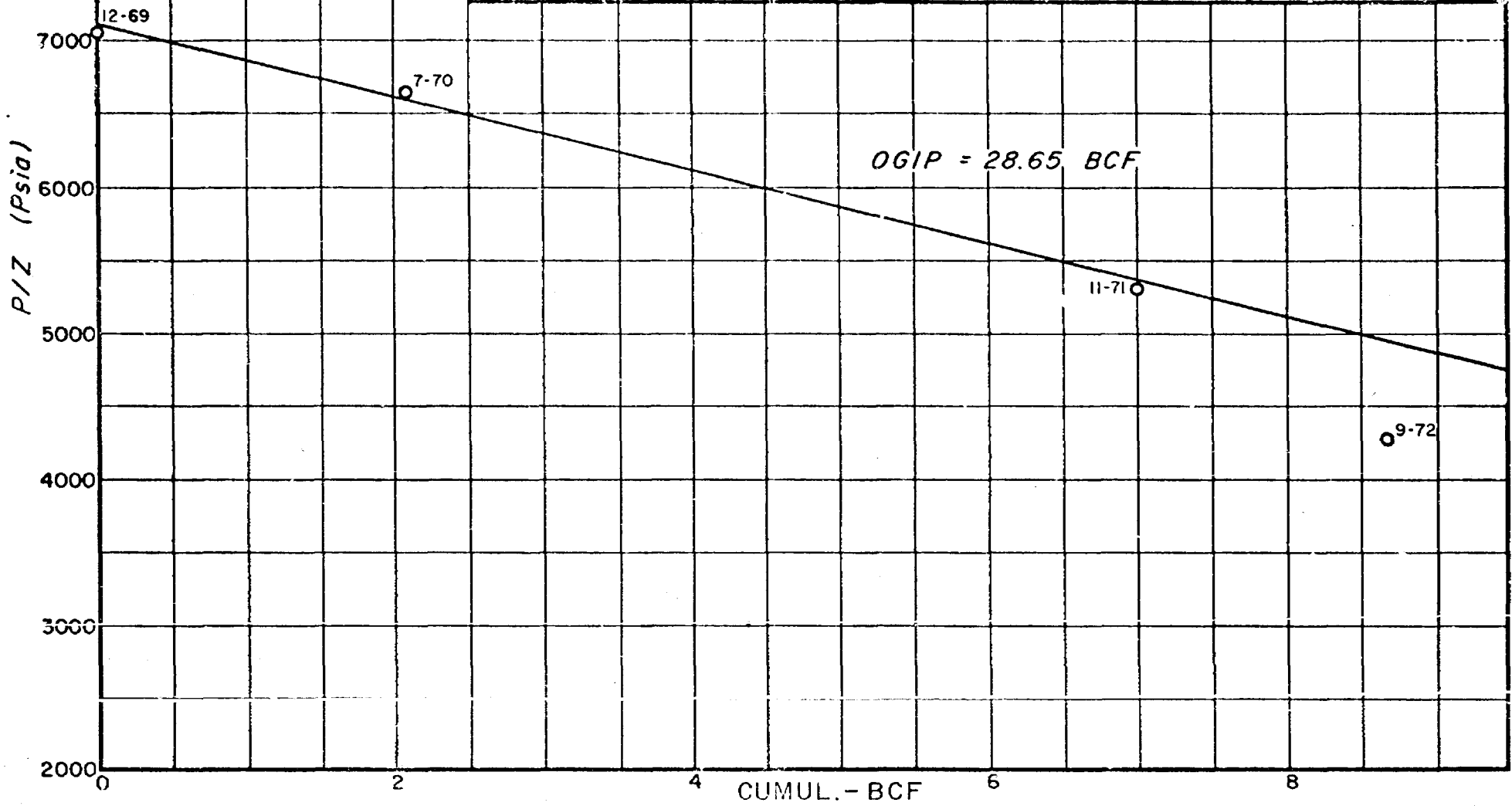
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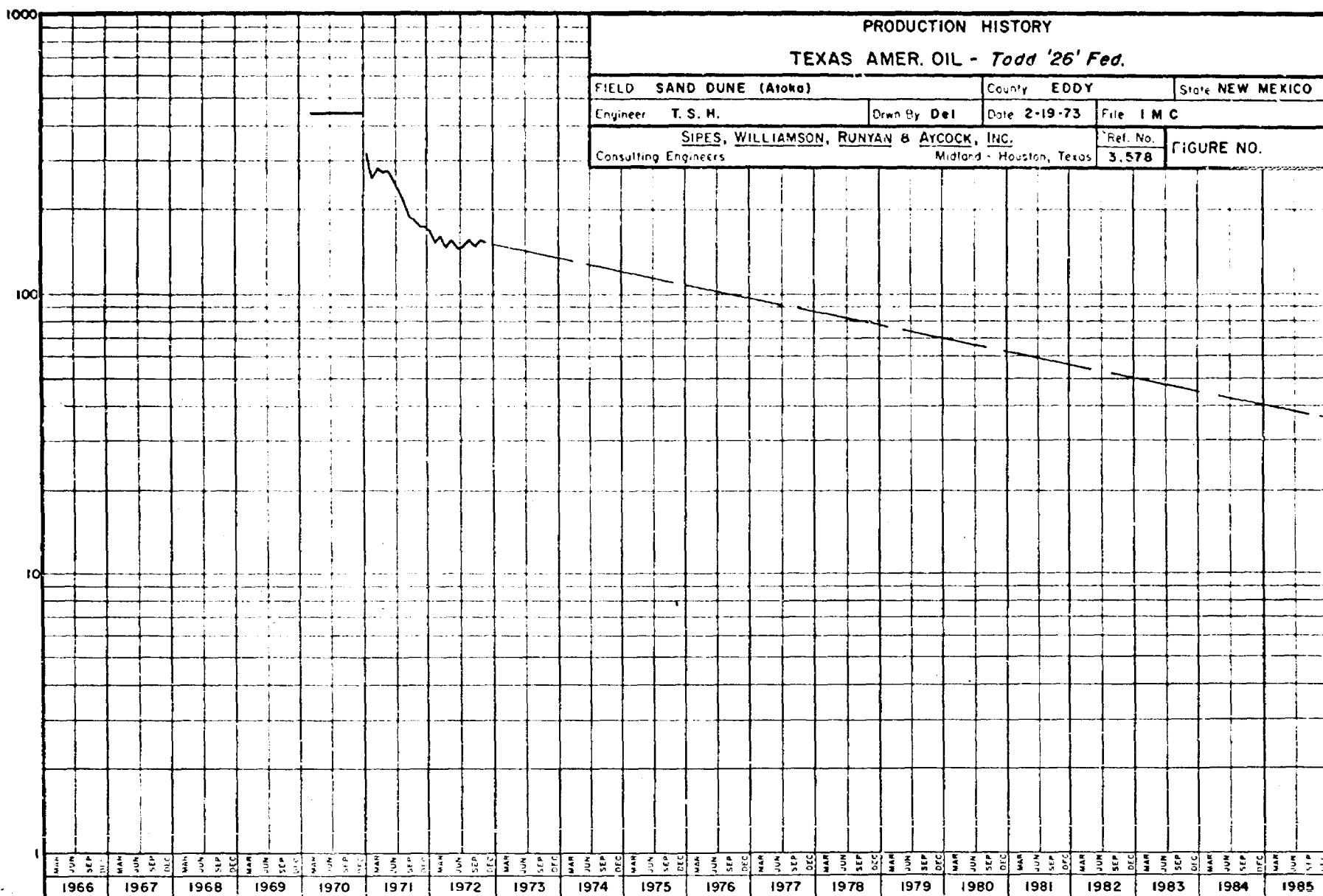


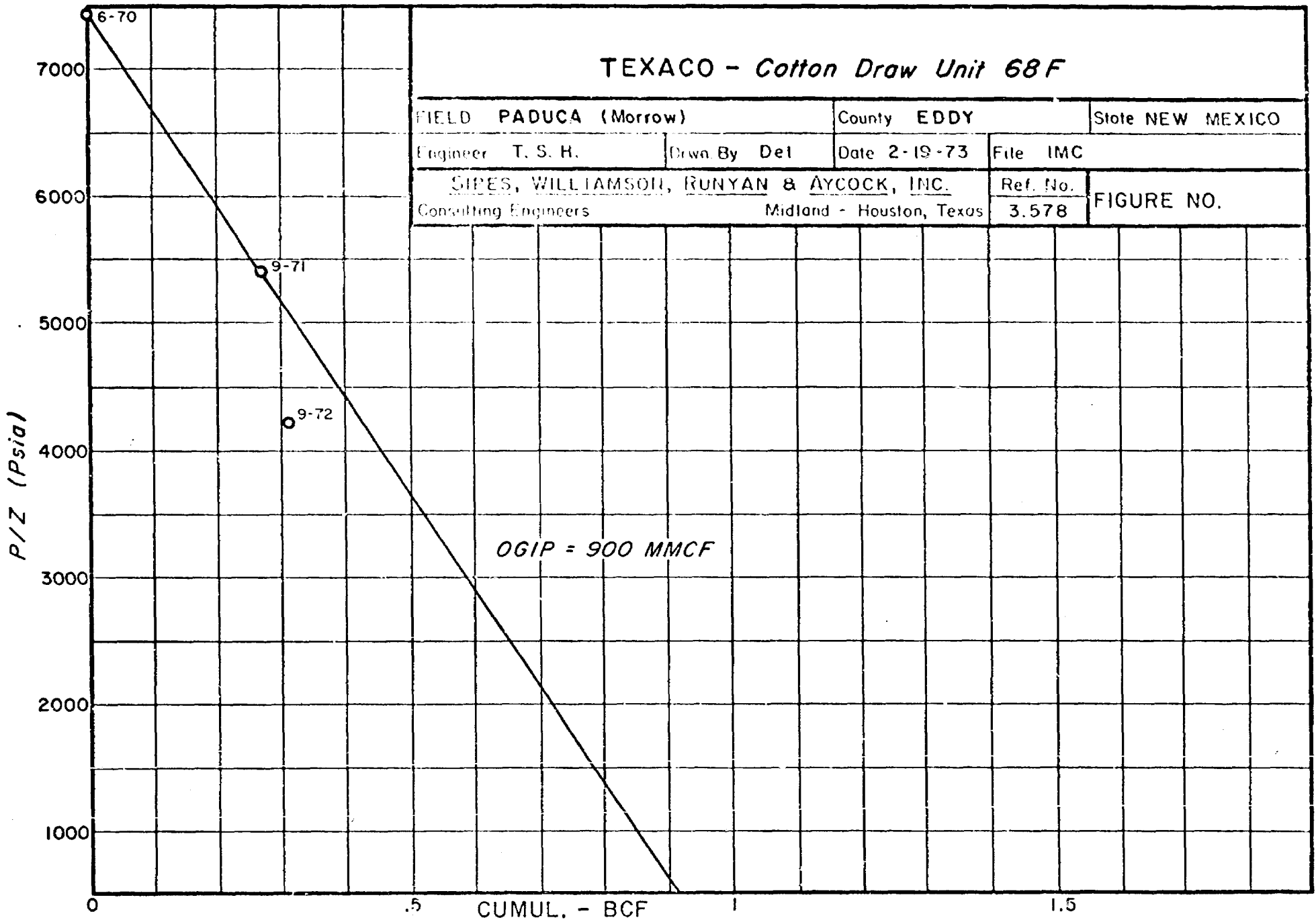
# TEXAS AMER. OIL - Todd '26' Fed.

FIELD	SAND DUNE (Atoka)	County	EDDY	State	NEW MEXICO
Engineer	T. S. H.	Drawn By	Del	Date	2-19-73
				File	IMC
SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.				Ref. No.	FIGURE NO.
Consulting Engineers				3.578	
Midland - Houston, Texas					

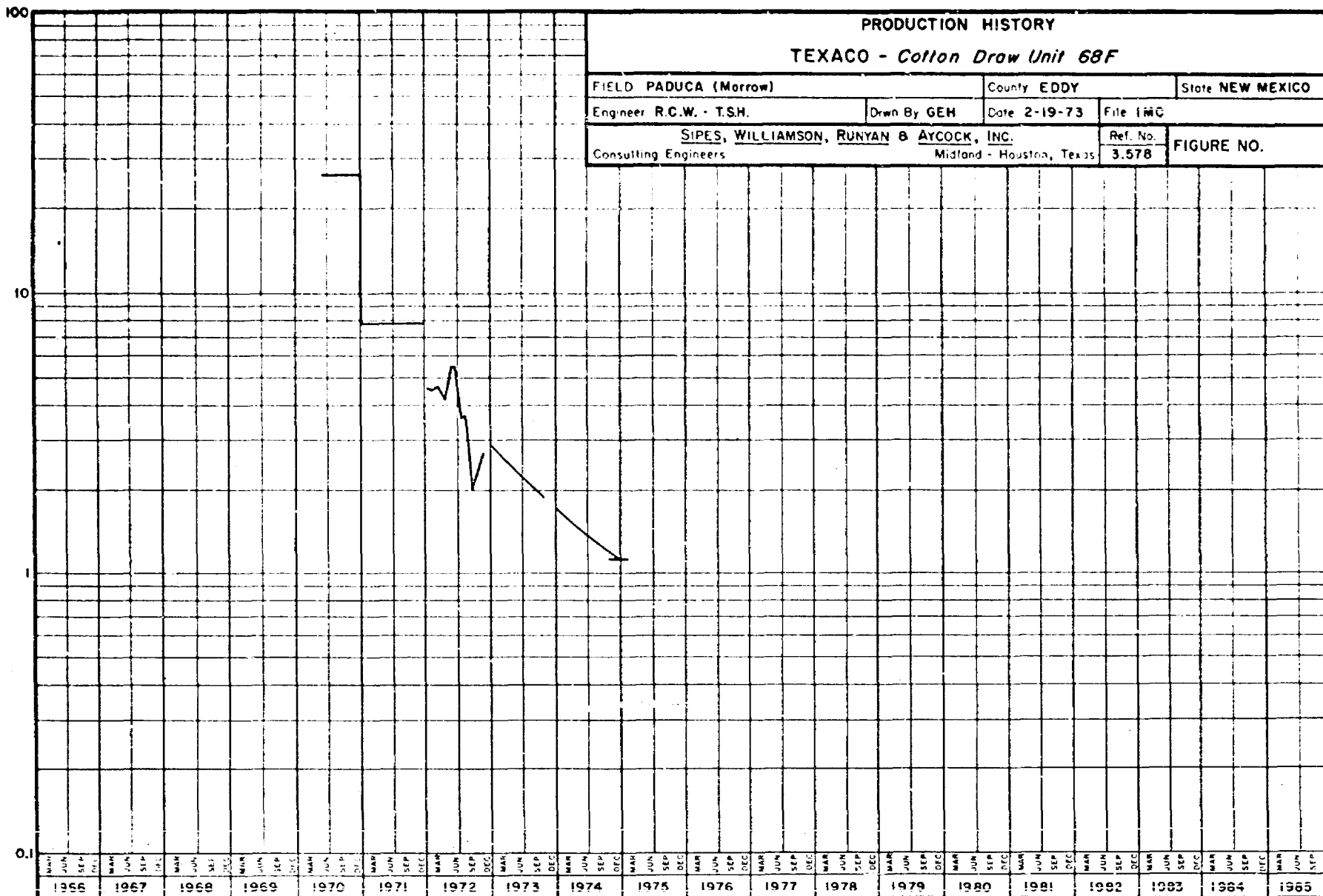


GAS PRODUCTION - MMCF/Mo.





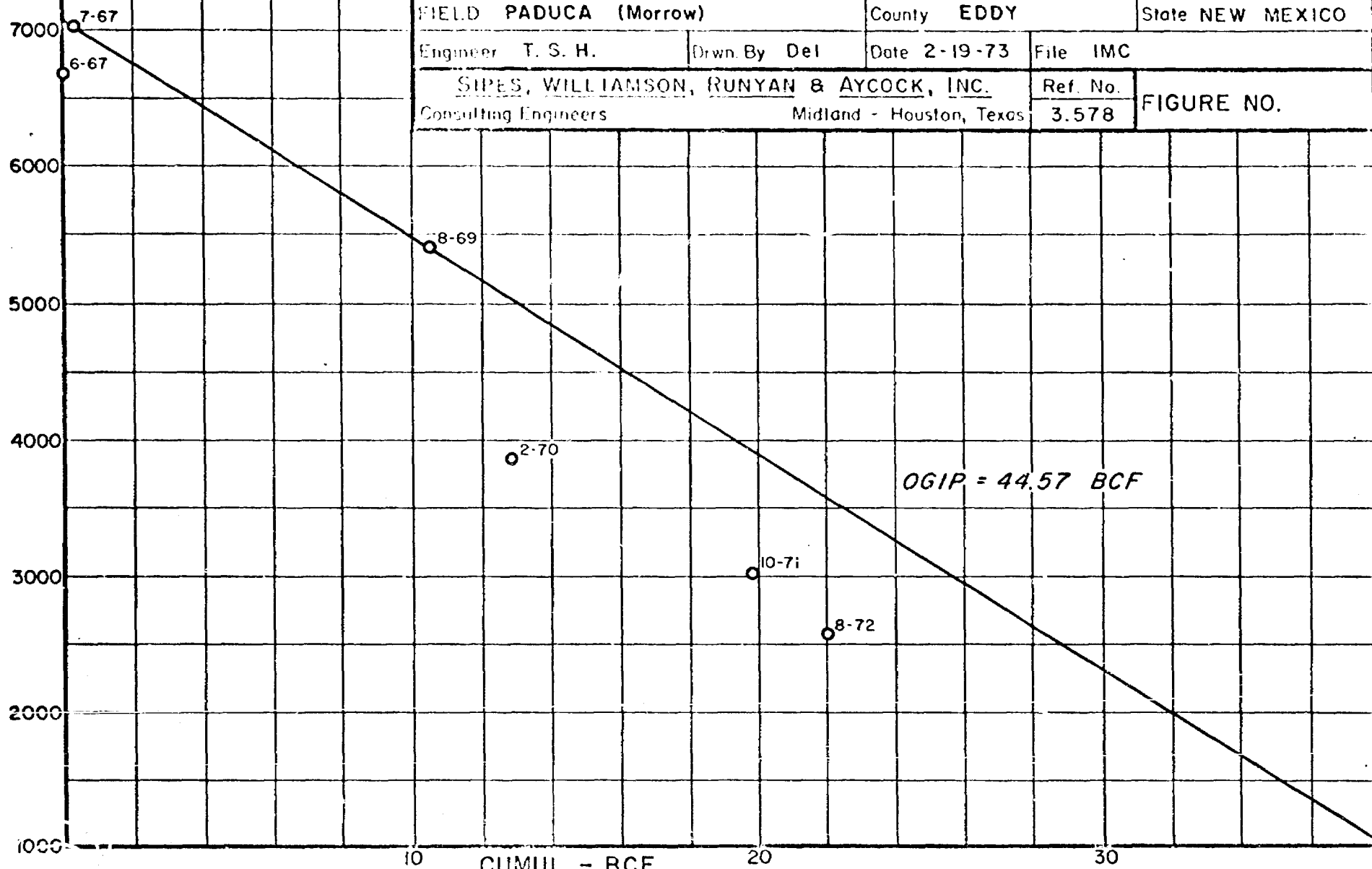
GAS PRODUCTION - MMCF/Mo.



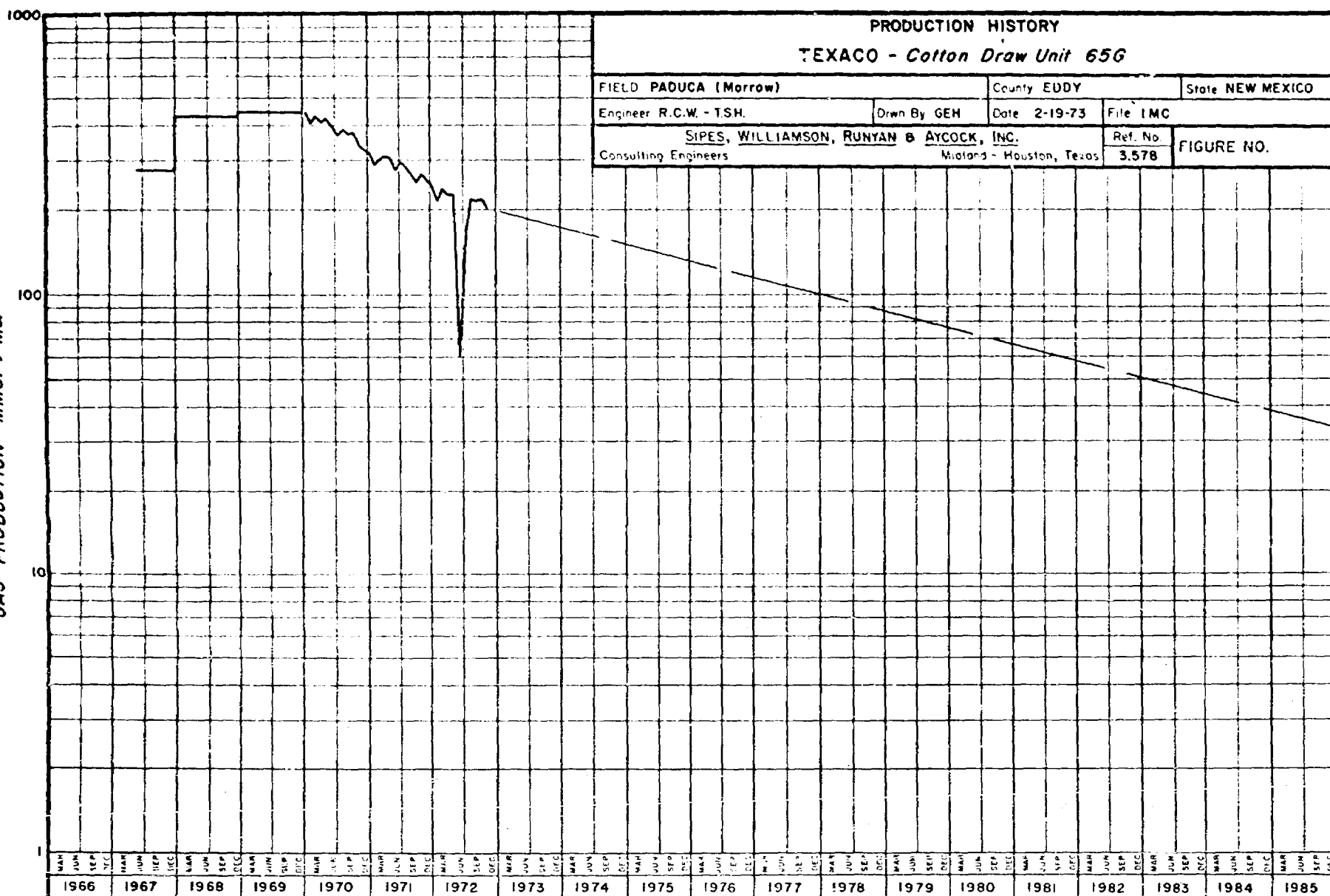
# TEXACO - Cotton Draw Unit 65G

FIELD PADUCA (Morrow)		County EDDY	State NEW MEXICO
Engineer T. S. H.	Drwn. By Del	Date 2-19-73	File IMC
SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.		Ref. No.	FIGURE NO.
Consulting Engineers		3.578	
Midland - Houston, Texas			

P/Z (Psia)



GAS PRODUCTION - MMCF / Mo



# TEXACO - Cotton Draw Unit 67 L

FIELD PADUCA (Morrow) County EDDY State NEW MEXICO

Engineer T. S. H. Drwn. By Del Date 2-19-73 File IMC

SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.

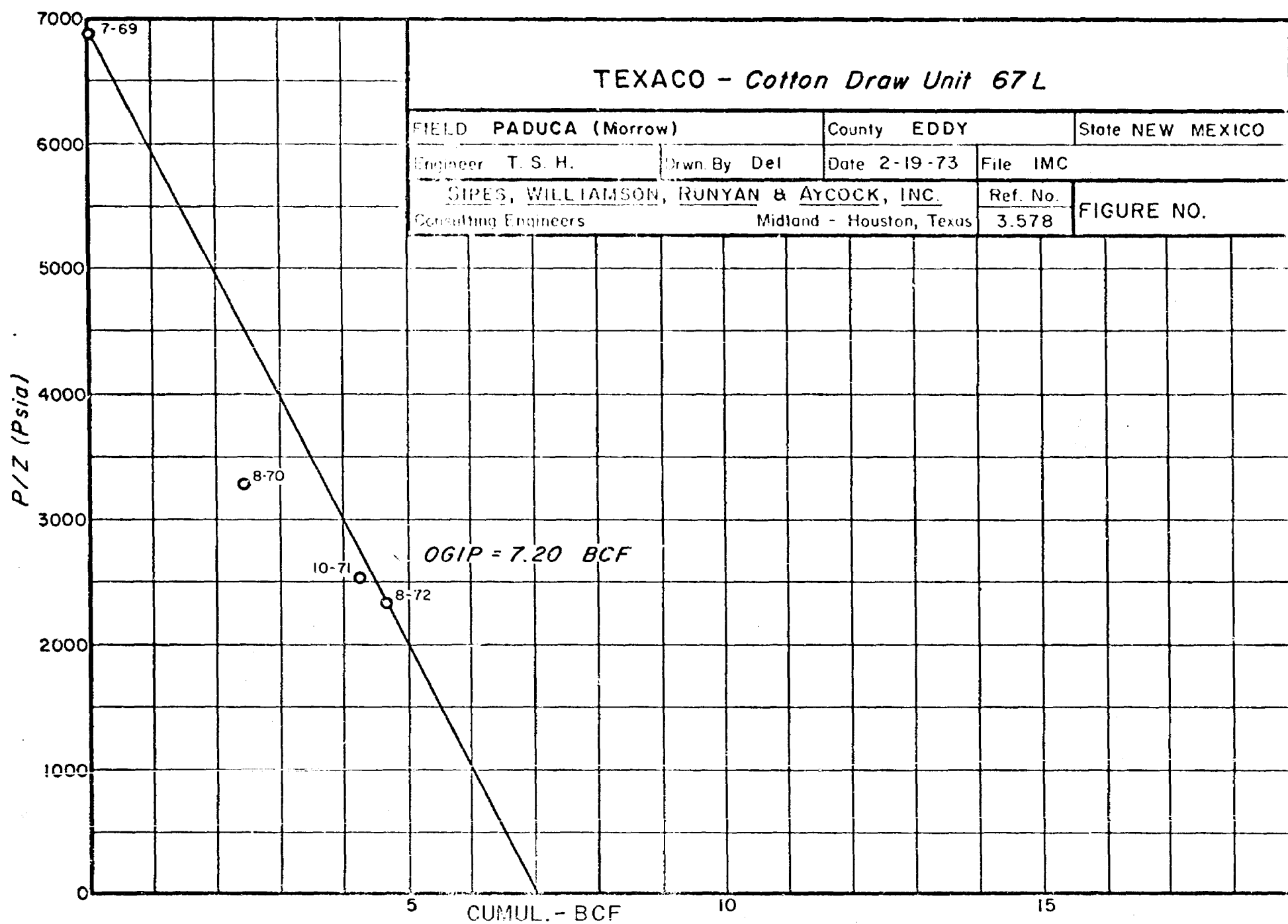
Consulting Engineers

Midland - Houston, Texas

Ref. No.

3.578

FIGURE NO.



1000

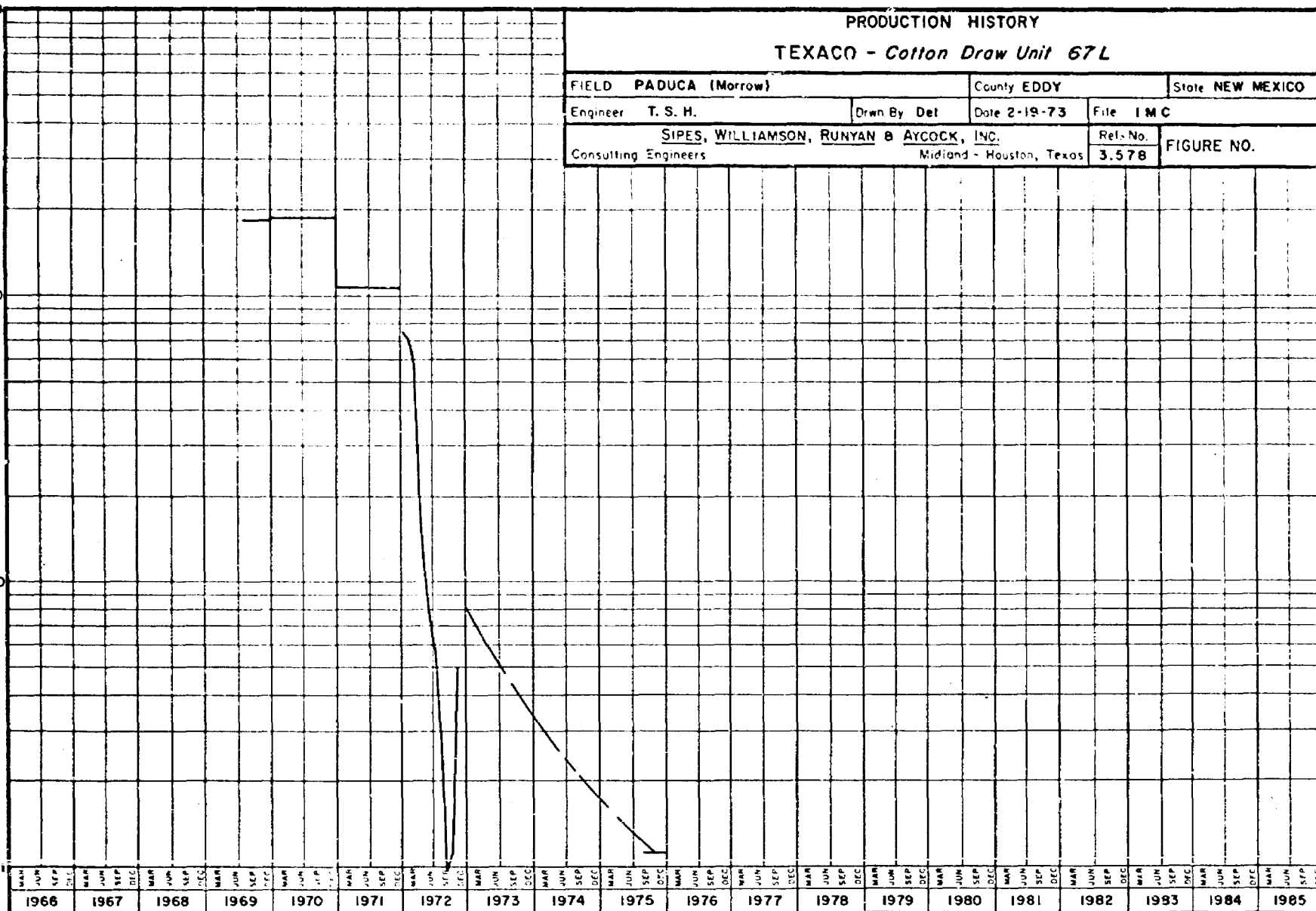




EXHIBIT 23

TABLE OF PRODUCTION AND RESERVE DATA  
CERTAIN PENNSYLVANIAN AGE FIELDS  
BIDY COUNTY, NEW MEXICO

REPORT TO THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
Case No. 4906 Exhibit No. 23  
Submitted by: IMC  
Hearing Date: 2-21-73

FIELD (RESERVOIR)	OPERATOR	Lease Name - Well No. & (Location)	Date of Initial Production	Cumulative Production @ 12/1/72 BCF	Reserves @ 12/1/72 BCF	Ultimate Reserves BCF	Total Producing Life Years
LOS MEDANOS FIELD	BELCO	James Ranch No. 3 (1-23S-30S)	not connected	0.000	0.000	0.000	0
LOS MEDANOS (ATOKA) FIELD	SHELL OIL COMPANY	James Ranch Unit 10 (36-22S-30E)	2/58	11.872	19.684	31.556	72
PADUCA (MORROW) FIELD	TEXACO INC.	Cotton Draw Unit 65G (2-25S-31E)	6/67	22.677	17.353	40.030	46
		67L (35-24S-31E)	8/69	4.690	0.055	4.745	6
		68F (12-25S-31E)	6/70	0.319	0.045	0.364	4.5
SAND DUNES (ATOKA) WEST FIELD	EL PASO NATURAL GAS CO.	Arco State 1K (16-23S-31E)	12/71	0.183	0.057	0.240	3
SAND DUNES FIELD	EL PASO NATURAL GAS	Mobil-Federal 1 (29-23S-31E)	not connected	0.000	0.000	0.000	0
SAND DUNES (LOWER PENN) FIELD	EL PASO NATURAL GAS CO.	Sundance Federal 1F (4-24S-31E)	11/72	0.012	-	-	-
	TEXAS AMERICAN OIL CORPORATION	Todd Federal 14-1 1K (14-23S-31E)	3/71	0.087	0.000	0.087	2
SAND DUNES (ATOKA) FIELD	TEXAS AMERICAN OIL CORPORATION	Todd Federal 26-1 1G (26-23S-31E)	3/70	8.978	16.654	25.632	50
SAND DUNES FIELD	TEXAS AMERICAN OIL CORPORATION	Todd Federal 36 1 (36-23S-31E)	not connected	0.000	0.000	0.000	0

EXHIBIT 23  
IMC

SIPES, WILLIAMSON, RUMYAN & AYCOCK, INC.  
1100 GHLS TOWER WEST MIDLAND, TEXAS 79701  
ROY C. WILLIAMSON, JR., P. E./pw 2/19/73

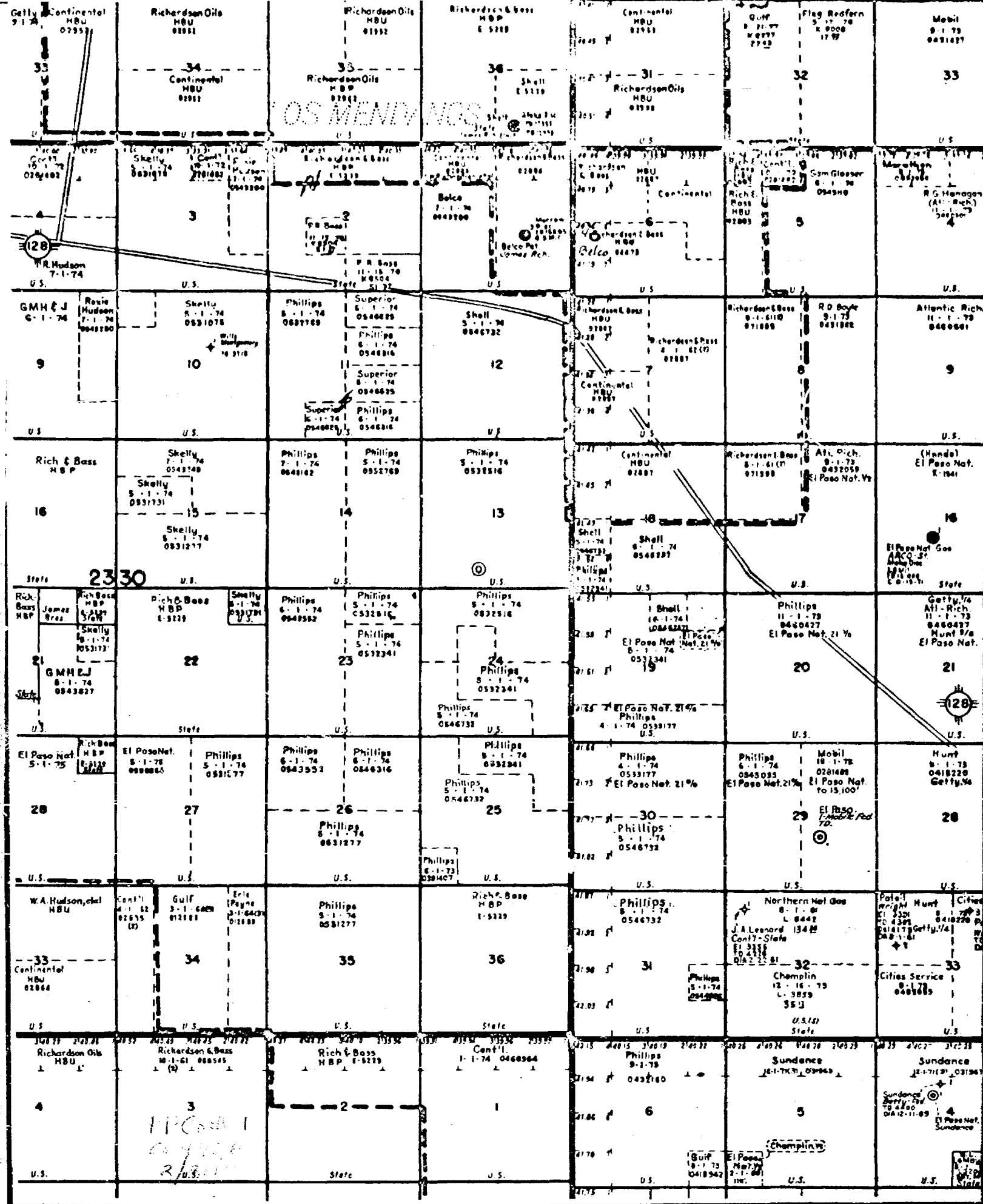
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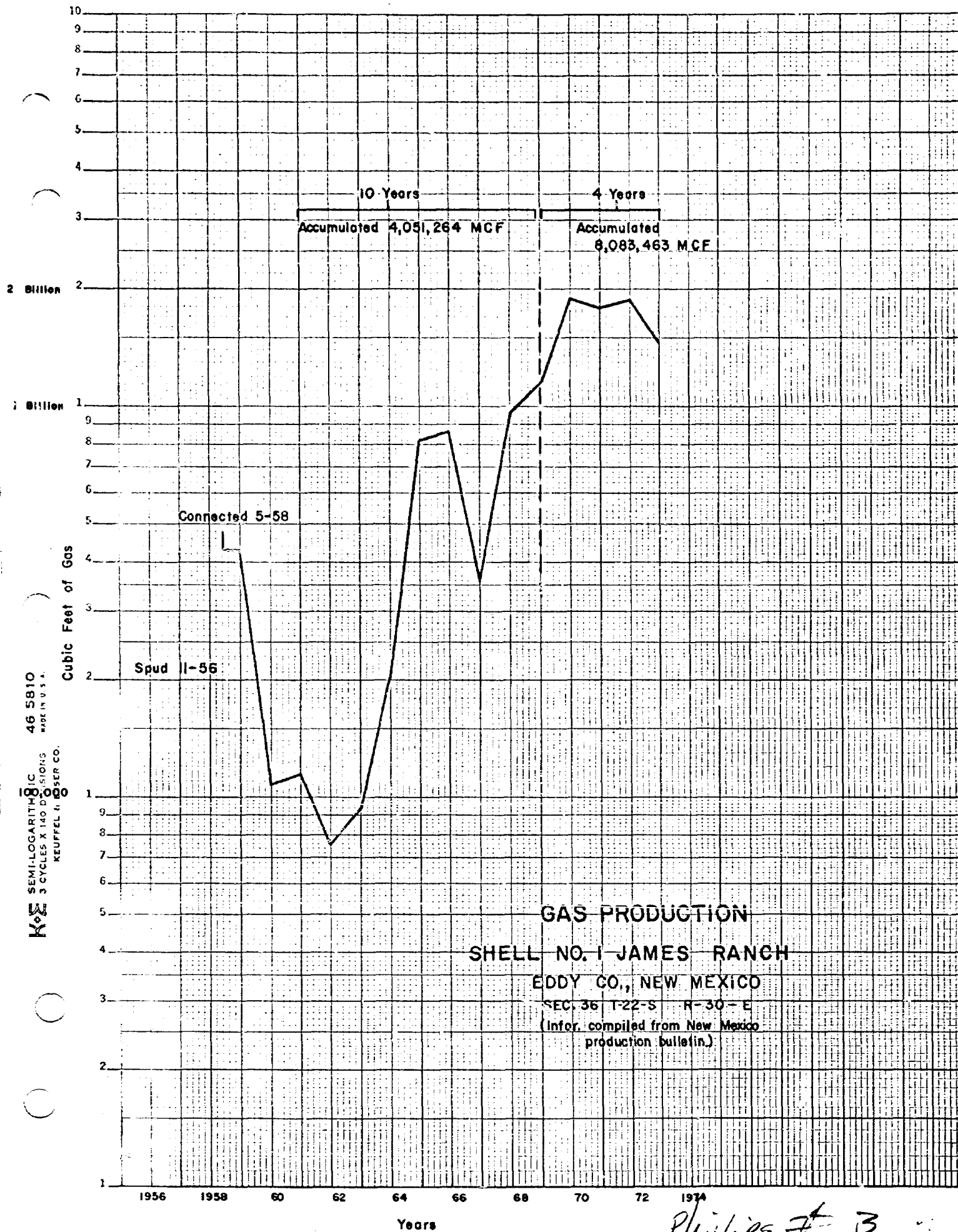
From  
D. S. NUTTER  
CHIEF ENGINEER

To

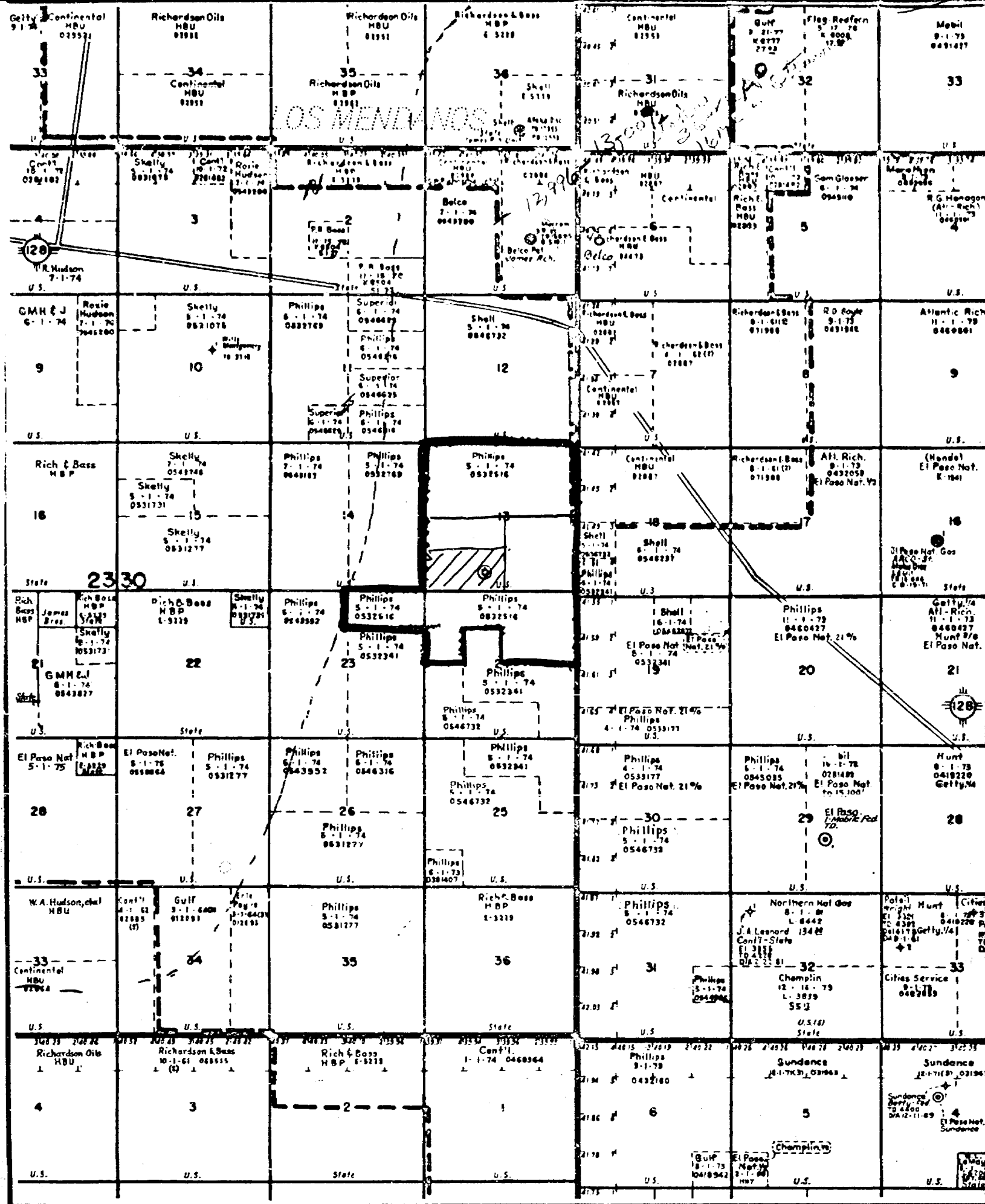
Photocopy Exhibits  
1, 2, 3 (complete)  
Ex 1706  
2/21/73

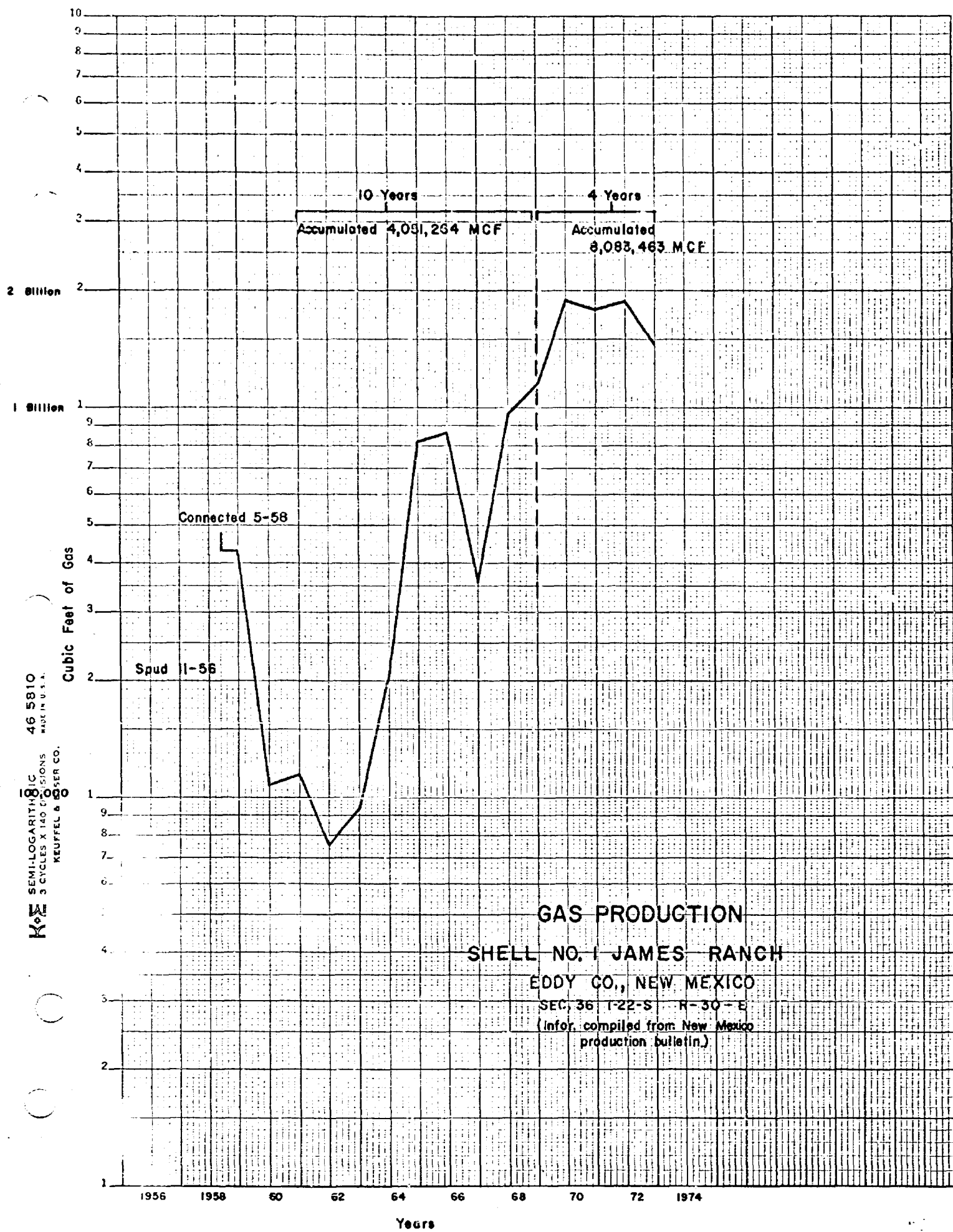
Robert Long





Phillips # 3





DOCKET: REGULAR HEARING - WEDNESDAY - FEBRUARY 21, 1973

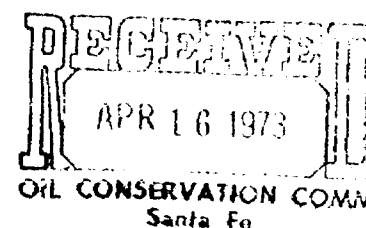
OIL CONSERVATION COMMISSION - 9 A.M. - STATE LAND OFFICE  
CONFERENCE ROOM, STATE LAND OFFICE BUILDING,  
SANTA FE, NEW MEXICO

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CASE 4906: Application of Phillips Petroleum Company for a drilling permit in the Potash-Oil Area, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its proposed Dunes-A well to test the Morrow formation at a location 660 feet from the South line and 1980 feet from the West line of Section 13, Township 23 South, Range 30 East, Eddy County, New Mexico, said location being within the boundaries of the Potash-Oil Area as defined by Commission Order No. R-111-A, and having been objected to by the owners of potash leases in the area.

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. 4906  
Order No. R-4500

APPLICATION OF PHILLIPS PETROLEUM  
COMPANY FOR A DRILLING PERMIT IN  
THE POTASH-OIL AREA, EDDY COUNTY,  
NEW MEXICO

APPLICATION FOR REHEARING

COMES NOW Phillips Petroleum Company, applicant in the above captioned case, and pursuant to the provisions of Section 65-3-22, New Mexico Statutes, Annotated, 1953 Compilation, as amended, applies to the Oil Conservation Commission of New Mexico for rehearing of the above captioned Case No. 4906, Order No. R-4500 issued pursuant thereto, and in support thereof would show the Commission:

I.

Applicant owns the right to drill for, develop and produce the oil and gas hydrocarbons underlying Section 13, Township 23 South, Range 30 East, N.M.P.M., Eddy County, New Mexico, and is affected by Order No. R-4500, which was entered by the Commission under date of March 27, 1973.

II.

Order No. R-4500 is unlawful, arbitrary and capricious, is unsupported by substantial evidence, and lacks the basic



findings necessary to, and upon which the Commission's jurisdiction depends for the entry of such order.

### III.

The findings of the Commission upon which Order No. R-4500 depends for its validity are arbitrary, capricious and not supported by substantial evidence in the following respects:

1. Finding (2) is erroneous in that the Morrow formation underlying the section was a secondary objective of applicant, whose primary objective is the Atoka formation, as shown by the evidence.

2. Findings (8) and (9) are not supported by substantial evidence in that there is no definition of what constitutes potash in commercial quantities and no evidence was offered in this hearing to show what constitutes commercial quantities of potash ore. On the contrary, the evidence introduced by International Minerals and Chemical Corporation and the Duval core show that ore underlying Section 13 is non-commercial. A finding that Phillips' proposed well "location is in an area previously found by the Commission to contain potash deposits in commercial quantities" is not the equivalent of a finding that the proposed location is underlaid by ore in commercial quantities, and is contrary to the evidence in this case.

3. Finding (10) is correct in stating that International Minerals & Chemical Corporation is not conducting active mining operations in Section 13, Township 23 South, Range 30 East, N.M.P.M., at the present time, but its finding that "the subject section 13 lies in the heart of a substantial ore body which comprises nearly one-half of International's total ore reserves"

is wholly unsupported by the evidence in that the "substantial ore body" was never defined by International; no computations were given on reserves underlying Section 13, or on the reserves of any other portion of International's properties; and no evidence was given as to what relationship there was between the total reserves, or the reserves in the "substantial ore body" and the reserves underlying Section 13. International gave no evidence of what reserves it owns, or where they are located.

4. Finding (10) is unsupported by evidence, and is in fact contrary to the evidence in the record, when it states that "the company definitely plans to mine said Section 13." No evidence was given as to any definite plans to mine the section, and the company's witnesses refused to testify as to when any mining in the section would take place, and the finding is arbitrary and capricious.

5. Finding (14) is immaterial and applicant has never proposed to drill in an area of subsidence. The finding is speculative in that it assumes that there would be mining operations underway at the time applicant would drill its well. There is no evidence as to when, if ever, any mining operations would commence. By their own testimony, International would leave pillars in a 1400 foot radius around the well to prevent subsidence, if they mine while the well is being produced.

6. Findings (16) and (17) are conjectural and unsupported by the evidence. The findings assume that any well drilled would not be properly plugged and not be properly protected. The finding is contrary to Commission Order No. R-111-A which specifies the casing, cementing and plugging program to be followed to prevent the danger pointed out in Findings (16) and (17).

7. Finding (18) is unsupported by the evidence, and assumes there will be no compliance with the provisions of Order No. R-111-A, contrary to the evidence in this case. It further assumes there can be no secondary mining within 1400 feet of the well bore after abandonment, which is contrary to the evidence. It was the purpose of Order No. R-111-A to permit the drilling of oil and gas wells in potash areas, and the Commission in this case has disregarded its own order. The Commission is attempting to enforce Order R-111-A by denying the right to drill in a potash area.

8. Finding (19) is based upon scanty information, from one core in the Section ignoring the information obtained from another core nearer to Phillips' proposed location which showed non-commercial deposits. The finding, further, is capricious in that it is a gross figure, based on International's calculation of ore to be left in pillars, based upon insufficient information, and a gross figure with no information offered as to whether the ore could be economically mined, nor as to its value, if mined. Where costs of mining and processing and preparing for market are not included, the figure of the gross value of the ore in the ground is not a measure of the damages that would be suffered by International, nor of the value of the ore involved. The finding further presupposes there could be no secondary mining in the area, which is contrary to the evidence, and that all of the ore would be left in the ground after the oil and gas reserves had been depleted, which is also contrary to the evidence.

9. Finding (20) would purport to show that Phillips could safely drill after primary and secondary mining has been completed, but there is nothing in the record to show when, if ever, the lands underlying the Phillips proposed location will

be mined, or when the subsidence will commence. Further there is nothing to show that subsidence will be completed by five years after secondary mining, and on the contrary the evidence shows residual subsidence will continue after that time and no witness testified it would be safe to drill under these circumstances. The one witness who expressed an opinion admitted he was not qualified to pass on the question.

10. Finding (21) is arbitrary and capricious and unsupported by any evidence in the record, and drilling as proposed by the finding is contrary to the orders and the rules and regulations of the Commission, and was not a subject matter of this hearing. There is no evidence to support a finding that directional drilling can be successfully conducted in this area, and the only competent evidence in the record on the question indicated that it could not.

11. Finding (22) is speculative, assumes that a well could be directionally drilled, which is not supported by evidence, and the finding that there would be no waste of potash is not supported by evidence, there being no evidence offered as to either the presence or absence of potash ore in Section 23, Township 23 South, Range 30 East, N.M.P.M. On the contrary the evidence shows there would probably be waste of potash if Findings (17), (18), and (19) are correct, which is not admitted.

12. Finding (23) is arbitrary and capricious and not supported by substantial evidence.

#### IV.

As shown by the evidence in this case, Belco Petroleum Corporation has a well north of Phillips' proposed location, completed for production from the Morrow, Atoka and Strawn formations, and is draining reserves from the reservoir sought

to be developed by Phillips. Commission Order No. R-4500 fails to protect the correlative rights of Phillips Petroleum Company contrary to the provisions of law, and denies Phillips the opportunity to produce its just and equitable share of the oil and gas in the pool. If the reservoirs continue to be drained by only two wells, Order No. R-4500 will result in waste, making inefficient use of reservoir energy, and will result in leaving substantial quantities of producible oil and gas in the reservoirs that could otherwise be produced, all contrary to the provisions of law.

V.

Commission Order No. R-4500 ignores substantial testimony offered to show that all of the reserves underlying Section 13, Township 23 South, Range 30 East, N.M.P.M., could be produced, and the well plugged and abandoned before any mining commences in the area, and ignores substantial increases in costs that would result from a delay of an unknown number of years before any well could be drilled, thus effectively denying Phillips the right to drill and produce its reserves under any circumstances.

VI.

Commission Order No. R-4500 is invalid, arbitrary and discriminatory and deprives this applicant of its property without due process of law in violation of the 14th Amendment to the Constitution of the United States and in violation of Article II, Section 18, of the Constitution of the State of New Mexico in that it deprives applicant of the right to recover the oil and gas hydrocarbons underlying the lands held by it under a valid oil and gas mineral lease.

Commission Order No. R-4500 is further invalid, unlawful and discriminatory in that it does not comply with the provisions of Section 65-3-4, F., New Mexico Statutes Annotated,

1953 Compilation, as amended, and does not comply with the provisions of Section 65-3-11 (17), New Mexico Statutes Annotated, 1953 Compilation, as amended, which are the sole authority of the Commission to act to prevent the waste of potash.

VIII.

If granted a rehearing, as prayed for, Applicant will on such rehearing, offer testimony to show that if permitted to develop the area fully, the reservoir would be depleted long in advance of any possible mining operations, and will offer evidence by a qualified drilling engineer to show that directional drilling in this area, as proposed by Oil Commission Finding (21) is impractical in this area. Applicant would further propose to offer the testimony of a qualified mining engineer as to the true value of any ore that could possibly be lost in the event Applicant were permitted to drill as prayed for; and to show costs of production, construction of shafts, and exploratory requirements normally required before instituting mining operations to refute the findings of the Commission in its Order No. R-4500.

WHEREFORE Applicant respectfully prays the Commission that a re-hearing be granted in the above styled and numbered case and its Order No. R-4500; that Applicant be permitted to offer further testimony bearing upon all of the questions raised by the Commission's findings, and that after such rehearing, the Commission enter its order granting applicant permission to drill as applied for.

Respectfully submitted,  
PHILLIPS PETROLEUM COMPANY

JOE V. PEACOCK  
Phillips Building  
Odessa, Texas 79760

JASON W. KELLAHIN  
Kellahin & Fox  
P. O. Box 1769  
Santa Fe, New Mexico  
ATTORNEYS FOR APPLICANT

BY

Jason W. Kellahin



# United States Department of the Interior

## GEOLOGICAL SURVEY

Drawer 1657  
Roswell, New Mexico 88201

February 2, 1973

### Memorandum

To: File

From: Carl C. Fraywick

Subject: Notes on N.M.O.C.C. Arbitration Meeting, R-111-A Procedure, held by Mr. A. L. Porter, Jr., Secretary Director, N.M.O.C.C. in the Roswell U. S. G. S. Area Office at 10:30 a.m., January 26, 1973

The subject meeting was occasioned by Phillips filing a notice of intention to drill a Pennsylvanian (Morrow) well in the SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, T. 23 S., R. 30 E., Eddy County, New Mexico, Federal lease New Mexico 0532516 located within the Secretary's Oil/Potash Area of southeastern New Mexico and the State oil potash area covered by N.M.O.C.C. Order No. R-111-A which provides for an arbitration hearing when an objection is received to the drilling of an oil or gas well in such area to attempt to resolve the objection to the mutual acceptance of both parties involved. In this case, International Mining and Chemical Corporation filed an objection to the drilling of the proposed oil and gas test well. An attendance list is attached. Also attached is a map showing the location under consideration with respect to other Pennsylvanian wells drilled in the area. The following notes are a casual summary of the discussion and results of the meeting.

Mr. VanSickle discussed the classification standards for langbeinite and sylvite ore. Mr. Childers with International stated that the presence of a high pressure gas well in section 13 would prevent second mining within 1400 feet of the well and prevent the recovery of langbeinite ore with a gross value of about \$9,000,000. The presence of langbeinite ore in commercial quantities underlying section 13 is established by two core holes provided that the number and location is adequate to justify this conclusion. Mr. Childers made the definite point that the langbeinite ore is a tangible portion of International's reserves and that it would be mined, however, he was unable to predict the approximate time that actual mining operations of the ore body underlying section 13 would be commenced, whether a separate shaft would be required, or if such ore would be mined from International's present mining operations located approximately seven miles north and north-westerly from section 13.

Phillips' attorney asked if the \$9,000,000 loss estimate would be reduced if the proposed well were drilled, completed, produced to depletion and plugged before the potash mining operations reached the vicinity of the drillsite, and International stated the loss would be less but were rather indefinite as to how much less.

The proposed Pennsylvania test would look at the Morrow at about 14,000 feet. The cost of the well is estimated at about \$1,000,000. Project life of well approximately 8 years with good market facilities. Spacing anticipated to be 640 acres. Reserves in the order of 10 billion cubic feet. The success ratio of Pennsylvania wells in this area has been exceptionally good (report prepared by Aguilar, November 1972). The Federal lease involved has an expiration date of May 1, 1974.

Mr. Porter asked Area Mining Supervisor Mr. Fulton as to his opinion as to whether section 13 was underlain by commercial ore, and Mr. Fulton's opinion was that such determination is adequately established by the core analysis available from the three test wells in section 13 and in the adjoining area. Phillips indicated that it was amenable to considering a compromise location in section 13 but that the proposed location was the optimum geologic selection. International advised that it would not agree to any location in section 13.

The dates involved as to the prospecting permit and subsequent potash lease versus the date of the oil and gas lease was discussed as to whatever legal effect might be established by prior rights. It was brought out that this is the only langbeinite deposit in the United States and the value of the langbeinite is stable and exceeds that of sylvite ore.

Mr. Porter asked the U.S.G.S. representatives if we had anything else to contribute or any further questions of Phillips or International and after receiving a negative answer summed up with the following conclusions:

1. The presence of potash ore underlying section 13 has been established.
2. Phillips has indicated a willingness to discuss a compromise location mutually acceptable to both parties even though this would increase the risk factor of the proposed Pennsylvania oil and gas test.
3. International is adamant as to its objection to any location in section 13.
4. It appears the life of the proposed well, if completed as a producing Morrow gas well, would be in the order of 8 to 9 years.
5. The time involved for the potash company to initiate and complete mining operations under section 13 would be in the order of 40 years, and that we are looking at perhaps 20 years past such point for subsurface effect caused by the mining operations to achieve equilibrium to the point that a well could be drilled through such area.



5. Under the circumstances, the adjudication meeting required by R-111-A is the next step in the procedure and this will be set as a full Commission meeting rather than a trial examiner hearing - Mr. Porter asked Phillips if it so desired. Answer - Affirmative. Mr. Porter concluded the meeting by advising that the next meeting would be set and advertised in due course.

He have been subsequently advised that the meeting will be set for February 21 in Santa Fe, which was previously cleared as acceptable with the U.S.G.S. representatives involved.

(ORIG. SGD.) CARL C. TRAYWICK

CARL C. TRAYWICK

cc:  
VanSickle  
Fulton  
Reg. Mgr., Denver  
Washington  
OS&D  
Artesia  
M.H.O.C.C. - Santa Fe ✓

CCTraywick:lh

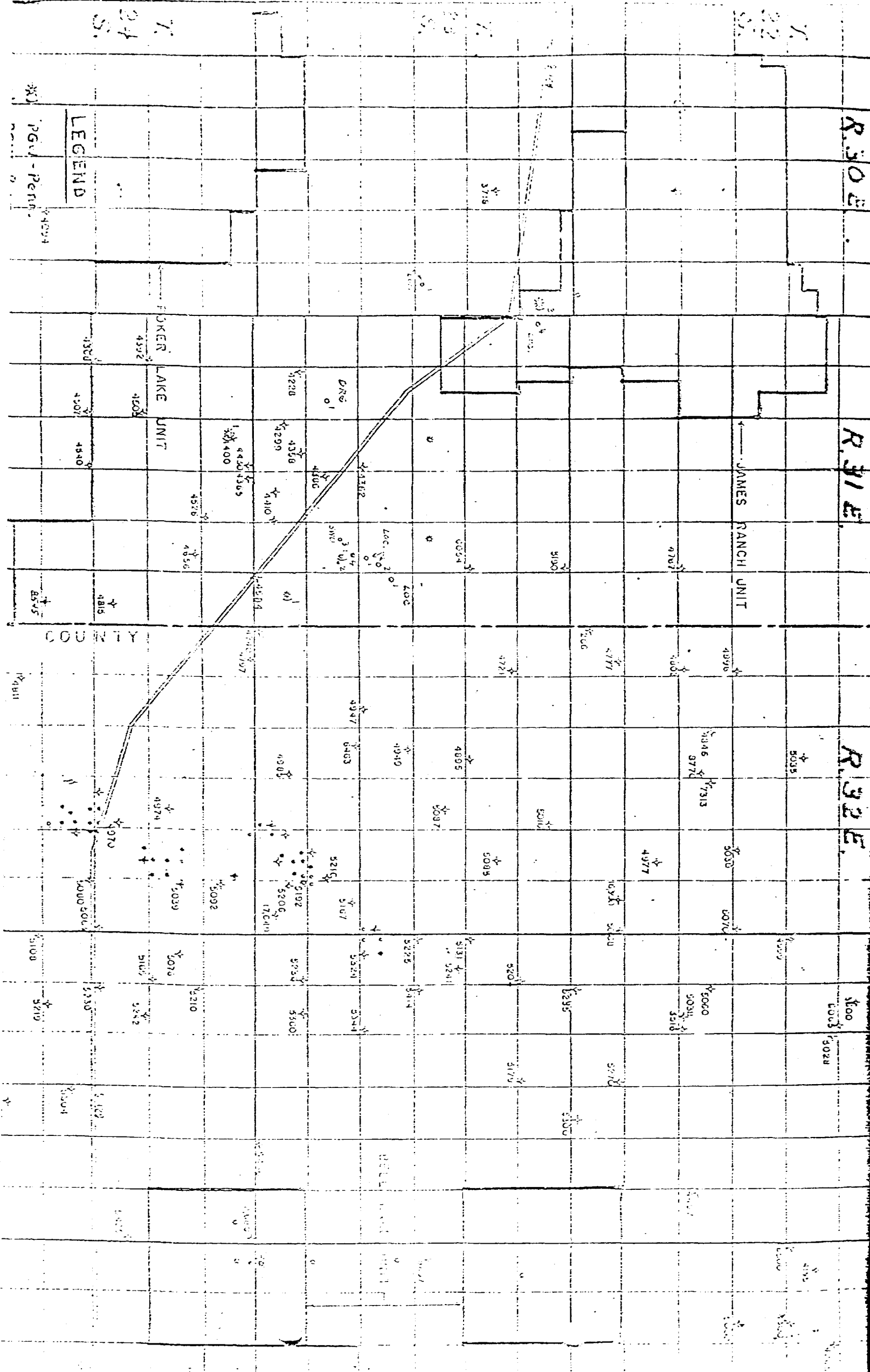
H.L. Forten, Jr.	N.M.O.C.C.	Box 2088 Santa Fe
Bill [unclear]	"	"
James Matthews	Atty for IMC	Drum N. Carlsbad
CE Childers	IMC	Box 11 Carlsbad
DAVID MUTTER	N.M.O.C.C.	Box 2032 Santa Fe
Pete C. Aguilar	USGS	Roswell
D M Van Sickley	"	"
B C Largent	Phillips Pet Co	Odessa, Tex
Jason Kellahan	atty for Phillips	Box 1769, Santa Fe, N.M.
E.M. Gorence	Phillips Pet.	Odessa, Tex.
JOE V. PEACOCK	"	"
Jim Knyaz	U.S.G.S.	Artesia, N.M.
D. S. Hutton	U.S.G.S.	Carlsbad, N.M.
Bill Gussert	N.M.O.C.C.	Artesia N. Mex.
DAVE H. LEASE	TERRA INC	Roswell, N.M.
Don C. Jones	U.S.G.S.	Roswell N. Mex.
N. O. Frederick	U.S.G.S.	Roswell, N. Mex.
Carl C. Haywick	U.S.G.S.	Roswell, N. Mex.
Aene Daniel	U.S.G.S.	Roswell, N. Mex.

4-11-68

LEGEND

Pen-Pen.

COUNTY



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

January 29, 1973

GOVERNOR  
BRUCE KING  
CHAIRMAN

LAND COMMISSIONER  
ALEX J. ARMIJO  
MEMBER

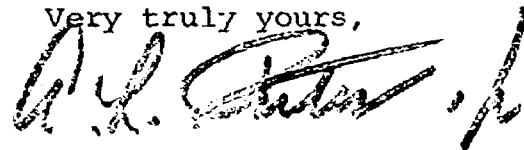
STATE GEOLOGIST  
A. L. PORTER, JR.  
SECRETARY - DIRECTOR

Mr. E. M. Gorence  
Phillips Petroleum Company  
Room 711 - Phillips Building  
Odessa, Texas 79761

Dear Mr. Gorence:

Pursuant to our discussion in Roswell last Friday, we will advertise a hearing to be held in the Conference Room of the State Land Office at 9 a.m. on February 21, 1973. The case to be docketed will concern the disputed location of your proposed well in Section 13, Township 23 South, Range 30 East, Eddy County, New Mexico.

Very truly yours,



A. L. PORTER, Jr.  
Secretary-Director

ALP/ir

cc: Mr. C. E. Childers - Carlsbad, New Mexico  
U. S. Geological Survey - Roswell, New Mexico  
U. S. Geological Survey - Artesia, New Mexico  
Mr. Jason Kellahin - Attorney at Law, Santa Fe, N.M.  
Mr. Bill Gressett, Oil Conservation Commission, Artesia  
Mr. W. N. Stanley, Vice President of Operations - Teledyne  
Potash - Box 101, Carlsbad, New Mexico 88220  
Mr. Robert S. Fulton - U. S. Geological Survey, Carlsbad,  
New Mexico

New Sh. Pl.  
Carrington

1970

At. 1970 - Dec 22, 1972

At. 1970 - position or local

4 feet 4 90 K<sub>2</sub>O

1000 of 690  
1400 feet

1400 ft. redox -  
59 million barrels

within 15 years. Many possibilities 10 yrs  
Probability in 5 yrs -

Time Required to complete Mining  
3 to 5 million tons per year.  
might be 15, 20 or 40 years -

Phillips Company 1964 - Prospecting permit  
Drill immediately 1963 - Den Hoober  
14,300 ft test

5 to 8 yrs. depletion - maybe 3 yrs.  
10 Billion cubic feet  
E.P.  
Well 3 miles east.

Arbitration Meeting  
Roswell, N.M.  
Jan 26, 1973

NAME	Company or Agency	Address
A.L. Forter, Jr	N.M.O.C.C.	Box 2088 Santa Fe
Bill Larr	"	"
Norme Matthews	Atty for IMC	Drum N. Carlsbad
CE Childers	IMC	Box 71 Carlsbad
DAVID NOTTICK	N.M.O.C.C.	Box 2088 SANTA FE
Pete C. Aguilar	USGS	Roswell
D M Van Sick Ky	"	"
B C Largent	Phillips Pet Co.	Odessa, Tex
Jason Kellahin	atty for Phillips	Box 1769, Santa Fe, N.M.
E.M. Gorence	Phillips Pet.	Odessa, Tex.
JOE V. PEACOCK	" "	" "
Jim Knyack	U.S.G.S.	Artesia, N.M.
R. S. Hulton	U.S.G.S.	Carlsbad, N.M.
Bill Gussert	N.M.O.C.C.	Artesia N. Mex.
DAVE N. LEAVITTEN	TRACO Inc.	Roswell, NM
Don C. Jones	U.S.G.S.	Roswell N. Mex

Philip has been on section 45

would be glad to say to section 13

Good night May 1, 1978  
Spring

Yes -

Present mine operation affect 7 mile  
long -

Cost of work \$627,000

Established commercial zone

Established boundary to 1/2 mile beyond

Commit agree on expansion location

" " " " delay of operation



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

January 15, 1973

GOVERNOR  
BRUCE KING  
CHAIRMAN

LAND COMMISSIONER  
ALEX J. ARMijo  
MEMBER

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

Phillips Petroleum Company  
Room 711 - Phillips Building  
Odessa, Texas 79761

Attention: Mr. Gorens

Gentlemen:

With further reference to my letter of January 8, 1973, I have contacted Mr. Carl Traywick of the U. S. Geological Survey in Roswell and have decided to have an arbitration meeting, having to do with your proposed well location, in Roswell at the U. S. Geological Survey offices at 10:30 a.m. on Friday, January 26, 1973.

By copies of this letter the other interested parties are being notified of the meeting.

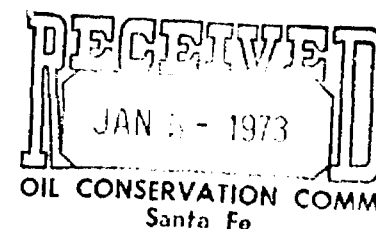
Very truly yours,

A. L. PORTER, Jr.  
Secretary-Director

ALP/ir

cc: Mr. C. E. Childers  
U. S. Geological Survey - Roswell, New Mexico  
U. S. Geological Survey - Artesia, New Mexico  
Mr. Jason Kellahin - Attorney at Law, Santa Fe, N. M.  
Mr. Bill Gressett, Oil Conservation Commission, Artesia, N.M.  
Mr. W. N. Stanley, Vice President of Operations - Teledyne  
Potash - Box 101, Carlsbad, New Mexico 88220





INTERNATIONAL MINERALS & CHEMICAL CORPORATION

January 3, 1973

Mr. A. L. Porter, Jr.  
Secretary, NM Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, NM 87501

Dear Mr. Porter:

This is to confirm my telephone conversation with Mr. Nutter on this date concerning the Phillips Petroleum Company application for permission to drill a gas well in Section 13, Township 23 South, Range 30 East.

International Minerals & Chemical Corporation does hereby file an objection to the drilling of said well.

Mr. Nutter informed me he would request that you telephone me upon your return to your office on Thursday, January 4, so we will probably have had a conversation by the time you receive this letter. In the interest of time, however, I felt written confirmation of my verbal protest to Mr. Nutter should be mailed today.

Yours very truly,

C. E. Childers  
General Superintendent  
Engineering & Maintenance

CEC:jw

cc: R. W. Hougland  
J. D. Matkins  
Phillips Petroleum Company  
Regional Oil and Gas Supervisor, USGS

 **TELEDYNE  
POTASH**

**RECEIVED**  
JAN 9 - 1973

BOX 101  
CARLSBAD, NEW MEXICO 88220  
MINE & OFFICE  
(505) 887-5591  
TWX (910) 986-0048  
REFINERY  
(505) 745-3541

OIL CONSERVATION COMM  
Santa Fe

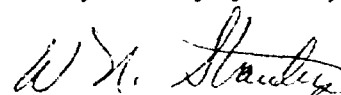
January 8, 1973

Mr. A. L. Porter, Secretary-Director  
New Mexico Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Dear Mr. Porter:

This is to advise you that Teledyne Potash wishes to protest the application for the permit to drill which has been filed by Phillips Petroleum Company, and was received in our office on January 3, 1973. The proposed drill location is in Section 13, Township 23 South, Range 30 East. This area is covered by Rule R-111A.

Very truly yours,



W. N. Stanley  
Vice President of Operations

WNS:ns

c.c. Mr. R. S. Fulton, U.S.G.S.  
Phillips Petroleum Company

*Copy of Phillips letter sent to Mr. Stanley on 1/9/73*



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

GOVERNOR  
BRUCE KING  
CHAIRMAN  
LAND COMMISSIONER  
ALEX J. ARMijo  
MEMBER  
STATE GEOLOGIST  
A. L. PORTER, JR.  
SECRETARY - DIRECTOR

January 8, 1973

Phillips Petroleum Company  
Room 711, Phillips Building  
Odessa, Texas 79761

Gentlemen:

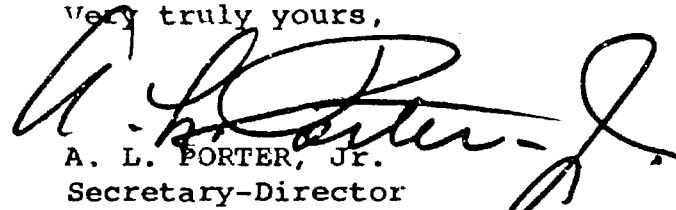
This is to advise that Mr. C. E. Childers of International Minerals & Chemical Corporation has filed an objection to the drilling of a well as you propose in the SE/4 SW/4 of Section 13, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico.

If it is your desire to pursue the matter, I will be happy to proceed in accordance with the provisions of Commission Order No. P-111-A to set up an arbitration meeting between the parties at a time that will be convenient for all concerned.

Since the acreage involved is under the jurisdiction of the United States Geological Survey, I believe it would be appropriate to hold the meeting in the offices of that agency in Roswell.

Further action in this matter will be delayed until I have received your reply.

Very truly yours,



A. L. PORTER, JR.  
Secretary-Director

ALP/ir

cc: Mr. C. E. Childers  
U. S. Geological Survey - Roswell, New Mexico  
U. S. Geological Survey - Artesia, New Mexico  
Mr. Bill Gressett, Oil Conservation Commission, Artesia, N.M.

*Mr. Gressett with  
PH 1-8-73*

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

## APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK <b>DRILL</b> <input checked="" type="checkbox"/> <b>DEEPEN</b> <input type="checkbox"/> <b>PLUG BACK</b> <input type="checkbox"/>			5. LEASE DESIGNATION AND SERIAL NO. NM 0532516	
b. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER <input type="checkbox"/>			6. IF INDIAN, ALLOTTEE OR TRIBE NAME ---	
2. NAME OF OPERATOR Phillips Petroleum Company			7. UNIT AGREEMENT NAME ---	
3. ADDRESS OF OPERATOR Room 711, Phillips Building, Odessa, Texas 79761			8. FARM OR LEASE NAME Dunes-A	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.) At surface 1980' FW and 660' FS Lines, Section 13. At proposed prod. zone Same			9. WELL NO. 1	
14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE* 17 miles east of Loving, New Mexico			10. FIELD AND POOL, OR WILDCAT Undesignated	
15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. line, if any) (Property) 1980' FW Line Sec.13			11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 13-23S-30E	
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. --			12. COUNTY OR PARISH Eddy	
21. ELEVATIONS (Show whether DF, RT, GR, etc.) Advise later.			13. STATE New Mexico	
16. NO. OF ACRES IN LEASE 1000±			17. NO. OF ACRES ASSIGNED TO THIS WELL 320	
19. PROPOSED DEPTH 14,300'			20. ROTARY OR CABLE TOOL Rotary	
22. APPROX. DATE WORK WILL START* Upon approval				

PROPOSED CASING AND CEMENTING PROGRAM				
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17-1/2"	13-3/8"	48#	500'	600 sx, circ at surface.
12-1/4"	10-3/4"	51#	4000'	Sufficient to circ at surface.
9-5/8"	7-5/8"	26.4#	12,100'	Sufficient to circ at surface.
6-3/4"	5-1/2" liner	23#	Total Depth	Sufficient to cover productive intervals.

Note: Drilling operations, casing program, and completion practices will be conducted in accordance with NMOCC Rule R-111-A.

Blowout Preventers: See Attached. Ser. 900 to 4000' (Fig. 4) Ser. 1500 to TD (Fig. 2)  
Mud Program: See Attached.

This well is located in a defined potash mining area. Potash lease owners are:

1. International Minerals and Chemical Corp., c/o Neal & Matkins, Attorneys, Drawer N, Carlsbad, New Mexico. 88220
2. U. S. Potash and Chemical Company, Box 101, Carlsbad, New Mexico. 88220

Copies of this filing have been mailed to these operators by certified mail, return receipt requested, on the date below. (See attached photo copy of mail receipts.).

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. <i>[Signature]</i> W. L. Mueller		TITLE Senior Reservoir Engineer	DATE 12-19-72.
PERMIT NO. <i>[Stamp]</i> APPROVAL DATE			
APPROVED BY <i>[Signature]</i>		TITLE	DATE
CONDITIONS OF APPROVAL OIL CONSERVATION COMM. Santa Fe			

\*See Instructions On Reverse Side

NEW MEXICO OIL CONSERVATION COMMISSION  
WELL LOCATION AND ACREAGE DEDICATION

Form C-102  
Supersedes C-128  
Effective 1-1-75

All distances must be from the outer boundaries of the Section

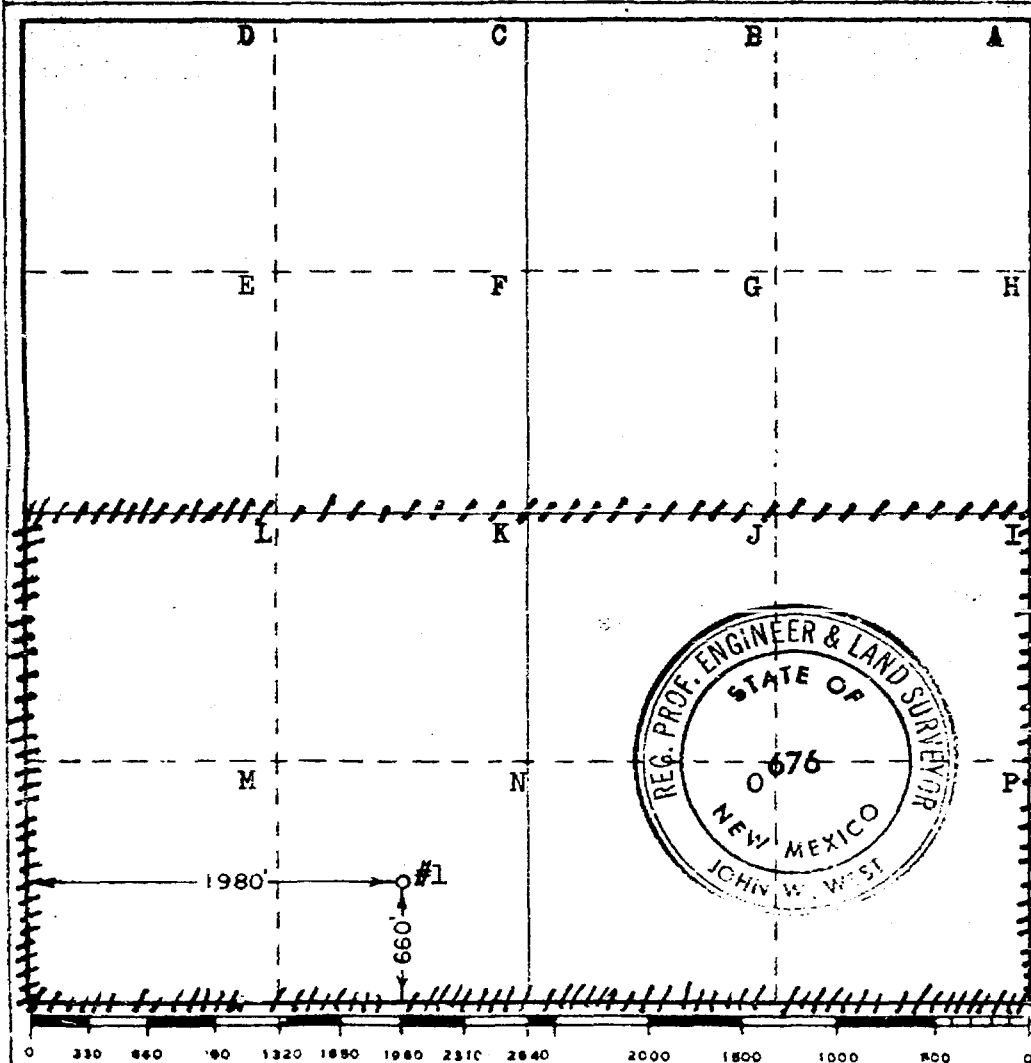
Operator <b>PHILLIPS PETROLEUM CO.</b>			Lease <b>DUNN CONSERVATION</b>			Well No. <b>1</b>
Unit Letter <b>N</b>	Section <b>13</b>	Township <b>23 South</b>	Range <b>30 East</b>	County <b>Santa Fe</b>	Eddy	
Actual Footage Location of Well: <b>660</b> feet from the <b>South</b> line and <b>1980</b> feet from the <b>West</b> line						
Ground Level Elev. <b>later</b>	Producing Formation <b>Morrow</b>		Pool <b>Undesignated - Morrow - Gas</b>		Dedicated Acreage: <b>320</b>	

1. Outline the acreage dedicated to the subject well by colored pencil or hatchure marks on the plat below.
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

☐ Yes ☐ No If answer is "yes," type of consolidation \_\_\_\_\_

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) \_\_\_\_\_

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

*W. J. Mueller*  
Name  
W. J. Mueller

Position  
Senior Reservoir Engineer

Company  
Phillips Petroleum Company

Date  
December 18, 1972

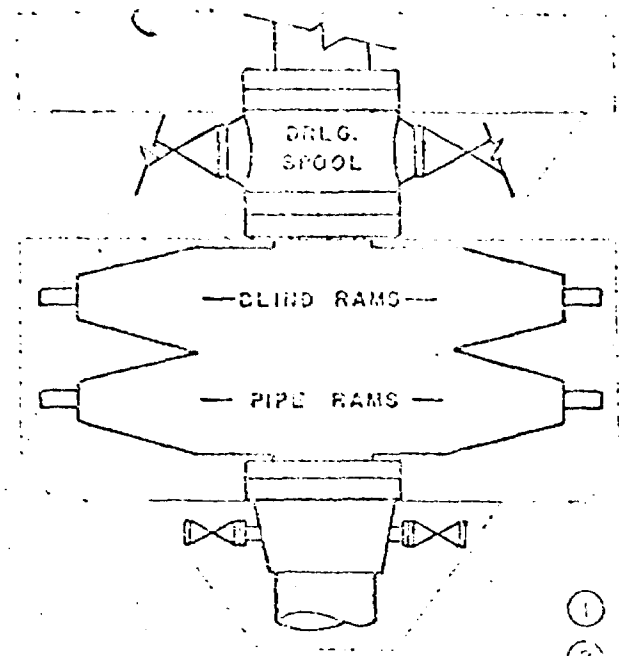
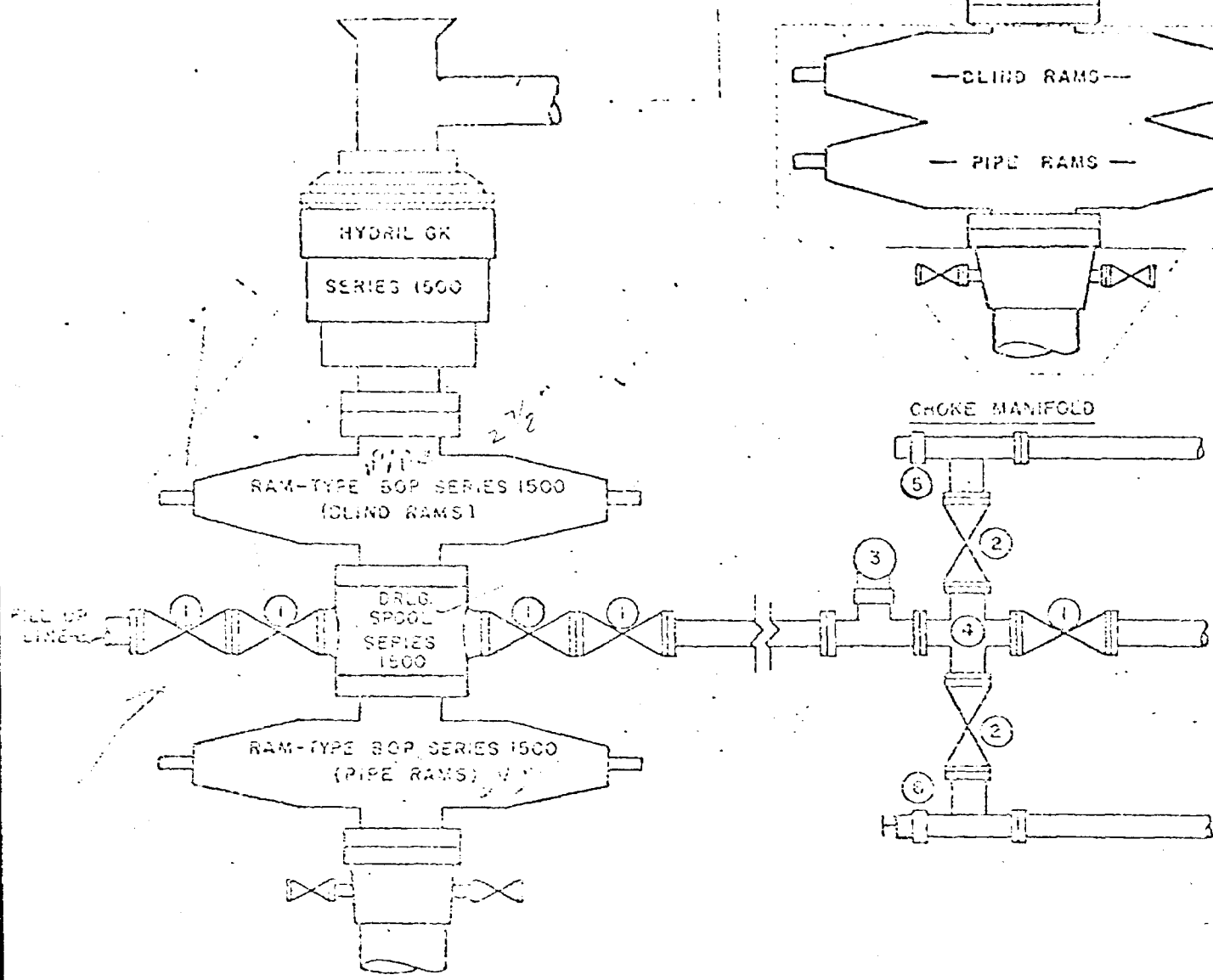
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed  
December 14, 1972

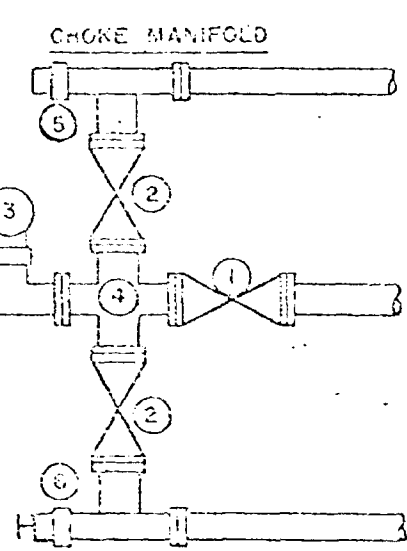
Registered Professional Engineer and/or Land Surveyor

*John W. West*  
Certificate No. 676

ALTERNATE HOOKUP  
FOR  
DOUBLE PREVENTERS



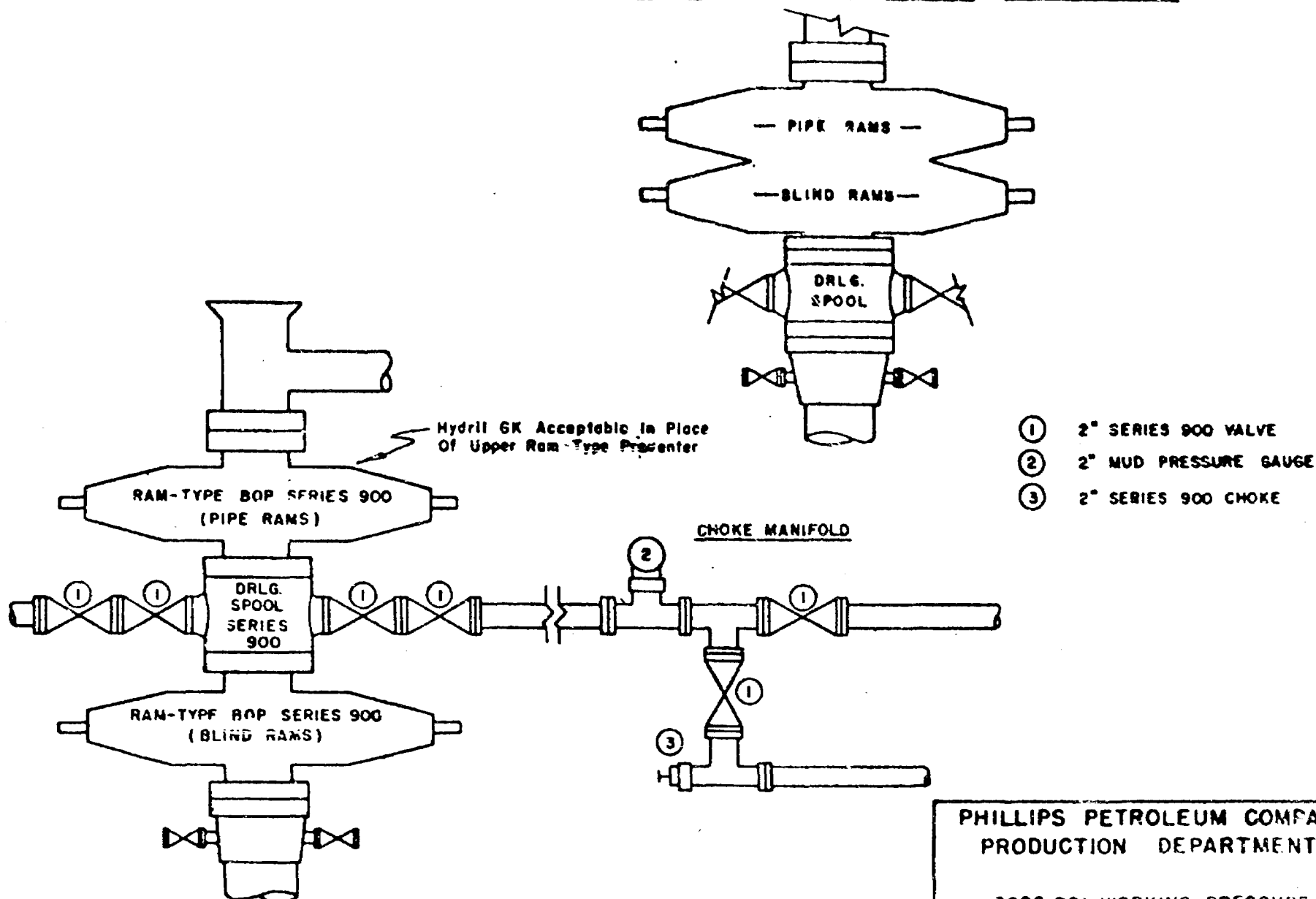
- ① 3" SERIES 1500 VALVE
- ② 2" SERIES 1500 VALVE
- ③ 2" MUD PRESSURE GAUGE ON 3" X 3" X 2" SERIES 1500 STEEL TEE
- ④ 3" SERIES 1500 X 2" SERIES 1500 STEEL CROSS
- ⑤ 2" SERIES 1500 POSITIVE CHOKE
- ⑥ 2" SERIES 1500 ADJUSTABLE CHOKE



PHILLIPS PETROLEUM COMPANY  
PRODUCTION DEPARTMENT

5000 PSI WORKING PRESSURE  
BLOWOUT PREVENTER HOOK-UP  
(SERIES 1500 FLANGES OR BETTER)

# ALTERNATE HOOKUP FOR DOUBLE PREVENTERS



PHILLIPS PETROLEUM COMPANY  
PRODUCTION DEPARTMENT

3000 PSI WORKING PRESSURE  
BLOWOUT PREVENTER HOOK-UP  
(SERIES 900 FLANGES OR BETTER)

FIGURE NO. 4

PHILLIPS PETROLEUM COMPANY

Proposed Mud Program - Dunes-A No. 1, 14,300' Morrow "Wildcat".  
Section 13, T-23-S, R-30-E, Eddy County, New Mexico.

0 - 500':

Drill out with Flosal" bentonite and lime mixed to a high viscosity. Maintain sufficient viscosity to assure running of casing.

500' - 4000':

Stay in steel pits and saturate system with potash salt. Keep system super saturated. Prior to reaching casing point mix Flosal as needed to assure a clean hole for running of casing.

4000' - 12,100':

Drill out with fresh water and circulate through the reserve pit. Maintain weight at 9.2 lbs. per gal. or less, Viscosity 34 to 36 sec. per full quart out, and Fluid loss 20 to 30 cc. with Drispac\*. Mix LCM as needed. If hole conditions dictate prior to reaching casing point, raise viscosity as needed to assure running of logs and casing.

12,100' - T.D.:

Have steel pits clean and drill out with a "low solids Drispac\* Mud". Weight 9 lbs. per gal. or less, Viscosity 36 to 38 sec. per full quart out and Fluid loss 20 cc or less. As hole depth increases or hole conditions dictate, adjust mud properties as necessary. Should loss occur, mix LCM as needed.

Special Production Practices.

Good samples surface to TD. Possible DST's in Strawn - 1, Atoka - 1, and Morrow - 2. Mud logging unit from approximately 12,000' to total depth.

Any deviations from this program must be approved by Phillips Area Superintendent and Drilling Specialties Company with a note advising the District Manager of any changes.

\* A Trademark



Phillips Petroleum Company - Dunes-A No.1 = 1930' FW and 660' FS,  
13, 23-S, 30-E, Eddy County

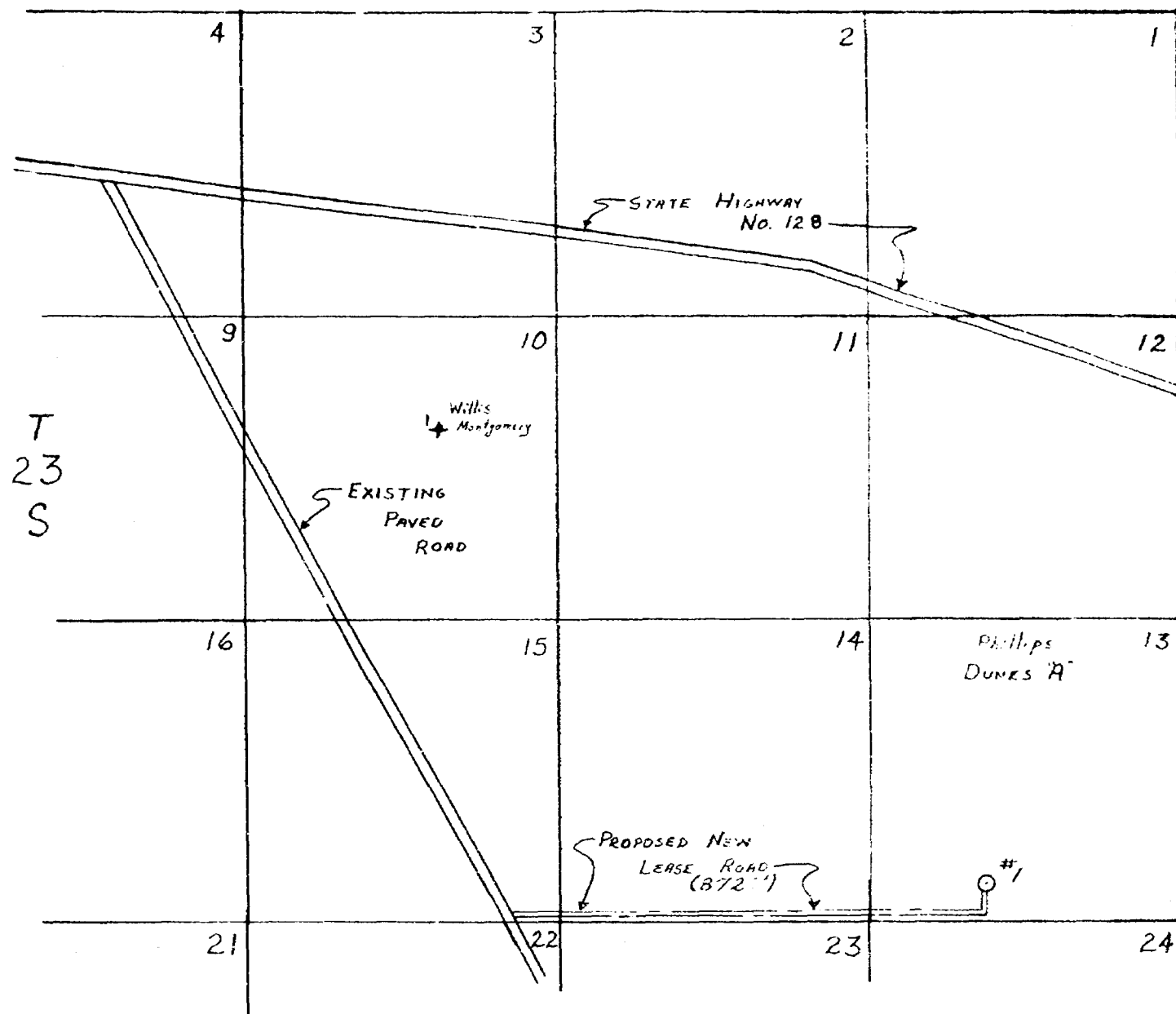
DEVELOPMENT PLAN FOR SURFACE USE

Attachment to  
Form 9-331-C

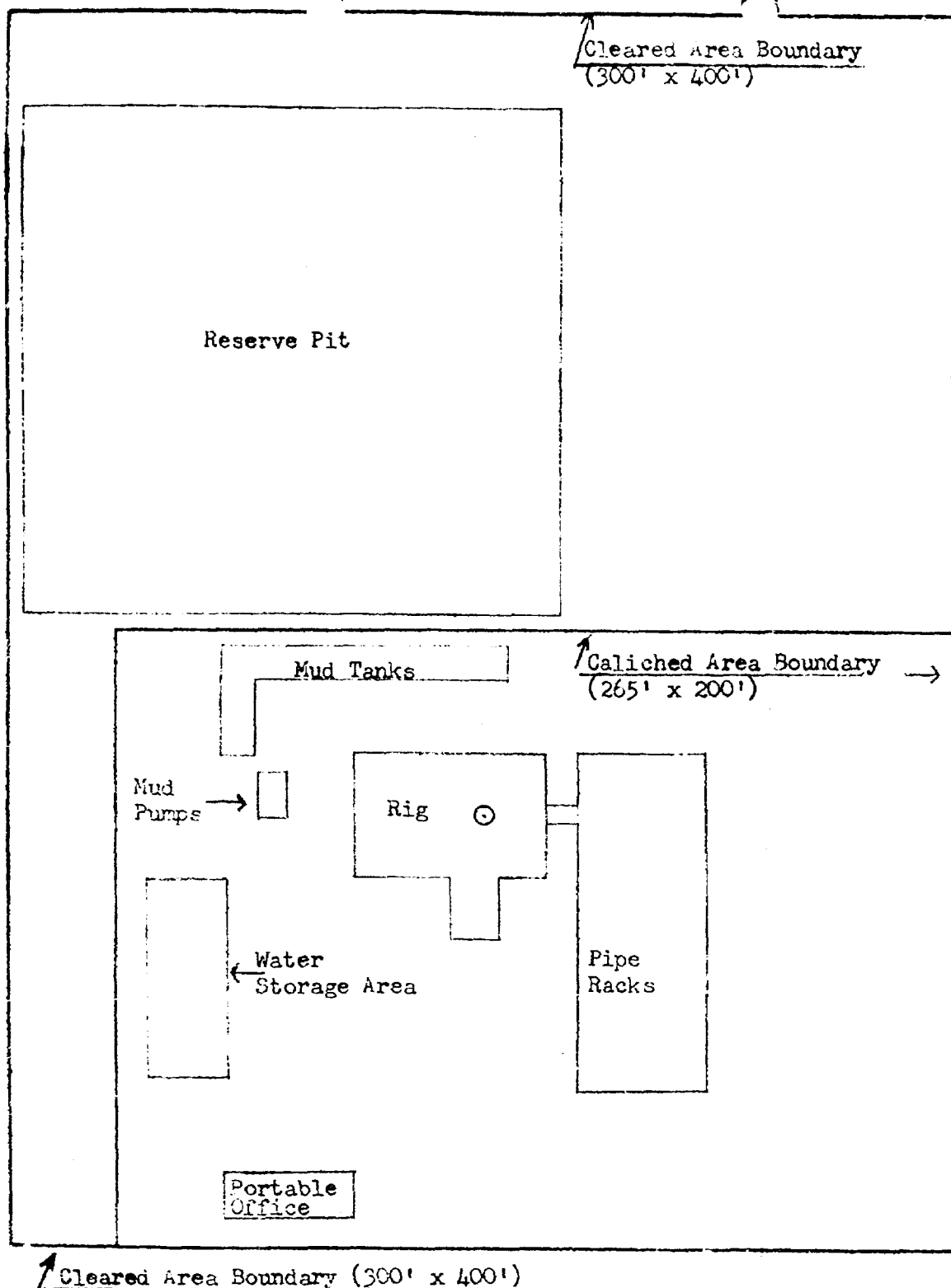
1. Existing roads on lease: None  
(See attached sketch.)
2. Planned access roads: Commence at existing paved road west of well, construct 8060' east & 660' north to Well No. 1 (20' wide roadway x 8720') See sketch
3. Location of wells: Well No. 1--1980' FW & 660' FS lines, Sec. 13, T-23-S, R-30-E, Eddy County, New Mexico
4. Lateral roads to well locations: The Jal/Loving Hwy-# 128 is approximately two miles north of wellsite. There is no access road from wellsite to that highway.
5. Tank battery and production facilities as required will be contained within drill site pad upon well completion.
6. Water supply undetermined at this time. Water storage tanks will be set on perimeter of pad.
7. All waste disposal will be put in pits and covered.
8. No camps will be located on the lease.
9. No airstrips will be located on the lease.
10. Drill site location will be an area 300' E-W x 400' N-S, cleared and leveled with reserve pits dug in the northern 200' portion. Rig, racks, pumps, steel pits, water tanks and portable office to be located on the southern 200' of the pad. The drill site proper (contained within the pad) will be permanently calched in an approximate area of 265' E-W x 200' N-S.
11. Restoration of surface: Dug pits within the cleared area will be back-filled and leveled. The calched pad of the cleared area is a permanent type emplacement.
12. This land use plan is essentially the same as that used on other wells of like depth in Eddy County.

HM:rm

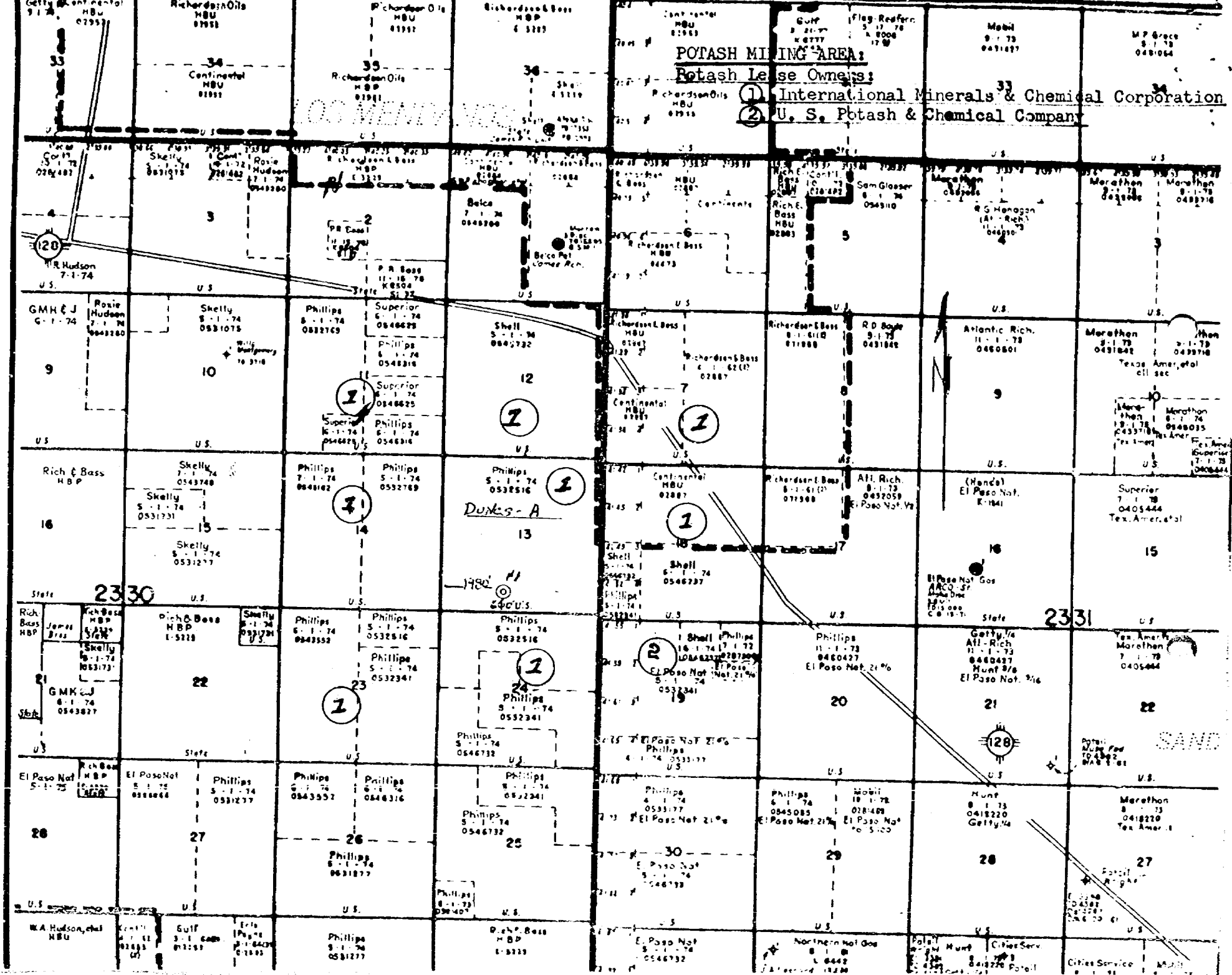
R-30-E



PHILLIPS PETROLEUM COMPANY, BARTLESVILLE, OKLAHOMA							
				DEVELOPMENT PLAN FOR COMPANY USE, Dunks A, No. 1 Located: 1000' E and 500' N, Sec. 33, T13N, R30E, May County, New Mexico			
		DRAWN		LLF	12-72	AFE. NO.	
		CHECKED				DWG. NO. /	
REVISION		BY		DATE		APPROVED	
						SCALE 1" = 2640'	
						SHEET NO. /	



PHILLIPS PETROLEUM COMPANY				BARTLESVILLE, OKLAHOMA		
				DEVELOPMENT PLAN FOR SURFACE USE		
				Dunes A No. 1		
				Located: 1980' FW and 660' FS, Sec. 13, T13S, R30E,		
				Eddy County, New Mexico		
				DRAWN	LLF	AFE. NO.
				CHECKED		DWG. NO. 2
				APPROVED		SCALE : 1" = 50'
REVISION	BY	DATE				SHEET NO. 1





**PHILLIPS PETROLEUM COMPANY**  
EXPLORATION & PRODUCTION DEPARTMENT  
PHILLIPS BUILDING, FOURTH & WASHINGTON  
ODESSA, TEXAS 79760



U. S. Potash & Chemical Company  
Box 101,  
Carlsbad, New Mexico  
88220



**PHILLIPS PETROLEUM COMPANY**  
EXPLORATION & PRODUCTION DEPARTMENT  
PHILLIPS BUILDING, FOURTH & WASHINGTON  
ODESSA, TEXAS 79760



International Minerals & Chemical Company  
C/O Neal & Watkins, Attnys.  
Drawer N,  
Carlsbad, New Mexico  
88220



SENDER: Be sure to follow instructions on other side

PLEASE FURNISH SERVICE(S) INDICATED BY (CHECKED BLOCKS)

(Additional charges required for these services)

☒ Show to whom, date and address where delivered

☐ Deliver ONLY to addressee

RECEIPT

Received the numbered article described below

REGISTERED NO.

SIGNATURE OR NAME OF ADDRESSEE (Must always be filled in)

CERTIFIED NO.

1

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

INSURED NO.

2

DATE DELIVERED

3

SHOW WHERE DELIVERED (Only if requested, and include ZIP Code)



SENDER: Be sure to follow instructions on other side

PLEASE FURNISH SERVICE(S) INDICATED BY (CHECKED BLOCKS)

(Additional charges required for these services)

☒ Show to whom, date and address where delivered

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RECEIPT

Received the numbered article described below

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CERTIFIED NO.

1

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

INSURED NO.

2

DATE DELIVERED

3

SHOW WHERE DELIVERED (Only if requested, and incl. ZIP Code)

Chuck Childers  
887-2871 Ext 313

International Minerals objects to

Phillips - proposed gas well

1980 FWL

660 FSL 13-23-30

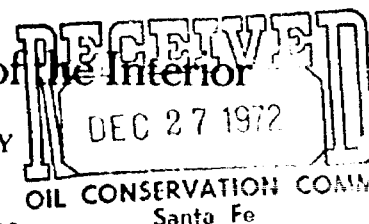
Langbeinite - high grade ore



United States Department of the Interior

GEOLOGICAL SURVEY

P. O. Drawer U  
Artesia, New Mexico 88210



December 26, 1972

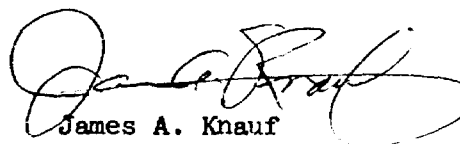
Mr. A. L. Porter, Jr.  
New Mexico Oil Conservation Commission  
Post Office Box 2088  
Santa Fe, New Mexico 87501

Re: Oil-Potash Area

Dear Mr. Porter:

Attached is an "Information Copy" of a Notice of Intention to Drill a well to a depth of 14,300 feet to test the Morrow formation in the SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, T. 23 S., R. 30 E., N.M.P.M., Eddy County, New Mexico, filed by Phillips Petroleum Company, Room 711, Phillips Building, Odessa, Texas 79761. The location is on Federal oil and gas lease New Mexico 0532516.

Sincerely yours,

  
James A. Knauf  
District Engineer

Attachment

Copy w/notice to: N.M.O.C.C., Artesia  
U.S.G.S., Roswell  
U.S.G.S., Carlsbad



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY(Other than  
revenue)Form approved  
Budget Bureau No. 42-R1426

## APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

## 1A. TYPE OF WORK

DRILL ☒DEEPEN ☐PLUG BACK ☐

## B. TYPE OF WELL

OIL  
WELL ☐GAS  
WELL ☒

OTHER

SINGLE  
ZONE ☒MULTIPLE  
ZONE ☐

## 2. NAME OF OPERATOR

Phillips Petroleum Company

## 3. ADDRESS OF OPERATOR

Room 711, Phillips Building, Odessa, Texas 79761

## 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements\*)

At surface

1980' FW and 660' FS Lines, Section 13.

At proposed prod. zone

Same

## 14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*

17 miles east of Loving, New Mexico

## 15. DISTANCE FROM PROPOSED

## LOCATION TO NEAREST

## PROPERTY OR LEASE LINE, FT.

## (Also to nearest drg. line, if any)

## 18. DISTANCE FROM PROPOSED LOCATION

## TO NEAREST WELL, DRILLING, COMPLETED,

## OR APPLIED FOR, ON THIS LEASE, FT.

## 21. ELEVATIONS (Show whether DF, RT, GR, etc.)

Advise later.

## 23.

## PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17-1/2"	13-3/8"	48#	500'	600 sk, circ at surface.
12-1/4"	10-3/4"	51#	4000'	Sufficient to circ at surface.
9-5/8"	7-5/8"	26.4#	12,100'	Sufficient to circ at surface.
6-3/4"	5-1/2" liner	23#	Total Depth	Sufficient to cover productive intervals.

Note: Drilling operations, casing program, and completion practices will be conducted in accordance with NMOCC Rule R-111-A.

Blowout Preventers: See Attached. Ser. 900 to 4000' (Fig. 4) Ser. 1500 to TD (Fig. 2)  
Mud Program: See Attached.

This well is located in a defined potash mining area. Potash lease owners are:

1. International Minerals and Chemical Corp., c/o Neal & Matkins, Attorneys, Drawer N, Carlsbad, New Mexico. 88220
2. U. S. Potash and Chemical Company, Box 101, Carlsbad, New Mexico. 88220

Copies of this filing have been mailed to these operators by certified mail, return receipt requested, on the date below. (See attached photo copy of mail receipts.).

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM. If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. (Give blowout preventer program, if any)

## 24.



W.J. Mueller

TITLE Senior Reservoir Engineer

DATE 12-19-72.

PERMIT NO.

APPROVAL DATE

APPROVED BY

CONDITIONS OF APPLICATION

TITLE

DATE

See Instructions On Reverse Side

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. 4906  
Order No. R-4500

APPLICATION OF PHILLIPS PETROLEUM  
COMPANY FOR A DRILLING PERMIT IN  
THE POTASH-OIL AREA, EDDY COUNTY,  
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on February 21, 1973, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 27th day of March, 1973, the Commission, a quorum being present, having considered the testimony presented, and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That the applicant, Phillips Petroleum Company, is the owner of certain oil and gas leases both within and adjacent to the Potash-Oil Area as defined by Commission Order No. R-111-A, as amended, a portion of which leases cover all of Section 13, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico.

(2) That the applicant proposes to drill a well to test the Morrow formation underlying said section, the location for the proposed well being 660 feet from the South line and 1980 feet from the West line of said Section 13.

(3) That International Minerals & Chemical Corporation and Teledyne Potash are the owners of potash mining leases within one mile of the aforesaid proposed well location, and as owners of such leases were notified by Phillips Petroleum Company of its intent to drill the proposed well, such notification being given pursuant to the provisions of Commission Order No. R-111-A, as amended.

(4) That International Minerals and Chemical Corporation and Teledyne Potash both protested to the Commission the drilling of the proposed well at the proposed location, whereupon the Secretary-Director of the Commission, pursuant to the

Case No. 4906  
Order No. R-4500

provisions of Commission Order No. R-111-A, as amended, sought a satisfactory settlement at an arbitration meeting at the Roswell, New Mexico, Area Offices of the United States Geological Survey.

(5) That no satisfactory settlement was forthcoming from said arbitration meeting, and on January 30, 1973, Phillips Petroleum Company made formal application for a hearing by the Commission of its proposed well at the location described in Finding No. (2) above.

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

(7) That appearances were made at said hearing by the applicant, Phillips Petroleum Company, and by International Minerals & Chemical Corporation.

(8) That the proposed location is in an area previously found by the Commission to contain potash deposits in commercial quantities. (Commission Order No. R-111-G, dated August 1, 1969.)

(9) That the commercial potash deposits underlying Section 13, Township 23 South, Range 30 East, NMPM, contain not only the relatively common form of potash ore known as sylvite but also the much more rare form of potash ore known as langbeinite, with the principal value of the ore being the langbeinite, the depth of the deposits being approximately 1400 feet beneath the surface of the ground.

(10) That although International Minerals & Chemical Corporation is not conducting active mining operations in Section 13, Township 23 South, Range 30 East, NMPM, at the present time, the evidence indicates that the subject Section 13 lies in the heart of a substantial ore body which comprises nearly one-half of International's total ore reserves, and that the company definitely plans to mine said Section 13.

(11) That primary mining operations in the oil-potash area of Southeast New Mexico normally recover approximately 50 percent of the ore in place.

(12) That secondary mining operations in said area normally recover an additional 40 percent of the ore in place, after which the floor and the ceiling of the mine converge as subsidence of the overburden occurs.

(13) That said subsidence occurs not only immediately above the mined-out area, but also outward from said area at a 45-degree angle to the surface of the ground.

-3-  
Case No. 4906  
Order No. R-4500

(14) That any well drilled within the aforesaid area of subsidence would be subjected to severe stresses as said subsidence occurs and could be sheared in two.

(15) That if such a well were sheared off below the surface of the ground, and if hydrocarbons were to escape from said well into the surrounding formations, there would be no practicable means of reentering said well to shut off said hydrocarbons.

(16) That such hydrocarbons would constitute a hazard to the safety of any potash-mining operation in the area.

(17) That to avert such hazard, the evidence indicates that no primary or secondary mining operations would be conducted closer than 150 feet to any well which produces or has produced hydrocarbons.

(18) That the evidence further indicates that primary mining operations would be conducted, but that secondary mining operations would not be conducted, in an area outside the 300 foot circle described in Finding No. (17) above, but within a 2800-foot circle (1400-foot radius) around any well which produces or has produced hydrocarbons.

(19) That according to the evidence, approximately 1,480,508 tons of ore having a value of \$9,947,339 would be left in the ground in the areas described in Findings No. (17) and (18) above if a well encountering hydrocarbons were to be drilled at the location proposed by the applicant and described in Finding No. (2) above.

(20) That approximately five years after primary and complete secondary mining operations have been conducted in a given area, subsidence in that area as well as outward from that area at a 45-degree angle to the surface of the ground will have been virtually completed, and a well could be safely drilled without danger of being subjected to the extreme stresses described in Finding No. (14) above.

(21) That a well could be located at a surface location approximately 1400 feet southwest of the southwest corner of Section 13, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico, and drilled vertically to a point beneath the salt section at which point it could be directionally drilled in a northeasterly direction to be bottomed in the Morrow formation at a suitable location underlying said Section 13.

(22) That the directional drilling of a well at the location and in the manner described in Finding No. (21) above would not cause the waste of potash and would afford the applicant the opportunity to test the Morrow formation underlying Section 13, Township 23 South, Range 30 East, NMPM.

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Case No. 4906  
Order No. R-4500

(23) That the drilling of a well at the location proposed by the applicant or at any alternative location in Section 13, Township 23 South, Range 30 East, NMPM, prior to completion of all mining operations in said Section 13, would result in the waste of potash as defined in Section 65-3-3 F., NMSA 1953 Comp.

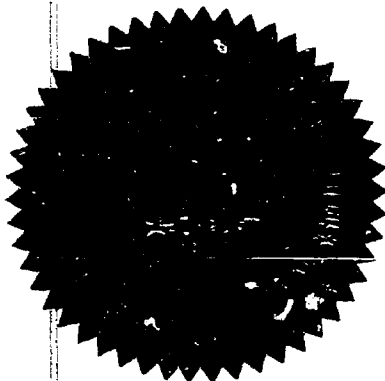
(24) That the application should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Phillips Petroleum Company to drill a well to test the Morrow formation, the location of which well would be 660 feet from the South line and 1980 feet from the West line of Section 13, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico, be and the same is hereby denied.

(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

*Bruce King*  
BRUCE KING, Chairman

*Alex J. Armijo*  
ALEX J. ARMIJO, Member

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

S E A L

dr/

BEFORE THE  
OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION  
OF PHILLIPS PETROLEUM COMPANY FOR  
A DRILLING PERMIT IN THE POTASH-  
OIL AREA, EDDY COUNTY, NEW MEXICO

CASE No. 4906

CLOSING STATEMENT  
OF PHILLIPS PETROLEUM COMPANY

This case was heard by the Oil Conservation Commission of New Mexico on February 21, 1973, on the application of Phillips Petroleum Company for a drilling permit in the Potash-Oil Area, Eddy County, New Mexico. Phillips, as applicant in the above case, seeks authority to drill its proposed Dunes-A well to test the Morrow formation at a location 660 feet from the South line, and 1980 feet from the West line of Section 13, Township 23 South, Range 30 East, N.M.P.M., Eddy County, New Mexico.

Phillips' proposed location is within the limits of the Potash-Oil Area as defined by New Mexico Oil Conservation Commission Order No. R-111-A, and classified as lands subject to the potash leasing provisions of the Mineral Leasing Act of 1920, as amended, by Secretary's Order No. 2563, amended by order of the Director, November 3, 1971.

The application was protested by International Minerals & Chemical Corporation, and by Teledyne Potash, and pursuant to the provisions of Order R-111-A, an arbitration meeting was held in Roswell, New Mexico, on January 26, 1973. Being unable to resolve the matter at the Roswell meeting, the case was set for hearing before the Oil Conservation Commission, and heard in Santa Fe, New Mexico, on February 21, 1973, at which time International Minerals and Chemical Corporation appeared and presented testimony.

The lands involved in this dispute are federally owned and are leased for both oil and gas, and for potash, being designated

for multiple use. The Federal regulations which govern the Potash-Oil Area generally provide that no potash operations shall be conducted that would constitute a hazard to oil or gas production, or that would unreasonably interfere with the orderly development and production under any oil or gas lease issued for the same land. (Secretary's Order, May 11, 1965). The same order further provides that no wells will be drilled for oil or gas at a location which, in the opinion of the Regional Oil and Gas Supervisor of the Geological Survey, would result in undue waste of potash deposits or would constitute a hazard to or unduly interfere with mining operations being conducted for the extraction of potash deposits. (Emphasis supplied.) Thus, basically, the problem is one governed by the regulations of the Department of the Interior.

The Commission, in cooperation with the United States Geological Survey, has adopted its Order No. R-111-A, and it is this order under which this hearing was conducted.

The problem is quite a simple one. Phillips Petroleum Company, owner of the oil and gas lease covering the lands involved, wants to drill and develop the acreage for anticipated gas production from the Morrow formation at a depth of approximately 14,300 feet. International Minerals and Chemical Corporation, as owner of the undeveloped potash lease covering the same lands, objects to the drilling on the grounds that it will interfere with its future mining of the properties.

Phillips, through its witnesses, E. M. Gorence, B. C. Largent, and Joe Woodson, showed that it is ready and willing to immediately commence a well at the proposed location, complying in all respects with the provisions of Order No. R-111-A as to the casing and cementing program for the well, which casing and cementing program was adopted by the Commission as a means of protecting the potash deposits in the area.

In contrast, International, through its General Superintendent in charge of Maintenance and Supervision, Charles Childers, showed that it had no present plans for the development of the potash reserves underlying the area. When pressed for a date when operations would commence he would only say that certainly they would be mining within fifteen years, maybe in ten, and as a possibility, five years. He admitted, however, that the area had not been included in any five year development plan filed with the Oil Conservation Commission under the provisions of Order R-111-A.

Considerable doubt is cast on the testimony of Mr. Childers when it is remembered that he testified that, on the basis of the core information available, eight cores in some seven sections, and relying on only one core in the subject section although another was available, he was ready to commence mining either by digging a shaft or extending present workings. His own witness, John T. Boyd, a recognized mining engineer, and consultant, stated he would not consider mining without further information, probably about eight cores to the section.

Mr. Childers ignored the information on the one core obtained closest to the Phillips proposed location, the Duval D-5-A, because the core did not agree with his findings on the presence and quality of langbenite ore. He did offer the information on this particular core when he testified before the Commission in Case No. 4175, and it should be considered by the Commission in this proceeding.

Mr. Childers also paid little attention to the information from his core No. 386, taken in Section 24, southwest of the proposed Phillips location, but admitted that the core information obtained there showed the area to be barren. Coupled with the information from the Dubal core, the situation at least casts doubt on Mr. Childers conclusions.



His methods of determining reserves, covering such a large area far removed from any potash development, was based on scant information and is of questionable value. At a minimum, it casts considerable doubt on his testimony that his company is ready to mine the area on the basis of presently available information -- a conclusion not even agreed to by his own witness, Mr. Boyd.

The most crucial matter involved in this case, however, is the element of time. Assuming that International will eventually mine the section involved, they flatly refused to say when, and their best estimate ranges up to fifteen years from the present time. The witness declined to put any date on mining plans for his company, and said that he could not do so. He said he did not know how the area would be mined, whether by a new shaft, or by extension of present workings. He would give no estimate on how long it would take to complete mining in the area once it was commenced. In other words, we are completely in the dark as to when International will occupy the area, how long they will be there, and when Phillips could come in after them, if ever.

If potash is to be developed first, mining will possibly start in fifteen years. Some forty years would have to be allowed as an estimate for mining operations and pulling of the pillars after first mining. Then, according to the witnesses, another five years for subsidence to occur before any drilling operations could be conducted. Phillips, assuming it could get its lease suspended, would be looking at sixty years before it could develop the area for gas production. There could well be no market for gas at that date.

There is no certainty that the area will ever be mined. The only thing we could get from International was that they intended to mine the area, didn't know when, but didn't want Phillips drilling before they mined it.

On the other hand, Phillips states it is ready to commence drilling operations immediately at the proposed location. In addition, while Phillips prefers to drill at this proposed location as stated in the application, it is willing to drill at a location 330 feet from the South line and 980 feet from the West line of Section 13, Township 23 South, Range 30 East, N.M.P.M., Eddy County, New Mexico. Further, Mr. Largent offered considerable testimony, supported by data from existing Morrow wells both in the vicinity and in the South Carlsbad Pool, to show that the gas reserves would be depleted within three to five years, or at a maximum, in eight years.

Some effort was made to discount this testimony, with figures on the poorer wells in the area. This testimony did not give weight to the history of the Shell No. 1 James Ranch well, Section 36, T. 22 S., R. 30 E., which produced in only four years, a total of 8,083,463 MCF, as compared to an accumulated production of 4,051,264 MCF for the preceding ten years. In other words, it is necessary to give consideration to the increasing market demand for gas that has occurred in the last few years, as evidenced by this and other wells. This demand will increase in the future, with lower line pressures to be anticipated as the demand increases.

There was also some testimony to the effect that drilling in the area poses a danger of gas entering the potash mine. No instance of this ever occurring was cited by the witnesses. With a properly plugged well, such a danger should be minimal. It is also a risk assumed where there is multiple use of lands, as is the situation here, and not a reason for denying the oil and gas lease owner the right to drill.

It should also be pointed out that the time factor has no bearing on the potash lease, which has no term, although the government reserves the right to reconsider it after twenty years.

Phillips has a right to drill for and develop the oil and gas underlying its lease. To postpone this right until some indefinite date many years in the future would effectively deny Phillips its rights under the lease.

As has been shown Phillips can develop its acreage, produce its gas, and plug and abandon its well long before International is ready on the basis of any testimony heard at this hearing, to commence mining operations. Admittedly Phillips bought its lease subject to the potash stipulations required by the government. International likewise purchased its lease subject to the rights of the oil and gas lessee.

In considering the equities involved in this situation, consideration should be given to the all-important question of time. Which owner can produce its minerals with the least delay and least damage to the other, where admittedly both have a right to be there.

The gas can be produced with little damage to the potash owner. Mining can commence immediately after the well has been plugged and abandoned. If the potash owner were ready to commence operations, or had commenced operations, something might be said for requiring the oil and gas production to wait. But with no such operations in sight in the predictable future, Phillips Petroleum Company should be permitted to immediately commence its well.

The Commission should further bear in mind that this is Federal land. No objection has been voiced by the U.S.G.S. to the drilling of the proposed well.

The test that should be applied by the Commission is the same one laid down by Federal regulations. Will the well "result in undue waste of potash deposits or constitute a hazard to or unduly interfere with mining operations being conducted for the extraction of potash deposits."

We submit that there will be no undue waste of potash deposits; no mining operations are being conducted and Phillips operations will not interfere with or pose any undue interference with any future operations.

The application of Phillips Petroleum Company for approval of its location for the Dunes-A well should be in all respects approved, and


Phillips should be permitted to drill the well at the proposed site.

Respectfully submitted,

JOE V. PEACOCK

KELLAHIN & FOX

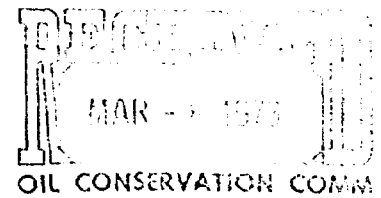
By



ATTORNEYS FOR PHILLIPS PETROLEUM CO.

KELLAHIN & FOX  
P. O. Box 1769  
Santa Fe, New Mexico

cc: Mr. Richard Morris and the  
U.S.G.S., Roswell  
New Mexico



BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

In the Matter of the Application of  
Phillips Petroleum Company for a  
drilling permit in the potash-oil  
area, Eddy County, New Mexico.

Case No. 4906

CLOSING STATEMENT OF INTERNATIONAL  
MINERALS & CHEMICAL CORPORATION

By Section 65-3-5 NMSA 1953, the Commission is given jurisdiction not only to effect conservation of oil and gas but also to prevent "waste of potash as a result of oil or gas operations", such waste being defined in Section 65-3-3F NMSA 1953 as:

"Drilling or producing operations for oil or gas within any area containing commercial deposits of potash where such operations would have the effect unduly to reduce the total quantity of such commercial deposits of potash which may reasonably be recovered in commercial quantities or where such operations would interfere unduly with the orderly commercial development of such potash deposits."

Pursuant to its statutory jurisdiction to prevent waste of potash, the Commission has entered Order No. R-111-A which sets forth those areas containing proven potash deposits of commercial grades and which prescribes procedures for disposition of applications to drill for oil and gas in those areas.

The application of Phillips Petroleum Company in this case concerns an area which the Commission, over Phillips' objection, previously determined to contain commercial potash reserves (Order No. R-111-G, dated August 1, 1969). Although Phillips was a party to the case in which such determination was made, no appeal was taken and the Commission's order is final. In addition to being governed by Order No. R-111-A, the lands upon which Phillips proposes to drill also are included in the

"Secretary's Area" specified by the Secretary of the Interior and in the "Known Potash Area" specified by the United States Geological Survey.

With the sole exception of the El Paso Natural Gas Company's Mobil Federal Well No. 1 located in Section 29 of the township to the east of Phillips' proposed well (concerning which peculiar circumstances relating to lease expiration precluded compliance with the hearing procedures of Order No. R-111-A), no oil and gas wells have been drilled within this portion of the protected area defined by Order No. R-111-A. The present application of Phillips is an attempt to "break" the protection of R-111-A in this area and to establish a precedent under which many additional wells could be drilled through the potash deposits. That Phillips is primarily interested in establishing this well as a precedent is amply demonstrated by its refusal to locate immediately outside the boundary of R-111-A in the extreme corner of the NE/4 of Section 23 or to drill directionally from that surface location to the proposed bottom hole location in such manner as to penetrate beneath the potash deposits in Section 13.

The potash deposits jeopardized by Phillips' proposed well contain langbeinite in commercial quantities and constitute the heart of the ore body in this particular area of IMC's leasehold. The langbeinite ore in Eddy County, New Mexico, is the only known commercial source of water-soluble magnesium, which is particularly useful in fertilizing citrus crops, and is not competitive with the sylvanite ores which are produced in Canada as well as in the potash mines of New Mexico. Only two potash companies (IMC and Duval) mine langbeinite ore whereas sylvanite ore is mined by all potash companies in New Mexico and Canada.

In contrast to the proven body of commercial langbeinite ore underlying Section 13, the presence of oil and gas in commercial quantities is unproven and speculative. Insufficient data exists to classify the proposed Phillips well as anything other than a "wildcat", which is the characterization imposed by Phillips' own witnesses. Phillips presented only the most general evidence concerning the nature of the gas-bearing formation it hopes to encounter at its proposed location or the reserves that could be anticipated if the formation should be present; however, IMC's witness Scott Hickman, based upon a detailed study of all area wells, concluded that Phillips has a poor chance of making a good well at the proposed location.

Drilling of the proposed Phillips well through the potash deposit, regardless of the success or failure of the well, would constitute an undue hazard to the IMC mine and would result in the waste of commercial potash ore. Although the well's chances are poor, if a successful well is made it will be productive for many years, and IMC would be required to leave a protective pillar of commercial ore, having an estimated value of approximately \$10 Million, surrounding the well bore. Even if the well is not commercial and has been plugged before this area is mined, the protective pillar may be required in order to provide complete protection against gas seepage into the mine. The safety hazard, as well as the hazard to property, obviously would dictate that the most cautious procedures be followed.

Denial of the Phillips application is the only way to prevent waste of potash deposits, yet denial will not preclude Phillips from pursuing other alternatives to explore for, to

develop and to produce whatever oil and gas reserves may be present in this area. Preferably, Phillips could defer drilling until mining in Section 13 has been completed. Less preferable to IMC, although it would be without recourse to prevent it, would be the drilling of a well in Section 23 or in any other adjoining area lying outside the boundaries of R-111-A, and IMC could offer no opposition to the directional drilling of a well from such adjoining lands provided the well did not penetrate the potash deposit under Section 13. The additional cost of directional drilling is more than outweighed by the waste of potash that otherwise would occur.

IMC respectfully submits that the application in this case should be denied.

Respectfully submitted,

MATKINS AND MARTIN

By Jerome R. Matkins  
JRM

MONTGOMERY, FEDERICI, ANDREWS,  
HANNAHS AND MORRIS

By Richard J. Morris

Attorneys for International  
Minerals & Chemical Corporation

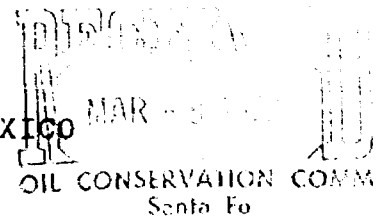
CERTIFICATE OF MAILING

This will certify that a true and correct copy of the foregoing Closing Statement of International Minerals & Chemical Corporation was mailed this 8th day of March, 1973 to Kellahin and Fox, P.O. Box 1769, Santa Fe, New Mexico, 87501.

Richard J. Morris



BEFORE THE  
OIL CONSERVATION COMMISSION OF NEW MEXICO



IN THE MATTER OF THE APPLICATION  
OF PHILLIPS PETROLEUM COMPANY FOR  
A DRILLING PERMIT IN THE POTASH-  
OIL AREA, EDDY COUNTY, NEW MEXICO

CASE No. 4906

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Phillips, through its witnesses, E. M. Gorence, B. C. Largent, and Joe Woodson, showed that it is ready and willing to immediately commence a well at the proposed location, complying in all respects with the provisions of Order No. R-111-A as to the casing and cementing program for the well, which casing and cementing program was adopted by the Commission as a means of protecting the potash deposits in the area.

In contrast, International, through its General Superintendent in charge of Maintenance and Supervision, Charles Childers, showed that it had no present plans for the development of the potash reserves underlying the area. When pressed for a date when operations would commence he would only say that certainly they would be mining within fifteen years, maybe in ten, and as a possibility, five years. He admitted, however, that the area had not been included in any five year development plan filed with the Oil Conservation Commission under the provisions of Order R-111-A.

Considerable doubt is cast on the testimony of Mr. Childers when it is remembered that he testified that, on the basis of the core information available, eight cores in some seven sections, and relying on only one core in the subject section although another was available, he was ready to commence mining either by digging a shaft or extending present workings. His own witness, John T. Boyd, a recognized mining engineer, and consultant, stated he would not consider mining without further information, probably about eight cores to the section.

Mr. Childers ignored the information on the one core obtained closest to the Phillips proposed location, the Duval D-5-A, because the core did not agree with his findings on the presence and quality of langebenite ore. He did offer the information on this particular core when he testified before the Commission in Case No. 4175, and it should be considered by the Commission in this proceeding.

Mr. Childers also paid little attention to the information from his core No. 386, taken in Section 24, southwest of the proposed Phillips location, but admitted that the core information obtained there showed the area to be barren. Coupled with the information from the Dubal core, the situation at least casts doubt on Mr. Childers conclusions.

His methods of determining reserves, covering such a large area far removed from any potash development, was based on scant information and is of questionable value. At a minimum, it casts considerable doubt on his testimony that his company is ready to mine the area on the basis of presently available information -- a conclusion not even agreed to by his own witness, Mr. Boyd.

The most crucial matter involved in this case, however, is the element of time. Assuming that International will eventually mine the section involved, they flatly refused to say when, and their best estimate ranges up to fifteen years from the present time. The witness declined to put any date on mining plans for his company, and said that he could not do so. He said he did not know how the area would be mined, whether by a new shaft, or by extension of present workings. He would give no estimate on how long it would take to complete mining in the area once it was commenced. In other words, we are completely in the dark as to when International will occupy the area, how long they will be there, and when Phillips could come in after them, if ever.

If potash is to be developed first, mining will possibly start in fifteen years. Some forty years would have to be allowed as an estimate for mining operations and pulling of the pillars after first mining. Then, according to the witnesses, another five years for subsidence to occur before any drilling operations could be conducted. Phillips, assuming it could get its lease suspended, would be looking at sixty years before it could develop the area for gas production. There could well be no market for gas at that date.

There is no certainty that the area will ever be mined. The only thing we could get from International was that they intended to mine the area, didn't know when, but didn't want Phillips drilling before they mined it.

On the other hand, Phillips states it is ready to commence drilling operations immediately at the proposed location. In addition, while Phillips prefers to drill at this proposed location as stated in the application, it is willing to drill at a location 330 feet from the South line and 980 feet from the West line of Section 13, Township 23 South, Range 30 East, N.M.P.M., Eddy County, New Mexico. Further, Mr. Largent offered considerable testimony, supported by data from existing Morrow wells both in the vicinity and in the South Carlsbad Pool, to show that the gas reserves would be depleted within three to five years, or at a maximum, in eight years.

Some effort was made to discount this testimony, with figures on the poorer wells in the area. This testimony did not give weight to the history of the Shell No. 1 James Ranch well, Section 36, T. 22 S., R. 30 E., which produced in only four years, a total of 8,083,463 MCF, as compared to an accumulated production of 4,051,264 MCF for the preceding ten years. In other words, it is necessary to give consideration to the increasing market demand for gas that has occurred in the last few years, as evidenced by this and other wells. This demand will increase in the future, with lower line pressures to be anticipated as the demand increases.

There was also some testimony to the effect that drilling in the area poses a danger of gas entering the potash mine. No instance of this ever occurring was cited by the witnesses. With a properly plugged well, such a danger should be minimal. It is also a risk assumed where there is multiple use of lands, as is the situation here, and not a reason for denying the oil and gas lease owner the right to drill.

It should also be pointed out that the time factor has no bearing on the potash lease, which has no term, although the government reserves the right to reconsider it after twenty years.

Phillips has a right to drill for and develop the oil and gas underlying its lease. To postpone this right until some indefinite date many years in the future would effectively deny Phillips its rights under the lease.

As has been shown Phillips can develop its acreage, produce its gas, and plug and abandon its well long before International is ready on the basis of any testimony heard at this hearing, to commence mining operations. Admittedly Phillips bought its lease subject to the potash stipulations required by the government. International likewise purchased its lease subject to the rights of the oil and gas lessee.

In considering the equities involved in this situation, consideration should be given to the all-important question of time. Which owner can produce its minerals with the least delay and least damage to the other, where admittedly both have a right to be there.

The gas can be produced with little damage to the potash owner. Mining can commence immediately after the well has been plugged and abandoned. If the potash owner were ready to commence operations, or had commenced operations, something might be said for requiring the oil and gas production to wait. But with no such operations in sight in the predictable future, Phillips Petroleum Company should be permitted to immediately commence its well.

The Commission should further bear in mind that this is Federal land. No objection has been voiced by the U.S.G.S. to the drilling of the proposed well.

The test that should be applied by the Commission is the same one laid down by Federal regulations. Will the well "result in undue waste of potash deposits or constitute a hazard to or unduly interfere with mining operations being conducted for the extraction of potash deposits."

We submit that there will be no undue waste of potash deposits; no mining operations are being conducted and Phillips operations will not interfere with or pose any undue interference with any future operations.

The application of Phillips Petroleum Company for approval of its location for the Dunes-A well should be in all respects approved, and

Phillips should be permitted to drill the well at the proposed site.

Respectfully submitted,

JOE V. PEACOCK

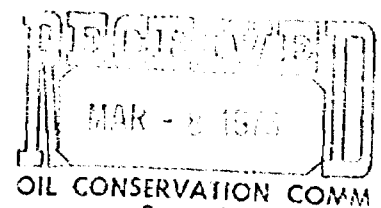
KELLAHIN & FOX

By W. F. Kellahin

ATTORNEYS FOR PHILLIPS PETROLEUM CO.

KELLAHIN & FOX  
P. O. Box 1769  
Santa Fe, New Mexico

cc: Mr. Richard Morris and the  
U.S.G.S., Roswell  
New Mexico



BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

In the Matter of the Application of  
Phillips Petroleum Company for a  
drilling permit in the potash-oil  
area, Eddy County, New Mexico.

Case No. 4906

CLOSING STATEMENT OF INTERNATIONAL  
MINERALS & CHEMICAL CORPORATION

By Section 65-3-5 NMSA 1953, the Commission is given jurisdiction not only to effect conservation of oil and gas but also to prevent "waste of potash as a result of oil or gas operations", such waste being defined in Section 65-3-3F NMSA 1953 as:

"Drilling or producing operations for oil or gas within any area containing commercial deposits of potash where such operations would have the effect unduly to reduce the total quantity of such commercial deposits of potash which may reasonably be recovered in commercial quantities or where such operations would interfere unduly with the orderly commercial development of such potash deposits."

Pursuant to its statutory jurisdiction to prevent waste of potash, the Commission has entered Order No. R-111-A which sets forth those areas containing proven potash deposits of commercial grades and which prescribes procedures for disposition of applications to drill for oil and gas in those areas.

The application of Phillips Petroleum Company in this case concerns an area which the Commission, over Phillips' objection, previously determined to contain commercial potash reserves (Order No. R-111-G, dated August 1, 1969). Although Phillips was a party to the case in which such determination was made, no appeal was taken and the Commission's order is final. In addition to being governed by Order No. R-111-A, the lands upon which Phillips proposes to drill also are included in the



"Secretary's Area" specified by the Secretary of the Interior and in the "Known Potash Area" specified by the United States Geological Survey.

With the sole exception of the El Paso Natural Gas Company's Mobil Federal Well No. 1 located in Section 29 of the township to the east of Phillips' proposed well (concerning which peculiar circumstances relating to lease expiration precluded compliance with the hearing procedures of Order No. R-111-A), no oil and gas wells have been drilled within this portion of the protected area defined by Order No. R-111-A. The present application of Phillips is an attempt to "break" the protection of R-111-A in this area and to establish a precedent under which many additional wells could be drilled through the potash deposits. That Phillips is primarily interested in establishing this well as a precedent is amply demonstrated by its refusal to locate immediately outside the boundary of R-111-A in the extreme corner of the NE/4 of Section 23 or to drill directionally from that surface location to the proposed bottom hole location in such manner as to penetrate beneath the potash deposits in Section 13.

The potash deposits jeopardized by Phillips' proposed well contain langbeinite in commercial quantities and constitute the heart of the ore body in this particular area of IMC's leasehold. The langbeinite ore in Eddy County, New Mexico, is the only known commercial source of water-soluble magnesium, which is particularly useful in fertilizing citrus crops, and is not competitive with the sylvanite ores which are produced in Canada as well as in the potash mines of New Mexico. Only two potash companies (IMC and Duval) mine langbeinite ore whereas sylvanite ore is mined by all potash companies in New Mexico and Canada.

In contrast to the proven body of commercial langbeinite ore underlying Section 13, the presence of oil and gas in commercial quantities is unproven and speculative. Insufficient data exists to classify the proposed Phillips well as anything other than a "wildcat", which is the characterization imposed by Phillips' own witnesses. Phillips presented only the most general evidence concerning the nature of the gas-bearing formation it hopes to encounter at its proposed location or the reserves that could be anticipated if the formation should be present; however, IMC's witness Scott Hickman, based upon a detailed study of all area wells, concluded that Phillips has a poor chance of making a good well at the proposed location.

Drilling of the proposed Phillips well through the potash deposit, regardless of the success or failure of the well, would constitute an undue hazard to the IMC mine and would result in the waste of commercial potash ore. Although the well's chances are poor, if a successful well is made it will be productive for many years, and IMC would be required to leave a protective pillar of commercial ore, having an estimated value of approximately \$10 Million, surrounding the well bore. Even if the well is not commercial and has been plugged before this area is mined, the protective pillar may be required in order to provide complete protection against gas seepage into the mine. The safety hazard, as well as the hazard to property, obviously would dictate that the most cautious procedures be followed.

Denial of the Phillips application is the only way to prevent waste of potash deposits, yet denial will not preclude Phillips from pursuing other alternatives to explore for, to

develop and to produce whatever oil and gas reserves may be present in this area. Preferably, Phillips could defer drilling until mining in Section 13 has been completed. Less preferable to IMC, although it would be without recourse to prevent it, would be the drilling of a well in Section 23 or in any other adjoining area lying outside the boundaries of R-111-A, and IMC could offer no opposition to the directional drilling of a well from such adjoining lands provided the well did not penetrate the potash deposit under Section 13. The additional cost of directional drilling is more than outweighed by the waste of potash that otherwise would occur.

IMC respectfully submits that the application in this case should be denied.

Respectfully submitted,

MATKINS AND MARTIN

By Jerome R. Matkins  
JRM

MONTGOMERY, FEDERICI, ANDREWS,  
HANNAHS AND MORRIS

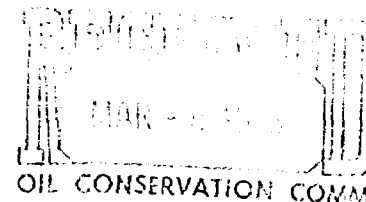
By Richard J. Morris

Attorneys for International  
Minerals & Chemical Corporation

CERTIFICATE OF MAILING

This will certify that a true and correct copy of the foregoing Closing Statement of International Minerals & Chemical Corporation was mailed this 8th day of March, 1973 to Kellahin and Fox, P.O. Box 1769, Santa Fe, New Mexico, 87501.

Richard J. Morris



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