STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 7416
Order No. R-6891

APPLICATION OF EL PASO NATURAL GAS COMPANY FOR POOL CREATION AND REDELINEATION, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on November 19, 1981, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 1st day of February, 1982, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, El Paso Natural Gas Company, seeks to contract the horizontal limits of the Jalmat Gas Pool by deleting therefrom most of the lands in Township 26 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That the applicant additionally seeks to redefine the Rhodes Yates-Seven Rivers Oil Pool as two separate pools, an oil pool and a gas pool, and to extend the horizontal limits of the Scarborough-Yates Seven Rivers Pool to take in two certain wells.

(4) Applicant further seeks to contract the horizontal boundaries of the Rhodes Gas Storage Unit to delete certain lands and wells not participating in the Rhodes Gas Storage Project and to withdraw without restriction all gas remaining in the newly redefined Rhodes Yates-Seven Rivers Gas Pool.

(5) That the aforesaid Jalmat Gas Pool and Rhodes Yates-Seven Rivers Oil Pool have substantially the same vertical limits and overlap, horizontally, to a great degree in Township 26 South, Range 37 East, Lea County, New Mexico.

(6) That to clarify the Division's pool nomenclature and eliminate said overlap, and to permit gas wells and oil wells within the overlap area to receive their proper allowable or authority to produce, the following action should be taken:

(a) the horizontal limits of the Jalmat Tansill-Yates-Seven Rivers Gas Pool should be contracted by deletion therefrom of the acreage shown in paragraph (a) of Exhibit "A" attached to this order;

(b) the horizontal limits of the Rhodes Yates-Seven Rivers Oil Pool should be contracted by deletion therefrom of the acreage shown in paragraph (b) of said Exhibit "A";

(c) the horizontal limits of the Scarborough Yates-Seven Rivers Pool should be extended to include therein the acreage shown in paragraph (c) of said Exhibit "A";

(d) That a new gas pool for Yates-Seven Rivers production should be created and designated the Rhodes Yates-Seven Rivers Gas Pool consisting of the acreage shown in paragraph (d) of said Exhibit "A".

(7) That no testimony was received relative to contraction of the Rhodes Gas Storage Unit and that portion of this application should be dismissed.

(8) That the newly created Rhodes Yates-Seven Rivers Gas Pool will be a non-prorated Gas Pool.

(9) That the effective date of this order should be January 1, 1982.

(10) That approval of the subject application and all the pool contractions, extensions, and creation included therein will not result in waste and will not violate correlative rights.

IT IS THEREFORE ORDERED:

(1) That the Jalmat Tansill Yates-Seven Rivers Gas Pool as previously defined and described in Lea County, New Mexico, is hereby contracted as shown in paragraph (a) of Exhibit "A" attached to this order.

(2) That the Rhodes Yates-Seven Rivers Oil Pool as previously defined and described in Lea County, New Mexico, is hereby contracted as shown in paragraph (b) of Exhibit "A" attached to this order.

(3) That the Scarborough Yates-Seven Rivers Pool as previously defined and described in Lea County, New Mexico, is hereby extended as shown in paragraph (c) of Exhibit "A" attached to this order.

(4) That a new pool for Yates-Seven Rivers gas production is hereby created and designated the Rhodes Yates-Seven Rivers Gas Pool with vertical limits consisting of the Yates and Seven Rivers formations and horizontal limits as shown in paragraph (d) of Exhibit "A" attached to this order, provided however, that the vertical limits of said pool in Section 4, Township 26 South, Range 37 East, NMPM, shall be the Yates formation and all of the Seven Rivers formation except the lowermost 100 feet thereof.

(5) That the portion of this case seeking deletion of certain lands from the Rhodes Gas Storage Unit is hereby dismissed.

(6) That the effective date of this order and of the pool contractions, extensions and creation and the dismissal contained herein shall be January 1, 1982.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

JOE D. RAMEY,
Director

S E A L

(a)

TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM
Sections 4, 5, and 6: All
Section 7: E/2 E/2
Sections 8 and 9: All
Section 10: W/2
Section 14: SW/4
Section 15, 16, and 17: All
Section 18: E/2 E/2
Section 19: E/2 NE/4
Sections 20, 21, and 22: All
Sections 27 and 28: All
Section 29: NE/4
Section 33: E/2 E/2
Section 34: All

(b) Contraction of the Rhodes Yates-Seven Rivers Oil Pool, Lea County, New Mexico:

TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM
Sections 4, 5, and 6: All
Section 7: E/2
Section 8: N/2, E/2 SE/4, SW/4 SE/4, and SE/4 SW/4
Section 9: All
Section 10: S/2
Sections 15 and 16: All
Section 17: NE/4, E/2 SE/4, and E/2 W/2
Section 21: N/2 N/2, SW/4 NW/4, and SE/4 NE/4
Section 22: N/2, N/2 SE/4, SE/4 SE/4, and NE/4 SW/4
Section 23: S/2

(c) Extension of the Scarborough-Yates-Seven Rivers Pool, Lea County, New Mexico:

TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM
Section 6: SW/4 SW/4
Section 29: NE/4

(d) Creation of the Rhodes-Yates-Seven Rivers Gas Pool, Lea County, New Mexico:

TOWNSHIP 26 SOUTH, RANGE 37 E., NMPM

Section 4: All
Section 5: E/2
Section 8: NE/4, E/2 SE/4, SW/4 SE/4, and SE/4 SW/4
Section 9: All
Section 10: W/2
Section 14: SW/4
Section 15 and 16: All
Section 17: NE/4, E/2 W/2, and E/2 SE/4
Section 21: N/2 N/2, SE/4 NE/4, and SW/4 NW/4
Section 22: N/2, N/2 SE/4, SE/4 SE/4, and NE/4 SW/4
Section 23: S/2

El Paso NATURAL GAS COMPANY

P. O. BOX 1492
EL PASO, TEXAS 79978

PHONE: 915-543-2600

1292

January 29, 1982

Seven NSP(s) (one order No)
Rule 104 D II, No offsets
Immediate Approval
Rhodes Gas Pool
NSPs are listed on attached sheets

New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. Dan Nutter

Re: Dedication Plats for El Paso Natural Gas Company
Rhodes Gas Pool Wells
Lea County, New Mexico

Dear Mr. Nutter:

Attached is a township plat for T26S, R37E, Lea County, New Mexico. On this plat I have marked 25 dedications (lettered A through Y). Also attached, is a list indicating the acreage description of each dedication and the names of the wells in each unit. Some dedications are standard dedications (quarter sections) and others are nonstandard due to irregular shapes and acreages less than 160 acres.

Acreage dedication plats (Form C-102) will be filed by the Production Department for each of the wells that presently do not have plats on file.

If these dedications require any additional data or if you have any questions, please call me.

Very truly yours,

H. L. Kendrick

je
Attachments

RECEIVED
FEB 09 1982
OIL CONSERVATION DIVISION
SANTA FE

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 2
CASE NOS. 12015 & 12017

Dedication Descriptions for
Rhodes Gas Pool Wells

All in Twp 26S - R37E

Identifying Letter	Color Code	Description and Section	Well Name(s) and Number(s) in Unit	Section Unit Letter	Number of Acres in Unit	Standard or Non-Standard Unit
A	Yellow	SW/4 Section 4	Farnsworth "C" No. 1	N	160	Standard
B	Pink	NE/4 Section 5	Shepherd "B" No. 3	A	160	Standard
C	Blue	SE/4 Section 5	Shepherd "B" No. 4	J	160	Standard
D	Red	NE/4 Section 8	Rhodes Stg. Unit No. 2 Rhodes Stg. Unit No. 22	A G	160	Standard
E	Yellow	E/2SE/4 and SW/4SE/4 Section 8	Rhodes Stg. Unit No. 23	P	120	Non-Standard X (1)
F	Dark Grey	NE/4 Section 9	Rhodes Stg. Unit No. 14 Rhodes Stg. Unit No. 15	G H	160	Standard
G	Green	NW/4 Section 9	Cagle "A" No. 2 Rhodes Stg. Unit No. 13	C E	160	Standard
H	Blue	SW/4 Section 9	Cagle "A" No. 1 Rhodes Stg. Unit No. 17	K M	160	Standard
I	Yellow	SE/4 Section 9	Rhodes Stg. Unit No. 1 Rhodes Stg. Unit No. 12	J P	160	Standard
J	Pink	NW/4 Section 10	Rhodes Stg. Unit No. 16	E	160	Standard

Identifying Letter	Color Code	Description and Section	Well Name(s) and Number(s) in Unit	Section Unit Letter	Number of Acres in Unit	Standard or Non-Standard Unit	
K	Light Blue	N/2 S/2 Section 10	Bates No. 1	L	160	Non-Standard	X 2
L	Red	SW/4 SW/4 Section 10	Rhodes Stg. Unit No. 9	M	40	Non-Standard	X 3
M	Blue	W/2NW/4 or SE/4NW/4 Section 15	Gregory "B" No. 1 Rhodes Stg. Unit No. 6 Rhodes Stg. Unit No. 7	E D F	120	Non-Standard	X 4
N	Pink	SW/4 Section 15	Cagle "B" No. 1 Cagle "B" No. 2 Rhodes Stg. Unit No. 24	L M N	160	Standard	
O	Yellow	SE/4 Section 15	Rhodes Stg. Unit No. 8 Rhodes Stg. Unit No. 25	J O	160	Standard	
P	Green	NE/4 Section 16	Rhodes Stg. Unit No. 3 State "Y" No. 1	A H	160	Standard	
Q	Red	NW/4 Section 16	Rhodes Stg. Unit No. 18 Rhodes Stg. Unit No. 19	D F	160	Standard	
R	Yellow	SW/4 Section 16	Rhodes Stg. Unit No. 20 Rhodes Stg. Unit No. 21	K M	160	Standard	
S	Dark Grey	SE/4 Section 16	Rhodes Stg. Unit No. 4 State "A" No. 1	J P	160	Standard	
T	Light Blue	S/2NE/4, E/2SE/4 Section 17	Elliott Fed. No. 3	H	160	Non-Standard	*

* already approved by R-474

Identifying Letter	Color Code	Description and Section	Well Name(s) and Number(s) in Unit	Section Unit Letter	Number of Acres in Unit	Standard or Non-Standard Unit	
U	Pink	E/2 W/2 Section 17	Elliott Fed. No. 1	F	160	Non-Standard	X *
V	Red	E/2NE/4 and NW/4NE/4 Section 21	Moberly "B" No. 1 Moberly "B" No. 2	A B	120	Non-Standard	X 5
W	Green	W/2NW/4 and NE/4NW/4 Section 21	Elliott Fed. No. 2 Moberly "C" No. 3	D E	120	Non-Standard	X 6
X	Blue	NW/4 Section 22	Rhodes "A" No. 1	C	160	Standard	
Y	Red	E/2SE/4 and NW/4SE/4 Section 22	Rhodes "A" No. 2	J	120	Non-Standard	X 7

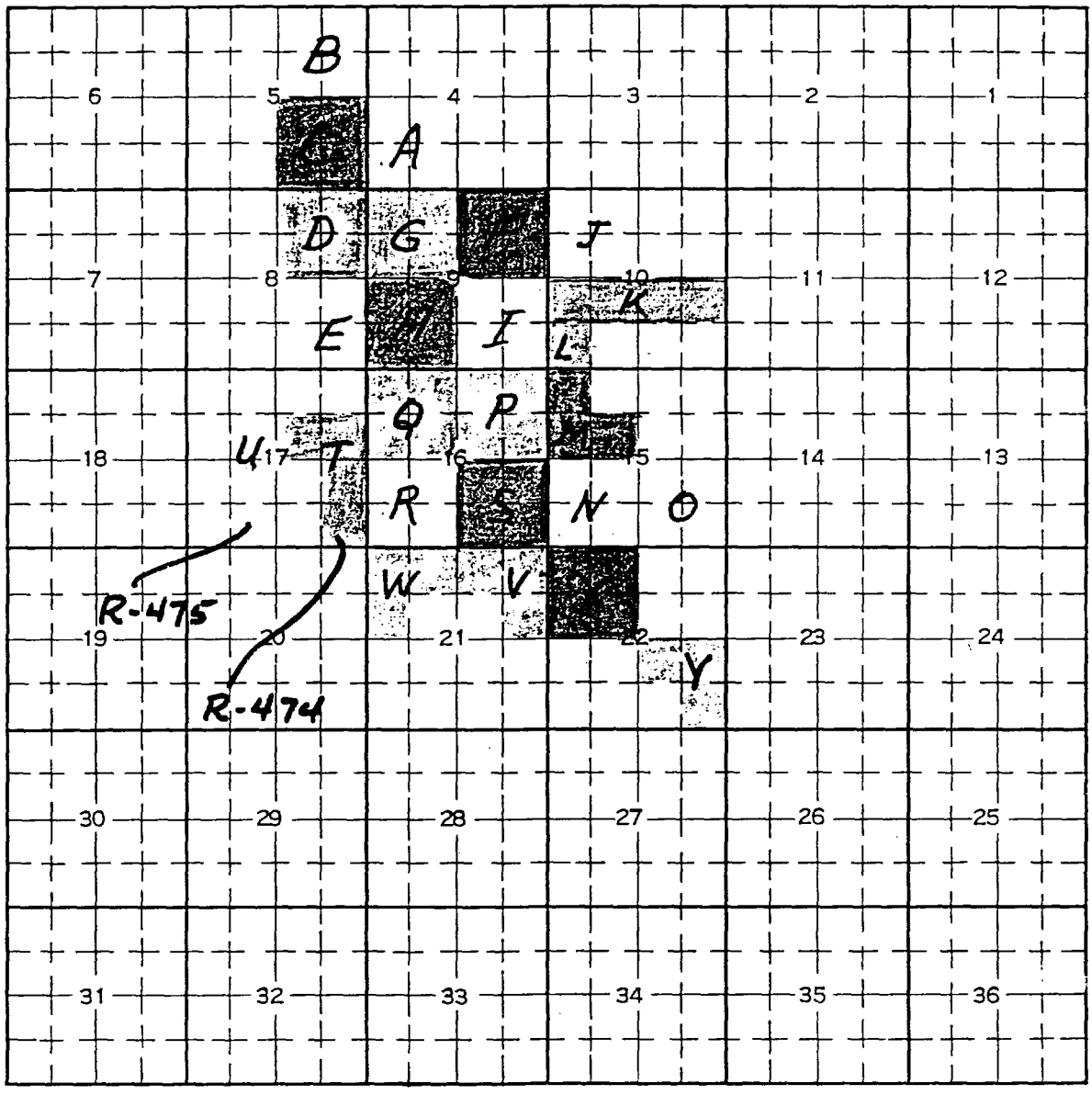
* Already approved by R-475

El Paso Natural Gas Company
Form 23-100 (4-57)

TOWNSHIP PLAT

(Scale: 1 in. - 1 mi.)

TOWNSHIP 26 S RANGE 37 E COUNTY LEA STATE N.M.



STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

February 10, 1982

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDI
SANTA FE, NEW MEXICO 87!
(505) 827-2434

El Paso Natural Gas Company
P. O. Box 1492
El Paso, Texas 79978

Attention: H. L. Kendrick

Administrative Order NSP-1292

Gentlemen:

Reference is made to your application for seven non-standard proration units consisting of the following acreage and wells in the Rhodes Gas Pool:

LEA COUNTY, NEW MEXICO
ALL IN TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM

Section 8: E/2 SE/4 and SW/4 SE/4 (120 acres)
Rhodes Stg. Unit Well No. 23

Section 10: N/2 S/2 (160 acres)
Bates Well No. 1

Section 10: SW/4 SW/4 (40 acres)
Rhodes Stg. Unit Well No. 9

Section 15: W/2 NW/4 and SE/4 NW/4 (120 acres)
Gregory "B" Well No. 1
Rhodes Stg. Unit Well No. 6
Rhodes Stg. Unit Well No. 7

Section 21: E/2 NE/4 and NW/4 NE/4 (120 acres)
Moberly "B" Well No. 1
Moberly "B" Well No. 2

Section 21: W/2 NW/4 and NE/4 NW/4 (120 acres)
Elliott Fed. Well No. 2
Moberly "C" Well No. 3

Section 22: E/2 SE/4 and NW/4 SE/4 (120 acres)
Rhodes "A" Well No. 2:

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 3
CASE NOS. 12015 & 12017

By authority granted me under the provisions of Rule 104 D II, the above non-standard proration units are hereby approved.

Sincerely,

JOE D. RAMEY,
Director

JDR/RLS/dr

cc: Oil Conservation Division - Hobbs
Oil & Gas Engineering Committee - Hobbs

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDI
SANTA FE, NEW MEXICO 87
(505) 827-5800

MEMORANDUM

TO: ALL OPERATORS

FROM: WILLIAM J. LEMAY, DIRECTOR WJL

SUBJECT: RULE 104 C II OF THE GENERAL RULES AND REGULATIONS

DATE: JULY 27, 1988

There has been some confusion about interpretation of the subject rule. In each paragraph of sections (a), (b) and (c) the rule states:

> "Unless otherwise provided in special pool rules, each development well for a defined gas pool shall be located on a tract..."

My interpretation of this sentence is that each well is to be located on its own individual specified unit and an additional well is not authorized simply by meeting the set back requirements of the rule.

This interpretation is necessary to prevent waste from the drilling of unnecessary wells and to protect correlative rights of all parties in the pool. Since the prorated pools have special pool rules the subject rules have greater impact on unprorated gas. Unprorated does not mean unregulated. Allowables are not issued in unprorated pools and the only method available to protect correlative rights is the control of well density and locations. Added well density required because of special geological situations can be addressed by special pool rules after notice and hearing.

Applications for additional wells on existing proration units will be approved only on the understanding that upon completion of the well the operator shall elect which well will be produced and which will be abandoned. Application to produce both wells will be approved only after notice and hearing and upon compelling ~~evidence~~ that the applicant's correlative rights will be impaired unless both wells are produced.

drl

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 4
CASE NOS. 12015 & 12017

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

MEMORANDUM

TO: ALL OPERATORS

FROM: WILLIAM J. LEMAY, DIRECTOR

SUBJECT: RULE 104 C II OF THE GENERAL RULES AND REGULATIONS

DATE: AUGUST 3, 1988

On July 27, 1988, we sent a memorandum to all operators to explain the Division's procedures for ensuring compliance with the above rule in handling applications for additional wells on existing proration units. The procedures are primarily applicable in unprorated gas pools.

The final paragraph of the July 27 memo reads as follows:

> "Applications for additional wells on existing proration units will be approved only on the understanding that upon completion of the well the operator shall elect which well will be produced and which will be abandoned. Application to produce both wells will be approved only after notice and hearing and upon compelling evidence that the applicant's correlative rights will be impaired unless both wells are produced."

Additional explanation of the intent of the above paragraph is set out below:

> Application to produce both wells continuously and concurrently will be approved only after notice and hearing and upon compelling evidence that the applicant's correlative rights will be impaired unless both wells are produced.
>
> Requests to produce the wells alternately (one well shut-in while the other produces) may be submitted for administrative handling. The request should set out the length of the producing and shut-in cycles for each well (a one month minimum is suggested), the proposed method for ensuring compliance with the proposed producing and shut-in schedules, and the reasons for the request. Notice should be provided to offset operators in the usual manner, allowing a 20-day waiting period. The application should be sent to Santa Fe with a copy to the appropriate District office.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 5
CASE NOS. 12015 & 12017

E
B

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 10683
ORDER NO. R-9870

APPLICATION OF MERIDIAN OIL, INC. FOR A NON-STANDARD GAS SPACING AND PRORATION UNIT, LEA COUNTY, NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on March 18, 1993 at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 14th day of April, 1993 the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

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

(2) The applicant, Meridian Oil Inc. ("Meridian"), seeks approval of a 160-acre non-standard gas spacing and proration unit in the designated and Undesignated Rhodes-Yates-Seven Rivers Gas Pool comprising the SE/4 SE/4 of Section 10 and the NE/4 NE/4 and the S/2 NE/4 of Section 15, both in Township 26 South, Range 37 East, NMPM, Lea County, New Mexico, said unit to be dedicated to its Gregory "B" Well No. 2 to be drilled at a standard gas well location in Unit A (NE/4 NE/4) of said Section 15.

(3) This application and hearing is the result of a denial by the Division (see letter on file with the Division dated February 15, 1993) of an administrative application for a 120-acre non-standard gas spacing and proration unit filed by Meridian in December, 1992, requesting the NE/4 NE/4 and S/2 NE/4 of said Section 15 be dedicated to the proposed well.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 6
CASE NOS. 12015 & 12017

(4) The Rhodes-Yates-Seven Rivers Gas Pool is an unprorated gas pool governed under the Division's general Rules and Regulations which require 160-acre spacing and proration units, substantially in the form of a square which is a quarter section, being a legal subdivision of the U.S. Public Lands Survey. Said pool is also governed by the two Division Memorandums dated July 27, 1988 and August 3, 1990, which disallow the simultaneous dedication in gas spacing units of more than one well in unprorated gas pools.

(5) As expressed in the aforementioned correspondence to Meridian dated February 15, 1993, it was the Division's opinion that all references to "proration units" in its Memorandums were to be interpreted as "standard gas proration units of standard size for a particular pool". Meridian was informed by said letter that the practice of operators forming non-standard spacing units in order to avoid the Division's simultaneous dedication policy was no longer an accepted practice. Also, Meridian was notified that in most instances the practice of forming non-standard sized and shaped spacing units to avoid the compulsory pooling of acreage within standard sized and shaped spacing and proration units was also not considered just cause by the Division.

(6) Within this particular two Section area, development of the Rhodes-Yates-Seven Rivers Gas Pool is as follows:

(a) The 40-acre non-standard gas spacing unit comprising the SW/4 SW/4 (Unit M) of Section 10, approved by Division Administrative Order NSP-1292, is dedicated to Meridian's Rhodes GSU Well No. 9 in Unit M;

(b) the standard 160-acre unit comprising the NW/4 of Section 10 is dedicated to Meridian's Rhodes GSU Well No. 16 in Unit E;

(c) the N/2 S/2 of Section 10, being a non-standard 160-acre unit approved by Division Administrative Orders NSP-1292 and NSP-1292-A has been developed by Meridian's Bates Well No. 1 (well P & A'ed February, 1988) in Unit L and Doyle Hartman - Oil Operator attempted to develop the same acreage with its C. T. Bates Well No. 2 (well was P & A'ed in January, 1991 after encountering a severe waterflow during drilling) also in Unit L;

(d) the standard 160-acre unit comprising the SW/4 of Section 15 is simultaneously dedicated to Meridian's Cagle "B" Well No. 1 in Unit L and Rhodes GSU Well No. 24 in Unit N (simultaneous dedication occurred prior to the Division's July 27, 1988 Memorandum);

(e) the standard 160-acre unit comprising the SE/4 of Section 15 is simultaneously dedicated (pre-1988 authorization) to Meridian's Rhodes GSU Well Nos. 8 and 25 in Units J and O, respectively; and,

(f) the 120-acre non-standard gas spacing unit comprising the NW/4 NW/4 and S/2 NW/4 of Section 15, approved by Division Administrative Order NSP-1292, is simultaneously dedicated (pre-1988 authorization) to Meridian's Gregory "B" Well No. 1 in Unit F and Rhodes GSU Well No. 7 in Unit F.

(7) The undeveloped portions comprise the NE/4 and NE/4 NW/4 of said Section 15 and the NE/4, SE/4 SW/4, and S/2 SE/4 of said Section 10. The NE/4 of Section 10 is a standard 160-acre unit and can therefore be developed without exception to the spacing rules. The remaining 320 acres comprising the SE/4 SW/4 and S/2 SE/4 of Section 10 and the NE/4 and NE/4 NW/4 of Section 15, of which the subject 160-acre non-standard spacing unit is a part, would require special attention to accommodate any combination of two 160-acre units within the space available.

(8) In this instance the proposed 160-acre non-standard gas proration unit is within a single Federal lease owned and operated by Meridian. The remaining 160 acres comprising the SE/4 SW/4 and SW/4 SE/4 of Section 10 and the NW/4 NE/4 and NE/4 NW/4 of Section 15 is owned by Doyle Hartman - Oil Operator ("Hartman").

(9) The applicant approached Hartman to voluntarily pool his interest in the NW/4 NE/4 of Section 15 in order to form a standard 160-acre gas spacing and proration unit for the Rhodes-Yates-Seven Rivers Gas Pool comprising the entire NE/4. By correspondence dated January 7, 1993 Hartman notified Meridian that he was not interested in contributing his acreage in the NE/4 of said Section 15. In most normal circumstances the applicant would be required to force pool Hartman's interest in order to obtain the appropriate amount of acreage for the proposed gas well.

(10) Meridian's proposal, although a variance of Division policy and rules, appears to be an acceptable plan to correct a situation previously forced on both Hartman's and Meridian's acreage holdings by the existing non-standard drilling tracts.

(11) The entire non-standard gas proration unit may reasonably be presumed productive of gas from the Rhodes-Yates-Seven Rivers Gas Pool and the entire non-standard gas proration unit can be efficiently and economically drained and developed by the aforesaid well.

(12) No interest owner and/or offset operator appeared at the hearing in opposition to the application.

(13) Approval of the subject application will afford the applicant the opportunity to produce his just and equitable share of gas in the Rhodes-Yates-Seven Rivers Gas Pool, will prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling of an excessive number of wells, and will otherwise prevent waste and protect correlative rights.

(14) In the future Hartman, or any applicable operator, may petition the Division for administrative approval for the remaining non-standard 160-acre gas spacing and proration unit in the Rhodes-Yates-Seven Rivers Gas Pool comprising the SE/4 SW/4 and SW/4 SE/4 of Section 10 and the NW/4 NE/4 and NE/4 NW/4 of Section 15. The operator should be required to follow the notice provisions as provided in Division General Rules 104.D(2)(a)(iii) and (iv).

IT IS THEREFORE ORDERED THAT:

(1) The application of Meridian Oil Inc. for a 160-acre non-standard gas spacing and proration unit in the designated and Undesignated Rhodes-Yates-Seven Rivers Gas Pool comprising the SE/4 SE/4 of Section 10 and the NE/4 NE/4 and the S/2 NE/4 of Section 15, both in Township 26 South, Range 37 East, NMPM, Lea County, New Mexico, is hereby approved.

(2) Said unit is to be dedicated to its Gregory "B" Well No. 2 to be drilled at a standard gas well location in Unit A (NE/4 NE/4) of said Section 15.

IT IS FURTHER ORDERED THAT:

(3) Any applicable operator who possesses the right to develop the Rhodes-Yates-Seven Rivers Gas Pool comprising the SE/4 SW/4 and SW/4 SE/4 of said Section 10 and the NW/4 NE/4 and NE/4 NW/4 of said Section 15, may petition the Division for administrative approval for a non-standard 160-acre gas spacing and proration unit comprising said acreage.

(4) Said operator shall comply with the notice provisions as provided in Division General Rules 104.D(2)(a)(iii) and (iv).

(5) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

SEAL

State of New Mexico
Oil Conservation Division
Rules and Regulations

Rule 104.C.(2)

Lea, Chaves, Eddy and Roosevelt Counties

(a) Gas Wells. Unless otherwise provided in special pool rules, each development well for a defined gas pool in a formation younger than the Wolfcamp formation, or in the Wolfcamp formation which was created and defined by the Division prior to November 1, 1975, or in a Pennsylvanian age or older formation which was created and defined by the Division prior to June 1, 1964, shall be located on a designated drilling tract consisting of 160 surface contiguous acres, more or less, substantially in the form of a square which is a quarter section being a legal subdivision of the U.S. Public Land Surveys, and shall be located not closer than 660 feet to any outer boundary of such tract nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary nor closer than 1320 feet to the nearest well drilling to or capable of producing from the same pool.

[5-25-64...2-1-96]

* * *

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 7
CASE NOS. 12015 & 12017

State of New Mexico
Oil Conservation Division
Rules and Regulations

Rule 104.D. (2)

Non-Standard Spacing Units.

Any well which does not have the required amount of acreage dedicated to it for the pool or formation in which it is completed may not be produced until a standard spacing unit for the well has been formed and dedicated to until a non-standard spacing unit has been approved. [5-25-64…2-1-96]

* * *

State of New Mexico
Oil Conservation Division
Rules and Regulations

Rule 104.D. (3)

Number of Wells Per Spacing Unit in Non-Prorated Gas Pools:

Unless otherwise permitted by special pool rules or authorized after notice and hearing, only one (1) well per spacing unit is permitted in non-prorated pools. [5-25-64…2-1-96]

* * *

State of New Mexico
Oil Conservation Division
Rules and Regulations

Rule 104.E.

Form C-102, "Well Location and Acreage Dedication Plat", for any well shall designate the exact legal subdivision allotted to the well and Form C-101, "Application for Permit to Drill, Deepen, or Plug Back", will not be approved by the Division without such proper designation of acreage. [12-29-52...2-1-96]

* * *

NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10416

IN THE MATTER OF:

The Application of Presidio Exploration, Inc., for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico.

BEFORE:

MICHAEL E. STOGNER

Hearing Examiner

State Land Office Building

December 19, 1991

COPY

REPORTED BY:

DEBBIE VESTAL
Certified Shorthand Reporter
for the State of New Mexico

1142 Silver

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 10
CASE NOS. 12015 & 12017

arguments. Mr. Carr, I'll allow you to go first. Mr. Bruce, you may follow up.

MR. CARR: Mr. Stogner, about two-and-a-half years ago, Presidio developed the north half of section -- of the subject section with their No. 9 well. And now they're back seeking a second well. Yates opposes it. It's very simple. We think the well is unnecessary.

We think the well is unnecessary and inappropriate because of the large drainage areas we see because of pressure interference in this reservoir, even pressure interference from the Presidio wells.

We think the OCD shouldn't approve this application. This is an application for an unorthodox well location and simultaneous dedication. And we think what it in fact is is an effort to change the pool rules, at least to start down that road, because of wells on the fringe or the flank of the formation that may not be performing as well as other wells in the pool.

But in addition to your just not -- our opinion that it's inappropriate for you to change it, I submit to you you really can't, because

when you make your decision, you're really going to be bound by two things, the record in this case and the legal framework within which that decision must be made.

The legal framework within which that decision must be made includes the Division's memorandum dated August 3, 1990. Part of that memorandum, citing an earlier memo from the Division reads: "Applications for additional wells on existing proration units will be approved only on the understanding that upon completion of the well the operator shall elect which well will be produced and which will be abandoned."

It goes on to say: "Application to produce both wells will be approved upon compelling evidence that the applicant's correlative rights will be impaired unless both wells are produced."

In this case there is nothing in the record that says Presidio's correlative rights will be impaired. That's what the requirement is.

Their geological witness comes before you and talks about the reservoir. Their

engineering witness comes before you. And neither one of them can tell you from a geological point of view or from an engineering point of view that their rights will be impaired. They say there may be additional zones that could be picked up. Their engineering witness indicated that if you produce one, shut it in for a month while you produce the other, and rock back and forth, that you get there.

They've talked about not impairing the rights of others, but they have never met the requirement of this rule. And there is nothing in this record that would support an order simultaneously dedicating these wells.

The best you can do on this record and in the legal framework within which you must operate is to let them drill it and then order them to plug one or the other. And, simply, that is an unnecessary and wasteful practice.

I would request that the memorandum of the Division dated August 3, 1990, be incorporated into the record. And that concludes our presentation.

EXAMINER STOGNER: So it will be.

Mr. Bruce.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 10416
ORDER NO. R-9644

**APPLICATION OF PRESIDIO EXPLORATION, INC.
FOR AN UNORTHODOX GAS WELL LOCATION AND
SIMULTANEOUS DEDICATION, EDDY COUNTY, NEW MEXICO**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on December 19, 1991, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 13th day of March, 1992 the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

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

(2) The applicant in this matter, Presidio Exploration, Inc., is currently developing the East Burton-Flat Strawn Gas Pool underlying Section 1, Township 20 South, Range 29 East, NMPM, Eddy County, New Mexico, in the following manner:

- the N/2 equivalent of said Section 1 comprising 321.20 acres is dedicated to the Superior Federal Well No. 9, located at a standard gas well location 1830 feet from the North line and 1980 feet from the East line (Unit G). This well was drilled to a total depth of 11,892 feet by The Petroleum Corporation of Delaware in January/February 1991. In April, 1991, this well was dually completed in both the East Burton Flat-Strawn and East Parkway-Atoka Gas Pools; and,

- the S/2 of said Section 1, comprising 320 acres, is dedicated to the Superior Federal Well No. 8, located at a standard gas well location 990 feet from the South line and 2130 feet from the West line (Unit N). This well was drilled and completed in the second quarter of 1990. On July 31, 1990, this well began producing gas from the East Burton Flat-Strawn Gas Pool.

(3) At this time, Presidio Exploration, Inc. seeks an exception to Division General Rule 104.C(2) to allow for the simultaneous dedication of the existing 321.20-acre gas spacing and proration unit within the East Burton Flat-Strawn Gas Pool, comprising Lots 1 through 4 and the S/2 N/2 (N/2 equivalent) of said Section 1 to both the aforementioned Well No. 9 and to its proposed Superior Federal Well No. 10 to be drilled at an unorthodox gas well location 1300 feet from the North and West lines (Unit D) of said Section 1.

(4) The East Burton Flat-Strawn Gas Pool is at this time considered an "unprorated gas pool" and therefore is not governed by the General Rules for the Prorated Gas Pools of New Mexico, as promulgated by Division Order No. R-8170, as amended.

(5) The spacing requirements provided in Division Statewide Rule 104.C(2)(b) would therefore apply in this particular situation. Specifically that which states:

> "Unless otherwise provided in special pool rules, each development well for a defined gas pool..., shall be located on a designated drilling tract..."

(6) Two separate memorandums issued by the Division Director on July 22, 1988 and August 3, 1990 set forth officially the Division's interpretation and policy for those instances, such as this case, where an applicant is requesting an additional well on an existing non-prorated gas spacing unit. The Division's conclusions were as follows:

> "Application to produce both wells continuously and concurrently will be approved only after notice and hearing and upon compelling evidence that the applicant's correlative rights will be impaired unless both wells are produced.

Requests to produce the wells alternately (one well shut-in while the other produces) may be submitted for administrative handling. The request should set out the length of producing and shut-in cycles for each well (a one month minimum is suggested), the proposed method for ensuring compliance with the proposed producing and shut-in schedules and reasons for the request."

(7) Yates Petroleum Corporation, a twenty-five percent working interest owner in the aforementioned Superior Federal Well No. 9 and offset operator to the southwest in the S/2 of adjacent Section 2, appeared at the hearing and presented testimony in opposition to Presidio's request for a second well on the existing East Burton Flat-Strawn gas spacing and proration unit comprising the N/2 equivalent of said Section 1.

(8) The applicant, by testimony, demonstrated that the entire N/2 equivalent of said Section 1 may reasonably be presumed productive of gas from said Strawn gas pool. Further, the geological evidence presented by the applicant indicates that a well drilled at the proposed unorthodox gas well location would encounter additional "porosity stringers" not present in the No. 9 well, which would indicate the entire productive Strawn interval underlying the N/2 equivalent of Section 1 is not being adequately drained by the Superior Federal Well No. 9 in the NE/4 equivalent of said Section 1 continuously and concurrently.

(9) Yates Petroleum Corporation's objection in this matter was focused on the simultaneous dedication issue and not the location variance of the proposed Superior Federal Well No. 10.

(10) In the best interest of conservation and to allow Presidio to recover its just and fair share of the gas it's entitled to in the East Burton Flat-Strawn Gas Pool underlying the N/2 equivalent of said Section 1, the applicant should be allowed to drill its Superior Federal Well No. 10 at the proposed unorthodox gas well location in Unit D. Subsequent to the completion of the No. 10 well, the operator should be allowed to produce Strawn gas from both wells only on an alternating basis (one well shut-in while the other produces); at no time should both wells be allowed to produce East Burton Flat-Strawn Gas Pool production continuously and concurrently from both aforementioned wells.

(11) Such production/shut-in cycle period for both wells may be established by the Division Director after administrative request by the applicant; however, such period should not be for less than one month.

IT IS THEREFORE ORDERED THAT:

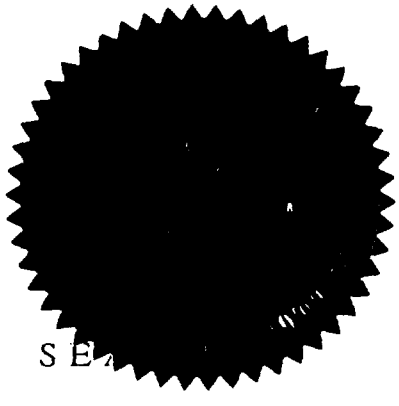
(1) The subject application of Presidio Exploration, Inc. for an exception to Division General Rule 104.C(2) to allow for the simultaneous dedication of the existing 321.20-acre gas spacing and proration unit within the East Burton Flat-Strawn Gas Pool, comprising Lots 1 through 4, and the S/2 N/2 (N/2 equivalent) of Section 1, Township 20 South, Range 29 East, NMPM, Eddy County, New Mexico, to both its Superior Federal Well No. 9 located at a standard gas well location 1830 feet from the North line and 1980 feet from the East line (Unit G) of said Section 1 and to its Superior Federal Well No. 10 to be drilled at an unorthodox gas well location 1300 feet from the North and West lines (Unit D) of said Section 1, is hereby granted conditional approval;

WHEREBY the applicant is permitted to produce Strawn gas from both wells alternately (one well shut-in while the other produces). Said production/shut-in cycle period for both wells may be established by the Division Director after administrative request by the applicant; however, such period shall not be for less than one month.

(2) The applicant's request to continuously and concurrently produce East Burton Flat-Strawn Gas Pool production in the N/2 equivalent of said Section 1 from both of said wells is hereby *denied.*

(3) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

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



STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
PO Drawer DD, Artesia, NM 88211-0719
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

Form C-
Revised October 18, 1
Instructions on b
Submit to Appropriate District Of
5 Co

☐ AMENDED REPO

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

[1] Operator name and Address	[2] OGRID Number
Gruy Petroleum Management Company P.O. Box 140907 Irving, Texas 75014	162683
	[3] Reason for Filing Code: Change of Operator (5/1/97)

[4] API Number	[5] Pool Name	[6] Pool Code
30-0 30-025-11952	Rhodes Yates-SR Gas	83810

[7] Property Code	[8] Property Name	[9] Well Number
21755	Farnsworth C	1

II. [10] Surface Location

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
N	4	26S	37E		990	South	1650	West	Lea

[11] Bottom Hole Location

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County

[12] Lse Code	[13] Producing Method Code	[14] Gas Connection Date	[15] C-129 Permit Number	[16] C-129 Effective Date	[17] C-129 Expiration Date
F	F	3/1/93			

III. Oil and Gas Transporters

[18] Transporter OGRID	[19] Transporter Name and Address	[20] POD	[21] O/G	[22] POD ULSTR Location and Description
20809	Sid Richardson	1716730	G	

IV. Produced Water

[23] POD	[24] POD ULSTR Location and Description

V. Well Completion Data

[25] Spud Date	[26] Ready Date	[27] TD	[28] PBTD	[29] Perforations	[30] DHC, DC, MC

[31] Hole Size	[32] Casing & Tubing Size	[33] Depth Set	[34] Sacks Cement

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 11
CASE NOS. 12015 & 12017

VI. Well Test Data

[35] Date New Oil	[36] Gas Delivery Date	[37] Test Date	[38] Test Length	[39] Tbg. Pressure	[40] Csg. Pressure

[41] Choke Size	[42] Oil	[43] Water	[44] Gas	[45] AOF	[46] Test Method

[47] I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

Signature:
Printed name: R.D. Cronk
Title: Vice President of Operations
Date: 6/26/97 Phone: (972) 401-3111

OIL CONSERVATION DIVISION

Approved by: ORIGINAL SIGNED BY GARY WINK
Title: FIELD REP. II
Approval Date: JUL 10 1997

GRUY-0000685

[47] If this is a change of operator fill in the OGRID number and name of the previous operator

Kent Beers — Previous Operator Signature | Burlington Resources Oil & Gas Co. (26485) — Printed Name | — Title | 5/1/97 — Date

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
PO Drawer DD, Artesia, NM 88211-0719
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

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Revised February 21, 1994
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☒ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

[1] Operator name and Address	[2] OGRID Number
Gruy Petroleum Management Co. P. O. Box 140907 Irving, Texas 75014-0907	162683
	[3] Reason for Filing Code: Name change effective 05/01/97

[4] API Number	[5] Pool Name	[6] Pool Code
30 - 025-11952	Rhodes Yates Seven Rivers Gas	83810

[7] Property Code	[8] Property Name	[9] Well Number
22321	Formerly: Farnsworth C Change to: Rhodes Federal Unit	FROM: 1 TO: 41 A1

II. [10] Surface Location

UL or lot no.	Section	Township	Range	Lot.Idn	Feet from the	North/South Line	Feet from the	East/West line	County
N	04	26S	37E		990	South	1650	West	Lea

[11] Bottom Hole Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Lse Code	[13] Producing Method Code	[14] Gas Connection Date	[15] C-129 Permit Number	[16] C-129 Effective Date	[17] C-129 Expiration Date
F	F	03/01/93			

III. Oil and Gas Transporters

[18] Transporter OGRID	[19] Transporter Name and Address	[20] POD	[21] O/G	[22] POD ULSTR Location and Description
020809	Sid Richardson	1716730	G	

IV. Produced Water

[23] POD	[24] POD ULSTR Location and Description
2814995	

V. Well Completion Data

[25] Spud Date	[26] Ready Date	[27] TD	[28] PBTD	[29] Perforations

[30] Hole Size	[31] Casing & Tubing Size	[32] Depth Set	[33] Sacks Cement

VI. Well Test Data

[34] Date New Oil	[35] Gas Delivery Date	[36] Test Date	[37] Test Length	[38] Tbg. Pressure	[39] Csg. Pressure

[40] Choke Size	[41] Oil	[42] Water	[43] Gas	[44] AOF	[45] Test Method

[46] I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

Signature: J.D. Highsmith

Printed name: J. D. Highsmith

Title: Manager Operations Administration

Date: December 22, 19997 Phone: (972) 401-3111

OIL CONSERVATION DIVISION

Approved by: ORIGINAL SIGNED BY CHRIS WILLIAMS
DISTRICT I SUPERVISOR

Title:

Approval Date:

GRUY-0000684

[47] If this is a change of operator fill in the OGRID number and name of the previous operator

Previous Operator Signature	Printed Name	Title	Date

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
PO Drawer DD, Artesia, NM 88211-0719
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

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I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

[1] Operator name and Address	[2] OGRID Number
Gruy Petroleum Management Co. P. O. Box 140907 Irving, Texas 75014-0907	162683
	[3] Reason for Filing Code Name change effective 05/01/97

[4] API Number	[5] Pool Name	[6] Pool Code
30 - 025-24505	Rhodes Yates - SR Gas	83810

[7] Property Code	[8] Property Name	[9] Well Number
22874	Formerly: Rhodes GSU Change to: Rhodes State Com	FROM: 19 TO: 19

II. [10] Surface Location

UL or lot no.	Section	Township	Range	Lot.Idn	Feet from the	North/South Line	Feet from the	East/West line	County
F	16	26S	37E		2080	North	1980	West	Lea

[11] Bottom Hole Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Lse Code	[13] Producing Method Code	[14] Gas Connection Date	[15] C-129 Permit Number	[16] C-129 Effective Date	[17] C-129 Expiration Date
S	F				

III. Oil and Gas Transporters

[18] Transporter OGRID	[19] Transporter Name and Address	[20] POD	[21] O/G	[22] POD ULSTR Location and Description
020809	Sid Richardson	1364030	G	

IV. Produced Water

[23] POD	[24] POD ULSTR Location and Description

V. Well Completion Data

[25] Spud Date	[26] Ready Date	[27] TD	[28] PBTD	[29] Perforations

[30] Hole Size	[31] Casing & Tubing Size	[32] Depth Set	[33] Sacks Cement

VI. Well Test Data

[34] Date New Oil	[35] Gas Delivery Date	[36] Test Date	[37] Test Length	[38] Tbg. Pressure	[39] Csg. Pressure

[40] Choke Size	[41] Oil	[42] Water	[43] Gas	[44] AOF	[45] Test Method

[46] I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

Signature: Zeno Farris

Printed name: Zeno Farris

Title: Manager Operations Administration

Date: January 22, 1998 Phone: (972) 401-3111

OIL CONSERVATION DIVISION

Approved by: Gary W. Wink

Title: FIELD REPRESENTATIVE II

Approval Date: APR 03 1998

[47] If this is a change of operator fill in the OGRID number and name of the previous operator

Previous Operator Signature	Printed Name	Title	Date

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
PO Drawer DD, Artesia, NM 88211-0719
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

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I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

[1] Operator name and Address	[3] OGRID Number
Gruy Petroleum Management Co. P. O. Box 140907 Irving, Texas 75014-0907	162683
	[3] Reason for Filing Code: Name change effective 05/01/97

[4] API Number	[5] Pool Name	[6] Pool Code
30 - 025-24504	Rhodes Yates - SR Gas	83810

[7] Property Code	[8] Property Name	[9] Well Number
22874	Formerly: Rhodes GSU Change to: Rhodes State Com	FROM: 18 TO: 18

II. [10] Surface Location

Ul or lot no.	Section	Township	Range	Lot.Idn	Feet from the	North/South Line	Feet from the	East/West line	County
D	16	26S	37E		660	North	860	West	Lea

[11] Bottom Hole Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Lse Code	[13] Producing Method Code	[14] Gas Connection Date	[15] C-129 Permit Number	[16] C-129 Effective Date	[17] C-129 Expiration Date
S	F				

III. Oil and Gas Transporters

[18] Transporter OGRID	[19] Transporter Name and Address	[20] POD	[21] O/G	[22] POD ULSTR Location and Description
020809	Sid Richardson	1363930	G	

IV. Produced Water

[23] POD	[24] POD ULSTR Location and Description

V. Well Completion Data

[25] Spud Date	[26] Ready Date	[27] TD	[28] PBTD	[29] Perforations

[30] Hole Size	[31] Casing & Tubing Size	[32] Depth Set	[33] Sacks Cement

VI. Well Test Data

[34] Date New Oil	[35] Gas Delivery Date	[36] Test Date	[37] Test Length	[38] Tbg. Pressure	[39] Csg. Pressure

[40] Choke Size	[41] Oil	[42] Water	[43] Gas	[44] AOF	[45] Test Method

[46] I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

Signature: Zeno Farris

Printed name: Zeno Farris

Title: Manager Operations Administration

Date: January 22, 1998 Phone: (972) 401-3111

OIL CONSERVATION DIVISION

Approved by: Gary W. Wink

Title: GARY W. WINK FIELD REPRESENTATIVE II

Approval Date: JAN 29 1998

[47] If this is a change of operator fill in the OGRID number and name of the previous operator

Previous Operator Signature	Printed Name	Title	Date

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
PO Drawer DD, Artesia, NM 88211-0719
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
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I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

[1] Operator name and Address	[2] OGRID Number
Gruy Petroleum Management Co. P. O. Box 140907 Irving, Texas 75014-0907	162683
	[3] Reason for Filing Code: Name change effective 05/01/97

[4] API Number	[5] Pool Name	[6] Pool Code
30 - 025-11949	Langlie Mattix; 7 RVRS - Q - Grayburg	37240

[7] Property Code	[8] Property Name	[9] Well Number
21371	Formerly: Farnsworth 4 / Change to: Rhodes Federal Unit	FROM: 5 TO: 4-3

II. [10] Surface Location

Ul or lot no.	Section	Township	Range	Lot.Idn	Feet from the	North/South Line	Feet from the	East/West line	County
L	04	26S	37E		2310	South	990	West	Lea

[11] Bottom Hole Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Lse Code	[13] Producing Method Code	[14] Gas Connection Date	[15] C-129 Permit Number	[16] C-129 Effective Date	[17] C-129 Expiration Date
F	TA Exp. 07/11/96				

III. Oil and Gas Transporters

[18] Transporter OGRID	[19] Transporter Name and Address	[20] POD	[21] O/G	[22] POD ULSTR Location and Description
020809	Sid Richardson	1369330	G	
022628	Texas New Mexico Pipeline	1369310	O	

IV. Produced Water

[23] POD	[24] POD ULSTR Location and Description
1369350	

V. Well Completion Data

[25] Spud Date	[26] Ready Date	[27] TD	[28] PBTD	[29] Perforations

[30] Hole Size	[31] Casing & Tubing Size	[32] Depth Set	[33] Sacks Cement

VI. Well Test Data

[34] Date New Oil	[35] Gas Delivery Date	[36] Test Date	[37] Test Length	[38] Tbg. Pressure	[39] Csg. Pressure

[40] Choke Size	[41] Oil	[42] Water	[43] Gas	[44] AOF	[45] Test Method

[46] I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

Signature: J.D. Highsmith
Printed name: J.D. Highsmith
Title: Manager Operations Administration
Date: December 22, 19997 Phone: (972) 401-3111

OIL CONSERVATION DIVISION
Approved by: Chris Williams
Title: DISTRICT I SUPERVISOR
Approval Date: JAN 26 1998

[47] If this is a change of operator fill in the OGRID number and name of the previous operator

Previous Operator Signature	Printed Name	Title	Date

Form 3160-5
(November 1994)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

P.O. Box 1980
Hobbs, NM 88241

FORM APPROVED
OMB No. 1004-0135
Expires July 31, 1996

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side

5. Lease Serial No.
LC - 054668

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.
8920003820

1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.
Rhodes Federa Unit No. 43

2. Name of Operator
Gruy Petroleum Management Co.

9. API Well No.
30-025-11949

3a. Address
P.O. Box 140907 Irving, TX 75014-0907

3b. Phone No. *(include area code)*
972.401.3111

10. Field and Pool, or Exploratory Area
Rhodes Yates 7 Rivers Gas

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
2310' FSL & 990 FWL Sec. 4 26S, 37E

11. County or Parish, State
Lea, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☒ Recomplete	☒ Other Add Perf's
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	I
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereo If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zone Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 da following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed onc testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator h determined that the site is ready for final inspection.)

A CIBP was set at 3150' and well was temporarily abandoned in September, 1993.

Plan to re-complete well to Yates formation. Add perforations from 2680' - 2923' and acidize w/ 1000 gallons of 7.5% acid. Will frac all perforations 2680' - 2693'; 2740' - 2753'; 2760' - 2755'; 2782' - 2785'; 2789' - 2792'; 2805' - 2815'; 2820' - 2836'; 2846' - 2852'; 2865' - 2877'; and 2900' - 2923' with 150,000# of 20/40 and 12/20 sand. Frac job may be altered when job design is completed. Return well to production in the Yates Formation.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 12
CASE NOS. 12015 & 12017

14. I hereby certify that the foregoing is true and correct

Name *(Printed/Typed)*	Title
Zeno Farris	Manager Operations Administration
Signature Zeno Farris	**Date** February 16, 1998

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
ORIG. SGD.) DAVID R. GLASS		
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office	

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious c fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on reverse)

GRUY PETROLEUM MANAGEMENT CO.

AUTHORITY FOR EXPENDITURE

LEASE WELL	RHODES FEDERAL UNIT #4-3	DATE:	3/4/98
LOCATION	2310' fsl, 990 frw, Unit L, Sec. 4, T26S-R37E	PREPARED BY:	H. Miller
COUNTY,STAT	LEA NEW MEXICO	AFE NUMBER:	0
PROJECT	Perforate Yates and stimulate.		

ACCT	WORKOVER EXPENSE				AMOUNT
800.05	LEASE ACQUISITION COST				
870.10	DAMAGES				
870.12	DIRTWORK, ROADS, CLEANUP				
870.24	RIG / WELL SERVICE UNIT	4 DAYS @	$1,250 / DAY		5,000.00
870.25	MISCELLANEOUS SUPPLIES				
870.30	FUEL, POWER, LUBE OILS				
870.31	WATER & WATER HAULING				500.00
870.32	TRANSPORTATION				
870.40	CHEMICALS				
870.52	WIRELINE SERVICES (Perforating)				
870.60	CEMENT & CEMENTING				
870.61	CASING CREW & EQUIPMENT				
870.70	EQUIPMENT RENTAL				2,500.00
870.74	ACIDIZING / FRACTURING				59,000.00
870.75	PERFORATING				5,600.00
870.77	FRAC OIL				
870.78	ROUSTABOUTS				
870.80	CONTRACT LABOR - WELDING				
870.81	SUPERVISION - COMPANY				1,000.00
870.82	SUPERVISION - CONTRACT				
870.84	ENGINEERING / GEOLOGICAL				
870.85	OVERHEAD				
870.95	MISCELLANEOUS & CONTINGENCIES (10%)				7,360.00
				TOTAL EXPENSE	80,960.00

	EQUIPMENT					
840.10	CASING		FT @		$/FT	
840.11	CASING		FT @		$/FT	
840.12	CASING		FT @		$/FT	
840.13	TUBING	3000	FT @	$ 2.30	$/FT	6,900.00
840.24	RODS	3000	FT @	$ 1.00	$/FT	3,000.00
840.50	FLOW LINE		FT @		$/FT	
840.20	WELLHEAD EQUIPMENT					
840.23	SUBSURFACE EQUIPMENT (BH PUMP ETC.)					1,500.00
840.60	TANKS					
840.30	TREATER					
840.31	SEPARATOR					
	GAS PROCESSING UNIT/SWEETENERS					
840.21	PUMPING UNIT AND POWER					5,500.00
	OTHER MISCELLANEOUS EQUIPMENT (FENCES,CULVERTS,TOOLS)					
840.80	CONSTRUCTION / INSTALLATION					
840.95	MISCELLANEOUS & CONTINGENCY (10%)					1,690.00
					TOTAL EQUIPMENT	18,590.00
					TOTAL WELL COST	99,550.00

RHODES FED. UNIT #4-3 (PBP)
4L26S37E LEA CO. NM
YATES/SEVEN RIVERS
(PREV. NAME: FARNSWORTH #4-5)

DATE: 03/05/98
TIME: 07:28:49
FILE: RFU82
GET#: 3

RESERVES AND ECONOMICS

AS OF APRIL 1, 1998

-END-	---GROSS PRODUCTION---		----NET PRODUCTION----		--PRICES---		--------OPERATIONS, M$--------					10.00 PCT
MO-YR	OIL, MBBL	GAS, MMCF	OIL, MBBL	GAS, MMCF	OIL $/B	GAS $/M	NET OPER REVENUES	SEV+ADV TAXES	NET OPER EXPENSES	CAPITAL COSTS, M$	CASH FLOW BTAX, M$	CUM. DISC BTAX, M$
12-98	.000	37.825	.000	33.097	.00	2.15	71.159	5.835	4.500	99.550	-38.726	-40.849
12-99	.000	24.644	.000	21.564	.00	2.15	46.363	3.802	6.000	.000	36.561	-8.382
12- 0	.000	16.332	.000	14.291	.00	2.15	30.726	2.520	6.000	.000	22.206	9.545
12- 1	.000	13.979	.000	12.232	.00	2.15	26.299	2.157	6.000	.000	18.142	22.859
12- 2	.000	12.312	.000	10.773	.00	2.15	23.162	1.899	6.000	.000	15.263	33.042
12- 3	.000	10.999	.000	9.624	.00	2.15	20.692	1.697	6.000	.000	12.995	40.924
12- 4	.000	9.941	.000	8.698	.00	2.15	18.701	1.533	6.000	.000	11.168	47.082
12- 5	.000	9.068	.000	7.935	.00	2.15	17.060	1.399	6.000	.000	9.661	51.925
12- 6	.000	8.335	.000	7.293	.00	2.15	15.680	1.286	6.000	.000	8.394	55.750
12- 7	.000	7.713	.000	6.749	.00	2.15	14.510	1.190	6.000	.000	7.320	58.782
12- 8	.000	7.178	.000	6.281	.00	2.15	13.504	1.107	6.000	.000	6.397	61.191
12- 9	.000	6.711	.000	5.872	.00	2.15	12.625	1.035	6.000	.000	5.590	63.105
12-10	.000	6.301	.000	5.513	.00	2.15	11.853	.972	6.000	.000	4.881	64.624
12-11	.000	5.939	.000	5.197	.00	2.15	11.174	.916	6.000	.000	4.258	65.829
12-12	.000	5.617	.000	4.915	.00	2.15	10.567	.866	6.000	.000	3.701	66.781
12-13	.000	5.326	.000	4.660	.00	2.15	10.019	.822	6.000	.000	3.197	67.529
12-14	.000	5.066	.000	4.433	.00	2.15	9.531	.782	6.000	.000	2.749	68.113
12-15	.000	4.829	.000	4.225	.00	2.15	9.084	.745	6.000	.000	2.339	68.565
12-16	.000	4.613	.000	4.036	.00	2.15	8.677	.712	6.000	.000	1.965	68.910
12-17	.000	4.416	.000	3.864	.00	2.15	8.308	.681	6.000	.000	1.627	69.170
S TOT	.000	207.144	.000	181.252	.00	2.15	389.694	31.956	118.500	99.550	139.688	69.170
REM.	.000	22.585	.000	19.763	.00	2.15	42.490	3.484	35.035	.000	3.971	69.678
TOTAL	.000	229.729	.000	201.015	.00	2.15	432.184	35.440	153.535	99.550	143.659	69.678
CUM.	.000	.000										
JLT.	.000	229.729										

		NET OIL REVENUES (M$)	.000		
		NET GAS REVENUES (M$)	432.184		
		TOTAL REVENUES (M$)	432.184		
BTAX RATE OF RETURN (PCT)	44.53	PROJECT LIFE (YEARS)	25.589		
BTAX PAYOUT YEARS	1.85	DISCOUNT RATE (PCT)	10.000		
BTAX PAYOUT YEARS (DISC)	2.22	GROSS OIL WELLS	.000		
BTAX NET INCOME/INVEST	2.44	GROSS GAS WELLS	1.000		
BTAX NET INCOME/INVEST (DISC)	1.70	GROSS WELLS	1.000		
INITIAL W.I. FRACTION	1.000000	INITIAL NET OIL FRACTION	.000000		
FINAL W.I. FRACTION	1.000000	FINAL NET OIL FRACTION	.000000		
PRODUCTION START DATE	4- 1-98	INITIAL NET GAS FRACTION	.875000		
MONTHS IN FIRST LINE	9.00	FINAL NET GAS FRACTION	.875000		

---------PRESENT WORTH PROFILE---------

DISC RATE	PW OF NET BTAX, M$	DISC RATE	PW OF NET BTAX, M$
.0	143.659	30.0	17.022
2.0	122.625	35.0	10.140
5.0	98.185	40.0	4.411
8.0	79.680	45.0	-.453
10.0	69.678	50.0	-4.640
12.0	61.092	60.0	-11.519
15.0	50.274	70.0	-16.967
18.0	41.337	80.0	-21.415
20.0	36.199	90.0	-25.130
25.0	25.488	100.0	-28.300

Form 3160-5
November 1994)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OPERATOR'S COPY

FORM APPROVED
OMB No. 1004-0135
Expires July 31, 1996

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side

5. Lease Serial No.
LC-054668

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit or CA/Agreement, Name and/or No.
8920003820

1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.
RHODES FEDERAL UNIT #43

2. Name of Operator
Gruy Petroleum Management Co.

9. API Well No.
30-025-11949

3a. Address
P. O. Box 140907 Irving, TX 75014-0907

3b. Phone No. *(include area code)*
972-401-3111

10. Field and Pool, or Exploratory Area
Rhodes-Yates-7 Rivers Gas

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
2310' FSL & 99FWL Sec. 4-26S-37E

11. County or Parish, State
Lea Co., NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☒ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☒ Subsequent Report	☐ Alter Casing	☒ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

03/05/98 MIRU NDWH NUBOP. Tag CIBP @ 3150' KB.

03/06/98 MIRU pump truck, pumped 20 bbls 2% KCL wtr, POOH w/ tbg. Log from 3150' PBTD to 2150'
Perf'd 2680' - 2923', 1 jspf (114 holes). PU & RIH w/ bailer to dump 2 sx cement on CIBP.

03/09/98 Acidize well w/ 2,200 gals 15% HCL.

03/10/98 CO2 Foam Frac well w/ 50Q CO2 foam & 77,200 lbs 16/30 Brady sand.

03/11/98 Set tbg @ 2915'. Well flowing on test.

03/12/98 SI WO pipeline connection.

ACCEPTED FOR RECORD
PETER W. CHESTER
JUL 30 1998
BUREAU OF LAND MANAGEMENT
ROSWELL RESOURCE AREA

14. I hereby certify that the foregoing is true and correct

Name *(Printed/Typed)*
Zeno Farris

Title
Manager Operations Administration

Signature Zeno Farris

Date
July 14, 1998

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

GRUY-0000741

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on reverse)

Gruy Petroleum Well History Report

WellNo	*70228.0403.1*
WellName	*Rhodes Federal Unit 4-3*
Operated	Yes
OpName	*Workover*
AreaGroupName	*Yates / Seven Rivers*

ReportDate	*ReportText*

3/13/98

Placed on 30/64" choke: FTP 52#, FCP 52#, 184 MCFD. See "Production Watch Report" for future production.

FINAL REPORT

3/11/98

Present Operation - Flowing well on test.
PU & RIH w/ 6-1/4" bit, bit sub, on 2-3/8" tbg, tag @ 3123'. POH w/ tbg, lay down bit, RIH w/ 2-3/8" SN, on 2-3/8" tbg, to 2753'. RIH w/ swab, FFL @ 2700'. 3-run swab to SN, moved SN to 2915', ND BOP, NU WH, RIH w/ swab, FFL @ 2700', 2nd run f/ SN, 10# tbg, 100# csg, made 2 more runs @ SN, turn to frac tank, 10/64" choke, 10# on tbg, 100# on csg, returns of 5 bbls fluid. SDON.

3/10/98

Present Operation - CO2 foam frac.
Unable to pull well head, adapted master valve to well. NUWH to flowback. MIRU Halliburton to CO2 foam frac. Pumped as follows: (1) start 25,000 gas of 50 quality foam; (2) start 15,000 gals of 50 1-4 ppg sand; (3) start 10,000 gals of 50 quality 4 ppg sand; (4) start 4431 gals 50 quality foam flush; (5) Record pressure ISIP - 499#, 10 mins 496#, 77200lbs, 722 sacks, FV 747, CO2 vol 653 bbls, 113 ton down hole. RDMO Halliburton. Open @ 12:25pm 10/64" choke 500# flowed gas, 1:25pm 12/64" @ 450#, 2:25pm 14/64" @ 325 lbs, 16/64" @ 200 lbs, 3:55pm 18/64" @ 110#, 5:00pm @ 18/64" 10#, flowing gas, no fluid, left flowing to frac tank over night. SDON.

3/9/98

Present Operation - Acidize.
PU & RIH w/ RBP pkr, flow control valve, on 2-3/8" tbg. Pickle tbg @ 2930'. Test FCV, open @ 1106#, closed @ 551#. RIH w/ RBP below perfs. Set pkr between 2900' - 2877', pumped acid @ 1052#, moved tools, set on each side of 2877' - 2865', @ 1050# moved tools to each side 2846' - 2852', @ 1010#, move tools to each side at 2805' - 2836', @ 1194# broke to 1053#, move tools to each side of 2782' - 2792' @ 2200#, broke to 1002#, moved tools to each side at 2760' - 2775', @ 1101#, move tool to each side 2740' - 2753', @ 2300#, broke back to 996#, moved tools to each side 2680' - 2693', @ 2683#, broke back to 1042#, pump off all sets @ 1BPM rate, moved RBP below perfs, set pkr @ 2664', swab down in 3 runs, FFL 1400', 2nd 2200', 3rd - SN, 8 bbls fluid. Released pkr & RBP, POH & layed down tool. ND BOP, WH, NU w/ Guardian valve & equip. SDON.

Submit 2 copies to Appropriate
District Office.
DISTRICT I
P.O. Box 1980, Hobbs, NM 88240
DISTRICT II
P.O. Drawer DD, Artesia, NM 88210
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-116
Revised 1/1/89

GAS - OIL RATIO TEST

Operator	Pool	County
Gruy Petroleum Management Co.	Langlie Mattix; 7 RVRS -Q Grayburg	Lea

Address	TYPE OF TEST - (X)			
P. O. Box 140907, Irving, TX 75014-0907	Scheduled [ ]	Completion [ ]	Special [X]	

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT/BBL
Rhodes Federal Unit	4-3	L	4	26S	37E	05/29/98	F		18		24	0	N/A	0	240	

Instructions:

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Division.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

(See Rule 301, Rule 1116 & appropriate pool rules.)

I hereby certify that the above information is true a complete to the best of my knowledge and belief.

Susan Morse
Signature

Susan Morse, Energy Production Analyst
Printed name and title

July 24, 1998 (972) 401 - 3111
Date Telephone No.

GRUY-0000740

Form 3160-4
(October 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

FOR APPROVED
OMB NO. 1004-0137
Expires: December 31, 1991

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

5. LEASE DESIGNATION AND SERIAL NO.: LC-054668

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME: 8920003820

8. FARM OR LEASE NAME, WELL NO.: Rhodes Federal Unit # 43

9. API WELL NO.: 30-025-11949

10. FIELD AND POOL, OR WILDCAT: Rhodes Yates- 7 Rivers Gas

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec 4 26S 37E

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☒ DRY ☐ Other

b. TYPE OF COMPLETION: NEW WELL ☐ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☒ DIFF. RESVR. ☐ Other

2. NAME OF OPERATOR: Gruy Petroleum Management Co.

3. ADDRESS AND TELEPHONE NO.: P O Box 140907 Irving Tx. 75014-0907

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface: 2310' FSL & 990' FWL
At top prod. interval reported below:
At total depth:

14. PERMIT NO. | DATE ISSUED

12. COUNTY OR PARISH: Lea | 13. STATE: NM

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
3-5-98		3-11-98	2984	

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
	3150'		→		

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: Yates - 2680' - 2923'

25. WAS DIRECTIONAL SURVEY MADE: N/A

26. TYPE ELECTRIC AND OTHER LOGS RUN: N/A, used old log

27. WAS WELL CORED:

28. CASING RECORD (*Report all strings set in well*)

CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	TOP OF CEMENT, CEMENTING RECORD	AMOUNT PULLED

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 3/8"	2915'	

31. PERFORATION RECORD (*Interval, size and number*): 2680' - 2923' 114 holes 1spf

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
2680'-2923'	2,200 gals 15% HCL
2680'-2923'	50,000 gals 50/50 CO2, 77,200 #
	16/30 Brady sand

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or shut-in*)
	Flowing	Shut-in

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
8-17-98	24 hours	48/64"		-0-	227	-0-	—

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
21	20		-0-	504	-0-	—

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*): Sold

TEST WITNESSED BY:

35. LIST OF ATTACHMENTS: C-122 Back Pressure test

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED Linda Favors TITLE Manager, Operations Admin. DATE 08/25/98

***(See Instructions and Spaces for Additional Data on Reverse Side)**

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

GRUY-0000703

Magnum Hunter Production, Inc.
600 East Las Colinas Blvd., Suite 1200, Irving, TX 75039 (972) 401-3111, Fax (972) 401-1834
Mailing Address: P.O. Box 140907 Irving, TX 75014-0907

August 25, 1998

US Department of the Interior
Bureau of Land Management
2909 W. Second Street
Roswell, NM 88201

RE: Lease No. LC-054668 for Well No 415 – Rhodes Federal Unit,
Location 660/South and 660/West.

Dear BLM,

Enclosed please find the re-completion Report and Log Form 3160-4 original plus 6 copies. Also included is the form C-122 original and 6 copies and the Inclination Report.

Should you have any questions regarding this issue, please contact me at (972) 401-3111.

Sincerely,

Susan Morse

Susan Morse
Energy Production Analyst

Attachments

IN REPLY REFER TO

United States Department of the Interior

Bureau Of Land Management
Roswell District Office
2909 W. Second St.
Roswell, N.M. 88201

Date 8/21/98

Gruy Petroleum Mang. Co,
P.O. Box 140907
Irving, TX 75014-0907

Lease No. LC-054668
Well No. 43-Rhodes Fed. Ut.
Location 2310/S 990/W
Sec. 4 T. 26S. R. 37E

Gentlemen:

The reports and Logs checked below are required by the Oil and Gas Operating Regulations 43 CFR 3160, and have not been received by the subject well:

_____ Notice of Intention to _____ Form 3160-5 (Original & 6 copies)

_____ Subsequent Report of _____ Form 3160-5 (Original & 6 copies)

_____ Subsequent Report of _____ Form 3160-5 (Original & 6 copies)

_____ Completion Report and Log Form 3160-4 (Original & 6 copies)

X Re-completion Report and Log Form 3160-4 (Original & 6 copies) Front & back copies enclosed.

_____ Geologic Logs (30 CFR 221.50 requires that two (2) copies of all electric logs, deviation, temperature, drilling time, case description, sample description, or other special logs be submitted).

_____ Other

X Comments: Needs to be submitted since well now producing from different formation.

You are requested to submit these reports to this office within 15 days.

Sincerely yours,
Peter W. Chester
(505) 627 0240

Gruy Petroleum Mgmt. Co.
600 Las Colinas Blvd.
Suite 1200
Irving, Texas 75039-5518

Rhodes Federal Unit #4-3

Lea County, NM

CO2 Foam Frac Recommendations

Prepared for: Mr. Howard Miller

3/4/98

Version
1

Prepared by:
A. Jay Ringhoffer
Halliburton Energy Services
2601 Beltline Rd.
Carrollton, Texas 75006-5401

(972) 418-3237

HALLIBURTON

The Future Is Working Together.

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Halliburton appreciates the opportunity to present this proposal and looks forward to being of service to you.

Foreword

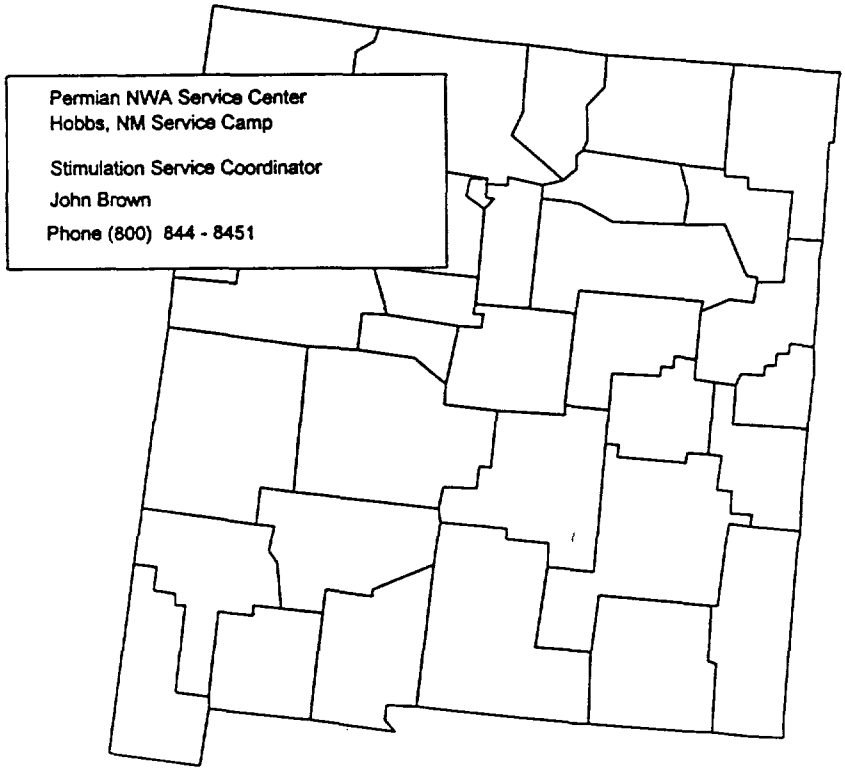
Purpose:

To determine the equipment and materials necessary to perform the stimulating services in the referenced well. The information in this report includes well data, calculations, materials, and cost estimate. **This proposal is based on information from our field personnel and previous treatments in the area.**

Howard,

We appreciate the opportunity to provide this recommendation to you. If you have any further questions, please do not hesitate to call.

Jay Ringhoffer



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Well Information

Formation	Yates Formation
Permeability	.3 md
Porosity	18 %
BHTP	2282 psi
BHP	300 psi
E	4500000 psi
Skin Factor	0
BHT	95 °F
Well Bore Diameter	8.00 in
Well Spacing	80 acres
Reservoir Compressibility	8.3e-005 1/psi
Reservoir Fluid Viscosity	.02 cp
Closure Stress	2100 psi
Gross Interval	2675 - 2950 ft
No. of Perforations	114 - 0.43 in holes
Perforated Interval # 1	2680 - 2693 ft
Perforated Interval # 2	2740 - 2753 ft
Perforated Interval # 3	2760 - 2775 ft
Perforated Interval # 4	2782 - 2785 ft
Perforated Interval # 5	2789 - 2792 ft
Perforated Interval # 6	2805 - 2815 ft
Perforated Interval # 7	2820 - 2836 ft
Perforated Interval # 8	2846 - 2852 ft
Perforated Interval # 9	2865 - 2877 ft
Perforated Interval #10	2900 - 2923 ft

Calculations

Pw = Wellhead Treating Pressure
HHP = Hydraulic Horsepower

HHP = (WHTP * Rate) / 40.8

Pw = 1200 psi (From Computer Design)

Liquid Phase Horsepower:

HHP = (1200 * 35.0) / 40.8
HHP = 1029

CO2 Phase Horsepower:

HHP = (1200 * 23.37) / 40.8
HHP = 687

Job Recommendation

40# WATER FRAC G DETAILS: (31,000 gal)

Base Fluid	40 lb WATERFRAC G
Mixing Fluid	Fresh Water*
Foamer	6 gal/M AQF-2
Breaker	0.5 lbs/M GBW-30
Clay Control	167 lbs/M KCl (Potassium Chloride)
Surfactant	1 gal/M LOSURF-300

*Customer Supplied

Job Procedure

1. Hold safety meeting with customer and crew.
2. Rig up to wellhead and pressure test lines to pressure set by customer.
3. Stimulate down 7" casing at 50 BPM with 77,000 lbs of 16/30 Brady Sand with 120 Tons of CO2 as follows:

STAGE	FLUID	CONC	PROPPANT
1 - Pad	25,000 gal 50% CO2 Foam		
2 - SLF	15,000 gal 50% CO2 Foam	1-4 lb/gal	16/30 Brown Sand (37,039 lb)
3 - SLF	10,000 gal 50% CO2 Foam	4 lb/gal	16/30 Brown Sand (40,000 lb)
4 - Flush	±4,324 gal 50% CO2 Foam		

4. Shut down and get ISIP, 5 min., 10 min., 15 min. pressure readings.
5. Shut in wellhead and rig down.

JOB SUMMARY

Total 40# Linear Gel	31,000 gallons
Total Water on Location	31,000 gallons
Clean Frac Tanks needed	2 each
Total 16/30 Brady Sand	77,000 pounds
Anticipated Surface Pressure	1,277 psi
Injection Rate	50 bpm
HHP Required Liquid	741 HHP
HHP Required CO2	693 HHP
Total CO2 needed (cool down included)	120 Tons

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C-O-TWO Foam Frac

Cost Estimate

Price Ref	Description	Qty	U/M	Unit Price	Total
	**** Stimulation Equipment ****				
300-111	MILEAGE FOR STIMULATION EQUIP	100	MI	$ 3.65	$ 3,650.00
		10	UNT		
300-112	MILEAGE FOR STIMULATION CREW	100	MI	2.15	430.00
		2	UNT		
300-131	DELIVERY CHARGE (CHEMICALS)	4	HR	115.00	460.00
		1	UNT		
999-026	ENVIRONMENTAL SURCHARGE	1	JOB	55.00	55.00
301-010	ON LOCATION PUMPING EQUIP CHRG	2	HR	0.55	5,500.00
		5000	HHP		
301-085	MINIMUM PUMP CHG HT-400 V-12	1	HR	2,451.75	9,807.00
	(PER 4 HR)	4	PMP		
301-135	STAND BY PUMPS HT-400 V-12 ENG	1	HR	762.20	1,524.40
	(PER 4 HR)	2	PMP		
301-267	ON LOC PROPORTIONER EQUP CHRG	1	UNT	326.70	653.40
		2	HR		
301-200	PROPORTIONER	33	BPM	3,927.00	3,927.00
		1	EA		
307-220	MOUNTAIN MOVER SAND SYSTEM	1	DAY	1,236.25	1,236.25
		1	UNT		
300-111	MILEAGE FOR MOUNTAIN MOVER	100	MI	3.65	365.00
		1	UNT		
307-686	HALLIBURTON CRANE/IRON TRUCK	1	JOB	392.15	392.15
		1	EA		
390-740	FRAC MANIFOLD TRAILER	1	JOB	1,020.75	1,020.75
307-015	FRACTURING VALVE 3.5-4.5	1	DAY	704.95	704.95
		1	EA		
307-785	FRACVAN II	1	JOB	1,995.00	1,995.00
307-962	MOBILE LAB VAN W/TECH	1	DAY	2,546.25	2,546.25
	**** Co2 Equipment & Materials ****				
310-002	SERVICE CHARGE FOR CO2	120	TON	38.00	4,560.00
310-034	MINIMUM PUMP CHARGE LIQUID CO2	1	HR	2,942.10	8,826.30
	(PER 4 HR)	3	PMP		
310-035	PUMPING EQUIPMENT STANDBY	1	HR	762.20	762.20
	(PER 4 HR)	1	PMP		
	**** Stimulation Chemicals ****				
310-106	WATERFRAC G	40	LB	8.95	11,098.00
	(PER 1000 GAL)	31000	GAL		
308-877	AQF-2	186	GAL	20.65	3,840.90
311-065	GBW-30	16	LB	24.30	388.80

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C-O-TWO Foam Frac

Price Ref	Description	Qty	U/M	Unit Price	Total
314-153	POTASSIUM CHLORIDE	5177	LB	0.43	2,226.11
218-703	LOSURF 300	31	GAL	37.00	1,147.00
	**** Stimulation Proppants ****				
510-120	SAND 16/30 BROWN BULK (PER 100 LB)	77000	LB	10.09	7,769.30
308-882	FLUID PROPPANT HANDLING CHARGE	2.0	PPG	0.06	206.20
		3586	GAL		
308-882	FLUID PROPPANT HANDLING CHARGE	5.0	PPG	0.15	513.08
		3432	GAL		
308-882	FLUID PROPPANT HANDLING CHARGE	7.5	PPG	0.25	1,828.43
		7227	GAL		
500-340	MILEAGE FOR BULK FRAC.MATERIAL	1928	TMI	1.18	2,275.04
	TOTAL AMOUNT				$ 79,708.51
	DISCOUNTED TOTAL				$ 42,271.36
	THIRD PARTY CHARGES				
309-997	LIQUID CO2	120	TON	$ 95.00	$ 11,400.00
309-998	BOOSTER PUMP LIQUID CO2	1	HR	700.00	700.00
		1	PMP		
310-008	CO2 H.P. 2-TRUCK MANIFOLD	1	JOB	610.00	610.00
310-009	CO2 SUCTION HOSE HIGH PRESSURE	1	DAY	42.50	42.50
	ADDITIONAL AMOUNT				$ 12,752.50
	NET TOTAL				$ 12,752.50

NOTE: Service Location - Hobbs

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Engineering Program Results

PROP
Halliburton Energy Services' Fracture Design Program

Gruy; Rhodes Federal Unit #4-3; Rhodes/Yates SR Field
Lea County, NM; Yates Formation; 50% CO2 Foam

Treatment Summary

Job Type - C-O-TWO* Fracturing Service
Daneshy Fracture Geometry

Treatment Data

Injection rate	50.0	bpm
Treatment fluid sp gr (pad)	.918	
Cw (1000. psi)	.00320	ft/SQRT(min)
Cw (1982. psi)	.00451	ft/SQRT(min)
Cvc	.00066	ft/SQRT(min)
C-overall (pay)	.00065	ft/SQRT(min)
Ceff (non-producing zones)	.00100	ft/SQRT(min)
Surface temperature	70.	deg F
Surface fluid temperature	70.	deg F
Apparent viscosity	312.	cp at .3" width

Fluid parameters: Base Fluid Two-Phase Fluid (pad)

n'	.4828	.4828	n'
K'(slot)	.030260	.062590	lbf-sec /sq ft
Yield stress	--	.004	lbf/sq ft

Design No.	Volume Total (1000 gal)	Pad	Created Length (ft)	Wid. (in.)	Pad Width (in.)	Propped Length (ft)	Ht. (ft)	Total Prop (sx)	Prod Incr	Fluid Eff (pct)
1	53.5	25.0	350.5	.30	.23	208.9	274.9	770.	3.6	67.8

Well & Formation Data

Young's modulus	4.50E+06	psi
Permeability	.3000	md
Porosity	18.0	pct
Reservoir fluid compressibility	8.30E-05	1/psi
Reservoir fluid viscosity	.02	cp
BHTP	2282.	psi
Reservoir fluid pressure	300.	psi
Closure stress	2100.	psi
Gross fracture height	275.	ft
Net fracture height	114.	ft
Wellbore diameter	8.00	in.
Drainage radius	933.	ft
Well spacing	80.	acres
Skin factor	.0	
Bottom-hole temperature	95.	deg F

C-O-TWO* Fluid Treatment & Pumping Schedule for Design No. 1

C-O-TWO* Fracturing Calculations Based on Constant Downhole Slurry Rate and Specified Internal-Phase Volume Fraction (IPF) at Perforations with Proppant Added to Specified Stage Volumes

* A patented process of Halliburton Company;
Patent No. 4,480,696; Nov. 6, 1984.
Reissued Dec. 9, 1986; Reissue No. RE32302

Treating Schedule

Stage No.	gal Foam	IPF at Perfs	Prop Conc lb/gal Foam	lb Proppant Stage	lb Proppant Cumulative
1	25000.	.50	0.00	0.	0.
2	15000.	.50	1.00- 4.00	37042.	37042.
3	10000.	.50	4.00	40000.	77042.
4A	4324. gal of foam displacement (IPF = .50)				
or 4 B-C	93.08 bbl of carbon dioxide displacement				

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Blender Operations Schedule

Stage No.	Pumping Time (mm:ss)	Liquid Volume (gal)	Proppant Conc. (lb/gal liq)	Liquid + Prop Vol (gal)	Rate Out (bpm)
1	11:54	12500.	.00	12500.	25.00
2	7:57	8339.	1.91- 6.77	10017.	27.17- 32.67
3	5:37	5906.	6.77	7718.	32.67
Total	25:28	26745.		30235.	
4A	2:01	2120.	.00	2120.	25.00
or 4B	5:47	CO2 displacement at 16.12 bpm			
or 4C	2:00	CO2 displacement at 46.50 bpm			

Gas Injection Schedule

Stage No.	Pumping Time (mm:ss)	CO2 Volume (bbl)**	CO2 Rate (bpm)**	Surface Vol Tot (gal)	WHTP (psi)
1	11:54	277.4	23.30	25548.	1277.
2	7:57	147.7	21.28- 16.14	16220.	 1099.
3	5:37	90.7	16.12	11525.	1004.
Total	25:28	515.8		53293.	
4A	2:01	46.9	23.25	4324.	
or 4B	5:47	CO2 displacement at 16.12 bpm			
or 4C	2:00	CO2 displacement at 46.50 bpm			

** 1 bbl (liquid, 0 F)=3063 scf (60 F, 14.7 psia)=0.1787 ton

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Injection down.	Casing	
Flow rate in wellbore	50.00	bpm
Total volume of foam less flush . . .	50000.	gal
Average wellhead fluid temperature. .	50.	F
Final bottom-hole wellbore fluid temp	54.	F
Liquid density.	8.43	lb/gal
Bottom-hole treating pressure in frac	2282.	psi
Instantaneous shut-in pressure - CO2.	1238.	psi
Instantaneous shut-in pressure - foam	1174.	psi
Maximum friction loss in wellbore . .	134.	psi
Number of perforations.	114	
Perforation diameter.	.43	in.
Perforation discharge coefficient . .	.90	
Average perforation friction.	15.	psi
CO2 for treatment and gas flush . . .	109.06	tons--plus cool-down
CO2 for treatment and foam flush. . .	100.80	tons--plus cool-down

Tubular Goods

Measured Depth (ft) Top	Bottom	Tubing ID (in.)	Tubing OD (in.)	Casing ID (in.)	Casing OD (in.)
0.	2680.	--	--	6.260	7.000

Proppant Schedule for Design No. 1

Pumping Schedule

25000. gal of pad volume
15000. gal w/ 1.00 - 4.00 lb/gal of 16/30 Brady sand
10000. gal with 4.00 lb/gal of 16/30 Brady sand
50000. gal total fluid
770. sacks total proppant

Bed Deposition for Design No. 1

Deposition Profiles

At the end of pumping:

Carry distance	208.9 ft
Max bed height	.0 ft
Avg bed height	.0 ft
Pct prop deposited	.0 pct

Distance From Well (ft)	Deposited Height (ft)	Suspended Proppant Height (ft)	Suspended Proppant Concentration (lb/gal)	Suspended Proppant Concentration (lb/sq ft)
4.0	.0	275.0	4.0	.82
16.0	.0	275.0	4.0	.82
28.0	.0	275.0	4.1	.83
40.0	.0	275.0	4.1	.83
52.0	.0	275.0	4.2	.84
64.0	.0	275.0	4.2	.83
76.0	.0	275.0	4.3	.84
88.0	.0	275.0	4.4	.86
100.0	.0	274.9	4.1	.79
112.0	.0	274.9	3.7	.73
124.0	.0	274.9	3.4	.66
136.0	.0	274.9	3.1	.60
148.0	.0	274.9	2.7	.53
160.0	.0	274.9	2.4	.46
172.0	.0	274.9	2.4	.45
184.0	.0	274.8	2.0	.38
196.0	.0	274.8	1.7	.31
208.0	.0	274.8	1.3	.24

Fracture depth: 2675. - 2950. ft

Producing Interval (ft)	Propped Length (ft)	Propped Height in Zone (ft)	Proppant Conc. (lb/sq ft)	Flow Capacity (md-ft)	Dim'less Capacity	Cr
2680.- 2693.	209.	13.	.665	2013.	40.56	10.22
2740.- 2753.	209.	13.	.665	2013.	40.56	10.22
2760.- 2775.	209.	15.	.665	2013.	40.56	10.22
2782.- 2785.	209.	3.	.665	2013.	40.56	10.22
2789.- 2792.	209.	3.	.665	2013.	40.56	10.22
2805.- 2815.	209.	10.	.665	2013.	40.56	10.22
2820.- 2836.	209.	16.	.665	2013.	40.56	10.22
2846.- 2852.	209.	6.	.665	2013.	40.56	10.22
2865.- 2877.	209.	12.	.665	2013.	40.56	10.22
2900.- 2923.	209.	23.	.665	2013.	40.56	10.22

PROP

Halliburton Energy Services' Fracture Design Program

Gruy; Rhodes Federal Unit #4-3; Rhodes/Yates SR Field
Lea County, NM; Yates Formation; 50% CO2 Foam

The above report is based on sound engineering practices, but because of variable well conditions and other information which must be relied upon, Halliburton makes no warranty, express or implied, as to the accuracy of the data or of any calculations or opinions expressed herein. You agree that Halliburton shall not be liable for any loss or damage whether due to negligence or otherwise arising out of or in connection with such data calculations or opinions.

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Conditions

NOTE

The cost in this analysis is good for the materials and/or services outlined within. These prices are based on Halliburton being awarded the work on a first call basis. Prices will be reviewed for adjustments if awarded on 2nd or 3rd call basis and/or after 30 days of this written analysis. This is in an effort to schedule our work and maintain a high quality of performance for our customers.

The unit prices stated in the proposal are based on our current published prices. The projected equipment, personnel, and material needs are only estimates based on information about the work presently available to us. At the time the work is actually performed, conditions then existing may require an increase or decrease in the equipment, personnel, and/or material needs. Charges will be based upon unit prices in effect at the time the work is performed and the amount of equipment, personnel, and/or material actually utilized in the work. Taxes, if any, are not included. Applicable taxes, if any, will be added to the actual invoice.

It is understood and agreed between the parties that with exception of the subject discounts, all said services and materials will be furnished in accordance with the terms and conditions of Halliburton's regular work orders applicable to the particular item. In this connection, it is also understood and agreed that Customer will continue to execute Halliburton usual field work orders and/or tickets customarily required by Halliburton in connection with the furnishing of said services and materials.

All services performed and equipment and materials sold are provided subject to Halliburton's General Terms and Conditions (which include LIMITATION OF LIABILITY and WARRANTY provisions), and pursuant to the applicable Halliburton Work Order Contract (whether or not executed by you), unless a signed Master Service and/or Sales Contract exists between your company and Halliburton, in which case the negotiated Master Contract shall govern the relationship between the parties. We enclose a copy of the General Terms and Conditions, for your convenient review, and we would appreciate receiving any questions you may have about them. Should your company be interested in negotiating a Master Contract with Halliburton, our Legal Department would be pleased to work with you to finalize a mutually agreeable contract.

If customer does not have an approved open account with Halliburton or a mutually executed written contract with Halliburton, which dictates payment terms different than those set forth in this clause, all sums due are payable in cash at the time of performance of services or delivery of equipment, products, or materials. If customer has an approved open account, invoices are payable on the twentieth day after date of invoice. Customer agrees to pay interest on any unpaid balance from the date payable until paid at the highest lawful contract rate applicable, but never to exceed 18% per annum. In the event Halliburton employs an attorney for collection of any account, customer agrees to pay attorney fees of 20% of the unpaid account, plus all collection and court costs.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-KSB

{X} Annual Report under Section 13 or 15(d) of the Securities Exchange Act of 1934 For the fiscal year ended December 31, 1997

{ } Transition Report under Section 13 or 15(d) of the Securities Exchange Act of 1934 For the transition period from _____ to _____ .

Commission File No. 1-12508

MAGNUM HUNTER RESOURCES, INC.
(Name of small business issuer in its charter)

Nevada	87-0462881
State or other jurisdiction of incorporation or organization	(I.R.S. Employer Identification No.)

600 East Las Colinas Blvd., Suite 1200, Irving, Texas 75039
(Address of principal executive offices) (zip code)

Issuer's telephone number, including area code: (972) 401-0752

Securities registered under Section 12(b) of the Exchange Act:

Title of each class	Name of each exchange on which registered
Common Stock ($.002 par value)	American Stock Exchange

Securities registered under Section 12(g) of the Act: None

Check whether the Issuer (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 2 months (or for such shorter period that the Issuer was required to file such reports) and (2) has been subject to such filing requirements for the past 90 da Yes X No

Check if no disclosure of delinquent filers in response to Item 405 of regulation S-B is contained in this form, and no disclosure will be contained, to the best of the Issuer's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-KSB or any amendment to this Form 10-KSB { }

The Issuer's revenues for its most recent fiscal year: $49,923,000

As of March 27, 1998, the aggregate market value of voting stock held by non-affiliates, computed by reference to the closing price as reported by the American Stock Exchange, was $94,578,801.

The number of shares outstanding of the Issuer's common stock at December 31, 1997: 21,738,320

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Securities and Exchange Commission
Item Number and Description

PART I

PART II

PART III

Item 1. Description of Business

The Company

Magnum Hunter Resources, Inc., a Nevada corporation ("Magnum Hunter" or the "Company"), is an independent energy company engaged in the exploitation and development, acquisition, exploration and operation of oil and gas properties with a geographic focus in Texas, Oklahoma and New Mexico. In December 1995, the Company consummated the acquisition of all of the subsidiaries of Hunter Resources, Inc., a Pennsylvania corporation (the "Magnum Hunter Combination"), and the management of Hunter Resources, Inc. assumed operating control of the Company. The new management implemented a business strategy that emphasized acquisitions of long-lived proved reserves with significant exploitation and development opportunities where the Company generally could control the operations of the properties. As part of this strategy, in June 1996 the Company acquired the Panoma Properties (as defined herein) from Burlington Resources Inc. ("Burlington") for a net purchase price of $34.7 million (the "Panoma Acquisition"). Additionally, in April 1997 the Company acquired the Permian Basin Properties (as defined herein) from Burlington for a net purchase price of $133.8 million (the "Permian Basin Acquisition"). The Company presently intends to focus its efforts on its substantial inventory of exploitation and development opportunities, further acquisitions and, to a lesser extent, selected exploratory drilling prospects. The Company has identified over 600 development drilling locations (including both production and injection wells) on its properties, substantially all of which are low-risk in-fill drilling opportunities.

At December 31, 1997, the Company had an interest in 2,626 wells and had estimated proved reserves of 333 Bcfe with an SEC PV-10 (as defined herein) of $211.6 million. Approximately 68% of these reserves were proved developed producing reserves and 90% were attributable to the Panoma Properties and the Permian Basin Properties. At December 31, 1997, the Company's proved reserves had an estimated reserve life index of approximately 16 years and were 62% gas. The Company serves as operator for approximately 70% of its properties (based on the number of producing wells in which the Company owns an interest). Additionally, the Company owns over 500 miles of gas gathering systems and a 50% interest in a gas processing plant that is connected to the Company's largest gas gathering system, which was purchased with the Panoma Properties.

Beginning with the Magnum Hunter Combination in December 1995, the Company has made nine acquisitions for an aggregate net purchase price of $185.4 million. This strategy has added approximately 305.6 Bcfe of reserves (determined as of the respective times of their acquisition) at an average cost of $0.61 per Mcfe, as well as a 427 mile gas gathering system and a 50% interest in the McLean Gas Plant (the "McLean Plant Acquisition"). As a result of its acquisitions, the Company has achieved substantial growth as described below:

- Proved reserves increased to 333 Bcfe at year end 1997 from 36.7 Bcfe at year end 1995;
- SEC PV-10 increased to $211.6 million at year end 1997from $37.2 million at year end 1995;
- Average daily production increased to 50.5 million cubic feet equivalent in the fourth quarter of 1997 from 800 thousand cubic feet equivalent in fiscal 1995; and

Business Strategy

The Company's objective is to increase its reserves, production, cash flow and earnings utilizing a program of (i) exploitation and development of acquired properties,(ii)strategic acquisitions and (iii) a selective exploration program.

Property	Operator	Well Count	Working Interest	Net Revenue Interest	Production (Bbl/d)
TLB Unit.....	Company	20	100.0%	87.3%	85
Veal Lease.....	Company	52	100.0%	87.1%	225
NW Slaughter Unit.....	Company	83	74.8%	62.8%	330

Discovered in the 1930's, all three properties have been actively waterflooded since the 1970's. While the projects are mature, additional drilling and waterflood enhancement are likely. No proved undeveloped reserves were assigned by Ryder Scott to either the TLB Unit or the Veal Lease. Proved undeveloped reserves were assigned by Ryder Scott to the NW Slaughter Unit in contemplation of a carbon dioxide injection project which is anticipated for that property. The operator of an adjacent property has been successfully injecting carbon dioxide for several years to enhance production.

Lea County Shallow Properties. The Lea County Shallow Properties consist of approximately 300 wells in Lea County, New Mexico which are in the Rhodes, Jalmat, Monument, Langlie Mattix, Eumont and Eunice Fields. The fields produce from the Yates, Seven Rivers, Queen and other formations at depths generally shallower than 3,000 feet. Production is generally high Btu gas, which produces into low pressure gathering systems. At year-end approximately 13 proved undeveloped locations were identified and the Company anticipates that numerous additional recompletion, stimulation, workover or development drilling opportunities will result from detailed geological and engineering studies which are planned.

Brunson Ranch. The Brunson Ranch Field consists of four wells located in Loving County, Texas in the deep Delaware Basin geological province of the Permian Basin. Three of these wells are currently producing a total of approximately 2.4 MMcf of gas per day from the Atoka formation at a depth of approximately 16,000 feet. The Company recompleted an additional well in June 1997 that is producing 2.3 MMcf of gas per day. Undeveloped potential exists on the properties through redrilling the Atoka formation and completing such wells using technology designed for high bottom hole pressure conditions.

Burlington has agreed to indemnify the Company for breaches by Burlington of the purchase agreement as well as any claims attributable to or arising out of acts or omissions of Burlington (including, but not limited to, environmental claims) occurring before January 1, 1997. There are certain limitations on the amount of, and time period for bringing, a claim for indemnity made by the Company. Burlington is a defendant in two actions claiming that Burlington underpaid royalty owners on properties in New Mexico and Texas, including properties that are a part of the Permian Basin Properties. The plaintiffs in the New Mexico action are seeking class certification while the Texas action has been certified as a class action. Burlington's indemnity would hold the Company harmless from any of these claims arising prior to January 1, 1997. The Company has also agreed, subject to certain limitations, to indemnify Burlington for matters arising subsequent to January 1, 1997 as well as for certain liabilities and obligations assumed by the Company as part of the purchase transaction.

Panoma Acquisition

On June 28, 1996, the Company purchased from Burlington interests in 520 gas wells in the Texas Panhandle and western Oklahoma (470 of which are operated by the Company) and the associated 427 mile gas gathering system (the "Panoma Properties"). At year-end the Company had drilled an additional 40 wells, and a continuous drilling program is progressing into 1998, with an additional well being added every 7 days. The net purchase price, after certain purchase price adjustments, was $34.7 million, funded by borrowings under the Company's previous credit facility. Gruy is the operator of the gas gathering system and

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1-each of NM.
BY: Wells.
<FILE>

FOOTAGE DRILLING CONTRACT

THIS AGREEMENT CONTAINS PROVISIONS RELATING TO INDEMNITY, RELEASE OF LIABILITY, AND ALLOCATION OF RISK

THIS AGREEMENT (The "Contract") is made and entered into on the date hereinafter set forth by and between the parties herein designated as "Operator" and Contractor:

OPERATOR: GRUY PETROLEUM MANAGEMENT

Address: BOX 140907 IRVING, TX 76116

CONTRACTOR: Key Energy Drilling, Inc.

Address: 812 9th Street, Suite B Levelland, TX 79336

IN CONSIDERATION of the mutual promises, conditions and agreements herein contained and the specifications and special provisions set forth in Exhibit "A" and Exhibit "B" attached hereto and made a part hereof, Operator engages Contractor as an Independent Contractor to drill the hereinafter designated well in search of oil or gas on a footage basis.

For purposes hereof, the term "footage basis" means Contractor shall furnish the equipment, labor, and perform services as herein provided to drill a well, as specified by Operator, to the contract footage depth. Subject to terms and conditions hereof, payment to Contractor at a stipulated price per foot of hole drilled is earned upon attaining such contract footage depth or other specified objective. While drilling on a footage basis Contractor shall direct, supervise and control drilling operations and assumes certain liabilities to the extent specifically provided for herein. Notwithstanding that this is a footage basis contract, Contractor and Operator recognize that certain portions of the operations as hereinafter designated, both above and below contract footage depth, will be performed on a daywork basis. For purposes hereof, the term "daywork basis" means Contractor shall furnish equipment, labor, and perform services as herein provided for a specified sum per day under the direction, supervision and control of Operator (inclusive of any employee, agent, consultant, or subcontractor engaged by Operator to direct drilling operations). When operating on a daywork basis, Contractor shall be fully paid at the applicable rates of payment and assumes only the obligations and liabilities stated herein as being applicable during daywork operations. Except for such obligations and liabilities specifically assumed by Contractor, Operator shall be solely responsible and assumes liability for all consequences of operations by both parties while on a daywork basis, including results and all other risks or liabilities incurred in or incident to such operations.

1. **LOCATION OF WELL:**
Well Name:
and Number: MULTI-WELL PACKAGE (SEE ATTACHED EXHIBIT "C")
Parish/
County: LEA State: NM Field Name: RHODES FED. UNIT
Well location and
land description: SEE ATTACHED EXHIBIT "C"

The above is for well and Contract identification only and Contractor assumes no liability whatsoever for a proper survey or location stake on Operator's lease.

2. **COMMENCEMENT DATE:**
Contractor agrees to use reasonable efforts to commence operations for the drilling of the well by the 16TH day of JUNE, 1998, or AS SOON AS RIG IS AVAILABLE.

3. **DEPTH:**
Subject to the right of Operator to direct the stoppage of work at any time (as provided in Par. 6), the well shall be drilled to the depth as specified below:

3.1 Contract Footage Depth: The well shall be drilled to 3400 & 3800 feet or _____ formation, or to the depth at which the 5-1/2 inch casing (oil string) is set, whichever depth is first reached, on a footage basis and Contractor is to be paid for such drilling at the footage rate specified below, which depth is hereinafter referred to as the contract footage depth.

3.2 Daywork Basis Drilling: All drilling below the above specified contract footage depth shall be on a daywork basis as defined herein and Contractor shall be paid for such drilling at the applicable daywork rate specified below.

3.3 Complete Daywork Basis Drilling: If all operations hereunder are performed at applicable daywork rates, provisions of this Contract applicable to drilling on a "footage basis" shall not apply.

3.4 Maximum Depth: Contractor shall not be required to drill said well under the terms of this Contract below a maximum depth of 4000 feet.

4. **FOOTAGE RATE, DAYWORK RATES, BASIS OF DETERMINING AMOUNTS PAYABLE TO CONTRACTOR:**
Contractor shall be paid at the following rates for the work performed hereunder.

4.1 Footage Rate: For work performed on a footage basis the rate will be $ 9.00 ON 3400' WELLS AND $9.50 ON 3800' WELLS per linear foot of hole drilled determined by steel line measurement from the surface of the ground if Contractor provides cellar, or from the bottom of the cellar if Operator provides cellar, less footage made in regular size hole while working on daywork basis.

4.2 Operating Day Rate: For work performed on a daywork basis the daywork rate per twenty-four hour day with 4 man crew shall be:

Depth Intervals			
From	To	Without Drill Pipe	With Drill Pipe
0	TD	$ 5000.00 per day	$ 5000.00 per day
Insert Intervel	Insert Intervel	$ Enter Cost Day per day	$ Enter Cost Day per day
Insert Intervel	Insert Intervel	$ Enter Cost Day per day	$ Enter Cost Day per day

Using Operator's drill pipe $ 5000.00 per day.

If under the above column "With Drill Pipe" no day rates are specified, the daywork rate per twenty-four hour day when drill pipe is in use shall be the applicable daywork rate specified in the column "Without Drill Pipe" plus compensation for any drill pipe actually used at the rates specified below, computed on the basis of the maximum drill pipe in use at any time during each twenty-four hour day.

DRILL PIPE RATES PER 24-HOUR DAY					
Straight Hole	Size	Grade	Directional or Uncontrollable Deviated Hole	Size	Grade
$			$		
$			$		
$			$		

Directional or uncontrolled deviated hole will be determined to exist when deviation exceeds 5 degrees or when the change of angle exceeds 2 degrees per one hundred feet.

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CASE NOS. 12015 & 12017

Drill pipe shall be considered in use not only when in actual use but also while it is being picked up or laid down. When drill pipe is standing in the derrick, it shall not be considered in use, provided, however, that if Contractor furnishes special strings of drill pipe, drill collars, and handling tools as provided for in Exhibit "A", the same shall be considered in use at all times when on location or until released by Operator. In no event shall fractions of an hour be considered in computing the amount of time drill pipe is in use but such time shall be computed to the nearest hour, with thirty minutes or more being considered a full hour and less than thirty minutes not to be counted.

4.3 Work Stoppage Rate: $ 5000.00/PER DAY $ 208.33/PER HOUR

The above rate shall apply under the following circumstances:

(a) During any continuous period that normal operations are suspended or cannot be carried on due to conditions of force majeure as defined in paragraph 22 hereof. It is understood, however, that Operator shall have the right to release the rig in accordance with Operator's right to direct stoppage of the work (See Paragraph 6), effective when conditions will permit the rig to be moved from the location.

(b) During any period when Contractor has notified Operator that the rig is available for movement to the drilling site and movement cannot be accomplished because of Operator's failure or inability to furnish and/or maintain adequate roadway and/or canal to location and/or location and/or weather prevents positioning the rig on a water location drill site.

(c) During any period after operations under this Contract have been completed and Operator has released the rig and the same cannot be dismantled and/or transported from the location due to inadequate roadway or canal, or weather or water conditions which will not allow such activity to be conducted with reasonable safety.

(d) Operator agrees at all times to maintain the road and location in such a condition that will allow free access and movement to and from the drilling site in an ordinarily equipped highway type vehicle. If Contractor is required to use bulldozers, tractors, four-wheel drive vehicles, or any other specialized transportation equipment for the movement of necessary personnel, machinery, or equipment over access roads or on the drilling location, Operator shall furnish the same at its expense and without cost to Contractor. The actual cost of repairs to any transportation equipment furnished by Contractor or its personnel damaged as a result of improperly maintained access roads or location will be charged to Operator.

4.4 Repair Time: In the event it is necessary to shut down Contractor's rig for repairs excluding routine rig servicing while Contractor is performing daywork hereunder, Contractor shall be allowed compensation at the applicable daywork rate for such shut down time up to a maximum of 4 hours for any one repair job.

4.5 Standby Time Rate with Crews: $ 5000.00 per twenty-four (24) hour day. Standby time shall be defined to include time when the rig is shut down although in readiness to begin or resume operations but Contractor is waiting on orders of Operator or on materials, services or other items to be furnished by Operator.

4.6 Reimbursable Costs: Operator shall reimburse Contractor for the costs of materials, equipment, work or services which are to be furnished by Operator as provided for herein but which for convenience are actually furnished by Contractor at Operator's request, plus 30 percent for such cost of handling.

4.7 Daywork Operations: In addition to other work specified herein the following work performed by Contractor shall be on a daywork basis:

(a) All drilling below the contract footage depth as provided in Par.3.1, including the setting of any string of casing below such depth;

(b) All work performed by Contractor, whether or not prior to reaching the contract footage depth in an effort to restore the hole to such condition that further drilling or other operations may be conducted, in the event of loss or damage to the hole as a result of any delay by Operator or the failure at any time of materials, equipment, goods or services provided by Operator, including without limitation to the foregoing, the failure of Operator's casing or equipment, either during or after the running and setting of such casing or as a result of the subsequent failure of the cementing job resulting in parted casing;

(c) All work performed when conditions set forth in Paragraph 12 are applicable;

(d) All other work performed by Contractor at the request of Operator, regardless of depth, which is not within the scope of the work to be performed on a footage basis, including all coring, drill stem testing, bailing, gun or jet perforating, electric logging, acid treatment, shooting, cleaning out, hydraulic fracturing, plugging, running tubing, setting liners, squeeze cementing, abandoning well and installation of well head equipment.

4.8 Daywork Time: In determining the amount of daywork time for which Contractor is to be compensated at the applicable daywork rate, it is agreed that such daywork time shall begin when Contractor, in accordance with the terms hereof, suspends normal footage drilling operations. There shall be included in daywork time any time required to condition the hole preparatory to performing such daywork and also the time required to restore the hole to the same drilling conditions which existed when operations were suspended for the purpose of beginning daywork, in order to again resume normal footage drilling operations.

4.9 Revision in Rates: The rates and/or payments herein set forth due to Contractor from Operator shall be revised to reflect the change in costs if the costs of any of the items hereinafter listed shall vary by more than 15 percent from the costs thereof on the date of this Contract or by the same percent after the date of any revision pursuant to this paragraph:

(a) Labor costs, including all benefits, of Contractor's personnel;
(b) Contractor's cost of insurance premiums;
(c) Contractor's cost of fuel, including all taxes and fees; the cost per gallon /MCF being $ .65;
(d) Contractor's cost of catering, when applicable;
(e) If Operator requires Contractor to increase or decrease the number of Contractor's personnel;
(f) Contractor's cost of spare parts and supplies with the understanding that such spare parts and supplies constitute 30 percent of the operating rate and that the parties shall use the U.S. Bureau of Labor Statistics Oilfield Machinery and Equipment Wholesale Price Index (Code No. 1191-02) to determine to what extent a price variance has occurred in said spare parts and supplies;
(g) If there is any change in legislation or regulations in the area in which Contractor is working that alters Contractor's financial burden

5. TIME OF PAYMENT:

Subject to Operator's right to require Contractor to furnish him with satisfactory evidence that Contractor has paid all labor and material claims chargeable to Contractor, payment becomes due by Operator to Contractor as follows:

5.1 Footage Basis: If the well is drilled to total depth on a footage basis, payment becomes due for all services (footage and daywork) when Contractor completes the performance of the services which he agrees to perform under this Contract, provided, however, if Contractor prior to the completion of the Contract performs a substantial amount of daywork, payment for such daywork shall be due and payable upon presentation of invoice therefore at the end of the month in which such daywork was performed.

5.2 Daywork Basis: If the entire hole or the bottom section of the hole is drilled on a daywork basis, payment shall become due as follows: Upon Contractor's completion of the footage basis drilling to the depth specified above and upon acceptance by the Operator of the hole as drilled to such depth in accordance with this Contract, payment becomes due for all footage drilled and for all work performed on a daywork basis to the date of completion of the footage drilled. Payment for drilling and other work performed at daywork rates below the depth specified at which daywork basis drilling commences shall become due upon acceptance by Operator of the work performed in accordance with this Contract upon presentation of invoice therefore upon completion of the well or at the end of the month in which such daywork was performed, whichever shall first occur.

5.3 Disputed Invoice and Late Payment: Operator shall pay all invoices within 30 days after receipt except that if Operator disputes an invoice or any part thereof. Operator shall, within fifteen days after receipt of the invoice, notify Contractor of the item disputed, specifying the reason therefore and payment of the disputed item may be withheld until settlement of the dispute, but timely payment shall be made of any undisputed portion. Any sums (including amounts ultimately paid with respect to a disputed invoice) not paid within the above specified days shall bear interest at the maximum legal rate per month from the due date until paid. If Operator does not pay undisputed items within the above stated time, Contractor may terminate this Contract as specified under Subparagraph 6.2.

5.4 Attorney's Fees: If this Contract is placed in the hands of an attorney for collection of any sums due hereunder, or suit is brought on same, or sums due hereunder are collected through bankruptcy or probate proceedings, then Operator agrees that there shall be added to the amount due reasonable attorney's fees and costs.

6. STOPPAGE OF WORK BY OPERATOR OR CONTRACTOR:

6.1 By Operator: Notwithstanding the provisions of Paragraph 3 with respect to the depth to be drilled, Operator shall have the right to direct the stoppage at the work to be performed by the Contractor hereunder at any time prior to reaching the specified depth, and even though Contractor has made no default hereunder, and in such event Operator shall be under no obligation to Contractor except as set forth in Subparagraph 6.3 hereof.

6.2 By Contractor: Notwithstanding the provisions of Paragraph 3 with respect to the depth to be drilled, in the event of Force Majeure necessitating a termination of operations, or in the event of total or constructive total loss of the rig, or if Operator shall become insolvent or be adjudicated a bankrupt, or file by way of petition or answer, a debtor's petition or other pleading seeking adjustment of Operator's debts under any bankruptcy or debtor's relief laws now or hereafter prevailing, or it any such be filed against Operator, or in case a receiver be appointed of the Operator or Operator's property, or any part thereof, or Operator's affairs be placed in the hands of Creditor's Committee, or, following ten (10) days written notice to Operator, if Operator does not pay Contractor within the time specified in Subparagraph 5.3 all undisputed items due and owing, Contractor may, at its option, elect to terminate further performance of any work under this Contract and Contractor's right to compensation shall be as set forth in Subparagraph 6.3 hereof. In addition to Contractor's right to terminate performance hereunder, Operator hereby expressly agrees to protect, defend and indemnify Contractor from and against any claims, demands and causes of action, including all costs of defense, in favor of Operator, Operator's joint ventures, or other parties arising out of any drilling commitments or obligations contained in any lease, farmout agreement or other agreement, which may be affected by such termination of performance hereunder.

6.3 Early Termination Compensation:

(a) Prior to Commencement: In the event this Contract is terminated prior to commencement of operations hereunder, Operator shall pay Contractor as liquidated damages and not as a penalty a sum equal to the Footage Rate (Paragraph 4.1) multiplied by the Contract Footage Depth (Paragraph 3.1) plus the Standby Rate (Paragraph 4.5) for a period of N/A days for estimated daywork drilling below Contract Footage Depth; or a lump sum of $ N/A.

(b) Prior to Spudding: If such work stoppage occurs after commencement of operations but prior to the spudding of the well, Operator shall pay to Contractor the sum of the following: (1) All expenses reasonably and necessarily incurred and to be incurred by Contractor by reason of the Contract and by reason of the premature stoppage of the work, excluding, however, expenses of normal drilling crew and supervision; (2) ten percent (10%) of the amount of such reimbursable expenses; and (3) a sum calculated at the standby rate for all time from the date upon which Contractor commences any operations hereunder down to such date subsequent to the date of work stoppage as will afford Contractor reasonable time to dismantle its rig and equipment.

(c) Subsequent to Spudding: If such work stoppage occurs after the spudding of the well, Operator shall pay the Contractor (1) the amount owing Contractor at the time of such work stoppage under the footage rate, applicable daywork rate, and standby rate; but in such event Operator shall pay Contractor for a minimum footage of N/A feet regardless of whether or not the well has been drilled to such depth at the time of work stoppage; or (2) at the election of Contractor and in lieu of the foregoing, Operator shall pay Contractor for all expenses reasonable and necessarily incurred and to be incurred by Contractor by reason of this Contract and by reason of the premature stoppage of work plus the sum of $N/A

7. CASING PROGRAM:

7.1 The casing program to be followed in the drilling of said well is set forth in Exhibit "A", and Contractor shall drill a hole of the size specified in Exhibit "A" to set at the approximate depth therein indicated the size of casing so specified. The exact setting depths for each string of casing shall be specified by Operator. Operator may modify said casing program provided any modification thereof which materially increases Contractor's hazards or costs of performing its obligations hereunder can only be made by mutual consent of Contractor and Operator.

7.2 The setting of any string of casing within the footage contract depth shall be performed as specified in Exhibit "A".

7.3 The setting of any string of casing below the footage contract depth shall be performed by Contractor under the direction of Operator but Operator shall pay Contractor for all time so consumed at the applicable daywork rate.

7.4 Operator reserves the right to require Contractor to set strings of casing or liners in addition to those listed (subject to the limitations upon Operator's right to modify the casing program as provided for in Par. 7.1) and in such event Contractor agrees to provide rig time for cementing and testing cement on such liners and strings of casing and to provide rig time for performing cement squeezing jobs as required by Operator. Operator shall pay Contractor for time consumed by such work at the applicable daywork rates.

8. LABOR, EQUIPMENT, MATERIALS, SUPPLIES, AND SERVICES:

The furnishing of labor, equipment, appliances, materials, supplies, and services of whatever character necessary or proper in the drilling and completion of said well and not otherwise specifically provided for herein shall be furnished by Contractor or Operator as specified in Exhibit "A".

9. DRILLING METHODS AND PRACTICES:

9.1 Contractor shall maintain well control equipment in good condition at all times and shall use all reasonable means to prevent and control fires and blowouts and to protect the hole.

9.2 Subject to the terms hereof, at all times during the drilling of the well, Operator shall have the right to control the mud program, and the drilling fluid must be of a type and have characteristics acceptable to Operator and be maintained by Contractor in accordance with the specifications shown in Par. 2 of Exhibit "A"". No change or modification of said specifications which materially increases Contractor's hazards or costs of performing its obligations hereunder shall be made by Operator without consultation with and consent of Contractor. Operator shall have the right to make any tests of the drilling fluid which may be necessary. Should no mud control program be specified by Operator in Exhibit "A", Contractor shall have the right to determine the mud program and the type and character of drilling fluid during the time that Contractor is performing work upon a footage basis under the terms of this Contract.

9.3 Contractor shall measure the total length of drill pipe in service with a steel tape at the point where the contract footage depth has been reached; and when requested by Operator, before setting casing or liner and after reaching final depth.

9.4 Contractor agrees to furnish equipment, workmen and instruments acceptable to Operator and to make slope tests as provided in Exhibit "A". Unless operations are on a daywork basis, all such slope tests shall be made at Contractor's sole risk, cost and expense. If, in the opinion of Operator, it becomes advisable to obtain the use of an additional slope test instrument and accessory equipment for the purpose either of checking previous readings or of determining the direction of the drift, the rental charges therefore shall be paid by Operator, and the running of same shall be on a daywork basis. Should the hole at any depth during the time Contractor is performing work on a footage basis have either a deviation from vertical or a change of inclination in excess of the limits prescribed in Exhibit "A", Contractor agrees to restore the hole to a condition suitable to Operator either by conventional methods and procedures while drilling ahead or by cementing off and redrilling. While operations are being performed on a "Daywork Basis", or during "Complete Daywork Basis Drilling", Contractor agrees to exercise due diligence and care to maintain the straight hole specifications, if any, set forth in Par. 3 of Exhibit "A" but all risk and expense of maintaining such specifications or restoring the hole to a condition suitable to Operator shall be assumed by Operator.

9.5 Each party hereto agrees to comply with all laws, rules, and regulations of any federal, state or local governmental authority which are now or may become applicable to that party's operations covered by or arising out of the performance of this Contract. When required by law, the terms of Exhibit "B" shall apply to this Contract. In the event any provision of this contract is inconsistent with or contrary to any applicable federal, state or local law, rule or regulation, said provision shall be deemed to be modified to the extent required to comply with said law, rule, or regulation and as so modified said provision and this Contract shall continue in full force and effect.

10. COMPLETION TESTS AND INSTALLATION OF WELL CONNECTIONS OR ABANDONMENT:

Contractor will either complete the well and install well head equipment and connections or plug and abandon same in accordance with Operator's instructions, at the applicable rates set forth in Par. 4 above, using equipment, material, and services to be furnished and paid for by either Operator or Contractor as specified in Exhibit "A".

11. CORING AND CUTTINGS:

11.1 As directed by Operator and utilizing the type of coring equipment specified and furnished as shown in Exhibit "A", Contractor agrees at any time to take either rat-hole or full hole conventional or wire line cores in the manner requested by Operator. Regardless or depth, all coring shall be paid for at the applicable daywork rate. All coring footage shall be deducted from the total footage charge if the well is being drilled on footage basis at that depth. Reaming of the rat-hole shall be paid for at the applicable daywork rate.

11.2 When requested by Operator, Contractor shall save and identify the cuttings and cores, free from contamination, and place them in separate containers which shall be furnished by Operator; such cuttings and cores shall be made available to a representative or Operator at the location.

12. FORMATIONS DIFFICULT OR HAZARDOUS TO DRILL:

12.1 In the event chert, pyrite, quartzite, granite, igneous rock or other impenetrable substance, is encountered while drilling on the footage basis and the footage drilled during each twenty-four (24) hour period multiplied by the footage rate does not equal the applicable daywork rate plus cost of bits, all drilling operations shall be conducted on a daywork basis at the applicable daywork rate, with Operator furnishing the bits, until normal drilling operations and procedures can be resumed. The footage drilled on daywork rate shall be deducted from the footage charge.

12.2 In the event water flow, domal, steeply dipping or faulted formation, abnormal pressure, underground mind or cavern, heaving formation, salt or other condition is encountered which makes drilling abnormally difficult or hazardous, causes sticking of drill pipe or casing, or other difficulty which precludes drilling ahead under reasonably normal procedures, Contractor shall, in all such cases, without undue delay, exert every reasonable effort to overcome such difficulty. When such condition is encountered, further operations shall be conducted on daywork basis at the applicable daywork rate until such conditions have been overcome and normal drilling operations can be resumed. Operator shall assume the risk of loss of or damage to the hole and to Contractor's equipment in the hole from the time such condition is encountered. The footage drilled while on daywork basis shall be deducted from the footage charge.

12.3 In the event loss of circulation or partial loss of circulation is encountered, Contractor shall, without undue delay, exert every reasonable effort to overcome such difficulty. When such condition is encountered, Operator shall assume risk of loss of or damage to the hole and to Contractor's equipment in the hole. Should such condition persist in spite of Contractor's efforts to overcome it, then after a period of 2 hours time consumed in such efforts, further operations shall be conducted on a daywork basis at the applicable daywork rate until such condition has been overcome and normal drilling operations can be resumed. The total rig time furnished by Contractor under the terms of this paragraph shall be limited to a cumulative 4 hours. The footage drilled while on daywork basis shall be deducted from the footage charge.

13. REPORTS TO BE FURNISHED BY CONTRACTOR:

13.1 Contractor shall keep and furnish to Operator an accurate record of the work performed and formations drilled on the IADC-API Daily Drilling Report Form or other form acceptable to Operator. A legible copy of said form signed by Contractor's representative shall be furnished by Contractor to Operator.

13.2 Delivery tickets, if requested by Operator, covering any material or supplies furnished by Operator shall be turned in each day with the daily drilling report. The quantity and description of materials and supplies so furnished shall be checked by contractor and such tickets shall be properly certified by Contractor.

14. INGRESS AND EGRESS TO LOCATION:

Operator hereby assigns to Contractor Operator's rights of ingress and egress with respect to the tract of land where the well is to be located for the performance by Contractor of all work contemplated by this Contract. Should Contractor be denied free access to the location for any reason not reasonably within Contractor's control, any time lost by Contractor as a result of such denial shall be paid for at the applicable rate in keeping with the stage of operations at that time. In the event there are any restrictions, conditions or limitations in Operator's lease which would affect the free right of ingress and egress to be exercised by Contractor, its employees, or subcontractors hereunder, Operator agrees to timely advise Contractor in writing with respect to such restrictions, conditions, or limitations, and Contractor agrees to observe same. Operator shall reimburse Contractor for all amounts reasonably expended by Contractor for repairs and/or reinforcement of roads, bridges and related or similar facilities (public and private) required as a direct result of a rig move pursuant to performance hereunder.

15. RESPONSIBILITY FOR A SOUND LOCATION:

Operator shall prepare a sound location, adequate in size and capable of properly supporting the drilling rig, and shall be responsible for a conductor pipe program adequate to prevent soil and subsoil washout. It is recognized that Operator has superior knowledge of the location and access routes to the location, and must advise Contractor of any subsurface conditions, or obstructions (including, but not limited to mines, caverns, sink holes, streams, pipelines, power lines and telephone lines) which Contractor might encounter while en route to the location or during operations hereunder. In the event subsurface conditions cause a cratering or shifting of the location surface, or if seabed conditions prove unsatisfactory to properly support the rig during marine operations hereunder, and loss or damage to the rig or its associated equipment results therefrom, Operator shall, without regard to other provisions of this Contract, reimburse Contractor to the extent not covered by Contractor's insurance, for all such loss or damage including payment of work stoppage rate during repair and/or demobilization, if applicable.

16. INSURANCE:

During the life of this Contract, Contractor shall at Contractor's expense maintain, with an insurance company or companies authorized to do business in the state where the work is to be performed or through a self-insurance program, insurance coverage of the kind and in the amounts set forth in Exhibit "A", insuring the liabilities specifically assumed by Contractor in Paragraph 18 of this Contract. Contractor shall, if requested to do so by Operator, procure from the company or companies writing said insurance a certificate or certificate satisfactory to Operator that said insurance is in full force and effect and that the same shall not be canceled or materially changed without ten (10) days prior written notice to Operator. For liabilities assumed hereunder by Contractor, its insurance shall be endorsed to provide that the underwriters waive their right of subrogation against Operator. Operator will, as well, cause its insurer to subrogation against Contractor for liability it assumes and shall maintain, at Operator's expense, or shall self insure, insurance coverage of the same kind and in the same amount as is required of Contractor, insuring the liabilities specifically assumed by Operator in Paragraph 18 of this Contract.

17. PAYMENT OF CLAIMS:

Contractor agrees to pay all claims for labor, material, services, and supplies to be furnished by Contractor hereunder, and agrees to allow no lien by such third parties to be fixed upon the lease, the well, or other property of Operator or the land upon which said well is located.

18. RESPONSIBILITY FOR LOSS OR DAMAGE, INDEMNITY, RELEASE OF LIABILITY AND ALLOCATION OF RISK:

18.1 Contractor's Surface Equipment: Contractor shall assume liability at all times, regardless of whether the work is being performed on a footage basis or daywork basis, for damage to or destruction of Contractor's surface equipment, regardless of when or how such damage or destruction occurs, except for such loss or damage as provided in Paragraph 15 and 18.4 herein, and Contractor shall release Operator of any liability for any such loss.

18.2 Contractor's In-Hole Equipment - Footage Basis: Contractor shall assume liability at all times while work is being performed on a footage basis for damage to or destruction of Contractor's in-hole equipment, including, but not limited to, drill pipe, drill collars, and tool joints, and Contractor shall release Operator of any liability for any such loss, except as provided for in Paragraphs 12.2, 12.3, 15 and 18.4.

18.3 Contractor's In-Hole Equipment - Daywork Basis: Operator shall assume liability at all times for damage to or destruction of Contractor's in-hole equipment, including, but not limited to, drill pipe, drill collars, and tool joints, and Operator shall reimburse Contractor for the value of any such loss or damage; the value to be determined by agreement between Contractor and Operator as current repair cost or 100 percent of current new replacement cost of such equipment delivered to the well site.

18.4 Contractor's Equipment - Environmental Loss or Damage: Notwithstanding the provisions of Paragraph 18.1 above, Operator shall assume liability at all times for damage to or destruction of Contractor's equipment caused by exposure to highly corrosive or otherwise destructive elements, including those introduced into the drilling fluid.

18.5 Operator's Equipment: Operator shall assume liability at all times for damage to or destruction of Operator's equipment including, but not limited to, casing, tubing, well head equipment, and platform, if applicable, regardless of when or how such damage or destruction occurs, and Operator shall release Contractor of any liability for any such loss or damage.

18.6 The Hole - Footage Basis: Subject to the provisions of Paragraphs 12 and 15 hereof, should a fire or blowout occur or should the hole for any cause attributable to Contractor's operations be lost or damaged while Contractor is engaged in the performance of work hereunder on a footage basis, all such loss of or damage to the hole shall be borne by Contractor; and if the hole is not in condition to be carried to the contract depth as herein provided, Contractor shall, if requested by Operator, commence a new hole without delay at Contractor's cost; and the drilling of the new hole shall be conducted under the terms and conditions of this Contract in the same manner as though it were the first hole. In such case, Contractor shall not be entitled to any payment or compensation for expenditures made or incurred by Contractor on or in connection with the abandoned hole, except for daywork earned in coring, testing, and logging said well for which Contractor would have been compensated had such hole not been junked and abandoned. Notwithstanding the foregoing provisions, if the hole is lost or damaged as a result of any delay by

Operator or the failure at any time of materials, equipment, goods or services provided by Operator, including without limitation to the foregoing, the failure of Operator's casing or equipment either during or after the running and setting of such casing, or as a result of subsequent failure of the cementing job resulting in parted casing, such loss shall be borne by Operator and Contractor shall nevertheless be paid: (a) For all footage drilled and other work performed by Contractor prior thereto; (b) For work performed in an effort to restore the hole to such condition that further drilling or other operations may be conducted at the applicable daywork rate: and (c) The cost of dismantling the rig and moving to and rigging up Contractor's equipment prior to starting the drilling of a new hole at a location designated by Operator if such be required. The work of drilling the new hole shall be performed by Contractor under the terms and conditions of this Contract.

18.7 The Hole - Daywork Basis: In the event the hole should be lost or damaged, while Contractor is working on a daywork basis, Operator shall be solely responsible for such damage to or loss of the hole, including the casing therein, as well as for cost of control of any wild well. Operator shall release Contractor of any liability for damage to or loss of the hole and for cost of control of any wild well, and shall protect, defend and indemnify Contractor from and against any and all claims, liability, and expenses relating to such damage to or loss of the hole, and for the cost of control of any wild well.

18.8 Underground Damage: Operator shall release Contractor of any liability for, and shall protect, defend and indemnify Contractor from and against any and all claims, liability, and expenses resulting from operations under this Contract on account of injury to, destruction of, or loss or impairment of any property right in or to oil, gas, or other mineral substance or water, if at the time of the act or omission causing such injury, destruction, loss, or impairment, said substance had not been reduced to physical possession above the surface of the earth, and for any loss or damage to any formation, strata, or reservoir beneath the surface of the earth.

18.9 Inspection of Materials Furnished by Operator:

(a) Contractor agrees to visually inspect all materials furnished by Operator before using same and to notify Operator of any apparent defects therein. Contractor shall not be liable for any loss or damage resulting from the use of materials furnished by Operator.

(b) Contractor will preassemble, disassemble, or assemble materials to be furnished by Operator only when directed by Operator and when such work can be accomplished by normal rig personnel. All of such services shall be performed on a daywork basis. Operator shall release Contractor from, and shall protect, defend and indemnify Contractor from and against any liability for such service.

18.10 Contractor's Indemnification of Operator: Contractor shall release Operator of any liability for, and shall protect, defend and indemnify Operator, its officers, directors, employees and joint owners from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Contractor's employees or Contractor's subcontractors or their employees, or Contractor's invitees, on account of bodily injury, death or damage to property. Contractor's indemnity under this paragraph shall be without regard to and without any right to contribution from any insurance maintained by Operator pursuant to Paragraph 16. If it is judicially determined that the monetary limits of insurance required hereunder or of the indemnities voluntarily assumed under Paragraph 18.10 (which Contractor and Operator hereby agree will be supported either by available liability insurance, under which the insurer has no right of subrogation against the indemnitees, or voluntarily self-insured, in part or whole) exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.

18.11 Operator's Indemnification of Contractor: Operator shall release Contractor of any liability for, and shall protect, defend and indemnity Contractor, its officers, directors, employees and joint owners from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Operator's employees or Operator's contractors or their employees or Operator's invitees other than those parties identified in Paragraph 18.10 on account of bodily injury, death or damage to property. Operator's indemnity under this paragraph shall be without regard to and without any right to contribution from any insurance maintained by Contractor pursuant to Paragraph 16. If it is judicially determined that the monetary limits of insurance required hereunder or of the indemnities voluntarily assumed under Paragraph 18.11 (which Contractor and Operator hereby agree will be supported either by available liability insurance, under which the insurer has no right of subrogation against the indemnities, or voluntarily self-insured, in part or whole exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.

18.12 Pollution and Contamination: Notwithstanding anything to the contrary contained herein, except the provisions of Paragraphs 15 and 18.13, it is understood and agreed by and between Contractor and Operator that the responsibility for pollution and contamination shall be as follows:

(a) Unless otherwise provided herein, Contractor shall assume all responsibility for, including control and removal of, and shall protect, defend and indemnify Operator from and against all claims, demands and causes of action of every kind and character arising from pollution or contamination, which originates above the surface of the land or water from spills of fuels, lubricants, motor oils, pipe dope, paints, solvents, ballast, bilge and garbage, except unavoidable pollution from reserve pits, wholly in Contractor's possession and control and directly associated with Contractor's equipment and facilities.

(b) Operator shall assume all responsibility for, including control and removal of, and shall protect, defend and indemnify Contractor from and against all claims, demands, and causes of action of every kind and character arising directly or indirectly from all other pollution or contamination which may occur during the conduct of operations hereunder, including but not limited to, that which may result from fire, blowout, cratering, seepage or any other uncontrolled flow of oil, gas, water or other substance, as well as the use or disposition of all drilling fluids, including, but not limited to, oil emulsion, oil base or chemically treated drilling fluids, contaminated cuttings or cavings, lost circulation and fish recovery materials and fluids. Operator shall release Contractor of any liability for the foregoing.

(c) In the event a third party commits an act or omission which results in pollution or contamination for which either Contractor or Operator, for whom such party is performing work, is held to be legally liable, the responsibility therefor shall be considered, as between Contractor and Operator, to be the same as if the party for whom the work was performed had performed the same and all the obligations respecting protection, defense, indemnity and limitation of responsibility and liability, as set forth in (a) and (b) above, shall be specifically applied.

18.13 Termination of Location Liability: When Contractor has complied with all obligations of the Contract regarding restoration of Operator's location, Operator shall thereafter be liable for damage to property, personal injury or death of any person which occurs as a result of the condition of the location and Contractor shall be relieved of such liability; provided, however, if Contractor shall subsequently reenter upon the location for any reason, including removal of the rig, any term of the Contract relating to such reentry activity shall become applicable during such period.

18. 14 Consequential Damages: Neither party shall be liable to the other for special, indirect or consequential damages resulting from or arising out of this Contract, including, without limitation, loss of profit or business interruptions including loss or delay of production, however same may be caused.

18.15 Indemnity Obligation: Except as otherwise expressly limited herein, it is the intent of parties hereto that all indemnity obligations and/or liabilities assumed by such parties under terms of this Contract, including without limitation Paragraphs 18.1 through 18.14 hereof, be without limit and without regard to the cause or causes thereof (including preexisting conditions), the unseaworthiness of any vessel or vessels, strict liability, or the negligence of any party or parties, whether such negligence be sole, joint or concurrent, active or passive. The indemnities, and releases and assumptions of liability extended by the parties hereto under the provisions of Paragraph 18 shall inure to the benefit of the parties, their parent, holding and affiliated companies and their respective officers, directors, employees, agents and servants. The terms and provisions of Paragraphs 18.1 through 18.14 shall have no application to claims or causes of action asserted against Operator or Contractor by reason of any agreement of indemnity with a person or entity not a party hereto.

19. INDEPENDENT CONTRACTOR RELATIONSHIP:

19.1 In the performance of the work herein contemplated on a "footage basis", Contractor is an Independent Contractor, with the authority to control and direct the performance of the details of the work, Operator being only interested in the results obtained. The work on such "footage basis" shall meet the approval of Operator and be subject to the right of inspection and supervision herein provided. Operator shall not unreasonably withhold approval of all such work, when performed by Contractor in accordance with the generally accepted practices and methods customary in the industry. Contractor agrees to comply with all laws, rules, and regulations, Federal, State, and Local, which are now, or may in the future become applicable to Contractor, Contractor's business, equipment, and personnel engaged in operations covered by this Contract or accruing out of the performance of such operations; provided, however, as between Operator and Contractor specific provisions herein contained respecting the risk and responsibility for such compliance shall be controlling.

19.2 Operator shall be privileged to designate a representative or representatives who shall at all times have access to the premises for the purpose of observing tests or inspecting the work of Contractor. Such representative or representatives shall be empowered to act for Operator in all matters relating to the work herein undertaken and Contractor shall be entitled to rely on the orders and directions issued by such representative or representatives as being those of Operator.

20. AUDITS:

If any payment provided for hereunder is made on the basis of Contractor's costs, Operator shall have the right to audit Contractor's books and records relating to such costs. Contractor agrees to maintain such books and records for a period of two (2) years from the date such costs were incurred and to make such books and records available to Operator at any reasonable time or times within the period.

21. NO WAIVER EXCEPT IN WRITING:

It is fully understood and agreed that none of the requirements of this Contract shall be considered as waived by either party unless the same is done in writing, and then only by the persons executing this Contract, or other duly authorized agent or representative of the party.

22. FORCE MAJEURE:

Neither Operator nor Contractor shall be liable to the other for any delays or damage or failure to act due, occasioned or caused by reason of any laws, rule, regulations or orders promulgated by any Federal, State or Local governmental body or the rules, regulations, or orders of any public body or official purporting to exercise authority or control respecting the operations covered hereby, including the procurance or use of tools and equipment, or due, occasioned or caused by strikes, action of the elements, water conditions, inability to obtain fuel or other critical materials or other causes beyond the control of the party affected thereby. In the event that either party hereto is rendered unable, wholly or in part, by any of these causes to carry out its obligation under this Contract, it is agreed that such party shall give notice and details of Force Majeure in writing to the other party as promptly as possible after its occurrence. In such cases, the obligations of the party giving the notice shall be suspended during the continuance of any inability so caused except that Operator shall be obligated to pay to Contractor the Work Stoppage rate set forth in Paragraph 4.3 above.

23. GOVERNING LAW:

This Contract shall be construed. governed, interpreted. enforced and litigated, and the relations between the parties determined in accordance with the Laws of State of Texas.

24. INFORMATION CONFIDENTIAL:

Upon written request by Operator, information obtained by Contractor in the conduct of drilling operations on this well, including, but not limited to, depth, formations penetrated, the results of coring, testing, and surveying, shall be considered confidential and shall not be divulged by Contractor or its employees, to any person, firm, or corporation other than Operator's designated representative.

25. SUBCONTRACTS BY OPERATOR:

Operator may employ other contractors to perform any of the operations or services to be provided or performed by it according to Exhibit "A".

26. ASSIGNMENT:

Neither party may assign this Contract without the prior written consent of the other, and prompt notice of any such intent to assign shall be given to the other party. In the event of such assignment, the assigning party shall remain liable to the other party as a guarantor of the performance by the assignee of the terms of this Contract. If any assignment is made that materially alters Contractor's financial burden, Contractor's compensation shall be adjusted to give effect to any increase or decrease in Contractor's operating costs.

27. NOTICES AND PLACE OF PAYMENT:

All notices to be given with respect to this Contract unless otherwise provided for shall be given to Contractor and to Operator respectively at the addresses hereinabove shown. All sums payable hereunder to Contractor shall be payable at its address hereinabove shown unless otherwise specified herein.

28. SPECIAL PROVISIONS:

29. ACCEPTANCE OF CONTRACT:

The foregoing Contract is agreed to and accepted by Operator this 18 day of June, 1998.

OPERATOR Gruy Petroleum Mgmt Co.

By F B Brouk

Title VP Operations

The foregoing Contract is accepted by the undersigned as Contractor this 1ST day of JUNE, 19 98 which is the effective date of this Contract, subject to rig availability, and subject to all of its terms and provisions, with the understanding that it will not be binding upon Operator until Operator has noted its acceptance, and with further understanding that unless said Contract is thus executed by Operator within 10 days of the above date Contractor shall be in no manner bound by its signature thereto.

CONTRACTOR: Key Energy Drilling, Inc.

By: Jimi Mayfield

Title: CONTRACT MANAGER

EXHIBIT "A"

To Drilling Contract dated JUNE 1, 1998.
Operator: GRUY PETROLEUM MANAGEMENT
Well Name and Number: SEE ATTACHED EXHIBIT "C"

Contractor : Key Energy Drilling, Inc.

SPECIFICATIONS AND SPECIAL PROVISIONS

1. CASING PROGRAM (See par. 7)

	Hole Size	Casing Size	Weight	Grade	Approximate Setting Depth	Wait on Cement Time
Conductor	in.	in.	lbs / ft.		ft.	hrs.
Surface	12-1/4 in.	8-5/8 in.	22 - 24 lbs / ft.		750 +/- ft.	12 hrs.
Protection	in.	in.	lbs / ft.		ft.	hrs.
Production	7-7/8 in.	4-1/2/5-1/2 in.	10.5 – 14.0 lbs / ft.		TD ft.	0 hrs.
Liner	in.	in.	lbs / ft.		ft.	hrs.

2. MUD CONTROL PROGRAM (See par. 9)

Depth Intervel (ft.) From To	Type Mud	Weight (lbs / gal.)	Viscosity (Secs)	Water Loss (cc)
0 - TD	BRINE – H2O	8.3 – 9.2	N/C	N/C

It is understood that in the event it becomes necessary to discontinue drilling operations and to suddenly raise the mud weight .5lbs. per gallon above the weight currently being used OR to raise the mud weight at any time to 9.6 lbs. per gallon, it will conclusively constitute "Abnormal Pressure" as that term is employed in Paragraph 12.2 of the Contract. Operations will thereafter go forward under the terms of such provision (12.2) until such condition has been overcome, the well is under control and the mud system stabilized at a weight less than 9.6 lbs. per gallon, so as to permit normal drilling operations to be resumed.

Other mud specifications:

5. STRAIGHT HOLE SPECIFICATIONS (See Par. 9.4)

Well Depth From	To	Maximum Distance Between Surveys, Feet	Maximum Deviation From Vertical, Degrees	Maximum Change of Inclination per 100', Degrees (1)
0	TD	500	5	2

Location of well bore at T.D. feet shall be Within lease lines.

(1) a. Reduce proportionately for survey intervals less than 100 feet, but do not use intervals shorter than 30 feet.
b. If these limits are exceeded and the distance between surveys is more than 100 feet, Contractor shall take intermediate surveys no more than 100 feet apart. If such intermediate surveys show that above limits for any interval have been exceeded, Contractor shall correct hole deviation to within limits of above specifications.

4. INSURANCE (See Par. 16) (SEE CERTIFICATES ON FILE)

4.1 Adequate Workers' Compensation Insurance Complying with State laws applicable or Employers' Liability Insurance with limits at $ 1,000,000 covering all of Contractor's employees working under this Contract.

4.2 Comprehensive Public Liability Insurance or Public Liability Insurance with limits of $ 1,000,000 for the death or injury of any one person and $ 1,000,000 for each accident.

4.3 Comprehensive Public Liability Property Damage Insurance or Public Liability Property Damage Insurance with limits of $ 1,000,000 for each accident and $ 1,000,000 aggregate per policy.

4.4 Automobile Public Liability Insurance with limits of $ 1,000,000 for the death or injury of each person and $ 1,000,000 for each accident; and Automobile Public Liability Property Damage Insurance with limits of $ 1,000,000 for each accident

4.5 In the event operations are over water, Contractor shall carry in addition to the Statutory Workers' Compensation Insurance, endorsements covering liability under the Longshoremen's & Harbor Workers' Compensation Act and Maritime liability including maintenance and cure with limits at $ N/A for each death or injury to one person and $ N/A for any one accident.

4.6 Other Insurance: $ 5,000,000 Umbrella

5. EQUIPMENT, MATERIALS AND SERVICES TO BE FURNISHED BY CONTRACTOR:
The machinery, equipment, tools, materials, supplies, instruments, services and labor hereinafter listed, including any transportation required for such items, shall be provided at the well location at the expense of Contractor unless otherwise noted by this Contract.

5.1 Drilling Rig: (SEE ATTACHED INVENTORY)
Complete drilling rig, designated by Contractor as its Rig No. 5, the major items of equipment being:
Drawworks: Make and Model:
Engines: Make, Model, and H.P:
No. on Rig:
Pumps: No. 1 Make, Size, and Power:
No. 2 Make, Size, and Power:
Mud Mixing Pump: Make, Size, and Power:
Boilers: Number, Make, H.P. and W.P:
Derrick or Mast: Make, Size, and Capacity:
Substructure: Site and Capacity:
Rotary Drive: Type
Drill Pipe: Size_____in._____ft.; Size_____in._____ft._____
Drill Collars: Number and Size _____
*Blowout Preventers:*_____

Size	Series or Test Pr.	Make & Model	Number
B.O.P. Closing Unit:			
B.O.P. Accumulator:			

5.2 Trucking service and other transportation, hauling, or winching services as required to move Contractor's property to location, rig up Contractor's rig, tear down Contractor's rig, and remove all of Contractor's property from location.
5.3 Drilling bits, reamers, stabilizers, reamer cutters, and other drilling tools or devices (except while on daywork).
5.4 Contract fishing tool services and fishing tool rentals (except while on daywork).
5.5 Derrick timbers.
5.6 Normal strings of drill pipe and drill collars specified above.
5.7 Conventional drift indicator.
5.8 Circulating mud pits.
5.9 Necessary pipe racks and rigging up material.
5.10 Normal storage for mud and chemicals.
5.11 Shale Shaker.

6. EQUIPMENT, MATERIALS AND SERVICES TO BE FURNISHED BY OPERATOR:
The machinery, equipment, tools, materials, supplies, instruments, services and labor hereinafter listed, including any transportation required for such items, shall be provided at the well location at the expense of Operator unless otherwise noted by this Contract.

6.1 Furnish and maintain adequate roadway and/or canal to location, right-of-way, including rights-of-way for fuel and water lines, river crossings, highway crossings, gates and cattle guards.
6.2 Stake location, clear and grade location, and provide turnaround, including surfacing when necessary.
6.3 Test tanks with pipe and fittings.
6.4 Mud storage tanks with pipe and fittings.
6.5 Separator with pipe and fittings.
6.6 Labor to connect and disconnect mud tank, test tank, and separator.
6.7 Labor to disconnect and clean test tanks and separator.
6.8 Drilling mud, chemicals, lost circulation materials and other additives.
6.9 Pipe and connections for oil circulating lines.
6.10 Labor to lay, bury and recover oil circulating lines.
6.11 Drilling bits, reamers, reamer cutters, stabilizers and special tools while operating on daywork basis.
6.12 Contract fishing tool services and tool rental while operating on a daywork basis.
6.13 Wire line core bits or heads, core barrels and wire line core catchers if required.
6.14 Conventional core bits, core catchers and core barrels.
6.15 Diamond core barrel with head.
6.16 Cement and cementing service.
6.17 Electrical wireline logging services.
6.18 Directional, caliper, or other special services.
6.19 Gun or jet perforating services.
6.20 Explosives and shooting devices.
6.21 Formation testing, hydraulic fracturing, acidizing and other related services.
6.22 Equipment for drill stem testing.
6.23 Mud logging services.
6.24 Sidewall coring service.
6.25 Welding service for welding bottom joints of casing, guide shoe, float shoe, float collar and in connection with installing of well head equipment if required.
6.26 Casing, tubing, liners, screen, float collars, guide and float shoes and associated equipment.
6.27 Casing scratchers and centralizers.
6.28 Well head connections and all equipment to be installed in or on well or on the premises for use in connection with testing, completion and operation of well.
6.29 Special or added storage for mud and chemicals.
6.30 Casinghead, API series, to conform to that shown for the blowout preventers specified in Paragraph 5. 1 above.
6.31 Blowout Preventer testing packoff.
6.32 Casing Thread Protectors and Casing lubricant.
6.33 H_2S training and equipment as necessary or as required by law.

7. EQUIPMENT, MATERIALS, AND SERVICES TO BE FURNISHED BY DESIGNATED PARTY:

The machinery, equipment, tools, materials, supplies, instruments, services, and labor listed as the following numbered items, including any transportation required for such item unless otherwise specified, shall be provided at the well location and at the expense of the party hereto as designated by an X mark in the appropriate column.

Item	To Be Provided By and At the Expense of	
	Operator	Contractor
7.1 Cellar and runways	X	
7.2 Fuel (located at)		X
7.3 Fuel Lines		X
7.4 Water at source including required permits	X	
7.5 Water well including required permits	X	
7.6 Water lines including required permits	X	
7.7 Water storage tanks 400 BBL capacity		X
7.8 Labor to operate water well or water pump		X
7.9 Maintenance of water well, if required	X	
7.10 Water Pump	X	
7.11 Fuel for water pump	X	
7.12 Mats for engines and boilers, or motors and mud pumps	X	
7.13 Transportation of Contractor's property: Move in		X
Move out		X
7.14 Materials for "boxing in" rig and derrick	N/A	N/A
7.15 Special strings of drill pipe and drill collars as follows:	X	
7.16 Kelly joints, subs, elevators, tongs and slips for use with special drill pipe	X	
7.17 Drill pipe protectors for Kelly joint and each joint of drill pipe running inside of Surface Casing as required, for use with normal strings of drill pipe	X	
7.18 Drill pipe protectors for Kelly joint and drill pipe running inside of Protection Csg...	X	
7.19 Rate of penetration recording device		X
7.20 Extra labor for running and cementing casing (Casing Crews)		X
7.21 Casing tools		X
7.22 Rig time for running of casing-conductor	N/A	N/A
7.23 Rig time for running of casing-surface		X
7.24 Rig time for running of casing-protection	N/A	N/A
7.25 Rig time for running of casing-production		X
7.26 Rig time for running of casing-liner	N/A	N/A
7.27 Rig time to circulate and condition hole to log	X	
7.28 Rig time to log	X	
7.29 Rig time to condition hole to lay down drill string	X	
7.30 Rig time to lay down drill string		X
7.31 Extra labor to lay down drill string (IF .NEEDED)	X	
7.32 Lay down and pickup machine	N/A	N/A
7.33 Rig time to clean mud tanks	X	
7.34 Cost of all labor and materials to clean rig after use of oil-base mud	N/A	N/A
7.35 Power casing tongs		X
7.36 Tubing tools	N/A	N/A
7.37 Power tubing tong	N/A	N/A
7.38 Drilling mouse and rate holes		X
7.39 Drilling hole for or driving for conductor pipe	N/A	N/A
7.40 Reserve pits	X	
7.41 Crew Boats, Number_____	N/A	N/A
7.42 Service Barge	N/A	N/A
7.43 Service Tug Boat	N/A	N/A
7.44 Upper Kelly Cock	X	
7.45 Lower Kelly Valve	X	
7.46 Drill Pipe Safety Valve		X
7.47 Inside Blowout Preventer	X	
7.48 Charges, cost of bonds for public roads		X
7.49 Portable Toilet	N/A	N/A
7.50 Trash Receptacle	X	
7.51 Linear Motion Shale Shaker	X	
7.52 Shale Shaker Screens		X
7.53 Mud Cleaner	N/A	N/A
7.54 Mud/Gas Separator	N/A	N/A
7.55 Desander		X
7.56 Desilter		X
7.57 Degasser	N/A	N/A
7.58 Centrifuge	N/A	N/A
7.59 Rotating Head	N/A	N/A
7.60 Rotating Head Rubbers	N/A	N/A
7.61 Hydraulic Adjustable Choke	N/A	N/A
7.62 Pit Volume Totalizer	N/A	N/A
7.63 Communications, type (CELLULAR)		X
7.64 Forklift, capacity	N/A	N/A
7.65 Corrosion Inhibitor for protecting drill string..(IF NEEDED)	X	
7.66 H2S EQUIPMENT (IF NEEDED)	X	
7.67		

OTHER PROVISIONS:

Signed by the
Parties as correct:

For Contractor Jim Mayfield

For Operator

GRUX

EXHIBIT "B"
(See Paragraph 9.5)

The following clauses, when required by law, are incorporated in the Contract by reference as if fully set out:

(1) The Equal Opportunity Clause prescribed in 41 CFR 60-1.4.
(2) The Affirmative Action Clause prescribed in 41 CFR 60-250.4 regarding veterans and veterans of the Vietnam era.
(3) The Affirmative Action Clause for handicapped workers prescribed in 41 CFR 60-741.4.
(4) The Certification of Compliance With Environmental Laws prescribed in 40 CFR 15.20.

EXHIBIT "C"

GRUY PETROLEUM MANAGEMENT
MULTI-WELL PACKAGE

WELL NAME	LOCATION
RHODES FEDERAL UNIT # 10-3	10-T26S-R37E
RHODES FEDERAL UNIT # 15-9	15-T26S-R37E
RHODES FEDERAL UNIT # 4-15	4- T26S-R37E
RHODES FEDERAL UNIT # 5-5	5-T26S-R37E
RHODES FEDERAL UNIT #22-7	22-T26S-R37E
RHODES FEDERAL UNIT # 22-6	22-T26S-R37E
RHODES FEDERAL UNIT #26-7	26-T26S-37E
RHODES FEDERAL UNIT #17-1	17-R26S-37E
RHODES STATE COM # 5	16-T26S-37E
RHODES "B" FEDERAL # 1	25-T26S-37E
CAGLE "C" #5	3-T26S-37E
CAGLE "C" # 6.	10-T26S-37E
RHODES STATE COM #6 (RE-ENTRY: DAYWORK)	16-T26S-37E

FUTURE WELLS MAY BE ADDED OR DELETED BY LETTER OF ADDENDUM UPON AGREEMENT OF CONTRACTOR & OPERATOR.

Farnsworth 4-1
NW4 Sec. 4
Rework oil well

Form 3160-3
(July 1992)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

FORM APPROVED
OMB NO. 1004-0136
Expires: February 28, 1995

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

5. LEASE DESIGNATION AND SERIAL NO.: LC-054638

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: ---

7. UNIT AGREEMENT NAME: ---

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]

b. TYPE OF WELL: OIL WELL [ ] GAS WELL [X] OTHER — SINGLE ZONE [X] MULTIPLE ZONE [ ]

8. FARM OR LEASE NAME, WELL NO.: RHODES FEDERAL UNIT # 415

2. NAME OF OPERATOR: GRUY PETROLEUM MANAGEMENT COMPANY (ZENO FARRIS) 972-443-6489

9. API WELL NO.: 30-025-34396

3. ADDRESS AND TELEPHONE NO.: P.O. BOX 14097 IRVING, TEXAS 75014

10. FIELD AND POOL, OR WILDCAT: RHODES-YATES-7 RIVERS GAS

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 660' FSL & 660' FWL SEC 4 T26S-R37E LEA CO NM
At proposed prod. zone: SAME

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: SEC. 4 T26S-R37E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: Approximately 5 miles South of Jal New Mexico

12. COUNTY OR PARISH: LEA CO. 13. STATE: NEW MEXICO

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)	16. NO. OF ACRES IN LEASE	17. NO. OF ACRES ASSIGNED TO THIS WELL
660'	160	160
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.	**19. PROPOSED DEPTH**	**20. ROTARY OR CABLE TOOLS**
1500'	3380'	ROTARY

21. ELEVATIONS (Show whether DF, RT, GR, etc.): GR. 2984' — CAPITAN CONTROLLED WATER BASIN

22. APPROX. DATE WORK WILL START*: As soon as approved

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12¼'	K-55 8 5/8"	24	750'	600 Sx. circulate to surface
7 7/8"	K-55 4½"	11.6	3380'	1000 Sx. circulate to surface

1. Drill 12¼" hole to 750'. Run and set 750' of 8 5/8" J-55 24# ST&C casing. Cement with 400 Sx. of Halco Light + additives, tail in with 200 Sx. of Class "C" + ¼# flocele/Sx + 2% CaCl, circulate cement to surface.

2. Drill 7 7/8" hole to 3380'. Run and set 3380' of 4½" J-55 11.6# LT&C casing. Cement in two stages. First stage cement with 400 Sx. of Class "C" cement + 3# of salt/Sx. + ¼# flocele/Sx. Second stage cement with 600 Sx. of Class "C" Halco Light + 9# salt/Sx. + ¼# flocele/Sx., circulate cement to surface.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 16
CASE NOS. 12015 & 12017

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, 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.

SIGNED Joe T Janica TITLE Agent DATE 04/07/98

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

CONDITIONS OF APPROVAL, IF ANY:

(ORIG. SGD.) ARMANDO A. LOPEZ

APPROVED BY _____ TITLE Acting DATE MAY 04 1998

*See Instructions On Reverse Side

STRICT I
. Box 1980, Hobbs, NM 88241-1980

STRICT II
. Drawer DD, Artesia, NM 88211-0719

STRICT III
00 Rio Brazos Rd., Aztec, NM 87410

STRICT IV
. Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-34396	83810	RHODES-YATES-7 RIVERS

Property Code	Property Name	Well Number
22321	RFU	415

OGRID No.	Operator Name	Elevation
162683	GRUY PETROLEUM MANAGEMENT CO.	2984

Surface Location

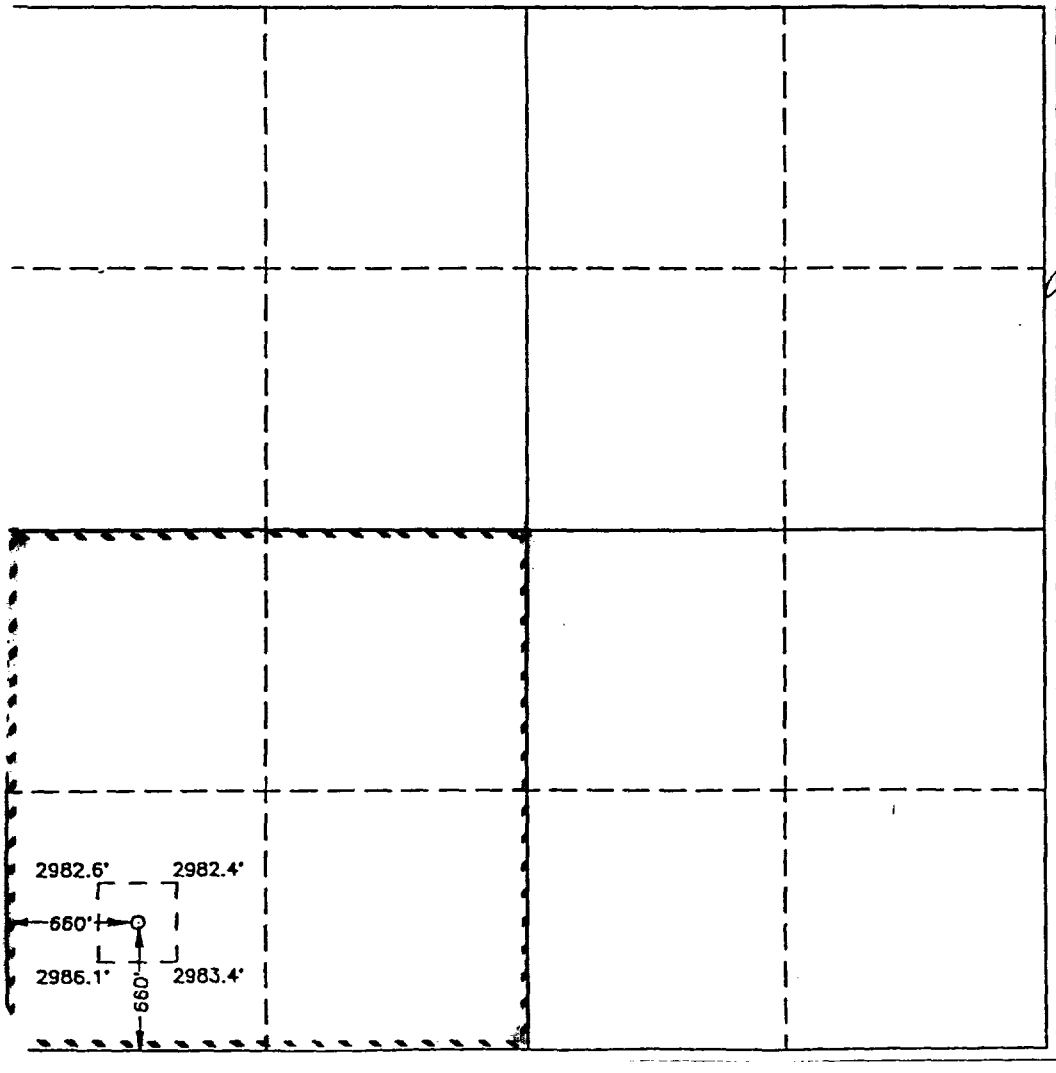
Ul. or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	4	26 S	37 E		660	SOUTH	660	WEST	LEA

Bottom Hole Location If Different From Surface

Ul. or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Joe T. Janica
Signature

Joe T. Janica
Printed Name

Agent
Title

04/07/98
Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my belief.

MARCH 26, 1998
Date Surveyed JLP

Signature & Seal of Professional Surveyor

NEW MEXICO — RONALD J. EIDSON — REGISTERED PROFESSIONAL SURVEYOR

3-31-98

W.O. Num. 98-11-0497

Certificate No. RONALD J. EIDSON, 3239
GARY L. EIDSON, 12641
JASON McDONALD, 12185

Form 3160-5
(November 1994)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OPERATOR COPY

FORM APPROVED
OMB No. 1004-0135
Expires July 31, 1996

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side

5. Lease Serial No.
LC-054668

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit or CA/Agreement, Name and/or No.
8920003820

1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.
RHODES FEDERAL UNIT #415

2. Name of Operator
Gruy Petroleum Management Co.

9. API Well No.
30-025-34396

3a. Address
P. O. Box 140907 Irving, TX 75014-0907

3b. Phone No. *(include area code)*
972-401-3111

10. Field and Pool, or Exploratory Area
Rhodes-Yates-7 Rivers Gas

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
660' FSL & 660' FWL Sec. 4, T26S, R37E

11. County or Parish, State
Lea Co., NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☒ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Spud & set surface casing.
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

06/12/98 Drilled 40' of 18" hole, ran 40' of 14" conductor pipe and cemented with Ready Mix to surface.

06/16/98 MI & RU Key Energy rig #5. Spudded 12-1/4" hole @ 6:00 p.m. CDT.

06/17/98 Drilled to 774' KB. Ran 18 jts. 8-5/8" 24# ST/C J-55 casing & set @ 770.9' KB. Cemented w/ 275 sx 'C' w/ 4% gel, 2% CaCl & 1/4# celloflake and tailed w/ 200 sx 'C' w/ 2% CaCl & 1/4# celloflake. PD @ 1:10 p.m. CDT. WOC - 12 hrs. NU BOP & wellhead and test same to 1000 psi for 30 mins - ok. (Witnessed by BLM representative.)

Note: Will run 5-1/2" production casing instead of 4-1/2".

ACCEPTED FOR RECORD
PETER W. CHESTER
Peter W. Chester
JUL 8 1998
BUREAU OF LAND MANAGEMENT
ROSWELL RESOURCE AREA

14. I hereby certify that the foregoing is true and correct

Name *(Printed/Typed)*	Title
Zeno Farris	Manager Operations Administration
Signature: Zeno Farris	Date: June 23, 1998

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office	

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on reverse)

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit 1 duplicate to appropriate district office
See Rule 401 & Rule 1122

Form C-122
Revised 4-1-91

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Operator: GRUY MANAGEMENT		Lease or Unit Name: RHODES FED UNIT	
Type Test: [X] Initial [ ] Annual [ ] Special		Test Date: 7/28/98	Well No.: 415
Completion Date: 7/28/98	Total Depth: 3005	Plug Back TD: 2975	Elevation: 2984	Unit Ltr. - Sec. - TWP - Rge.: 4-26S-37E
Csg. Size: 5½	Wt.: 15.5	d: 4.950	Set At:	Perforations: From: To:	County: LEA
Tbg. Size: 2-3/8	Wt.: 4.7	d: 1.995	Set At: 2759	Perforations: From: To:	Pool:
Type Well - Single - Bradenhead - G.G. or G.O. Multiple: single		Packer Set At: none			Formation: YATES/7-Rivers
Producing Thru: tbg	Reservoir Temp. °F: 85°	Mean Annual Temp. °F: 60°	Baro. Press - P_a: 13.2		Connection: AIR

L	H	Gg	% CO_2	% N_2	% H_2S	Prover	Meter Run	Taps
2759	2759	.896	24.879	1.146		6" Poss. choke	none	

NO.	FLOW DATA: Prover Line Size X Orifice Size	Press. p.s.i.g.	Diff. h_w	Temp. °F	TUBING DATA: Press. p.s.i.g.	TUBING DATA: Temp. °F	CASING DATA: Press. p.s.i.g.	CASING DATA: Temp. °F	Duration of Flow
SI	6" Poss Choke				120			N/A	
1.	24/64 "				62	92°	78		60min
2.	20/64 "				75	90°	85		60min
3.	18/64 "				81	90°	87		60min
4.	16/64 "				86	89°	92		60min
5.									

RATE OF FLOW CALCULATIONS

NO.	COEFFICIENT (24 HOUR)	$\sqrt{h_w P_m}$	Pressure P_m	Flow Temp. Factor F_t	Gravity Factor F_g	Super Compress. Factor, F_{pv}	Rate of Flow Q, Mcfd
1.	2.591		75.2	.9706	1.056	1.064	212
2.	1.771		88.2	.9723	1.056	1.056	169
3.	1.422		94.2	.9723	1.056	1.056	145
4.	1.112		99.2	.9752	1.056	1.056	119
5.							

NO.	P_r	Temp. °R	T_r	Z
1.	.67	522	1.28	.884
2.	.71	550	1.35	.896
3.	.71	550	1.35	.896
4.	.71	549	1.35	.896
5.				

Gas Liquid Hydrocarbon Ratio: N/A Mcf/bbl.
A.P.I. Gravity of Liquid Hydrocarbons: N/A Deg.
Specific Gravity Separator Gas: .896 XXXXXXXXX
Specific Gravity Flowing Fluid: XXXXX
Critical Pressure: 768 P.S.I.A. P.S.I.A.
Critical Temperature: 406 R R

P_c 120.1 P_c^2 14.42

NO.	P_t^2	P_w	P_w^2	$P_c^2 - P_w^2$
1.		68.9	6.81	7.61
2.		80.8	6.52	7.90
3.		86.2	7.43	6.99
4.		90.8	8.24	7.43
5.				

1) $\frac{P_c^2}{P_c^2 - P_w^2} = 1.89$

(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2}\right]^n = 1.89$

AOF = Q $\left[\frac{P_c^2}{P_c^2 - P_w^2}\right]^n = 400.7$

Absolute Open Flow: 400.7 Mcfd @ 15.025 | Angle of Slope θ: 45° | Slope, n: 1.000

Remarks: *CALCULATED FROM KNOWN BOTTOM PRESSURES
* NO LIQUID MADE DURING TEST

Approved By Division	Conducted By:	Calculated By:	Checked By:
	PRO WELL TESTING	MB	BM

Form 3160-4
(October 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

FOR APPROVED
OMB NO. 1004-0137
Expires: December 31, 1991

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

5. LEASE DESIGNATION AND SERIAL NO.: LC-054668

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☒ DRY ☐ Other

b. TYPE OF COMPLETION: NEW WELL ☒ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other

7. UNIT AGREEMENT NAME: 8920003820

2. NAME OF OPERATOR: Gruy Petroleum Management Co.

8. FARM OR LEASE NAME, WELL NO.: Rhodes Federal Unit # 415

3. ADDRESS AND TELEPHONE NO.: P O Box 140907 Irving Tx. 75014-0907

9. API WELL NO.: 30-025-34396

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface: 660 FSL & 660 FWL
At top prod. interval reported below
At total depth

10. FIELD AND POOL, OR WILDCAT: Rhodes Yates- 7 Rivers Gas

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec 4 26S 37E

14. PERMIT NO.	DATE ISSUED	12. COUNTY OR PARISH	13. STATE
	5-4-98	Lea	NM

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
6-12-98	6-20-98	7-23-98	2984 GR	

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
3057'	2980'		→	All	

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: Yates - 2740-2837

25. WAS DIRECTIONAL SURVEY MADE: Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN: Sector Bond; Gamma Ray/CCL

27. WAS WELL CORED: No

28. CASING RECORD (*Report all strings set in well*)

CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	TOP OF CEMENT, CEMENTING RECORD	AMOUNT PULLED
8 5/8" J-55	24 #	770.9'	12 1/4"	475 sx C w/ 2% CaCl, surface	-0-
5 1/2" J-55	15.5 #	3005'	7 7/8"	850 sx C Poz, surface	-0-

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 3/8	2759'	

31. PERFORATION RECORD (*Interval, size and number*): 2740'-2837' 102 holes 2 spf

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
2740'-2837'	8000 gals 10% HCL
2740'-2837'	74,000 gals 50/50 CO2, 190,000 # 16/30 Brady sand

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or shut-in*)
8-4-98	Flowing	Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
7-28-98	4 hours	24/64		0	212	0	---

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
62	78		0	400.7	0	---

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*): Vented

TEST WITNESSED BY:

35. LIST OF ATTACHMENTS: C-122 Back Pressure Test, electric log, and deviation summary

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED Zeno Farris TITLE Manager, Operations Adm. DATE 8-19-98

***(See Instructions and Spaces for Additional Data on Reverse Side)**

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

GRUY-0000742

Instructions on back
Submit to Appropriate District Office
State Lease - 6 Copies
Fee Lease - 5 Copies

☐ AMENDED REPORT

Artesia, NM 88210
Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

[1] Operator Name and Address.	[2] OGRID Number
GRUY PETROLEUM MANAGEMENT COMPANY P.O. BOX 140907. IRVING, TEXAS 75014-0907	162683
	[3] API Number 30-025-34417

[4] Property Code	[5] Property Name	[6] Well No.
22824	RHODES STATE..COM.	5

[7] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	16	26S	37E		660'	North	1980'	West	LEA

[8] Proposed Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[9] Proposed Pool 1	[10] Proposed Pool 2
RHODES YATES 7RIVERS-GAS (83810)	

[11] Work Type Code	[12] Well Type Code	[13] Cable/Rotary	[14] Lease Type Code	[15] Ground Level Elevation
N	G	R	S	2978'
[16] Multiple	**[17] Proposed Depth**	**[18] Formation**	**[19] Contractor**	**[20] Spud Date**
NO	4000'	YATES-7RIVERS	UNKNOWN	WHEN APPROVED

[21] Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
25"	20"	NA	40'	Redi-mix	Surface
12¼"	8 5/8"	24	750'	400 Sx.	Surface
7 7/8"	5½"	15.5	4000'	1000 Sx.	Surface

[22] Describe the proposed program. If this application is to DEEPEN or PLUG BACK give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

1. Drill 25" hole to 40'. Set 40' of 20" conductor pipe and cement to surface with Redi-mix.
2. Drill 12¼" hole to 750'. Run and set 750' of 8.5/8" 24# J-55 ST&C casing. Cement with 400 Sx. of Class "C" Halco Light + additives, tail in with 200 Sx. of Class "C" + ¼# flocele/Sx. + 2% CaCl, circulate cement to surface.
3. Drill 7 7/8" hole to 4000'. Run and set 4000' of 5½" 15.5# J-55 ST&C casing. Cement in two stages: 1st stage cement with 400 Sx. of Class "C" + 3# salt/Sx., +¼# flocele/Sx. 2nd stage cement with 600 Sx. of Class "C" Halco Light + 9# salt Per Sx. + ¼# flocele/Sx. , circulate cement to surface.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 17A
CASE NOS. 12015 & 12017

GRUY-0000214

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: Joe T Janica

Printed name: Joe T. Janica

Title: Agent Filed 6-3-98

Date: 06/02/98 Phone:

OIL CONSERVATION DIVISION

Approved By: ORIGINAL SIGNED BY CHRIS WILLIAMS

Title: DISTRICT I SUPERVISOR

Approval Date: JUN 09 1998 Expiration Date:

Conditions of Approval:

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

DISTRICT II
811 S. First St., Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. Box 2088, Santa Fe, NM 87504-2088

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-34417	83810	RHODES-YATES, 7R's (GAS)

Property Code	Property Name	Well Number
22874	RHODES STATE COM.	5

OGRID No.	Operator Name	Elevation
162683	GRUY PETROLEUM MANAGEMENT CO.	2978

Surface Location

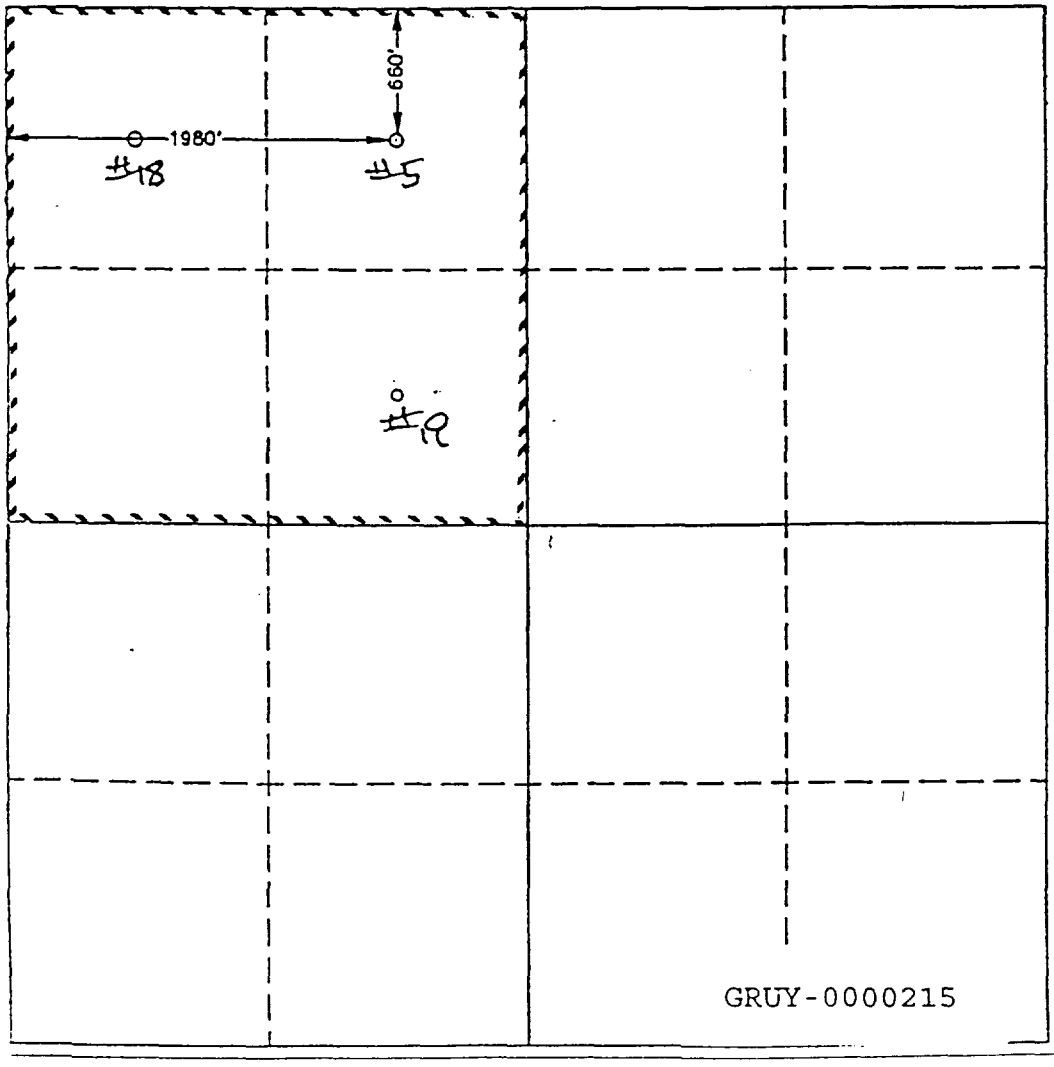
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	16	26 S	37 E		660	NORTH	1980	WEST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Signature: Joe T. Janica

Printed Name: Agent

Title: 06-05-98

Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my belief.

JUNE 2, 1998

Date Surveyed JLP

Signature & Seal of Professional Surveyor

Certificate No. RONALD J. EIDSON, 3239
GARY L. EIDSON, 12641
JACON McDONALD, 12185

W.O. Num. 98-11-0860

GRUY-0000215

811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

Instructions on back
Submit to Appropriate District Office
State Lease - 6 Copies
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☒ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

[1] Operator Name and Address.	[2] OGRID Number
GRUY PETROLEUM MANAGEMENT COMPANY P.O. BOX 140907. IRVING, TEXAS 75014-0907	162683
	[3] API Number 30-025-34417

[4] Property Code	[5] Property Name	[6] Well No.
22874	RHODES STATE COM.	5

[7] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	16	26S	37E		330'	North	2310'	West	LEA

[8] Proposed Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[9] Proposed Pool 1	[10] Proposed Pool 2
RHODES YATES 7RIVERS-GAS (83810)	

[11] Work Type Code	[12] Well Type Code	[13] Cable/Rotary	[14] Lease Type Code	[15] Ground Level Elevation
N	G	R	S	
[16] Multiple	**[17] Proposed Depth**	**[18] Formation**	**[19] Contractor**	**[20] Spud Date**
NO	4000'	YATES-7RIVERS	UNKNOWN	WHEN APPROVED

[21] Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
25"	20"	NA	40'	Redi-mix	Surface
12¼"	8 5/8"	24	750'	400 Sx.	Surface
7 7/8"	5½"	15.5	4000'	1000 Sx.	Surface

[22] Describe the proposed program. If this application is to DEEPEN or PLUG BACK give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

1. Drill 25" hole to 40'. Set 40' of 20" conductor pipe and cement to surface with Redi-mix.
2. Drill 12¼" hole to 750'. Run and set 750' of 8 5/8" 24# J-55 ST&C casing. Cement with 400 Sx. of Class "C" Halco Light + additives, tail in with 200 Sx. of Class "C" + ¼# flocele/Sx. + 2% CaCl, circulate cement to surface.
3. Drill 7 7/8" hole to 4000'. Run and set 4000' of 5½" 15.5# J-55 ST&C casing. Cement in two stages: 1st stage cement with 400 Sx. of Class "C" + 3# salt/Sx., +¼# flocele/Sx. 2nd stage cement with 600 Sx. of Class "C" Halco Light + 9# salt Per Sx. + ¼# flocele/Sx. , circulate cement to surface.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 17B
CASE NOS. 12015 & 12017

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: Zeno Farris

Printed name: Zeno Farris

Title: Manager, Operations Administration

Date: June 26, 1998 Phone: (972)401-2111

OIL CONSERVATION DIVISION

Approved by: Chris Williams

Title: DISTRICT 1 SUPERVISOR

Approval Date: JUN 09 1998 Expiration Date:

Conditions of Approval:

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-34417	83810	RHODES YATES-7RIVERS GAS

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OGRID No.	Operator Name	Elevation
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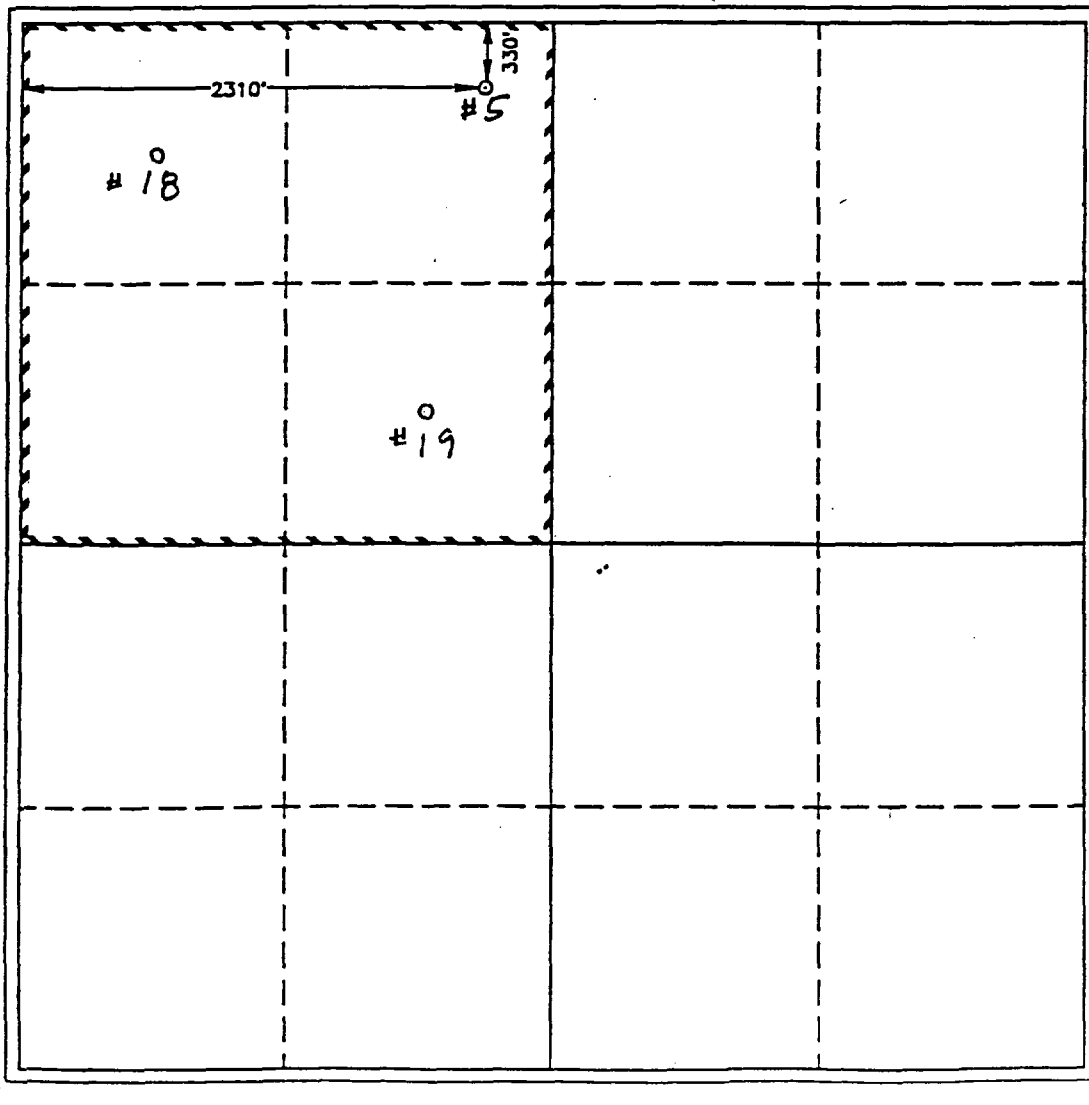
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Zeno Farris
Signature

Zeno Farris
Printed Name

Mgr., Operations Admin.
Title

June 26, 1998
Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my belief.

MAY 7, 1998
Date Surveyed JLP

Signature & Seal of Professional Surveyor
RONALD J. EIDSON
NEW MEXICO
3239

5-11-98

W.O. Num. 98-11-0700

Certificate No. RONALD J. EIDSON 3239
GARY L. EIDSON 12641
JACON McDONALD 12185

Submit 3 Copies to Appropriate District Office

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-103
Revised 1-1-89

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

OIL CONSERVATION DIVISION
310 Old Santa Fe Trail, Room 206
Santa Fe, New Mexico 87503

WELL API NO.
30-025-34417

5. Indicate Type of Lease STATE ☒ FEE ☐

6. State Oil & Gas Lease No.
162683

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
Rhodes State Com.

1. Type of Well:
OIL WELL ☐ GAS WELL ☒ OTHER

2. Name of Operator
Gruy Petroleum Management Co.

8. Well No.
5

3. Address of Operator
P. O. Box 140907, Irving TX 75014-0907

9. Pool name or Wildcat
Rhodes-Yates-7 Rivers- Gas (83810)

4. Well Location
Unit Letter C : 330' Feet From The North Line and 2310' Feet From The West Line

Section 16 Township 26S Range 37E NMPM Lea County

10. Elevation (Show whether DF, RKB, RT, GR, etc.)
2978' GR

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	☐
PULL OR ALTER CASING	☐			CASING TEST AND CEMENT JOB	☒		
OTHER:	☐			OTHER: Cement surface & production casing			☐

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

06/21/98 Drilled to 40' & set 14' of conductor pipe w/ Ready Mix.

06/23/98 Spudded 12-1/4" hole @ 2:00 PM MDT 6-23-98. Drilled to 774' KB. Ran 18 jts 8-5/8" ST/C J-55 #24 csg & 6 centralizers. Set @ 772.09' KB. Cemented w/ 275 sx 'C' w/ 4% gel, 2% CaCl & 0.25 pps celloflake (14.8 ppg & 1.32 cf/sk.) Tailed w/ 200 sx 'C' w/ 2% CaCl & 0.25 pps celloflake (14.8 ppg & 1.32 cf/sk.) Circ 50 sx to pit. Plugged down @ 4:00 PM MDT 6-23-98. WOC - 18 hrs. Test to 1000 psi for 30 mins - ok.

06/28/98 Drilled to 3400' TD. Ran 77 jts LT/C K-55 15.5# csg & 10 centralizers. Cemented w/ 650 sx 35/65 Poz 'C' w/ 1.5% salt, 6% gel, 0.25 pps & 0.2% defoamer (12.8 #/gal, 1.94 cf/sk, 6.27 gal/sk.) Tailed w/ 250 sx 'C' w/ 0.6% FLAC (D127), 1.5% CaCl & 0.2% defoamer (14.8#, 1.34 cf/sk, 6.27 gal/sk.) Circ 100 sx to pit. Plugged down @ 10:15 AM MDT 06-28-98.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Zeno Farris TITLE Manager Operations Administration DATE July 29, 1998

TYPE OR PRINT NAME Zeno Farris TELEPHONE NO. 972-401-3111

(This space for State Use)
ORIGINAL SIGNED BY CHRIS WILLIAMS
DISTRICT I SUPERVISOR

APPROVED BY _____ DATE AUG 06 1998

CONDITIONS OF APPROVAL, IF ANY:

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 17C
CASE NOS. 12015 & 12017

Submit 3 Copies to Appropriate District Office

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-103
Revised 1-1-89

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

OIL CONSERVATION DIVISION
310 Old Santa Fe Trail, Room 206
Santa Fe, New Mexico 87503

WELL API NO.
30-025-34417

5. Indicate Type of Lease STATE ☒ FEE ☐

6. State Oil & Gas Lease No.
162683

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
Rhodes State Com.

1. Type of Well:
OIL WELL ☐ GAS WELL ☒ OTHER

2. Name of Operator
Gruy Petroleum Management Co.

8. Well No.
5

3. Address of Operator
P. O. Box 140907, Irving TX 75014-0907

9. Pool name or Wildcat
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4. Well Location
Unit Letter C : 330' Feet From The North Line and 2310' Feet From The West Line

Section 16 Township 26S Range 37E NMPM Lea County

10. Elevation (Show whether DF, RKB, RT, GR, etc.)
2978' GR

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	☐
PULL OR ALTER CASING	☐			CASING TEST AND CEMENT JOB	☒		
OTHER:	☐			OTHER: Cement surface & production casing	☐		

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

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I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Zeno Farris TITLE Manager Operations Administration DATE July 29, 1998

TYPE OR PRINT NAME Zeno Farris TELEPHONE NO. 972-401-3111

(This space for State Use)

APPROVED BY ORIGINAL SIGNED BY CHRIS WILLIAMS DISTRICT I SUPERVISOR DATE AUG 06 1998

CONDITIONS OF APPROVAL, IF ANY:

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 17D
CASE NOS. 12015 & 12017

Form 3160-3
(July 1992)

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

FORM APPROVED
OMB NO. 1004-0136
Expires: February 28, 1995

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

5. LEASE DESIGNATION AND SERIAL N: NM-90796

6. IF INDIAN, ALLOTTEE OR TRIBE NA:

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]

b. TYPE OF WELL: OIL WELL [ ] GAS WELL [X] OTHER SINGLE ZONE [X] MULTIPLE ZONE [ ]

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME, WELL NO: RHODES FEDERAL UNIT # 15

2. NAME OF OPERATOR: GRUY PETROLEUM MANAGEMENT COMPANY (ZENO FARRIS) 972-443-6489

9. API WELL NO.:

3. ADDRESS AND TELEPHONE NO.: P.O. BOX 140907 IRVING, TEXAS 75014 -0907

10. FIELD AND POOL, OR WILDCAT: RHODES-YATES-7 RIVERS

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 2110' FNL & 460' FEL SEC. 15 T26S-R37E LEA CO. NM
At proposed prod. zone: SAME

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: SEC. 15 T26S-R37E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: Approximately 5 miles South of Jal New Mexico

12. COUNTY OR PARISH: LEA CO. 13. STATE: NEW MEXI

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any): 990'

16. NO. OF ACRES IN LEASE: 320

17. NO. OF ACRES ASSIGNED TO THIS WELL: 120

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.: 1980'

19. PROPOSED DEPTH: 3380'

20. ROTARY OR CABLE TOOLS: ROTARY

21. ELEVATIONS (Show whether DF, RT, GR, etc.): GR. 2981

LEA COUNTY CONTROLLED WATER BASIN

22. APPROX. DATE WORK WILL START: As soon as approved

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12¼"	K-55 8 5/8"	24	750'	600 Sx. circulate to surface
7 7/8"	K-55 4½"	11.6	3380'	1000 Sx. circulate to surface

1. Drill 12¼" hole to 750'. Run and set 750' of 8 5/8" J-55 24# ST&C casing. Cement with 400 Sx. of Halco Light + additives, tail in with 200 Sx. of Class "C" + ¼# flocele/Sx + 2% CaCl, circulate cement to surface.

2. Drill 7 7/8" hole to 3380'. Run and set 3380' of 4½" J-55 11.6# LT&C casing. Cement in two stages. First stage cement with 400 Sx. of Class "C" cement + 3# of salt/Sx. + ¼# flocele/Sx. Second stage cement with 600 Sx. of Class "C" Halco Light + 9# salt/S: + ¼# flocele/Sx., circulate cement to surface.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 18
CASE NOS. 12015 & 12017

APPROVAL SUBJECT TO
GENERAL REQUIREMENTS AND
SPECIAL STIPULATIONS
ATTACHED

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill o deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED Joel Jones TITLE Agent DATE 04/07/98

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations the

CONDITIONS OF APPROVAL, IF ANY:

APPROVED BY (ORIG. SGD.) ARMANDO A. LOPEZ TITLE Acting DATE MAY 04 1998

*See Instructions On Reverse Side

NSL

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-
Revised February 10,
Submit to Appropriate District O
State Lease - 4 C
Fee Lease - 3 C

☐ AMENDED REP

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
	83810	RHODES-YATES-7RIVERS

Property Code	Property Name	Well Number
22321	RFU	159

OGRID No.	Operator Name	Elevation
162683	GRUY PETROLEUM MANAGEMENT CO.	2981

Surface Location

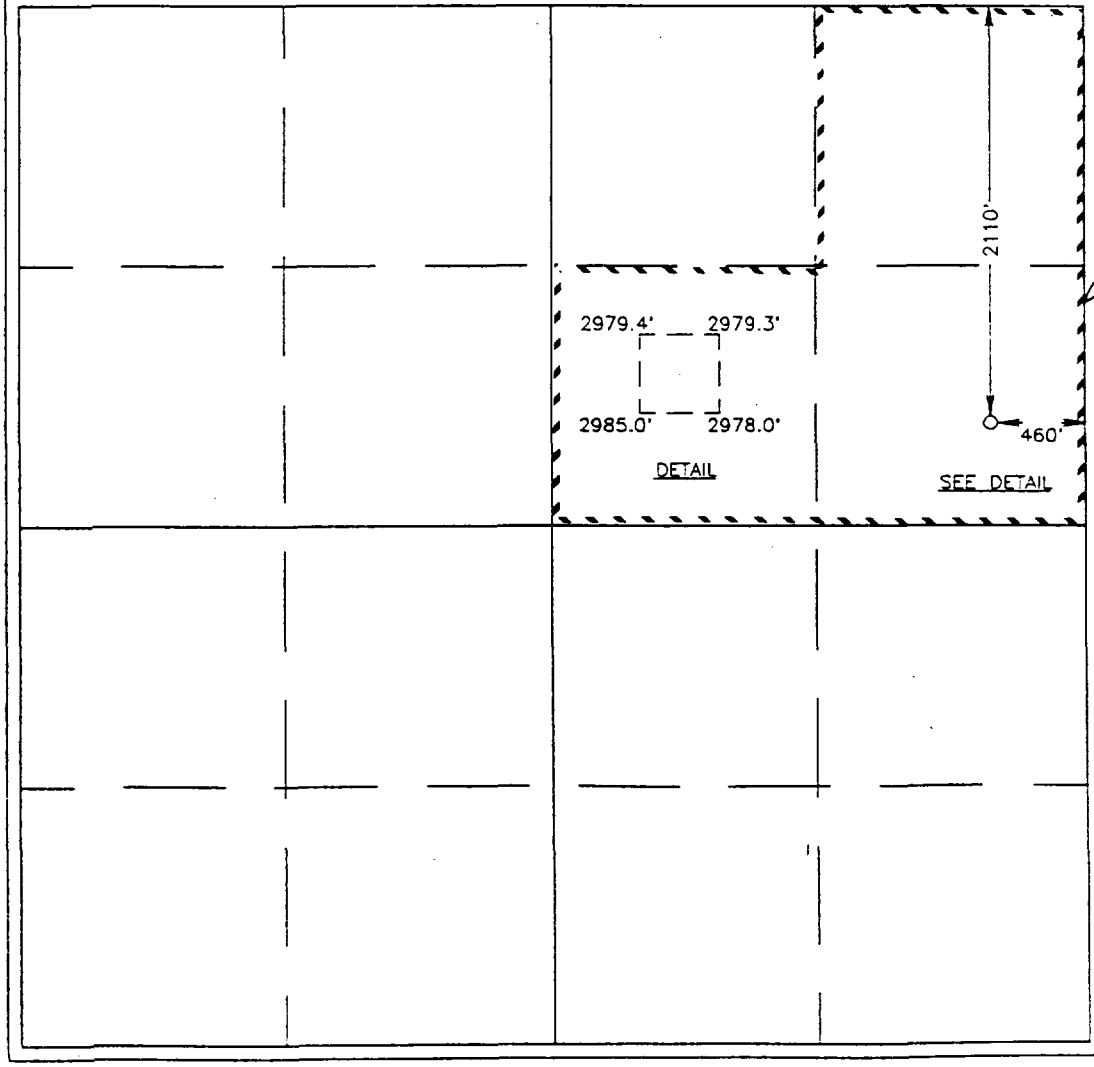
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	Cou
H	15	26 S	37 E		2110	NORTH	460	EAST	L

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	Cou

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
120			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the informat contained herein is true and complete to best of my knowledge and belief.

Signature
Joe T. Janica

Printed Name
Agent

Title
04/07/98

Date

SURVEYOR CERTIFICATION

I hereby certify that the well location sha on this plat was plotted from field notes actual surveys made by me or under supervison, and that the same is true correct to the best of my belief.

MARCH 26, 1998

Date Surveyed

Signature & Seal of Professional Surveyor

4-01-

98-11-0499

Certificate No. JOHN W. WEST
RONALD G. EIDSON
GARY L. EIDSON

EXHIBIT "A-1"

Form 3160-3
(July 1992)

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

FORM APPROVED
OMB NO. 1004-0136
Expires: February 28, 1995

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

5. LEASE DESIGNATION AND SERIAL N: NM-90796

6. IF INDIAN, ALLOTTEE OR TRIBE NAM:

7. UNIT AGREEMENT NAME:

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ]

b. TYPE OF WELL: OIL WELL [ ] GAS WELL [X] OTHER — SINGLE ZONE [X] MULTIPLE ZONE [ ]

8. FARM OR LEASE NAME, WELL NO.: RHODES FEDERAL UNIT #1

2. NAME OF OPERATOR: GRUY PETROLEUM MANAGEMENT COMPANY (ZENO FARRIS) 972-443-6489

9. API WELL NO.:

3. ADDRESS AND TELEPHONE NO.: P.O. BOX 140907 IRVING, TEXAS 75014-0907

10. FIELD AND POOL, OR WILDCAT: RHODES-YATES-7 RIVERS

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 990' FSL & 990' FEL SEC. 10 T26S-R37E LEA CO. NM
At proposed prod. zone: SAME

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 10 T26S-R37E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: Approximately 5 miles South of Jal New Mexico

12. COUNTY OR PARISH: LEA CO.

13. STATE: NEW MEXI

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)	16. NO. OF ACRES IN LEASE	17. NO. OF ACRES ASSIGNED TO THIS WELL
990'	320	40
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.	**19. PROPOSED DEPTH**	**20. ROTARY OR CABLE TOOLS**
1980'	3380'	ROTARY

21. ELEVATIONS (Show whether DF, RT, GR, etc.): GR. 2984'

22. APPROX. DATE WORK WILL START: As soon as approved

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12½'	K-55 8 5/8"	24	750'	600 Sx. circulate to surface
7 7/8"	K-55 4½"	11.6	3380'	1000 Sx. circulate to surface

1. Drill 12½" hole to 750'. Run and set 750' of 8 5/8" J-55 24# ST&C casing. Cement with 400 Sx. of Halco Light + additives, tail in with 200 Sx. of Class "C" + ¼# flocele/Sx + 2% CaCl, circulate cement to surface.

2. Drill 7 7/8" hole to 3380'. Run and set 3380' of 4½" J-55 11.6# LT&C casing. Cement in two stages. First stage cement with 400 Sx. of Class "C" cement + 3# of salt/Sx. + ¼# flocele/Sx. Second stage cement with 600 Sx. of Class "C" Halco Light + 9# salt/Sx + ¼# flocele/Sx., circulate cement to surface.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, 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.

SIGNED Jack Ramirez TITLE Agent DATE 04/07/98

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations there

CONDITIONS OF APPROVAL, IF ANY:

(ORIG. SGD.) ARMANDO A. LOPEZ MAY 04 1998

APPROVED BY _____ TITLE _____ DATE _____

*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-10
Revised February 10, 199
Submit to Appropriate District Offic
State Lease - 4 Copie
Fee Lease - 3 Copie

☐ AMENDED REPOR

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
[illegible]	83810	RHODES-YATES-7RIVERS

Property Code	Property Name	Well Number
22321	RFU	103

OGRID No.	Operator Name	Elevation
162683	GRUY PETROLEUM MANAGEMENT CO.	2984

Surface Location

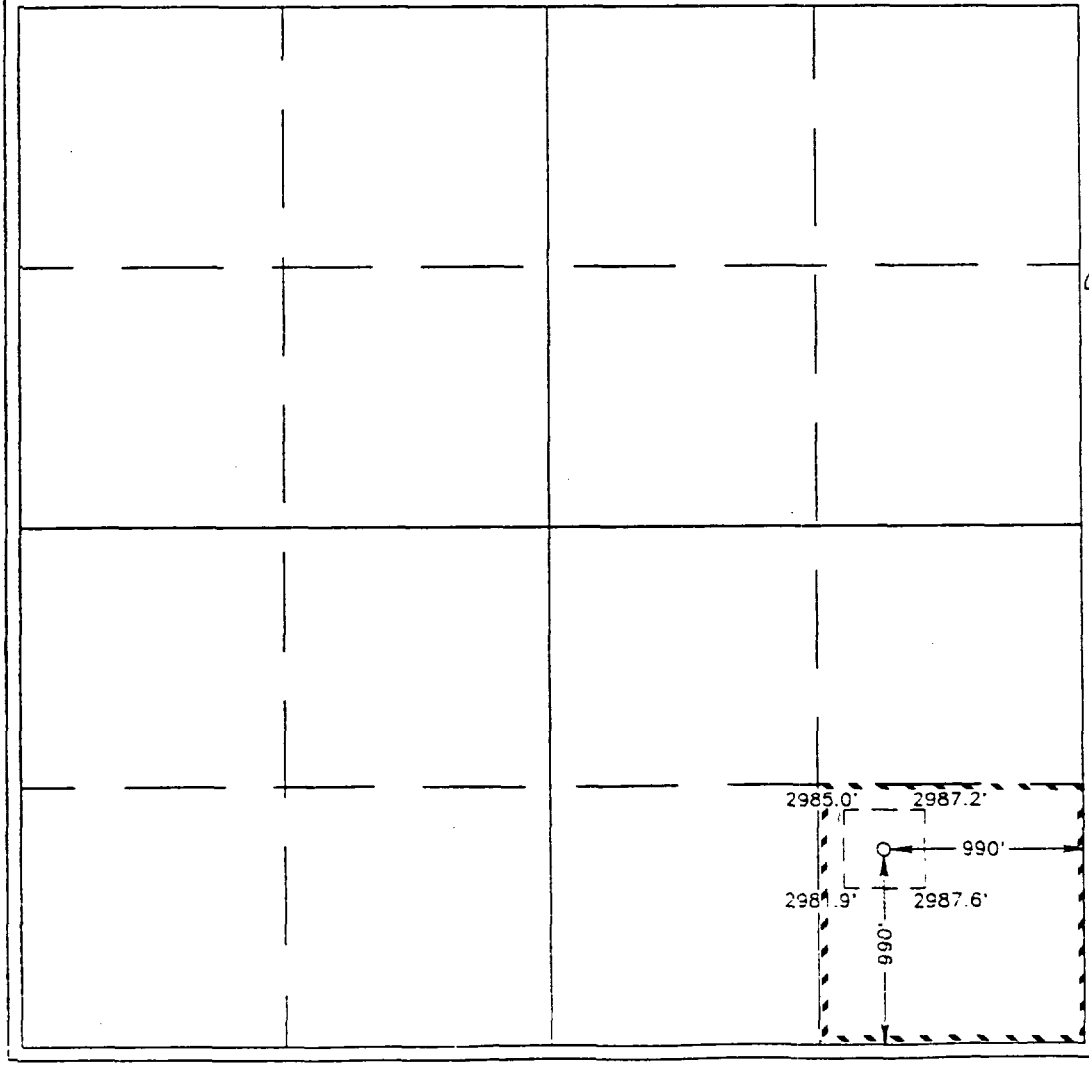
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	10	26 S	37 E		990	SOUTH	990	EAST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
40			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Signature

Joe T. Janica

Printed Name

Agent

Title

04/07/98

Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my belief.

MARCH 26, 1998

Date Surveyed DMCC

Signature & Seal of Professional Surveyor

RONALD J. EIDSON NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR

98-11-0498

Certificate No. JOHN W. WEST 676
RONALD J. EIDSON 3239
GARY L. JONES 1264

EXHIBIT "A-1"

Gruy Petroleum Management Co.
600 East Las Colinas Blvd. • Suite 1200 • Irving, TX 75039 • (972) 401-3111 • Fax (972) 443-6450
Mailing Address: P.O. Box 140907 • Irving, TX 75014-0907

A wholly-owned subsidiary of Magnum Hunter Resources, Inc., an American Stock Exchange company

Tierra Exploration Inc.
726 East Michigan Suite 188
Hobbs New Mexico 88240
Attn: Mr. Joe Janica

Date: April 17,1998

Dear Mr. Janica:

Enclosed are the following:

1. Copies of Lease Responsibility Statements for our three locations in sections 4, 10 and 15.
2. Copies of the C-102 for the Gregory "B" Federal No. 2 well, now the Rhodes Federal Unit No. 153. The plat for this well shows a 160 acre non-standard unit comprising the SE/4SE/4 of sec.10, and the NE/4NE/4 & S/2NE/4 of sec. 15. This is the same dedication that our new Rhodes Federal Unit No. 103 and 159 wells have. I think we need a new plat for our 103 and 159 wells, and may need to file an amended C-102. What do you think?
3. Copies of the 3160-3's, and C-102's for the above wells. I've written in the unit agreement name, and the acres assigned to the wells where applicable.
4. Statement Accepting Responsibility for Operations for the NW/4 of sec. 8, 26S-37E, and a penciled in 3160-3 for our proposed re entry of the Texaco H. G. Moberly Federal (a) No. 2. Our well will be called the Rhodes Federal Unit No. 86. Also enclosed is a copy of the Texaco C-102. It is my understanding that we can modify the Texaco plat and use their archaeological clearance, and file this well for permitting without to much delay.

Joe, the Rhodes Federal Unit No. 86 is the next well we want to permit. I seem to recall talking to Mike Stogner at the N.M.O.C.C. and he said they may be able to streamline this permit, and get it through quicker than normal. If that's possible, please let me know. Also please let me know when you have filed the permit on the RFU No. 86. We want to send a copy of the permit and a letter to owner of the borehole explaining our intentions.

Sincerely,

Zeno Farris

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 19
CASE NOS. 12015 & 12017

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-34395	83810	RHODES-YATES-7RIVERS

Property Code	Property Name	Well Number
22321	RFU	159

OGRID No.	Operator Name	Elevation
162683	GRUY PETROLEUM MANAGEMENT CO.	2981

Surface Location

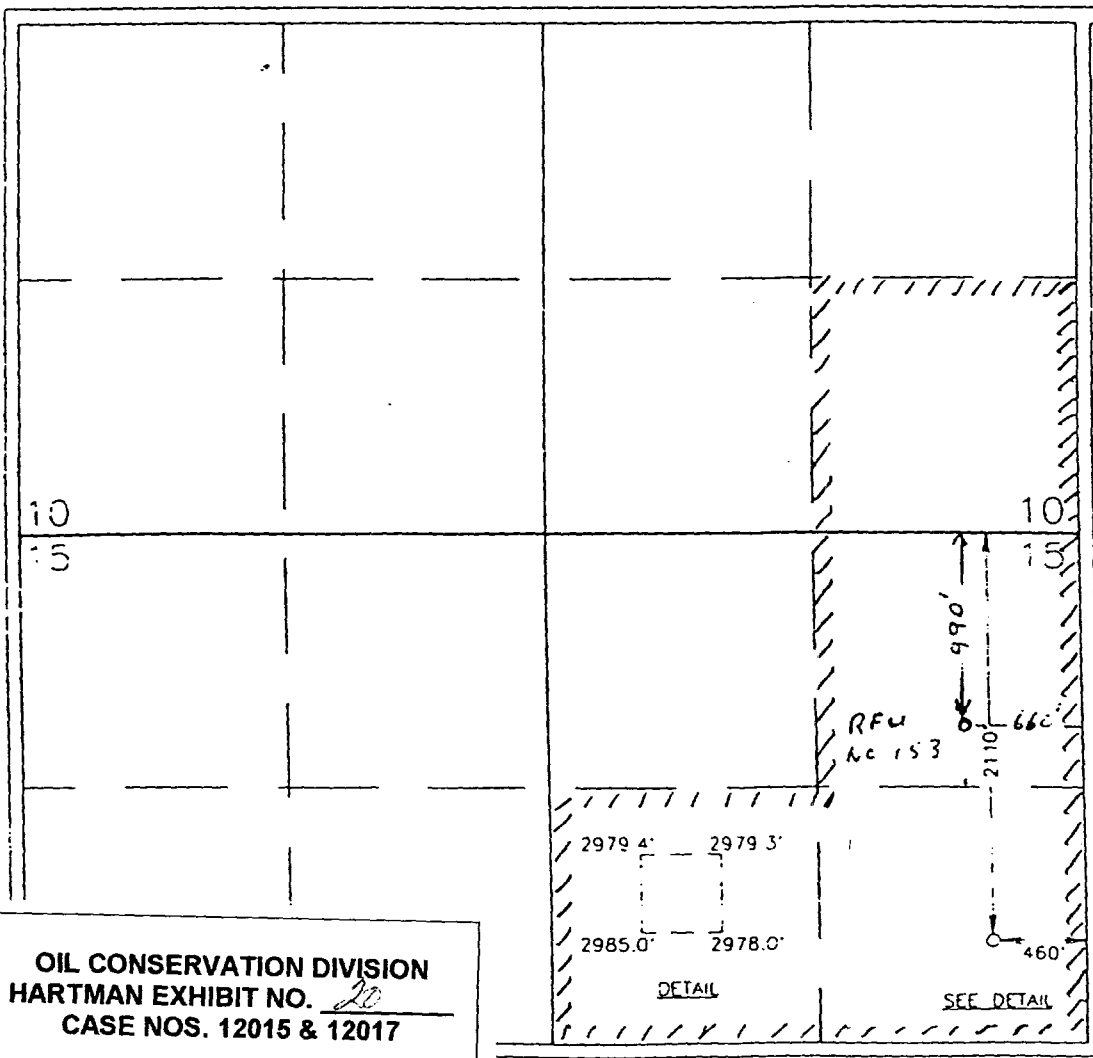
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	15	26 S	37 E		2110	NORTH	460	EAST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Zeno Farris
Signature

Zeno Farris
Printed Name

Mgr., Operations Admin.
Title

July 17, 1998
Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my belief.

MARCH 26, 1998
Date Surveyed DMCC

Signature & Seal of Professional Surveyor

Ronald J. Eidson 4-21-98

98-11-0499

Certificate No. JOHN W. WEST 675
RONALD J. EIDSON 3239
GARY EIDSON 12641

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 20
CASE NOS. 12015 & 12017

DISTRICT I
P O Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P O Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

X AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-34394	83810	RHODES-YATES-7 RIVERS

Property Code	Property Name	Well Number
22321	RFU	103

OGRID No.	Operator Name	Elevation
162683	GRUY PETROLEUM MANAGEMENT CO.	2984

Surface Location

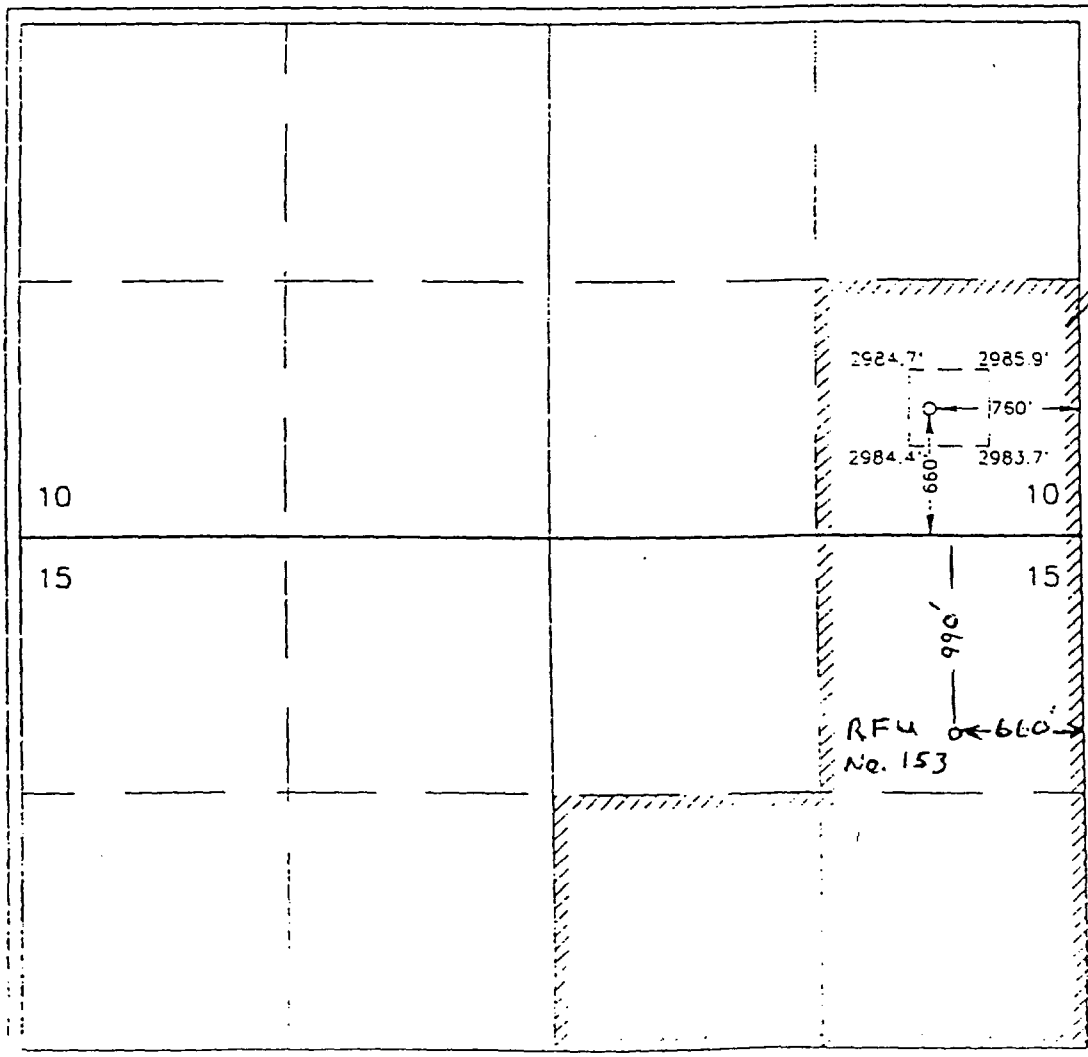
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	10	25 S	37 E		660	SOUTH	760	EAST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Zeno Farris
Signature

Zeno Farris
Printed Name

Mgr., Operations Admin.
Title

July 17, 1998
Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my belief.

JUNE 29, 1998
Date Surveyed

Signature & Seal of Professional Surveyor

RONALD J. EIDSON
NEW MEXICO
3239
7-07-98
REGISTERED PROFESSIONAL SURVEYOR

Certificate No. RONALD J. EIDSON 3239

Gruy Petroleum Management Co.
600 East Las Colinas Blvd. • Suite 1200 • Irving, TX 75039 • (972) 401-3111 • Fax (972) 443-6450
Mailing Address: P.O. Box 140907 • Irving, TX 75014-0907

A wholly-owned subsidiary of Magnum Hunter Resources, Inc., an American Stock Exchange company

Tierra Exploration Inc.
726 East Michigan Suite 188
Hobbs New Mexico 88240
Attn Mr. Joe Janica

Re: New Well Locations
T26S-R37E

Date: April 20, 1998

Dear Joe:

Enclosed is a copy of a spreadsheet containing the locations for 11 new drills in T26S-R37E. Note the comment on the proposed Rhodes "B" Federal No. 1. We are not sure that we own the target formation, so we want to hold off on permitting this well until we are sure. Please begin the permitting process on the rest of wells, as soon as practical. As usual, keep Reggie informed of survey dates. He wants to be there when the wells are staked.

Sincerely,

Zeno Farris
Manager, Operations Administration

DOYLE HARTMAN
Oil Operator
3811 TURTLE CREEK BLVD., SUITE 200
DALLAS, TEXAS 75219

(214) 520-1800
(214) 520-0811 FAX

Via FedEx

May 21, 1998

New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

Attn: Lori Wrotenbery, Director
Michael E. Stogner, Chief Hearing Officer

Re: Unorthodox Gas Well Location, Simultaneous Dedication, and Lack of Notice
Gruy Petroleum Management Company
Rhodes Federal Unit Nos. 103 and 159
Sections 10 and 15, T-26-S, R-37-E
Lea County, New Mexico
(Rhodes Gas Pool)

Gentlemen:

Reference is made to the following locations that have just been announced by Gruy Petroleum Management Company:

Rhodes Federal Unit No. 103	Rhodes Federal Unit No. 159
990' FSL and 990' FEL (P)	2100' FNL and 460' FEL (H)
Section 10, T-26-S, R-37-E	Section 15, T-26-S, R-37-E
Lea County, New Mexico	Lea County, New Mexico
(Rhodes Gas Pool)	(Rhodes Gas Pool)

As the lessee of record of 100% of the leasehold estate covering the north and west offset 320-acre C.T. Bates fee lease, we hereby give notice that Gruy Petroleum Management Company's recently announced Rhodes Federal Unit (RFU) Nos. 103 and 159 wells are (1) located within the boundaries of the Rhodes Gas Pool (which now provides for a single producing well on 160-acre spacing) and (2) as gas wells, are subject to 660' setbacks from the spacing and proration unit (S.P.U.) line, not

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 22
CASE NOS. 12015 & 12017

a 330' setback as requested by Gruy for its proposed unorthodox RFU No. 103 location consisting of 990' FSL and 990' FEL of Section 10, T-26-S, R-37-E.

As currently proposed, and as depicted on the ownership-structure map enclosed herewith, Gruy's newly announced RFU Nos. 103 and 159 wells are to be drilled on the same 160-acre non-standard non-prorated S.P.U. that is presently dedicated to Gruy's Gregory "B" No. 2 Rhodes (Gas) well situated 990' FNL and 660' FEL of Section 15, T-26-S, R-37-E. The 160-acre Gregory "B" No. 2 Rhodes (Gas) S.P.U. was created on April 14, 1993, by NMOCD Order No. R-9870.

In light of the foregoing, we respectfully request that Gruy's proposed 330'-setback unorthodox location for the RFU No. 103 location be promptly adjusted to an orthodox gas well (in a gas pool) location, which is 660' from the lease line, and that Gruy take notice that Doyle Hartman opposes a new Rhodes gas well (in a gas pool) completion (that is situated at an unorthodox 330'-setback location) from receiving approval to produce at unrestricted full deliverability rates, as would be the case, if a well were situated, as a single well, on a full 160-acre S.P.U., and at an orthodox 660' setback location.

Moreover, as the second and third gas wells, on the currently existing 160-acre Gregory "B" No. 2 non-prorated gas S.P.U., the proposed Gruy-operated RFU Nos. 103 and 159 wells are not in compliance with the NMOCD's August 3, 1990 *Memorandum to All Operators*, which memorandum pertains to "...applications for additional wells on existing proration units...(emphasis added)". A copy of the NMOCD's August 3, 1990 memorandum is enclosed herewith. Consequently, Doyle Hartman further objects to Gruy's requested deviation from the NMOCD's revised policy (after July 27, 1988) of prohibiting more than one producing well on a non-prorated gas S.P.U.

Finally, as documented by the herein enclosed excerpts (pertaining to Tracts 58 and 59 of Exhibit "A-2") from that certain January 2, 1986 assignment from Sun Oil Company to Doyle Hartman, et. al., Doyle Hartman and James A. Davidson (as successors-in-interest, through Sun, to R. Olsen and Stanolind Oil and Gas Company) own certain oil, casinghead gas, and processed liquids rights under the 5,480-acre 1944-approved Rhodes Federal Unit, with one of the Hartman-Davidson contributed RFU tracts consisting of the S/2NE/4 Section 15, T-26-S, R-37-E, on which Gruy now proposes to drill its subject RFU No. 159 well. Hartman's and Davidson's ownership notwithstanding, and contrary to the spirit and purpose of 70-2-16 through 70-2-18 NMSA, to date, Doyle Hartman and James A. Davidson have received no notice or paperwork whatsoever regarding Gruy's newly proposed RFU Nos. 103 and 159 wells in Sections 10 and 15, T-26-S, R-37-E, nor, as previously requested, has Gruy, or its predecessor-in-interest, made any attempt to account for Hartman and

Davidson's recorded ownership under the Rhodes Federal Unit (copy of Hartman to Meridian letter of March 25, 1996 enclosed).

Your very prompt attention to the herein above-discussed matters is respectfully requested prior to the newly announced Rhodes Federal Unit wells being drilled.

Very truly yours,

DOYLE HARTMAN, Oil Operator

Doyle Hartman

enclosures

rcs/rjr
wpdocs\corresp.dh\gruy

cc: Bureau of Land Management
1717 W. Second
Roswell, NM 88201
Attn: Armando Lopez, Asst. District Mgr., Minerals

Bureau of Land Management
620 E. Green (88220)
P.O. Box 1778
Carlsbad, NM 88221-1778
Attn: Richard L. Manus, Area Manager

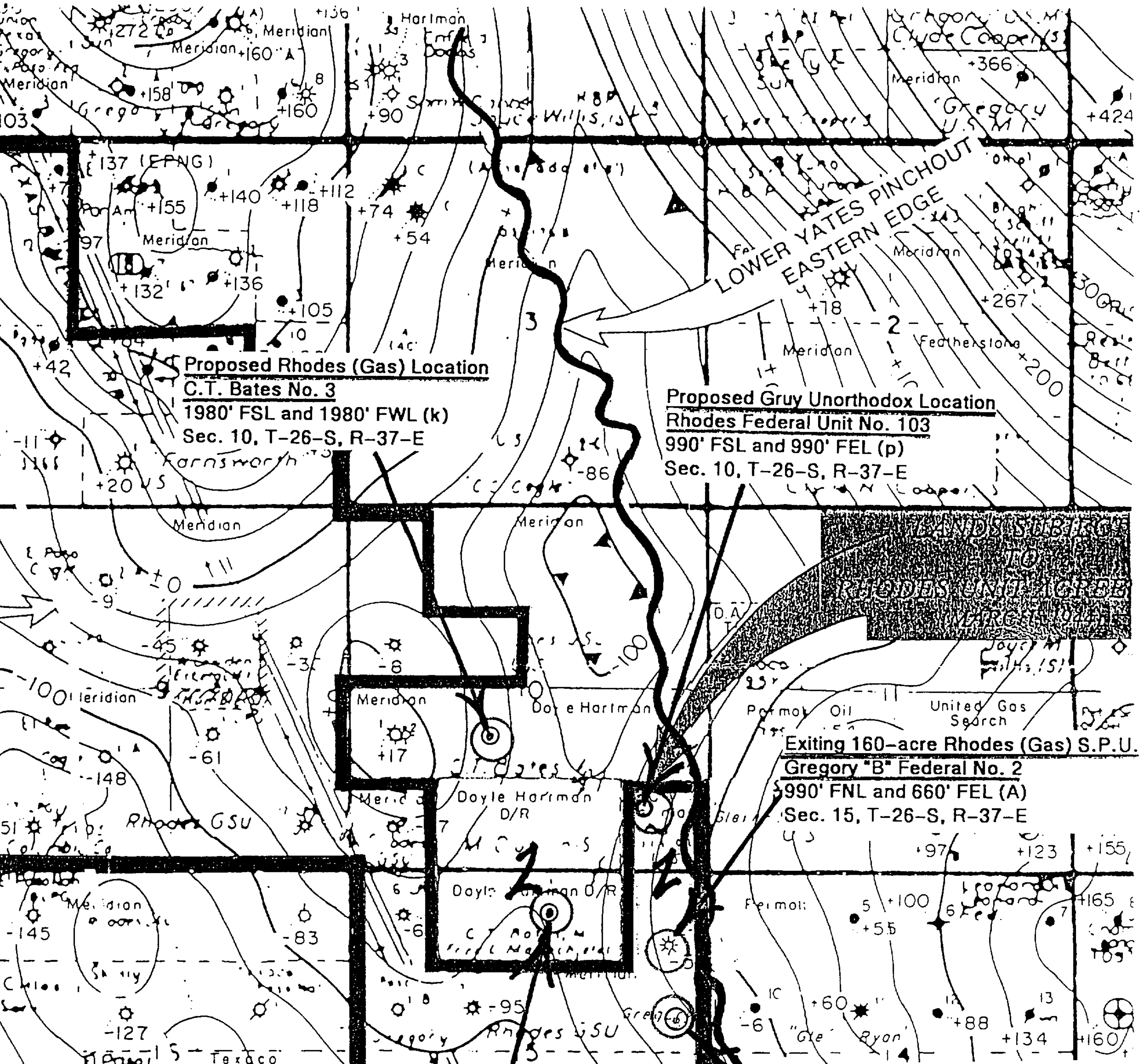
Bureau of Land Management
414 W. Taylor
Hobbs, NM 88240
Attn: Vince Balderaz, Lead Oil & Gas Inspector

New Mexico Oil Conservation Division
1000 W. Broadway (88240)
P.O. Box 1980
Hobbs, NM 88241
Attn: Chris Williams, District Supervisor

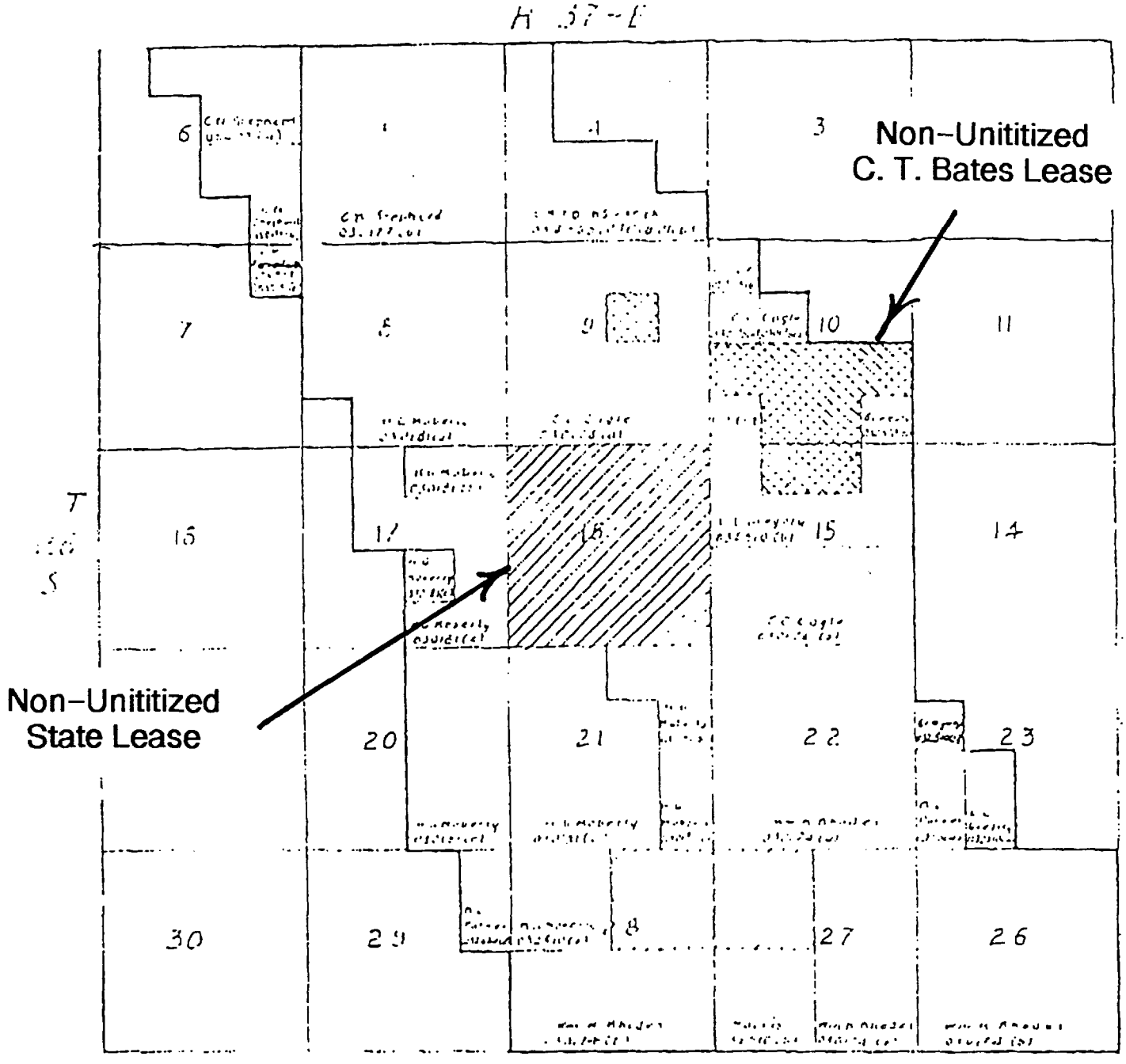
Via Express Mail and Certified Mail, Return Receipt Requested
Gruy Petroleum Management Company
600 E. Las Colinas Blvd., Suite 1200 (75039)
P.O. Box 140907
Irving, TX 75014-0907
Attn: Richard R. Frazier, President & Chief Operating Officer
Bill Mann, Operations Manager
Greg Jessup, Vice President Land

James A. Davidson
214 W. Texas, Suite 710
Midland, TX 79701

Gallegos Law Firm
460 St. Michaels Drive, Building 300
Santa Fe, NM 87505
Attn: J.E. Gallegos
Michael J. Condon


LOWER YATES PINCHOUT
EASTERN EDGE
Proposed Rhodes (Gas) Location
C.T. Bates No. 3
1980' FSL and 1980' FWL (k)
Sec. 10, T-26-S, R-37-E
Proposed Gruy Unorthodox Location
Rhodes Federal Unit No. 103
990' FSL and 990' FEL (p)
Sec. 10, T-26-S, R-37-E
Exiting 160-acre Rhodes (Gas) S.P.U.
Gregory "B" Federal No. 2
990' FNL and 660' FEL (A)
Sec. 15, T-26-S, R-37-E
Meridian
Hartman
Doyle Hartman
Doyle Hartman D/R
Featherstone
Farnsworth
Rhodes GSU
United Gas Search
Parmol Oil
Texaco

Excerpt From 1944
Rhodes Federal Unit Agreement



LEGEND

Area Boundry

Federal Land

State Land

Private Land

PLAT OF
RHODES UNIT AREA

LEA COUNTY, NEW MEXICO
SCALE 1"=1 MI.

GRUY PETROLEUM MANAGEMENT CO.

AUTHORITY FOR EXPENDITURE

LEASE WELL	RHODES FEDERAL UNIT #4-3	DATE:	3/4/98
LOCATION	2310' fsl, 990 frw, Unit L, Sec. 4, T26S-R37E	PREPARED BY:	H. Miller
COUNTY,STAT	LEA NEW MEXICO	AFE NUMBER:	0
PROJECT	Perforate Yates and stimulate.		

ACCT	WORKOVER EXPENSE			AMOUNT
800.05	LEASE ACQUISITION COST			
870.10	DAMAGES			
870.12	DIRTWORK, ROADS, CLEANUP			
870.24	RIG / WELL SERVICE UNIT	4 DAYS @	$1,250 / DAY	5,000.00
870.25	MISCELLANEOUS SUPPLIES			
870.30	FUEL, POWER, LUBE OILS			
870.31	WATER & WATER HAULING			500.00
870.32	TRANSPORTATION			
870.40	CHEMICALS			
870.52	WIRELINE SERVICES (Perforating)			
870.60	CEMENT & CEMENTING			
870.61	CASING CREW & EQUIPMENT			
870.70	EQUIPMENT RENTAL			2,500.00
870.74	ACIDIZING / FRACTURING			59,000.00
870.75	PERFORATING			5,600.00
870.77	FRAC OIL			
870.78	ROUSTABOUTS			
870.80	CONTRACT LABOR - WELDING			
870.81	SUPERVISION - COMPANY			1,000.00
870.82	SUPERVISION - CONTRACT			
870.84	ENGINEERING / GEOLOGICAL			
870.85	OVERHEAD			
870.95	MISCELLANEOUS & CONTINGENCIES (10%)			7,360.00
			TOTAL EXPENSE	80,960.00

	EQUIPMENT					
840.10	CASING		FT @		$/FT	
840.11	CASING		FT @		$/FT	
840.12	CASING		FT @		$/FT	
840.13	TUBING	3000	FT @	$ 2.30	$/FT	6,900.00
840.24	RODS	3000	FT @	$ 1.00	$/FT	3,000.00
840.50	FLOW LINE		FT @		$/FT	
840.20	WELLHEAD EQUIPMENT					
840.23	SUBSURFACE EQUIPMENT (BH PUMP ETC.)					1,500.00
840.60	TANKS					
840.30	TREATER					
840.31	SEPARATOR					
	GAS PROCESSING UNIT/SWEETENERS					
840.21	PUMPING UNIT AND POWER					5,500.00
	OTHER MISCELLANEOUS EQUIPMENT (FENCES,CULVERTS,TOOLS)					
840.80	CONSTRUCTION / INSTALLATION					
840.95	MISCELLANEOUS & CONTINGENCY (10%)					1,690.00
					TOTAL EQUIPMENT	18,590.00
					TOTAL WELL COST	99,550.00

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 23
CASE NOS. 12015 & 12017

GRUY PETROLEUM MANAGEMENT CO.

AUTHORITY FOR EXPENDITURE

LEASE WELL	RHODES FEDERAL UNIT 415	DATE:	4/20/98
LOCATION	660' FSL & 660' FWL, SEC 4,T 26S,R 37E	PREPARED BY:	HOWARD MILLER
COUNTY,STAT	LEA NM	AFE NUMBER:	97716
PROJECT	TEST YATES FORMATION		

ACCT					DRY HOLE WITHOUT PIPE	COMPLETED WELL
	DRILLING INTANGIBLES:					
820.10	LEGAL,TITLE, ENVIRONMENTAL				2,000.00	2,000.00
820.12	LOCATION, ROADS, PITS, DAMAGES				1,500.00	1,500.00
820.21	FOOTAGE	3200 FEET@	$12.50 / FT		40,000.00	40,000.00
820.22	DAYWORK	1 DAYS @	$5,000 / DAY		5,000.00	5,000.00
820.60	CEMENT AND CEMENTING				4,000.00	4,000.00
820.50	TESTING					0.00
820.51	CORING					0.00
820.52	LOGGING - INDUCT/DENSITY/MICRO/SONIC				7,500.00	7,500.00
820.41	MUD LOGGER	4	DAY	400	1,600.00	1,600.00
820.83	PROFESSIONAL SERVICES (ENGINEERING, GEOLOGICAL,SURVEY)				1,000.00	1,000.00
820.40	MUD MATERIALS				5,000.00	5,000.00
820.31	WATER				2,500.00	2,500.00
820.24	BITS, COREHEADS AND RENTALS					0.00
820.15	INSURANCE				800.00	800.00
820.81	SUPERVISION					0.00
820.32	TRANSPORTATION					0.00
820.85	DRILLING OVERHEAD				800.00	800.00
820.95	MISCELLANEOUS & CONTINGENCY (10%)				7,170.00	7,170.00
				TOTAL DRILLING	78,870.00	78,870.00
	COMPLETION INTANGIBLES:					
830.24	COMPLETION UNIT					6,250.00
830.60	CEMENT AND CEMENTING					8,200.00
830.75	PERFORATING					3,500.00
830.52	LOGGING					
830.74	FRAC AND/OR ACID TREATMENT					45,000.00
830.31	WATER					1,000.00
830.30	FUEL					
830.12	DIRT WORK					500.00
830.70	COMPLETION TOOLS AND EQUIPMENT - RENTALS					1,000.00
830.84	PROFESSIONAL SERVICES (ENGINEERING)					500.00
830.80	WELDING					
830.78	ROUSTABOUT LABOR					
830.61	CASING CREWS					1,000.00
830.32	TRANSPORTATION					
830.81	SUPERVISION					800.00
830.95	MISCELLANEOUS & CONTINGENCY (10% (Production Testing)				0.00	6,775.00
				TOTAL COMPLETION	0.00	74,525.00
				TOTAL INTANGIBLES	78,870.00	153,395.00
	DRILLING AND COMPLETION TANGIBLES:					
840.10	CASING 8-5/8"	500 FT	@	$ 10.30 $/FT	5,150.00	5,150.00
840.11	CASING	FT	@	$/FT		
840.12	CASING 5-1.2"	3200 FT	@	$ 5.60 $/FT		17,920.00
840.13	TUBING 2-3/8"	3200 FT	@	$ 2.10 $/FT		6,720.00
840.24	RODS 3/4"	3200 FT	@	$ 1.00 $/FT		3,200.00
840.50	FLOW LINE	1000 FT	@	$ 0.50 $/FT		500.00
840.20	WELLHEAD EQUIPMENT					1,500.00
840.23	SUBSURFACE EQUIPMENT (BH PUMP ETC.)					1,500.00
840.60	TANKS					10,000.00
840.30	TREATER					
840.31	SEPARATOR					
840.36	GAS PROCESSING UNIT/SWEETENERS					
840.21	PUMPING UNIT AND POWER					7,500.00
840.71	OTHER MISCELLANEOUS EQUIPMENT (FENCES,CULVERTS,TOOLS)					2,500.00
840.80	CONSTRUCTION / INSTALLATION					1,500.00
840.90	MISCELLANEOUS & CONTINGENCY (10%)				515.00	5,799.00
				TOTAL TANGIBLES	5,665.00	63,789.00
				TOTAL WELL COST	84,535.00	217,184.00

File: S:/Production/DRILLAFE
Version: July 16, 1997

GRUY PETROLEUM MANAGEMENT CO.

P. O. Box 140907
Irving, Texas 75014-0907

Affiliate of Magnum Hunter Production, Inc.

AUTHORITY FOR EXPENDITURE

Date: 6/29/98
AFE No.: 98777

Lease, Well or Project	RHODES STATE COM #5	Property No.	73060
Field / Prospect	RHODES YATES SEVEN RIVERS	Depth	3300'
Location	330'FNL & 2310' FWL, SEC16,T26S,R37E	County LEA	State NM
AFE Type	Development Original [X] Supplement [ ] Addendum [ ]	Operator	Gruy Petroleum Management Co.
Objective Formation	RHODES YATES SEVEN RIVERS		
Project Description	DRILL & COMPLETE YATES FORMATION		

Estimated Start Date: 6/21/98
Estimated Completion Date: 6/25/98
Prepared By: KEL

GROSS WELL DATA

	Dry Hole	Completion	Total
Days			0
This AFE	$81,428	$130,931	$212,359
Prior AFE's	$0	$0	$0
Total Cost	$81,428	$130,931	$212,359

JOINT INTEREST OWNERS

Participant	Owner Number	Working Interest	Dry Hole $	Completed $
			$0	$0
			$0	$0
			$0	$0
			$0	$0
Magnum Hunter Production, Inc.	45	100.000000%	$81,428	$212,359
AFE TOTAL		100.000000%	$81,428	$212,359

GRUY PETROLEUM APPROVAL

Approved _____ Date _____
R. D. Cronk, V. P. Operations

PARTNER APPROVAL

Company Name _____ Approved [ ] Disapproved [ ]

Authorized By _____ Date _____

Title _____

File: S:/Production/DRILLAFE
Version: July 16, 1997

GRUY PETROLEUM MANAGEMENT CO.

AUTHORITY FOR EXPENDITURE

LEASE WELL	RHODES STATE COM #5	DATE:	6/29/98
LOCATION	330'FNL & 2310' FWL, SEC16,T26S,R37E	PREPARED BY:	KEL
COUNTY,STAT	LEA NM	AFE NUMBER:	98777
PROJECT	DRILL & COMPLETE YATES FORMATION		

ACCT				DRY HOLE WITHOUT PIPE	COMPLETED WELL
	DRILLING INTANGIBLES:				
820.10	LEGAL,TITLE, ENVIRONMENTAL			2,000.00	2,000.00
820.12	LOCATION, ROADS, PITS, DAMAGES			18,000.00	18,000.00
820.21	FOOTAGE	3300 FEET@	$9.25 / FT	30,525.00	30,525.00
820.22	DAYWORK	DAYS @	/ DAY	6,500.00	6,500.00
820.60	CEMENT AND CEMENTING			3,500.00	3,500.00
820.50	TESTING				0.00
820.51	CORING				0.00
820.52	LOGGING - INDUCT/DENSITY/MICRO/SONIC			5,000.00	5,000.00
820.41	MUD LOGGER	DAYS@		0.00	0.00
820.83	PROFESSIONAL SERVICES (ENGINEERING, GEOLOGICAL,SURVEY)				0.00
820.40	MUD MATERIALS			1,600.00	1,600.00
820.31	WATER			2,000.00	2,000.00
820.24	BITS, COREHEADS AND RENTALS			1,500.00	1,500.00
820.15	INSURANCE				0.00
820.81	SUPERVISION			1,500.00	1,500.00
820.32	TRANSPORTATION				0.00
820.85	DRILLING OVERHEAD				0.00
820.95	MISCELLANEOUS & CONTINGENCY (10%)			7,212.50	7,212.50
			TOTAL DRILLING	79,337.50	79,337.50
	COMPLETION INTANGIBLES:				
830.24	COMPLETION UNIT				7,000.00
830.60	CEMENT AND CEMENTING				8,600.00
830.75	PERFORATING				5,500.00
830.52	LOGGING				
830.74	FRAC AND/OR ACID TREATMENT				50,000.00
830.31	WATER				
830.30	FUEL				
830.12	DIRT WORK				1,500.00
830.70	COMPLETION TOOLS AND EQUIPMENT - RENTALS				2,500.00
830.84	PROFESSIONAL SERVICES (ENGINEERING)				
830.80	WELDING				
830.78	ROUSTABOUT LABOR				2,000.00
830.61	CASING CREWS				
830.32	TRANSPORTATION				
830.81	SUPERVISION				2,500.00
830.95	MISCELLANEOUS & CONTINGENCY (10% (Production Testing)			0.00	7,960.00
			TOTAL COMPLETION	0.00	87,560.00
			TOTAL INTANGIBLES	79,337.50	166,897.50
	DRILLING AND COMPLETION TANGIBLES:				
840.10	CASING	FT @	$/FT	400.00	400.00
840.11	CASING	750 FT @	$ 9.75 $/FT		7,313.00
840.12	CASING	FT @	$/FT		17,325.00
840.13	TUBING	FT @	$/FT		8,215.00
840.24	RODS	FT @	$/FT		0.00
840.50	FLOW LINE	FT @	$/FT		2,775.00
840.20	WELLHEAD EQUIPMENT			1,500.00	1,500.00
840.23	SUBSURFACE EQUIPMENT (BH PUMP ETC.)				
840.60	TANKS				
840.30	TREATER				
840.31	SEPARATOR				
840.36	GAS PROCESSING UNIT/SWEETENERS				
840.21	PUMPING UNIT AND POWER				
840.55	GAS METER				1,800.00
840.71	OTHER MISCELLANEOUS EQUIPMENT (FENCES,CULVERTS,TOOLS)				
840.80	CONSTRUCTION / INSTALLATION				2,000.00
840.90	MISCELLANEOUS & CONTINGENCY (10%)			190.00	4,133.00
			TOTAL TANGIBLES	2,090.00	45,461.00
			TOTAL WELL COST	81,427.50	212,358.50

File: S:/Production/DRILLAFE
Version: July 16, 1997

August 1998

Well Name: Rhodes State Com #5
Pumping Unit: flowing Previous Q: 0 (new well)
Stroke Length: SPM:

	CHK	TBG	CSG	BO	BW	MCF	Remarks
1							
2							
3							
4							
5							
6							
7							
8	SI	55	56	0	0	0	SI
9	SI	55	56	0	0	0	SI
10	SI	55	55	0	0	0	SI
11	SI	56	56	0	0	0	SI
12		56	55	0	0	0	opened well to SID
13		23	23	0	0	54	
14		24	22	0	0	49	
15		21	18	0	0	44	
16		21	18	0	0	45	
17		21	18	0	0	45	
18		20	17	0	0	39	
19		13	15	0	0	41	
20		13	15	0	0	39	
21		13	16	0	0	37	
22		0	0	0	0	36	SI for down hole test
23		0	0	0	0	0	SI for down hole test
24		0	0	0	0	0	
25		0	0	0	0	0	
26		0	0	0	0	0	opened well back up
27		13	15	0	0	46	
28		13	15	0	0	48	
29			15	0	0	45	
30		13	16	0	0	40	
31		13	15	0	0	42	

REMARKS:

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 24
CASE NOS. 12015 & 12017

June 1998

Well Name: Rhodes Federal Unit 4-3
Pumping Unit: flowing Previous Rate: 0 - TA
Stroke Length: _____ SPM: _____

	CHK	TBG	CSG	BO	BW	MCF	Remarks
1		17	17			379	
2		18	18			358	
3		17	17			331	
4		17	17			298	
5		17	17			289	
6		17	17			272	
7		16	16			265	
8		16	16			258	
9		16	16			252	
10		16	16			252	
11		16	16			252	
12		16	16			255	
13		16	16			232	
14		18	18			224	
15		17	18			224	
16		18	18			224	
17		18	18			218	
18		16	16			222	
19		16	16			222	
20		16	16			222	
21		16	16			222	
22		16	16			222	
23		18	18			215	
24		18	18			203	
25		16	16			203	
26		14	14			203	
27		14	14			203	
28		14	14			208	
29		14	14			208	
30		14	14			198	
31							

REMARKS: 1st delivery 5/28/98 @ 1430

Well Name: RFU 4-15

Pumping Unit: _____ Previous Q: new well

Stroke Length: _____ SPM: _____

	CHK	TBG	CSG	BO	BW	MCF	Remarks
1							
2							
3							
4							1st delivery
5	tbg	28	45	0	0	230	flowed 16hrs
6		29		0	0	336	
7		29	44	0	1	328	
8		29	44	0	1	324	
9		24	44	0	1	314	
10		25	44	0	1	303	
11		25	44	0	1	303	
12		25	44	0	0.5	284	
13		30	49	0	0.5	276	
14		26	46	0	0	275	
15		32	47	0	0	257	
16		28	46	0	0.5	257	
17		28	46	0	0.5	251	
18		26	40	0	0.5	241	
19		17	35	0	0	282	
20		15	34	0	0.5	270	
21		15	34	0	0.5	230	
22		13	32	0	0.5	279	
23		13	32	0	0.5	248	
24		13	32	0	0.5	234	
25		13	32	0	0.5	261	
26		13	32	0	0	262	
27		13	32	0	0	204	
28		13	34	0	0	216	
29		13	35	0	0	216	
30		16	40	0	0	215	
31		13	32	0	0	207	

REMARKS:

Mathematical Relationship Between Drainage Area and Slope of Pressure-Cum. Plot For a Volumetric Gas Reservoir

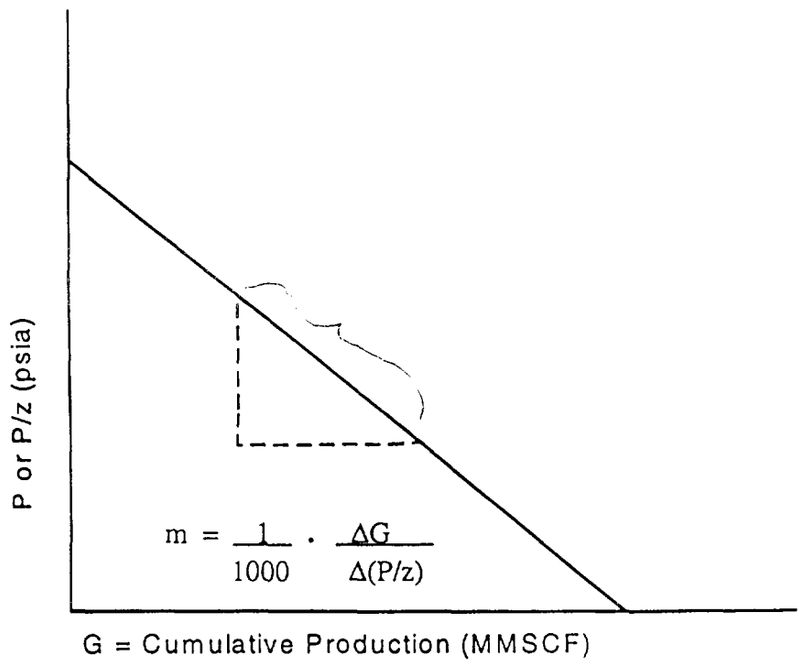
$$G = 43{,}560\ \phi h A\ (1-S_w)\ B_g$$

$$B_g = \frac{T_{sc}}{P_{sc}} \cdot \frac{P}{zT}$$

$$G = 43{,}560\ \phi h A\ (1-S_w) \left(\frac{T_{so}}{P_{sc}T}\right) \left(\frac{P}{z}\right)$$

$$G = 43{,}560 \cdot \frac{T_{so}}{P_{sc}T} \cdot \phi h A \cdot (1-S_w) \cdot \left(\frac{P}{z}\right)$$

m = slope of Pressure-Cum. Plot, MCF/psi



$$1000\ m = \frac{\Delta G_p}{\Delta(P/z)} = -43{,}560 \left(\frac{T_{sc}}{P_{sc} \cdot T}\right) \phi h A (1-S_w)$$

$$A = \frac{-1000\ m}{43{,}560 \cdot \frac{T_{so}}{P_{sc}T} \cdot \phi h\ (1-S_w)}$$

Where:

A	=	drainage area, acres
ΔG_p	=	production or change in gas in place, SCF
$\Delta(P/z)$	=	change in corrected reservoir pressure, psi
B_g	=	gas volume factor, SCF/ft.^{3}
T	=	reservoir temperature, °R
T_{sc}	=	temperature at standard conditions, °R
P_{sc}	=	pressure at standard conditions, psia
ϕ	=	average pay-section porosity
h	=	net pay, ft.
S_w	=	average pay-section water saturation

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Mathematical Relationship Between Drainage Area and Slope of Pressure-Cum. Plot For Jalmat and Rhodes Gas Pools

$$A = \frac{-1000\ m}{43{,}560 \cdot \frac{T_{sc}}{P_{sc}T} \cdot \phi h\,(1-S_w)}$$

Where:

	A	= drainage area, acres
	m	= slope of Pressure-Cum. Plot, MCF/psi
	T	= reservoir temperature, °R
	T_{sc}	= temperature at standard conditions, °R
	P_{sc}	= pressure at standard conditions, psia
	ϕ	= average pay-section porosity
	h	= net pay, ft.
	S_w	= average pay-section water saturation

T = 86°F = 546°R (Jalmat and Rhodes Gas Pools)
T_{sc} = 60°F = 520°R
P_{sc} = 15.025 psia

$$A = \frac{-1000\ m}{\frac{(43{,}560)(520)}{(15.025)(546)} \cdot \phi h\,(1-S_w)}$$

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Applied

PETROLEUM RESERVOIR ENGINEERING

B. C. CRAFT

and

M. F. HAWKINS

Petroleum Engineering Department
Louisiana State University

PRENTICE-HALL, INC.

Englewood Cliffs, N. J.

13. Material Balances in Gas Reservoirs. In the previous sections the initial gas in place was calculated on a unit basis of one acre-foot of bulk productive rock from a knowledge of the porosity and connate water. To calculate the initial gas in place on any particular portion of a reservoir it was necessary to know, in addition, the bulk volume of that portion of the reservoir. In many cases the porosity, connate water, and/or the bulk volumes are not known with any reasonable precision, and the methods described can not be used. In this case the *material-balance* method may be used to calculate the initial gas in place; however, this method is applicable only to the reservoir as a whole, because of the migration of gas from one portion of the reservoir to another in both volumetric and water-drive reservoirs.

The conservation of mass may be applied to gas reservoirs to give the following material balance:

$$\begin{bmatrix}\text{Weight of gas}\\ \text{produced}\end{bmatrix} = \begin{bmatrix}\text{Weight initially}\\ \text{in the reservoir}\end{bmatrix} - \begin{bmatrix}\text{Weight remaining}\\ \text{in the reservoir}\end{bmatrix}$$

The balance may also be made on any definable component, e.g., methane. Where the composition of the production is constant, the standard cubic feet both produced and remaining in the reservoir are directly proportional to the masses, and a material balance may be made in terms of standard cubic feet, as

$$\begin{bmatrix}\text{SCF produced}\\ \text{from the reservoir}\end{bmatrix} = \begin{bmatrix}\text{SCF initially}\\ \text{in the reservoir}\end{bmatrix} - \begin{bmatrix}\text{SCF remaining}\\ \text{in the reservoir}\end{bmatrix}$$

Finally, a material balance may be made in terms of moles of gas, as

$$n_p = n_i - n_f \tag{1.27}$$

The subscripts p, i, and f stand for produced, initial, and final, respectively. The term final means at some later stage of production rather than necessarily at abandonment. If V_i is the initial *gas* pore volume in cubic feet, and if at the final pressure p_f, W_e cubic feet of water has encroached into the reservoir and W_p cubic feet of water has been produced from the reservoir, then the final volume V_f after producing G_p standard cubic feet of gas is

$$V_f = V_i - W_e + B_w W_p \tag{1.28}$$

B_w is the volume factor for the water in units of barrels per surface barrel. V_i and V_f are gas pore volumes, i.e., they do not include connate water. The terms in Eq. (1.27) may be replaced by their equivalents using the gas law, Eq. (1.5), and Eq. (1.28), as

$$\frac{p_{sc}G_p}{T_{sc}} = \frac{p_i V_i}{z_i T} - \frac{p_f(V_i - W_e + B_w W_p)}{z_f T} \tag{1.29}$$

G_p is the standard cubic feet of produced gas at standard pressure and temperature, p_{sc} and T_{sc}.

For volumetric reservoirs there is no water influx and water production is generally negligible, and Eq. (1.29) reduces to

$$\frac{p_{sc}G_p}{T_{sc}} = \frac{p_i V_i}{z_i T} - \frac{p_f V_i}{z_f T} \tag{1.30}$$

For fixed values of p_{sc} and T_{sc}, since p_i, z_i, and V_i are also fixed for a given volumetric reservoir, Eq. (1.30) may be written as

$$G_p = b - m\left(\frac{p_f}{z_f}\right) \tag{1.31}$$

where $$b = \frac{p_i V_i T_{sc}}{z_i p_{sc} T} \text{ and } m = \frac{V_i T_{sc}}{p_{sc} T}$$

Equation (1.31) indicates that for a *volumetric* gas reservoir the graph of the cumulative gas production G_p in standard cubic feet versus the ratio p/z is a straight line of negative slope m. Figure 1.9 shows a plot of cumula-

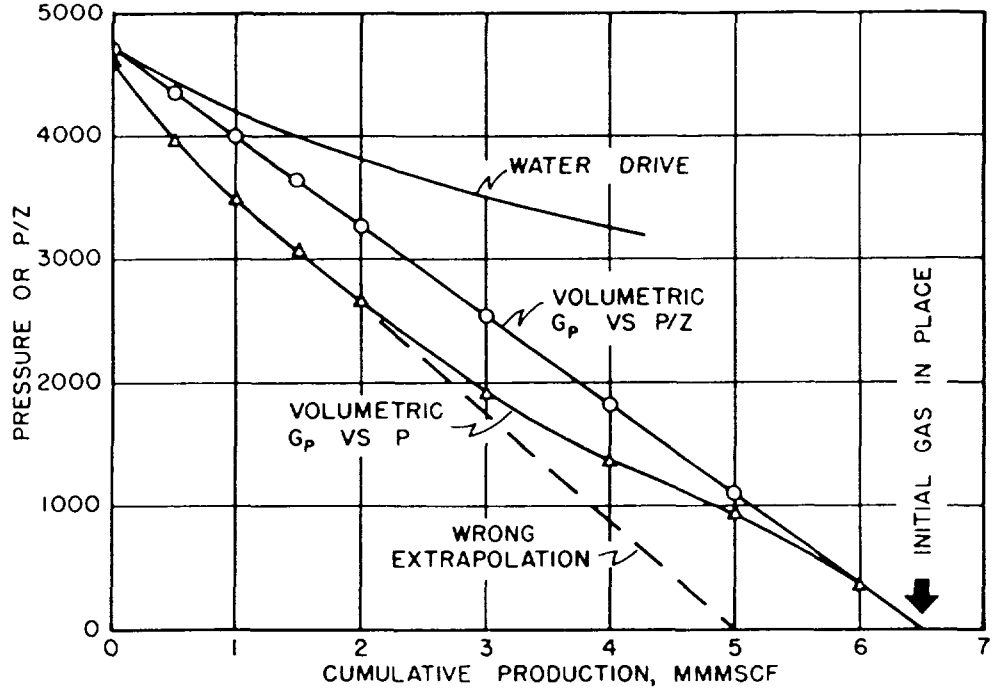


Fig. 1.9. Comparison of theoretical values of p and p/z plotted versus cumulative production from a volumetric gas reservoir.

tive gas production in standard cubic feet plotted versus p/z. Within the limits of error of the values of average reservoir pressure and cumulative productions, the plot of G_p versus p/z is linear and may be extrapolated to zero pressure to find the initial gas in place, or to any abandonment value of p/z to find the initial reserve. The slope m in Fig. 1.9 is

$$m = \frac{\Delta G_p}{\Delta(p/z)} = \frac{6.5 \times 10^9}{4700} = 1.383 \times 10^6 \text{ SCF/psi}$$

Then for $p_{sc} = 14.7$ psia, $T_{sc} = 520°$R, and $T = 200°$F,

$$V_i = \frac{mp_{sc}T}{T_{sc}} = \frac{1.383 \times 10^6 \times 14.7 \times 660}{520}$$

$$= 25.8\text{MM cu ft}$$

For $B_{gi} = 251.9$ SCF/cu ft, the initial gas in place is

$$G = V_i \times B_{gi} = 25.8 \times 10^6 \times 251.9 = 6.50\text{MMM SCF}$$

Figure 1.9 also contains a plot of cumulative gas production G_p versus pressure. As indicated by Eq. (1.31) this is not linear, and extrapolations from the pressure-production data may be in considerable error. As the minimum value of the gas deviation factor occurs near 2500 psia, the extrapolations will be low for pressures above 2500 psia, and high for pressures below 2500 psia. Equation (1.30) may be used graphically as shown in Fig. 1.9 to find the initial gas in place or the reserves at any pressure for any selected abandonment pressure. For example at 1000 psia (or $p/z = 1220$) abandonment pressure the *initial* reserve is 4.85MMM SCF. At 2500 psia (or $p/z = 3130$) the (remaining) reserve is 4.85 less 2.20, that is 2.65MMM SCF. The equation may be used numerically as illustrated using data from the Bell Gas Field in Example 1.6. Note that the base pressure is 15.025 psia in the calculations of Example 1.6.

Example 1.6. Calculating the initial gas in place and the initial reserve of a gas reservoir from pressure-production data for a volumetric reservoir.

Given:

Initial pressure = 3250 psia
Reservoir temperature = 213°F
Standard pressure = 15.025 psia
Standard temperature = 60°F
Cumulative production = 1.00×10^9 SCF
Average reservoir pressure = 2864 psia
Gas deviation factor at 3250 psia = 0.910
Gas deviation factor at 2864 psia = 0.888
Gas deviation factor at 500 psia = 0.951

SOLUTION: Solve Eq. (1.30) for the reservoir gas pore volume V_i

$$\frac{15.025 \times 1.00 \times 10^9}{520} = \frac{3250 \times V_i}{0.910 \times 673} - \frac{2864\ V_i}{0.888 \times 673}$$

$$V_i = 56.17\text{MM cu ft}$$

AVERAGE GRUY NET PAY ZONE VERSUS BATES NO. 3 NET PAY ZONE

Rhodes (Yates-U7R) Interval
T-26-S, R-37-E
Lea County, New Mexico

Average Gruy Rhodes (Yates-U7R) Pay Zone:

Gruy document 0000403 states that the average pay zone consists of [redacted] [$\phi \cdot h \cdot (1-Sw)$].

Average Bates No. 3 Rhodes (Yates-U7R) Pay Zone:

For the Bates No. 3 Rhodes (Yates-U7R) interval, computer log calculations (utilizing 0.5-foot increment digitized log data) indicate a net pay zone of 13.0 hydrocarbon feet, for Rw = 0.03 ohm-meters (Sw = 34.4%). For Rw = 0.05 ohm-meters (Sw = 43.0%), the computed net pay zone is 11.3 hydrocarbon feet.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 26
CASE NOS. 12015 & 12017

Rhodes Refrac Program
Eight Rhodes Field Wells
Lea County, New Mexico

W.I. = 100% **N.R.I.= 79.27 (Average)**

Recommendation

Refracture stimulate and install pumping units on 8 Rhodes Gas Field wells. The total cost for this work is $790.5M (Meridian's Share = $790.5M). Risked uplift and reserve additions are 1672 MCFPD and 3312.3 MMCFG. As a whole, the project should pay out in 2.80 years with a 43.18% ROR.

Current Status

Seven of the eight wells are currently producing a total of 570 MCFPD. 400 MCFPD comes from two wells which recently had pumping units installed.

History

The majority of these wells were drilled as storage wells in 1973. However, the Cagle B #1 and the Elliott Fed. No. 3 were drilled in 1936 and 1954 respectively. All of these wells were once part of the Rhodes Storage Unit.

Discussion

Meridian currently operates the majority of wells in the Rhodes Gas Field. Within the area covered by these proposed workovers and previous Rhodes workovers, we have 15,548 MMCF of PDP reserves booked. If an average pay zone consisting of 12.2 hydrocarbon-feet and an average reservoir pressure of 180 psi is assumed, there is up to 24,300 MMCF of recoverable gas in place. In their current condition the wells will not recover the incremental 8,752 MMCFG which is not booked. Three recent workovers which have not been booked yet will account for approximately 2,500 MMCFG of these incremental reserves. A large portion of the remaining 6,252 MMCF of possible reserves will be added by the proposed eight workovers. The estimated uplift and reserve additions are consistent with what has been seen on previous Rhodes workovers. A large upside potential also exists since many of the wells are on the edge of the field and may drain larger areas than the infield wells which were used for analogy.

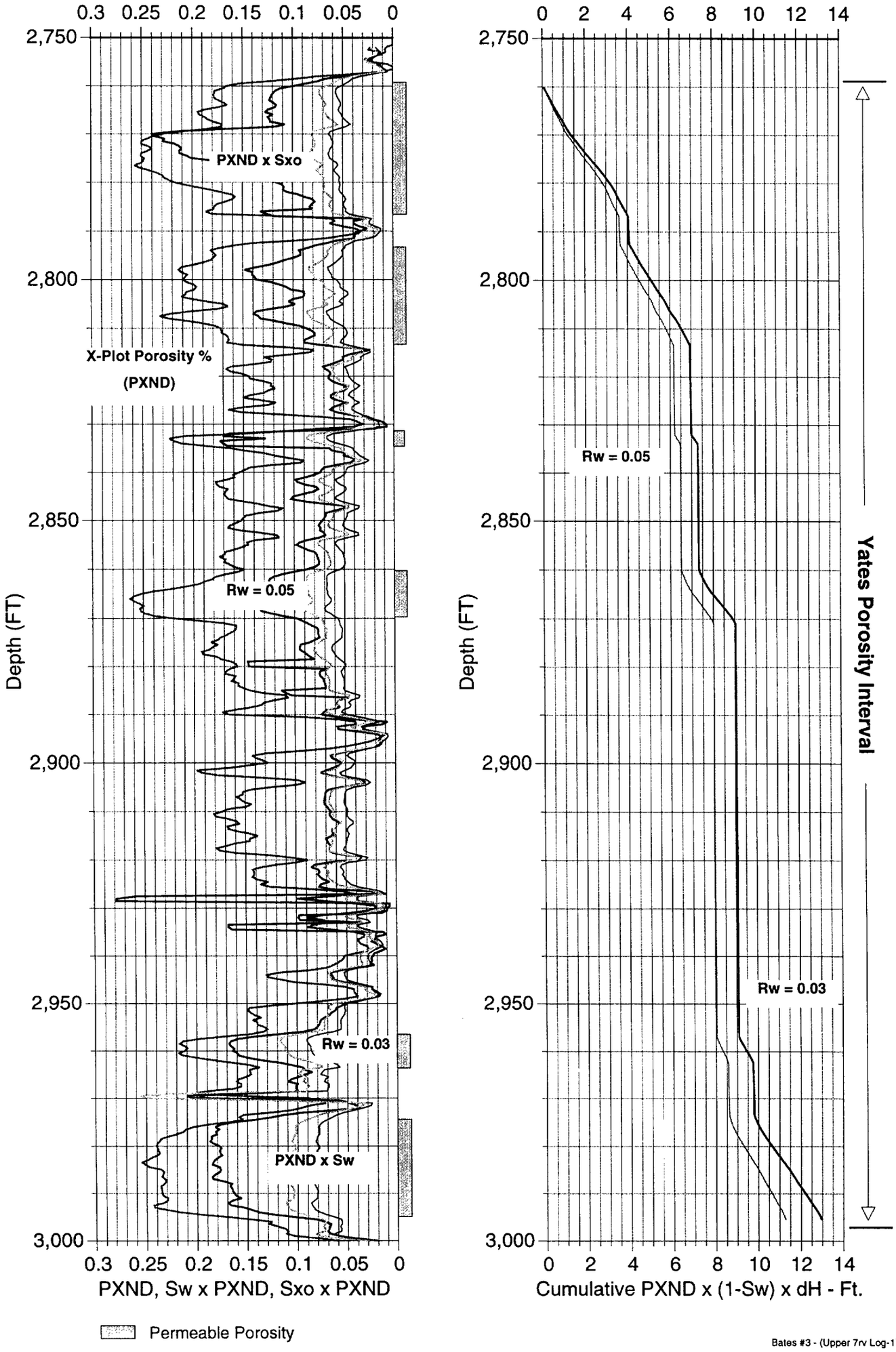
Economics

Presented below is the combined economic prediction for the eight-well program. Company guidelines for pricing and taxation were used.

Net Investment ($M): 790.5
Discounted Payout (years): 2.80
Discounted ROR (%): 43.18
Net Present Value @ 12% ($M): 823.1
P/I @ 12% ($/$): 0.84
Gross/Net Reserve Adds (MMCF): 3312.3/2610.5
Find & Development Cost ($/MCF): 0.25

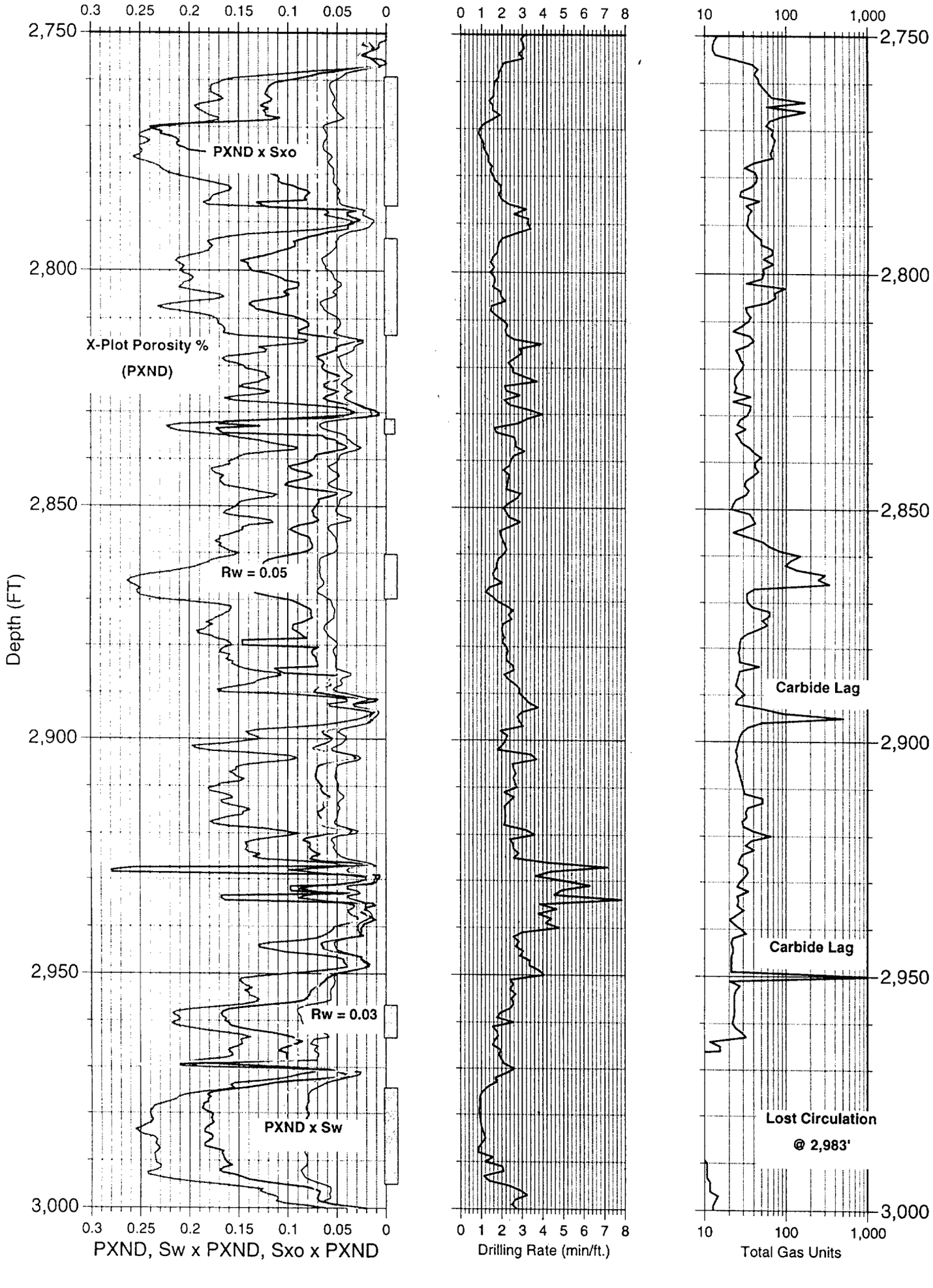
C. T. BATES # 3

X - Plot Porosity (PXND), Sw x PXND, Sxo x PXND vs. Depth
Cumulative Productive Pore Space vs. Depth
Rhodes (Yates-Upper Seven Rivers) Interval
K - 10 - 26S - 37E
Lea County, NM



C. T. BATES # 3

X - Plot Porosity (PXND), Sw x PXND, Sxo x PXND vs. Depth
Mud Log Drilling Rate and
Total Gas Units vs. Depth
K - 10 - 26S - 37E
Lea County, NM



Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.03)

DEPTH	HLLD	PXND	Sw @ (Rw=0.03)	(Sw x PXND)	Sg=(1-Sw)	PXND x (1-Sw)	Cum PXND x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2,760.0	11.07300	0.16551	0.31450	0.05205	0.68550	0.11346	0.40230	0.5	0.5	0.05673	0.16551
2,760.5	9.44837	0.16906	0.33330	0.05635	0.66670	0.11271	0.51501	0.5	1.0	0.11308	0.33457
2,761.0	9.20500	0.17747	0.32170	0.05709	0.67830	0.12038	0.63539	0.5	1.5	0.17327	0.51204
2,761.5	9.25178	0.17813	0.31970	0.05695	0.68030	0.12118	0.75657	0.5	2.0	0.23386	0.69017
2,762.0	9.55736	0.17820	0.31440	0.05603	0.68560	0.12217	0.87875	0.5	2.5	0.29495	0.86837
2,762.5	9.91402	0.17812	0.30880	0.05500	0.69120	0.12312	1.00186	0.5	3.0	0.35651	1.04649
2,763.0	10.49400	0.17382	0.30760	0.05347	0.69240	0.12035	1.12222	0.5	3.5	0.41669	1.22031
2,763.5	10.99182	0.16841	0.31020	0.05224	0.68980	0.11617	1.23838	0.5	4.0	0.47477	1.38872
2,764.0	11.08709	0.16518	0.31490	0.05202	0.68510	0.11316	1.35155	0.5	4.5	0.53135	1.55390
2,764.5	10.50126	0.17394	0.30730	0.05345	0.69270	0.12049	1.47204	0.5	5.0	0.59160	1.72784
2,765.0	10.13526	0.18733	0.29040	0.05440	0.70960	0.13293	1.60497	0.5	5.5	0.65806	1.91517
2,765.5	10.55486	0.19438	0.27430	0.05332	0.72570	0.14106	1.74603	0.5	6.0	0.72859	2.10955
2,766.0	11.39817	0.19271	0.26620	0.05130	0.73380	0.14141	1.88744	0.5	6.5	0.79930	2.30226
2,766.5	11.73244	0.18792	0.26910	0.05057	0.73090	0.13735	2.02479	0.5	7.0	0.86797	2.49018
2,767.0	12.98540	0.18411	0.26110	0.04807	0.73890	0.13604	2.16083	0.5	7.5	0.93599	2.67429
2,767.5	14.45142	0.17859	0.25510	0.04556	0.74490	0.13303	2.29386	0.5	8.0	1.00251	2.85288
2,768.0	16.65374	0.17024	0.24930	0.04244	0.75070	0.12780	2.42166	0.5	8.5	1.06641	3.02312
2,768.5	13.36357	0.17132	0.27660	0.04739	0.72340	0.12393	2.54559	0.5	9.0	1.12837	3.19444
2,769.0	9.72818	0.18724	0.29660	0.05554	0.70340	0.13170	2.67730	0.5	9.5	1.19423	3.38168
2,769.5	7.73110	0.20962	0.29720	0.06230	0.70280	0.14732	2.82462	0.5	10.0	1.26789	3.59130
2,770.0	7.18558	0.22880	0.28240	0.06461	0.71760	0.16419	2.98880	0.5	10.5	1.34998	3.82010
2,770.5	7.81271	0.23904	0.25920	0.06196	0.74080	0.17708	3.16589	0.5	11.0	1.43852	4.05914
2,771.0	7.91769	0.24495	0.25130	0.06156	0.74870	0.18339	3.34928	0.5	11.5	1.53022	4.30409
2,771.5	8.35970	0.25023	0.23940	0.05991	0.76060	0.19032	3.53960	0.5	12.0	1.62538	4.55432
2,772.0	8.28704	0.25039	0.24030	0.06017	0.75970	0.19022	3.72983	0.5	12.5	1.72049	4.80471
2,772.5	8.20224	0.24341	0.24850	0.06049	0.75150	0.18292	3.91275	0.5	13.0	1.81195	5.04812
2,773.0	7.60252	0.24018	0.26150	0.06281	0.73850	0.17737	4.09012	0.5	13.5	1.90064	5.28830
2,773.5	7.41108	0.24436	0.26040	0.06363	0.73960	0.18073	4.27085	0.5	14.0	1.99100	5.53266
2,774.0	7.23060	0.25041	0.25720	0.06441	0.74280	0.18600	4.45685	0.5	14.5	2.08401	5.78307
2,774.5	7.33090	0.25064	0.25520	0.06396	0.74480	0.18668	4.64353	0.5	15.0	2.17734	6.03371

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.03)

DEPTH	HLLD	PXND	Sw @ (Rw=0.03)	(Sw x PXND)	Sg=(1-Sw)	PXND x (1-Sw)	Cum PXND x (1-Sw)	dh	Cum dh	Cum *PXND x (1-Sw) x dh*	Cum *PXND x dh*
2,775.0	7.57342	0.24755	0.25420	0.06293	0.74580	0.18462	4.82815	0.5	15.5	2.26966	6.28126
2,775.5	8.46776	0.24831	0.23970	0.05952	0.76030	0.18879	5.01694	0.5	16.0	2.36405	6.52957
2,776.0	9.53183	0.25052	0.22390	0.05609	0.77610	0.19443	5.21137	0.5	16.5	2.46127	6.78009
2,776.5	9.93482	0.25712	0.21370	0.05495	0.78630	0.20217	5.41355	0.5	17.0	2.56235	7.03721
2,777.0	9.22015	0.25231	0.22610	0.05705	0.77390	0.19526	5.60881	0.5	17.5	2.65998	7.28952
2,777.5	8.64273	0.24335	0.24210	0.05892	0.75790	0.18443	5.79324	0.5	18.0	2.75220	7.53287
2,778.0	9.08034	0.23539	0.24420	0.05748	0.75580	0.17791	5.97115	0.5	18.5	2.84115	7.76826
2,778.5	9.95344	0.23020	0.23850	0.05490	0.76150	0.17530	6.14645	0.5	19.0	2.92880	7.99846
2,779.0	10.60395	0.22808	0.23320	0.05319	0.76680	0.17489	6.32134	0.5	19.5	3.01625	8.22654
2,779.5	10.30275	0.22349	0.24140	0.05395	0.75860	0.16954	6.49088	0.5	20.0	3.10102	8.45003
2,780.0	10.52810	0.21792	0.24500	0.05339	0.75500	0.16453	6.65541	0.5	20.5	3.18328	8.66795
2,780.5	10.65996	0.20810	0.25490	0.05304	0.74510	0.15506	6.81047	0.5	21.0	3.26081	8.87605
2,781.0	10.50040	0.19610	0.27260	0.05346	0.72740	0.14264	6.95311	0.5	21.5	3.33213	9.07215
2,781.5	10.34237	0.18343	0.29360	0.05386	0.70640	0.12957	7.08268	0.5	22.0	3.39692	9.25558
2,782.0	10.70558	0.17239	0.30710	0.05294	0.69290	0.11945	7.20213	0.5	22.5	3.45664	9.42797
2,782.5	11.86644	0.16146	0.31140	0.05028	0.68860	0.11118	7.31331	0.5	23.0	3.51224	9.58943
2,783.0	12.71848	0.15715	0.30900	0.04856	0.69100	0.10859	7.42190	0.5	23.5	3.56653	9.74658
2,783.5	13.56527	0.15985	0.29420	0.04703	0.70580	0.11282	7.53473	0.5	24.0	3.62294	9.90643
2,784.0	12.73500	0.16709	0.29050	0.04854	0.70950	0.11855	7.65328	0.5	24.5	3.68222	10.07352
2,784.5	12.28251	0.17519	0.28210	0.04942	0.71790	0.12577	7.77905	0.5	25.0	3.74510	10.24871
2,785.0	12.56590	0.17804	0.27440	0.04885	0.72560	0.12919	7.90823	0.5	25.5	3.80969	10.42675
2,785.5	13.50677	0.17871	0.26370	0.04713	0.73630	0.13158	8.03982	0.5	26.0	3.87549	10.60546
2,786.0	13.29434	0.18647	0.25480	0.04751	0.74520	0.13896	8.17877	0.5	26.5	3.94497	10.79193
2,786.5	15.36629	0.18113	0.24390	0.04418	0.75610	0.13695	8.31573	0.5	27.0	4.01344	10.97306
2,787.0	26.50821	0.10553	0.31880	0.03364	0.68120	0.07189	8.38761	0.5	27.5	4.04938	11.07859
2,792.5	16.39370	0.14074	0.30400	0.04278	0.69600	0.09796	8.83868	0.5	28.0	4.09836	11.12137
2,793.0	13.06231	0.15903	0.30140	0.04793	0.69860	0.11110	8.94978	0.5	28.5	4.15391	11.16931
2,793.5	12.68185	0.17275	0.28150	0.04863	0.71850	0.12412	9.07390	0.5	29.0	4.21597	11.21794
2,794.0	11.36378	0.18213	0.28210	0.05138	0.71790	0.13075	9.20465	0.5	29.5	4.28135	11.26931

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval

Schlumberger Platform Express Data

(Rw = 0.03)

DEPTH	HLLD	PXND	Sw @ (Rw=0.03)	(Sw x PXND)	Sg=(1-Sw)	PXND x (1-Sw)	Cum PXND x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2,794.5	11.69541	0.17893	0.28310	0.05066	0.71690	0.12827	9.33293	0.5	30.0	4.34549	11.31997
2,795.0	11.79521	0.17659	0.28560	0.05043	0.71440	0.12616	9.45908	0.5	30.5	4.40856	11.37040
2,795.5	10.87500	0.17928	0.29300	0.05253	0.70700	0.12675	9.58583	0.5	31.0	4.47194	11.42293
2,796.0	9.97568	0.18157	0.30200	0.05483	0.69800	0.12674	9.71257	0.5	31.5	4.53531	11.47777
2,796.5	8.98991	0.18963	0.30460	0.05776	0.69540	0.13187	9.84444	0.5	32.0	4.60124	11.53553
2,797.0	7.98902	0.20020	0.30610	0.06128	0.69390	0.13892	9.98336	0.5	32.5	4.67070	11.59681
2,797.5	6.98244	0.21153	0.30990	0.06555	0.69010	0.14598	10.12933	0.5	33.0	4.74369	11.66236
2,798.0	7.15940	0.21403	0.30240	0.06472	0.69760	0.14931	10.27864	0.5	33.5	4.81834	11.72709
2,798.5	7.41138	0.21106	0.30140	0.06361	0.69860	0.14745	10.42609	0.5	34.0	4.89207	11.79070
2,799.0	7.93079	0.20518	0.29980	0.06151	0.70020	0.14367	10.56975	0.5	34.5	4.96390	11.85221
2,799.5	7.84836	0.20711	0.29850	0.06182	0.70150	0.14529	10.71504	0.5	35.0	5.03654	11.91403
2,800.0	9.18986	0.20982	0.27230	0.05713	0.72770	0.15269	10.86773	0.5	35.5	5.11289	11.97117
2,800.5	9.98021	0.20587	0.26630	0.05482	0.73370	0.15105	11.01877	0.5	36.0	5.18841	12.02599
2,801.0	10.55371	0.19860	0.26850	0.05332	0.73150	0.14528	11.16405	0.5	36.5	5.26105	12.07932
2,801.5	10.58733	0.19609	0.27150	0.05324	0.72850	0.14285	11.30690	0.5	37.0	5.33247	12.13255
2,802.0	11.78324	0.19832	0.25440	0.05045	0.74560	0.14787	11.45477	0.5	37.5	5.40641	12.18301
2,802.5	14.20767	0.20607	0.22300	0.04595	0.77700	0.16012	11.61489	0.5	38.0	5.48646	12.22896
2,803.0	14.65383	0.20748	0.21810	0.04525	0.78190	0.16223	11.77711	0.5	38.5	5.56758	12.27421
2,803.5	12.71073	0.21092	0.23030	0.04857	0.76970	0.16235	11.93946	0.5	39.0	5.64875	12.32279
2,804.0	10.93355	0.19939	0.26270	0.05238	0.73730	0.14701	12.08647	0.5	39.5	5.72226	12.37517
2,804.5	10.18081	0.18499	0.29340	0.05428	0.70660	0.13071	12.21718	0.5	40.0	5.78761	12.42944
2,805.0	11.97293	0.16902	0.29620	0.05006	0.70380	0.11896	12.33614	0.5	40.5	5.84709	12.47951
2,805.5	9.99066	0.16503	0.33200	0.05479	0.66800	0.11024	12.44638	0.5	41.0	5.90221	12.53430
2,806.0	7.79047	0.17534	0.35390	0.06205	0.64610	0.11329	12.55967	0.5	41.5	5.95886	12.59635
2,806.5	6.69056	0.20136	0.33250	0.06695	0.66750	0.13441	12.69407	0.5	42.0	6.02606	12.66330
2,807.0	6.77504	0.22152	0.30040	0.06654	0.69960	0.15498	12.84905	0.5	42.5	6.10355	12.72985
2,807.5	7.24166	0.23306	0.27620	0.06437	0.72380	0.16869	13.01774	0.5	43.0	6.18789	12.79422
2,808.0	7.43715	0.22444	0.28300	0.06352	0.71700	0.16092	13.17866	0.5	43.5	6.26835	12.85773
2,808.5	8.23080	0.20570	0.29350	0.06037	0.70650	0.14533	13.32399	0.5	44.0	6.34102	12.91811
2,809.0	9.52463	0.18971	0.29580	0.05612	0.70420	0.13359	13.45758	0.5	44.5	6.40781	12.97422
2,809.5	11.53207	0.17778	0.28690	0.05101	0.71310	0.12677	13.58436	0.5	45.0	6.47120	13.02523

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval

Schlumberger Platform Express Data

(Rw = 0.03)

DEPTH	HLLD	PXND	Sw @ (Rw=0.03)	(Sw x PXND)	Sg=(1-Sw)	PXND x (1-Sw)	Cum PXND x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2,810.0	12.89467	0.17259	0.27950	0.04824	0.72050	0.12435	13.70871	0.5	45.5	6.53338	13.07347
2,810.5	13.62504	0.17140	0.27380	0.04693	0.72620	0.12447	13.83318	0.5	46.0	6.59561	13.12040
2,811.0	13.91467	0.17128	0.27110	0.04643	0.72890	0.12485	13.95803	0.5	46.5	6.65804	13.16683
2,811.5	13.42390	0.16637	0.28410	0.04727	0.71590	0.11910	14.07713	0.5	47.0	6.71759	13.21410
2,812.0	12.25657	0.16481	0.30020	0.04948	0.69980	0.11533	14.19246	0.5	47.5	6.77525	13.26357
2,812.5	10.88547	0.16438	0.31940	0.05250	0.68060	0.11188	14.30434	0.5	48.0	6.83119	13.31607
2,813.0	10.63363	0.16631	0.31940	0.05312	0.68060	0.11319	14.41753	0.5	48.5	6.88779	13.36919
2,813.5	13.80953	0.14927	0.31220	0.04660	0.68780	0.10267	14.52020	0.5	49.0	6.93912	13.41580
2,832.0	8.01065	0.15064	0.40620	0.06119	0.59380	0.08945	17.55523	0.5	49.5	6.98385	13.47699
2,832.5	6.66863	0.20941	0.32030	0.06707	0.67970	0.14234	17.69756	0.5	50.0	7.05502	13.54406
2,833.0	6.64833	0.22402	0.29990	0.06718	0.70010	0.15684	17.85440	0.5	50.5	7.13343	13.61124
2,833.5	7.23250	0.21973	0.29310	0.06440	0.70690	0.15533	18.00973	0.5	51.0	7.21110	13.67565
2,834.0	9.35390	0.21171	0.26750	0.05663	0.73250	0.15508	18.16480	0.5	51.5	7.28864	13.73228
2,860.0	10.27570	0.14997	0.36030	0.05403	0.63970	0.09594	23.46002	0.5	52.0	7.33660	13.78631
2,860.5	8.03145	0.15544	0.39320	0.06112	0.60680	0.09432	23.55434	0.5	52.5	7.38376	13.84743
2,861.0	6.86193	0.16785	0.39390	0.06612	0.60610	0.10173	23.65607	0.5	53.0	7.43463	13.91355
2,861.5	6.50528	0.17784	0.38190	0.06792	0.61810	0.10992	23.76599	0.5	53.5	7.48959	13.98147
2,862.0	6.52752	0.18136	0.37380	0.06779	0.62620	0.11357	23.87956	0.5	54.0	7.54638	14.04926
2,862.5	6.48620	0.18885	0.36010	0.06800	0.63990	0.12085	24.00041	0.5	54.5	7.60680	14.11726
2,863.0	6.66431	0.19471	0.34460	0.06710	0.65540	0.12761	24.12802	0.5	55.0	7.67061	14.18436
2,863.5	6.57641	0.20710	0.32610	0.06754	0.67390	0.13956	24.26758	0.5	55.5	7.74039	14.25189
2,864.0	6.46227	0.22094	0.30840	0.06814	0.69160	0.15280	24.42039	0.5	56.0	7.81679	14.32003
2,864.5	6.69891	0.23966	0.27920	0.06691	0.72080	0.17275	24.59313	0.5	56.5	7.90316	14.38695
2,865.0	6.67124	0.25168	0.26640	0.06705	0.73360	0.18463	24.77776	0.5	57.0	7.99548	14.45399
2,865.5	6.97994	0.25951	0.25260	0.06555	0.74740	0.19396	24.97172	0.5	57.5	8.09246	14.51955
2,866.0	7.45904	0.26292	0.24120	0.06342	0.75880	0.19950	25.17123	0.5	58.0	8.19221	14.58296
2,866.5	7.43670	0.25922	0.24500	0.06351	0.75500	0.19571	25.36694	0.5	58.5	8.29006	14.64647

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.03)

DEPTH	HLLD	PXND	Sw @ (Rw=0.03)	(Sw x PXND)	Sg=(1-Sw)	PXND x (1-Sw)	Cum PXND x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2,867.0	7.02606	0.25376	0.25750	0.06534	0.74250	0.18842	25.55535	0.5	59.0	8.38427	14.71181
2,867.5	6.33229	0.24962	0.27570	0.06882	0.72430	0.18080	25.73615	0.5	59.5	8.47467	14.78063
2,868.0	6.14126	0.25336	0.27590	0.06990	0.72410	0.18346	25.91961	0.5	60.0	8.56640	14.85054
2,868.5	6.29613	0.25242	0.27350	0.06904	0.72650	0.18338	26.10300	0.5	60.5	8.65809	14.91957
2,869.0	7.23526	0.24929	0.25830	0.06439	0.74170	0.18490	26.28789	0.5	61.0	8.75054	14.98396
2,869.5	8.08239	0.23941	0.25450	0.06093	0.74550	0.17848	26.46637	0.5	61.5	8.83978	15.04489
2,870.0	9.36266	0.22104	0.25610	0.05661	0.74390	0.16443	26.63081	0.5	62.0	8.92200	15.10150
2,870.5	9.75226	0.19576	0.28330	0.05546	0.71670	0.14030	26.77111	0.5	62.5	8.99215	15.15696
2,871.0	9.89393	0.17084	0.32230	0.05506	0.67770	0.11578	26.88688	0.5	63.0	9.05004	15.21202
2,957.0	4.06079	0.17350	0.49540	0.08595	0.50460	0.08755	39.70054	0.5	63.5	9.09381	15.29798
2,957.5	3.66841	0.19797	0.45680	0.09043	0.54320	0.10754	39.80807	0.5	64.0	9.14758	15.38841
2,958.0	3.68109	0.21379	0.42230	0.09028	0.57770	0.12351	39.93158	0.5	64.5	9.20933	15.47869
2,958.5	3.79900	0.21694	0.40960	0.08886	0.59040	0.12808	40.05966	0.5	65.0	9.27337	15.56755
2,959.0	3.98387	0.21224	0.40890	0.08678	0.59110	0.12546	40.18512	0.5	65.5	9.33610	15.65433
2,959.5	3.98716	0.20913	0.41480	0.08675	0.58520	0.12238	40.30750	0.5	66.0	9.39729	15.74108
2,960.0	4.05552	0.21187	0.40590	0.08600	0.59410	0.12587	40.43337	0.5	66.5	9.46023	15.82708
2,960.5	4.16805	0.21814	0.38890	0.08483	0.61110	0.13331	40.56668	0.5	67.0	9.52688	15.91191
2,961.0	4.36732	0.21313	0.38890	0.08289	0.61110	0.13024	40.69692	0.5	67.5	9.59200	15.99480
2,961.5	4.80557	0.19876	0.39750	0.07901	0.60250	0.11975	40.81667	0.5	68.0	9.65188	16.07381
2,962.0	5.86051	0.18290	0.39120	0.07155	0.60880	0.11135	40.92802	0.5	68.5	9.70756	16.14536
2,962.5	7.16385	0.16499	0.39220	0.06471	0.60780	0.10028	41.02830	0.5	69.0	9.75770	16.21007
2,973.5	7.95287	0.15453	0.39750	0.06143	0.60250	0.09310	42.34620	0.5	69.5	9.80425	16.27149
2,974.0	6.93804	0.15786	0.41660	0.06576	0.58340	0.09210	42.43829	0.5	70.0	9.85030	16.33726
2,974.5	6.01792	0.15404	0.45840	0.07061	0.54160	0.08343	42.52172	0.5	70.5	9.89201	16.40787
2,975.0	5.30783	0.16849	0.44620	0.07518	0.55380	0.09331	42.61503	0.5	71.0	9.93866	16.48305
2,975.5	4.95233	0.18878	0.41230	0.07783	0.58770	0.11095	42.72598	0.5	71.5	9.99414	16.56088
2,976.0	4.81574	0.20358	0.38770	0.07893	0.61230	0.12465	42.85063	0.5	72.0	10.05646	16.63981

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.03)

DEPTH	HLLD	PXND	Sw @ (Rw=0.03)	(Sw x PXND)	Sg=(1-Sw)	PXND x (1-Sw)	Cum PXND x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2,976.5	4.86553	0.21103	0.37210	0.07852	0.62790	0.13251	42.98314	0.5	72.5	10.12272	16.71834
2,977.0	4.84317	0.21343	0.36880	0.07871	0.63120	0.13472	43.11785	0.5	73.0	10.19008	16.79705
2,977.5	4.87952	0.22053	0.35560	0.07842	0.64440	0.14211	43.25996	0.5	73.5	10.26113	16.87547
2,978.0	4.64468	0.22907	0.35080	0.08036	0.64920	0.14871	43.40867	0.5	74.0	10.33549	16.95583
2,978.5	4.57071	0.23610	0.34310	0.08101	0.65690	0.15509	43.56377	0.5	74.5	10.41303	17.03683
2,979.0	4.45964	0.23722	0.34570	0.08201	0.65430	0.15521	43.71898	0.5	75.0	10.49064	17.11884
2,979.5	4.64410	0.23956	0.33550	0.08037	0.66450	0.15919	43.87817	0.5	75.5	10.57023	17.19921
2,980.0	4.85716	0.24057	0.32670	0.07859	0.67330	0.16198	44.04015	0.5	76.0	10.65122	17.27781
2,980.5	4.86491	0.23909	0.32840	0.07852	0.67160	0.16057	44.20072	0.5	76.5	10.73151	17.35632
2,981.0	4.54667	0.23834	0.34080	0.08123	0.65920	0.15711	44.35783	0.5	77.0	10.81006	17.43755
2,981.5	4.51914	0.23723	0.34340	0.08146	0.65660	0.15577	44.51360	0.5	77.5	10.88795	17.51902
2,982.0	4.74569	0.23938	0.33210	0.07950	0.66790	0.15988	44.67348	0.5	78.0	10.96789	17.59851
2,982.5	4.82013	0.24497	0.32200	0.07888	0.67800	0.16609	44.83957	0.5	78.5	11.05093	17.67739
2,983.0	4.63447	0.24871	0.32350	0.08046	0.67650	0.16825	45.00782	0.5	79.0	11.13506	17.75785
2,983.5	4.58647	0.25497	0.31720	0.08088	0.68280	0.17409	45.18191	0.5	79.5	11.22211	17.83873
2,984.0	4.55753	0.25102	0.32320	0.08113	0.67680	0.16989	45.35180	0.5	80.0	11.30705	17.91986
2,984.5	4.57175	0.24734	0.32750	0.08100	0.67250	0.16634	45.51814	0.5	80.5	11.39022	18.00086
2,985.0	4.49675	0.23619	0.34580	0.08167	0.65420	0.15452	45.67266	0.5	81.0	11.46748	18.08254
2,985.5	4.29441	0.23309	0.35860	0.08359	0.64140	0.14950	45.82216	0.5	81.5	11.54223	18.16612
2,986.0	4.18326	0.23367	0.36240	0.08468	0.63760	0.14899	45.97115	0.5	82.0	11.61672	18.25080
2,986.5	4.06563	0.23490	0.36570	0.08590	0.63430	0.14900	46.12015	0.5	82.5	11.69122	18.33671
2,987.0	4.01194	0.23201	0.37270	0.08647	0.62730	0.14554	46.26569	0.5	83.0	11.76399	18.42318
2,987.5	4.11968	0.23093	0.36950	0.08533	0.63050	0.14560	46.41129	0.5	83.5	11.83679	18.50851
2,988.0	4.32073	0.23279	0.35790	0.08332	0.64210	0.14947	46.56076	0.5	84.0	11.91153	18.59182
2,988.5	4.42147	0.23590	0.34920	0.08238	0.65080	0.15352	46.71428	0.5	84.5	11.98829	18.67420
2,989.0	4.57273	0.23553	0.34390	0.08100	0.65610	0.15453	46.86882	0.5	85.0	12.06556	18.75520
2,989.5	4.67795	0.23489	0.34090	0.08007	0.65910	0.15482	47.02363	0.5	85.5	12.14296	18.83527
2,990.0	4.64924	0.23476	0.34220	0.08033	0.65780	0.15443	47.17806	0.5	86.0	12.22018	18.91560
2,990.5	4.62470	0.23397	0.34420	0.08053	0.65580	0.15344	47.33149	0.5	86.5	12.29690	18.99614
2,991.0	4.60851	0.22913	0.35210	0.08068	0.64790	0.14845	47.47995	0.5	87.0	12.37112	19.07681
2,991.5	4.29802	0.22946	0.36410	0.08355	0.63590	0.14591	47.62586	0.5	87.5	12.44408	19.16036

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.03)

DEPTH	HLLD	PXND	Sw @ (Rw=0.03)	(Sw x PXND)	Sg=(1-Sw)	PXND x (1-Sw)	Cum PXND x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2,992.0	4.00559	0.23365	0.37040	0.08654	0.62960	0.14711	47.77297	0.5	88.0	12.51763	19.24690
2,992.5	4.07767	0.24292	0.35310	0.08578	0.64690	0.15714	47.93011	0.5	88.5	12.59621	19.33268
2,993.0	4.24820	0.24209	0.34710	0.08403	0.65290	0.15806	48.08817	0.5	89.0	12.67524	19.41671
2,993.5	4.40003	0.22893	0.36070	0.08258	0.63930	0.14635	48.23453	0.5	89.5	12.74841	19.49928
2,994.0	4.94043	0.21659	0.35980	0.07793	0.64020	0.13866	48.37319	0.5	90.0	12.81774	19.57721
2,994.5	5.84676	0.19544	0.36650	0.07163	0.63350	0.12381	48.49700	0.5	90.5	12.87965	19.64884
2,995.0	7.41595	0.16855	0.37740	0.06361	0.62260	0.10494	48.60194	0.5	91.0	12.93212	19.71245
2,995.5	9.24304	0.14688	0.38790	0.05697	0.61210	0.08991	48.69184	0.5	91.5	12.97707	19.76943

Note: **H = 91.5 ft.,** ϕ x H = 19.77, ϕ = 19.77 / 91.5, **ϕ = 21.60%**

For Rw = 0.03 : Cum ϕ x H (1-Sw) = 12.977, 1-Sw = 12.977 / 19.77, **Sw = 0.344**

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.05)

DEPTH	HLLD	PXND	Sw @ (Rw=0.05)	(Sw x PXDN)	Sg=(1-Sw)	PXDN x (1-Sw)	Cum PXDN x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2760.0	11.07300	0.16551	0.40600	0.06720	0.59400	0.09831	0.29467	0.5	0.5	0.04916	0.16551
2760.5	9.44837	0.16906	0.43030	0.07275	0.56970	0.09631	0.39098	0.5	1.0	0.09731	0.33457
2761.0	9.20500	0.17747	0.41530	0.07370	0.58470	0.10377	0.49475	0.5	1.5	0.14920	0.51204
2761.5	9.25178	0.17813	0.41270	0.07351	0.58730	0.10462	0.59937	0.5	2.0	0.20150	0.69017
2762.0	9.55736	0.17820	0.40590	0.07233	0.59410	0.10587	0.70524	0.5	2.5	0.25444	0.86837
2762.5	9.91402	0.17812	0.39870	0.07102	0.60130	0.10710	0.81234	0.5	3.0	0.30799	1.04649
2763.0	10.49400	0.17382	0.39710	0.06902	0.60290	0.10480	0.91713	0.5	3.5	0.36039	1.22031
2763.5	10.99182	0.16841	0.40050	0.06745	0.59950	0.10096	1.01810	0.5	4.0	0.41087	1.38872
2764.0	11.08709	0.16518	0.40660	0.06716	0.59340	0.09802	1.11611	0.5	4.5	0.45988	1.55390
2764.5	10.50126	0.17394	0.39670	0.06900	0.60330	0.10494	1.22105	0.5	5.0	0.51235	1.72784
2765.0	10.13526	0.18733	0.37490	0.07023	0.62510	0.11710	1.33815	0.5	5.5	0.57090	1.91517
2765.5	10.55486	0.19438	0.35410	0.06883	0.64590	0.12555	1.46370	0.5	6.0	0.63367	2.10955
2766.0	11.39817	0.19271	0.34370	0.06623	0.65630	0.12648	1.59018	0.5	6.5	0.69691	2.30226
2766.5	11.73244	0.18792	0.34740	0.06528	0.65260	0.12264	1.71281	0.5	7.0	0.75823	2.49018
2767.0	12.98540	0.18411	0.33700	0.06205	0.66300	0.12206	1.83488	0.5	7.5	0.81926	2.67429
2767.5	14.45142	0.17859	0.32940	0.05883	0.67060	0.11976	1.95464	0.5	8.0	0.87914	2.85288
2768.0	16.65374	0.17024	0.32190	0.05480	0.67810	0.11544	2.07008	0.5	8.5	0.93686	3.02312
2768.5	13.36357	0.17132	0.35700	0.06116	0.64300	0.11016	2.18024	0.5	9.0	0.99194	3.19444
2769.0	9.72818	0.18724	0.38290	0.07169	0.61710	0.11555	2.29579	0.5	9.5	1.04971	3.38168
2769.5	7.73110	0.20962	0.38360	0.08041	0.61640	0.12921	2.42500	0.5	10.0	1.11432	3.59130
2770.0	7.18558	0.22880	0.36460	0.08342	0.63540	0.14538	2.57038	0.5	10.5	1.18701	3.82010
2770.5	7.81271	0.23904	0.33470	0.08001	0.66530	0.15903	2.72941	0.5	11.0	1.26653	4.05914
2771.0	7.91769	0.24495	0.32440	0.07946	0.67560	0.16549	2.89490	0.5	11.5	1.34927	4.30409
2771.5	8.35970	0.25023	0.30910	0.07735	0.69090	0.17288	3.06778	0.5	12.0	1.43571	4.55432
2772.0	8.28704	0.25039	0.31020	0.07767	0.68980	0.17272	3.24050	0.5	12.5	1.52207	4.80471
2772.5	8.20224	0.24341	0.32080	0.07809	0.67920	0.16532	3.40582	0.5	13.0	1.60473	5.04812
2773.0	7.60252	0.24018	0.33770	0.08111	0.66230	0.15907	3.56490	0.5	13.5	1.68427	5.28830
2773.5	7.41108	0.24436	0.33610	0.08213	0.66390	0.16223	3.72713	0.5	14.0	1.76538	5.53266
2774.0	7.23060	0.25041	0.33210	0.08316	0.66790	0.16725	3.89437	0.5	14.5	1.84901	5.78307
2774.5	7.33090	0.25064	0.32950	0.08259	0.67050	0.16805	4.06243	0.5	15.0	1.93304	6.03371

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.05)

DEPTH	HLLD	PXND	Sw @ (Rw=0.05)	(Sw x PXDN)	Sg=(1-Sw)	PXDN x (1-Sw)	Cum PXDN x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2775.0	7.57342	0.24755	0.32820	0.08125	0.67180	0.16630	4.22873	0.5	15.5	2.01619	6.28126
2775.5	8.46776	0.24831	0.30950	0.07685	0.69050	0.17146	4.40019	0.5	16.0	2.10192	6.52957
2776.0	9.53183	0.25052	0.28910	0.07243	0.71090	0.17809	4.57829	0.5	16.5	2.19096	6.78009
2776.5	9.93482	0.25712	0.27590	0.07094	0.72410	0.18618	4.76447	0.5	17.0	2.28405	7.03721
2777.0	9.22015	0.25231	0.29190	0.07365	0.70810	0.17866	4.94313	0.5	17.5	2.37338	7.28952
2777.5	8.64273	0.24335	0.31260	0.07607	0.68740	0.16728	5.11041	0.5	18.0	2.45702	7.53287
2778.0	9.08034	0.23539	0.31520	0.07419	0.68480	0.16120	5.27160	0.5	18.5	2.53762	7.76826
2778.5	9.95344	0.23020	0.30790	0.07088	0.69210	0.15932	5.43092	0.5	19.0	2.61728	7.99846
2779.0	10.60395	0.22808	0.30110	0.06867	0.69890	0.15941	5.59033	0.5	19.5	2.69698	8.22654
2779.5	10.30275	0.22349	0.31170	0.06966	0.68830	0.15383	5.74416	0.5	20.0	2.77390	8.45003
2780.0	10.52810	0.21792	0.31620	0.06891	0.68380	0.14901	5.89317	0.5	20.5	2.84841	8.66795
2780.5	10.65996	0.20810	0.32910	0.06849	0.67090	0.13961	6.03278	0.5	21.0	2.91821	8.87605
2781.0	10.50040	0.19610	0.35190	0.06901	0.64810	0.12709	6.15988	0.5	21.5	2.98176	9.07215
2781.5	10.34237	0.18343	0.37910	0.06954	0.62090	0.11389	6.27377	0.5	22.0	3.03870	9.25558
2782.0	10.70558	0.17239	0.39640	0.06834	0.60360	0.10405	6.37782	0.5	22.5	3.09073	9.42797
2782.5	11.86644	0.16146	0.40200	0.06491	0.59800	0.09655	6.47438	0.5	23.0	3.13901	9.58943
2783.0	12.71848	0.15715	0.39900	0.06270	0.60100	0.09445	6.56882	0.5	23.5	3.18623	9.74658
2783.5	13.56527	0.15985	0.37980	0.06071	0.62020	0.09914	6.66796	0.5	24.0	3.23580	9.90643
2784.0	12.73500	0.16709	0.37500	0.06266	0.62500	0.10443	6.77239	0.5	24.5	3.28802	10.07352
2784.5	12.28251	0.17519	0.36420	0.06380	0.63580	0.11139	6.88378	0.5	25.0	3.34371	10.24871
2785.0	12.56590	0.17804	0.35430	0.06308	0.64570	0.11496	6.99874	0.5	25.5	3.40119	10.42675
2785.5	13.50677	0.17871	0.34050	0.06085	0.65950	0.11786	7.11660	0.5	26.0	3.46012	10.60546
2786.0	13.29434	0.18647	0.32890	0.06133	0.67110	0.12514	7.24174	0.5	26.5	3.52269	10.79193
2786.5	15.36629	0.18113	0.31490	0.05704	0.68510	0.12409	7.36583	0.5	27.0	3.58474	10.97306
2787.0	26.50821	0.10553	0.41150	0.04343	0.58850	0.06210	7.42793	0.5	27.5	3.61579	11.07859
2792.5	16.39370	0.14074	0.39240	0.05523	0.60760	0.08551	7.80650	0.5	28.0	3.65855	11.12137
2793.0	13.06231	0.15903	0.38900	0.06186	0.61100	0.09717	7.90367	0.5	28.5	3.70713	11.16931
2793.5	12.68185	0.17275	0.36350	0.06279	0.63650	0.10996	8.01363	0.5	29.0	3.76211	11.21794
2794.0	11.36378	0.18213	0.36420	0.06633	0.63580	0.11580	8.12942	0.5	29.5	3.82001	11.26931

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.05)

DEPTH	HLLD	PXND	Sw @ (Rw=0.05)	(Sw x PXDN)	Sg=(1-Sw)	PXDN x (1-Sw)	Cum PXDN x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2794.5	11.69541	0.17893	0.36540	0.06538	0.63460	0.11355	8.24297	0.5	30.0	3.87678	11.31997
2795.0	11.79521	0.17659	0.36870	0.06511	0.63130	0.11148	8.35445	0.5	30.5	3.93252	11.37040
2795.5	10.87500	0.17928	0.37820	0.06780	0.62180	0.11148	8.46593	0.5	31.0	3.98826	11.42293
2796.0	9.97568	0.18157	0.38990	0.07079	0.61010	0.11078	8.57671	0.5	31.5	4.04365	11.47777
2796.5	8.98991	0.18963	0.39330	0.07458	0.60670	0.11505	8.69175	0.5	32.0	4.10117	11.53553
2797.0	7.98902	0.20020	0.39520	0.07912	0.60480	0.12108	8.81284	0.5	32.5	4.16171	11.59681
2797.5	6.98244	0.21153	0.40000	0.08461	0.60000	0.12692	8.93975	0.5	33.0	4.22517	11.66236
2798.0	7.15940	0.21403	0.39050	0.08358	0.60950	0.13045	9.07021	0.5	33.5	4.29040	11.72709
2798.5	7.41138	0.21106	0.38920	0.08214	0.61080	0.12892	9.19912	0.5	34.0	4.35485	11.79070
2799.0	7.93079	0.20518	0.38700	0.07940	0.61300	0.12578	9.32490	0.5	34.5	4.41774	11.85221
2799.5	7.84836	0.20711	0.38540	0.07982	0.61460	0.12729	9.45219	0.5	35.0	4.48139	11.91403
2800.0	9.18986	0.20982	0.35150	0.07375	0.64850	0.13607	9.58825	0.5	35.5	4.54942	11.97117
2800.5	9.98021	0.20587	0.34380	0.07078	0.65620	0.13509	9.72335	0.5	36.0	4.61697	12.02599
2801.0	10.55371	0.19860	0.34660	0.06883	0.65340	0.12977	9.85311	0.5	36.5	4.68185	12.07932
2801.5	10.58733	0.19609	0.35050	0.06873	0.64950	0.12736	9.98047	0.5	37.0	4.74553	12.13255
2802.0	11.78324	0.19832	0.32850	0.06515	0.67150	0.13317	10.11364	0.5	37.5	4.81212	12.18301
2802.5	14.20767	0.20607	0.28790	0.05933	0.71210	0.14674	10.26039	0.5	38.0	4.88549	12.22896
2803.0	14.65383	0.20748	0.28150	0.05841	0.71850	0.14907	10.40946	0.5	38.5	4.96002	12.27421
2803.5	12.71073	0.21092	0.29740	0.06273	0.70260	0.14819	10.55765	0.5	39.0	5.03412	12.32279
2804.0	10.93355	0.19939	0.33920	0.06763	0.66080	0.13176	10.68941	0.5	39.5	5.10000	12.37517
2804.5	10.18081	0.18499	0.37880	0.07007	0.62120	0.11492	10.80433	0.5	40.0	5.15746	12.42944
2805.0	11.97293	0.16902	0.38230	0.06462	0.61770	0.10440	10.90873	0.5	40.5	5.20966	12.47951
2805.5	9.99066	0.16503	0.42870	0.07075	0.57130	0.09428	11.00301	0.5	41.0	5.25680	12.53430
2806.0	7.79047	0.17534	0.45690	0.08011	0.54310	0.09523	11.09824	0.5	41.5	5.30441	12.59635
2806.5	6.69056	0.20136	0.42930	0.08644	0.57070	0.11492	11.21315	0.5	42.0	5.36187	12.66330
2807.0	6.77504	0.22152	0.38780	0.08591	0.61220	0.13561	11.34877	0.5	42.5	5.42968	12.72985
2807.5	7.24166	0.23306	0.35650	0.08309	0.64350	0.14997	11.49874	0.5	43.0	5.50467	12.79422
2808.0	7.43715	0.22444	0.36530	0.08199	0.63470	0.14245	11.64119	0.5	43.5	5.57589	12.85773
2808.5	8.23080	0.20570	0.37890	0.07794	0.62110	0.12776	11.76896	0.5	44.0	5.63977	12.91811
2809.0	9.52463	0.18971	0.38190	0.07245	0.61810	0.11726	11.88621	0.5	44.5	5.69840	12.97422
2809.5	11.53207	0.17778	0.37040	0.06585	0.62960	0.11193	11.99815	0.5	45.0	5.75437	13.02523

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.05)

DEPTH	HLLD	PXND	Sw @ (Rw=0.05)	(Sw x PXDN)	Sg=(1-Sw)	PXDN x (1-Sw)	Cum PXDN x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2810.0	12.89467	0.17259	0.36080	0.06227	0.63920	0.11032	12.10846	0.5	45.5	5.80953	13.07347
2810.5	13.62504	0.17140	0.35340	0.06057	0.64660	0.11083	12.21929	0.5	46.0	5.86494	13.12040
2811.0	13.91467	0.17128	0.35000	0.05995	0.65000	0.11133	12.33062	0.5	46.5	5.92061	13.16683
2811.5	13.42390	0.16637	0.36680	0.06102	0.63320	0.10535	12.43597	0.5	47.0	5.97328	13.21410
2812.0	12.25657	0.16481	0.38750	0.06386	0.61250	0.10095	12.53692	0.5	47.5	6.02375	13.26357
2812.5	10.88547	0.16438	0.41230	0.06777	0.58770	0.09661	12.63352	0.5	48.0	6.07205	13.31607
2813.0	10.63363	0.16631	0.41230	0.06857	0.58770	0.09774	12.73126	0.5	48.5	6.12092	13.36919
2813.5	13.80953	0.14927	0.40310	0.06017	0.59690	0.08910	12.82036	0.5	49.0	6.16547	13.41580
2832.0	8.01065	0.15064	0.52450	0.07901	0.47550	0.07163	15.46379	0.5	49.5	6.20129	13.47699
2832.5	6.66863	0.20941	0.41350	0.08659	0.58650	0.12282	15.58661	0.5	50.0	6.26270	13.54406
2833.0	6.64833	0.22402	0.38710	0.08672	0.61290	0.13730	15.72391	0.5	50.5	6.33135	13.61124
2833.5	7.23250	0.21973	0.37840	0.08315	0.62160	0.13658	15.86049	0.5	51.0	6.39964	13.67565
2834.0	9.35390	0.21171	0.34530	0.07310	0.65470	0.13861	15.99910	0.5	51.5	6.46894	13.73228
2860.0	10.27570	0.14997	0.46510	0.06975	0.53490	0.08022	20.57518	0.5	52.0	6.50905	13.78631
2860.5	8.03145	0.15544	0.50760	0.07890	0.49240	0.07654	20.65172	0.5	52.5	6.54732	13.84743
2861.0	6.86193	0.16785	0.50860	0.08537	0.49140	0.08248	20.73420	0.5	53.0	6.58856	13.91355
2861.5	6.50528	0.17784	0.49300	0.08768	0.50700	0.09016	20.82436	0.5	53.5	6.63365	13.98147
2862.0	6.52752	0.18136	0.48260	0.08752	0.51740	0.09384	20.91820	0.5	54.0	6.68056	14.04926
2862.5	6.48620	0.18885	0.46490	0.08780	0.53510	0.10105	21.01925	0.5	54.5	6.73109	14.11726
2863.0	6.66431	0.19471	0.44490	0.08663	0.55510	0.10808	21.12734	0.5	55.0	6.78513	14.18436
2863.5	6.57641	0.20710	0.42100	0.08719	0.57900	0.11991	21.24725	0.5	55.5	6.84509	14.25189
2864.0	6.46227	0.22094	0.39810	0.08796	0.60190	0.13298	21.38023	0.5	56.0	6.91158	14.32003
2864.5	6.69891	0.23966	0.36050	0.08640	0.63950	0.15326	21.53349	0.5	56.5	6.98821	14.38695
2865.0	6.67124	0.25168	0.34400	0.08658	0.65600	0.16510	21.69860	0.5	57.0	7.07076	14.45399
2865.5	6.97994	0.25951	0.32610	0.08463	0.67390	0.17488	21.87348	0.5	57.5	7.15820	14.51955
2866.0	7.45904	0.26292	0.31140	0.08187	0.68860	0.18105	22.05453	0.5	58.0	7.24873	14.58296
2866.5	7.43670	0.25922	0.31630	0.08199	0.68370	0.17723	22.23176	0.5	58.5	7.33734	14.64647

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.05)

DEPTH	HLLD	PXND	Sw @ (Rw=0.05)	(Sw x PXDN)	Sg=(1-Sw)	PXDN x (1-Sw)	Cum PXDN x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2867.0	7.02606	0.25376	0.33240	0.08435	0.66760	0.16941	22.40117	0.5	59.0	7.42205	14.71181
2867.5	6.33229	0.24962	0.35600	0.08886	0.64400	0.16076	22.56192	0.5	59.5	7.50243	14.78063
2868.0	6.14126	0.25336	0.35610	0.09022	0.64390	0.16314	22.72506	0.5	60.0	7.58399	14.85054
2868.5	6.29613	0.25242	0.35300	0.08910	0.64700	0.16332	22.88838	0.5	60.5	7.66565	14.91957
2869.0	7.23526	0.24929	0.33350	0.08314	0.66650	0.16615	23.05453	0.5	61.0	7.74873	14.98396
2869.5	8.08239	0.23941	0.32850	0.07865	0.67150	0.16076	23.21529	0.5	61.5	7.82911	15.04489
2870.0	9.36266	0.22104	0.33060	0.07308	0.66940	0.14796	23.36326	0.5	62.0	7.90309	15.10150
2870.5	9.75226	0.19576	0.36580	0.07161	0.63420	0.12415	23.48741	0.5	62.5	7.96517	15.15696
2871.0	9.89393	0.17084	0.41610	0.07109	0.58390	0.09975	23.58716	0.5	63.0	8.01504	15.21202
2957.0	4.06079	0.17350	0.63960	0.11097	0.36040	0.06253	34.32492	0.5	63.5	8.04631	15.29798
2957.5	3.66841	0.19797	0.58970	0.11674	0.41030	0.08123	34.40615	0.5	64.0	8.08692	15.38841
2958.0	3.68109	0.21379	0.54510	0.11654	0.45490	0.09725	34.50340	0.5	64.5	8.13555	15.47869
2958.5	3.79900	0.21694	0.52880	0.11472	0.47120	0.10222	34.60562	0.5	65.0	8.18666	15.56755
2959.0	3.98387	0.21224	0.52780	0.11202	0.47220	0.10022	34.70584	0.5	65.5	8.23677	15.65433
2959.5	3.98716	0.20913	0.53550	0.11199	0.46450	0.09714	34.80298	0.5	66.0	8.28534	15.74108
2960.0	4.05552	0.21187	0.52410	0.11104	0.47590	0.10083	34.90381	0.5	66.5	8.33576	15.82708
2960.5	4.16805	0.21814	0.50210	0.10953	0.49790	0.10861	35.01242	0.5	67.0	8.39006	15.91191
2961.0	4.36732	0.21313	0.50200	0.10699	0.49800	0.10614	35.11856	0.5	67.5	8.44313	15.99480
2961.5	4.80557	0.19876	0.51320	0.10200	0.48680	0.09676	35.21532	0.5	68.0	8.49151	16.07381
2962.0	5.86051	0.18290	0.50500	0.09236	0.49500	0.09054	35.30585	0.5	68.5	8.53678	16.14536
2962.5	7.16385	0.16499	0.50640	0.08355	0.49360	0.08144	35.38729	0.5	69.0	8.57750	16.21007
2973.5	7.95287	0.15453	0.51310	0.07929	0.48690	0.07524	36.20504	0.5	69.5	8.61512	16.27149
2974.0	6.93804	0.15786	0.53780	0.08490	0.46220	0.07296	36.27800	0.5	70.0	8.65160	16.33726
2974.5	6.01792	0.15404	0.59170	0.09115	0.40830	0.06289	36.34090	0.5	70.5	8.68304	16.40787
2975.0	5.30783	0.16849	0.57600	0.09705	0.42400	0.07144	36.41234	0.5	71.0	8.71876	16.48305
2975.5	4.95233	0.18878	0.53230	0.10049	0.46770	0.08829	36.50063	0.5	71.5	8.76291	16.56088
2976.0	4.81574	0.20358	0.50050	0.10189	0.49950	0.10169	36.60232	0.5	72.0	8.81376	16.63981

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.05)

DEPTH	HLLD	PXND	Sw @ (Rw=0.05)	(Sw x PXDN)	Sg=(1-Sw)	PXDN x (1-Sw)	Cum PXDN x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2976.5	4.86553	0.21103	0.48040	0.10138	0.51960	0.10965	36.71197	0.5	72.5	8.86858	16.71834
2977.0	4.84317	0.21343	0.47610	0.10161	0.52390	0.11182	36.82378	0.5	73.0	8.92449	16.79705
2977.5	4.87952	0.22053	0.45900	0.10122	0.54100	0.11931	36.94309	0.5	73.5	8.98414	16.87547
2978.0	4.64468	0.22907	0.45290	0.10375	0.54710	0.12532	37.06841	0.5	74.0	9.04680	16.95583
2978.5	4.57071	0.23610	0.44300	0.10459	0.55700	0.13151	37.19992	0.5	74.5	9.11256	17.03683
2979.0	4.45964	0.23722	0.44640	0.10590	0.55360	0.13132	37.33125	0.5	75.0	9.17822	17.11884
2979.5	4.64410	0.23956	0.43310	0.10375	0.56690	0.13581	37.46705	0.5	75.5	9.24612	17.19921
2980.0	4.85716	0.24057	0.42170	0.10145	0.57830	0.13912	37.60618	0.5	76.0	9.31568	17.27781
2980.5	4.86491	0.23909	0.42400	0.10137	0.57600	0.13772	37.74389	0.5	76.5	9.38454	17.35632
2981.0	4.54667	0.23834	0.44000	0.10487	0.56000	0.13347	37.87736	0.5	77.0	9.45128	17.43755
2981.5	4.51914	0.23723	0.44340	0.10519	0.55660	0.13204	38.00940	0.5	77.5	9.51730	17.51902
2982.0	4.74569	0.23938	0.42880	0.10265	0.57120	0.13673	38.14614	0.5	78.0	9.58567	17.59851
2982.5	4.82013	0.24497	0.41580	0.10186	0.58420	0.14311	38.28925	0.5	78.5	9.65722	17.67739
2983.0	4.63447	0.24871	0.41760	0.10386	0.58240	0.14485	38.43410	0.5	79.0	9.72965	17.75785
2983.5	4.58647	0.25497	0.40950	0.10441	0.59050	0.15056	38.58466	0.5	79.5	9.80493	17.83873
2984.0	4.55753	0.25102	0.41730	0.10475	0.58270	0.14627	38.73093	0.5	80.0	9.87806	17.91986
2984.5	4.57175	0.24734	0.42280	0.10458	0.57720	0.14276	38.87369	0.5	80.5	9.94944	18.00086
2985.0	4.49675	0.23619	0.44650	0.10546	0.55350	0.13073	39.00442	0.5	81.0	10.01481	18.08254
2985.5	4.29441	0.23309	0.46290	0.10790	0.53710	0.12519	39.12962	0.5	81.5	10.07740	18.16612
2986.0	4.18326	0.23367	0.46790	0.10933	0.53210	0.12434	39.25395	0.5	82.0	10.13957	18.25080
2986.5	4.06563	0.23490	0.47210	0.11090	0.52790	0.12400	39.37795	0.5	82.5	10.20157	18.33671
2987.0	4.01194	0.23201	0.48120	0.11164	0.51880	0.12037	39.49832	0.5	83.0	10.26176	18.42318
2987.5	4.11968	0.23093	0.47710	0.11018	0.52290	0.12075	39.61907	0.5	83.5	10.32213	18.50851
2988.0	4.32073	0.23279	0.46210	0.10757	0.53790	0.12522	39.74429	0.5	84.0	10.38474	18.59182
2988.5	4.42147	0.23590	0.45080	0.10634	0.54920	0.12956	39.87385	0.5	84.5	10.44952	18.67420
2989.0	4.57273	0.23553	0.44400	0.10458	0.55600	0.13095	40.00480	0.5	85.0	10.51500	18.75520
2989.5	4.67795	0.23489	0.44010	0.10338	0.55990	0.13151	40.13632	0.5	85.5	10.58076	18.83527
2990.0	4.64924	0.23476	0.44170	0.10369	0.55830	0.13107	40.26738	0.5	86.0	10.64629	18.91560
2990.5	4.62470	0.23397	0.44440	0.10398	0.55560	0.12999	40.39738	0.5	86.5	10.71129	18.99614
2991.0	4.60851	0.22913	0.45460	0.10416	0.54540	0.12497	40.52235	0.5	87.0	10.77377	19.07681
2991.5	4.29802	0.22946	0.47000	0.10785	0.53000	0.12161	40.64396	0.5	87.5	10.83458	19.16036

Log Calculations
C. T. Bates # 3

Rhodes (Yates-Upper 7R) Interval
Schlumberger Platform Express Data
(Rw = 0.05)

DEPTH	HLLD	PXND	Sw @ (Rw=0.05)	(Sw x PXDN)	Sg=(1-Sw)	PXDN x (1-Sw)	Cum PXDN x (1-Sw)	dh	Cum dh	Cum PXND x (1-Sw) x dh	Cum PXND x dh
2992.0	4.00559	0.23365	0.47820	0.11173	0.52180	0.12192	40.76588	0.5	88.0	10.89554	19.24690
2992.5	4.07767	0.24292	0.45580	0.11072	0.54420	0.13220	40.89808	0.5	88.5	10.96163	19.33268
2993.0	4.24820	0.24209	0.44810	0.10848	0.55190	0.13361	41.03169	0.5	89.0	11.02844	19.41671
2993.5	4.40003	0.22893	0.46560	0.10659	0.53440	0.12234	41.15403	0.5	89.5	11.08961	19.49928
2994.0	4.94043	0.21659	0.46450	0.10061	0.53550	0.11598	41.27001	0.5	90.0	11.14760	19.57721
2994.5	5.84676	0.19544	0.47320	0.09248	0.52680	0.10296	41.37297	0.5	90.5	11.19908	19.64884
2995.0	7.41595	0.16855	0.48720	0.08212	0.51280	0.08643	41.45940	0.5	91.0	11.24230	19.71245
2995.5	9.24304	0.14688	0.50070	0.07354	0.49930	0.07334	41.53274	0.5	91.5	11.27897	19.76943

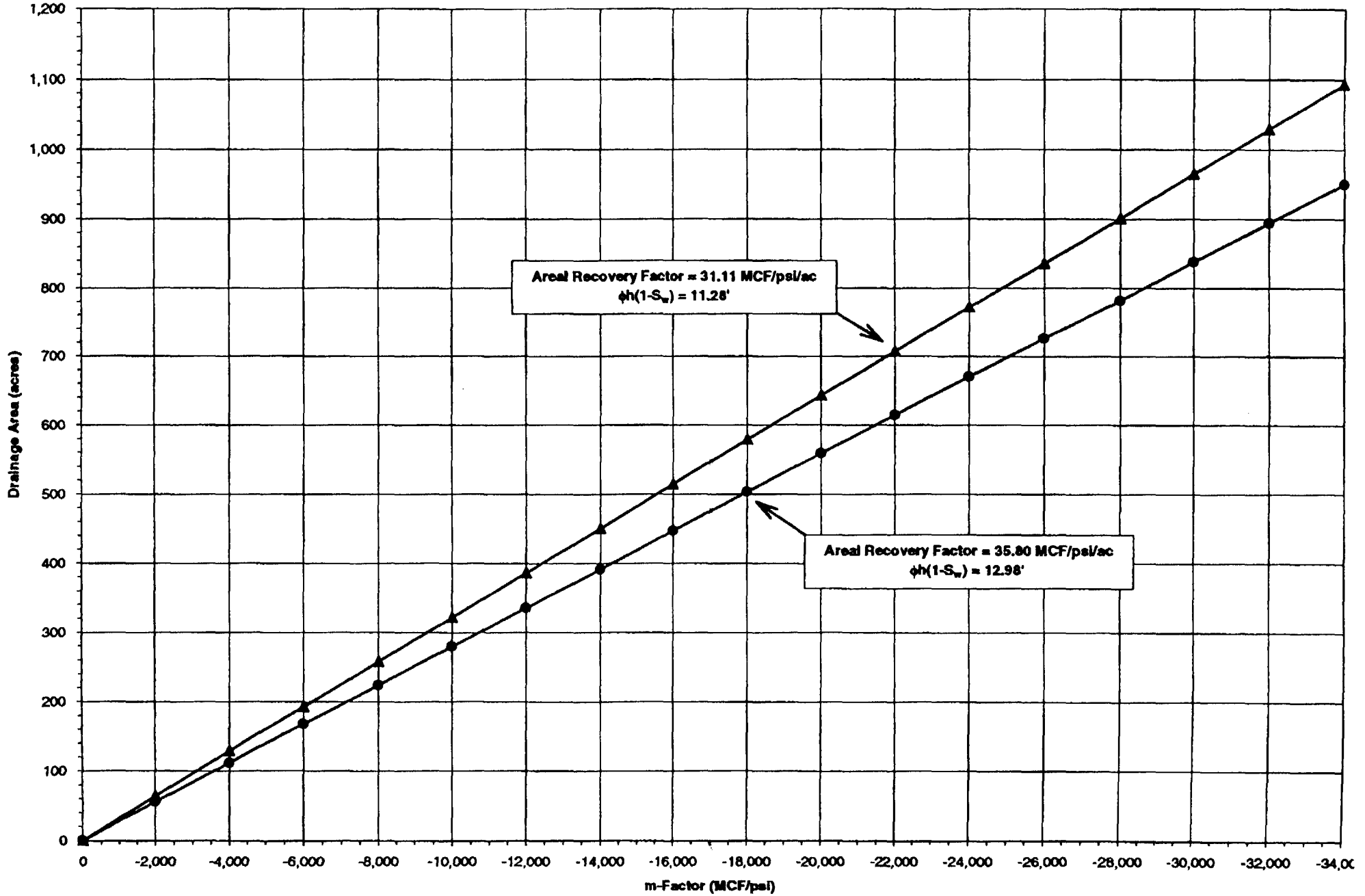
Note: **H = 91.5 ft.,** ϕ x H = 19.77, ϕ = 19.77 / 91.5, **ϕ = 21.60%**

For Rw = 0.05 : Cum ϕ x H (1-Sw) = 11.278, 1-Sw = 11.278 / 19.77, **Sw = 0.430**

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 27
CASE NOS. 12015 & 12017

Drainage Area as a Function of m-Factor (Stabilized Pressure-Cum Slope) for a Rhodes (Yates-U7R) Gas Well

(ϕ_{avg} = 21.6%, h = 91.5', S_w = 34.4% & 43.0%)



Drainage Area vs. m-Factor (Pressure - Cum. Slope) for a Rhodes (Yates-U7R) Gas Well (ϕ = 21.6 % and Sw = 34.4%)

ϕ	h (ft.)	Rw	Sw	T (°K)	Tsc (°K)	Psc (psia)	Pb (psia)	m (mcf/psi)	A (Acres)
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-2,000	56
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-4,000	112
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-6,000	168
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-8,000	223
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-10,000	279
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-12,000	335
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-14,000	391
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-16,000	447
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-18,000	503
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-20,000	559
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-22,000	615
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-24,000	670
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-26,000	726
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-28,000	782
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-30,000	838
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-32,000	894
0.216	91.5	0.03	0.344	546	520	14.7	15.025	-34,000	950

Drainage Area vs. m-Factor (Pressure - Cum. Slope)
for a Rhodes (Yates-U7R) Gas Well
(ϕ = 21.6 % and Sw = 43.0%)

ϕ	h (ft.)	Rw	Sw	T (°K)	Tsc (°K)	Psc (psia)	Pb (psia)	m (mcf/psi)	A (Acres)
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-2,000	64
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-4,000	129
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-6,000	193
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-8,000	257
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-10,000	321
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-12,000	386
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-14,000	450
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-16,000	514
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-18,000	579
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-20,000	643
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-22,000	707
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-24,000	772
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-26,000	836
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-28,000	900
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-30,000	964
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-32,000	1,029
0.216	91.5	0.03	0.430	546	520	14.7	15.025	-34,000	1,093

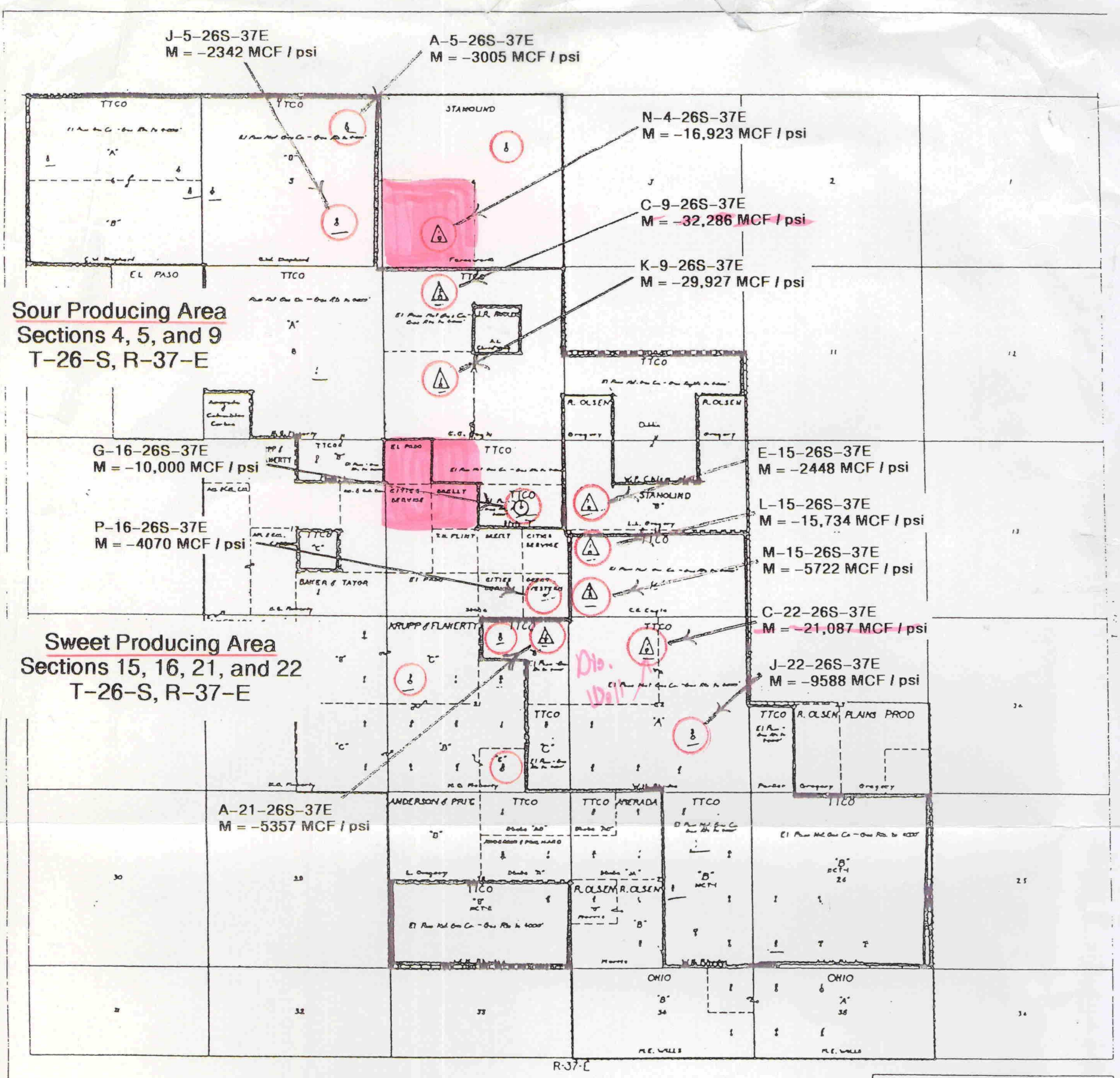
Drainage Area as a Function of m-Factor (Stabilized Pressure-Cum Slope) for a Rhodes (Yates-U7R) Gas Well

ϕ (%)	h (ft)	R_w (ohm-m)	S_w (%)	m/A: Areal Recovery Factor (MCF/psi/ac)	m: Stabilized Pressure-Cum Slope (MCF/psi)	A: Drainage Area (acres)
21.61	91.5	0.03	34.4	35.80	-34,000	949.72
21.61	91.5	0.03	34.4	35.80	-32,000	893.85
21.61	91.5	0.03	34.4	35.80	-30,000	837.99
21.61	91.5	0.03	34.4	35.80	-28,000	782.12
21.61	91.5	0.03	34.4	35.80	-26,000	726.26
21.61	91.5	0.03	34.4	35.80	-24,000	670.39
21.61	91.5	0.03	34.4	35.80	-22,000	614.53
21.61	91.5	0.03	34.4	35.80	-20,000	558.66
21.61	91.5	0.03	34.4	35.80	-18,000	502.79
21.61	91.5	0.03	34.4	35.80	-16,000	446.93
21.61	91.5	0.03	34.4	35.80	-14,000	391.06
21.61	91.5	0.03	34.4	35.80	-12,000	335.20
21.61	91.5	0.03	34.4	35.80	-10,000	279.33
21.61	91.5	0.03	34.4	35.80	-8,000	223.46
21.61	91.5	0.03	34.4	35.80	-6,000	167.60
21.61	91.5	0.03	34.4	35.80	-4,000	111.73
21.61	91.5	0.03	34.4	35.80	-2,000	55.87
21.61	91.5	0.03	34.4	35.80	0	0.00
21.61	91.5	0.05	43.0	31.11	-34,000	1,092.90
21.61	91.5	0.05	43.0	31.11	-32,000	1,028.61
21.61	91.5	0.05	43.0	31.11	-30,000	964.32
21.61	91.5	0.05	43.0	31.11	-28,000	900.03
21.61	91.5	0.05	43.0	31.11	-26,000	835.74
21.61	91.5	0.05	43.0	31.11	-24,000	771.46
21.61	91.5	0.05	43.0	31.11	-22,000	707.17
21.61	91.5	0.05	43.0	31.11	-20,000	642.88
21.61	91.5	0.05	43.0	31.11	-18,000	578.59
21.61	91.5	0.05	43.0	31.11	-16,000	514.30
21.61	91.5	0.05	43.0	31.11	-14,000	450.02
21.61	91.5	0.05	43.0	31.11	-12,000	385.73
21.61	91.5	0.05	43.0	31.11	-10,000	321.44
21.61	91.5	0.05	43.0	31.11	-8,000	257.15
21.61	91.5	0.05	43.0	31.11	-6,000	192.86
21.61	91.5	0.05	43.0	31.11	-4,000	128.58
21.61	91.5	0.05	43.0	31.11	-2,000	64.29
21.61	91.5	0.05	43.0	31.11	0	0.00

Where: A = [-m (Pressure-Cum Plot)]/[m/A (Volumetrically-Calculated)]

$$A = [-(G_2 - G_1)/(P_2 - P_1)]/[43{,}560\ (T_{sc}/P_{sc}/T)\ \phi\ h\ (1 - S_w)]$$

RHODES POOL GAS WELLS AS OF 7-11-42
SWEET AND SOUR PRODUCING AREAS



Jointly Owned by Amerada Pet. Corp., Columbian Carbon Co., & TTCo. - Operated by TTCo.

Legend

Gas Injection Well

Proposed Gas Injection Well

RHODES POOL
LEA COUNTY, NEW MEXICO
FIGURE NO. 2
OWNERSHIP MAP

FIELD BOUNDARY ——— SCALE

List of Producing Gas Wells as of 7/11/42
In the Sour and Sweet Areas of the Rhodes Pool
Sorted by Completion Date

(Cumulative Recovery as of 1/1/42: 66,531,461 MCF;
Estimated Remaining Reserves as of 1/1/42: 43,754,080 MCF;
Estimated Ultimate Recovery as of 1/1/42: 110,285,541 MCF)

Company	Well Name	Completion Date	Location	Producing Area	Cumulative Well Production to 1/1/42 (MMCF)	Individual Percentage of 1/1/42 Aggregate Cum (%)	Cumulative Percentage of 1/1/42 Aggregate Cum (%)	Individual Percentage of EUR (%)	Cumulative Percentage of EUR (%)
Texas Company	Rhodes A #1 *	10/31/27	26S-37E-22-C	Sweet	13,010	19.56	19.56	11.80	11.80
Texas Company	Cagle A #1	01/02/29	26S-37E-09-K	Sour	18,882	28.38	47.94	17.12	28.92
Texas Company	Cagle B #1	01/02/36	26S-37E-15-L	Sweet	9,454	14.21	62.15	8.57	37.49
Texas Company	Shepherd B #3	04/07/36	26S-37E-05-A	Sour	849	1.28	63.42	0.77	38.26
Texas Company	Rhodes A #2	06/21/37	26S-37E-22-J	Sweet	3,032	4.56	67.98	2.75	41.01
Texas Company	Shepherd B #4	06/25/37	26S-37E-05-J	Sour	1,025	1.54	69.52	0.93	41.94
Western Gas Co.	State A #1	11/01/37	26S-37E-16-P	Sweet	2,611	3.92	73.44	2.37	44.31
Texas Company	Cagle B #2	01/19/38	26S-37E-15-M	Sweet	2,291	3.44	76.89	2.08	46.38
Texas Company	Moberly B #1	02/26/38	26S-37E-21-A	Sweet	2,194	3.30	80.19	1.99	48.37
Texas Company	Cagle A #2	07/14/38	26S-37E-09-C	Sour	7,236	10.88	91.06	6.56	54.93
Stanolind Oil Co.	Gregory B #1	06/10/39	26S-37E-15-E	Sweet	945	1.42	92.48	0.86	55.79
Stanolind Oil Co.	Farnsworth C #1	10/13/39	26S-37E-04-N	Sour	1,440	2.16	94.65	1.31	57.10
Stanolind Oil Co.	Farnsworth C #2	12/19/39	26S-37E-04-G	Sour	2,043	3.07	97.72	1.85	58.95
Texas Company	State Y #1	02/03/40	26S-37E-16-G	Sweet	1,469	2.21	99.92	1.33	60.28
Texas Company	Moberly B #2	10/11/41	26S-37E-21-B	Sweet	50	0.08	100.00	0.05	60.33
Krupp & Flaherty	Moberly C #2	02/04/42	26S-37E-21-O	Sweet	0	0.00	100.00	0.00	60.33
Krupp & Flaherty	Moberly C #3	07/11/42	26S-37E-21-E	Sweet	0	0.00	100.00	0.00	60.33
Total:					66,531				

* First Production: 6/8/29

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 28
CASE NOS. 12015 & 12017

MAXIMUM DRAINAGE AREA OF PRODUCING GAS WELLS AS OF 7-11-42
IN THE SWEET AND SOUR PRODUCING AREAS OF THE RHODES POOL
(SORTED BY WELL COMPLETION DATE)

COMPANY	WELL NAME	LOCATION	PRODUCING AREA	COMPLETION DATE	INITIAL PRESSURE (psi)	INITIAL POTENTIAL (MCFPD)	CUM. PROD. TO 1-1-42 (MMCF)	MAX. P/Z SLOPE (MCF/psi)	DRAINAGE AREA @ARF = 35.8 MCF/psi/ac. (acres)
Texas Company	Rhodes A-1*	26-37-22-C	Sweet	10-31-27	1,400	23,000	13,010,417	-21,087	589
Texas Company	Cagle A-1	26-37-9-K	Sour	01-02-29	1 400	55,000	18,881,926	-29,927	836
Texas Company	Cagle B-1	26-37-15-L	Sweet	01-02-36	1,175	34,483	9,454,105	-15,734	439
Texas Company	Shepherd B-3	26-37-5-A	Sour	04-07-36	1,160	10,000	848,973	-3,005	84
Texas Company	Rhodes A-2	26-37-22-J	Sweet	06-21-37	920	25,000	3,031,868	-9,588	268
Texas Company	Shepherd B-4	26-37-5-J	Sour	06-25-37	1,240	8,500	1,025,372	-2,342	65
Western Gas Co.	State A-1	26-37-16-P	Sweet	11-01-37	1,000	50,000	2,611,043	-4,070	1141
Texas Company	Cagle B-2	26-37-15-M	Sweet	01-19-38	876	5,120	2,291,053	-5,722	160
Texas Company	Moberly B-1	26-37-21-A	Sweet	02-26-38	1,050	19,500	2,194,092	-5,357	150
Texas Company	Cagle A-2	26-37-9-C	Sour	07-14-38	840	50,000	7,236,171	-32,286	902
Stanolind	Gregory B-1	26-37-15-E	Sweet	06-10-39	925	4,000	944,737	-2,448	68
Stanolind	Farnsworth C-1	26-37-4-N	Sour	10-13-39	1,010	1,500	1,439,702	-16,923	473
Stanolind	Farnsworth C-2	26-37-4-G	Sour	12-19-39		12,004	2,043,240	-----	-----
Texas Company	State Y-1	26-37-16-H	Sweet	02-03-40	850	14,138	1,468,509	-10,000	279
Texas Company	Moberly B-2	26-37-21-B	Sweet	10-11-41	515	1,940	50,253	-----	-----
Krupp & Flaherty	Moberly C-2	26-37-21-O	Sweet	02-04-42	570	6,700	-0-	-----	-----
Krupp & Flaherty	Moberly C-3	26-37-21-E	Sweet	07-11-42	570	6,770	-0-	-----	-----
TOTAL/AVG.							66,581,461		341

on: 6-8-29.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 29
CASE NOS. 12015 & 12017

LIST OF PRODUCING GAS WELLS
IN RHODES POOL **SWEET GAS** AREA SHOWING
ACCUMULATED PRODUCTION TO JANUARY 1, 1942

Company	Well Name	Location	Completion Date	Initial Pressure	Initial Potential (MCFPD)	Acc. Prod. to 1-1-42 (MCF)
Texas Company	Cagle B-1	L-15-26-37	1-2-36	1 175	34,483	9,454,105
Texas Company	Cagle B-2	M-15-26-37	1-19-38	876	5,120	2,291,053
Texas Company	Moberly B-1	A-21-26-37	2-26-38	1,050	19,500	2,194,092
Texas Company	Moberly B-2	B-21-26-37	10-11-41	515	1,940	50,253
Texas Company	Rhodes A-1*	C-22-26-37	10-31-27	1,400	23,000	13,010,417
Texas Company	Rhodes A-2	J-22-26-37	6-21-37	920	25,000	3,031,868
Stanolind	Gregory B-1	E-15-26-37	6-10-39	925	4,000	944,737
Texas Company	State Y-1	G-16-26-37	2-3-40	850	14,138	1,468,509
Western Gas Co.	State A-1	P-16-26-37	11-1-37	1,000	50,000	2,611,043
Krupp & Flaherty	Moberly C-2	O-21-26-37	2-4-42	570	6,700	(Shut in) -0-
Krupp & Flaherty	Moberly C-3	E-21-26-37	7-11-42	570	6,770	(Shut in) -0-
TOTAL						35,056,077

LIST OF PRODUCING GAS WELLS
IN RHODES POOL **SOUR GAS** AREA SHOWING
ACCUMULATED PRODUCTION TO JANUARY 1, 1942

Company	Well Name	Location	Completion Date	Initial Pressure	Initial Potential (MCFPD)	Acc. Prod. to 1-1-42 (MCF)
Texas Company	Cagle A-1	K-9-26-37	1-2-29	1 400	55,000	18,881,926
Texas Company	Cagle A-2	C-9-26-37	7-14-38	840	50,000	7,236,171
Texas Company	Shepherd B-3	A-5-26-37	4-7-36	1,160	10,000	848,973
Texas Company	Shepherd B-4	J-5-26-37	6-25-37	1,240	8,500	1,025,372
Stanolind	Farnsworth C-1	N-4-26-37	10-13-39	1,010	1,500	1,439,702
Stanolind	Farnsworth C-2	G-4-26-37	12-19-39		12,004	2,043,240
TOTAL						31,525,384

List of Producing Gas Wells as of 7/11/42
In the Sour and Sweet Areas of the Rhodes Pool
Sorted by Maximum P/z Slope

Company	Well Name	Completion Date	Location	Producing Area	Completion Pressure (psi)	Initial Well Potential (MCFPD)	Cumulative Well Production to 1/1/42 (MMCF)	Individual Percentage of 1/1/42 Aggregate Cum (%)	Cumulative Percentage of 1/1/42 Aggregate Cum (%)	Maximum P/z Slope (MCF/psi)
Texas Company	Cagle A #2	07/14/38	26S-37E-09-C	Sour	840	50,000	7,236	10.88	10.88	-32,286
Texas Company	Cagle A #1	01/02/29	26S-37E-09-K	Sour	1,400	55,000	18,882	28.38	39.26	-29,927
Texas Company	Rhodes A #1 *	10/31/27	26S-37E-22-C	Sweet	1,400	23,000	13,010	19.56	58.81	-21,087
Stanolind Oil Co.	Farnsworth C #1	10/13/39	26S-37E-04-N	Sour	1,010	1,500	1,440	2.16	60.98	-16,923
Texas Company	Cagle B #1	01/02/36	26S-37E-15-L	Sweet	1,175	34,483	9,454	14.21	75.19	-15,734
Texas Company	State Y #1	02/03/40	26S-37E-16-G	Sweet	850	14,138	1,469	2.21	77.39	-10,000
Texas Company	Rhodes A #2	06/21/37	26S-37E-22-J	Sweet	920	25,000	3,032	4.56	81.95	-9,588
Texas Company	Cagle B #2	01/19/38	26S-37E-15-M	Sweet	876	5,120	2,291	3.44	85.39	-5,722
Texas Company	Moberly B #1	02/26/38	26S-37E-21-A	Sweet	1,050	19,500	2,194	3.30	88.69	-5,357
Western Gas Co.	State A #1	11/01/37	26S-37E-16-P	Sweet	1,000	50,000	2,611	3.92	92.62	-4,070
Texas Company	Shepherd B #3	04/07/36	26S-37E-05-A	Sour	1,160	10,000	849	1.28	93.89	-3,005
Stanolind Oil Co.	Gregory B #1	06/10/39	26S-37E-15-E	Sweet	925	4,000	945	1.42	95.31	-2,448
Texas Company	Shepherd B #4	06/25/37	26S-37E-05-J	Sour	1,240	8,500	1,025	1.54	96.85	-2,342
Stanolind Oil Co.	Farnsworth C #2	12/19/39	26S-37E-04-G	Sour		12,004	2,043	3.07	99.92	
Texas Company	Moberly B #2	10/11/41	26S-37E-21-B	Sweet	515	1,940	50	0.08	100.00	
Krupp & Flaherty	Moberly C #2	02/04/42	26S-37E-21-O	Sweet	570	6,700	0	0.00	100.00	
Krupp & Flaherty	Moberly C #3	07/11/42	26S-37E-21-E	Sweet	570	6,770	0	0.00	100.00	
Total:							**66,531**			

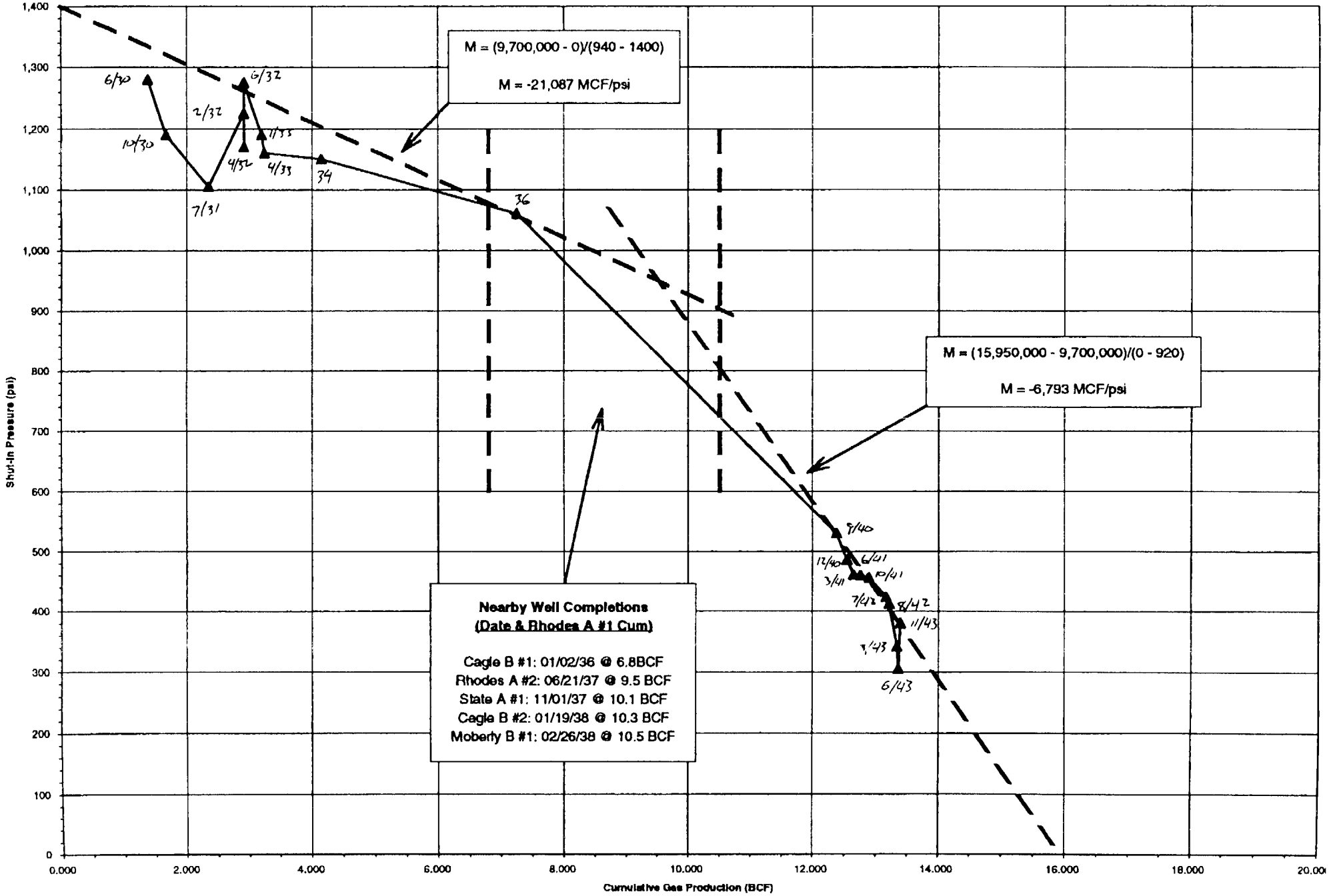
* First Production: 6/8/29

List of Producing Gas Wells as of 7/11/42
In the Sour and Sweet Areas of the Rhodes Pool
Sorted by Cumulative Well Production

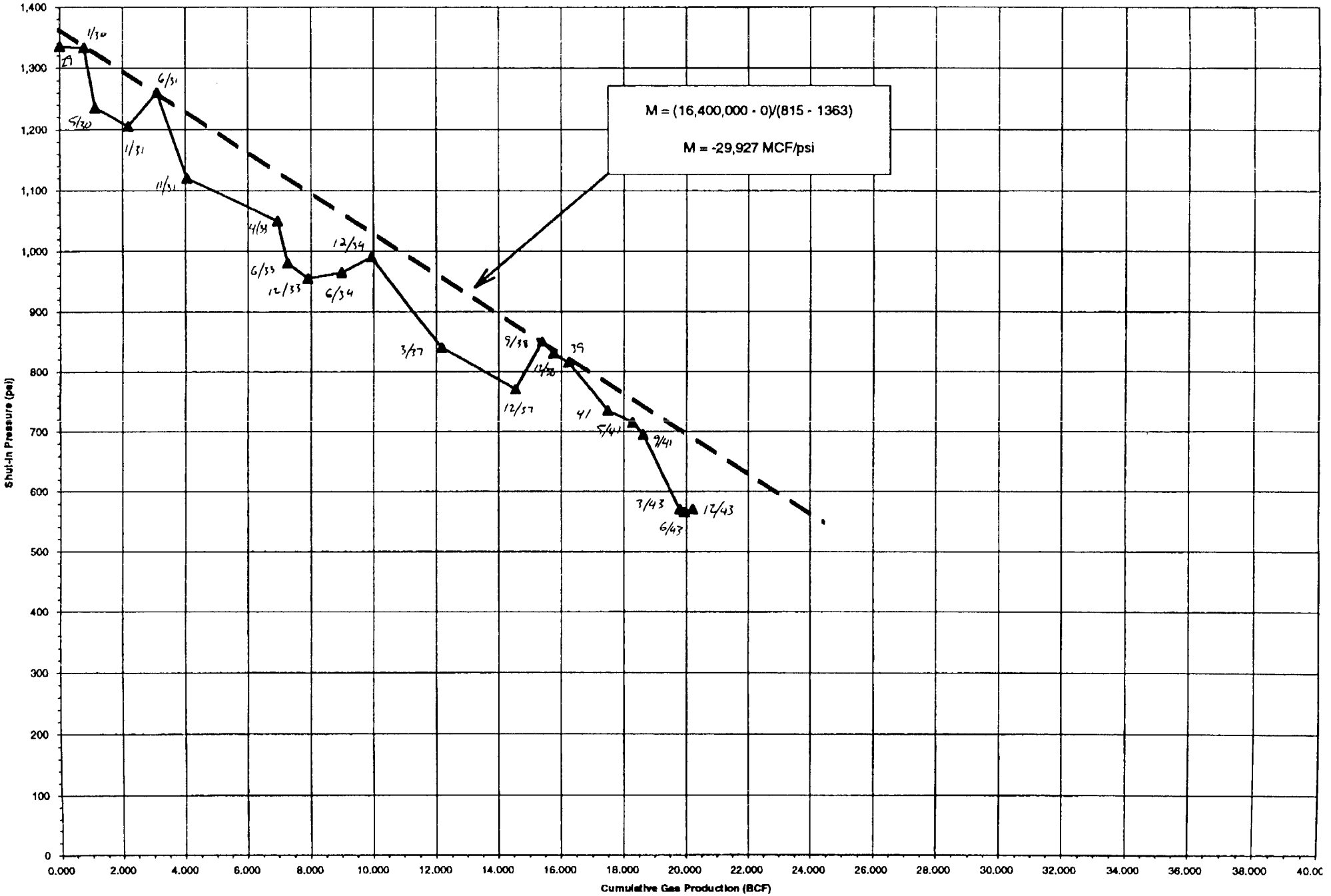
Company	Well Name	Completion Date	Location	Producing Area	Completion Pressure (psi)	Initial Well Potential (MCFPD)	Cumulative Well Production to 1/1/42 (MMCF)	Individual Percentage of 1/1/42 Aggregate Cum (%)	Cumulative Percentage of 1/1/42 Aggregate Cum (%)	Maximum P/z Slope (MCF/psi)
Texas Company	Cagle A #1	01/02/29	26S-37E-09-K	Sour	1,400	55,000	18,882	28.38	28.38	-29,927
Texas Company	Rhodes A #1 *	10/31/27	26S-37E-22-C	Sweet	1,400	23,000	13,010	19.56	47.94	-21,087
Texas Company	Cagle B #1	01/02/36	26S-37E-15-L	Sweet	1,175	34,483	9,454	14.21	62.15	-15,734
Texas Company	Cagle A #2	07/14/38	26S-37E-09-C	Sour	840	50,000	7,236	10.88	73.02	-32,286
Texas Company	Rhodes A #2	06/21/37	26S-37E-22-J	Sweet	920	25,000	3,032	4.56	77.58	-9,588
Western Gas Co.	State A #1	11/01/37	26S-37E-16-P	Sweet	1,000	50,000	2,611	3.92	81.50	-4,070
Texas Company	Cagle B #2	01/19/38	26S-37E-15-M	Sweet	876	5,120	2,291	3.44	84.95	-5,722
Texas Company	Moberly B #1	02/26/38	26S-37E-21-A	Sweet	1,050	19,500	2,194	3.30	88.24	-5,357
Stanolind Oil Co.	Farnsworth C #2	12/19/39	26S-37E-04-G	Sour		12,004	2,043	3.07	91.32	
Texas Company	State Y #1	02/03/40	26S-37E-16-G	Sweet	850	14,138	1,469	2.21	93.52	-10,000
Stanolind Oil Co.	Farnsworth C #1	10/13/39	26S-37E-04-N	Sour	1,010	1,500	1,440	2.16	95.69	-16,923
Texas Company	Shepherd B #4	06/25/37	26S-37E-05-J	Sour	1,240	8,500	1,025	1.54	97.23	-2,342
Stanolind Oil Co.	Gregory B #1	06/10/39	26S-37E-15-E	Sweet	925	4,000	945	1.42	98.65	-2,448
Texas Company	Shepherd B #3	04/07/36	26S-37E-05-A	Sour	1,160	10,000	849	1.28	99.92	-3,005
Texas Company	Moberly B #2	10/11/41	26S-37E-21-B	Sweet	515	1,940	50	0.08	100.00	
Krupp & Flaherty	Moberly C #2	02/04/42	26S-37E-21-O	Sweet	570	6,700	0	0.00	100.00	
Krupp & Flaherty	Moberly C #3	07/11/42	26S-37E-21-E	Sweet	570	6,770	0	0.00	100.00	
Total:							**66,531**			

* First Production: 6/8/29

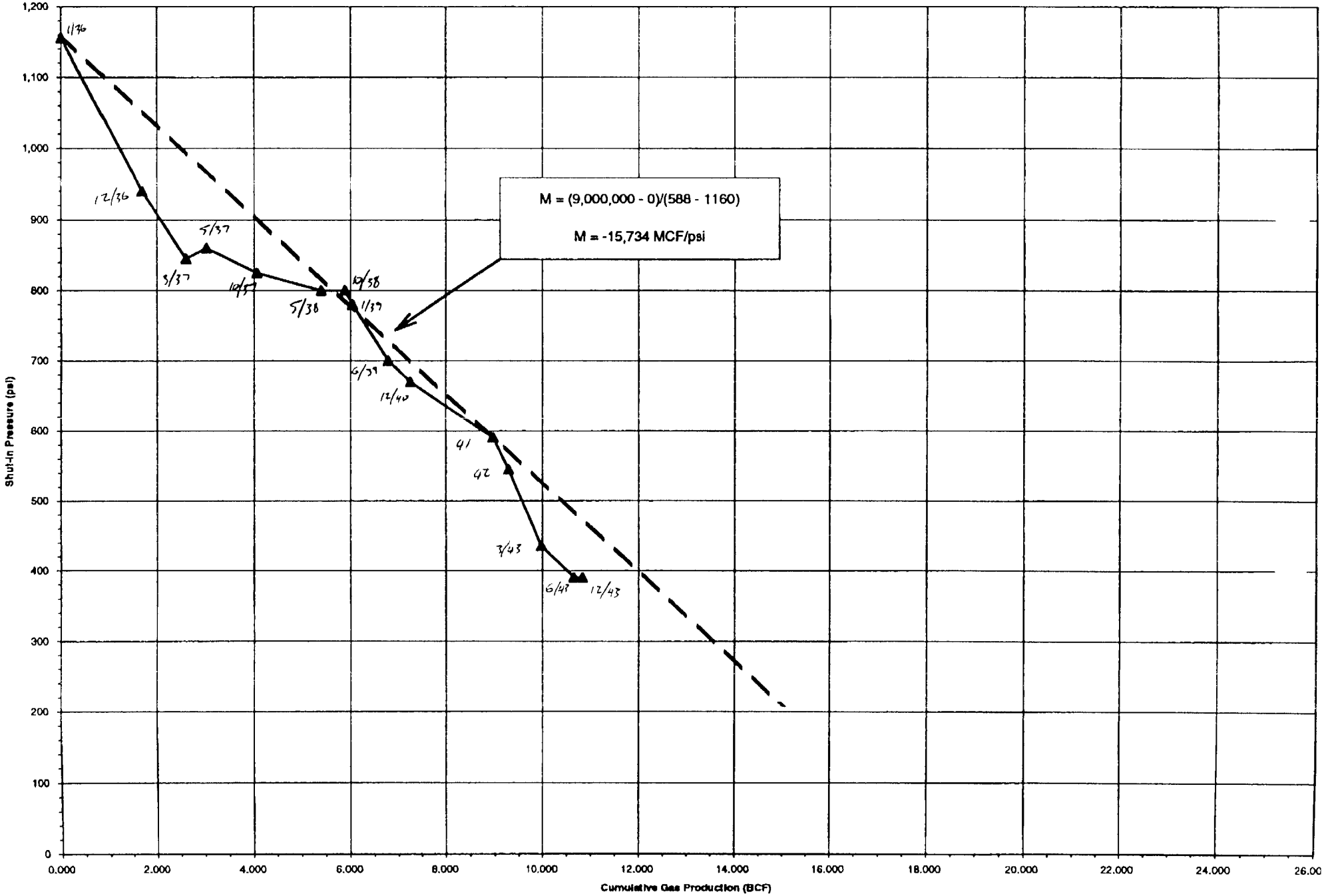
Rhodes A No. 1 (Rhodes Pool Discovery Well)
Rhodes (Yates-Seven Rivers) Gas Pool
C-22-26S-37E
Texas Company



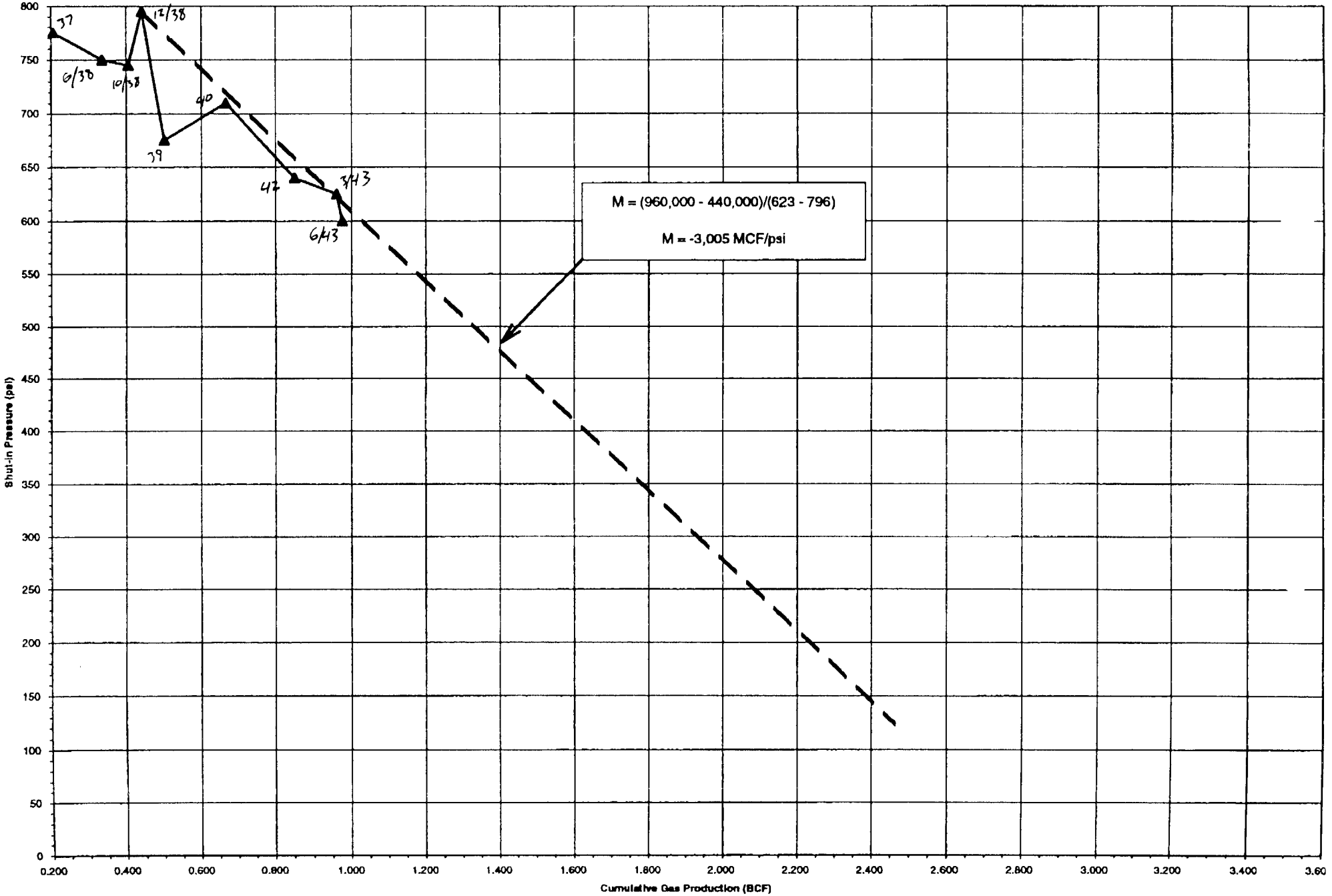
Cagle A No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
K-09-26S-37E
Texas Company



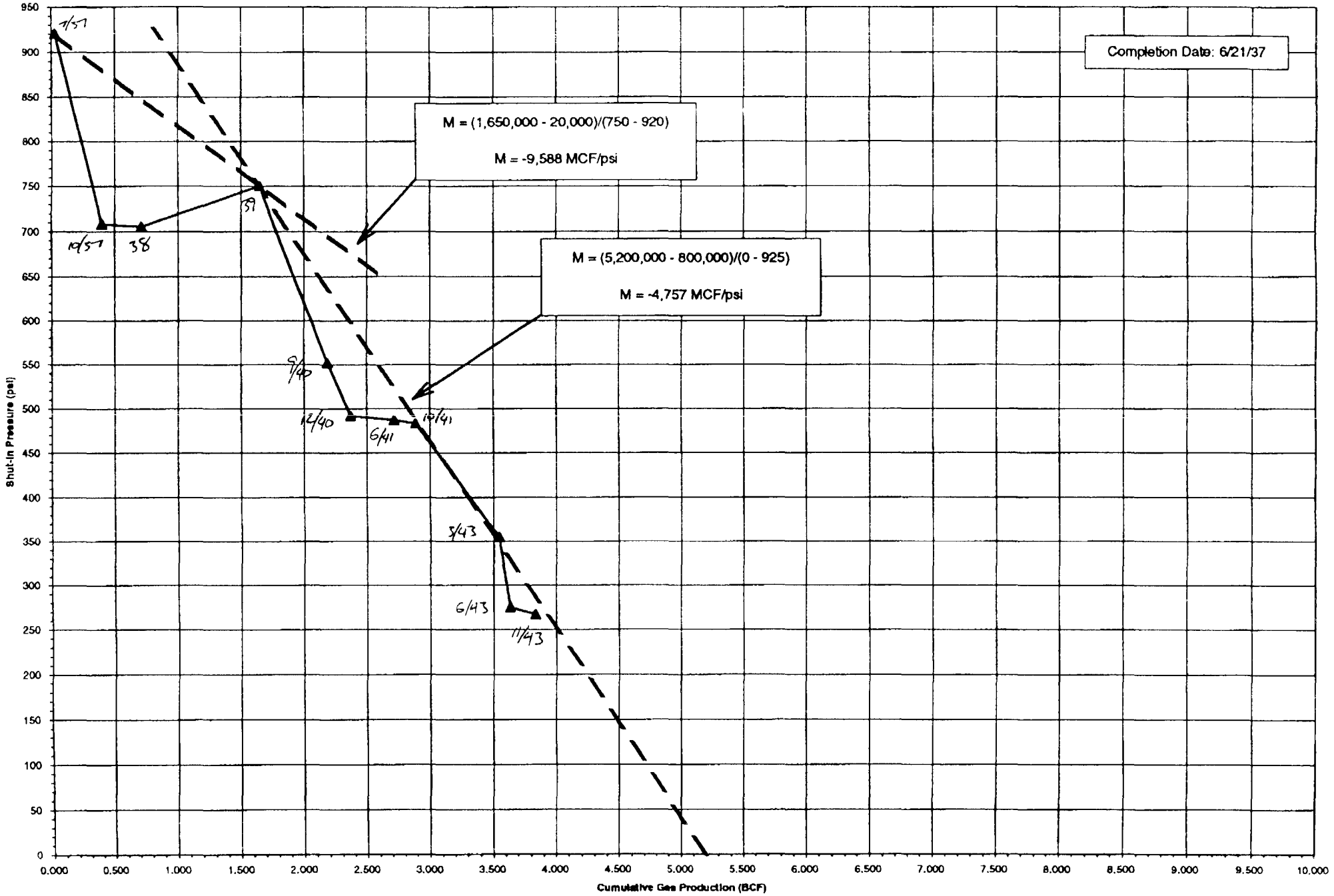
Cagle B No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
L-15-26S-37E
Texas Company



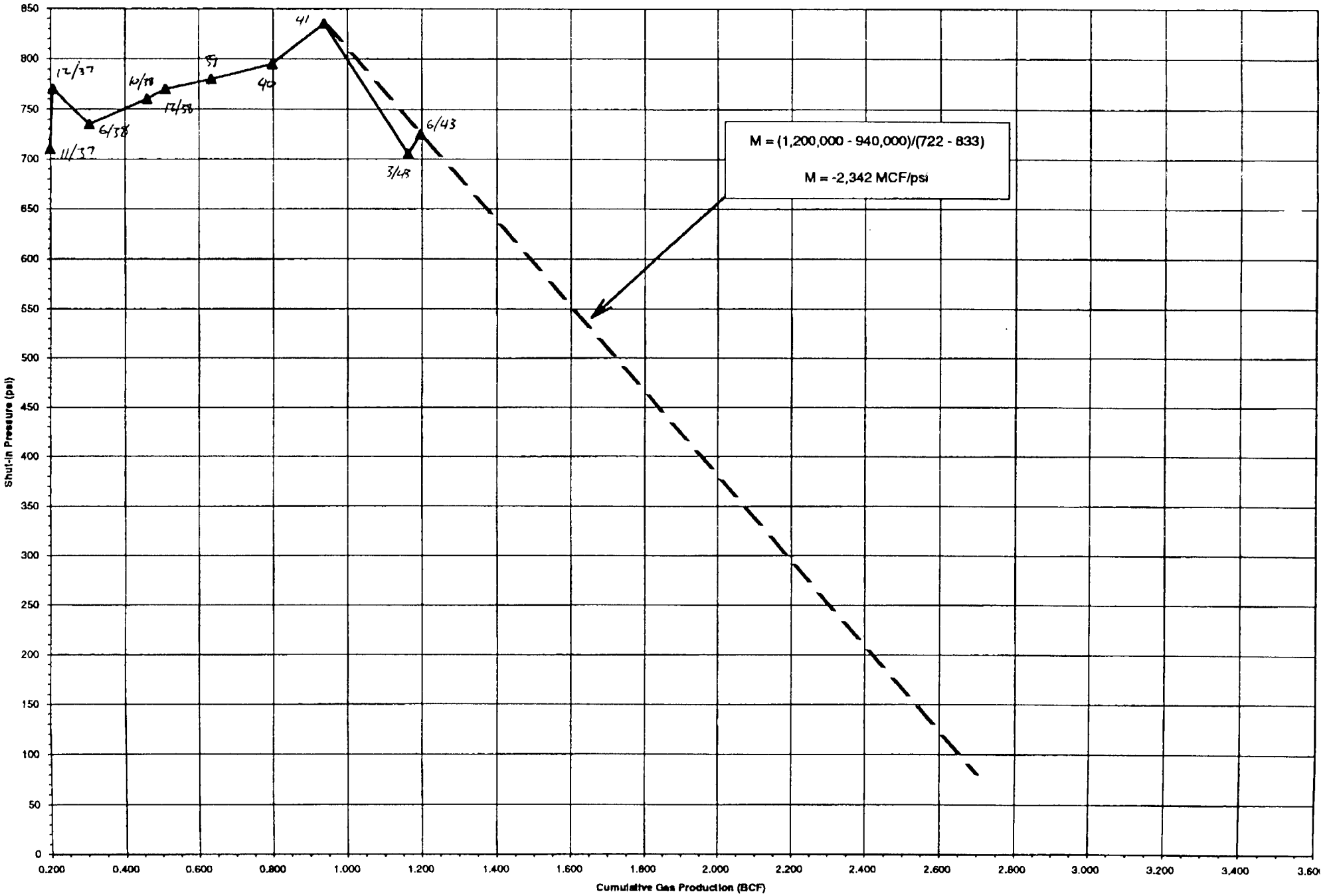
Shepherd B No. 3
Rhodes (Yates-Seven Rivers) Gas Pool
A-5-26S-37E
Texas Company



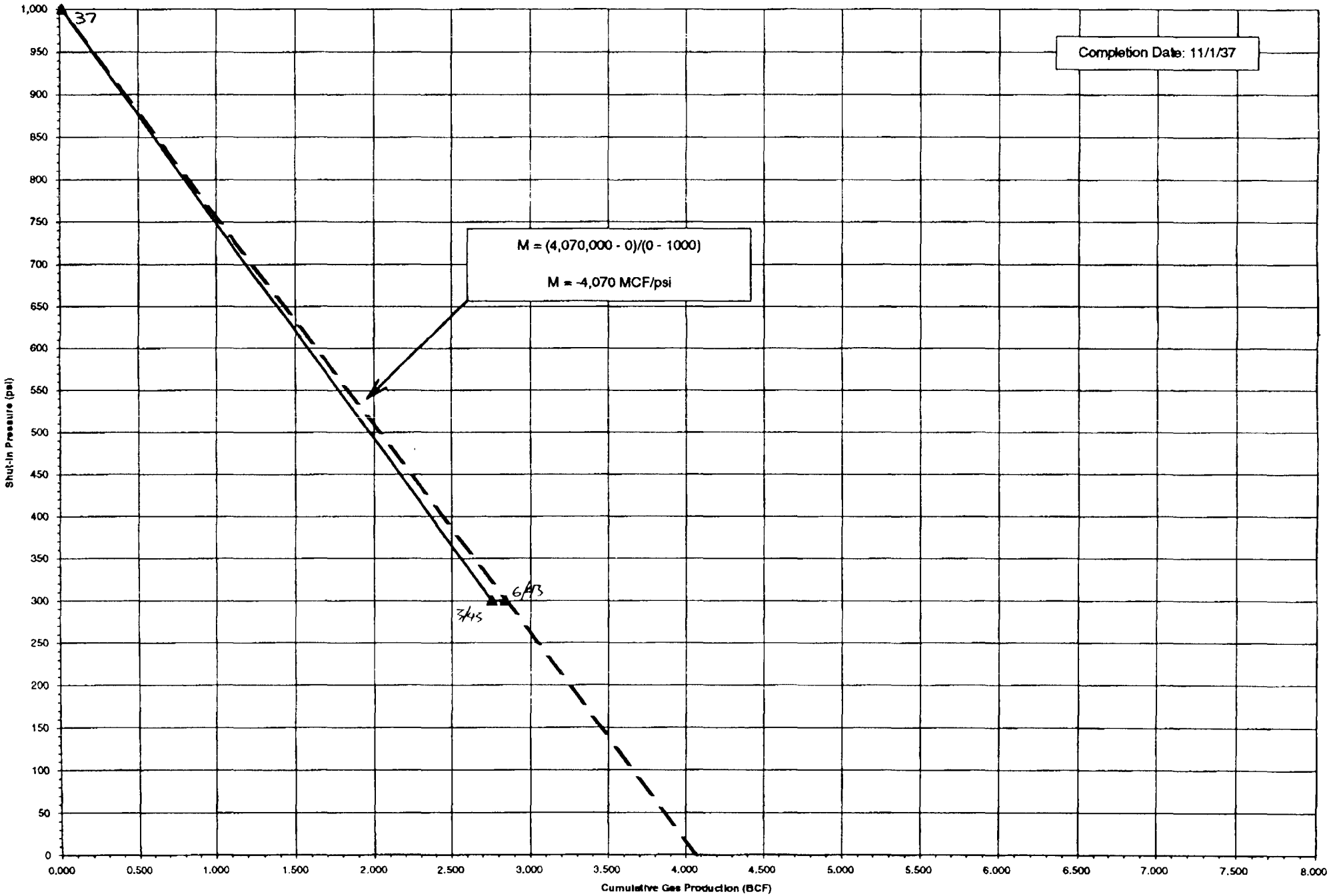
Rhodes A No. 2
Rhodes (Yates-Seven Rivers) Gas Pool
J-22-26S-37E
Texas Company



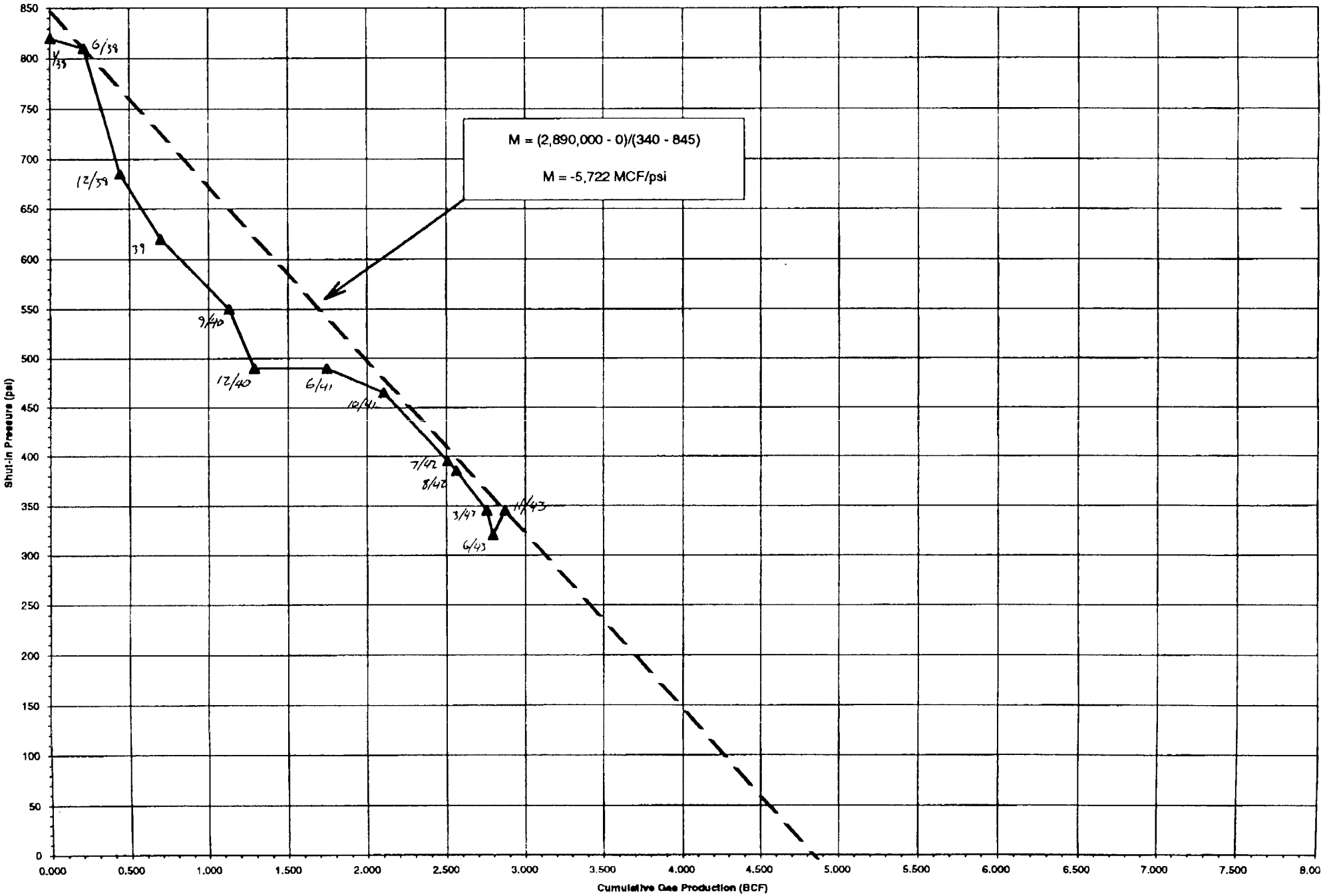
Shepherd B No. 4
Rhodes (Yates-Seven Rivers) Gas Pool
J-5-26S-37E
Texas Company



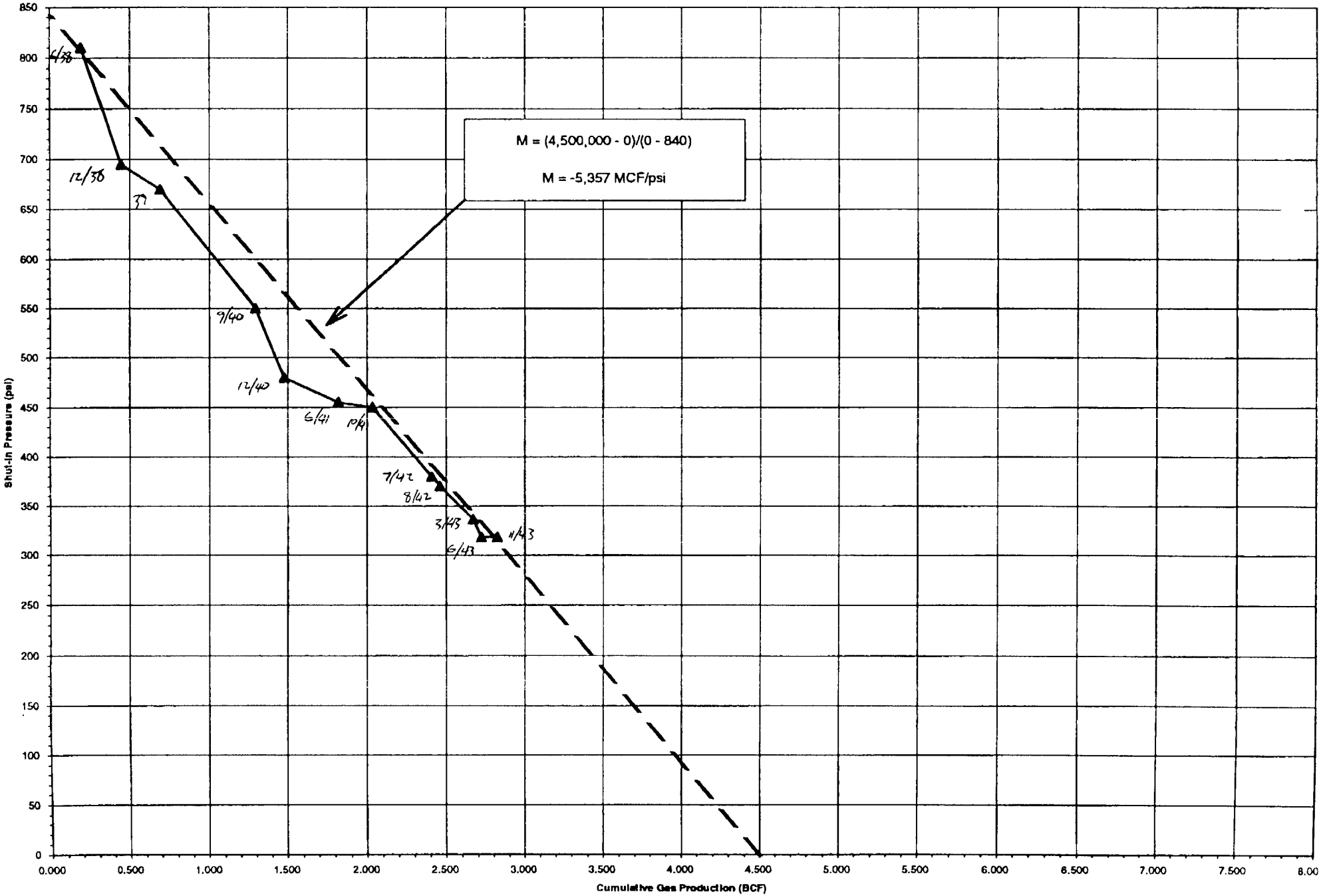
State A No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
P-16-26S-37E
Great Western Prod. Inc.



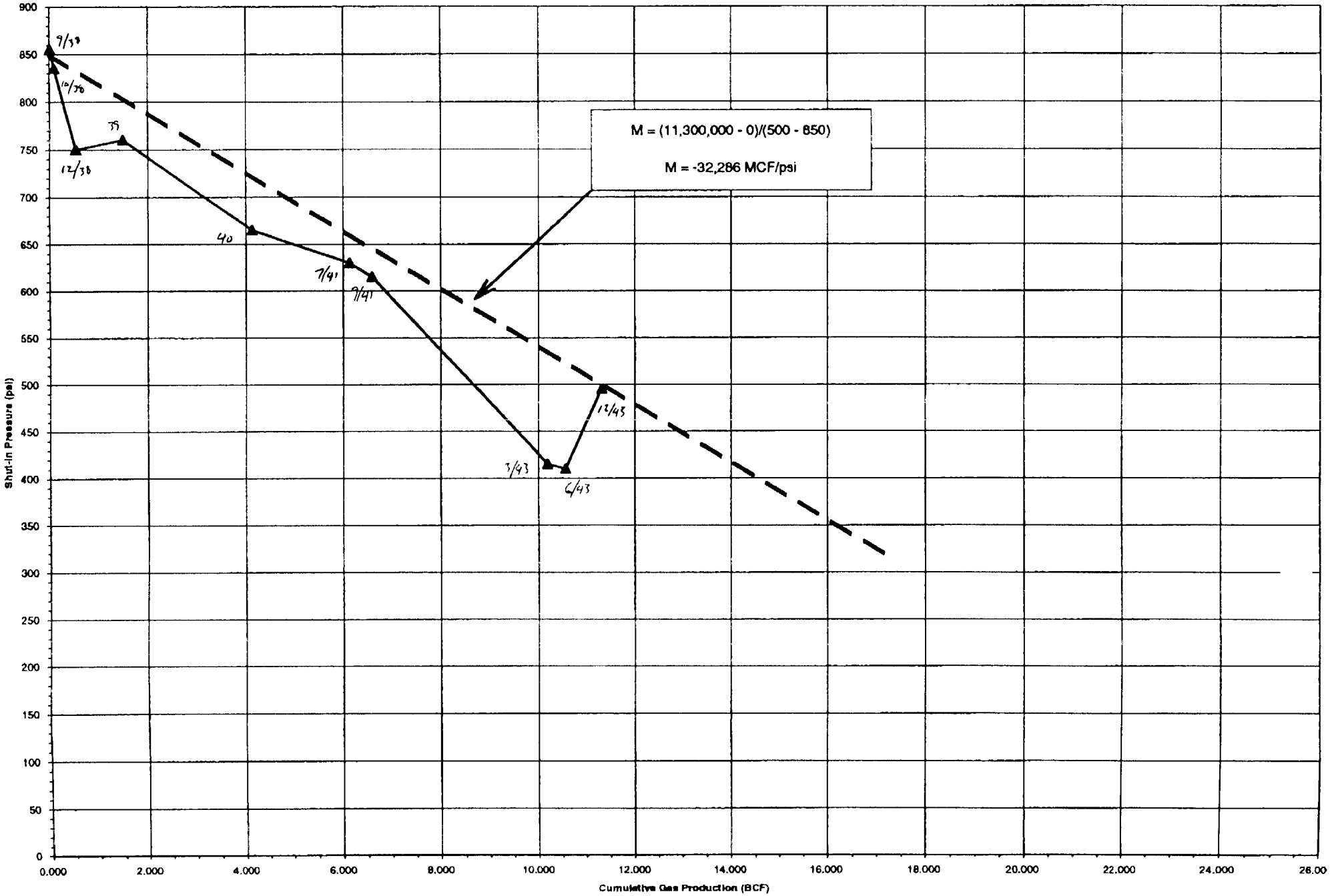
Cagle B No. 2
Rhodes (Yates-Seven Rivers) Gas Pool
M-15-26S-37E
Texas Company



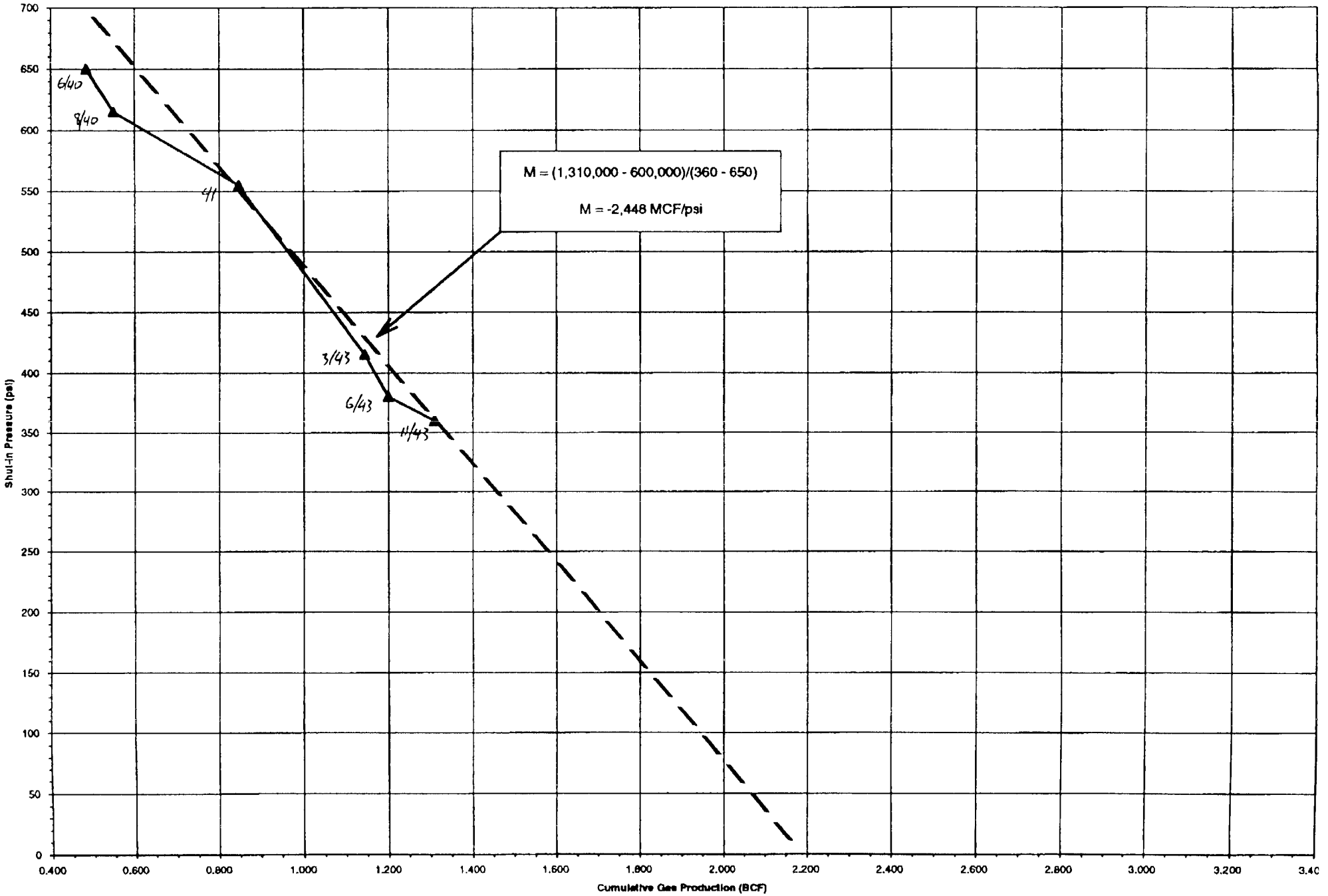
Moberly B No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
A-21-26S-37E
Texas Company



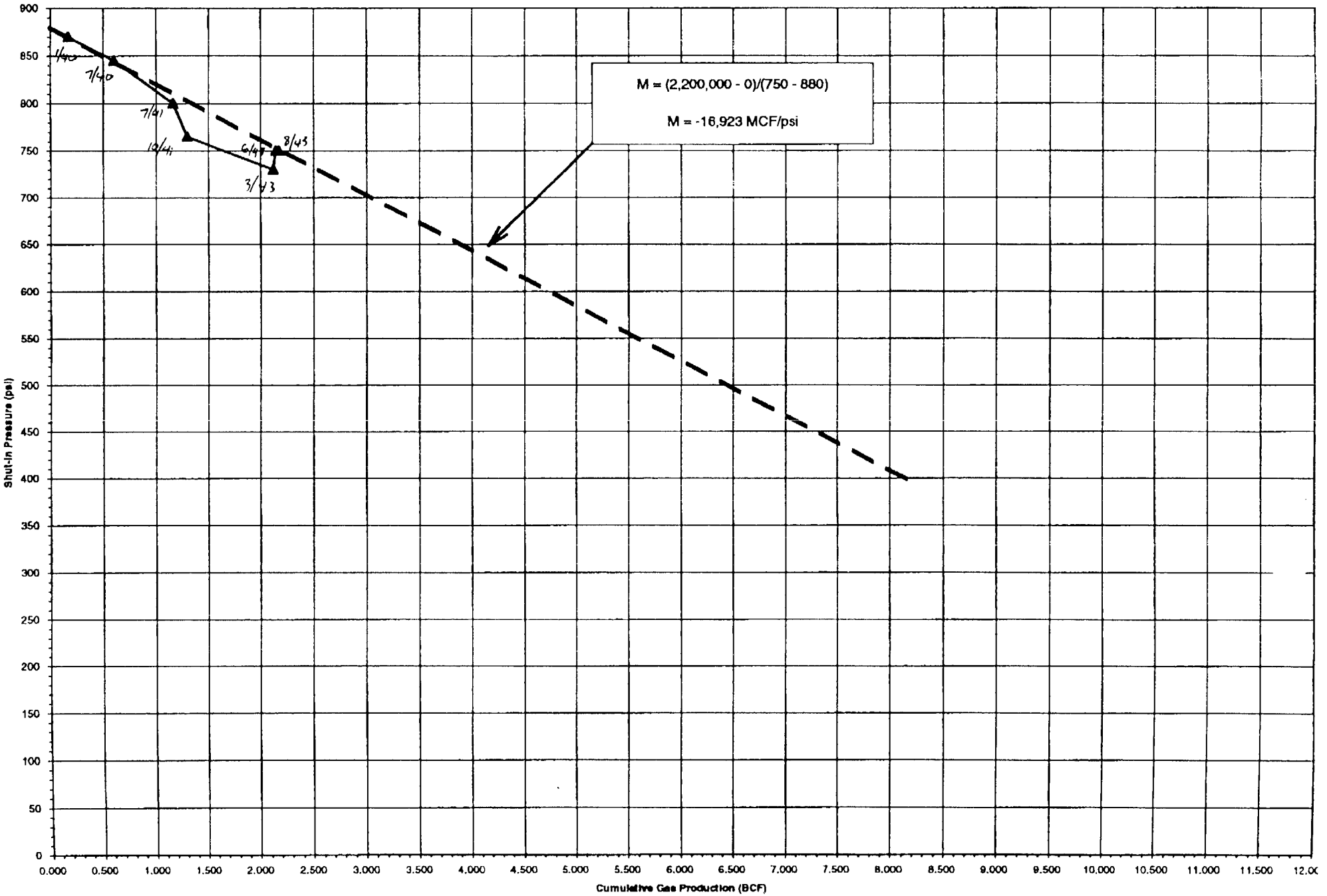
Cagle A No. 2
Rhodes (Yates-Seven Rivers) Gas Pool
C-09-26S-37E
Texas Company



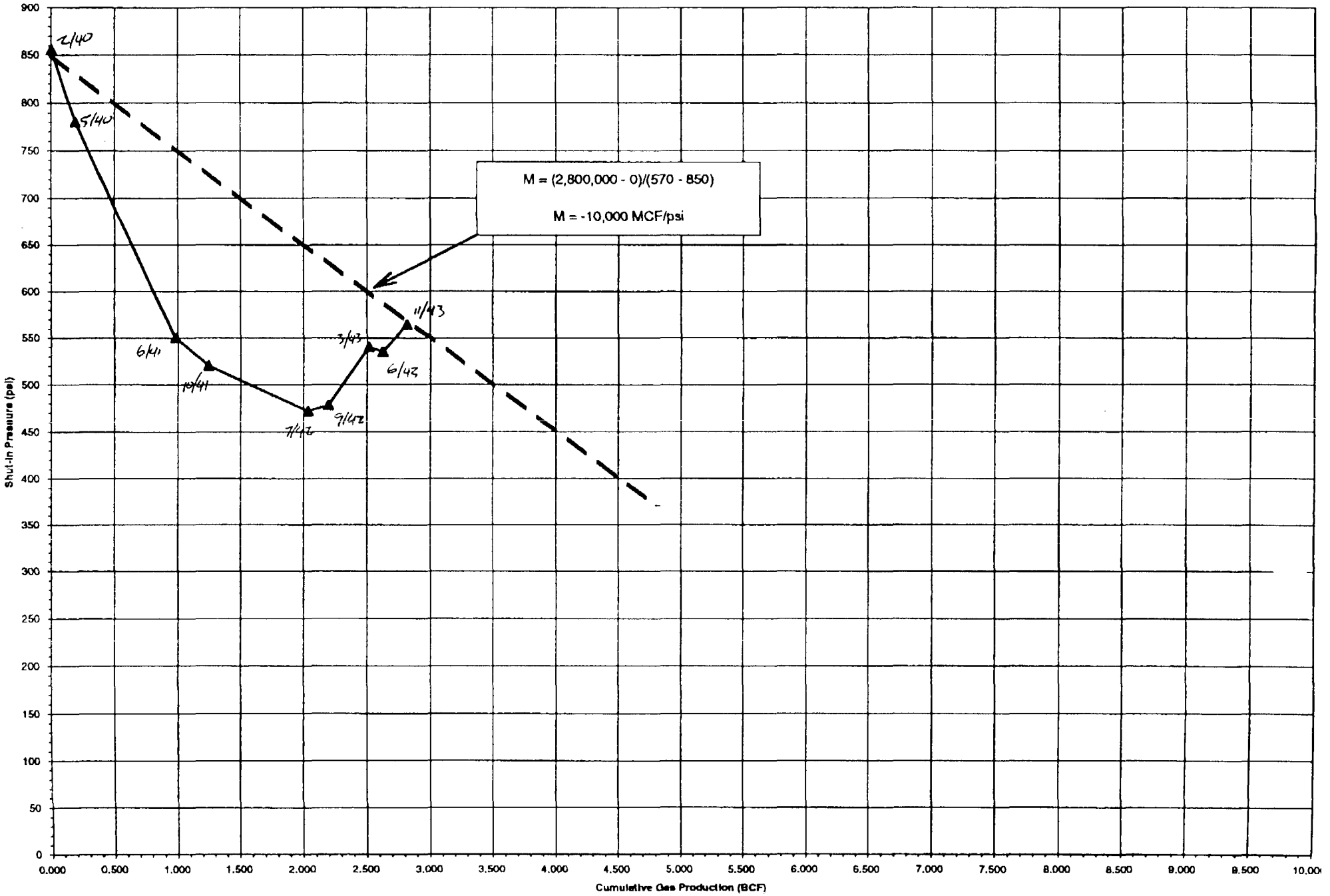
Gregory B No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
E-15-26S-37E
Stanolind Oil Company

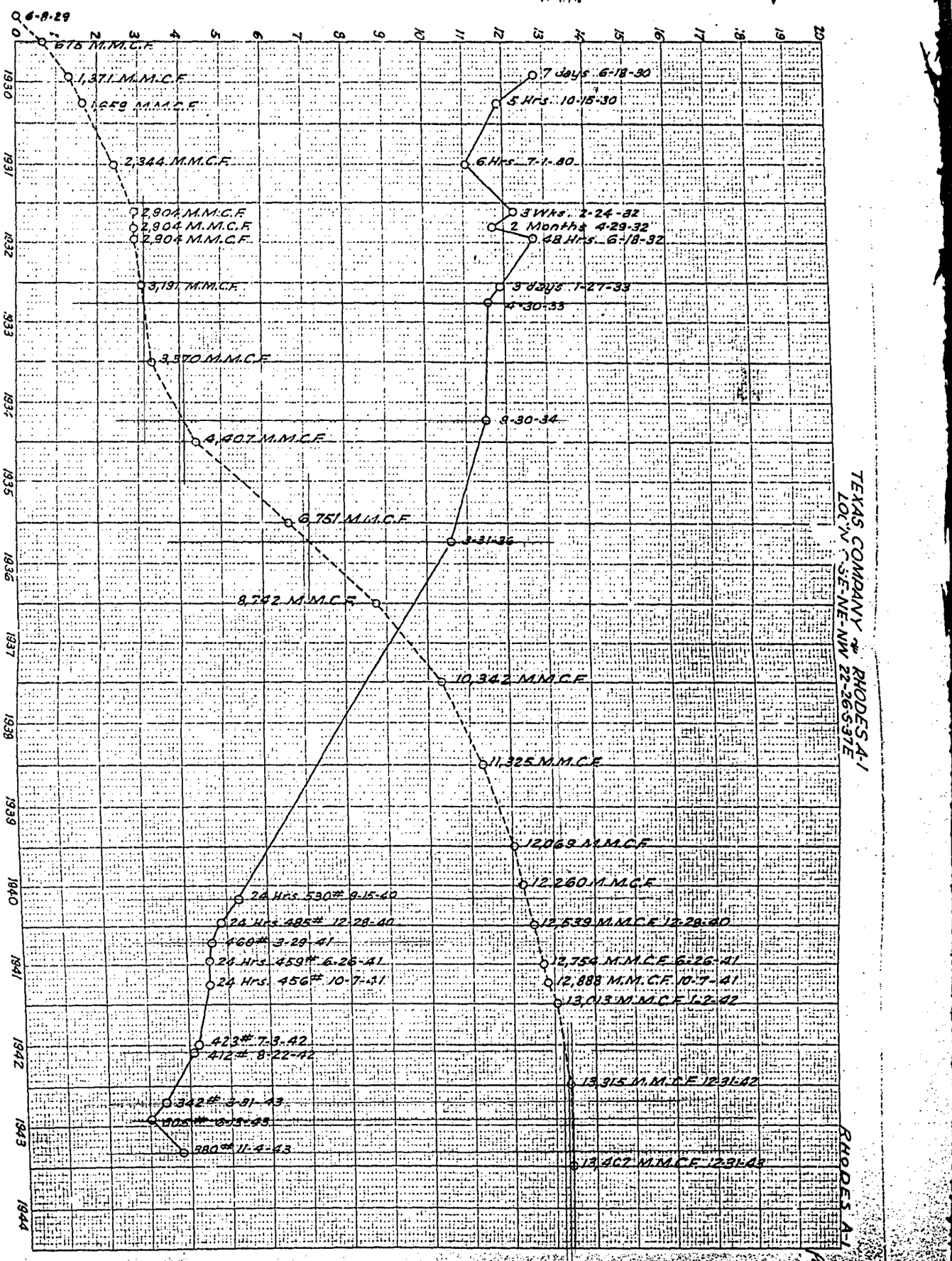


Farnsworth C No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
N-04-26S-37E
Stanolind Oil Company



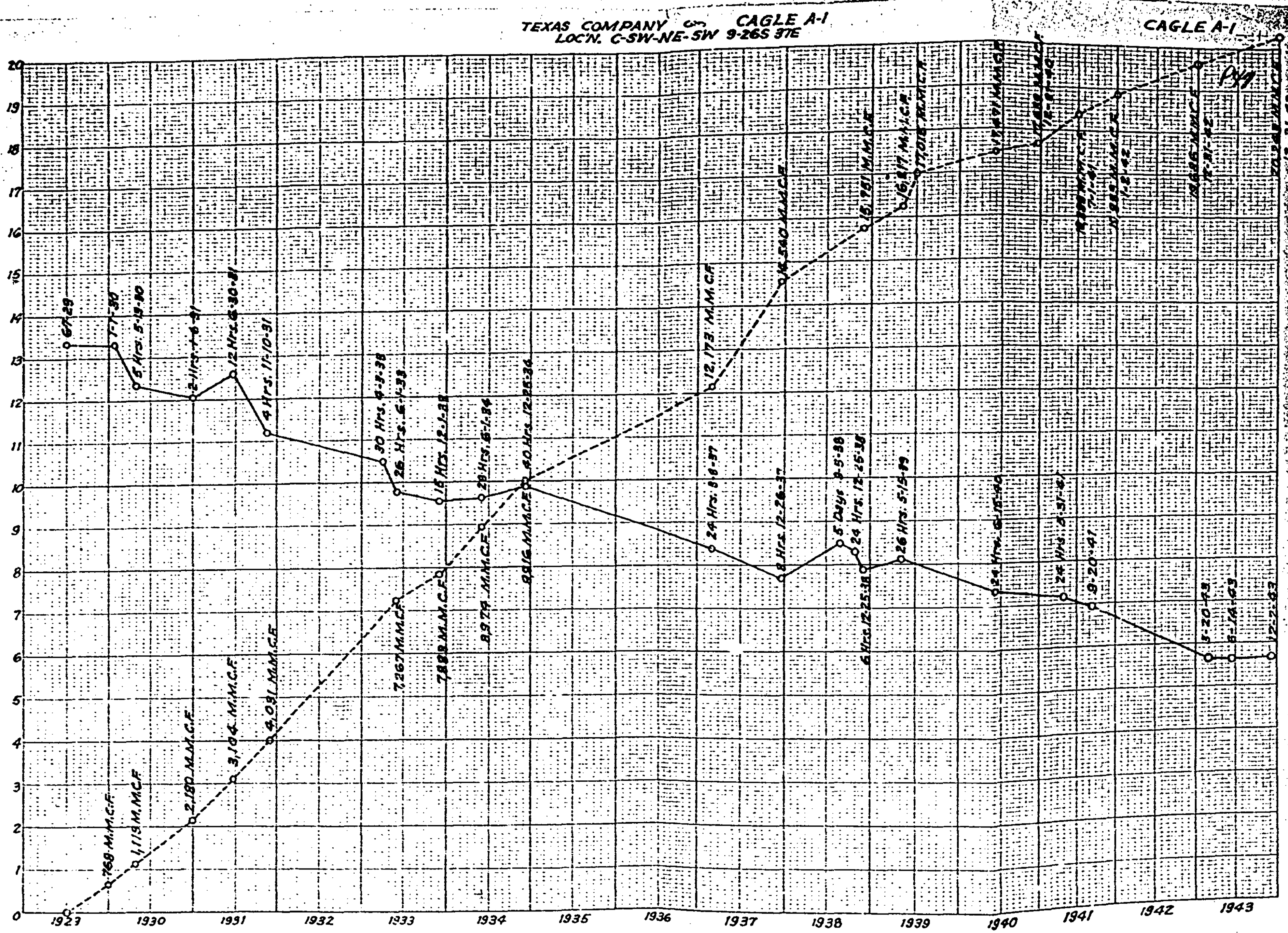
State Y No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
H-16-26S-37E
Texas Company





TEXAS COMPANY THE RHODES A-1
LOC'N C-SE-NE-NW 22-26-S-37E

RHODES A-1


TEXAS COMPANY CAGLE A-1
LOC'N. C-SW-NE-SW 9-26S 37E
CAGLE A-1
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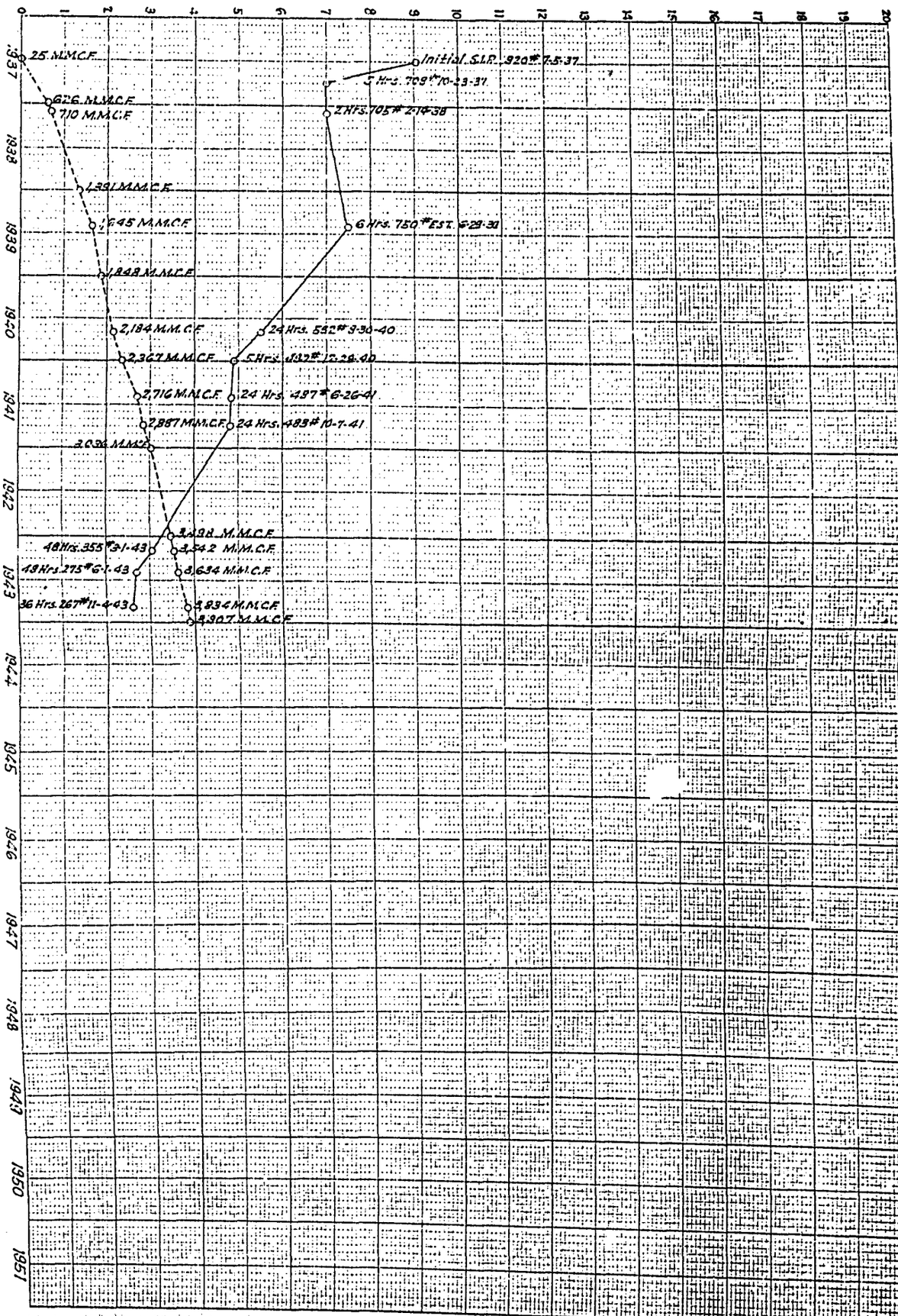
1942
1943
6-7-29
1-1-30
5 Hrs. 5-19-30
2 Hrs. 1-6-31
12 Hrs. 6-30-31
4 Hrs. 11-10-31
30 Hrs. 4-3-33
26 Hrs. 6-1-33
16 Hrs. 12-1-33
29 Hrs. 6-1-34
40 Hrs. 12-25-34
24 Hrs. 8-6-37
8 Hrs. 12-26-37
5 Days 9-5-38
24 Hrs. 12-25-38
6 Hrs. 12-25-38
26 Hrs. 5-15-39
24 Hrs. 6-15-40
24 Hrs. 5-31-41
9-20-41
3-20-43
12-2-43
768 M.M.C.F.
1,119 M.M.C.F.
2,180 M.M.C.F.
3,104 M.M.C.F.
4,091 M.M.C.F.
7,267 M.M.C.F.
8,979 M.M.C.F.
8,916 M.M.C.F.
12,173 M.M.C.F.
14,540 M.M.C.F.
16,917 M.M.C.F.
17,016 M.M.C.F.
12-31-40
7-1-41
1-2-42
12-31-42
12-31-43

TEXAS COMPANY THE CAGLE B-1
LOC'N C-NW-SW 15-26S-17E

CAGLE B-1
PKS

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
F-1-1-37
205 M.M.C.F.
388 M.M.C.F.
404 M.M.C.F.
440 M.M.C.F.
500 M.M.C.F.
606 M.M.C.F.
665 M.M.C.F. 6-15-40
726 M.M.C.F. 12-31-40
788 M.M.C.F. 7-1-41
843 M.M.C.F. 1-2-42
342 M.M.C.F. 12-31-42
1002 M.M.C.F. 12-31-43
6 Hrs. 12-8-37
6 Hrs. 6-20-38
24 Hrs. 10-17-38
24 Hrs. 12-25-38
12 Hrs. 5-6-39
24 Hrs. 6-15-40
B.U.P. 1-2-42
98 Hrs. 1-2-42
3-26-43
6-28-43
3-10-44
TEXAS COMPANY The SHEPHERD B-3
LOC'N. C-SW-NE-NE 5-26S-37E
SHEPHERD B-3
P36

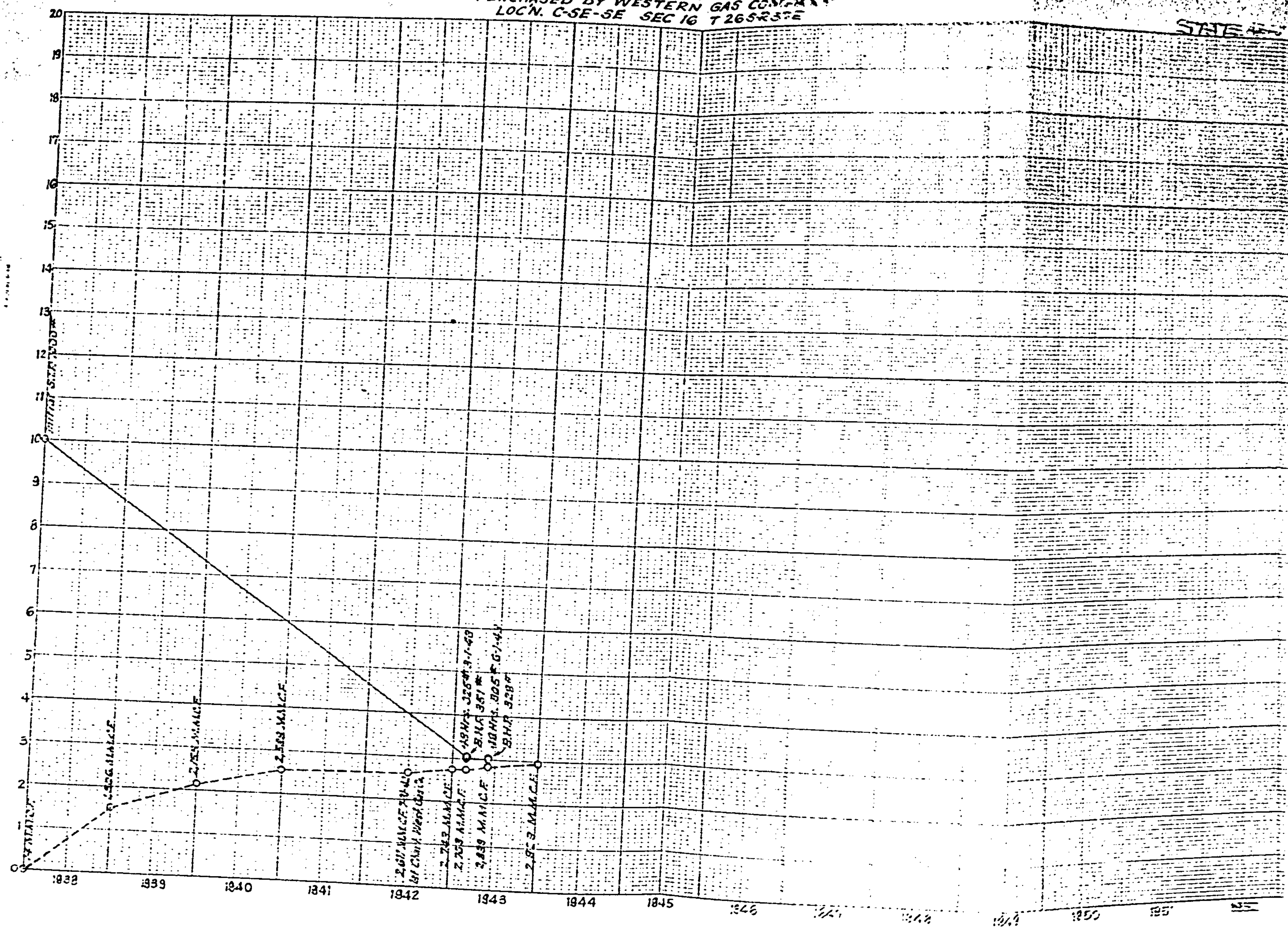


TEXAS COMPANY RHODES A-2
LOC'N 1650 S & E + SEC 22 T 26S R 37E

RHODES A-2 Rio

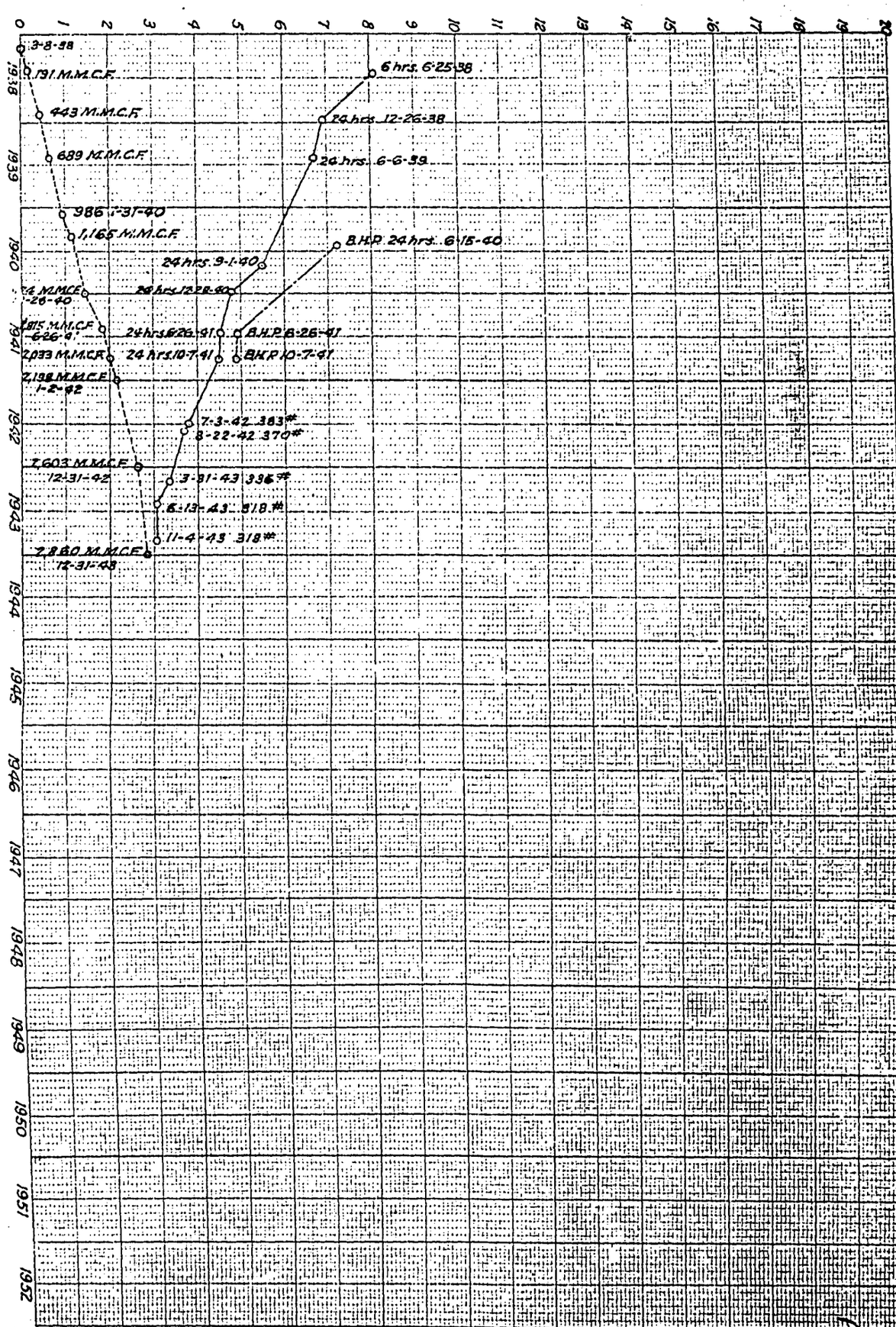
TEXAS COMPANY ∞ SHEPHERD B-4
LOCN 5-26S-37E
SHEPHERD B-4
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
7-10-37
198 M.M.C.F.
206 M.M.C.F.
364 M.M.C.F.
450 M.M.C.F.
503 M.M.C.F.
682 M.M.C.F.
729 12-22-39
803 M.M.C.F.
890 M.M.C.F. 1-1-41
960 M.M.C.F. 6-30-41
1028 M.M.C.F. 12-12-42
1132 M.M.C.F. 12-31-42
1262 M.M.C.F. 12-31-43
3 hrs. 11-27-37
6 hrs. 12-6-37
6 hrs. 6-20-38
24 hrs. 10-17-38
24 hrs. 12-26-38
24 hrs. 6-30-39
24 hrs. 6-15-40
B.H.P. 24 hrs.
1-28-41
3-26-43
6-28-43
3-10-44

GREAT WESTERN PROD., INC.
PURCHASED BY WESTERN GAS COMPANY
LOC'N. C-SE-SE SEC 16 T26S R37E



TEXAS COMPANY THE CAGLE B2
LOC'N C-SW-SW 15-26S-37E

CAGLE B2



TEXAS COMPANY (The) MOBERLY B-1
LOCN. C NE NE 21-26S-37E
MOBERLY B-1

TEXAS COMPANY ET AL CAGLE A2
LOCN. C-SW-NE-NW 9-26-37E

CAGLE A-2

STANOLIND OIL COMPANY - GREGORY B-1
LOC'N. SW-NW 15-26S-37E

GREGORY B-1

6-22-38
484 M.M.C.F.
548 M.M.C.F.
688 M.M.C.F.
846 M.M.C.F. 7-8-41
945 M.M.C.F. 2-2-42
1075 M.M.C.F. 3-31-42
1352 M.M.C.F. 12-31-43
24 hrs. 6-30-40
24 hrs. 8-31-40
24 hrs. 7-8-41
3-31-43 415#
6-19-43 380#
11-4-43 360#
This Well Transferred to Western Gas Co. Effective 3-1-49

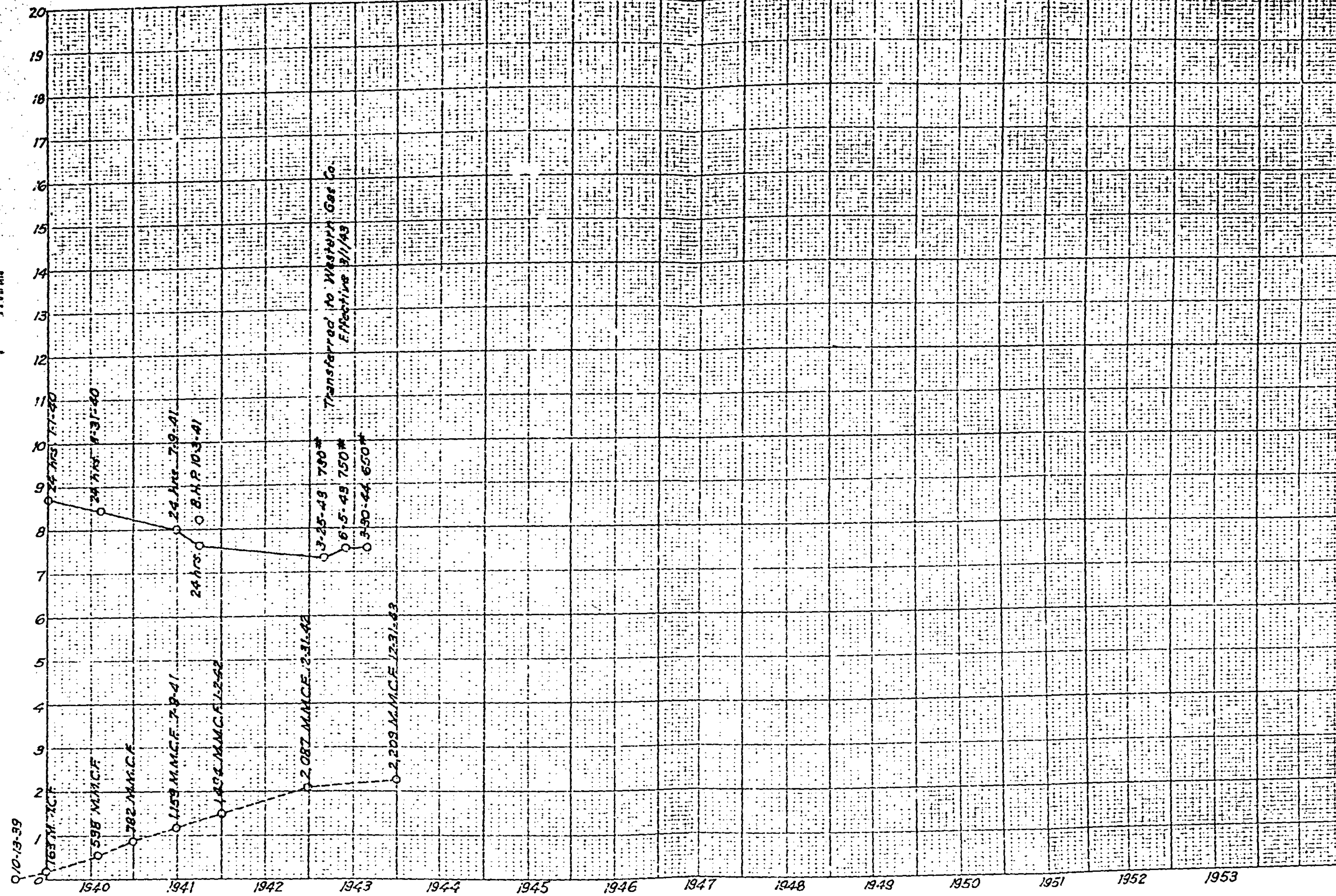
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954

STANOLIND OIL COMPANY ~ FARNSWORTH C-1
LOC'N NW-SE-SW 4-26S-37E

FARNSWORTH C-1

P31



TEXAS COMPANY on STATE Y-1
LOC'N SW-NE 16-26S-37E

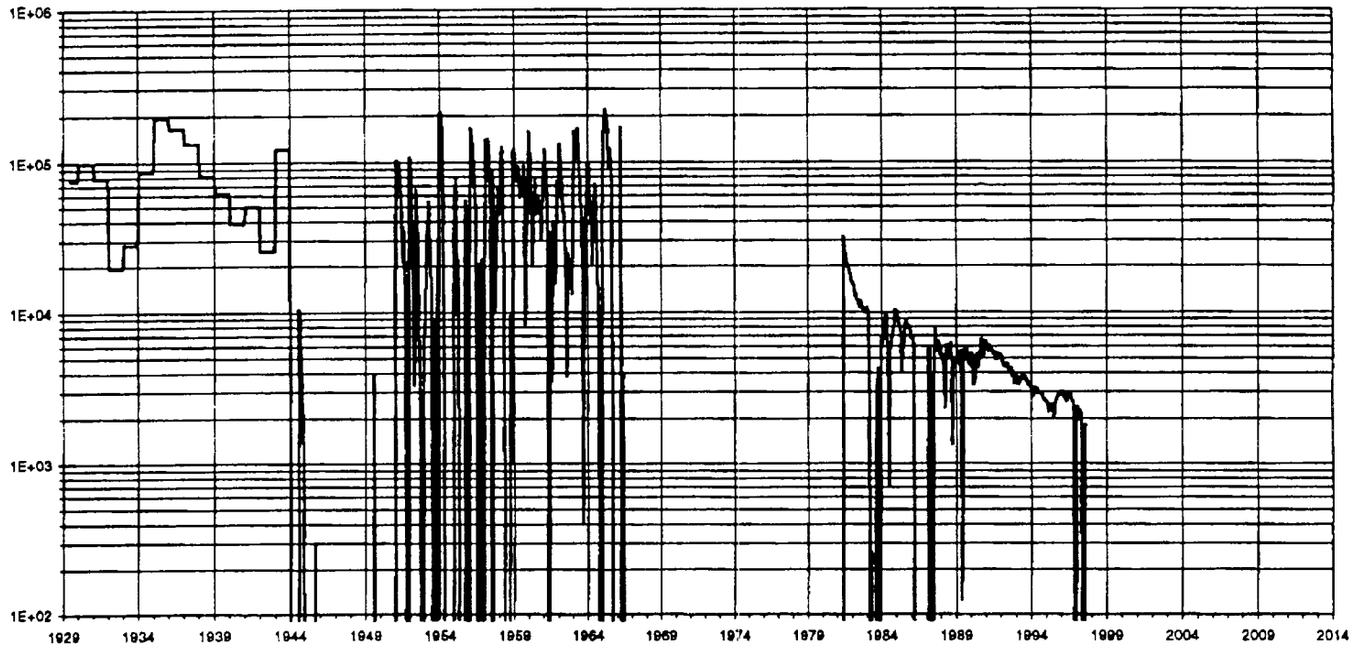
STATE Y-1

BY

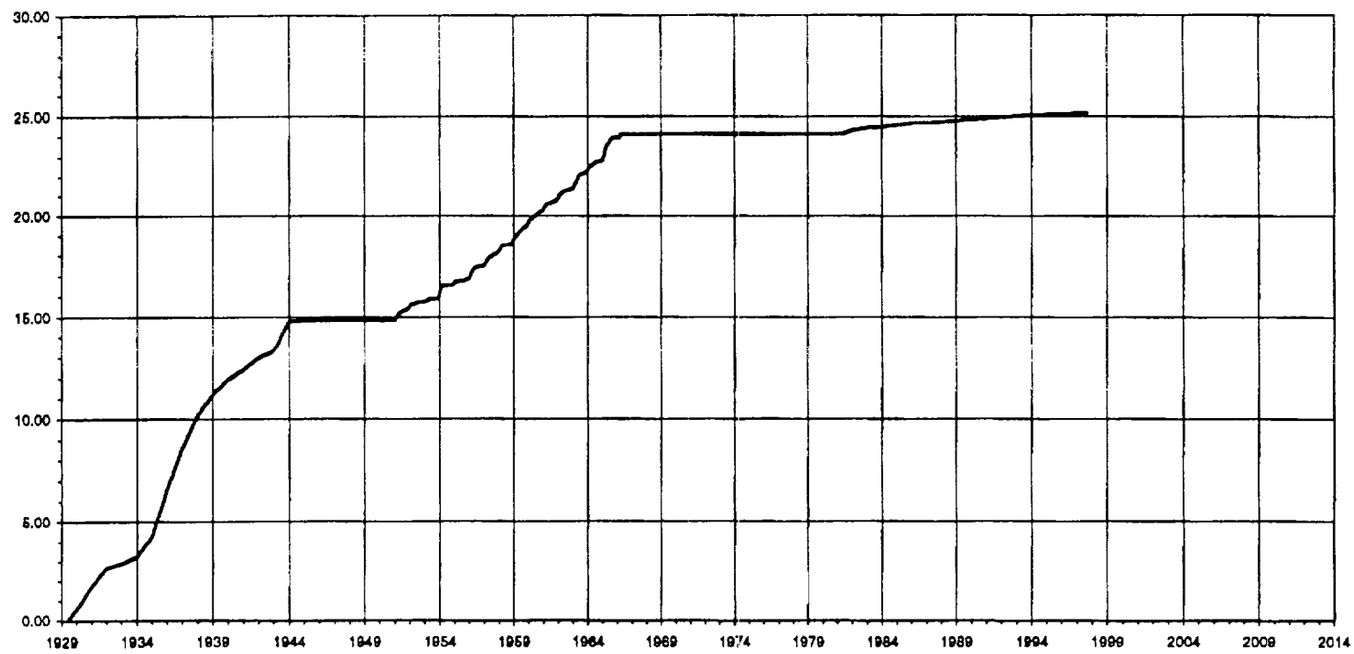
Rhodes A #1
Rhodes (Yates-Seven-Rivers) Gas Pool
C-22-26S-37E
Gruy Petroleum Management Co.

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 30
CASE NOS. 12015 & 12017

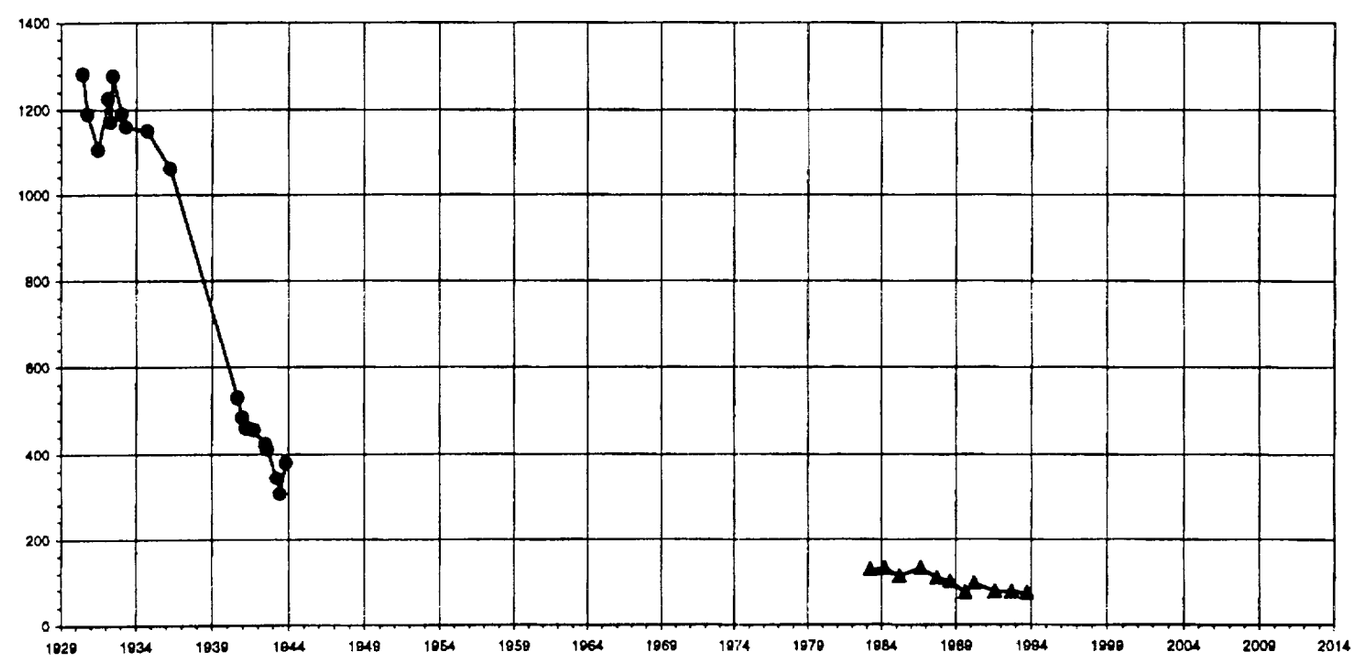
Gas Production (MCFPM)



Cumulative Gas Production (BCF)

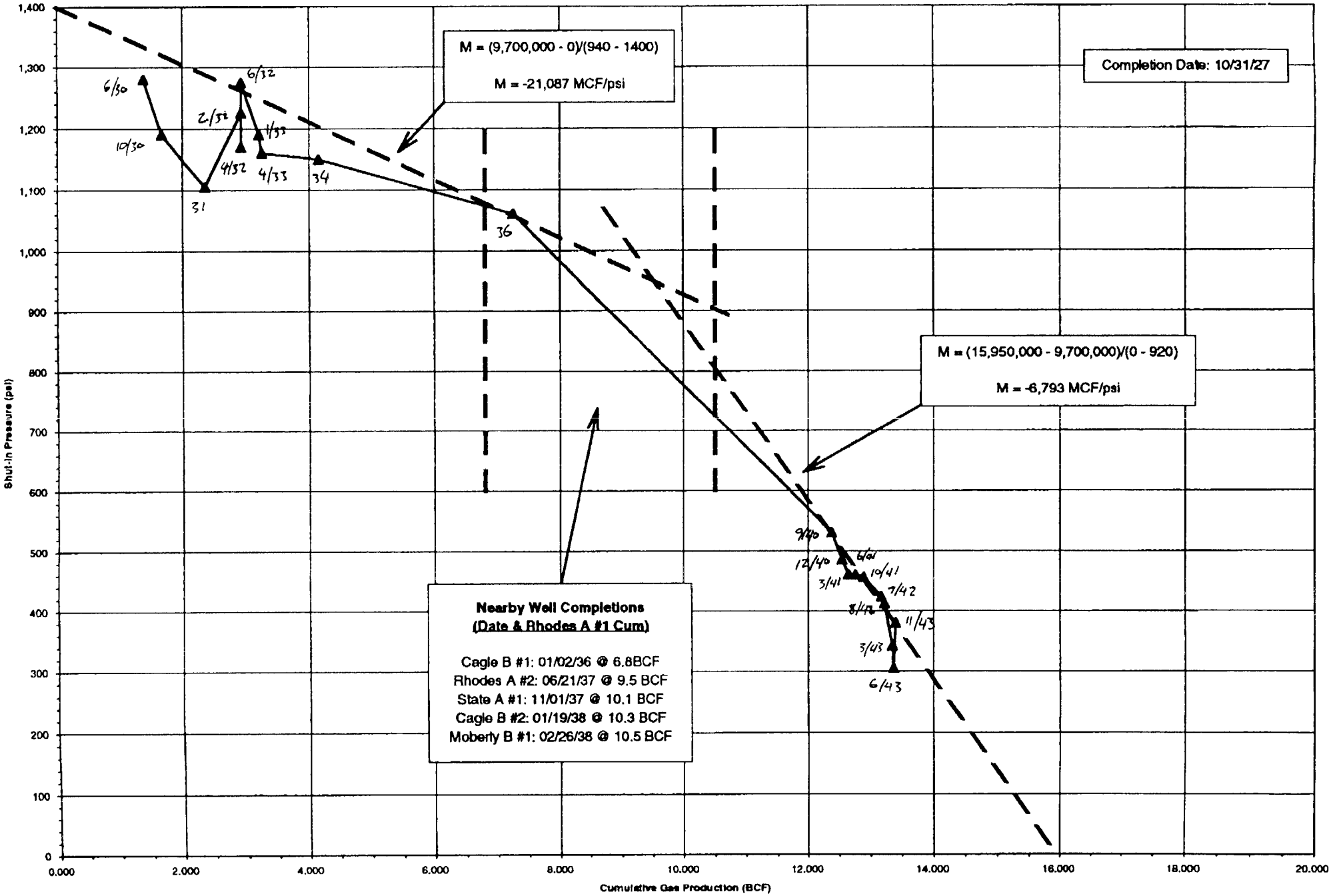


WHSIP (psia)

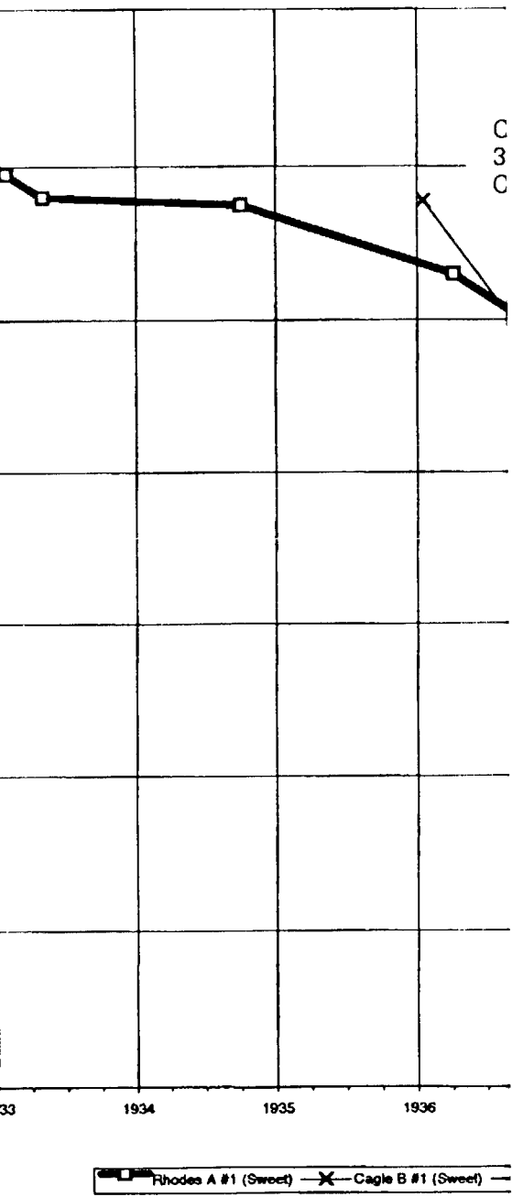


08/97: 25.144 BCF

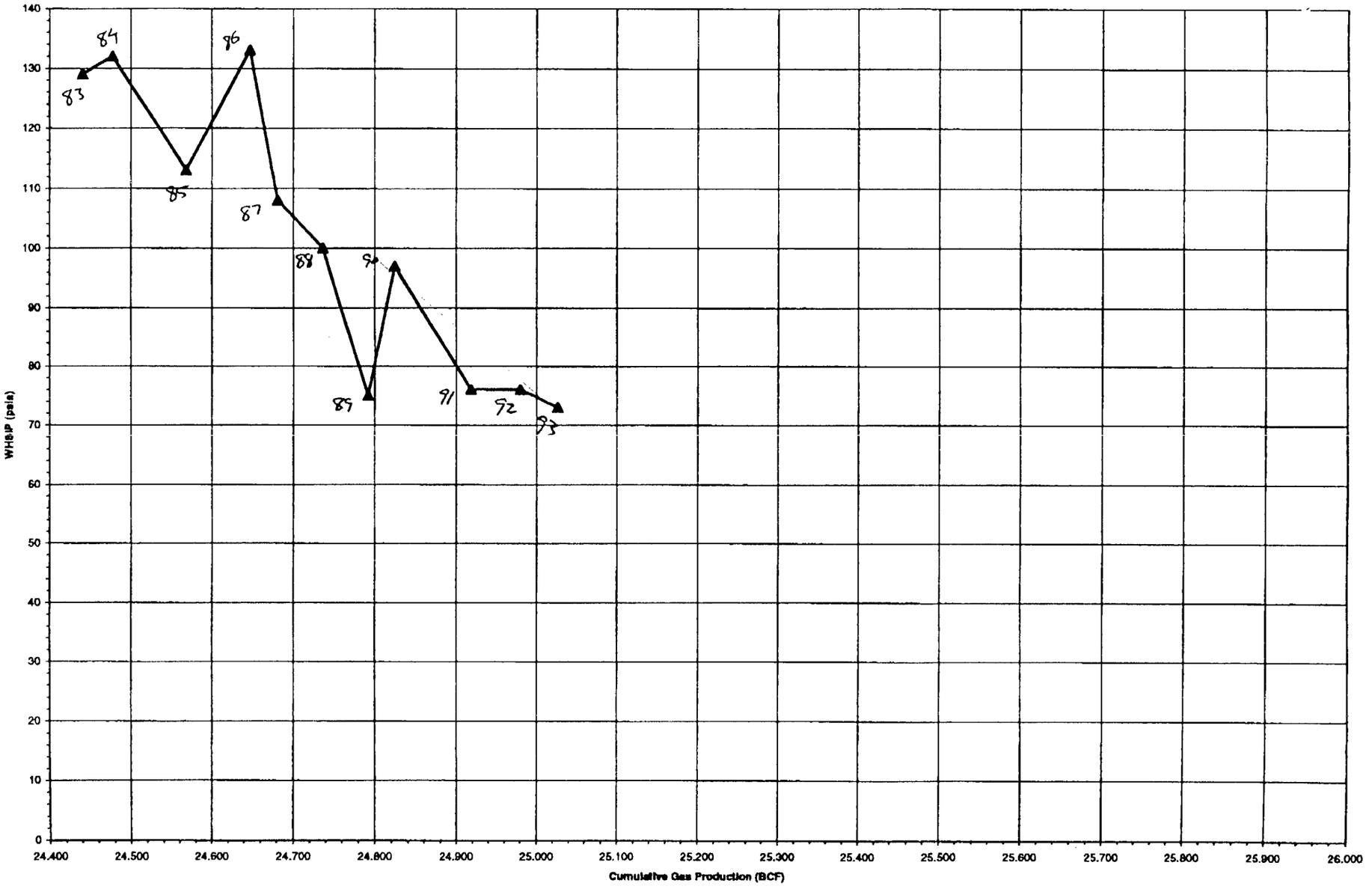
Rhodes A No. 1 (Rhodes Pool Discovery Well)
Rhodes (Yates-Seven Rivers) Gas Pool
C-22-26S-37E
Texas Company



o 12/31/45)
Wells
Gas Pool
R-37-E



Rhodes A #1
Rhodes (Yates-Seven-Rivers) Gas Pool
C-22-26S-37E
Gruy Petroleum Management Co.



10/93: 25.026 BCF

Rhodes Pool Discovery Well

The Texas Company
Rhodes "A" Federal No. 1
330' FNL & 1650' FWL
Sec. 22, T-26-S, R-37-E
Completed 10-31-27
G.L. @ 2988

Cable Tool Shows:

s/g 3040		(-52)
s/g 3105 - 30	16,000 MCFPD	(-117)
s/og 3160	22,000 MCFPD + s/o	(-172)
s/og 3193	23,000 MCFPD + 120 BOPD	(-205)

Geologist's Log:

3040	Sandy Lime	(gas)
3095	Gray Lime (Hard)	
3105	Sandy Lime	(flowed gas)
3130	Brown Sand	(increased gas)
3160	Gray Lime	(show of oil and gas)
3213	Gray Lime (Hard)	(best oil 3180 - 93)

Productive Formations:

Yates	Gas
Seven Rivers	Oil

Cumulative Production as of 12/97:

Gas	25.144 BCF
Oil	163.1 MBO

Historical Significance:

The Texas Company's Rhodes "A" Federal No. 1 well was the initial oil and gas "discovery well" for the southeastern portion of Lea County, New Mexico[1]. On June 9, 1929, the Rhodes "A" Federal No. 1 well was connected to El Paso Natural Gas Company's (El Paso's) newly completed 204-mile 16-inch Jal, New Mexico-El Paso, Texas gas pipeline. Lea County gas first reached the El Paso, Texas City Gate on June 18, 1929. For a four year period (1930-1933), the Rhodes "A" Federal No. 1 well was El Paso's only gas supply well capable of producing sweet (commercial) gas[2].

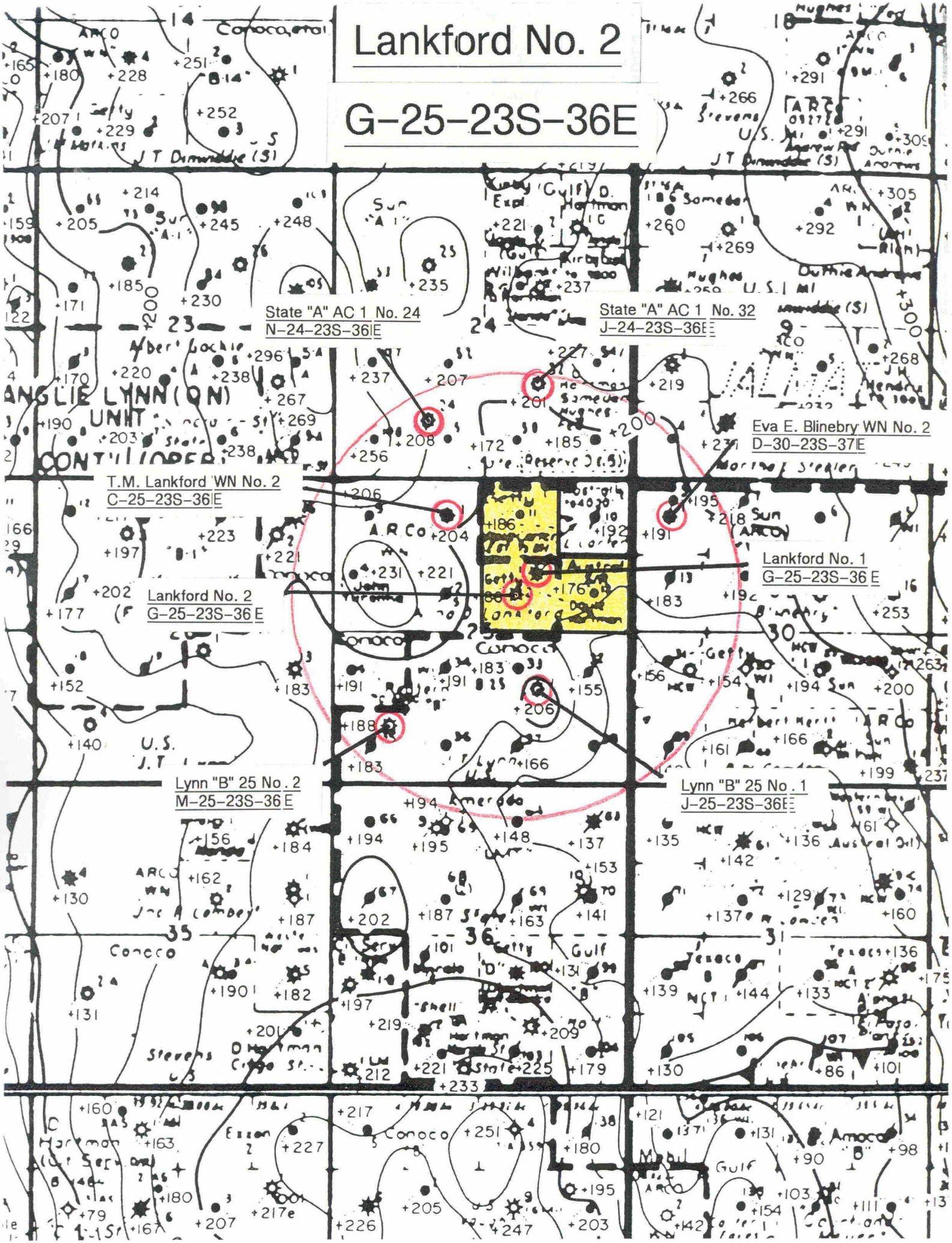
(1) Samuel D. Myers, The Permian Basin: Era of Discovery, p. 535, (El Paso: Permian Press, 1973).
(2) Frank Mangan, The Pipeliners, p.52-53, (El Paso: Guynes Press, 1977).

Stabilized M-Factors (Pressure-Cum Slopes) for Replacement Yates-U7R Gas Wells Drilled Near An Original Yates-U7R Gas Well

Current Operator	Infill Well	Location (T-R-S-U)	M_2: Stabilized P/z Slope (MCF/psi)	Initial Pressure (psia)	Projected Ultimate Recovery (MMCF)	Recovery Improvement Ratio (M_2/M_1)
Gruy	Lankford No. 2	23S-36E-25-G	15,848	112	1,284	2.10
Gruy	W. H. King No. 4	23S-37E-06-M	10,667	123	910	1.99
Gruy	Toby No. 3	24S-37E-07-L	9,057	205	1,635	1.87
Gruy	Northshore Woolworth No. 6	24S-37E-33-E	9,375	99	798	2.70
Hartman	Dabbs No. 3	25S-37E-34-M	15,000	171	968	1.97
Average:			**11,989**			**2.13**

Lankford No. 2

G-25-23S-36E



NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
DOYLE HARTMAN	LANKFORD	2

Unit Letter	Section	Township	Range	County
G	25	23 SOUTH	36 EAST	LEA

Actual Footage Location of Well:
1980 feet from the NORTH line and 1980 feet from the EAST line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3348.5	Yates-Seven Rivers	Jalmat (Gas)	120 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

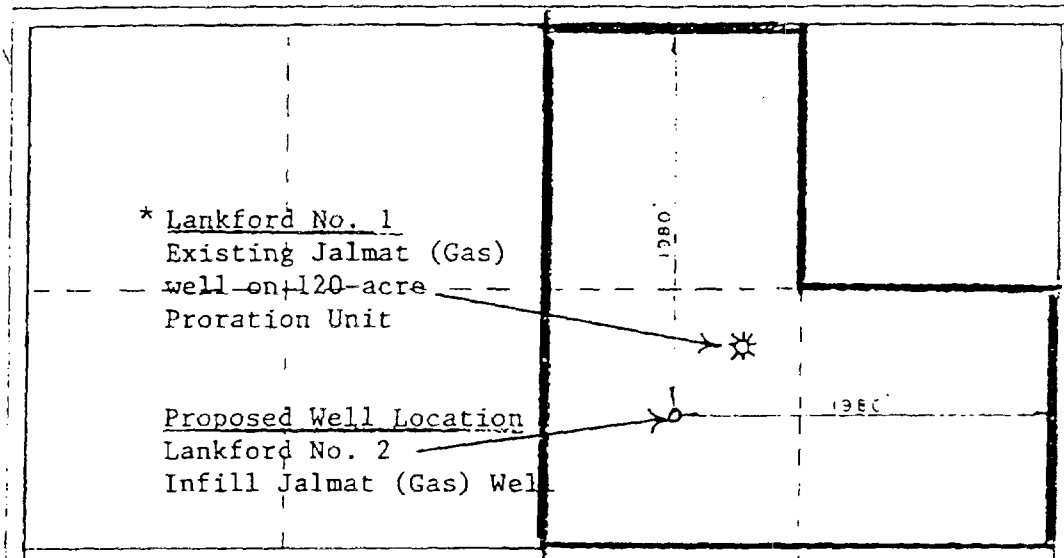
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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.

Name: Larry A. Nermyr

Signature: Larry A. Nermyr

Position: Engineer

Company: Doyle Hartman

Date: October 12, 1983

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.

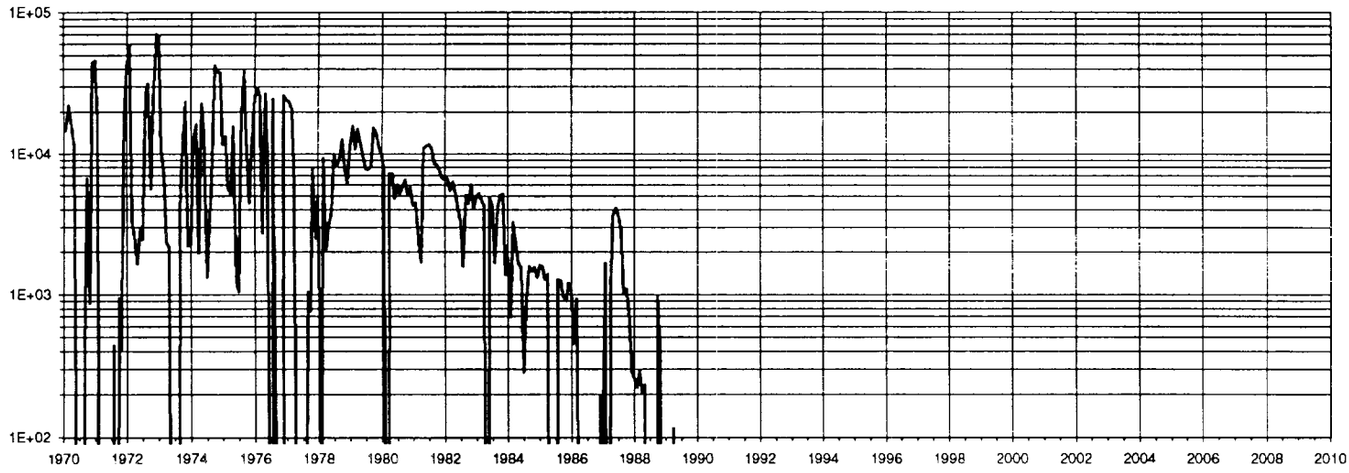
Date Surveyed: OCTOBER 4, 1983

Registered Professional Engineer and/or Land Surveyor

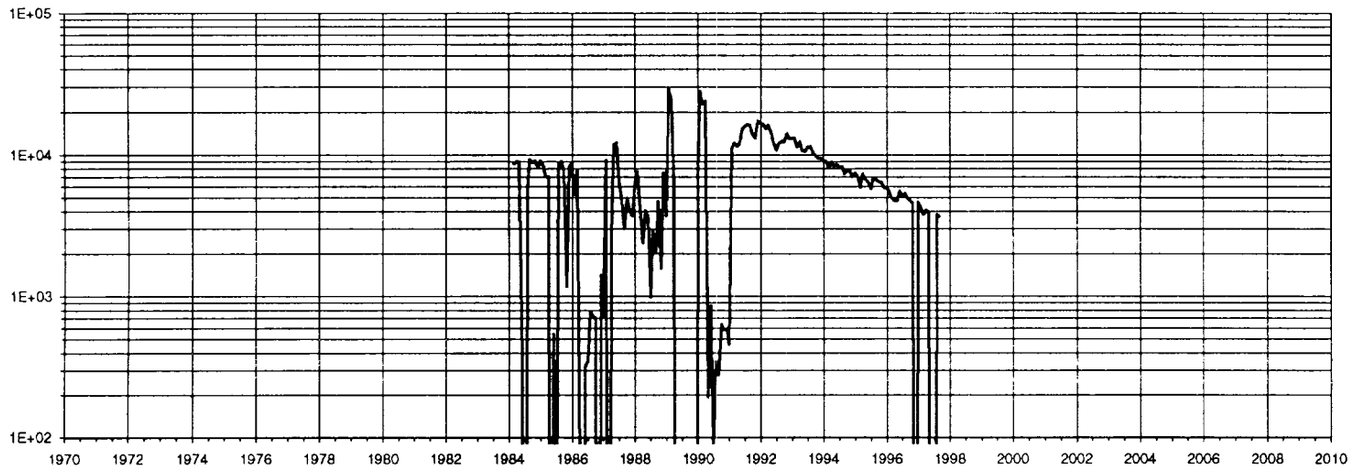
Certificate No.

Lankford Nos. 1 & 2
Jalmat Gas Pool
G-25-23S-36E
Gruy Petroleum Management Co.

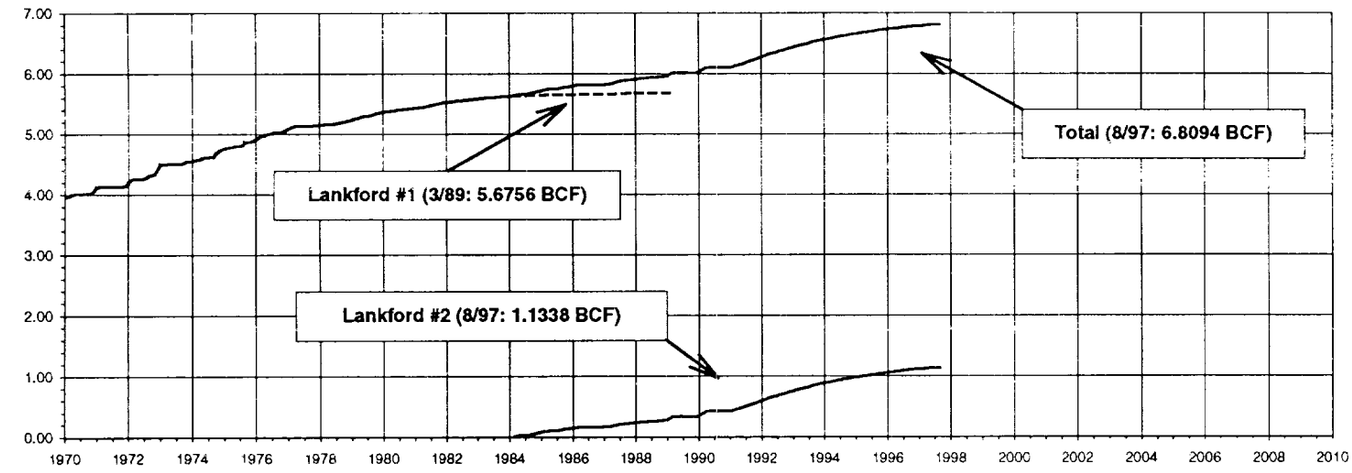
Lankford #1 Gas Production (MCFPM)



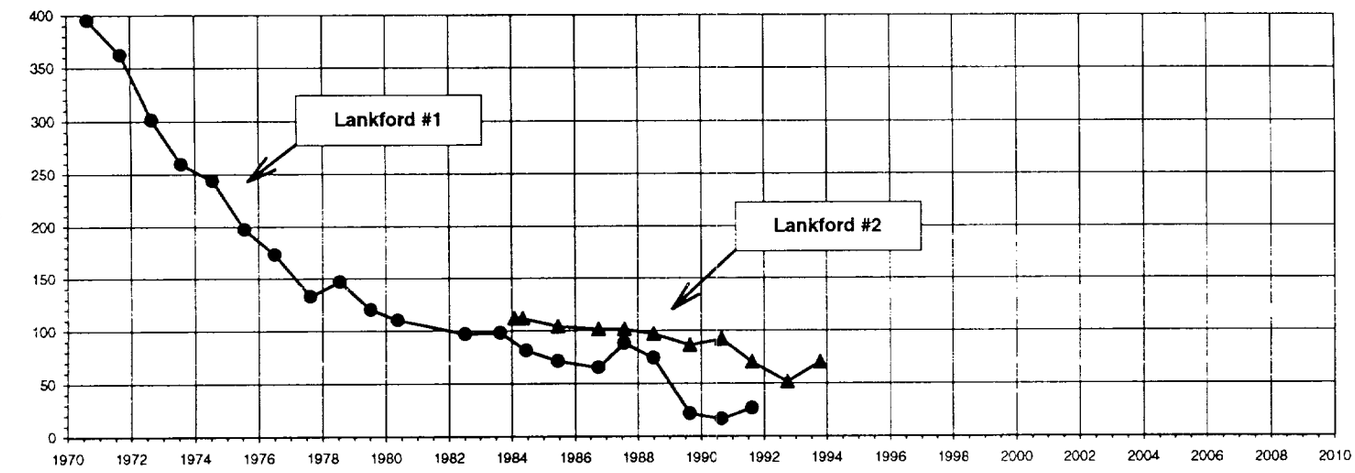
Lankford #2 Gas Production (MCFPM)



Lankford Nos. 1 & 2 Cumulative Gas Production (BCF)

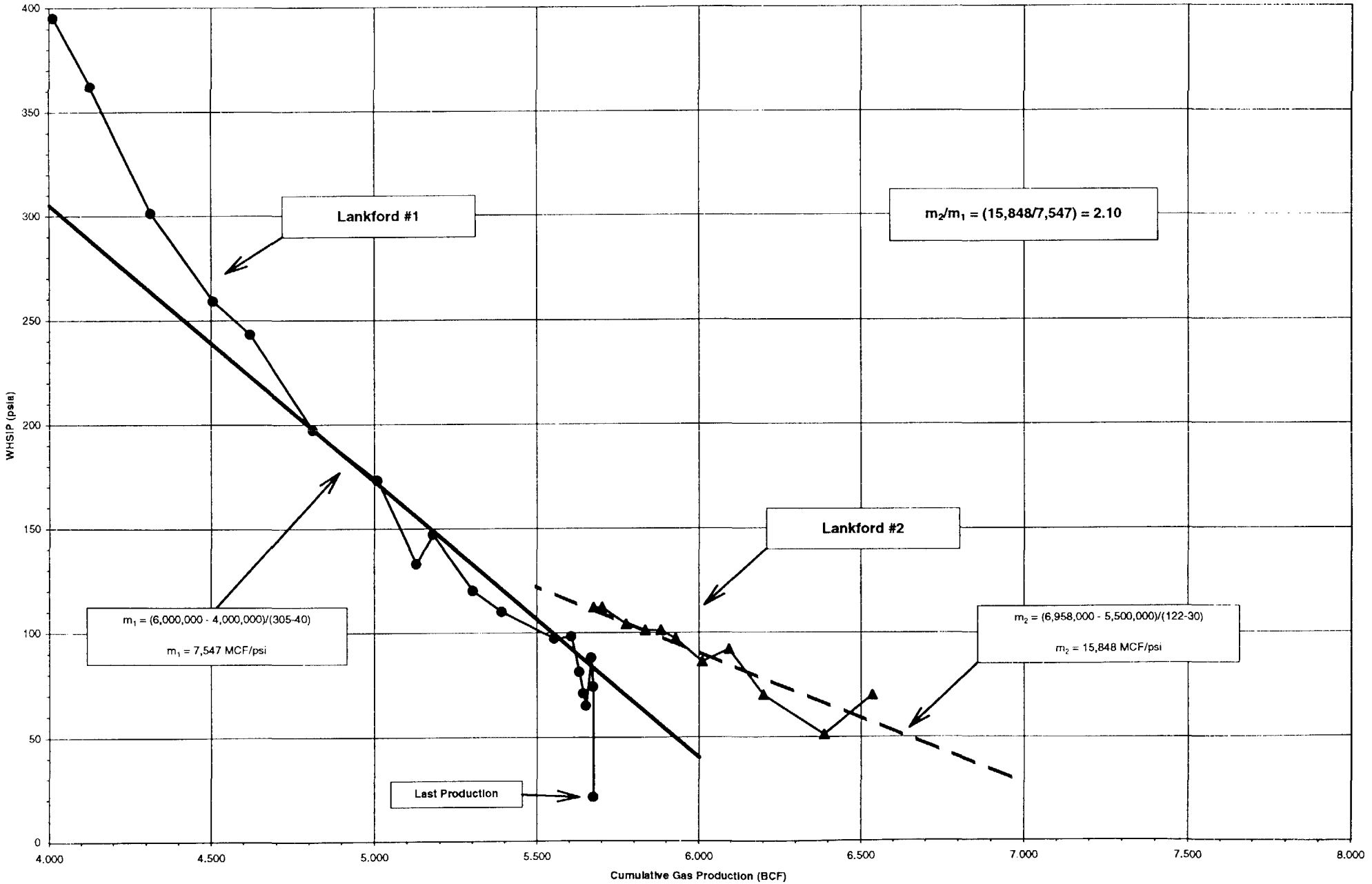


WHSIP (psia)



08/97: 6.809 BCF

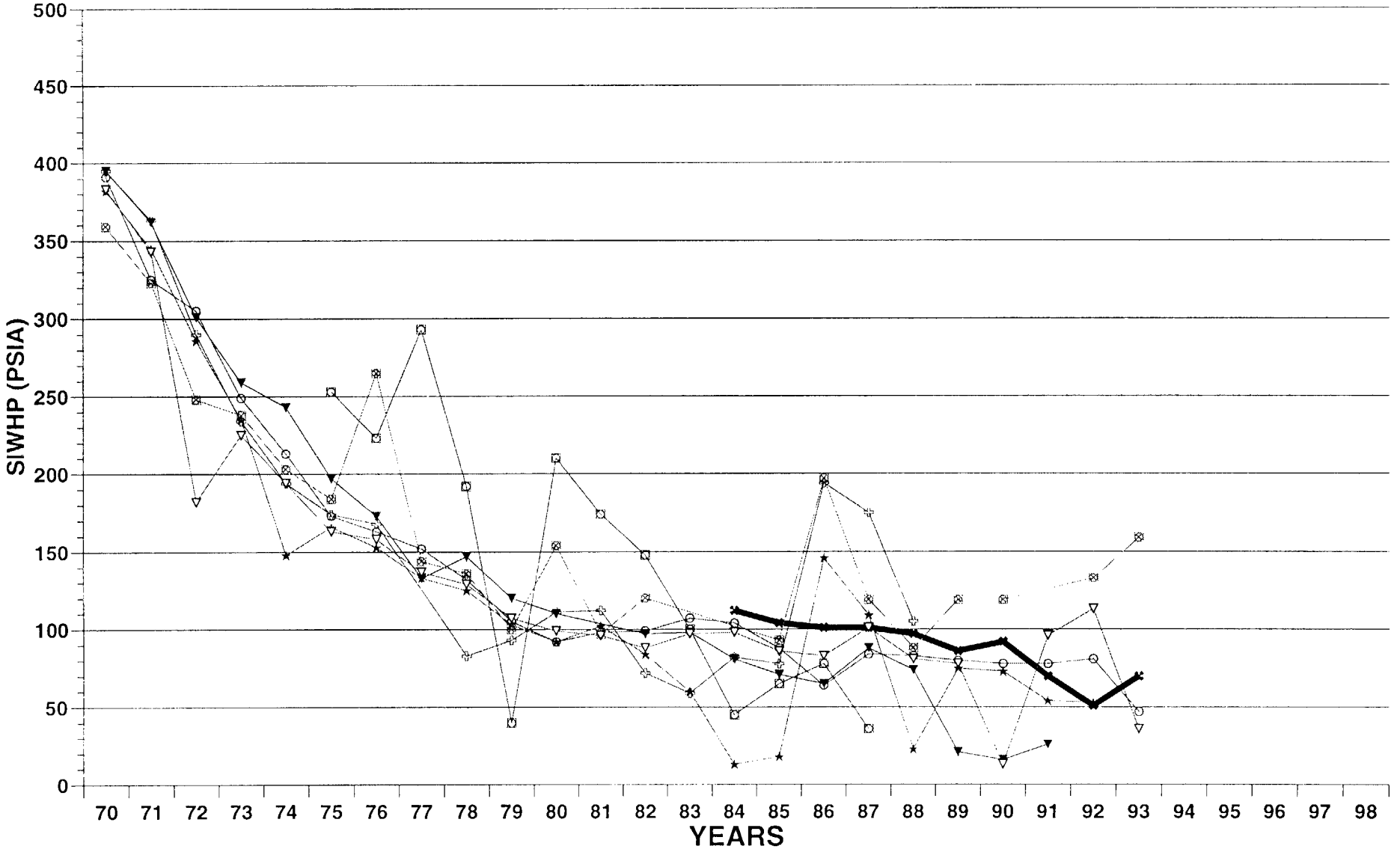
Lankford Nos. 1 & 2
Jalmat Gas Pool
G-25-23S-36E
Gruy Petroleum Management Co.

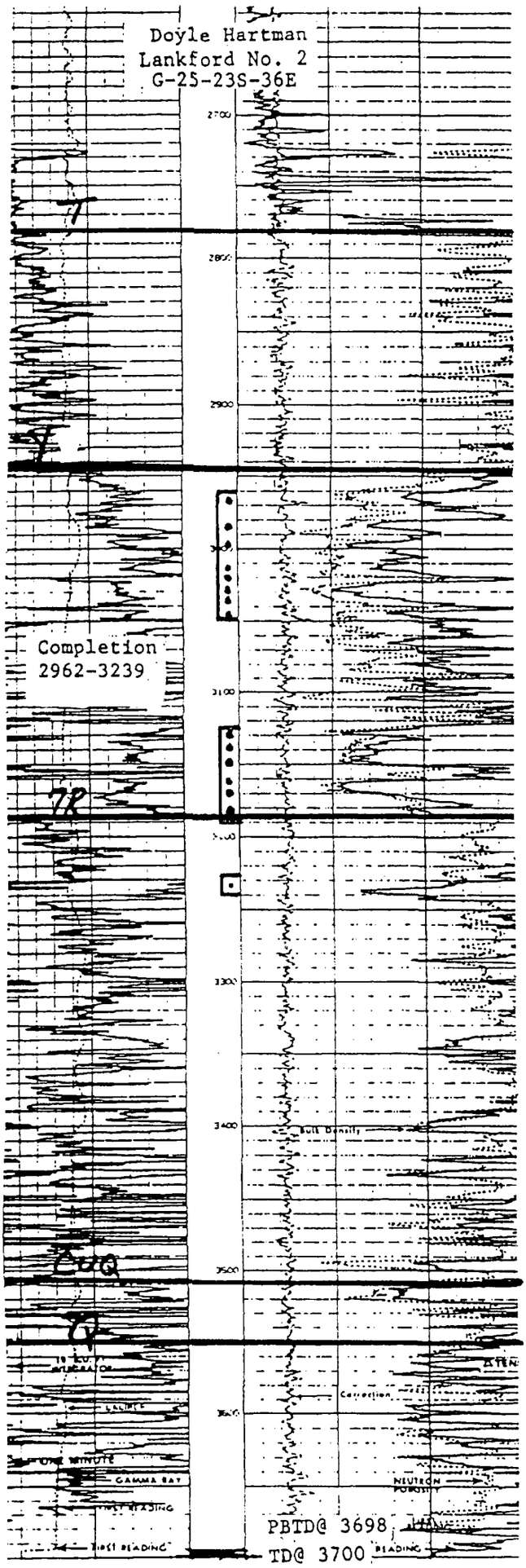


10/93: 6.534 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

Lankford # 1,2
Composite Pressure - Time Plot
Lea County, New Mexico





COMPANY Gruy Operating
(Doyle Hartman)
WELL Lankford No. 2

FIELD Jalmat (Gas)
LOCATION 1980' FNL & 1980' FEL (G)
Sec. 25, T-23-S, R-36-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB 3362.5
DF 3361.5
GL 3348.5

COMPLETION RECORD

SPUD DATE 12-17-83 COMP. DATE 1-3-84
TD 3700 PBTD 3697
CASING RECORD:
9 ⅝" @ 400 w/250 (TOC @)
7" @ 3700 w/850 (TOC @)
(TOC @)
(TOC @)
COMP. INTERVAL Perf 2962-3239 w/22

STIMULATION A/6000 15% MCA
ATR = 5 BPM. ATP = 1700 psi.
ISIP = 400 psi. 1.5-min SIP = 0 psi.
POT IPF = 58 MCFPD
GOR GR
TP 60 CP 60
CHOKE 12/64 TUBING 2 3/8 @ 3080
REMARKS
01-05-84: POP @ 9 x 64 x 1 ¼"

01-10-84: P/130 MCFPD
Choke = 64/64
PCP = 22 psi

01-18-84: SWF/110,950 + 25,300
ATR = 32 BPM
ATP = 1900 psi
ISIP = 700 psi
1-hr. SIP = 520 psi

01-20-84: P/657 MCFPD
Choke = 43/64
PCP = 78 psi

01-30-84: SIP = 99 psig

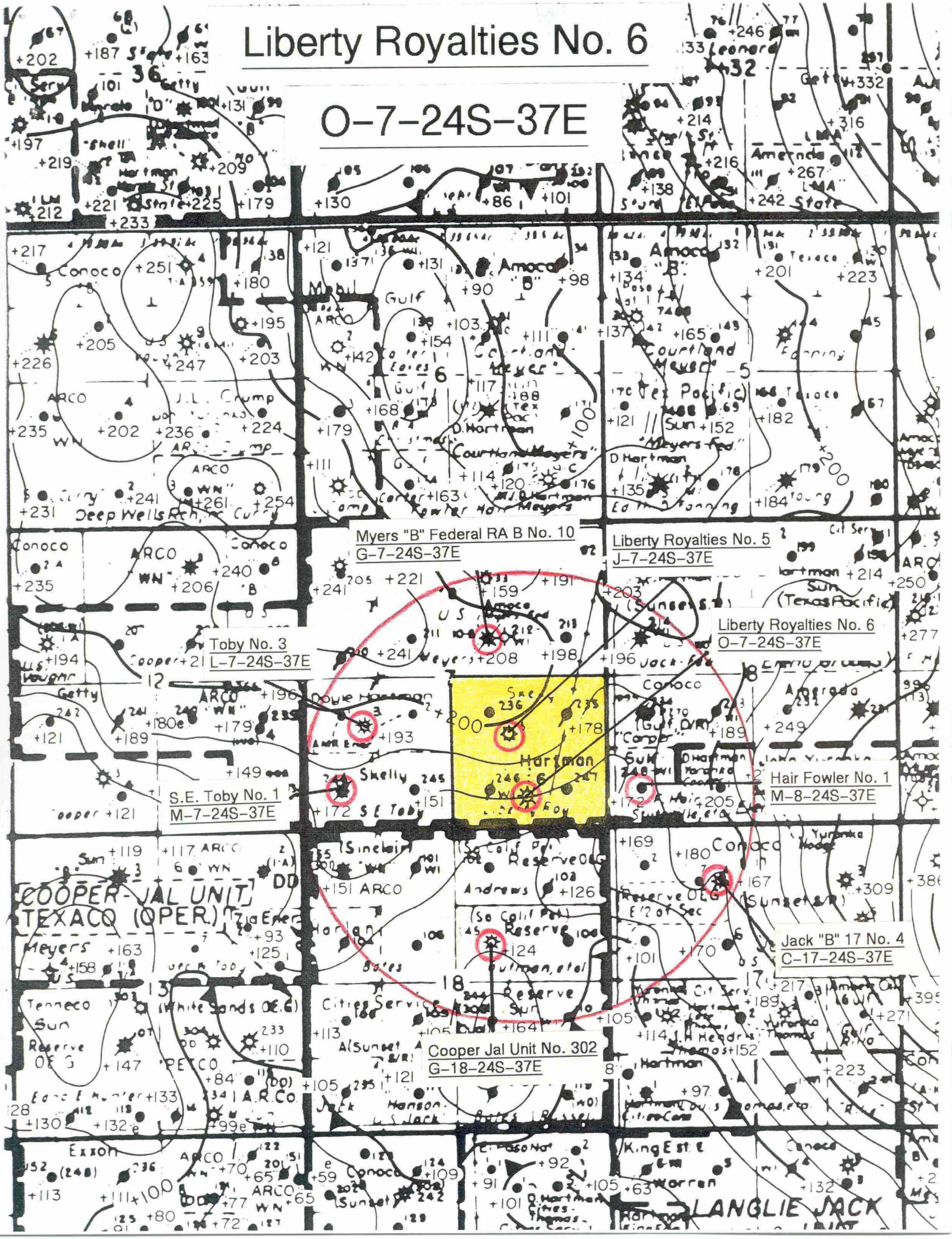
01-30-84: Tied well into EPNG.
P/324 MCFPD
PCP = 94 psig

09-01-97: Cum. = 1.1338 BCF
Est. Rem. = 150.0 MMCF
Est. Ult. = 1.2838 BCF
m = 15,848 MCF/psi

G-25-23S-36E

Liberty Royalties No. 6

O-7-24S-37E



WELL LOCATION AND ACREAGE DEDICATION PLAT

Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the section.

Operator	Lease	Well No.
Doyle Hartman	W. H. King	4

Unit Letter	Section	Township	Range	County
M	6	23S	~~36E~~ 37E	Lea

Actual Footage Location of Well:
990 feet from the South line and 330 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3395	Yates-Seven Rivers	Jalmat (Gas)	160 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

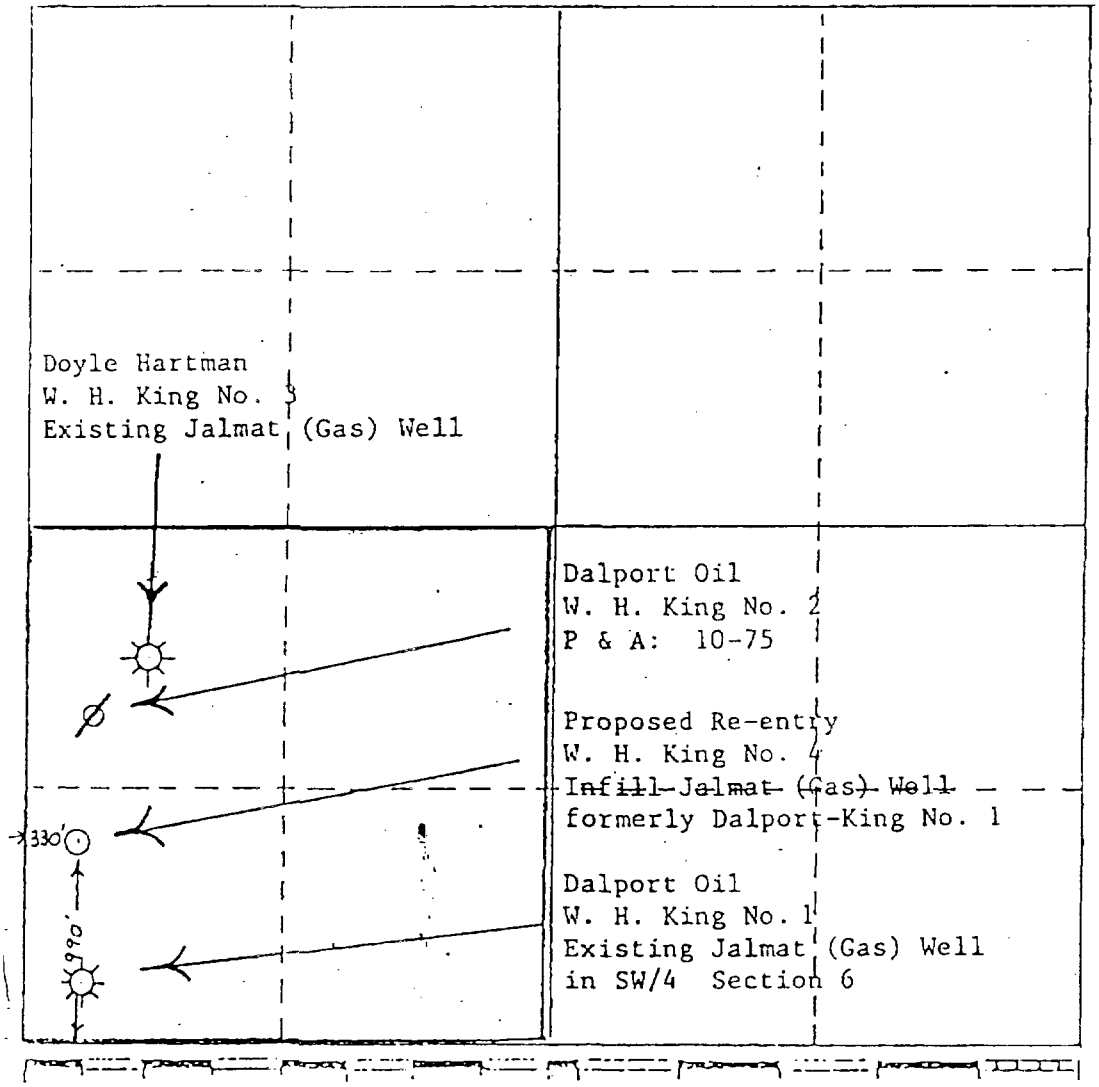
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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.

Larry A. Nermyr

Name: Larry A. Nermyr

Position: Engineer

Company: Doyle Hartman

Date: June 7, 1985

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

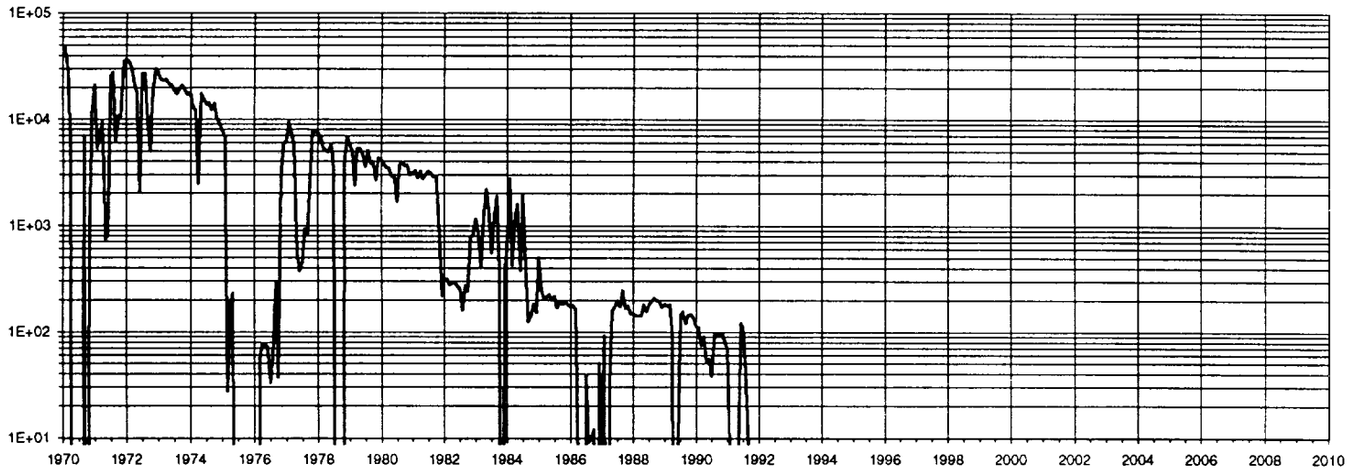
Registered Professional Engineer and/or Land Surveyor

Certificate No.

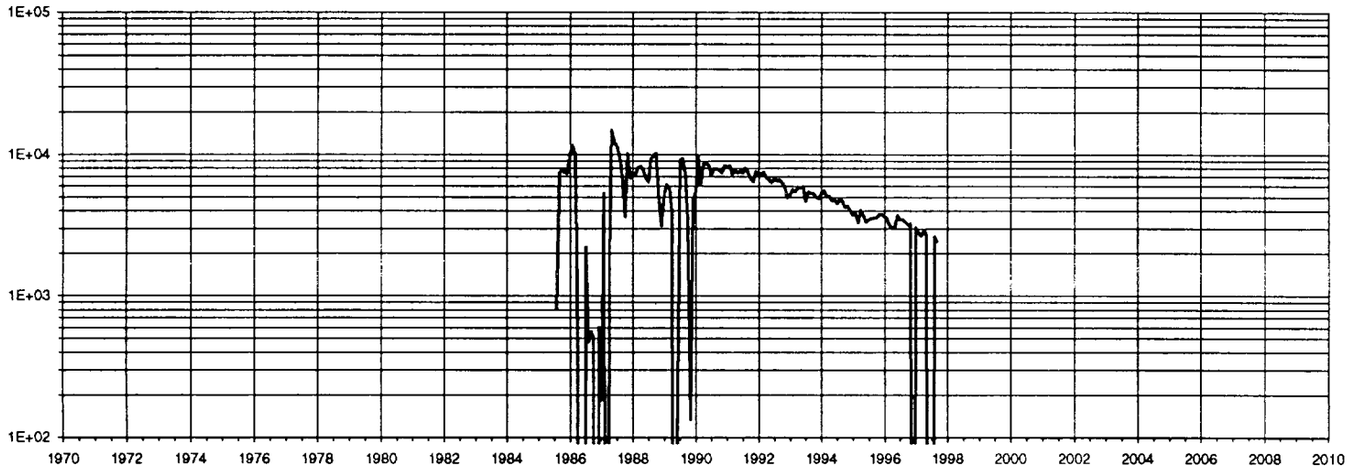
JUN 1 1985

W. H. King Nos. 1 & 4
Jalmat Gas Pool
M-6-23S-37E
Gruy Petroleum Management Co.

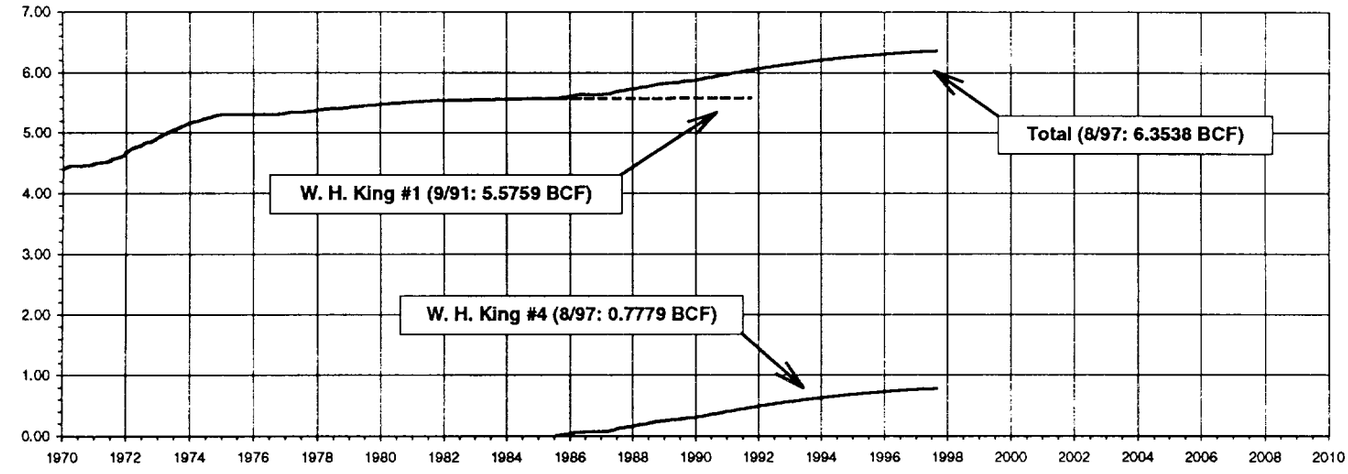
W. H. King #1 Gas Production (MCFPM)



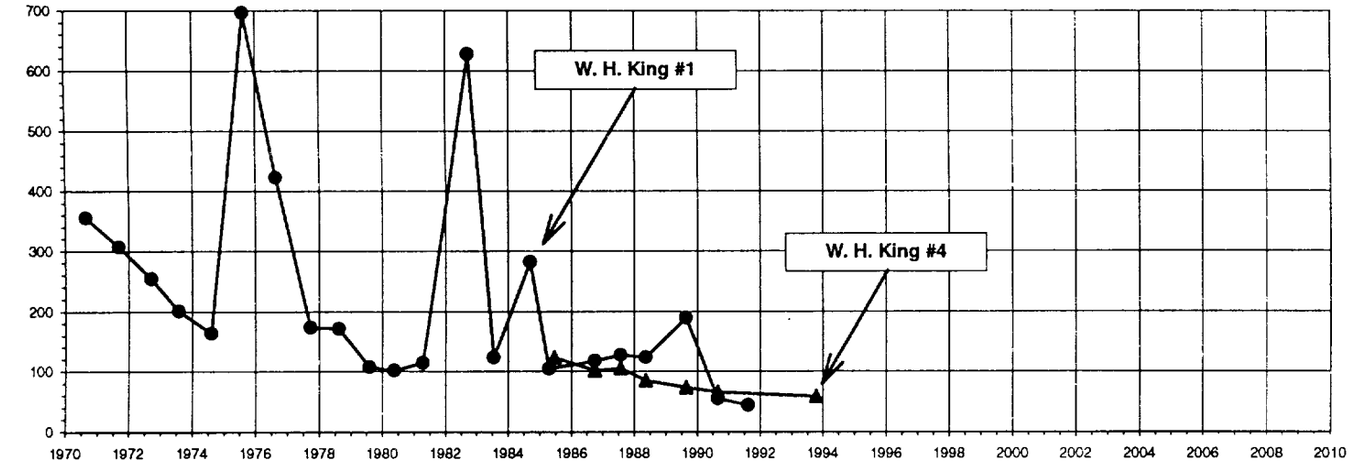
W. H. King #4 Gas Production (MCFPM)



Cumulative Gas Production (BCF)



WHSIP (psia)



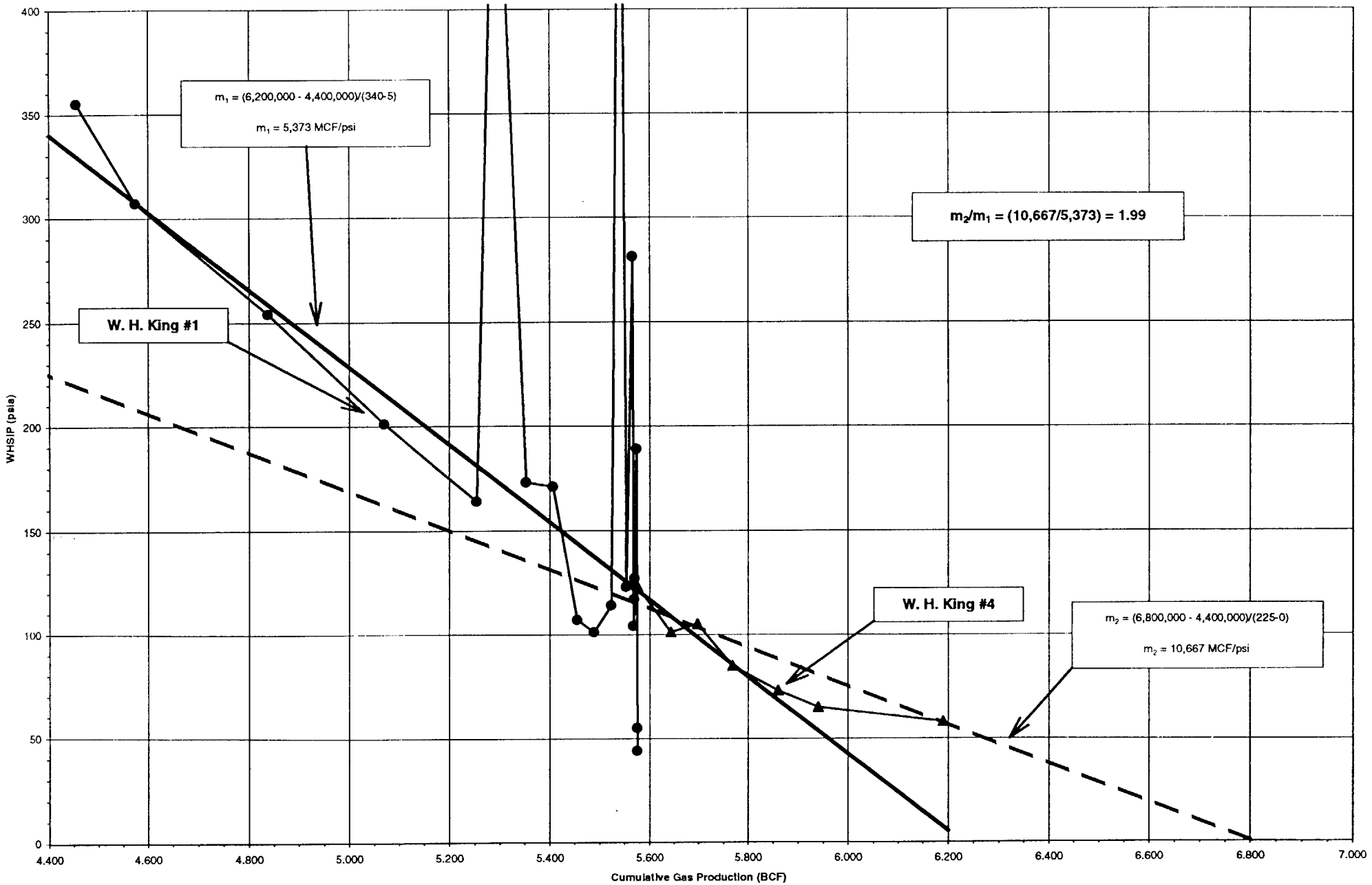
08/97: 6.354 BCF

W. H. King Nos. 1 & 4

Jalmat Gas Pool

M-6-23S-37E

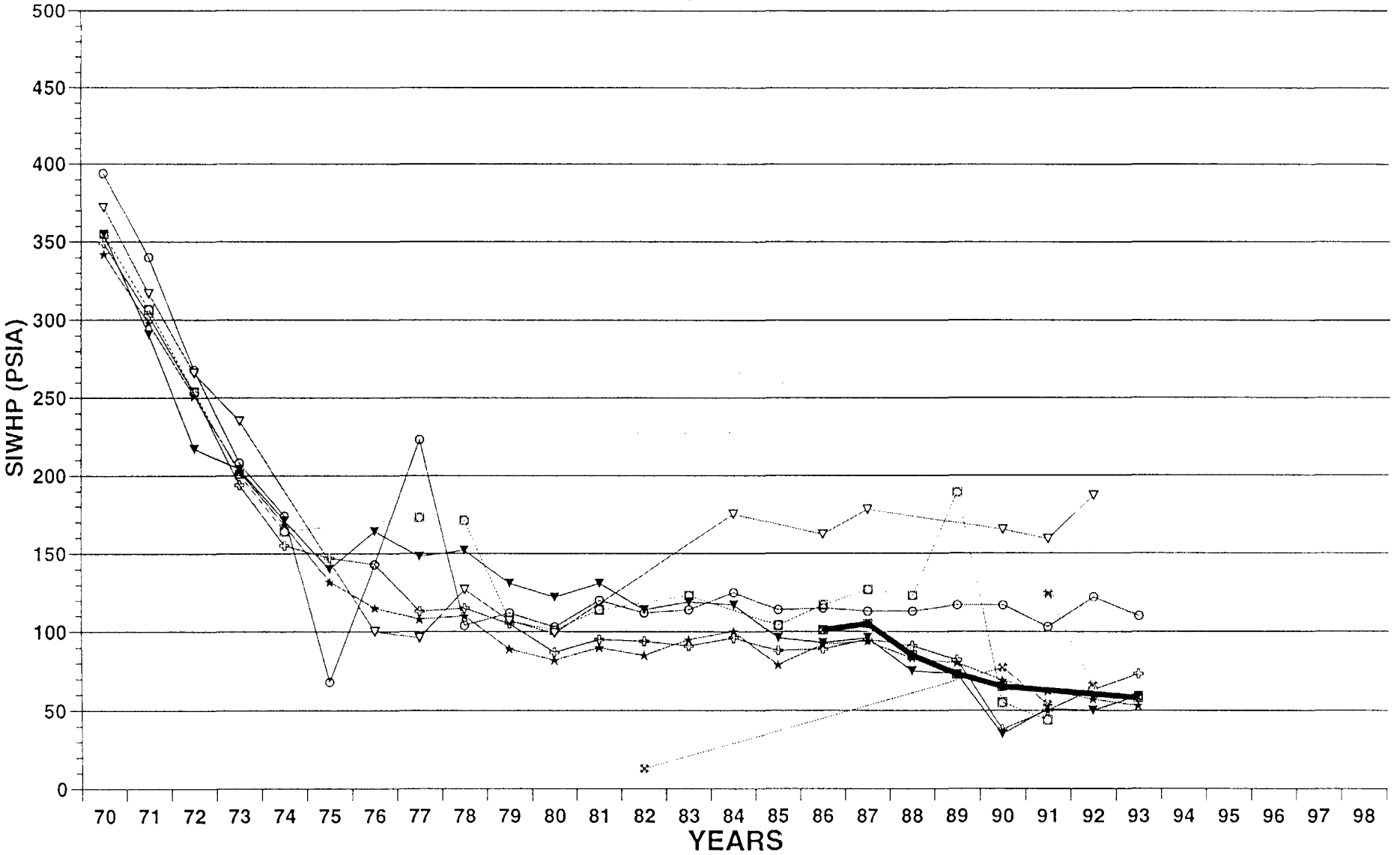
Gruy Petroleum Management Co.

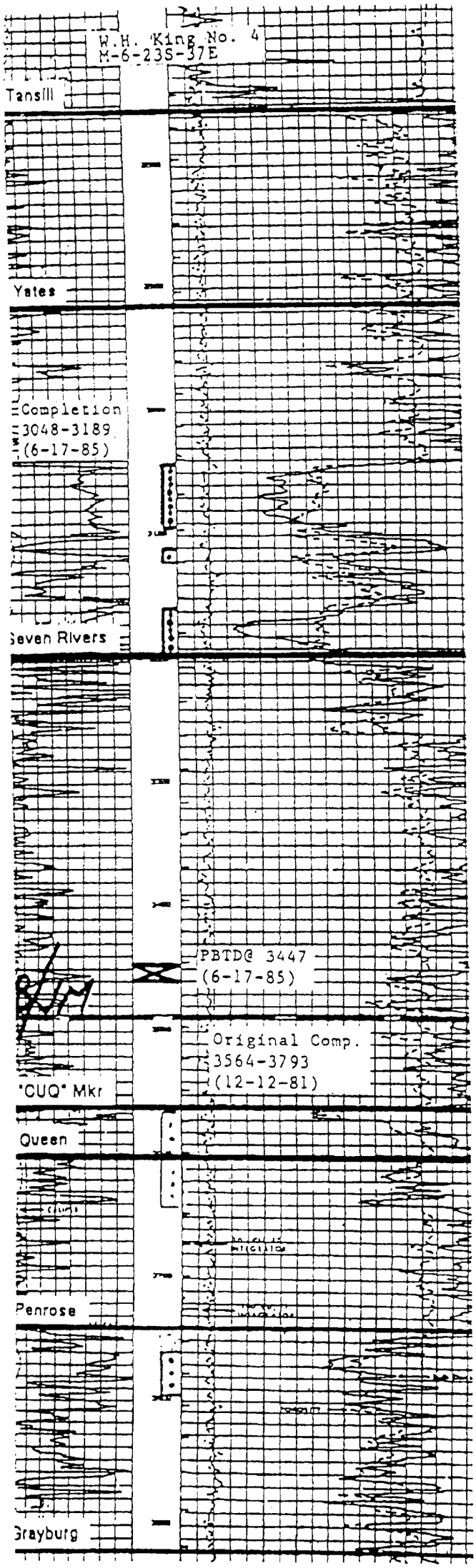


10/93: 6.190 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

W. H. King # 1,4
Composite Pressure - Time Plot
Lea County, New Mexico





M-6-23S-37E

COMPANY Gruy Operating
(Doyle Hartman/Yuronka)

WELL W.H. King No.4

FIELD Jalmat/Langlie Mattix

LOCATION 990' FSL & 330' FWL (M)
Sec. 6, T-23-S, R-37-E

COUNTY Lea

STATE New Mexico

ELEVATIONS:
KB 3406
DF 3405
GL 3395

COMPLETION RECORD

SPUD DATE 11-7-81 COMP. DATE 12-12-81

TD 4000 PBTD 3950

CASING RECORD:

8 5/8, 23# @ 419 w/325 (TOC @ Circ.)

5 ½, 14# @ 4000 w/700 (TOC @ Circ.)

(TOC @)

(TOC @)

COMP. INTERVAL Perf 3564-3793 (Langlie Mattix)

STIMULATION A/4150

POT IPF = 11 BOPD + 3 BWPD

GOR 356 GR 36

TP CP

CHOKE TUBING 2 3/8 @ 3772

REMARKS

1-18-85: Langlie Mattix abandoned. Well P & A'd.

6-14-85: CO to 3447'
Perf 3048-3189 w/20 (Jalmat)

6-15-85: A/4250 15% MCA
ATR = 3.2 BPM. ATP = 1500 psi.
ISIP = 0 psi.

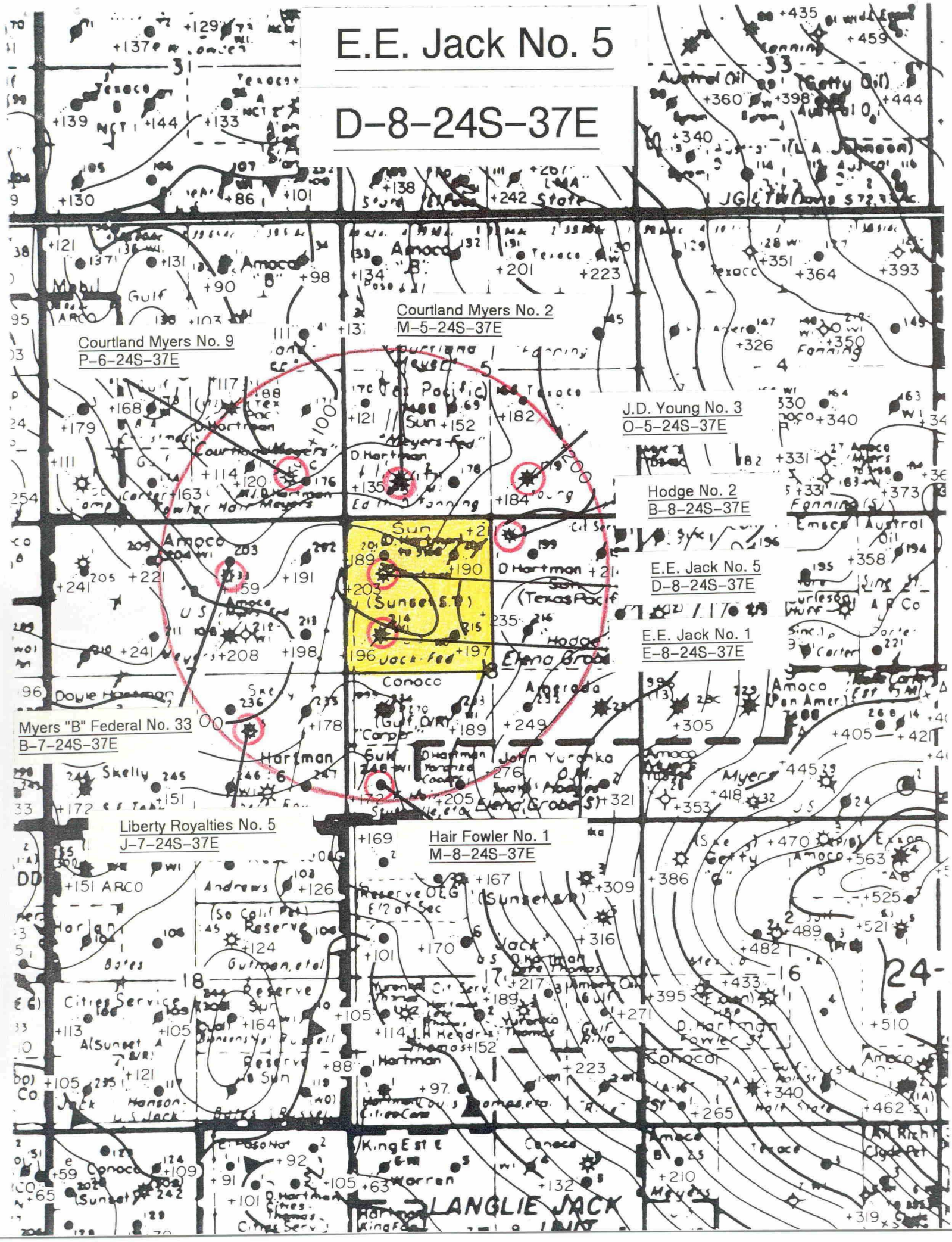
6-18-85: SICP = 110 psig (After acid)

6-19-85: SWF/163,000 + 320,000
ATR = 30 BPM. ATP = 2500 psi.
ISIP = 1090 psi. 1-hr. SIP = 705 psi.
Flare @ FCP = 170 psig.

6-21-85: POP @ 9.5 x 54 x 1 ¼
SICP = 127 psig (After frac)

6-24-85: P/1135 MCFPD. Choke = 40/64. FCP = 68 psig.
Est. C = 87. Est. M = 10,667.

09-01-97: Cum. = .7779 BCF
Est. Rem. = 131.9 MMCF
Est. Ult. = .9098 BCF
b = 0.173


E.E. Jack No. 5
D-8-24S-37E
Courtland Myers No. 2
M-5-24S-37E
Courtland Myers No. 9
P-6-24S-37E
J.D. Young No. 3
O-5-24S-37E
Hodge No. 2
B-8-24S-37E
E.E. Jack No. 5
D-8-24S-37E
E.E. Jack No. 1
E-8-24S-37E
Myers "B" Federal No. 33
B-7-24S-37E
Liberty Royalties No. 5
J-7-24S-37E
Hair Fowler No. 1
M-8-24S-37E
LANGLIE JACK

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
Doyle Hartman	Toby	3

Unit Letter	Section	Township	Range	County
I	7	24-S	37-E	Lea

Actual Footage Location of Well:
1780 feet from the South line and 1100 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3303.0'	Yates-Seven Rivers	Jalmat (Gas)	80 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

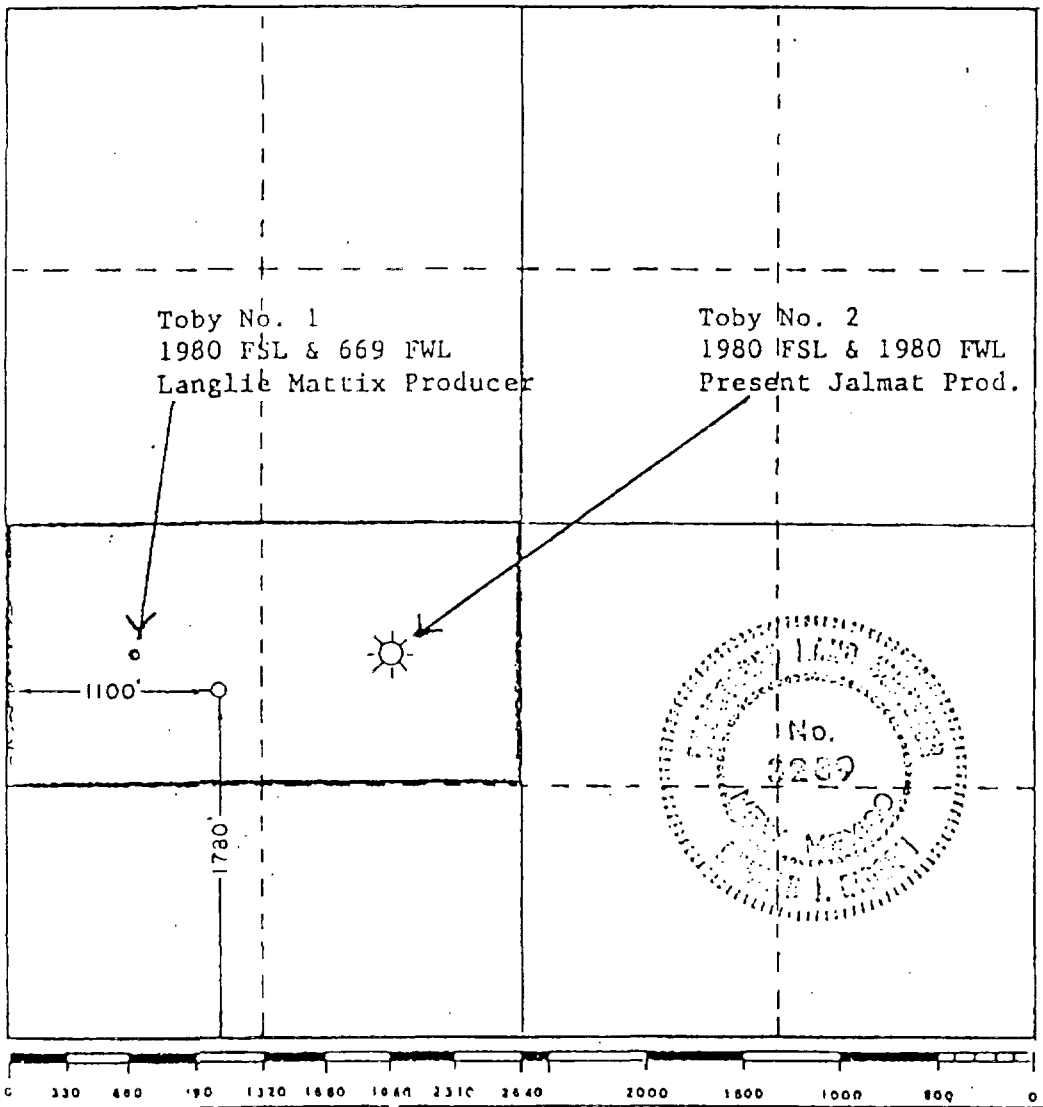
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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.

Larry Nermyr

Name: Larry G. Nermyr

Position: Engineer

Company: Doyle Hartman

Date: March 31, 1982

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: March 31, 1982

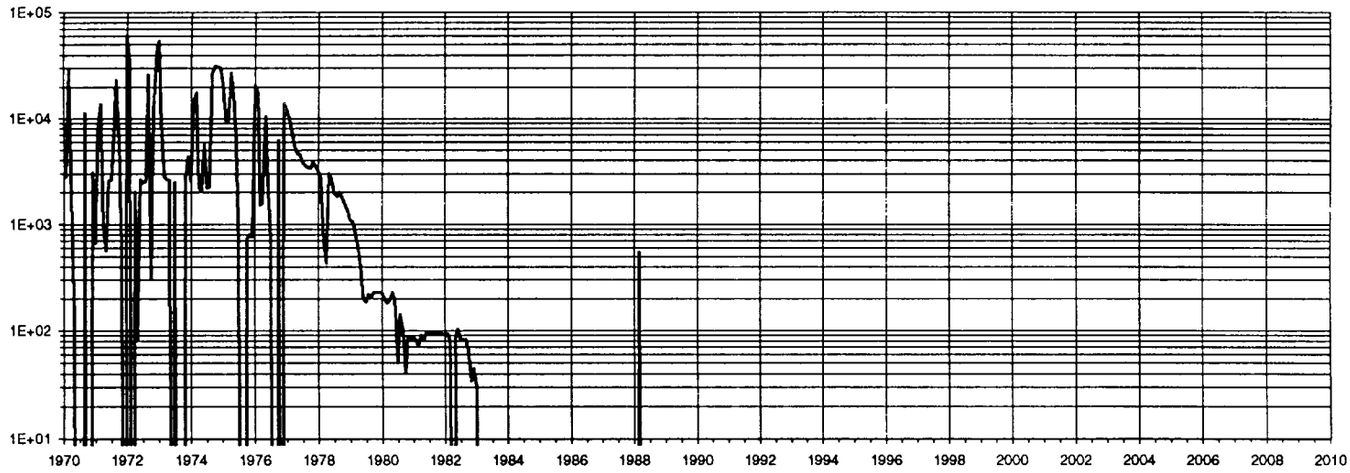
Registered Professional Engineer and/or Land Surveyor

Ronald J. Eidson

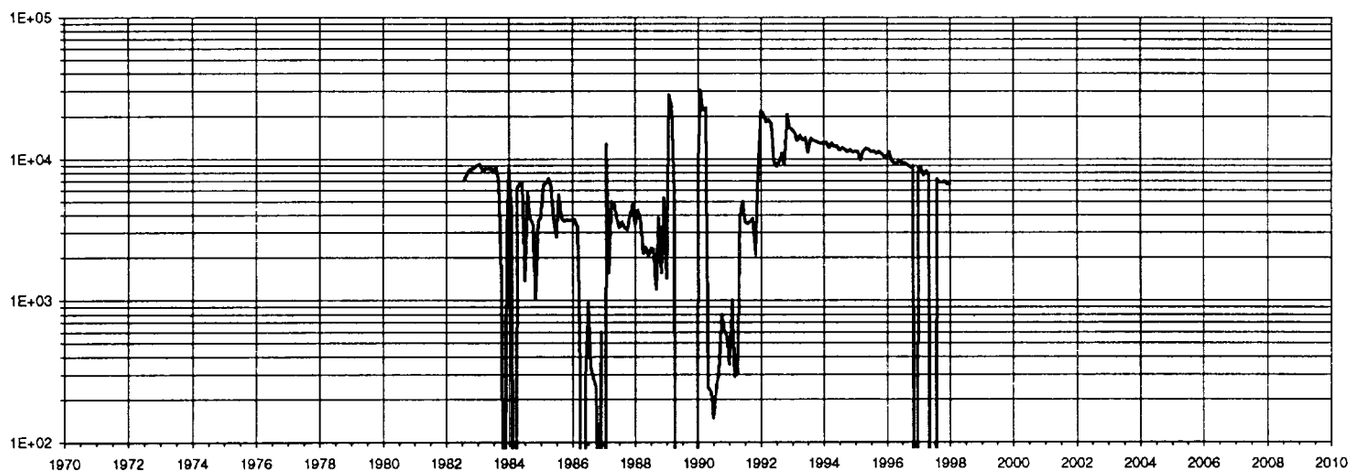
Certificate No. JOHN W. WEST 676
PATRICK A. ROMERO 6668
Ronald J. Eidson 3239

Toby Nos. 2 & 3
Jalmat Gas Pool
L-7-24S-37E
Gruy Petroleum Management Co.

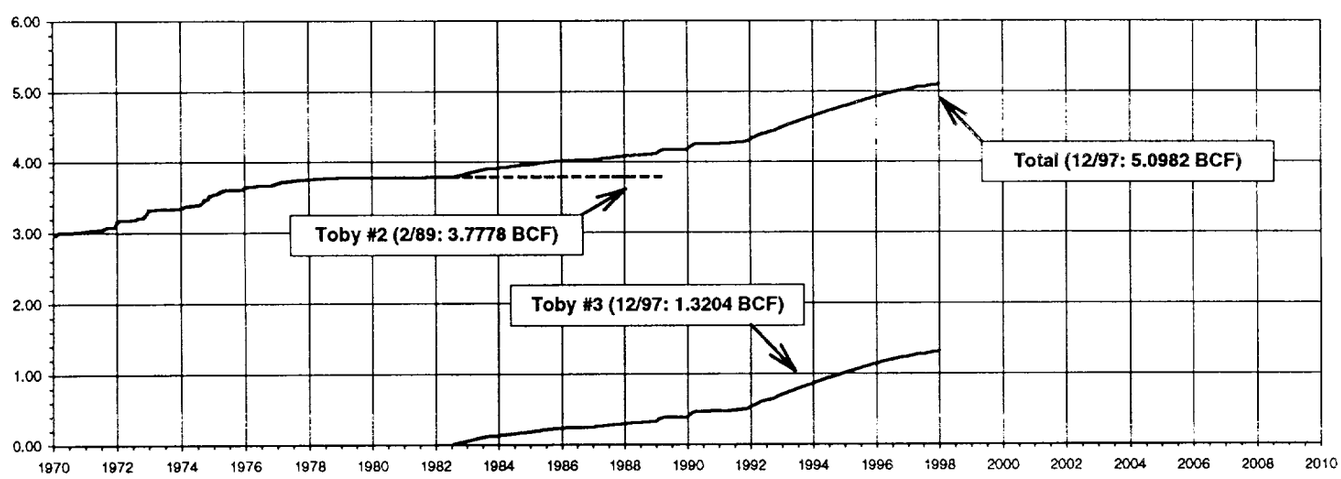
Toby No. 2 Gas Production (MCFPM)



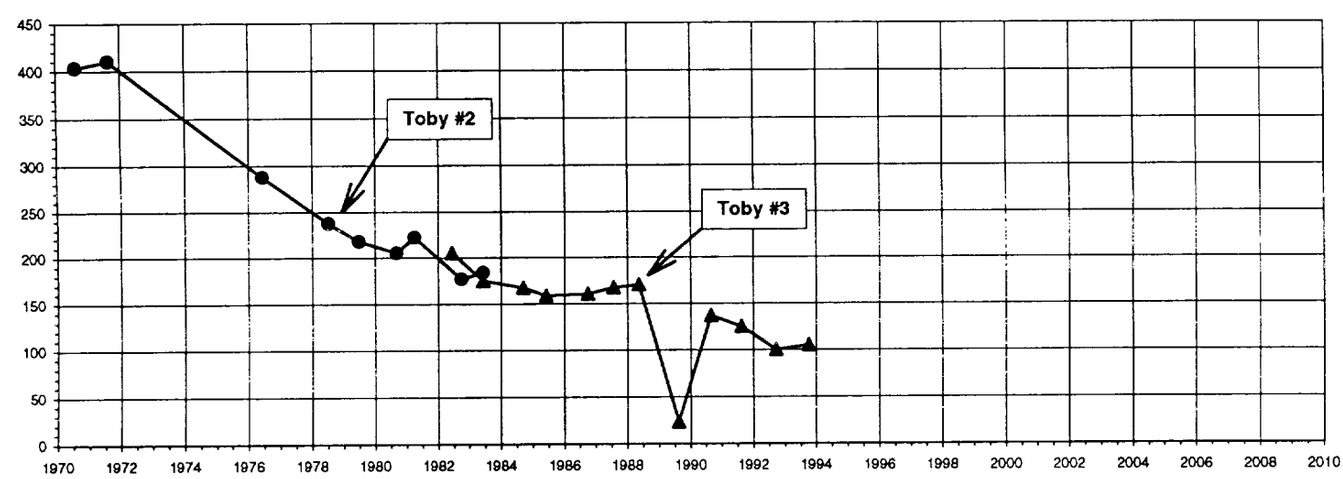
Toby No. 3 Gas Production (MCFPM)



Cumulative Gas Production (BCF)

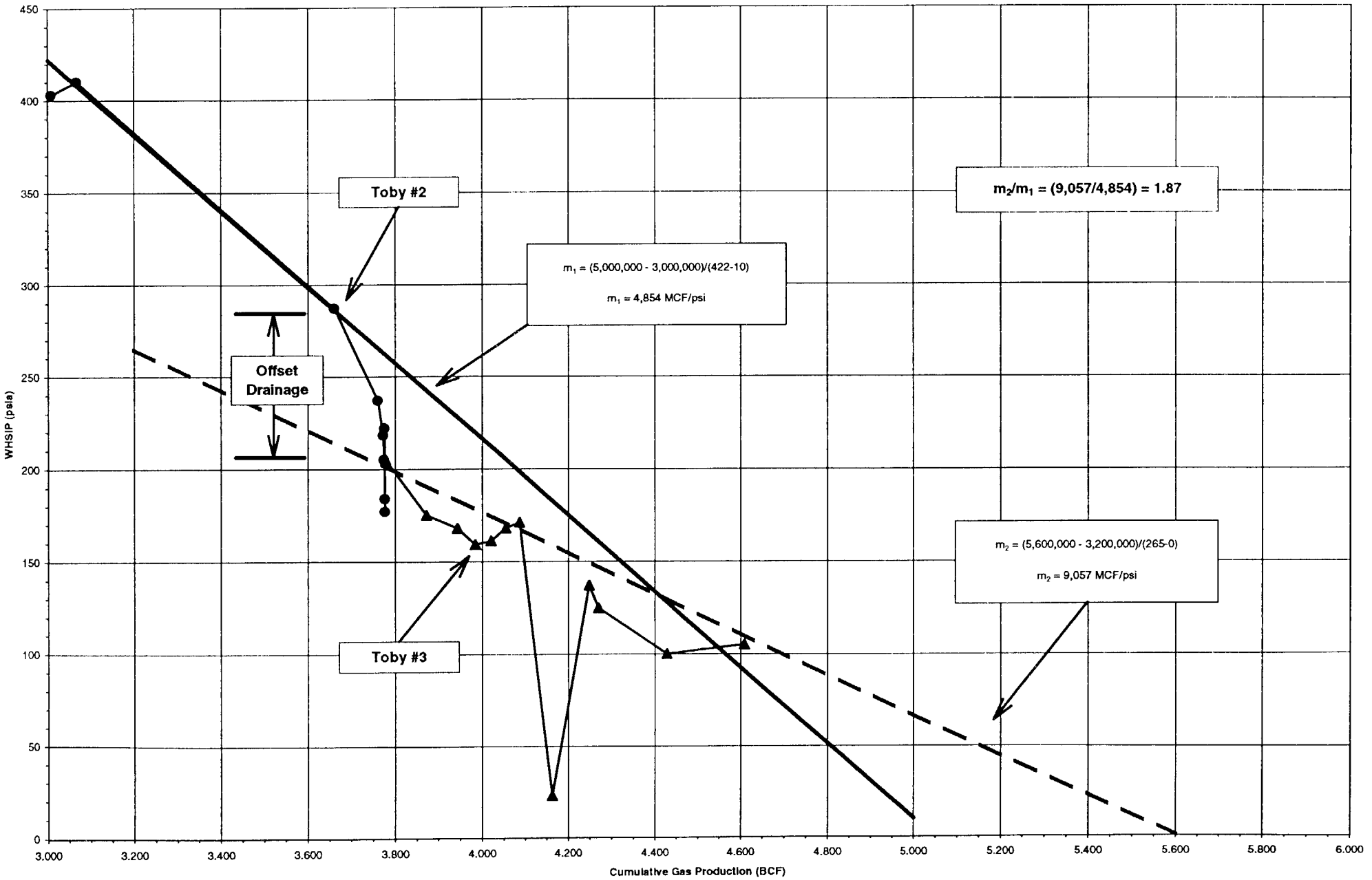


WHSIP (psia)



12/97: 5.098 BCF

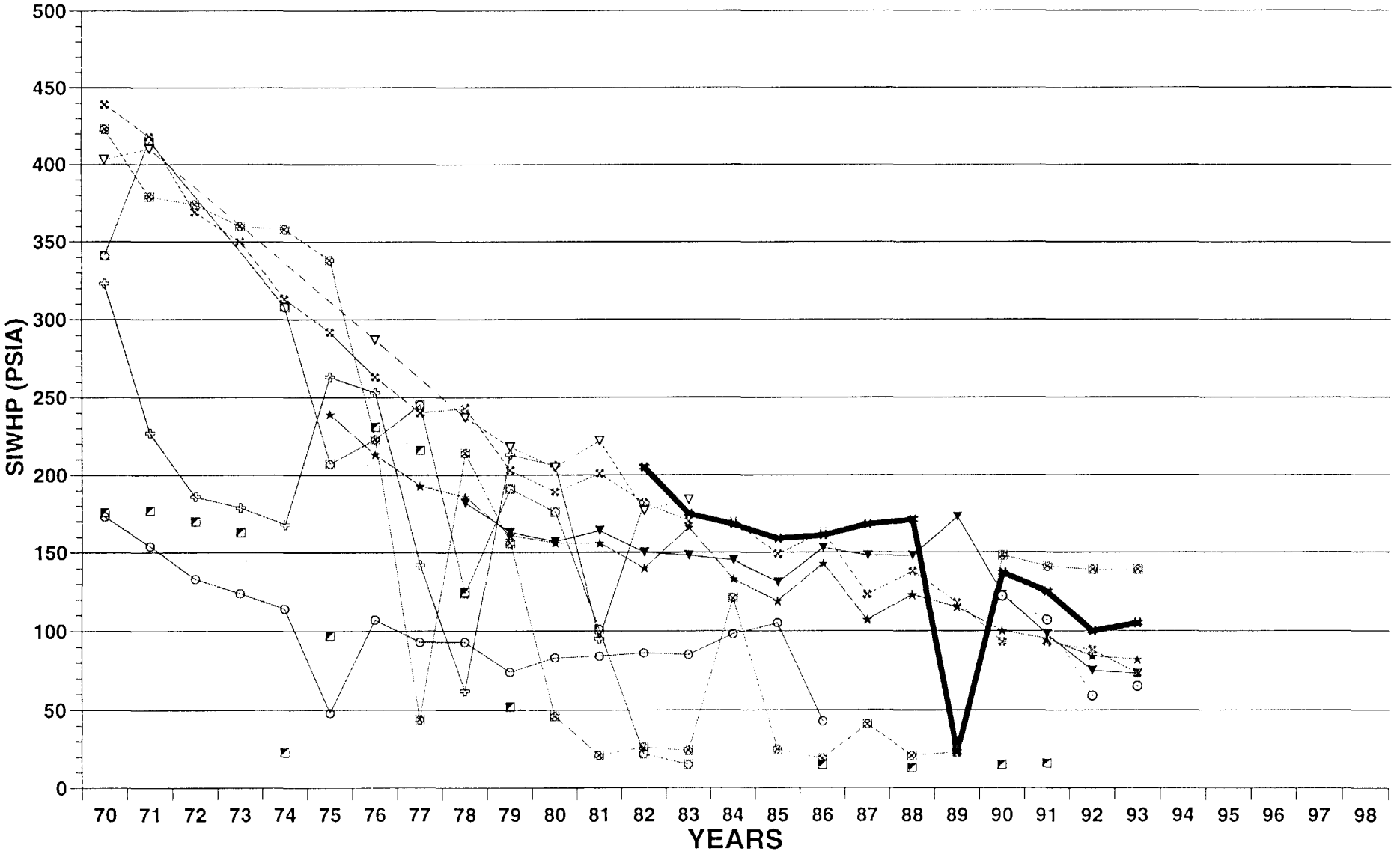
Toby Nos. 2 & 3
Jalmat Gas Pool
L-7-24S-37E
Gruy Petroleum Management Co.

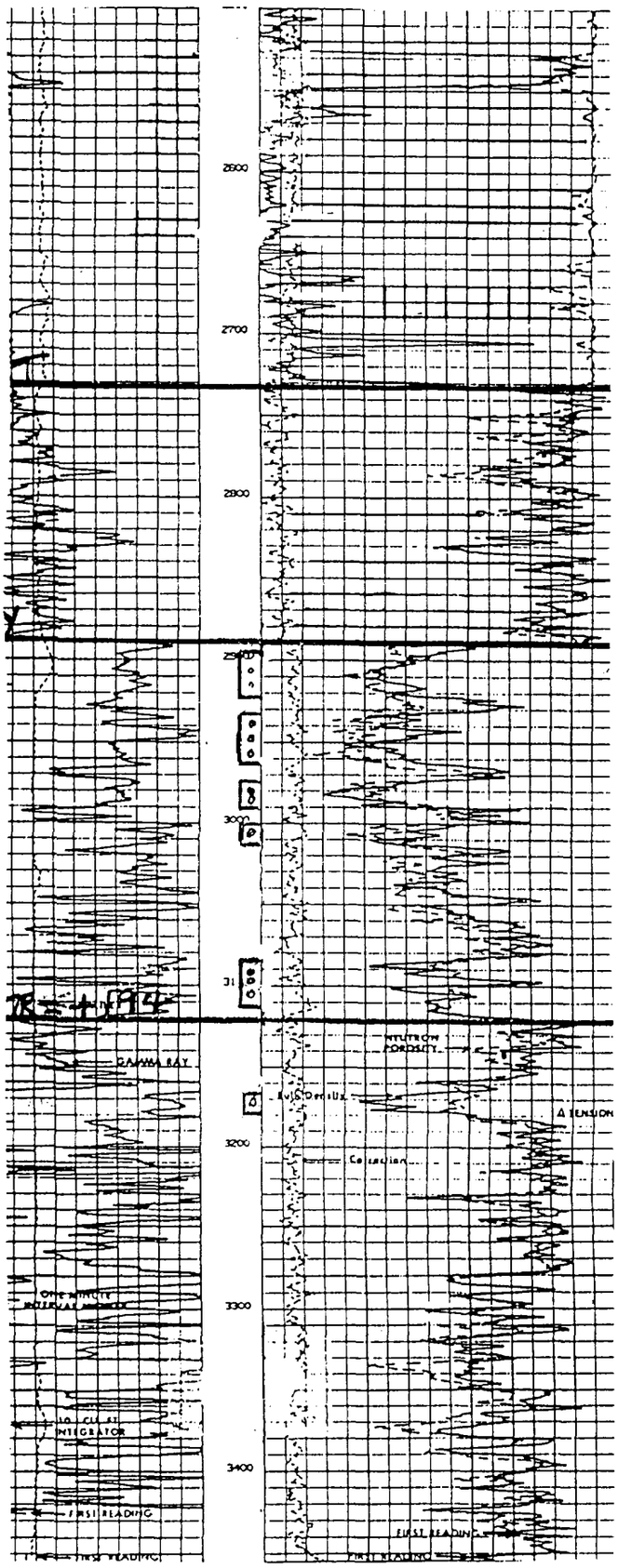


10/93: 4.608 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

Toby # 2,3
Composite Pressure - Time Plot
Lea County, New Mexico





COMPANY Gruy Operating
(Doyle Hartman)
WELL Toby No. 3

FIELD Jalmat (Gas)
LOCATION 1780' FSL & 1100' FWL (L)
Sec. 7, T-24-S, R-37-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB 3314
DF
GL 3303

COMPLETION RECORD

SPUD DATE 5-28-82 COMP. DATE 6-12-82
TD 3450 PBTD 3386
CASING RECORD:
9 5/8, 36# @ 430 w/250 (TOC @ Circ.)
7, 23# @ 3450 w/500 (TOC @ Circ.)
(TOC @)
(TOC @)
COMP. INTERVAL Perf 2897-3177 w/21

STIMULATION A/5600 15% MCA
ATR = 5 ¼ BPM. ATP = 1450 psi.
ISIP = 300 psi. 3-min. SIP = 0.
POT P/725 MCFPD (After Frac)
GOR GR
TP CP 182 psig (SICP = 196 psig)
CHOKE 28/64 TUBING 2 3/8 @ 3262
REMARKS
06-10-82: SICP = 206 psig (After acid)

06-10-82: SWF/92,000 + 214,000
ATR = 30 BPM
ATP = 1300 psi
ISIP = 530 psi
1-hr. SIP = 470 psi
19.5-hr. Test:
Flow Path - annulus
Choke = 64/64
FCP = 63 psi
FTP = 153 psi
(Sand Fill @ 3310' RKB)

6-11-82: POP @ 8 ½ x 64 x 1 ¼.
SICP = 196 psig (After Frac)

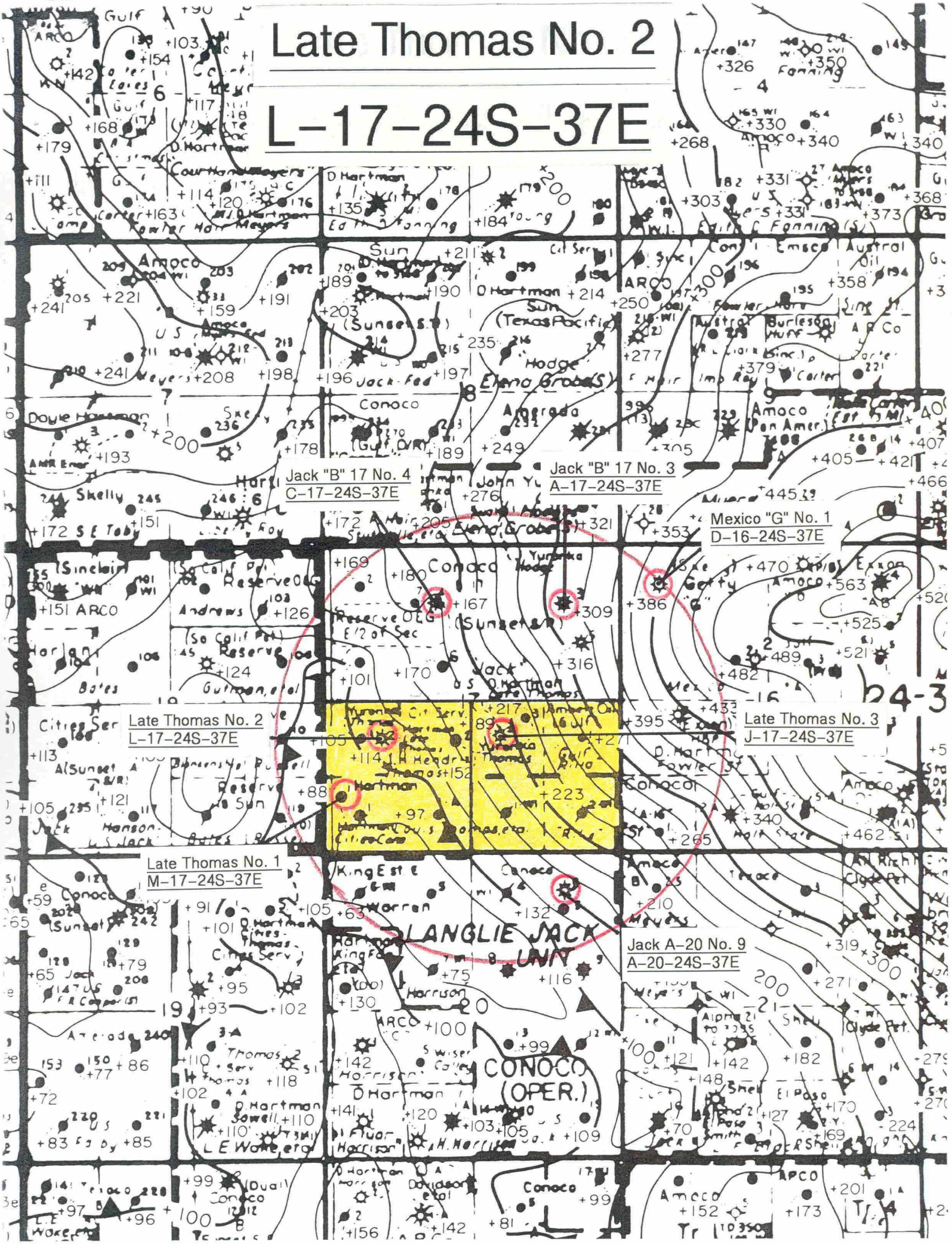
6-12-82: Est. C = 128

01-01-98: Cum. = 1.3204 BCF
Est. Rem. = 314.4 MMCF
Est. Ult. = 1.6348 BCF
b = .229
M = 9057 MCF/psia

L-7-24S-37E

Late Thomas No. 2

L–17–24S–37E



NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
Doyle Hartman, Oil Operator	North Shore Woolworth	6

Unit Letter	Section	Township	Range	County
E	33	24 South	37 East	Lea

Actual Footage Location of Well:
1720 feet from the North line and 310 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3162.0	Yates-Seven Rivers	Jalmat (Gas)	160 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

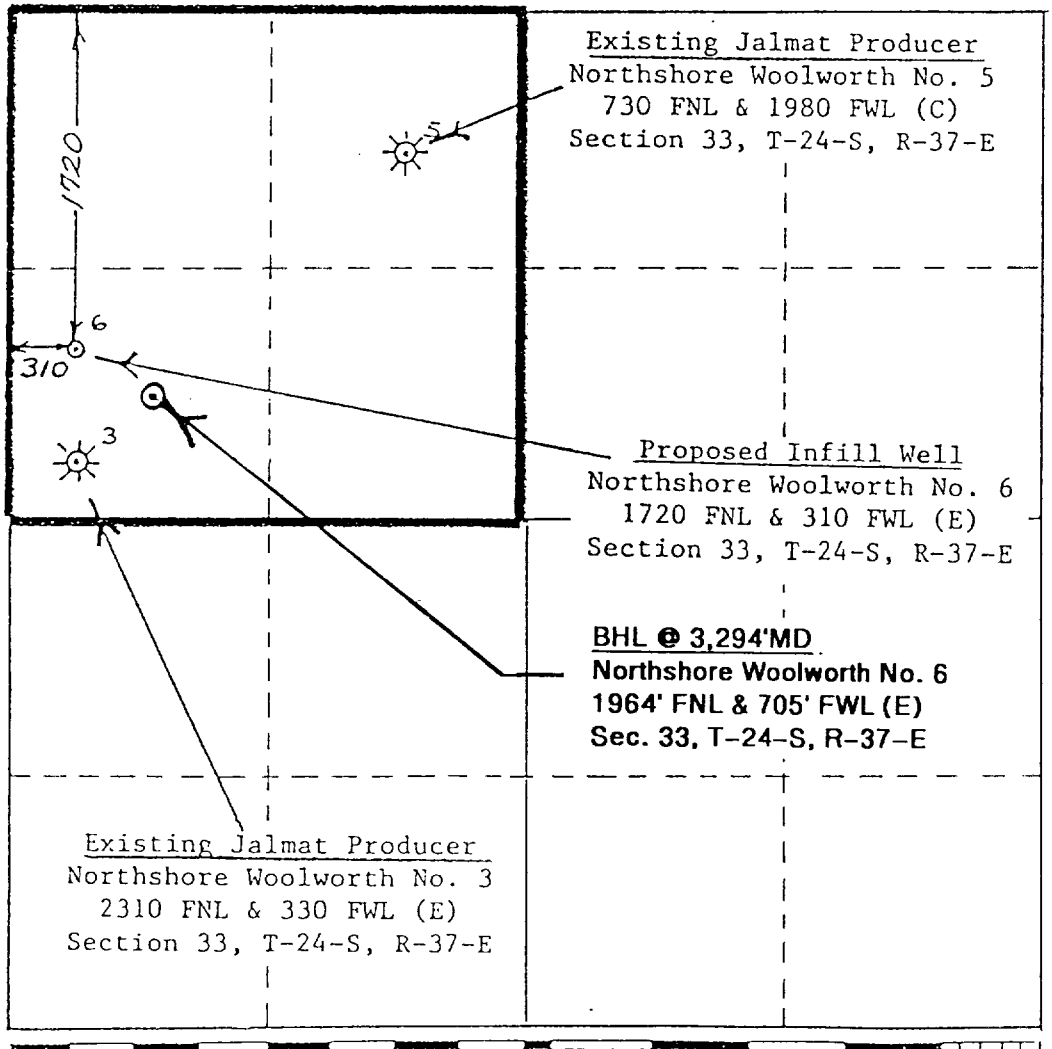
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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.

Larry A. Nermyr

Name: Larry A. Nermyr

Position: Engineer

Company: Doyle Hartman

Date: December 14, 1982

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 10, 1982

Registered Professional Engineer and/or Land Surveyor

Truman Gaskin

Certificate No. 2126

0042607

DOYLE HARTMAN
NORTH SHORE WOOLWORTH WELL NO.6
LEA COUNTY,NEW MEXICO BD1-271

COMPUTATION TIME 08:54:29 DATE 19-APR-83 PAGE NO.

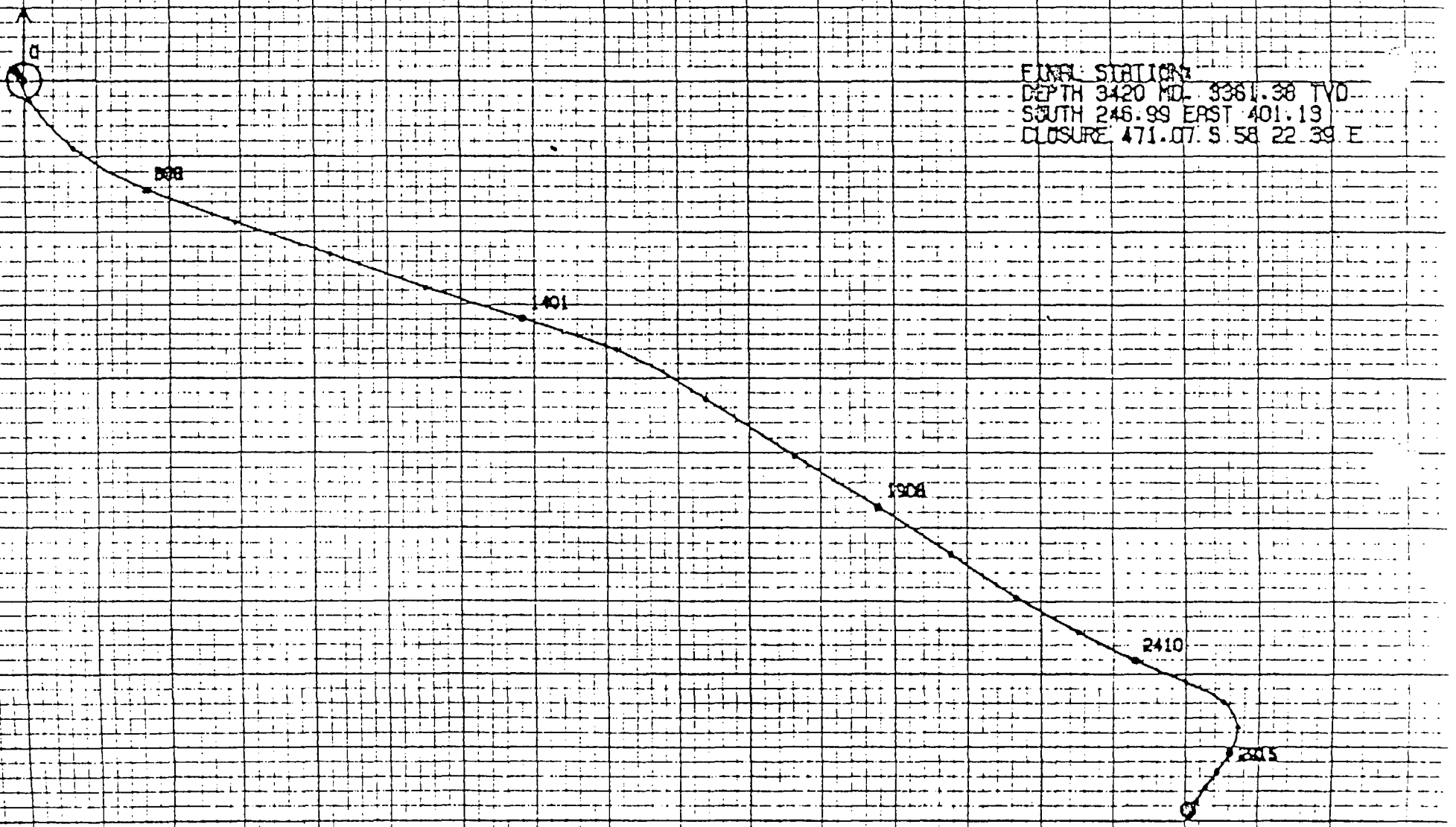
MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	RECTANGULAR COORDINATES FEET		DOGLEG SEVERITY DG/100FT
1779.	15 45	S 59 E	63.	1739.13	289.69	126.72 S	265.99 E	1.98
1843.	15 15	S 59 E	64.	1800.80	306.73	135.53 S	280.65 E	0.78
1906.	14 15	S 59 E	63.	1861.72	322.71	143.79 S	294.40 E	1.59
1969.	13 30	S 58 E	63.	1922.88	337.77	151.69 S	307.28 E	1.25
2032.	12 45	S 57 E	63.	1984.24	352.05	159.37 S	319.35 E	1.24
2095.	12 15	S 55 E	63.	2045.75	365.68	167.00 S	330.65 E	1.05
2158.	11 45	S 58 E	63.	2107.37	378.76	174.23 S	341.57 E	1.27
2221.	11 0	S 61 E	63.	2169.13	391.13	180.53 S	352.28 E	1.52
2284.	10 45	S 62 E	63.	2231.00	402.91	186.20 S	362.72 E	0.50
2347.	10 15	S 64 E	63.	2292.94	414.25	191.41 S	372.95 E	0.98
2410.	9 0	S 65 E	63.	2355.06	424.61	195.95 S	382.46 E	2.00
2474.	8 45	S 68 E	64.	2418.28	434.25	199.89 S	391.51 E	0.82
2537.	8 0	S 67 E	63.	2480.62	443.17	203.40 S	399.99 E	1.21
2600.	6 45	S 64 E	63.	2543.09	451.10	206.75 S	407.35 E	2.08
2663.	5 30	S 50 E	63.	2605.73	457.79	210.40 S	412.97 E	3.08
2726.	4 15	S 30 E	63.	2668.50	462.96	214.48 S	416.39 E	3.32
2789.	4 15	S 6 E	63.	2731.33	466.71	218.89 S	417.83 E	2.80
2852.	4 15	S 20 W	63.	2794.16	468.95	223.49 S	417.26 E	3.03
2915.	4 0	S 34 W	63.	2856.99	469.66	227.51 S	415.21 E	1.[illegible]
2978.	3 45	S 33 W	63.	2919.85	469.84	231.06 S	412.86 E	0.4[illegible]
3041.	3 0	S 35 W	63.	2982.74	469.97	234.14 S	410.79 E	1.20
3105.	2 45	S 35 W	64.	3046.66	470.03	236.77 S	408.94 E	0.39
3168.	3 0	S 37 W	63.	3109.58	470.02	239.32 S	407.09 E	0.43
3231.	2 45	S 31 W	63.	3172.50	470.13	241.94 S	405.32 E	0.62
3294.	2 0	S 36 W	63.	3235.45	470.25	244.12 S	403.88 E	1.23
3357.	1 45	S 47 W	63.	3298.41	470.05	245.66 S	402.52 E	0.69
3420.	1 45	S 45 W	63.	3361.38	469.71	247.00 S	401.13 E	0.10

FINAL CLOSURE - DIRECTION: S 58 DEGS 23 MINS E
DISTANCE: 471.08 FEET

DOYLE HARTMAN
NORTH SHORE WOOLWORTH WELL NO.6
LEA COUNTY, NEW MEXICO — BDI-271

HORIZONTAL PROJECTION
SCALE 1 IN. = 50 FEET
DEPTH INDICATORS MD

ERSTHAN WHIRSTOCK, INC.



FINAL STATION
DEPTH 3420 MD 3361.38 TVD
SOUTH 246.99 EAST 401.19
CLOSURE 471.07 S 58 22 39 E

0042559

Eastman Whipstock
A PETROLANE COMPANY
P. O. Box 5577/Midland, Texas 79704/(915) 563-0511

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Gary DeSpain, in the employ of Eastman Whipstock, Inc., did on the days of 4-8, 19 83 thru 4-8, 19 83 conduct or supervise the taking of a Gyroscopic Multi Shot survey by the method of magnetic orientation from a depth of 0 feet to 400 feet, with recordings of inclination and direction being obtained at approximate intervals of 50 feet.

This survey was conducted at the request of Doyle Hartman for their North Shore Woolworth #6, Lea County County, State of New Mexico, in the _____ field.

This data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Eastman Whipstock, Inc. and is true and correct to the best of my knowledge.

Gary DeSpain
Directional Supervisor/ Surveyor

The data for this survey has been examined by me and conforms to principles and procedures set forth by Eastman Whipstock, Inc.

Troy Dunn

Before me, the undersigned authority, on this day personally appeared Gary DeSpain, known to me to be the person whose name is subscribed to this instrument, who after being by me duly sworn on oath, states that he has knowledge of all the facts stated above and that this instrument is a true statement of facts therein recited.

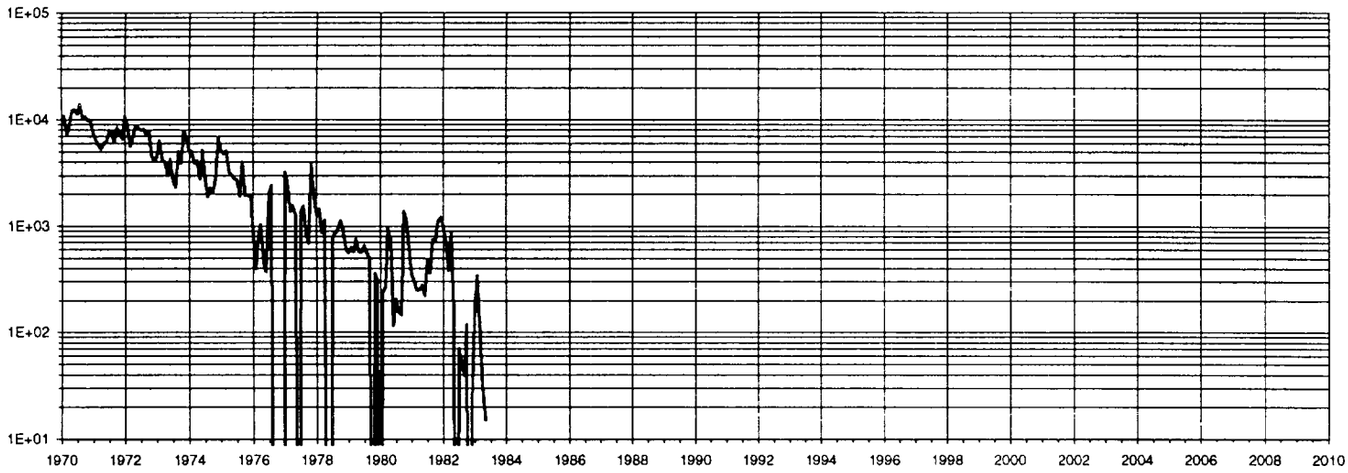
Subscribed and sworn to before me on this 19th day of April, 1983

Ray L. Stanke
Notary Public in and for the
County of Midland, Texas
My commission expires 7/9/85

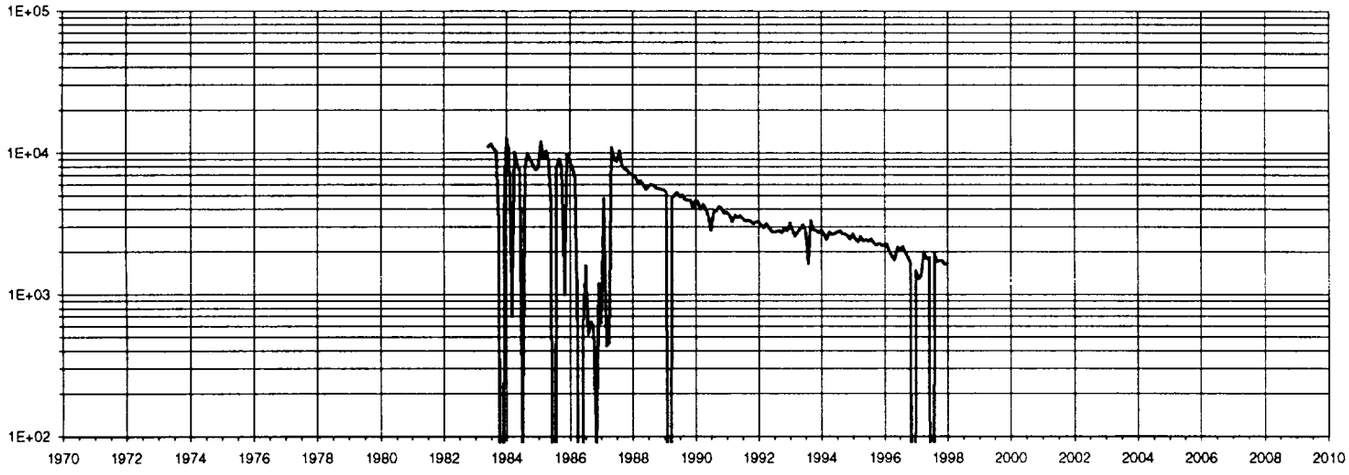
0042600

North Shore Woolworth Nos. 3 & 6
Jalmat Gas Pool
E-33-24S-37E
Gruy Petroleum Management Co.

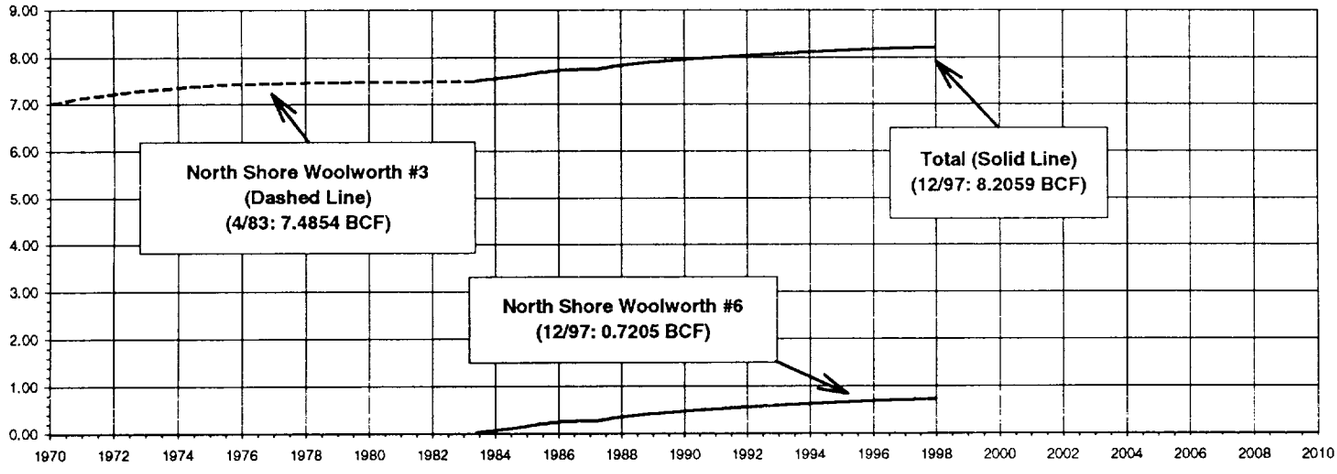
North Shore Woolworth #3 Gas Production (MCFPM)



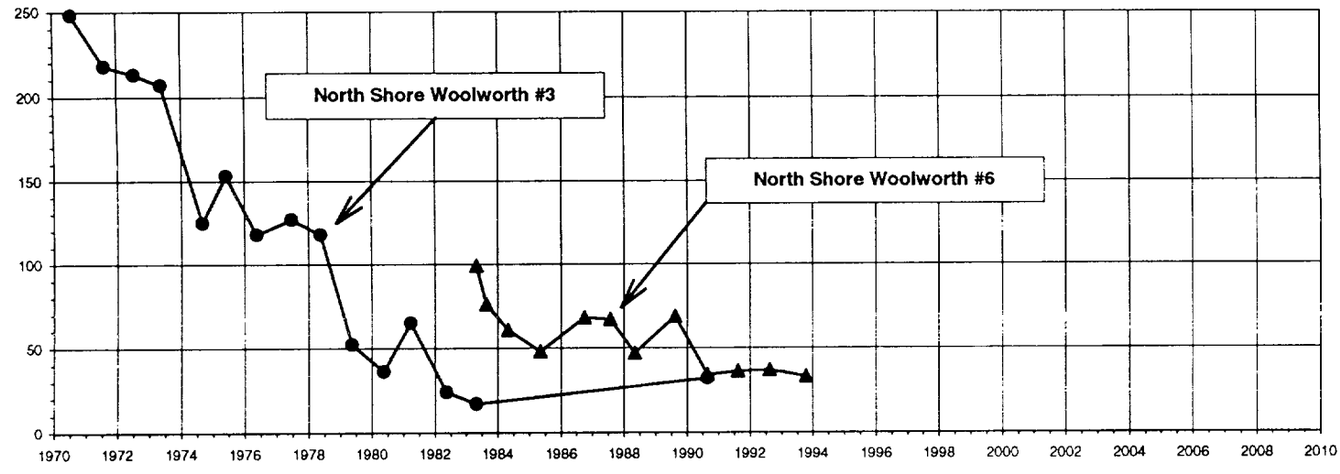
North Shore Woolworth #3 Gas Production (MCFPM)



Cumulative Gas Production (BCF)

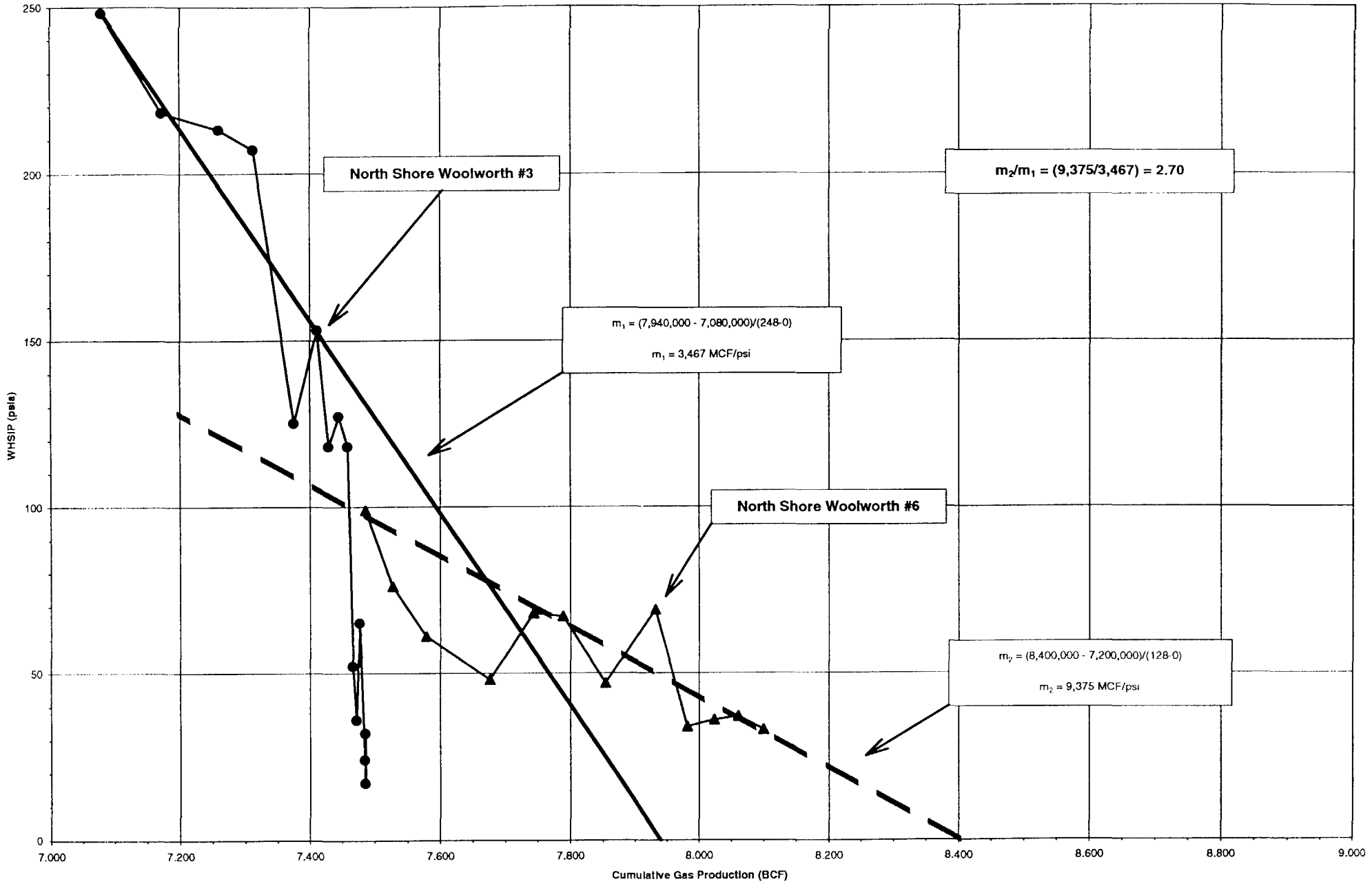


WHSIP (psia)



12/97: 8.206 BCF

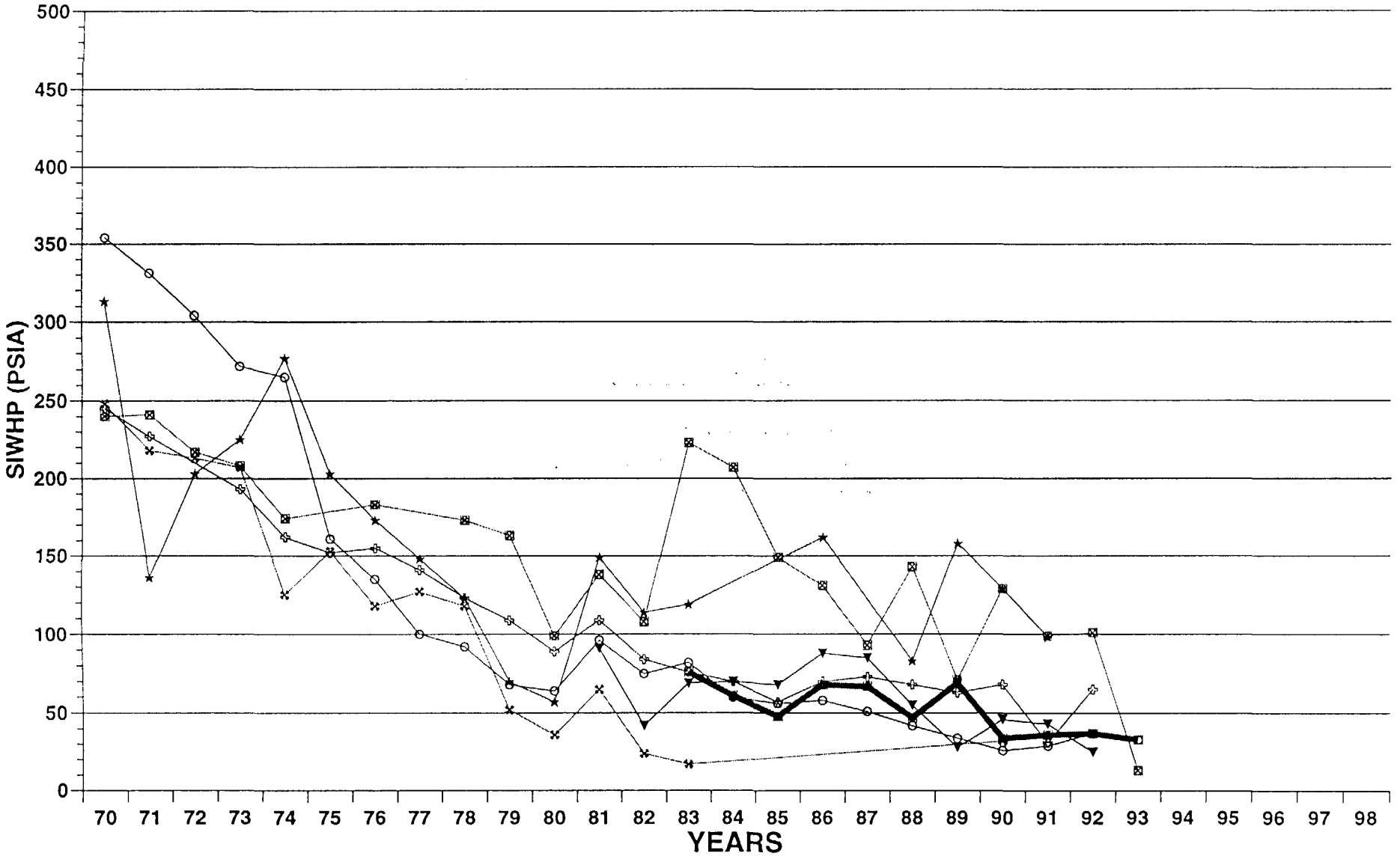
North Shore Woolworth Nos. 3 & 6
Jalmat Gas Pool
E-33-24S-37E
Gruy Petroleum Management Co.

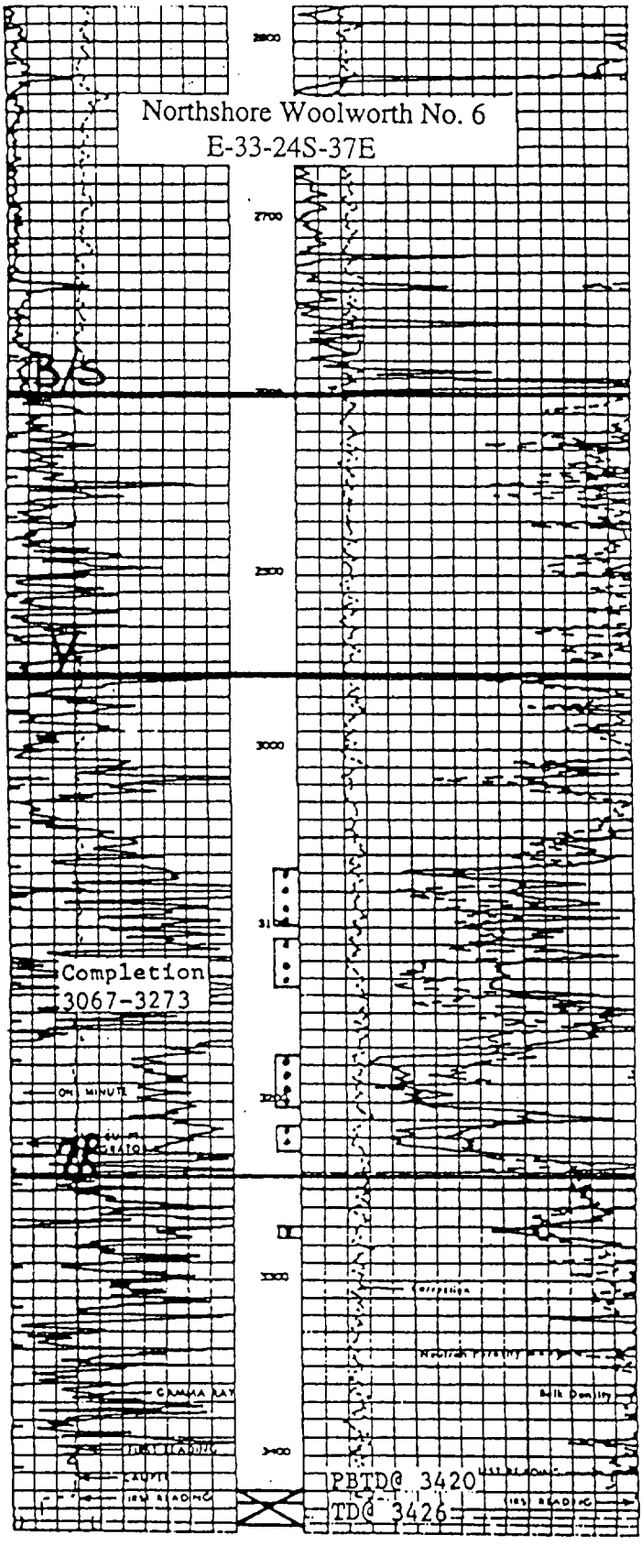


10/93: 8.099 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

Northshore-Woolworth # 3,6
Composite Pressure - Time Plot
Lea County, New Mexico





COMPANY Gruy Operating
(Doyle Hartman)
WELL Northshore Woolworth No. 6

FIELD Jalmat (Gas)
LOCATION 1710' FNL & 310' FWL (E)
Sec. 33, T-24-S, R-37-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB 3273'
DF 3272'
GL 3262'
BHL @ 3231': 1942' FNL & 715' FWL

COMPLETION RECORD

SPUD DATE 04-07-83 COMP. DATE 04-21-83
TD 3,426' *(3366') PBTD 3,420' *(3361')
CASING RECORD:
9 5/8" @ 467' w/250 sx. (TOC @)
7" @ 3426' w/700 sx. (TOC @)
(TOC @)
(TOC @)
COMP. INTERVAL Perf: 3067-3273' w/21.
*(3009-3220')
STIMULATION A/5500

POT IPF = 112 MCFPD + 1 BWPD
GOR GR
TP 45 CP 83
CHOKE 18/64 TUBING @
REMARKS * True Vertical Depth

04-25-83: F/155 MCFPD
Choke = 30/64
FTP = 25 psig
FCP= 40 psig

04-27-83: 48-hr SICP = 86 psig

04-27-83: SWF/90,000 + 206,000
ATR = 34 BPM
ATP = 2200 psi
ISIP = 640 psi
1-hr SIP = 525 psi

05-04-83: SICP = 100 psig

05-25-83: P/657 MCFPD
Choke = 54/64
FCP = 45 psi

01-01-98: Cum = 0.7295 BCF
Rem = 77.9 MMCF
Est. Ult. = 0.7984 BCF
b = 0.154
m = 9375 MCF/psi

E-33-24S-37E

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
Doyle Hartman	Dabbs	3

Unit Letter	Section	Township	Range	County
M	34	25 South	37 East	Lea County

Actual Footage Location of Well:
990 feet from the South line and 660 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3001.5	Tansil-Yates-7 Rivers	Jalmat (Gas)	320 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

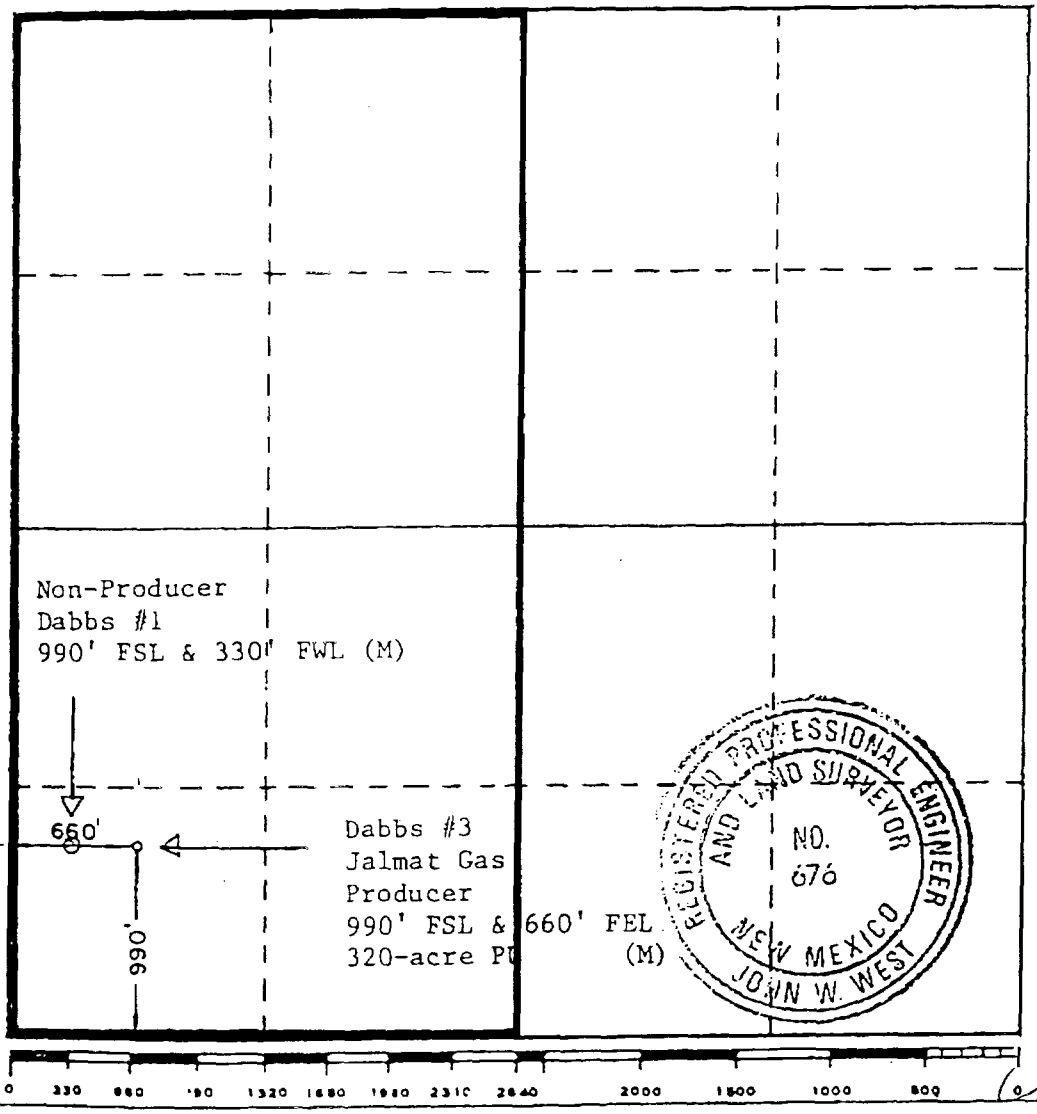
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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.

Name: Michael Stewart

Position: Engineer

Company: Doyle Hartman

Date: February 20, 1990

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 6, 1985

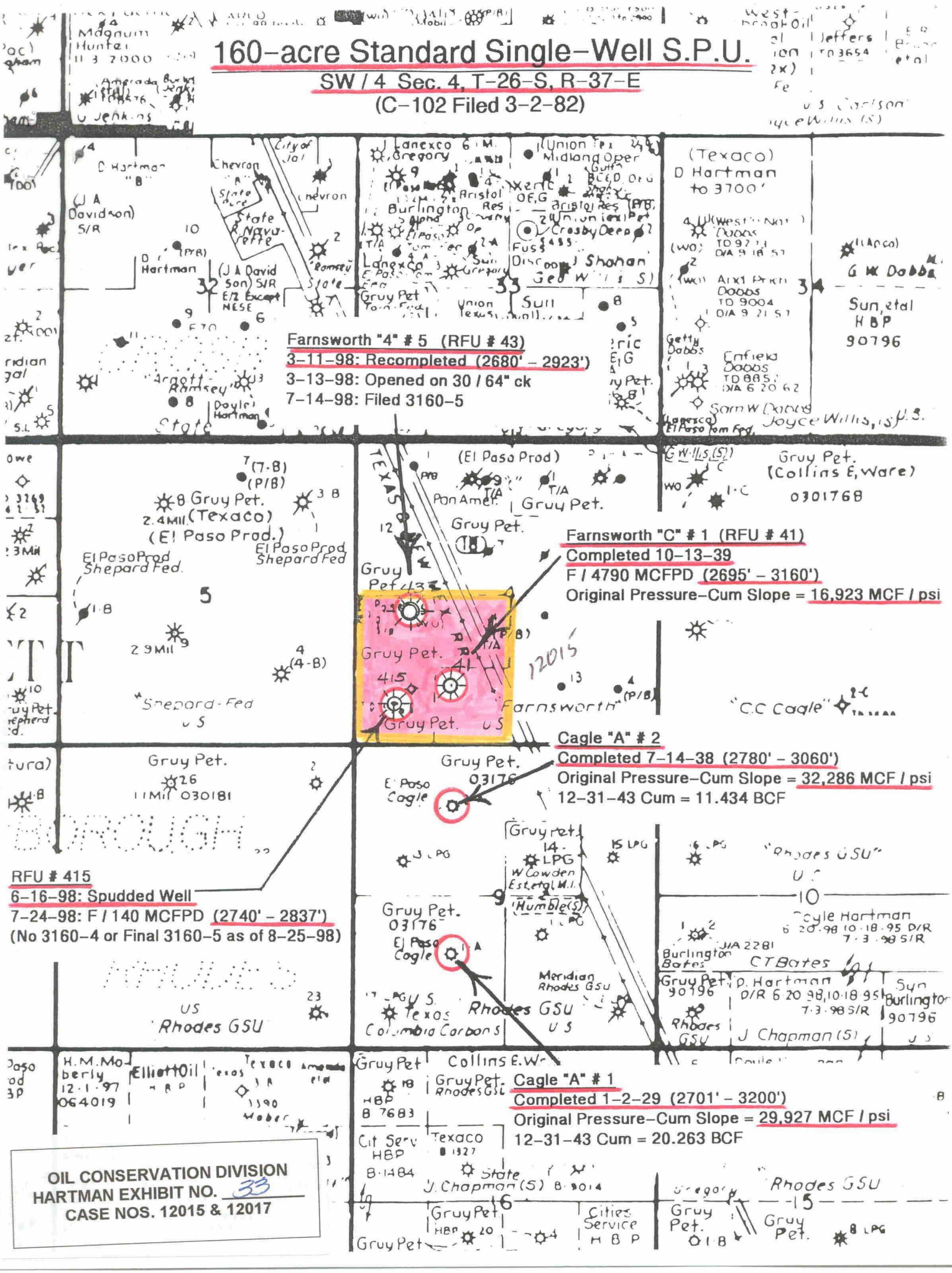
Registered Professional Engineer and/or Land Surveyor

Certificate No. JOHN W. WEST, 676
RONALD J. EIDSON, 3239

160-acre Standard Single-Well S.P.U.

SW / 4 Sec. 4, T-26-S, R-37-E

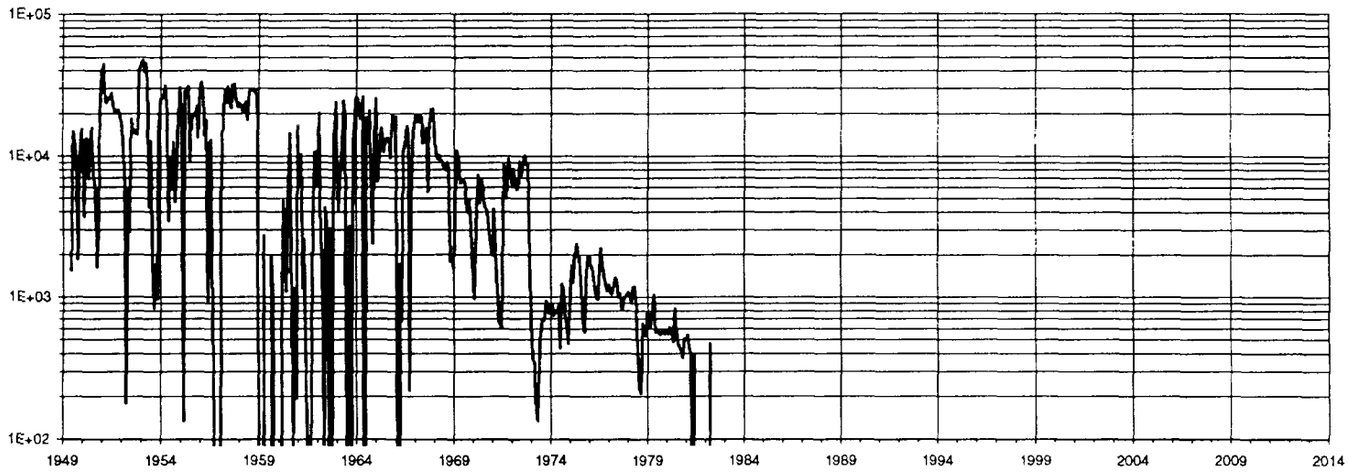
(C-102 Filed 3-2-82)



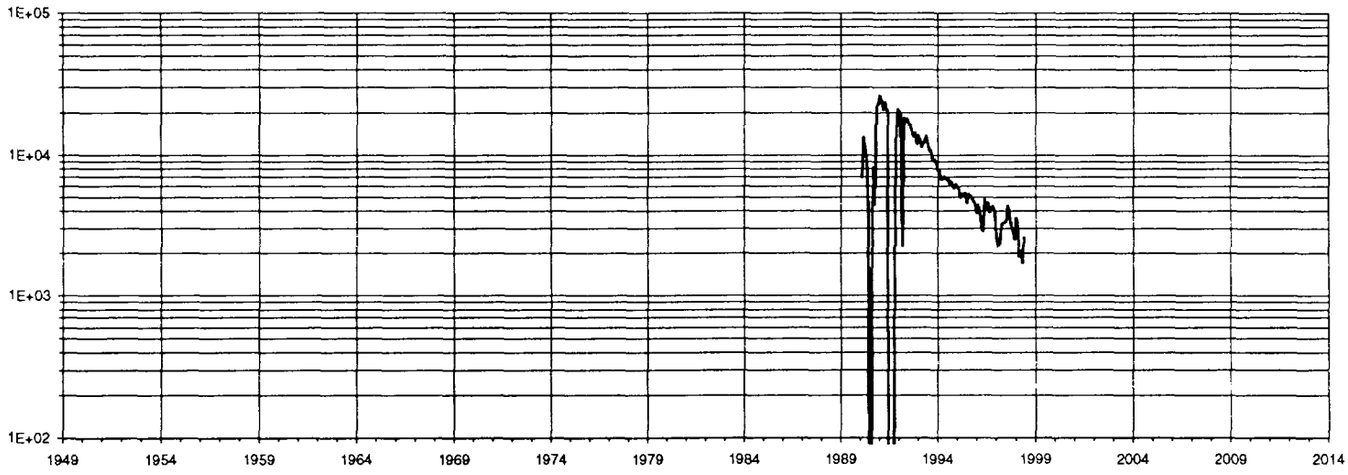
OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 33
CASE NOS. 12015 & 12017

Dabbs Nos. 1 & 3
Jalmat Gas Pool
M-34-25S-37E
Doyle Hartman

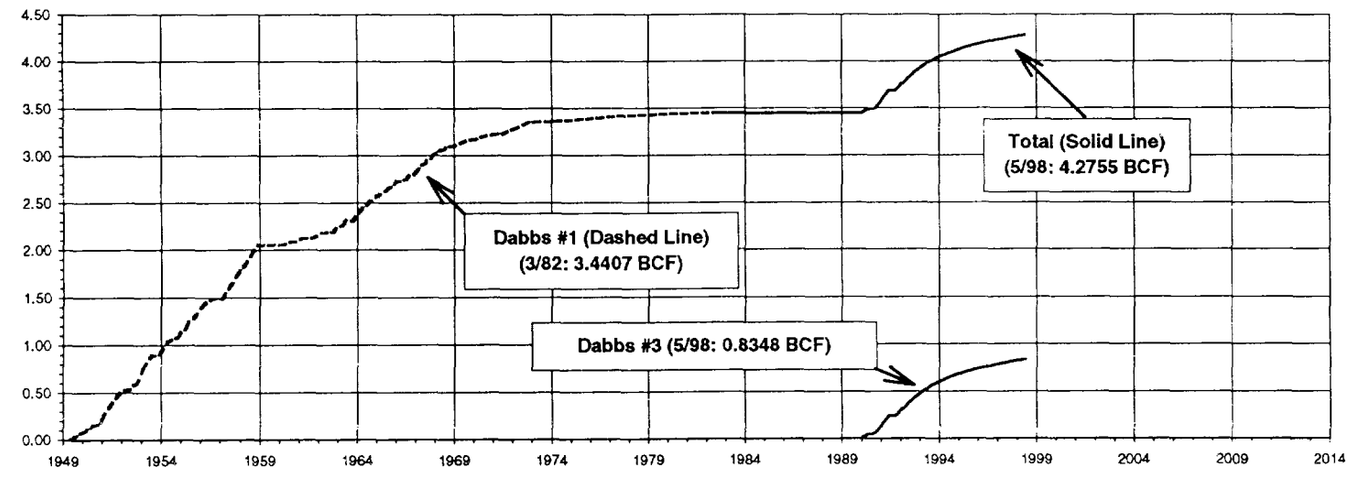
Dabbs #1 Gas Production (MCFPM)



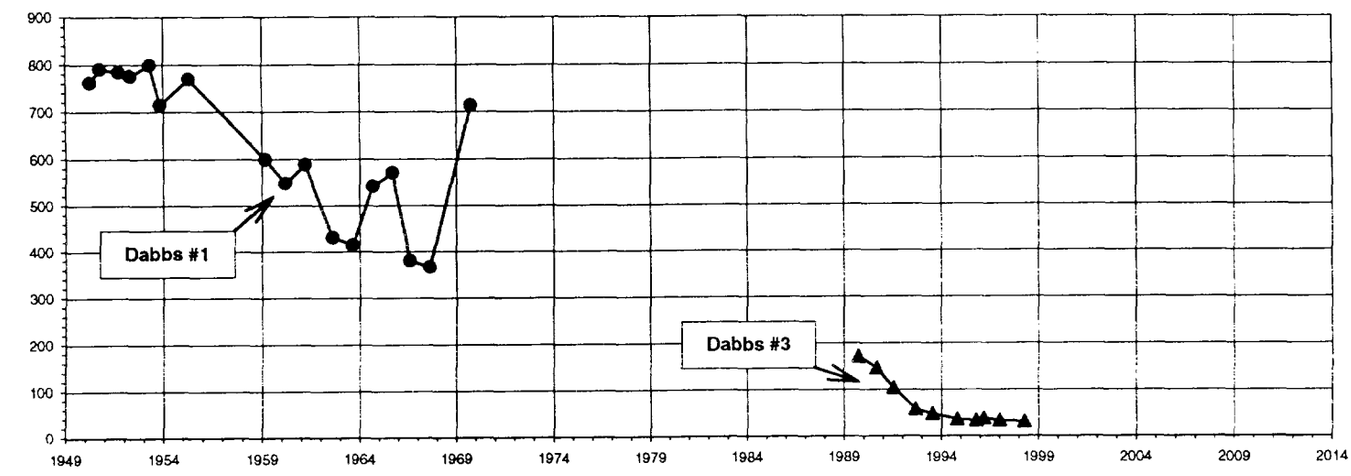
Dabbs #3 Gas Production (MCFPM)



Cumulative Gas Production (BCF)

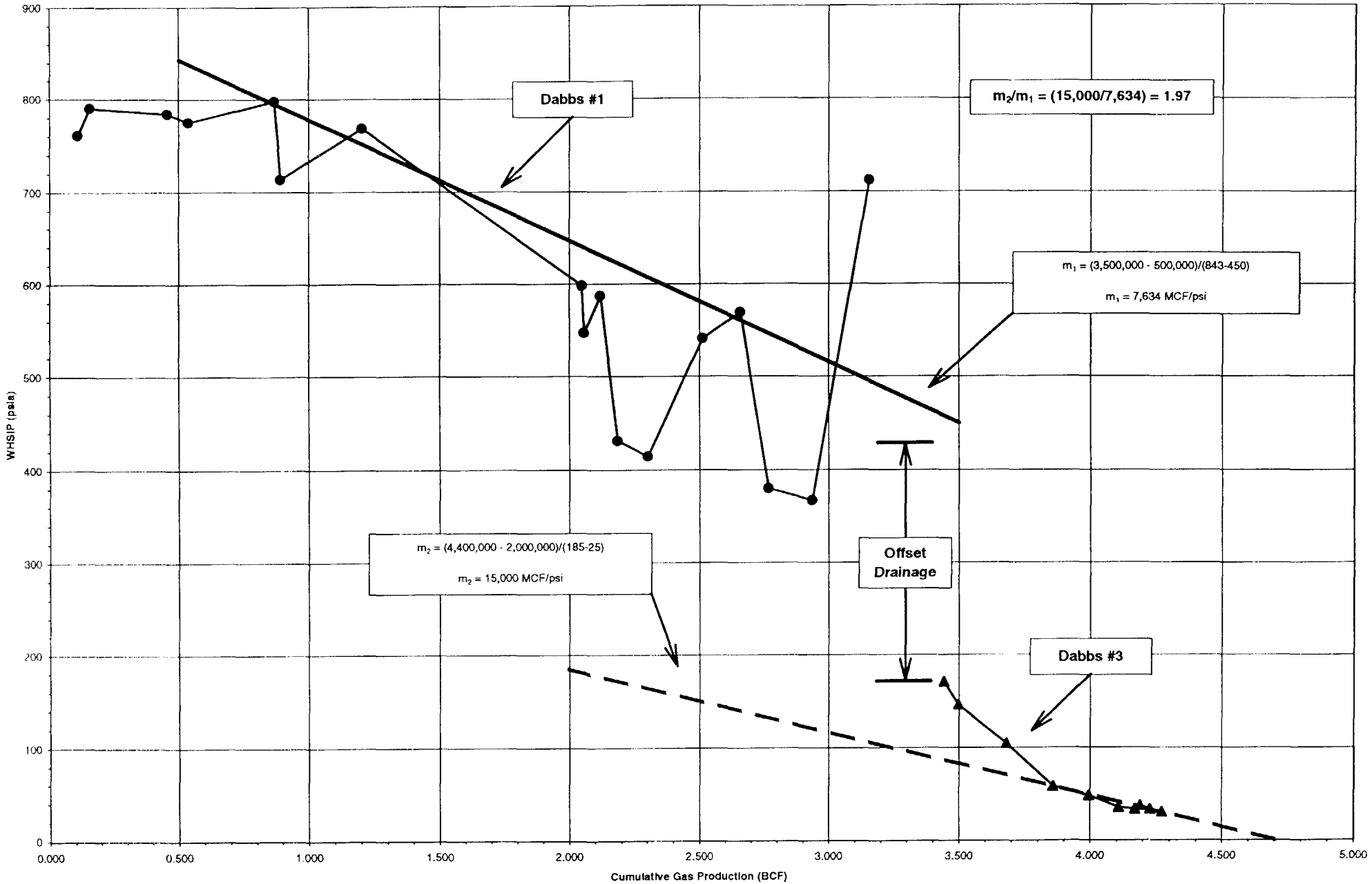


WHSIP (psia)



05/98: 4.275 BCF

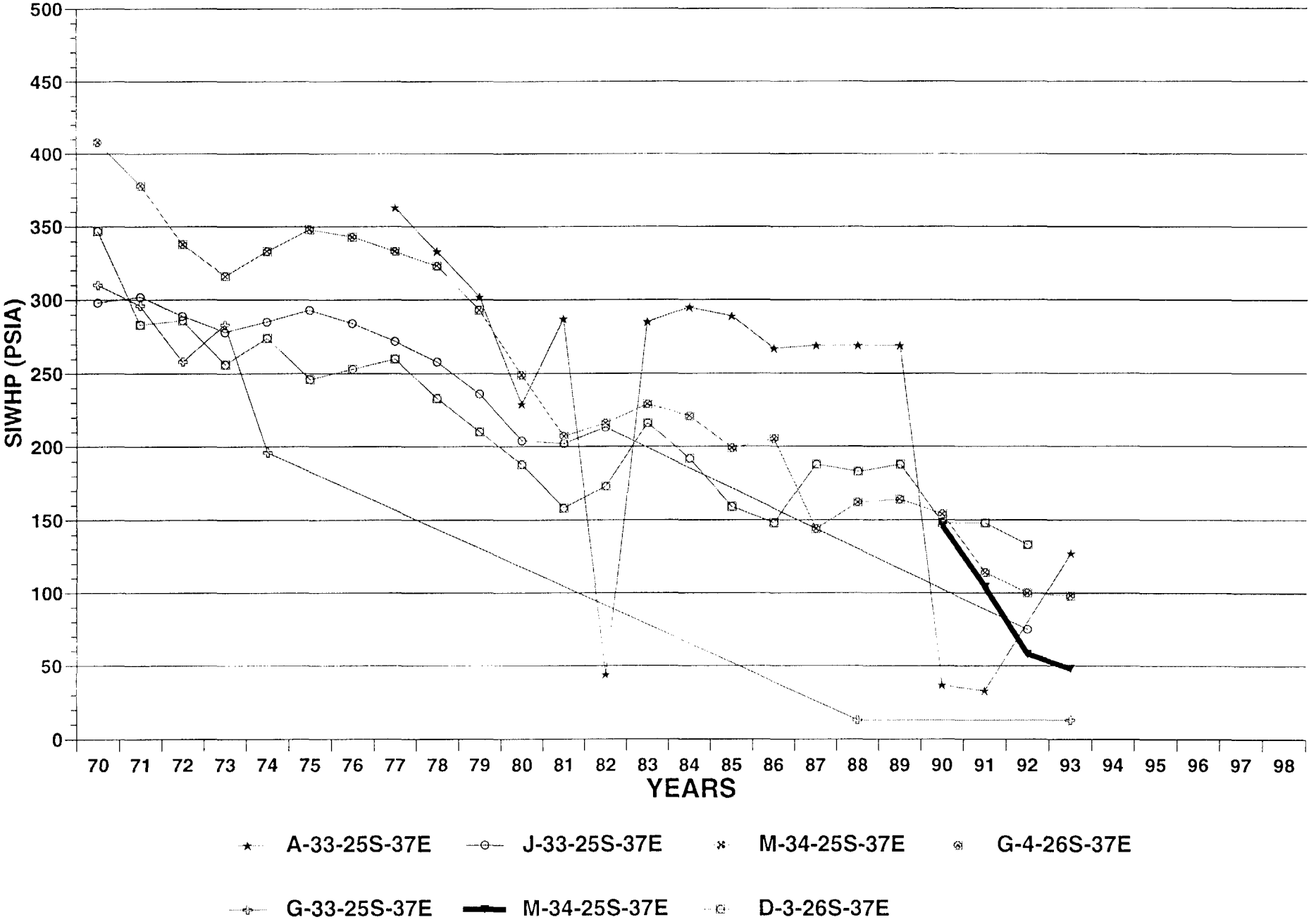
Dabbs Nos. 1 & 3
Jalmat Gas Pool
M-34-25S-37E
Doyle Hartman

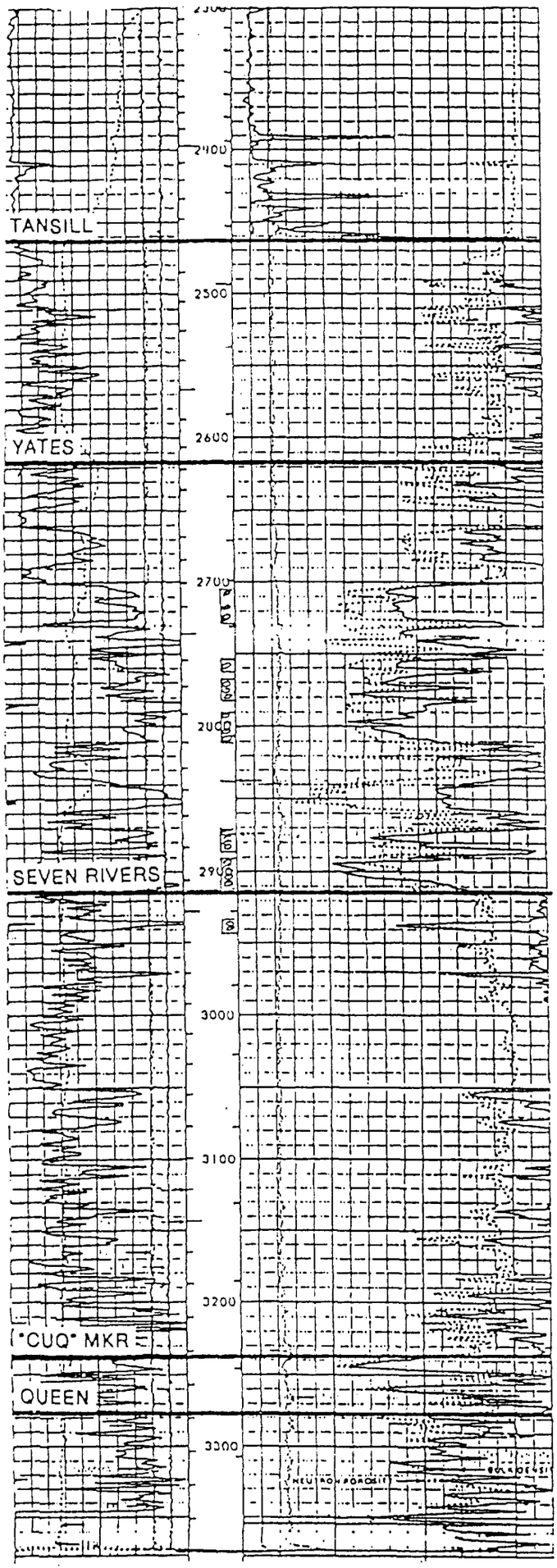


10/95: 4 169 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

Dabbs # 1,3
Composite Pressure - Time Plot
Lea County, New Mexico





COMPANY Doyle Hartman

WELL Dabbs No.3

FIELD Jalmat (Gas)

LOCATION 990' FSL & 660' FWL (M)
Sec. 34, T-25-S, R-37-E

COUNTY Lea

STATE New Mexico

ELEVATIONS: KB 3017.5
DF
GL 3001.5

COMPLETION RECORD

SPUD DATE 8-28-89 COMP. DATE 9-8-89

TD 3375 PBTD 3354

CASING RECORD:

9 5/8", @ 448 w/350 (TOC @ Circ.)

7", @ 3373 w/925 (TOC @ Circ.)

(TOC @)

(TOC @)

COMP. INTERVAL Perf 2707-2938 w/24
(Yates-Seven Rivers)

STIMULATION A/7000

POT IPF = 129 MCFPD (9-10-89)

GOR GR

TP 42 CP SI = 185 psig

CHOKE 64/64 TUBING 2 3/8" @ 3171

REMARKS

09-08-89: SICP = 185 psig (After acid)
Pop @ 9 x 54 x 1 ¼"

09-10-89: P/129 MCFPD
Choke = 64/64
PCP = 42 psig

09-11-89: SWF/207,000 + 504,000
ATR = 35.6 BPM
ATP = 1570 psi
ISIP = 920 psi
1-hr. SIP = 718 psi

09-16-89: P/1903 MCFPD
Choke = 72/64
PCP = 114 psig

09-29-89: SIP = 158 psig (After Frac)

06-01-98: Cum. = 0.8348 BCF
Rem. = 133.3 BCF
Est. Ult. = 0.9681 BCF
M = 15,000 MCF/psi

M-34-25S-37E

Stabilized m-Factors (Pressure-Cum Slopes) for Additional Yates-U7R Infill Gas Wells

Current Operator	Infill Well	Location (T-R-S-U)	m_2: Stabilized P/z Slope (MCF/psi)	Initial Pressure (psia)	Projected Ultimate Recovery (BCF)	Recovery Improvement Ratio (m_2/m_1)
Gruy	Shell State No. 5	23S-36E-13-J	18,782	89 (10/21/81)	1.3565	4.60
Gruy	Holt-Mexico State Com No. 1	23S-36E-36-O	11,818	156 (09/20/85)	1.6985	3.09
Hartman	Liberty Royalties No. 6	24S-37E-07-O	18,994	135 (09/12/89)	1.4759	5.84
Gruy	E. E. Jack No. 5	24S-37E-08-D	12,318	173 (12/07/85)	1.7165	1.19
Gruy	Late-Thomas No. 2	24S-37E-17-L	16,818	155 (10/27/81)	1.7088	2.87
Average:			**15,746**			**3.52**

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 32
CASE NOS. 12015 & 12017

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-1
Supersedes C-128

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
Doyle Hartman	Shell State	5

Unit Letter	Section	Township	Range	County
J	13	23 South	36 East	

Actual Footage Location of Well			
1800 feet from the South line and		1650 feet from the East	line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage
3367.1	Yates-Seven Rivers	Jalmat	160 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

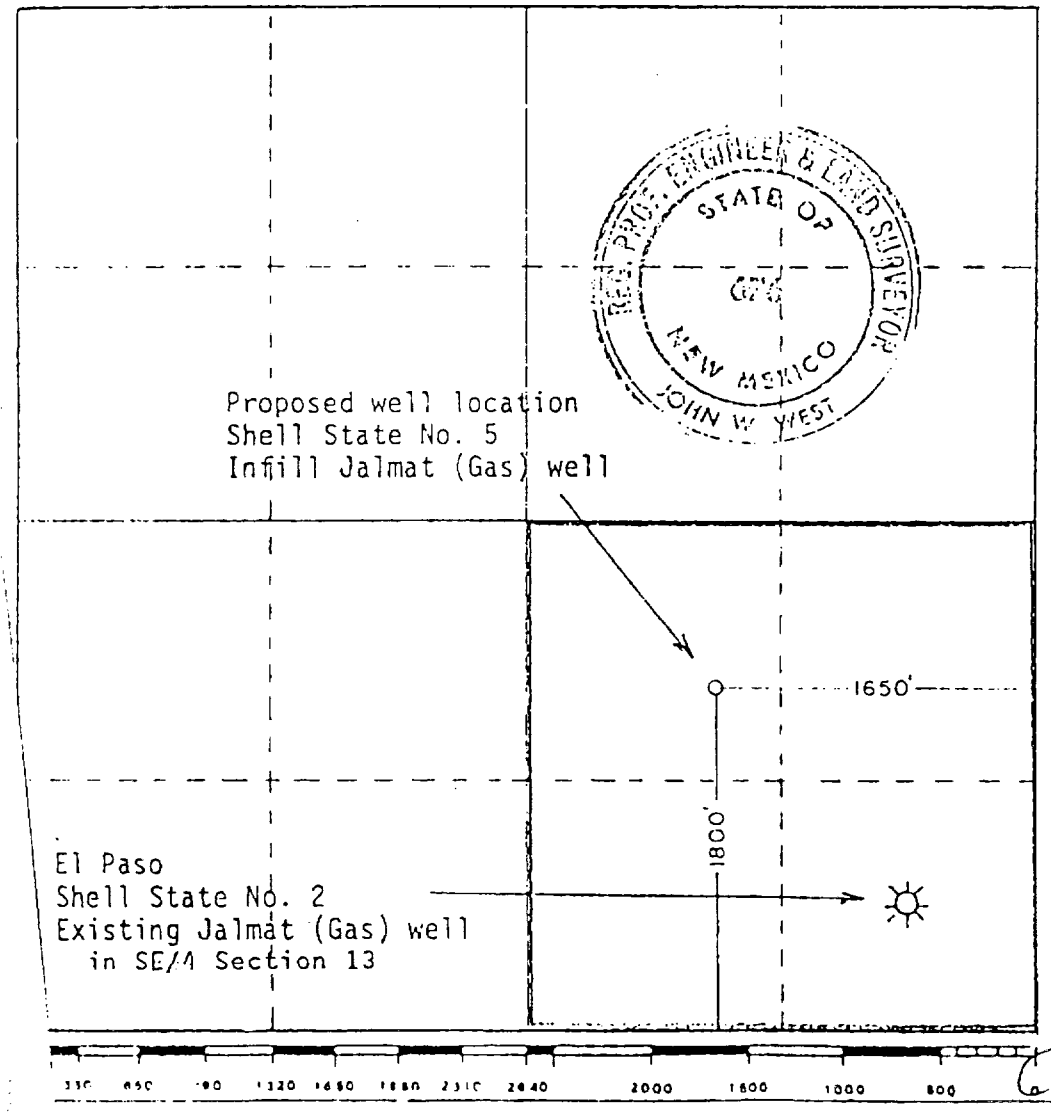
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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.

Name: Larry G. Hamm
Position: Engineer
Company: Doyle Hartman
Date: September 29, 1981

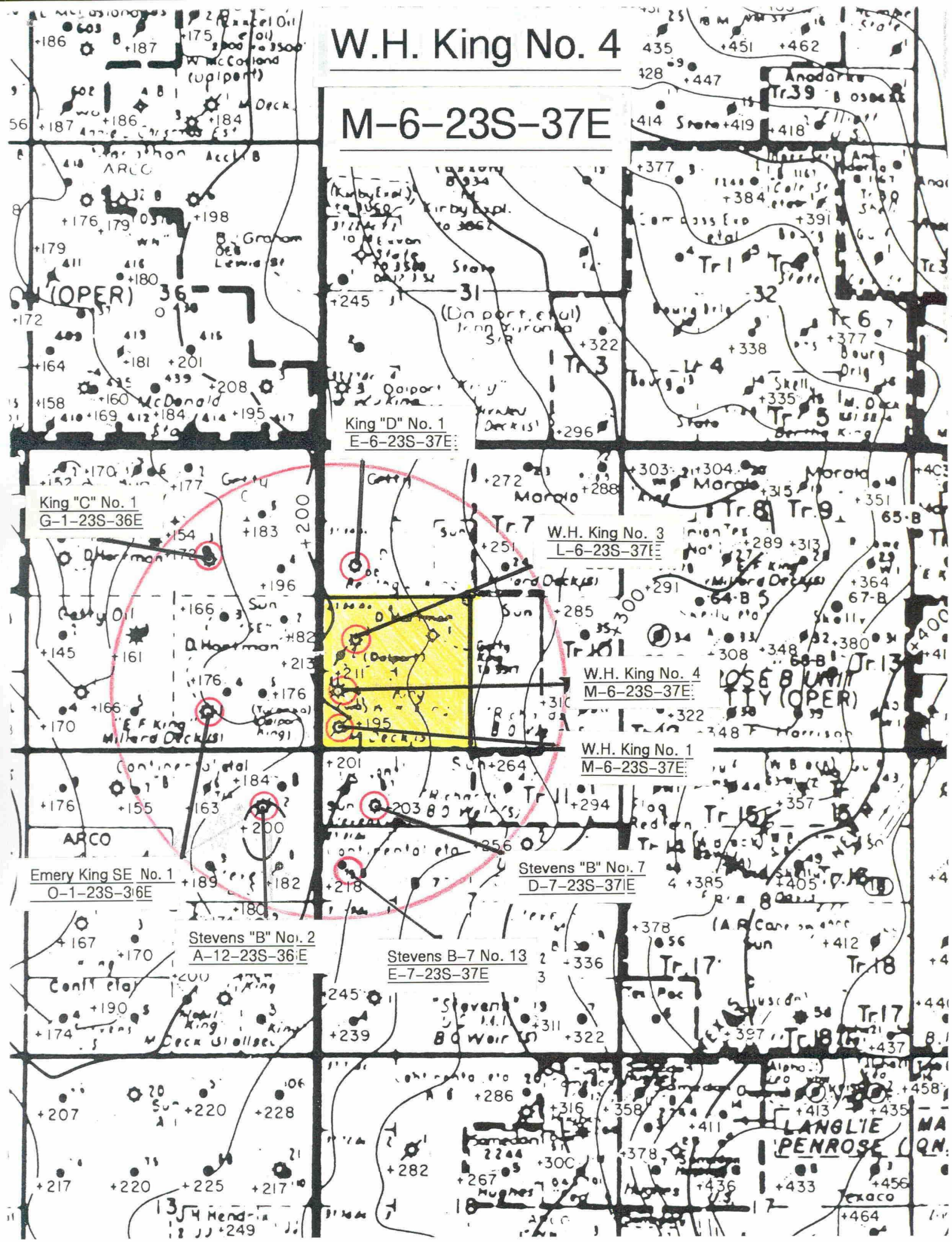
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

0041270

Date Surveyed: Sept. 26, 1981

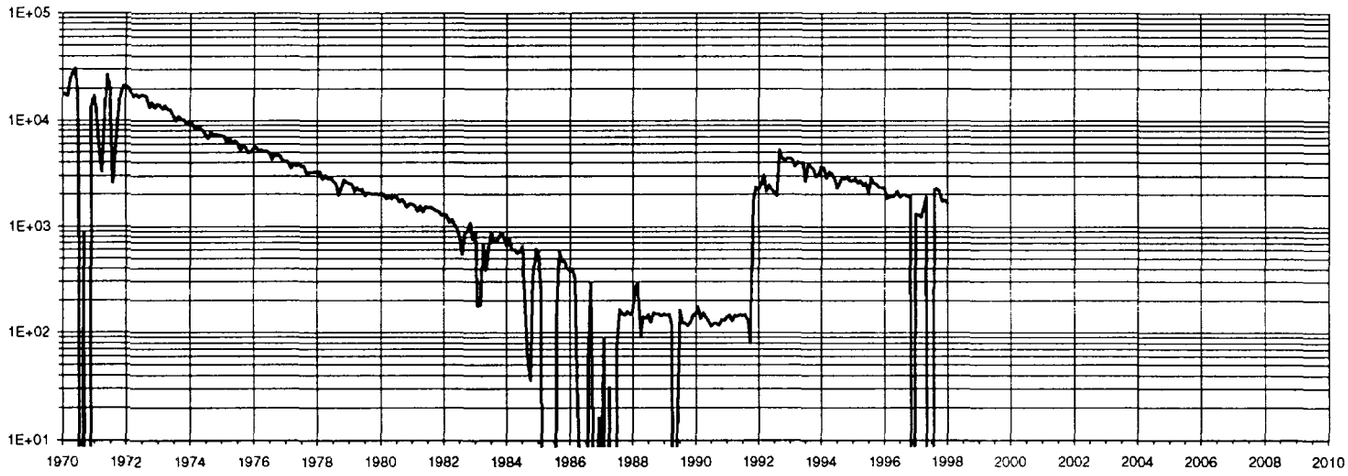
Registered Professional Engineer and/or Land Surveyor

Certificate No. JOHN W. WEST 676
PATRICK A. ROMERO 6668
Ronald J. Eidson 3239

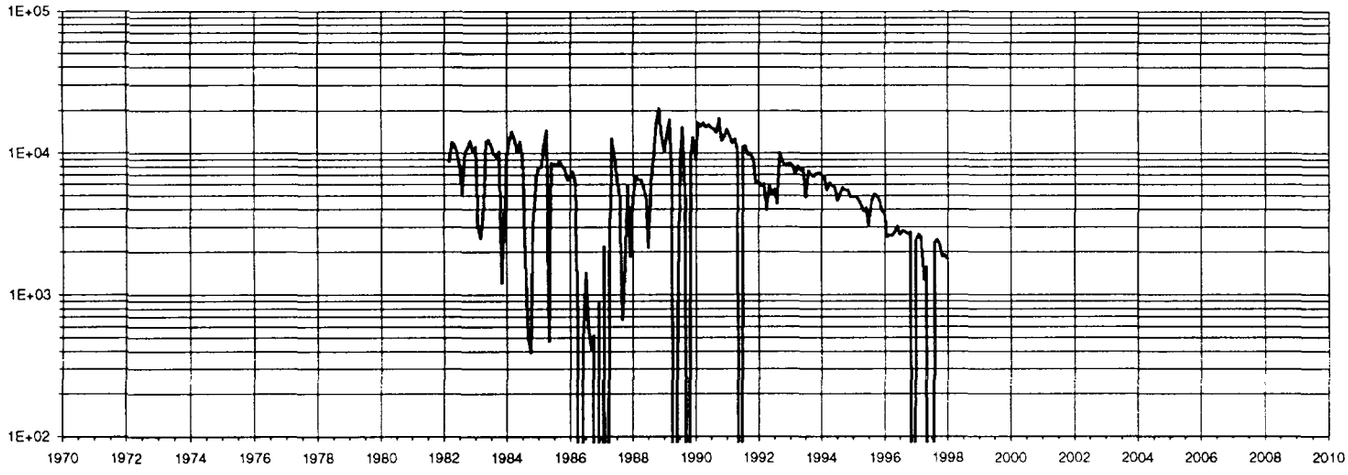

W.H. King No. 4
M-6-23S-37E
King "D" No. 1
E-6-23S-37E
King "C" No. 1
G-1-23S-36E
W.H. King No. 3
L-6-23S-37E
W.H. King No. 4
M-6-23S-37E
W.H. King No. 1
M-6-23S-37E
Emery King SE No. 1
O-1-23S-36E
Stevens "B" No. 7
D-7-23S-37E
Stevens "B" No. 2
A-12-23S-36E
Stevens B-7 No. 13
E-7-23S-37E

Shell State Nos. 2 & 5
Jalmat Gas Pool
P & J-13-23S-36E
Gruy Petroleum Management Co.

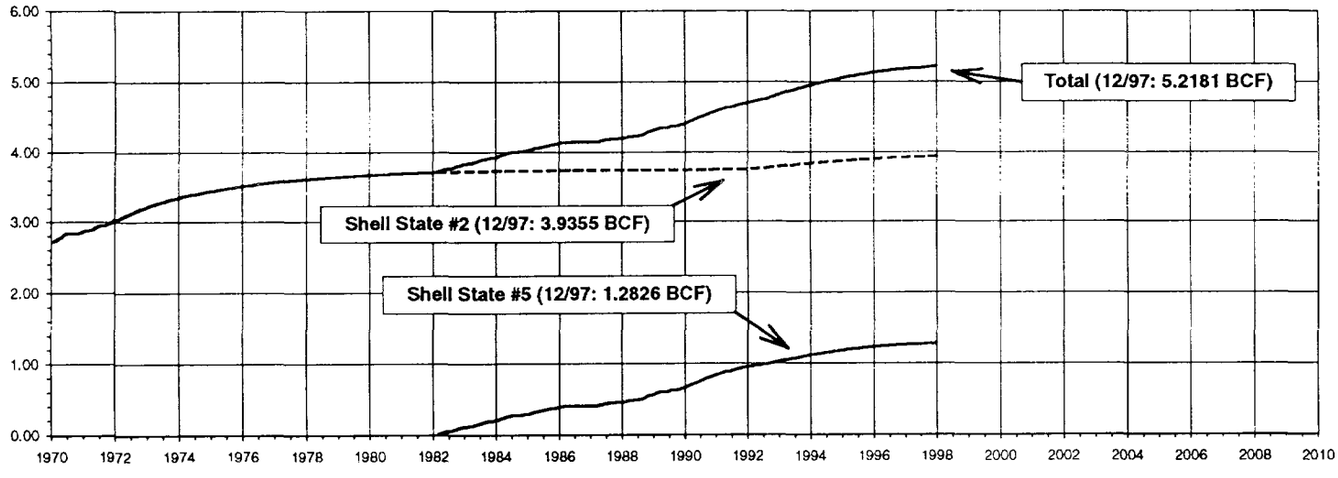
Shell State #2 Gas Production (MCFPM)



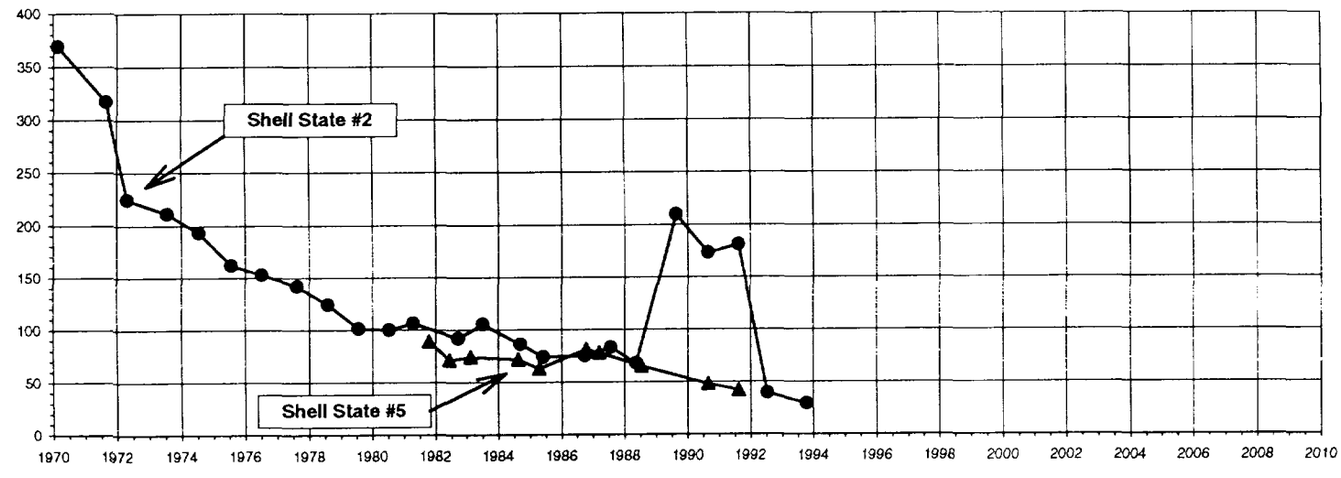
Shell State #5 Gas Production (MCFPM)



Cumulative Gas Production (BCF)

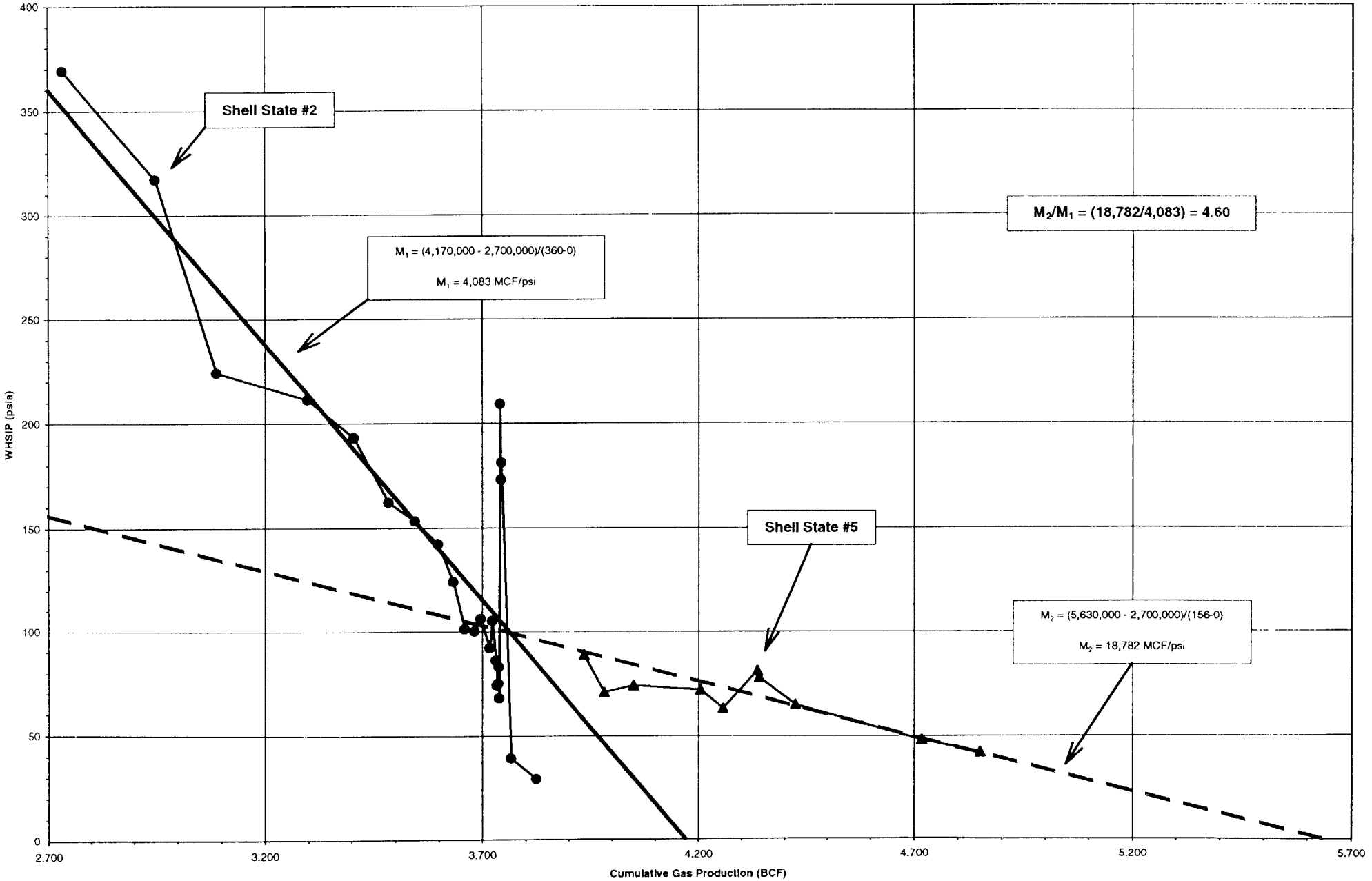


WHSIP (psia)



12/97: 5.218 BCF

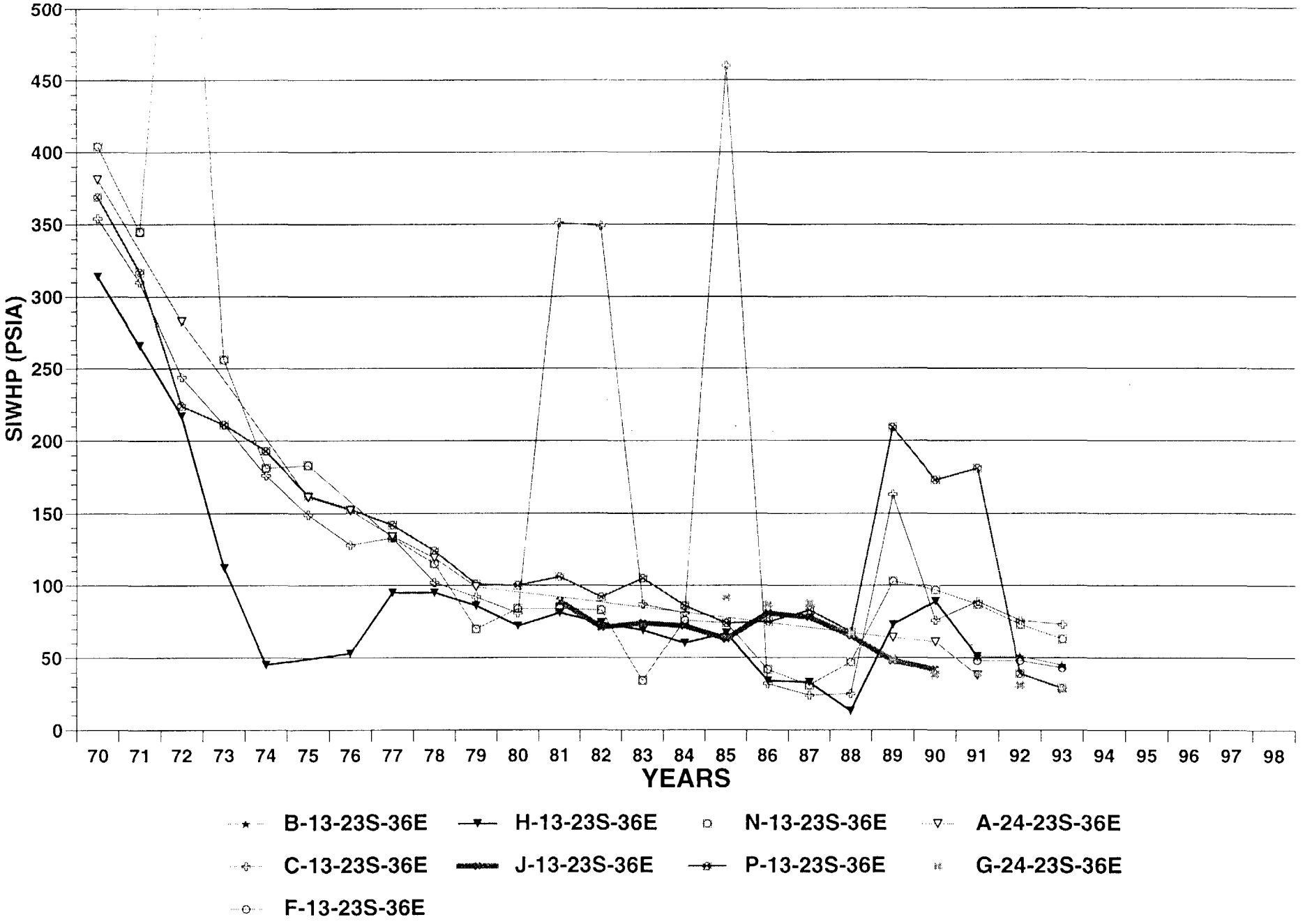
Shell State Nos. 2 & 5
Jalmat Gas Pool
P & J-13-23S-36E
Gruy Petroleum Management Co.

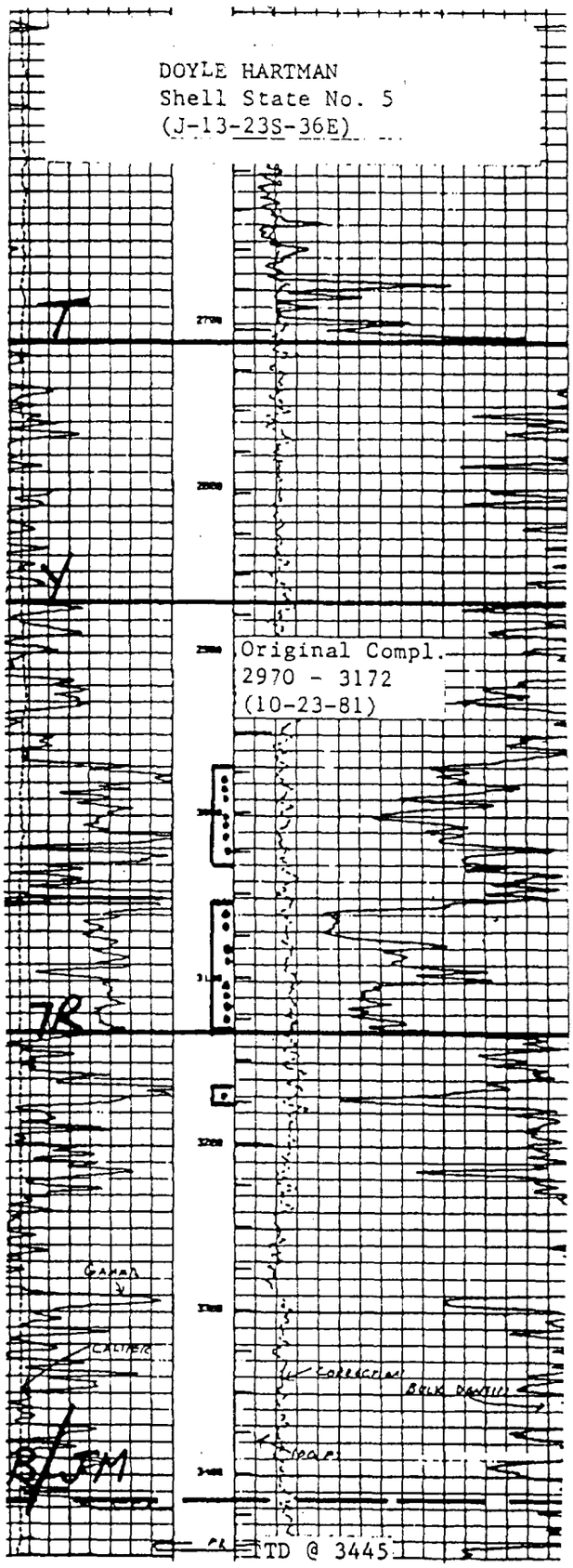


08/91: 4.850 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

Shell State # 5
Composite Pressure - Time Plot
Lea County, New Mexico





COMPANY Gruy Operating
(Doyle Hartman)
WELL Shell State No. 5

FIELD Jalmat (Gas)
LOCATION 1800' FSL & 1650' FEL (J)
Sec. 13, T-23-S, R-36-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB 3377
DF
GL 3367

COMPLETION RECORD

SPUD DATE 10-5-81 COMP. DATE 10-23-81
TD 3450 PBTD 3440
CASING RECORD:
9 5/8, 40# @ 435 w/225 (TOC @ Circ.)
7, 23# @ 3450 w/550 (TOC @ Circ.)
(TOC @)
(TOC @)
COMP. INTERVAL Perf 2970-3172 w/19

STIMULATION A/4500 15% MCA
ATR = 5.2 BPM. ATP = 1530 psi.
ISIP = 0 psi.
POT P/323 MCFPD (After frac)
GOR GR
TP CP 71 psig (SICP = 76 psig)
CHOKE 25/64 TUBING 2 3/8 @ 3335
REMARKS
10-19-81: SICP = 115 psig.

10-21-81: SICP = 76 psig.

10-21-81: SWF/72,000 + 173,000
ATR = 25 BPM
ATP = 1400 psi
ISIP = 560 psi
1-hr. SIP = 540 psi

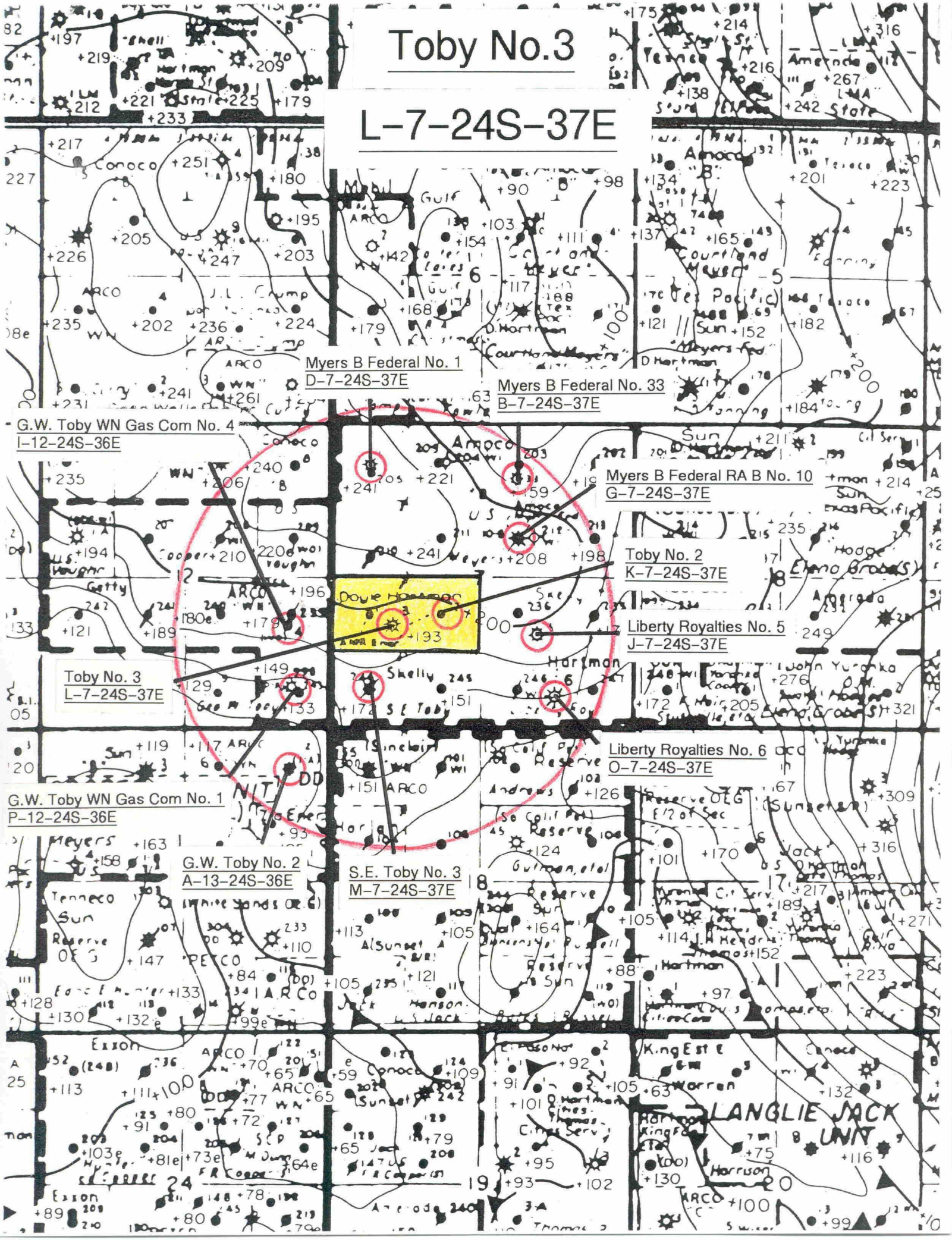
10-22-81: POP @ 11 x 64 x 1 ¼

1-14-82: Connected to EPNG.

1-20-82: P/335 MCFPD
Choke = 26/64
PCP = 68 psig
Est. C = 246

1-1-98: Cum. = 1.2826 BCF
Est. Rem. = 73.9 MMCF
Est. Ult. = 1.3565 BCF
b = 0.211

J-13-23S-36E


Toby No.3
L-7-24S-37E
Myers B Federal No. 1
D-7-24S-37E
Myers B Federal No. 33
B-7-24S-37E
G.W. Toby WN Gas Com No. 4
I-12-24S-36E
Myers B Federal RA B No. 10
G-7-24S-37E
Toby No. 2
K-7-24S-37E
Liberty Royalties No. 5
J-7-24S-37E
Toby No. 3
L-7-24S-37E
Liberty Royalties No. 6
O-7-24S-37E
G.W. Toby WN Gas Com No. 1
P-12-24S-36E
G.W. Toby No. 2
A-13-24S-36E
S.E. Toby No. 3
M-7-24S-37E
LANGLIE JACK UNIT

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
DOYLE HARTMAN	HOLT MEXICO ST. "COM"	1

Unit Letter	Section	Township	Range	County
O	36	23S	36E	LEA

Actual Footage Location of Well:
1650 feet from the EAST line and 1100 feet from the SOUTH line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3321.6	Yates-Seven Rivers	Jalmat (Gas)	160 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

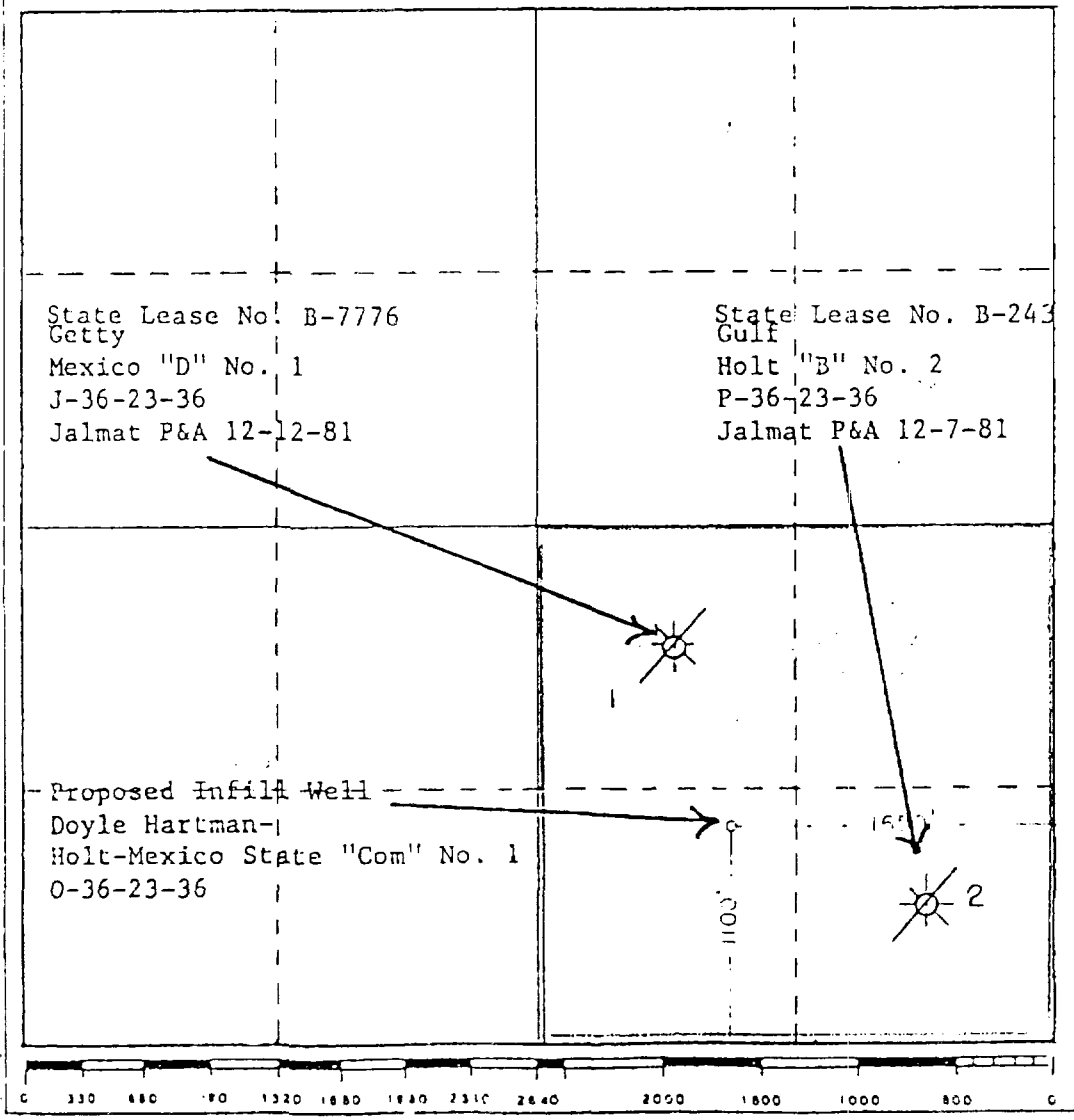
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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?

[X] Yes [ ] No If answer is "yes," type of consolidation Communitization

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 intercsts 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.

Larry A. Nermyr

Name: Larry A. Nermyr
Position: Engineer
Company: Doyle Hartman
Date: June 24, 1985

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: 6/20/85

Registered Professional Engineer and/or Land Surveyor

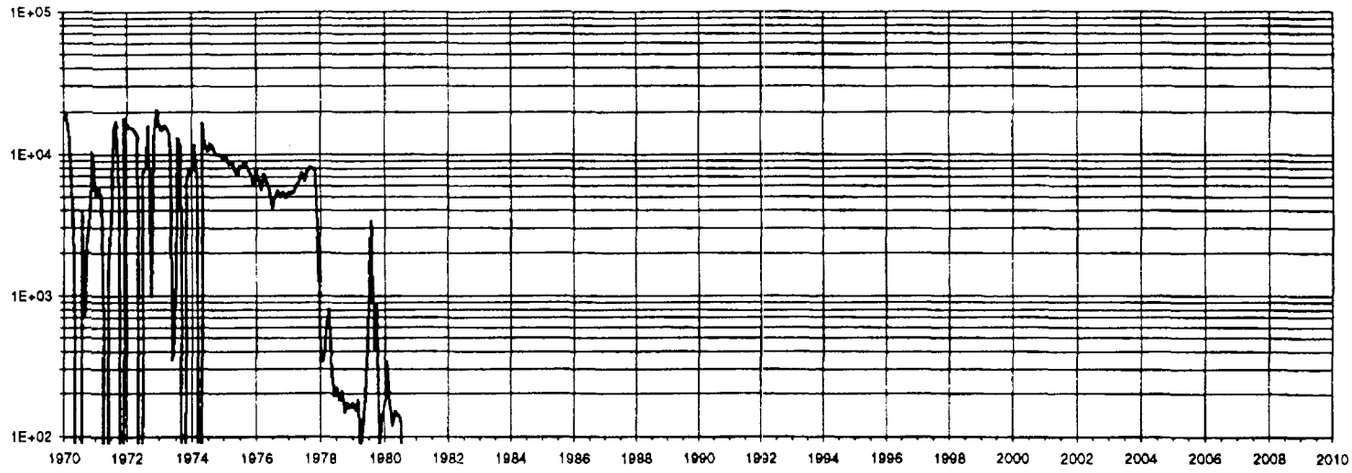
John W. West

Certificate No. JOHN W. WEST 676
RONALD J. EIDSON 3239

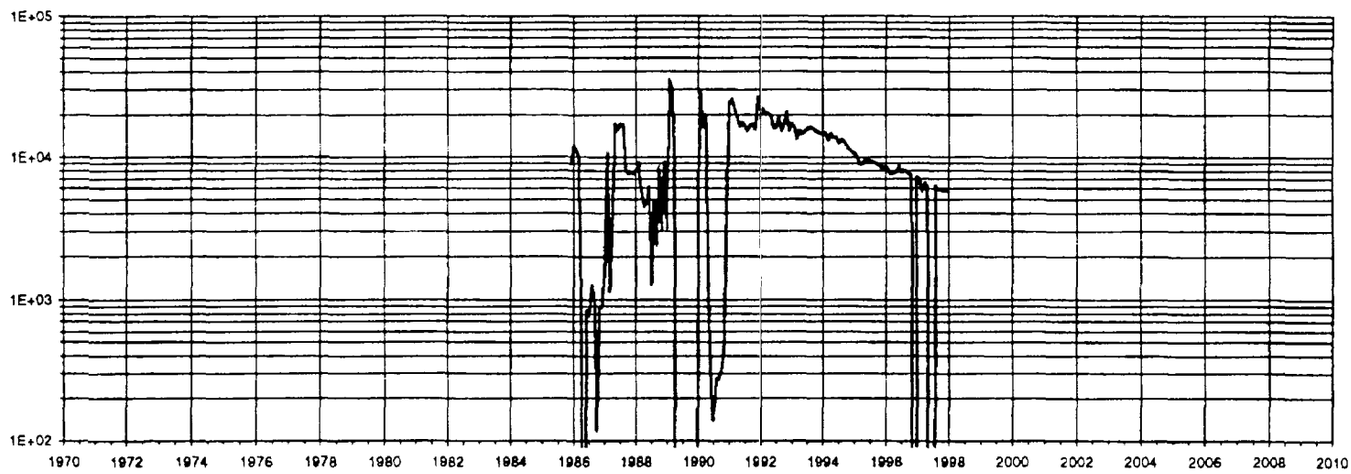
AUG 12 1985

Mexico D #1 & Holt Mexico State Com #1
Jalmat Gas Pool
J & O-36-23S-36E
Gruy Petroleum Management Co.

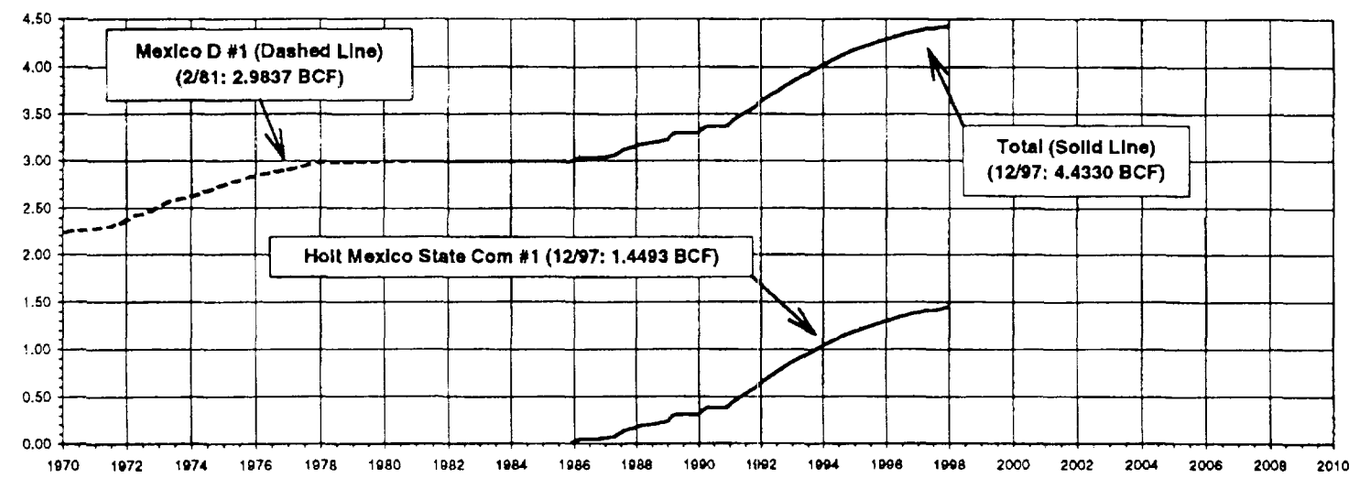
Mexico D #1 Gas Production (MCFPM)



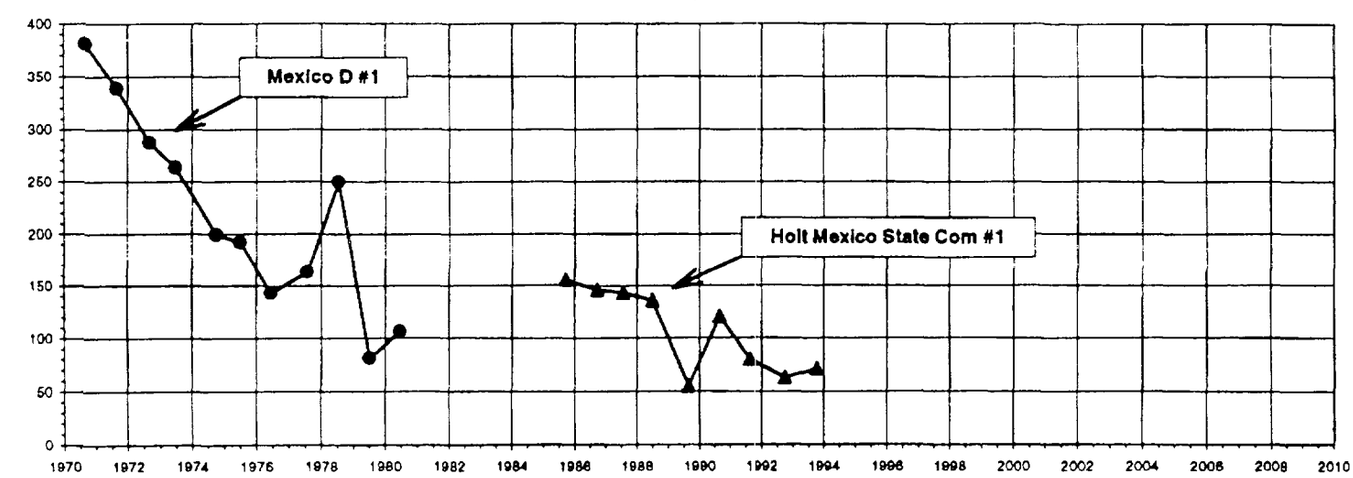
Holt Mexico State Com #1 Gas Production (MCFPM)



Cumulative Gas Production (BCF)



WHSIP (psia)



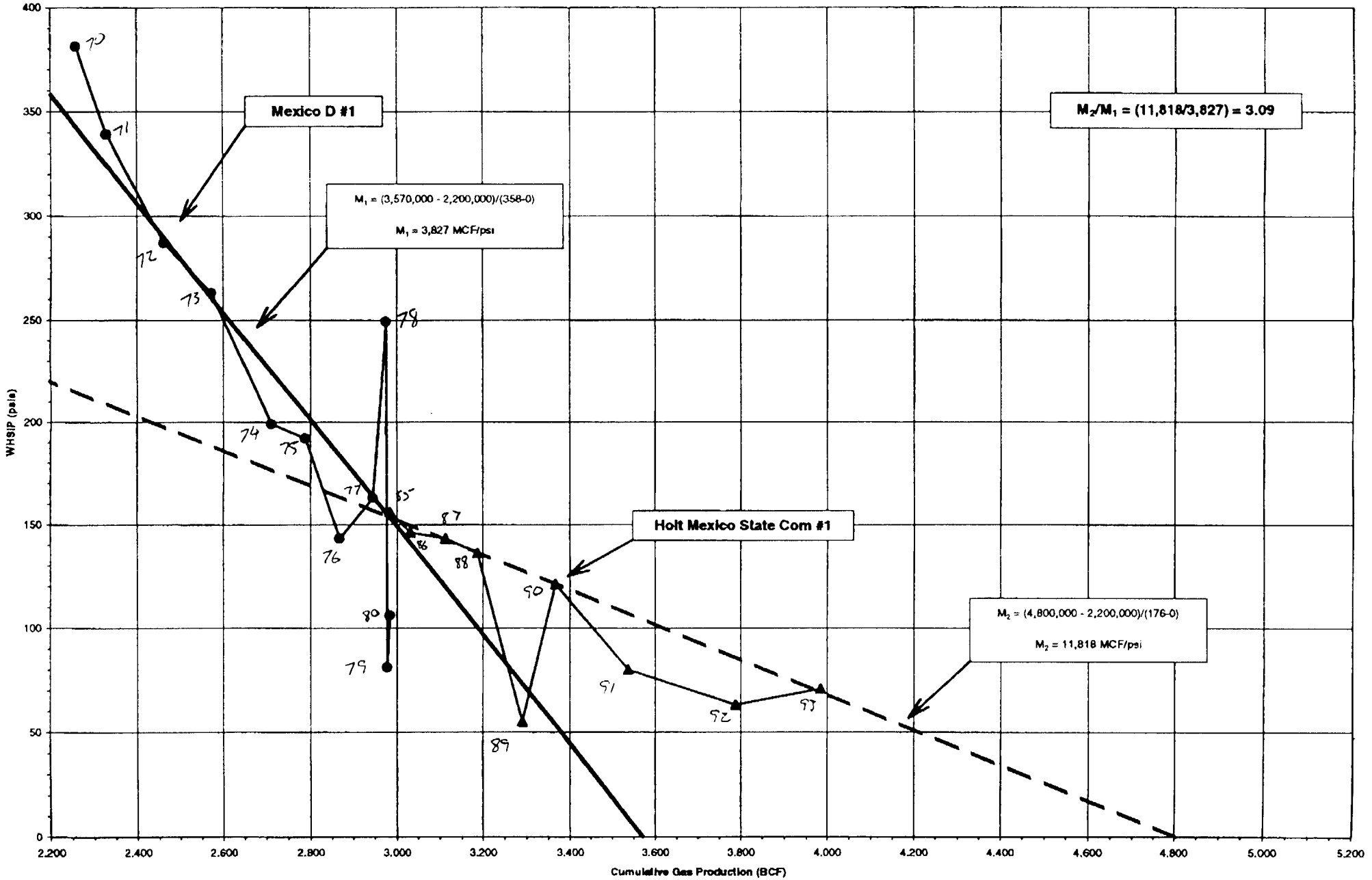
12/97: 4.433 BCF

Mexico D #1 & Holt Mexico State Com #1

Jalmat Gas Pool

J & O-36-23S-36E

Gruy Petroleum Management Co.



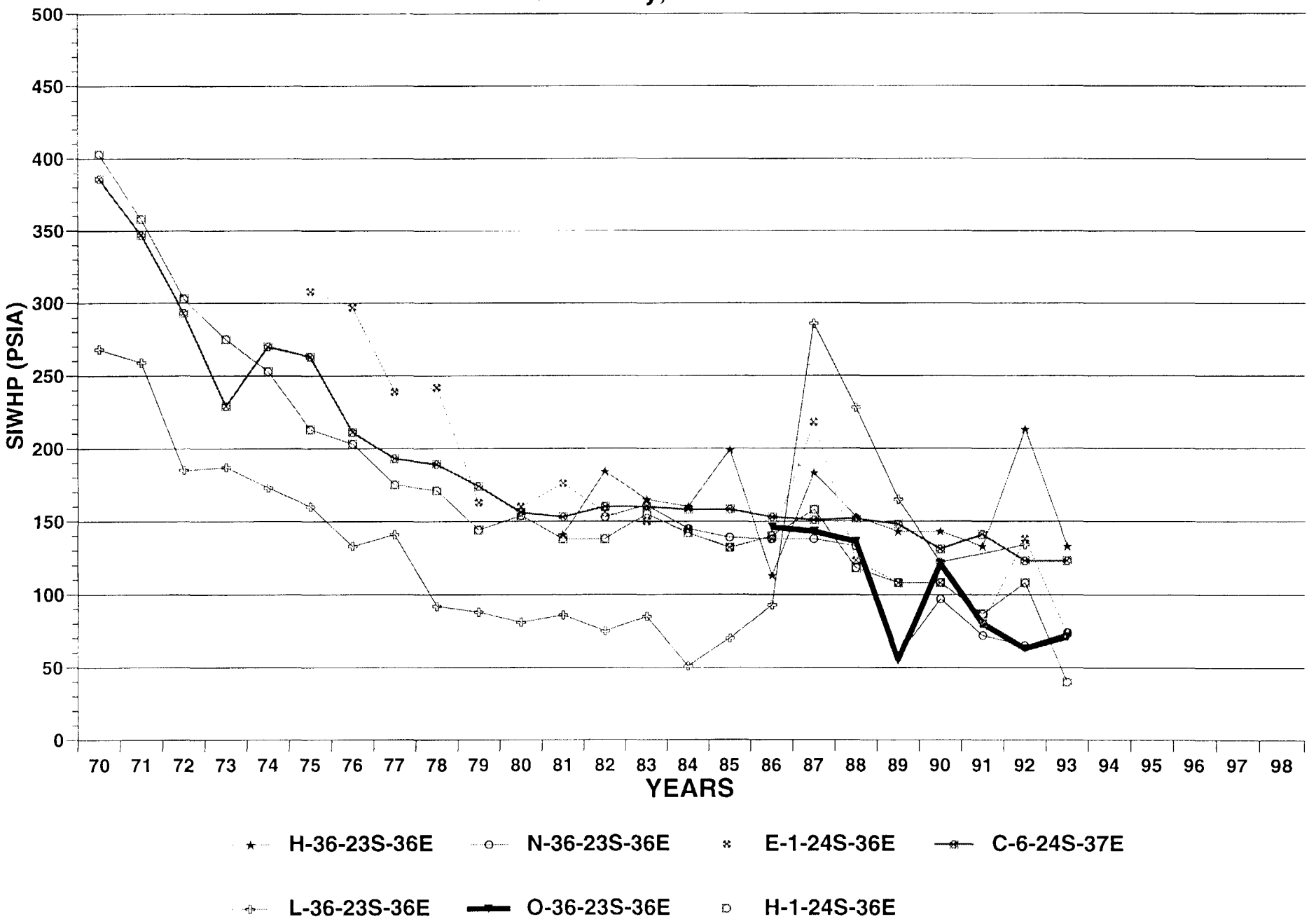
10/93: 3.983 BCF

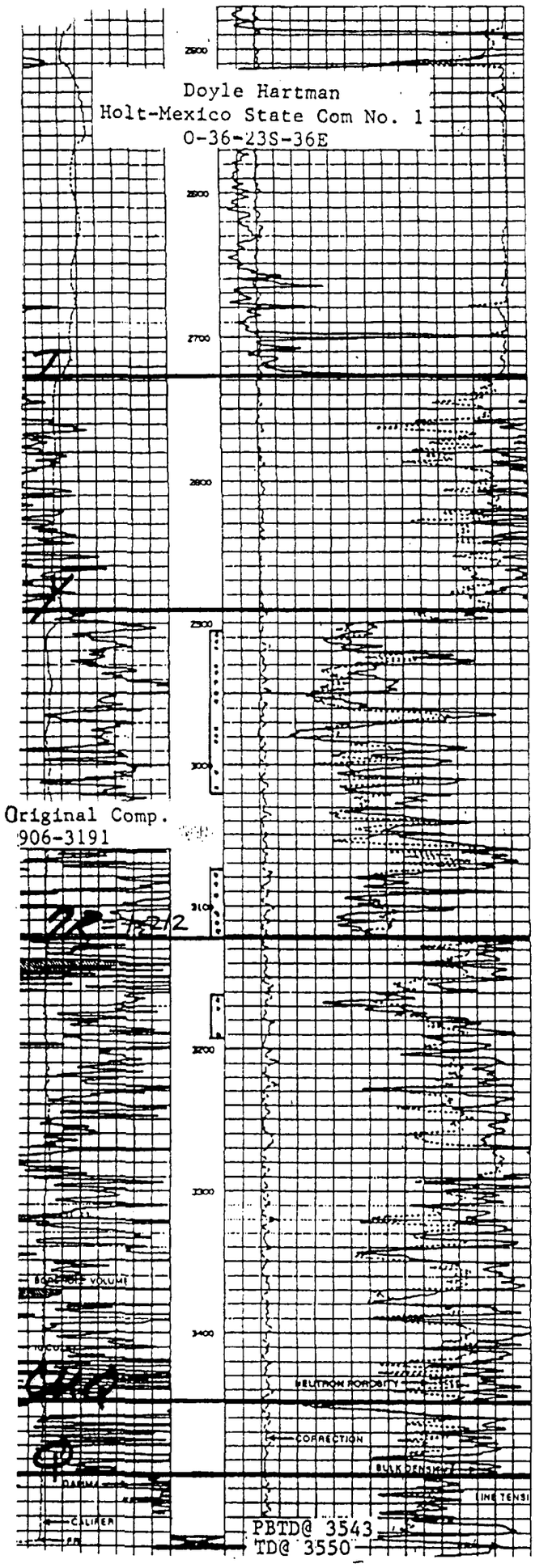
Jalmat (Tansill-Yates-Seven-Rivers) Pool

Holt Mexico # 1

Composite Pressure - Time Plot

Lea County, New Mexico





COMPANY Gruy Operating
(Doyle Hartman)
WELL Holt-Mexico Com No. 1

FIELD Jalmat (Gas)
LOCATION 1100' FSL & 1650' FEL (O)
Sec. 36, T-23-S, R-36-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB 3332'
DF
GL 3322'

COMPLETION RECORD

SPUD DATE 08-27-85 COMP. DATE 09-12-85
TD 3550' PBTD 3543'
CASING RECORD:
9 5/8" @ 445' w/350 sx (TOC @ (Circ))
7" @ 3550' w/800 sx (TOC @ (Circ))
(TOC @)
(TOC @)
COMP. INTERVAL Perf 2906-3191 w/25
(Yates - Upper 7R)
STIMULATION A/5600 15% MCA
ATR = 5.25 BPM. ATP = 2195 psi.
ISIP = 0 psi
POT IPP = 499 MCFPD (Acid)
GOR GR
TP CP 33 psi (SICP = 138 psi)
CHOKE 44/64 TUBING 2 3/8 @ 3215
REMARKS After acid, C = 24.1
09-14-85: SIP = 138 psig

09-18-85: SWF/187,890 + 400,000
ATR = 35.5 BPM
ATP = 880 psi
ISIP = 630 psi
15-Min. SIP = 510 psi
Flare @ 305 psi. Choke = 64/64
FCP = 55 psi. FTP = 105 psi

09-20-85: SIP = 143 psig
5-hr test: P/1150 MCFPD
Choke = 26/64
CP = 114 psi
After Frac, C = 172

02-87: SICP = 128 psig

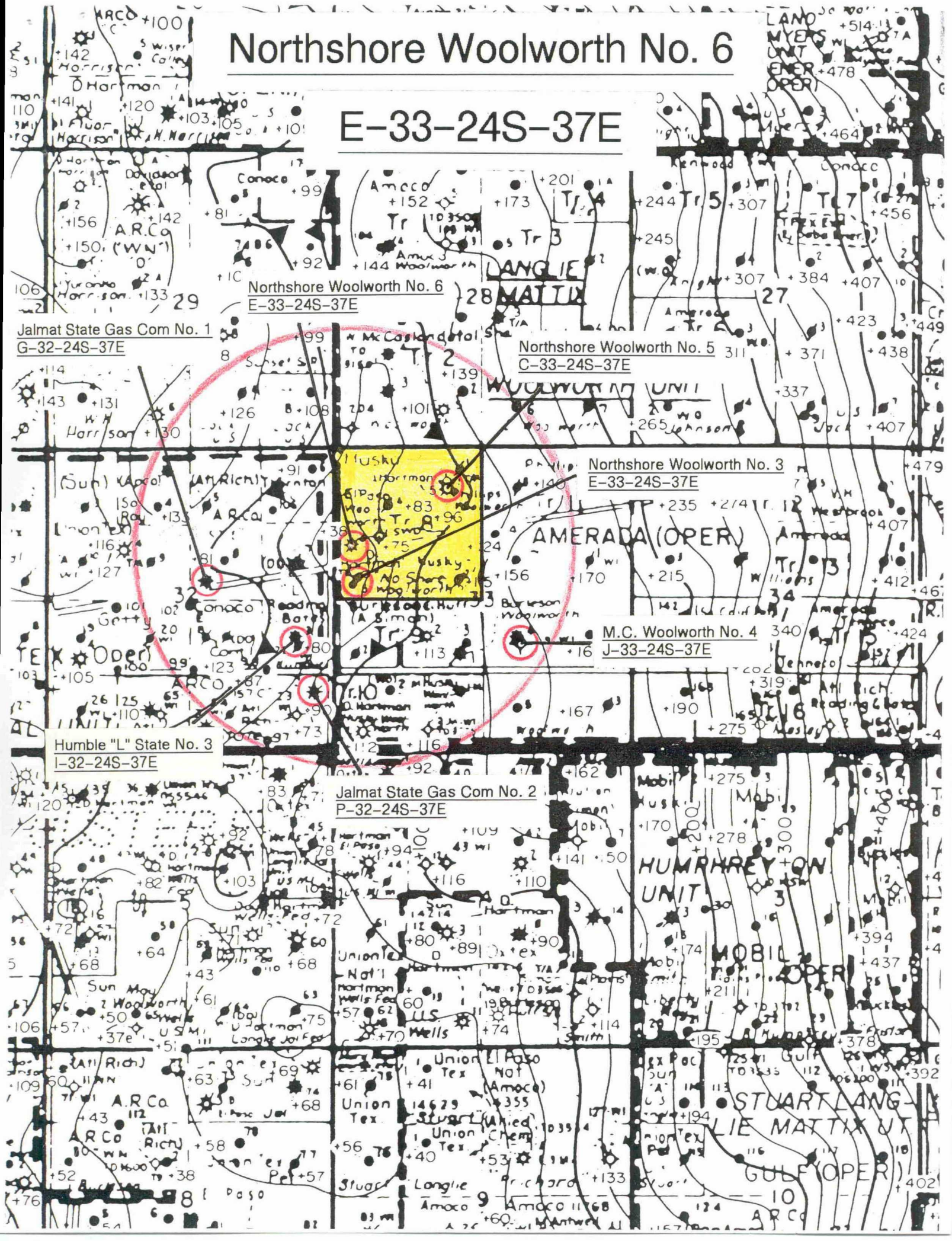
06-87: ADR = 566 MCFPD. Choke = 36/64.
PCP = 114 psig. Est. C = 194.

01-01-98: Cum. = 1.4493 BCF
Est. Rem. = 249.2 MMCF
Est. Ult. = 1.6985 BCF
b = 0.236
m = 11,818 MCF/psi

O-36-23S-36E

Northshore Woolworth No. 6

E-33-24S-37E



Submit to Appropriate
District Office
State Lease - 4 copies
Fee Lease - 3 copies

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-102
Revised 1-1-89

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator	Lease	Well No.
Doyle Hartman	Liberty Royalties	6

Unit Letter	Section	Township	Range	County
O	7	24 South	37 East NMPM	Lea

Actual Footage Location of Well:
660 feet from the south line and 1400 feet from the east line

Ground level Elev.	Producing Formation	Pool	Dedicated Acreage:
3305.0	Yates	Jalmat (Gas)	160 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

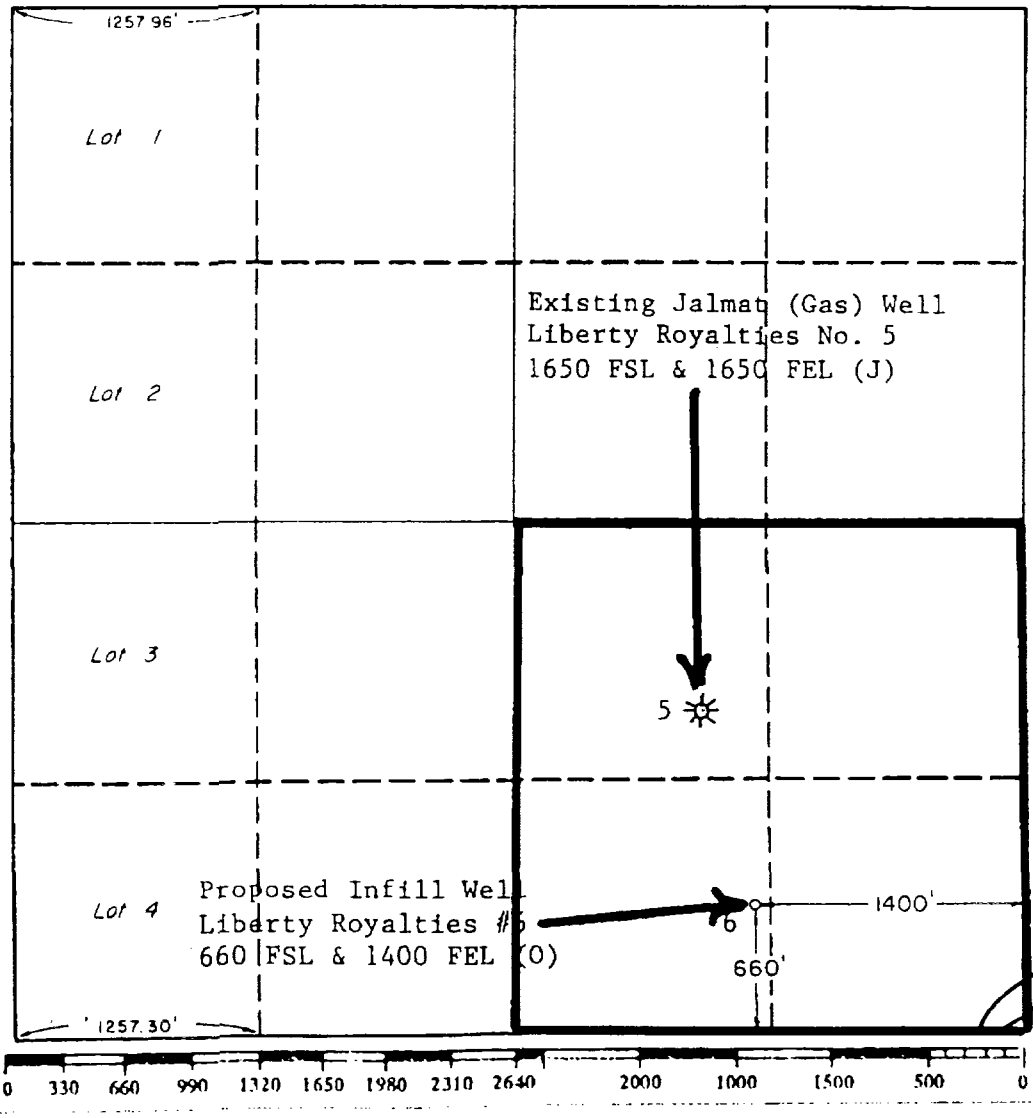
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interest 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 neccessary. _____

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 interest, has been approved by the Division.



OPERATOR CERTIFICATION

I hereby certify that the information contained herein in true and complete to the best of my knowledge and belief.

Michelle Wilcox
Signature

Michelle Wilcox
Printed Name

Administrative Assistant
Position

Doyle Hartman
Company

May 9, 1989
Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my knowledge and belief

Date Surveyed
April 21, 1989

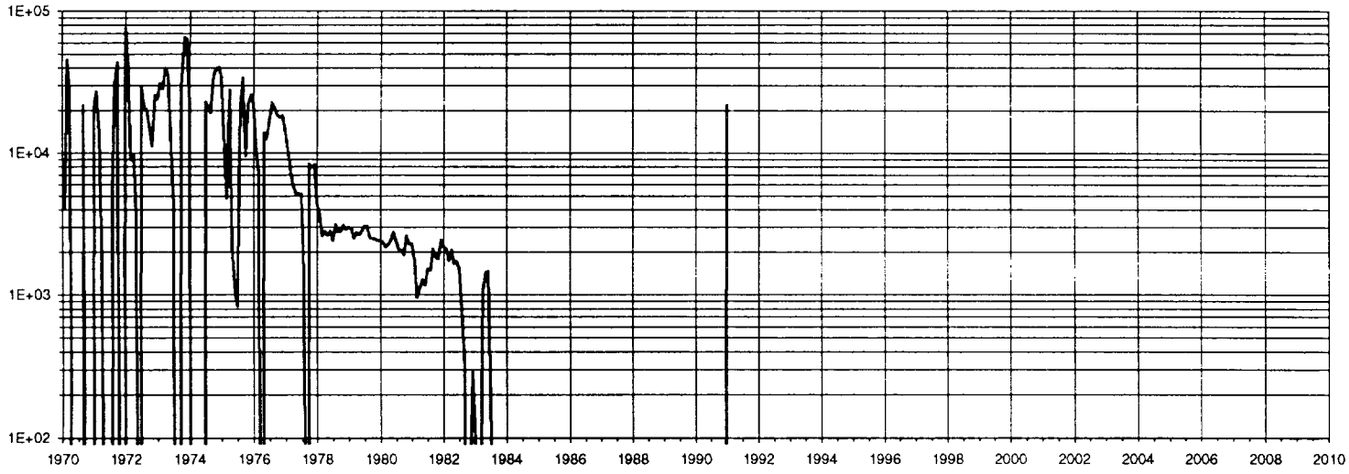
Signature & Seal of Professional Surveyor

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
NEW MEXICO
NO. 676
JOHN W. WEST

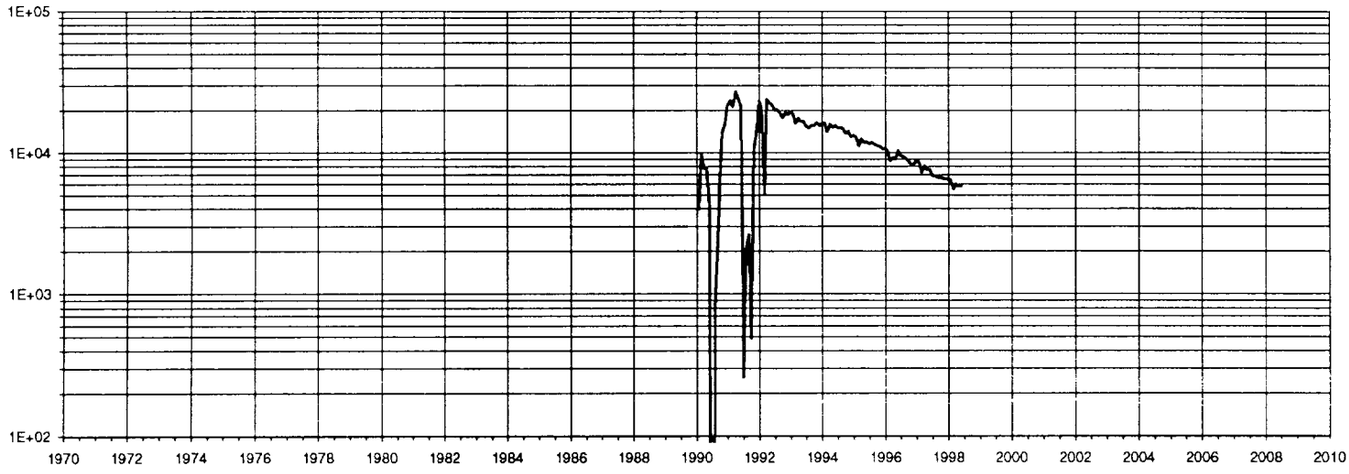
Certificate No. JOHN W. WEST, 676
RONALD J. EIDSON, 3239

Liberty Royalties Nos. 5 & 6
Jalmat Gas Pool
J & O-7-24S-37E
Doyle Hartman

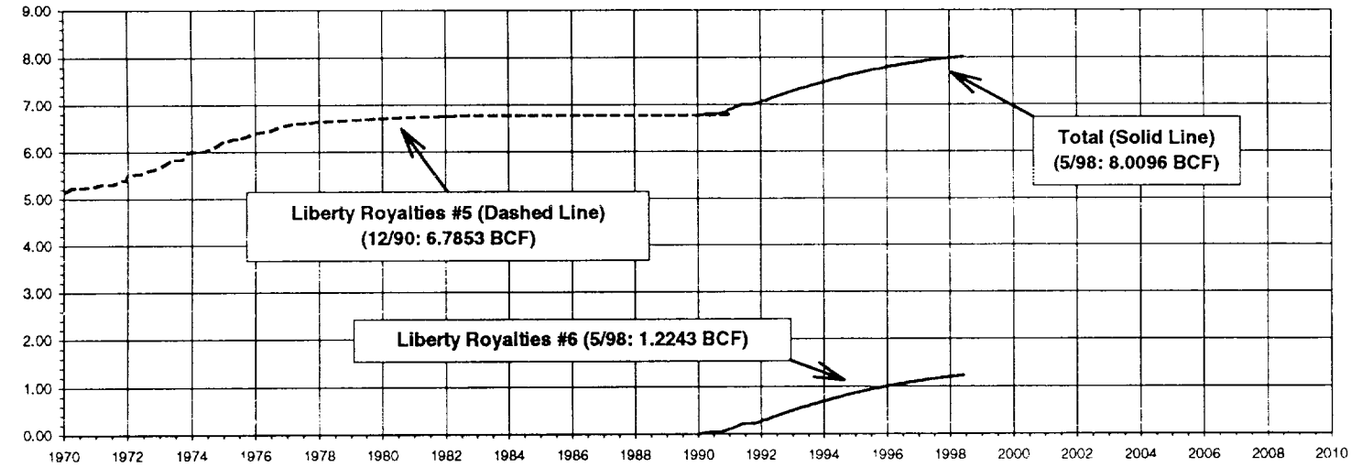
Liberty Royalties #5 Gas Production (MCFPM)



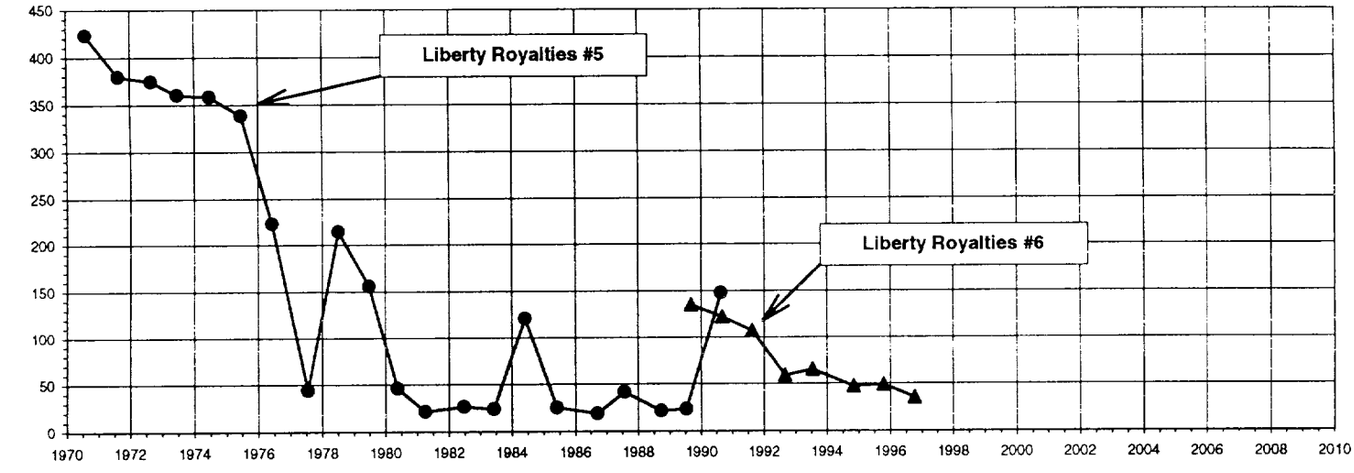
Liberty Royalties #6 Gas Production (MCFPM)



Cumulative Gas Production (BCF)

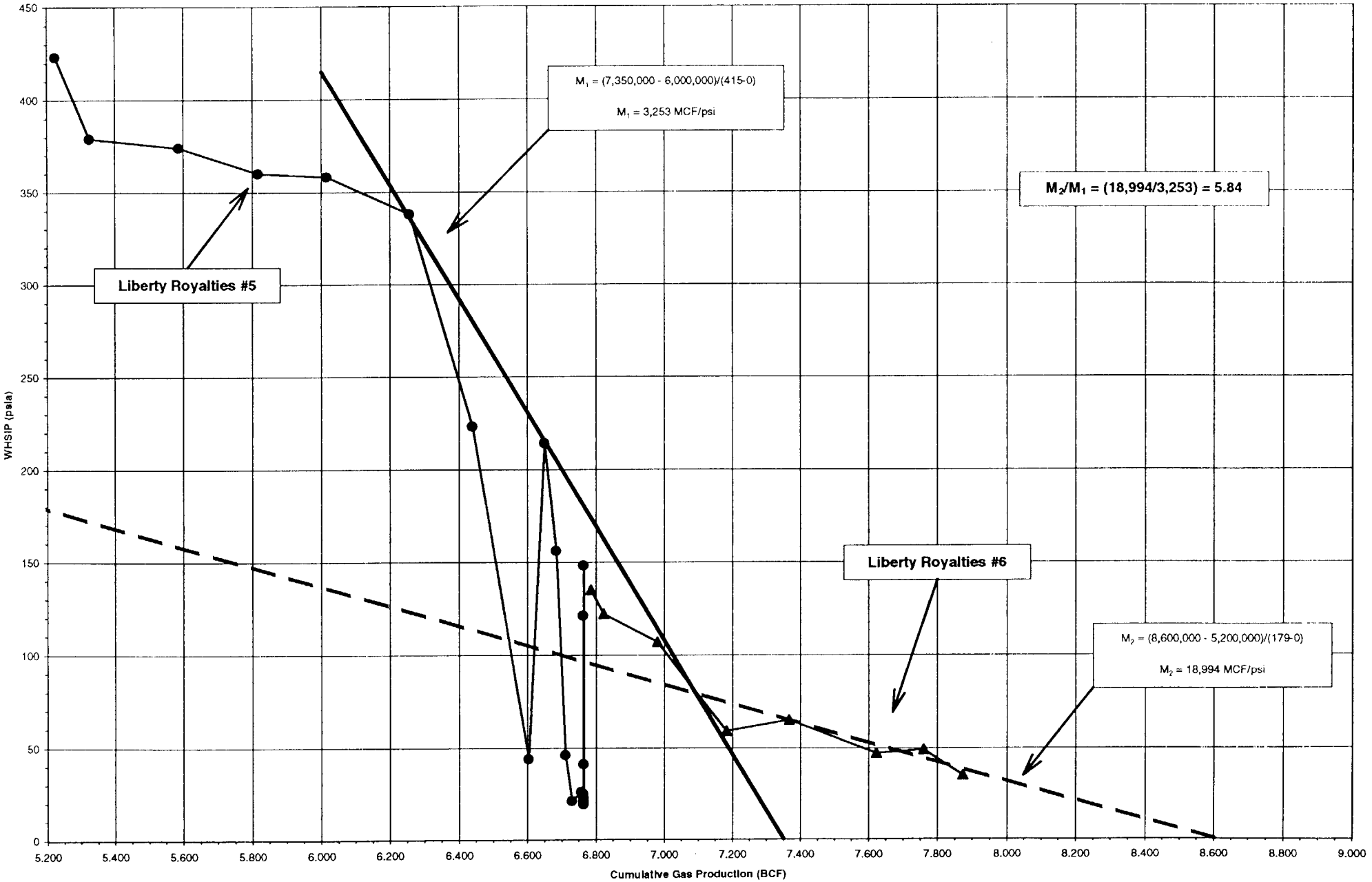


WHSIP (psia)



05/98: 8.010 BCF

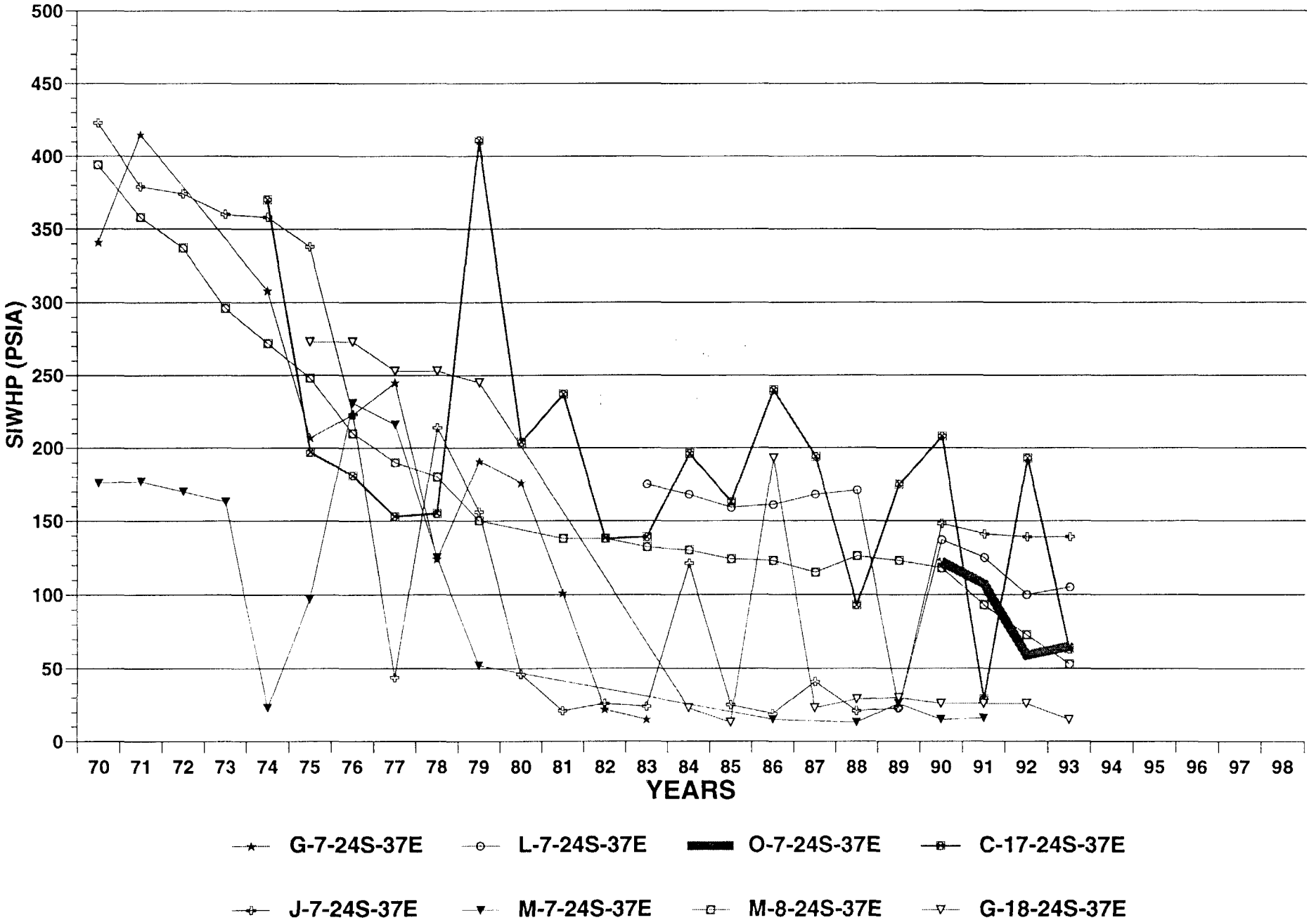
Liberty Royalties Nos. 5 & 6
Jalmat Gas Pool
J & O-7-24S-37E
Doyle Hartman

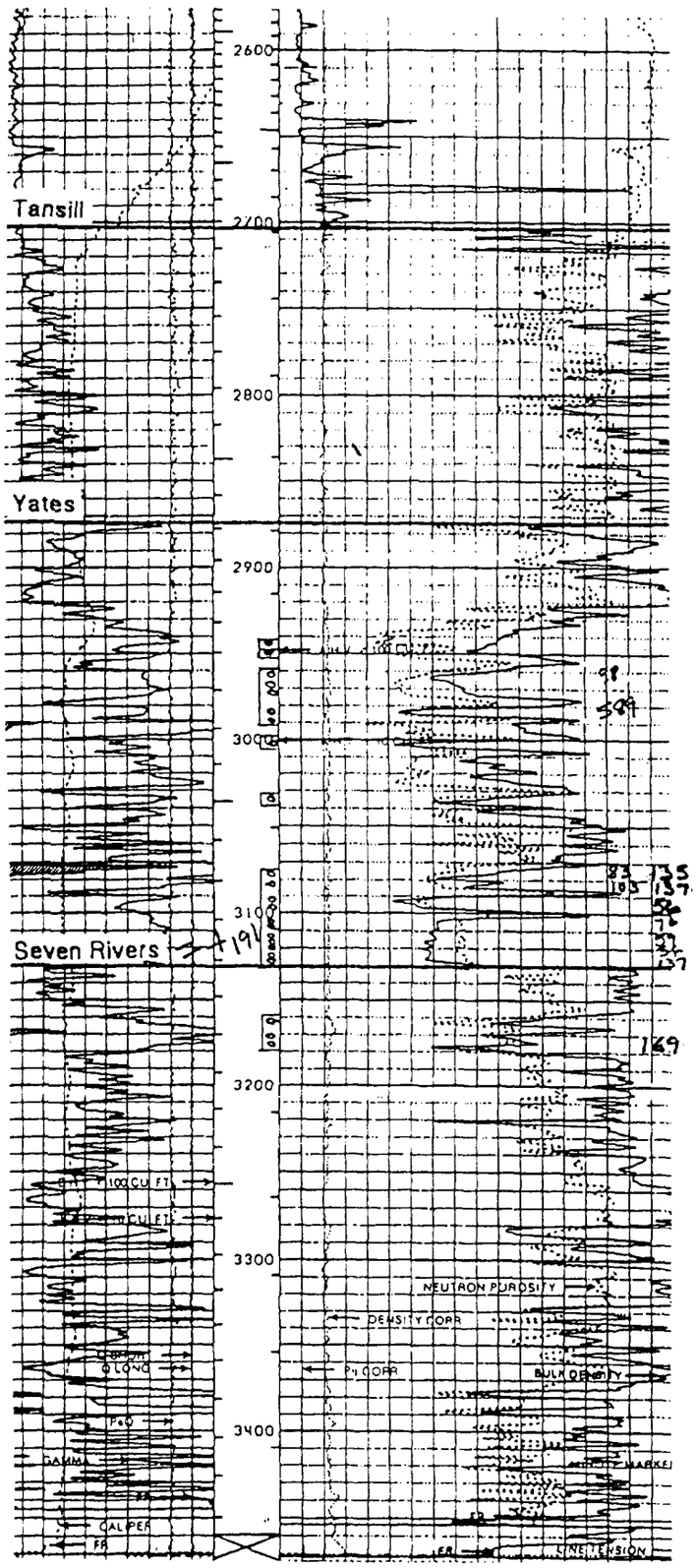


10/96: 7.873 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

Liberty Royalties # 6
Composite Pressure - Time Plot
Lea County, New Mexico





COMPANY Doyle Hartman

WELL Liberty Royalties No. 6

FIELD Jalmat (Gas)

LOCATION 660' FSL & 1400' FEL (O)
Sec. 7, T-24-S, R-37-E

COUNTY Lea

STATE New Mexico

ELEVATIONS: KB 3316
DF
GL 3305

COMPLETION RECORD

SPUD DATE 9-18-89 COMP. DATE 8-30-89

TD 3486 PBTD

CASING RECORD:

9 5/8, 36# @ 421 w/250 (TOC @ Circ.)

7, 23# @ 3486 w/1100 (TOC @ Circ.)

(TOC @)

(TOC @)

COMP. INTERVAL Perf 2944-3177 w/23

STIMULATION A/6660 15% MCA
ATR = 5 BPM
ATP = 1600 psi

POT P/151 MCFPD (After acid)

GOR GR

TP CP 29 psig (SICP = 151 psig)

CHOKE 64/64 TUBING 2 3/8 @ 3301

REMARKS

8-29-89: POP @ 9 x 64 x 1 ¼

8-30-89: SICP = 151 psig (After acid)

8-31-89: SWF/175,000 + 336,000
ATR = 37 BPM
ATP = 1447 psi
SITP = 302 psi
SICP = 380 psi

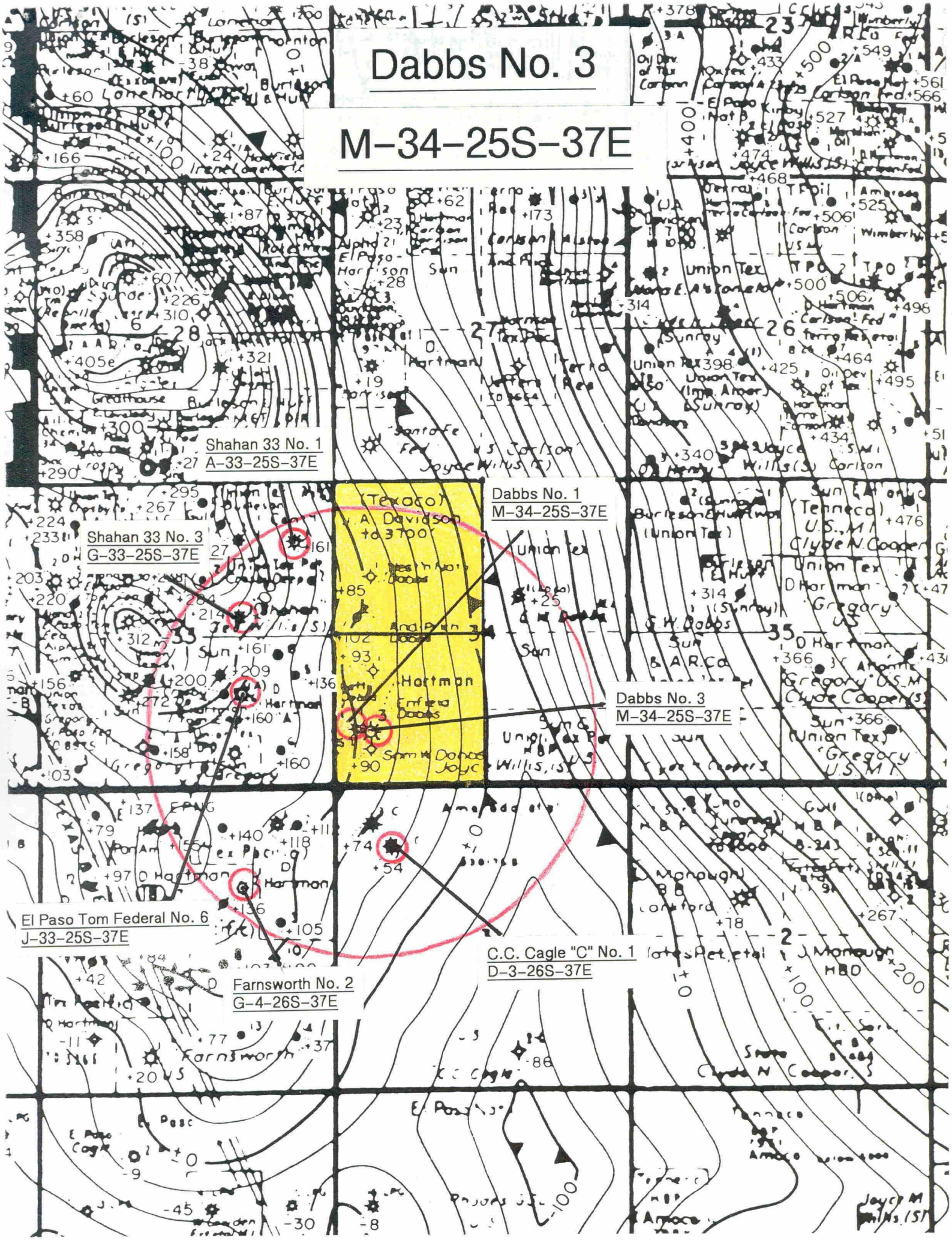
9-1-89: SICP = 186 psig

9-5-89: F/1746 MCFPD
Choke = 64/64
FCP = 91 psig

9-10-89: 25-hr. SICP = 111 psig (After frac)

6-1-98: Cum. = 1.2243 BCF
Est. Rem. = 251.6 MMCF
Est. Ult. = 1.4759 BCF
b = 0.240

O-7-24S-37E


Dabbs No. 3
M-34-25S-37E
Shahan 33 No. 1
A-33-25S-37E
Dabbs No. 1
M-34-25S-37E
Shahan 33 No. 3
G-33-25S-37E
Dabbs No. 3
M-34-25S-37E
El Paso Tom Federal No. 6
J-33-25S-37E
C.C. Cagle "C" No. 1
D-3-26S-37E
Farnsworth No. 2
G-4-26S-37E

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 10-65

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
DOYLE HARTMAN	E.E. JACK	5

Unit Letter	Section	Township	Range	County
D	8	24S	37E	LEA

Actual Footage Location of Well:
660 feet from the WEST line and 990 feet from the NORTH line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3312.5	Yates-Seven Rivers	Jalmat (Gas)	160 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

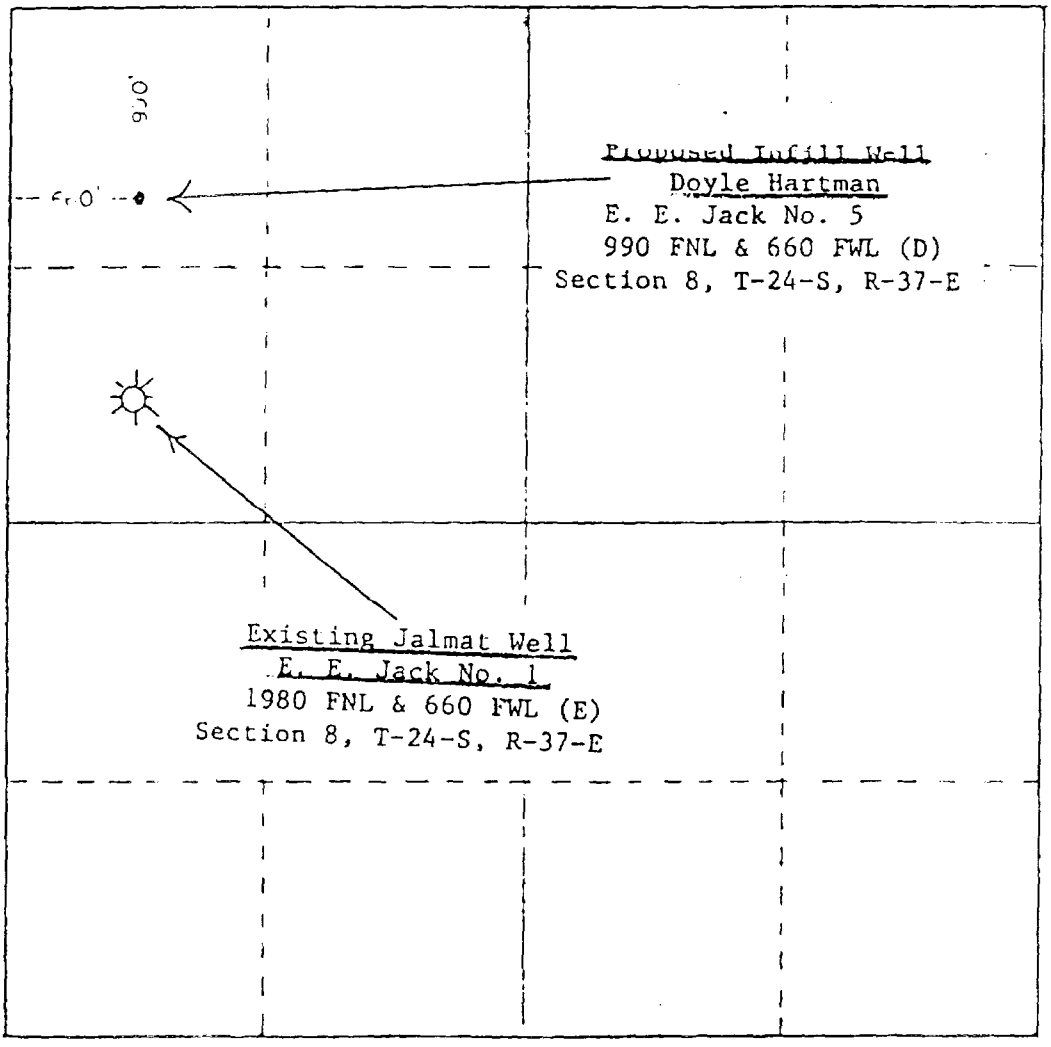
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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?

XX Yes ☐ No If answer is "yes," type of consolidation Force-Pooling

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.

Name: Larry A. Nermyr

Position: Engineer

Company: Doyle Hartman

Date: May 31, 1985

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: 4/15/85

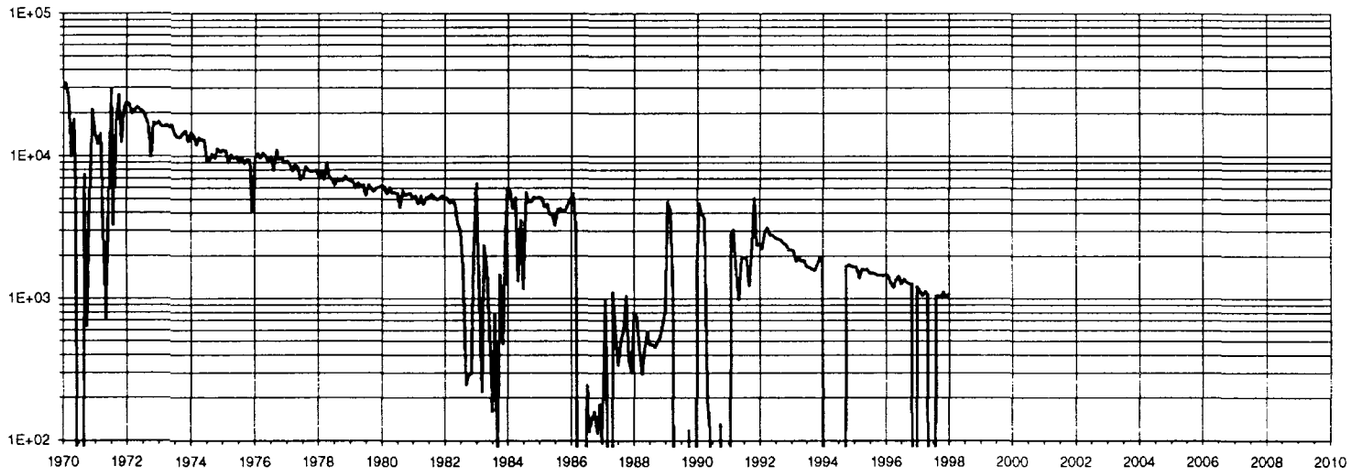
Registered Professional Engineer and/or Land Surveyor

Certificate No. JOHN W. WEST 676
RONALD J. EIDSON 3239

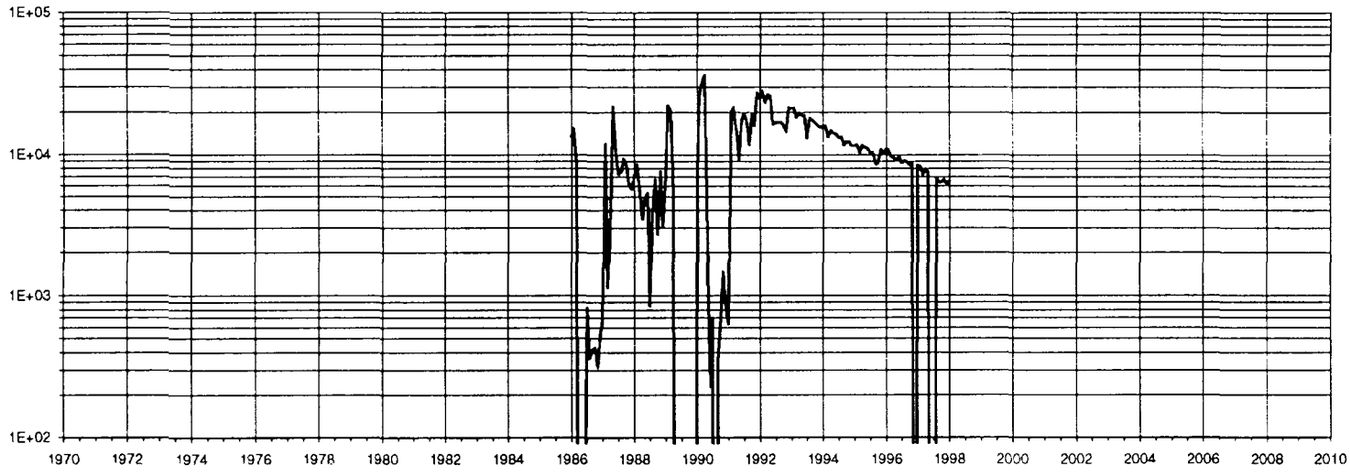
004724

E. E. Jack Nos. 1 & 5
Jalmat Gas Pool
E & D-8-24S-37E
Gruy Petroleum Management Co.

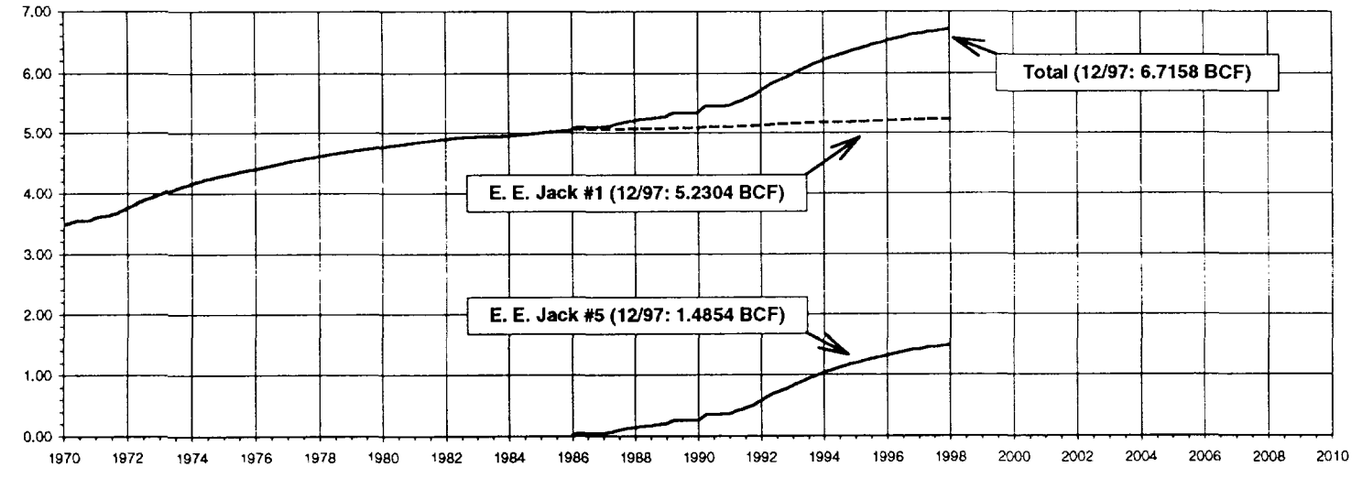
E. E. Jack #1 Gas Production (MCFPM)



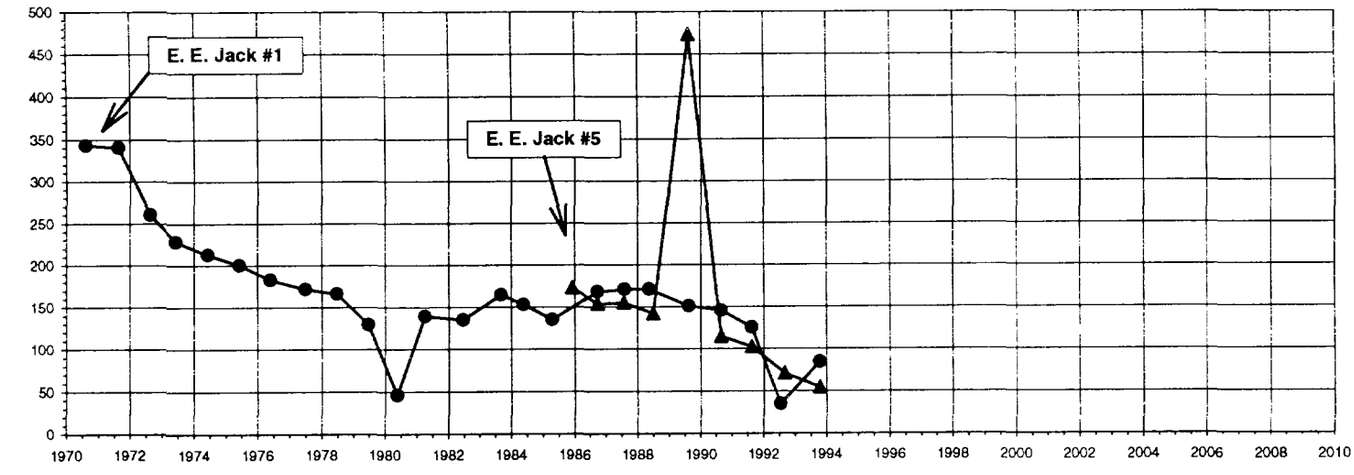
E. E. Jack #5 Gas Production (MCFPM)



Cumulative Gas Production (BCF)



WHSIP (psia)



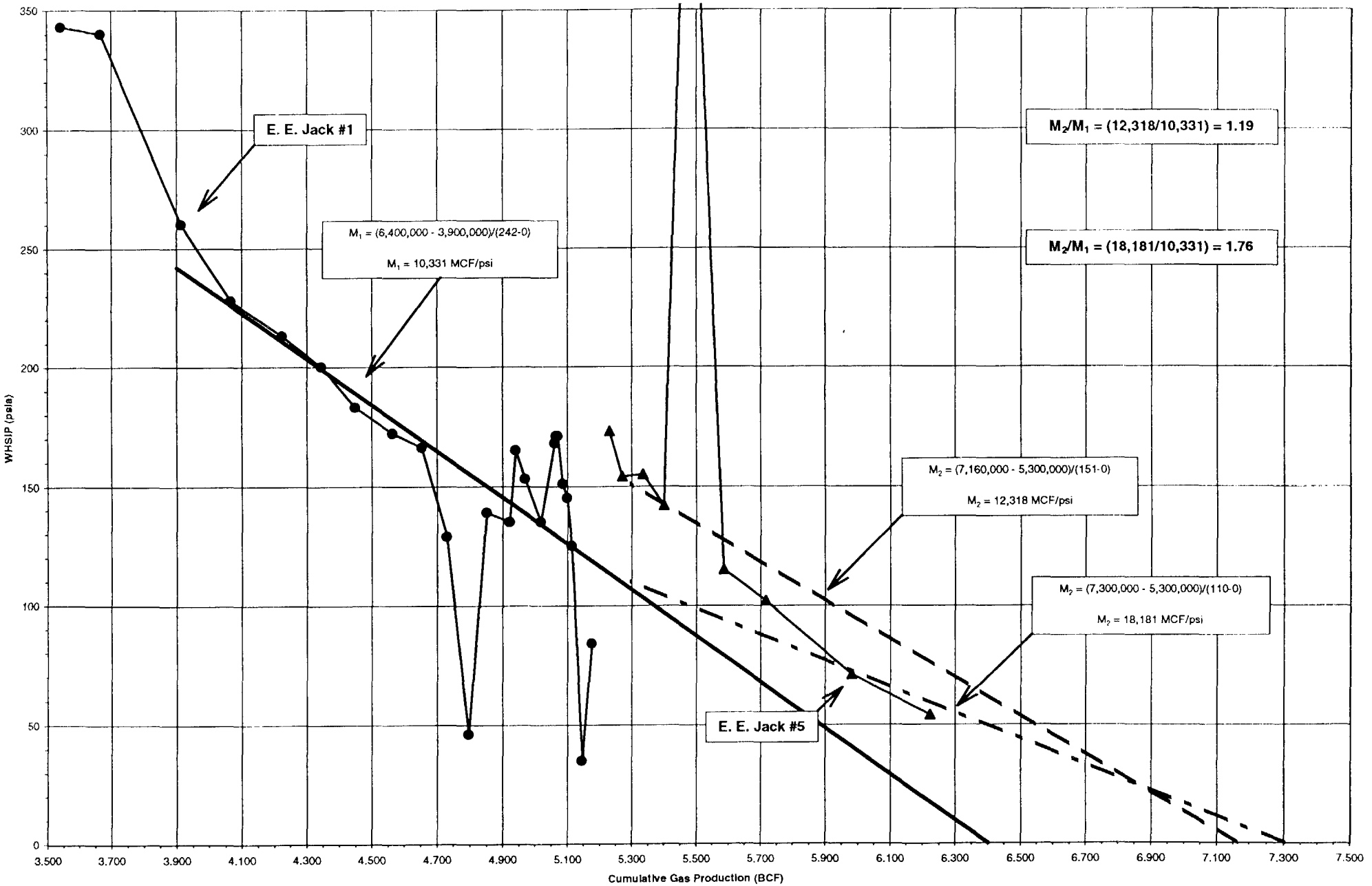
12/97: 6.716 BCF

E. E. Jack Nos. 1 & 5

Jalmat Gas Pool

E & D-8-24S-37E

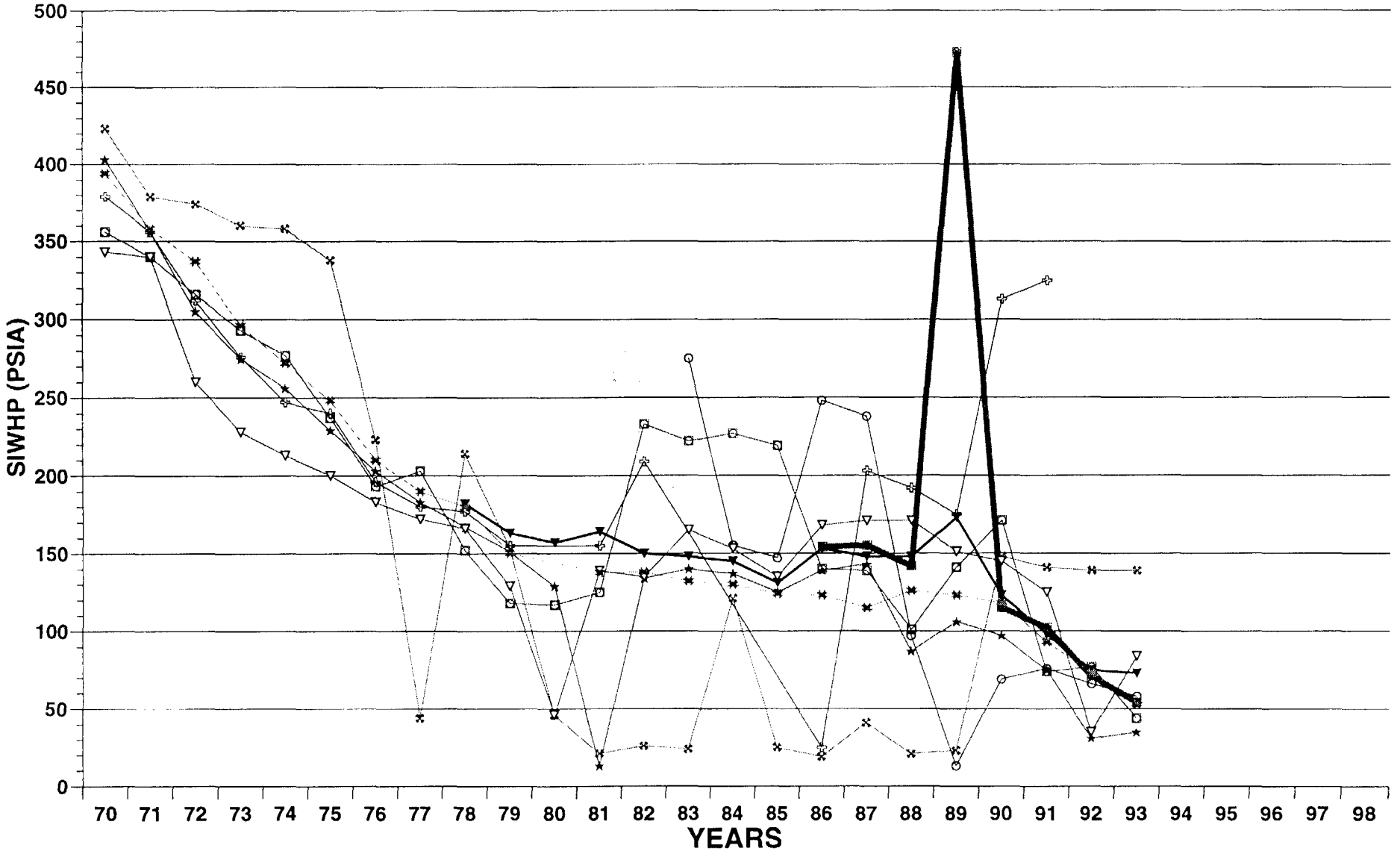
Gruy Petroleum Management Co.

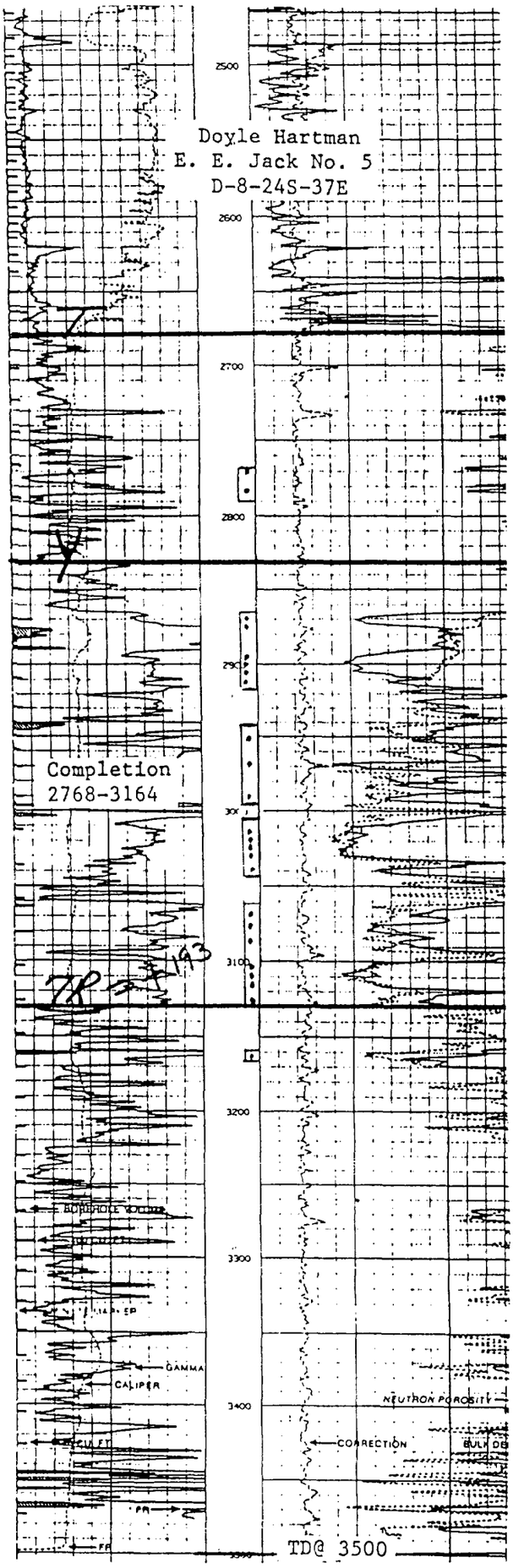


10/93: 6.222 BCF

Jalmat (Tansill-Yates-Seven-Rivers) Pool

E. E. Jack # 5
Composite Pressure - Time Plot
Lea County, New Mexico





COMPANY Gruy Operating
(Doyle Hartman)
WELL E.E. Jack No. 5

FIELD Jalmat (Gas)
LOCATION 990' FNL & 660' FWL (D)
Sec. 8, T-24-S, R-37-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB 3323
DF
GL 3312

COMPLETION RECORD

SPUD DATE 9-27-85 COMP. DATE 10-9-75
TD 3500 PBTD 3471
CASING RECORD:
9 5/8, 40# @ 402' w/350 (TOC @ Circ.)
7, 26# @ 3498' w/1150 (TOC @ Circ.)
(TOC @)
(TOC @)
COMP. INTERVAL Perf: 2768-3164 w/24

STIMULATION A/5675 15% MCA
ATR = 4.5 BPM ATP = 2536 psi.
ISIP = 1500 psi. 15-min. SIP = 200 psi.
POT IPF = 603 MCFPD (Kicked off w/o swabbing)
GOR GR
TP 78 CP 103
CHOKE 32/64 TUBING @
REMARKS Gas Show: While drilling, experienced gas entry from Tansil.

10-11-85: Lowered tubing to 2955'. F/310 MCFPD.
Choke = 16/64. FTP = 175 psi. FCP = 228 psi.

10-13-85: SICP = 233 psig.

10-15-85: SWF/214,000 + 449,000.
ATR = 36 BPM. ATP = 1760 psi.
ISIP = 590 psi. 1-hr. SIP = 530 psi.
Flare @ 345 psig. After 19 hrs, FTP = 66,
FCP = 206 on 64/64 choke.

10-16-85: SIP = 211 psig.

10-17-85: F/922 MCFPD.
Choke = 24/64. FTP = 151.
FCP = 189.

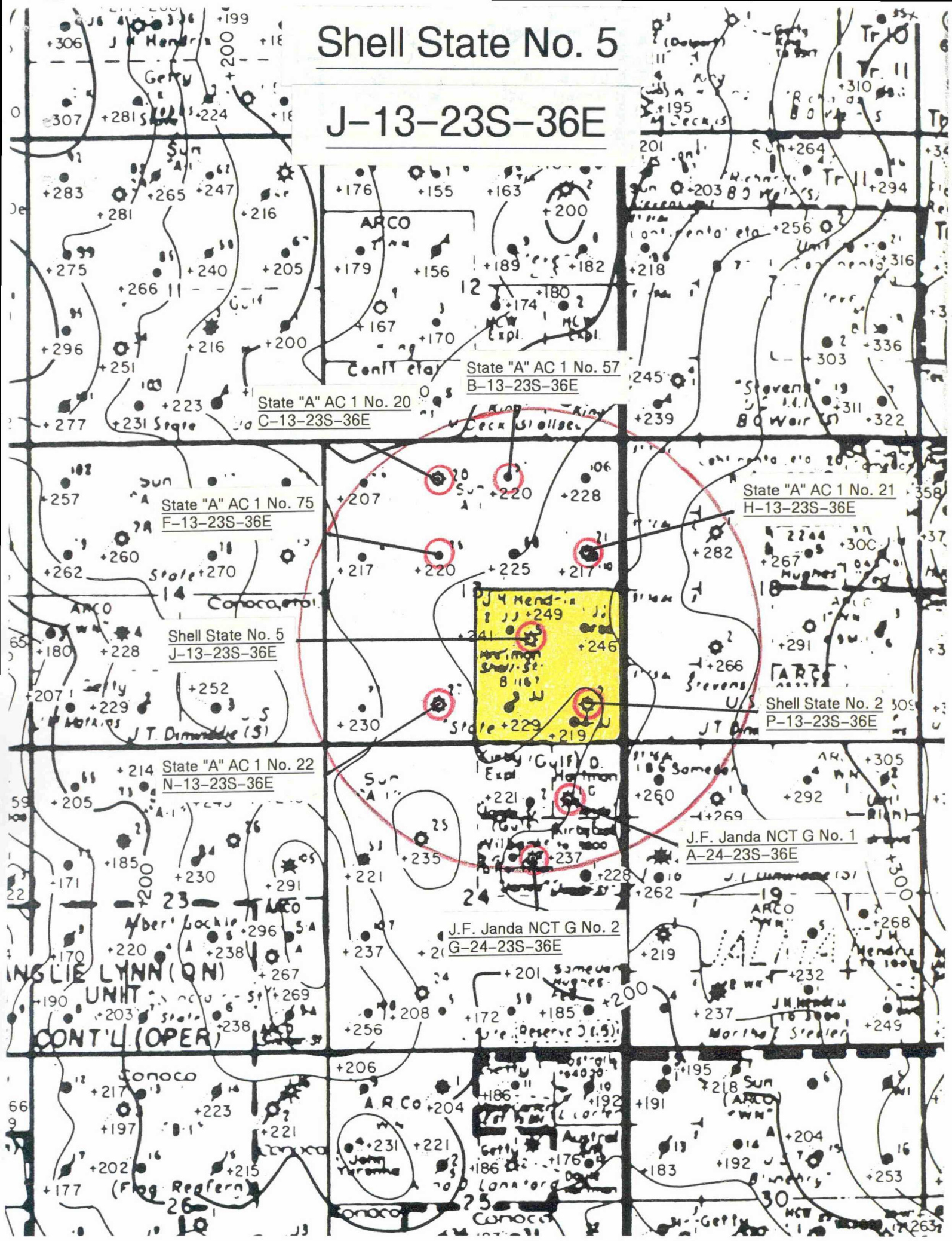
12-07-85: SIP = 160 psig.

1-01-98: Cum. = 1.4854 BCF
Est. Rem. = 231.1 MMCF
Est. Ult. = 1.7165 BCF
b = 0.270

D-8-24S-37E

Shell State No. 5

J-13-23S-36E



Well File

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
DOYLE HARTMAN	THOMAS	2

Unit Letter	Section	Township	Range	County
L	17	24 SOUTH	37 EAST	LEA

Actual Footage Location of Well:
1930 feet from the SOUTH line and 990 feet from the WEST line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3281.5	Yates-Seven Rivers	Jalmat (Gas)	320*

1 Outline the acreage dedicated to the subject well by colored pencil or hachure 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?

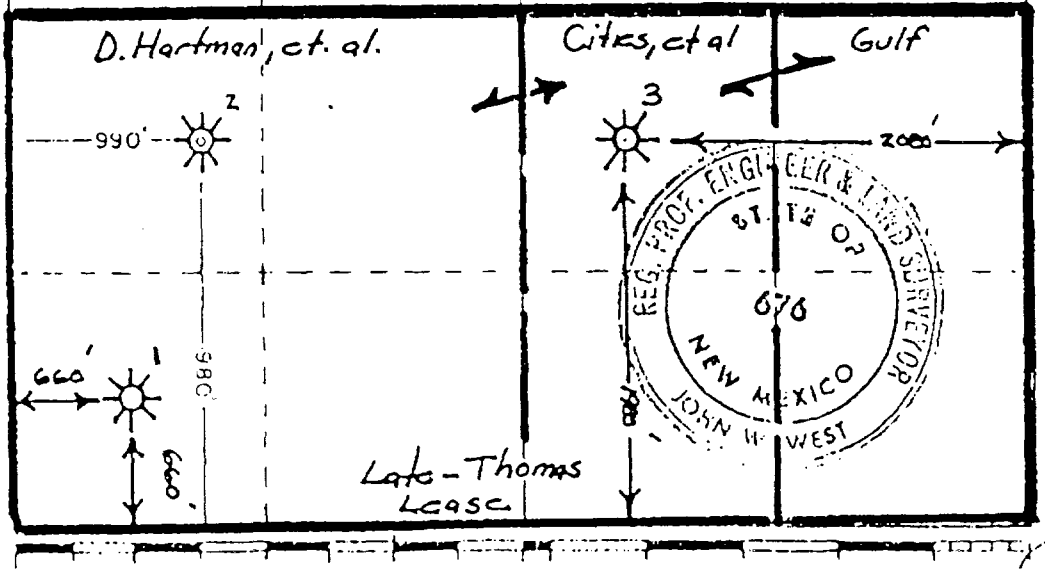
[X] Yes [ ] No If answer is "yes," type of consolidation Communitization Agreement
Compulsory Pooling R-6781

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.

* Simultaneous dedication of Late-Thomas Nos. 1, 2, and 3 to existing proration unit consisting of S/2 Section 17, T-24-S, R-37-E approved under NMOCD Order R-6781.

** Unorthodox location for Late-Thomas No. 2 approved under NMOCD Order R-6807.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Michelle Hembree

Name: Michelle Hembree

Position: Administrative Assistant

Company: Doyle Hartman

Date: 10-28-81

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: 8-4-81

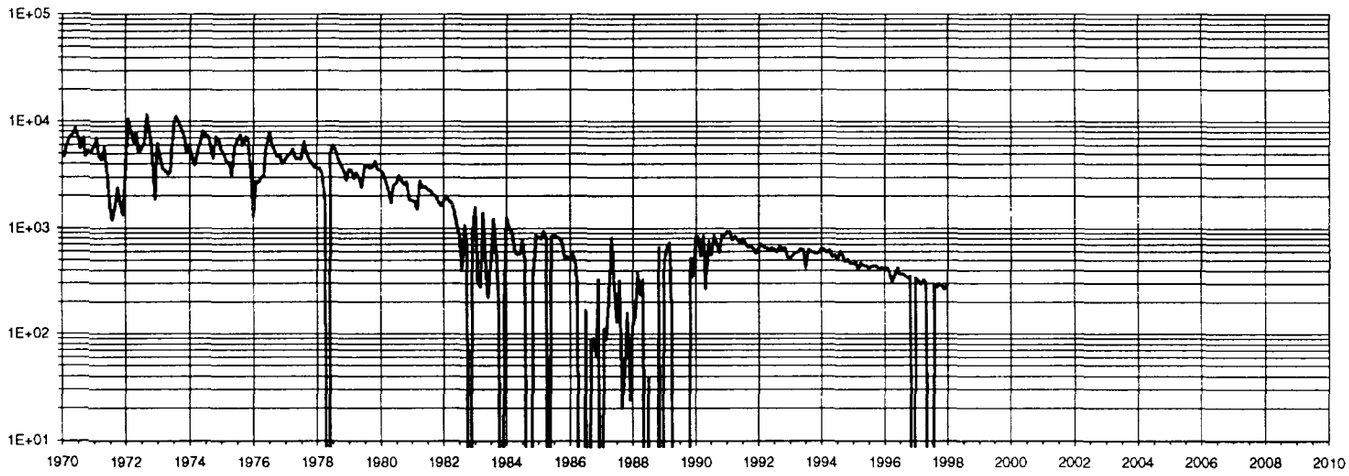
Registered Professional Engineer and/or Land Surveyor

John W. West

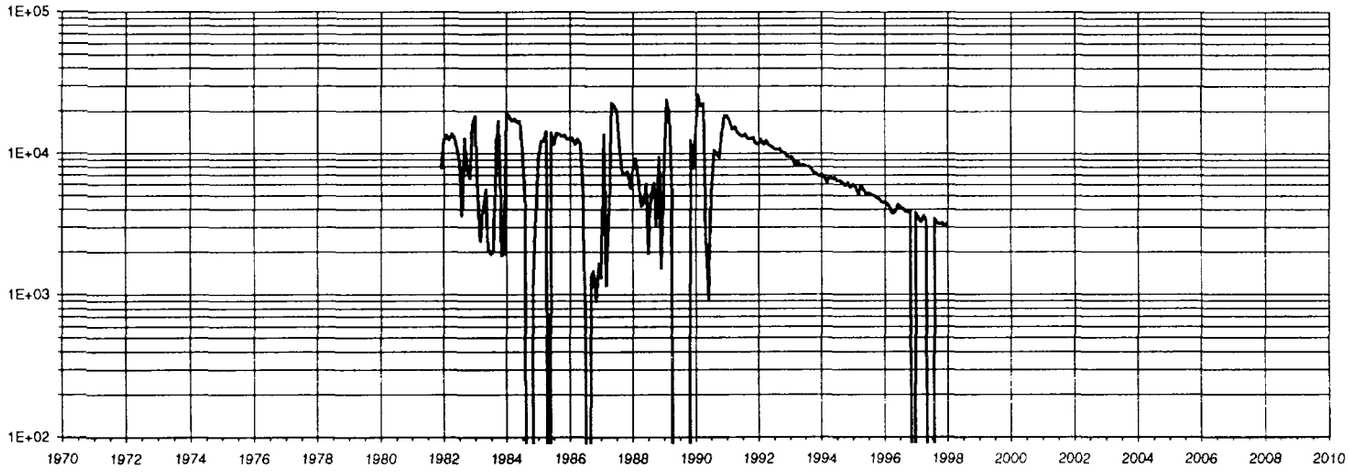
Certificate No. JOHN W. WEST 676
PATRICK A. ROMERO 5992

Late Thomas Nos. 1 & 2
Jalmat Gas Pool
L-17-24S-37E
Gruy Petroleum Management Co.

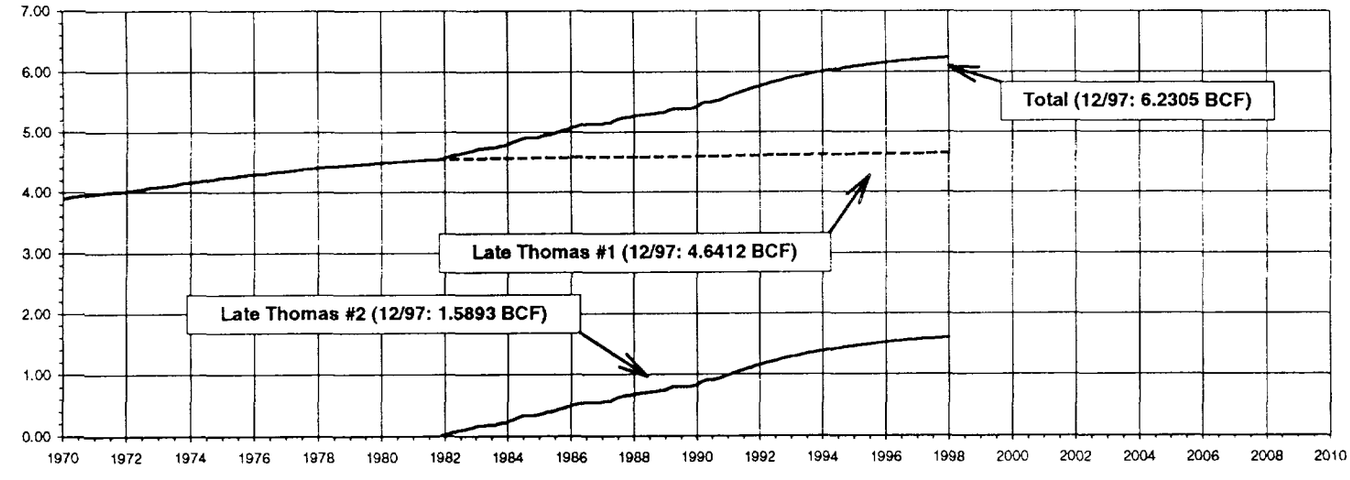
Late Thomas #1 Gas Production (MCFPM)



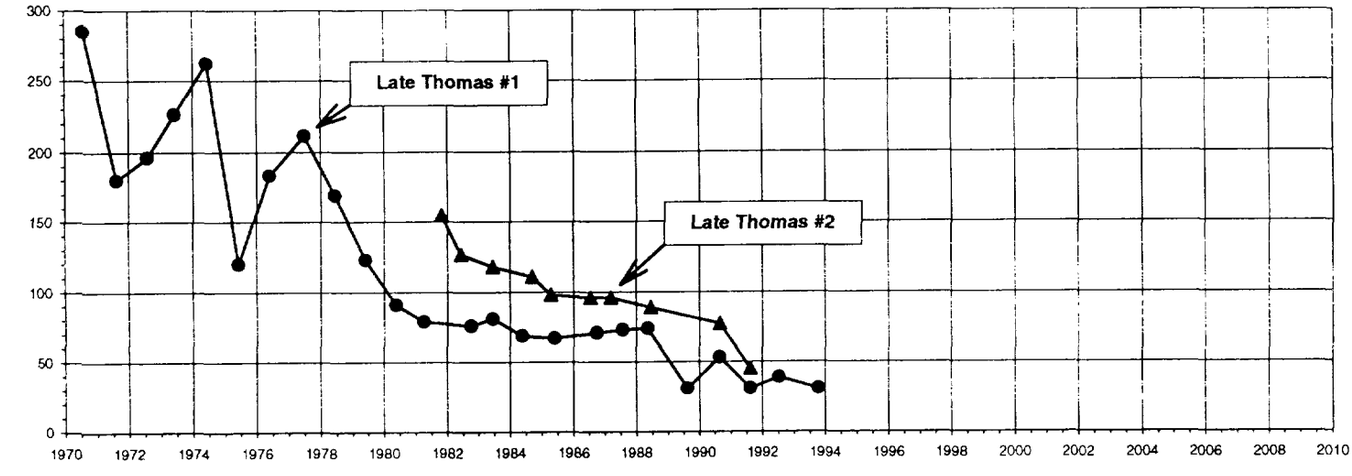
Late Thomas #2 Gas Production (MCFPM)



Cumulative Gas Production (BCF)



WHSIP (psia)



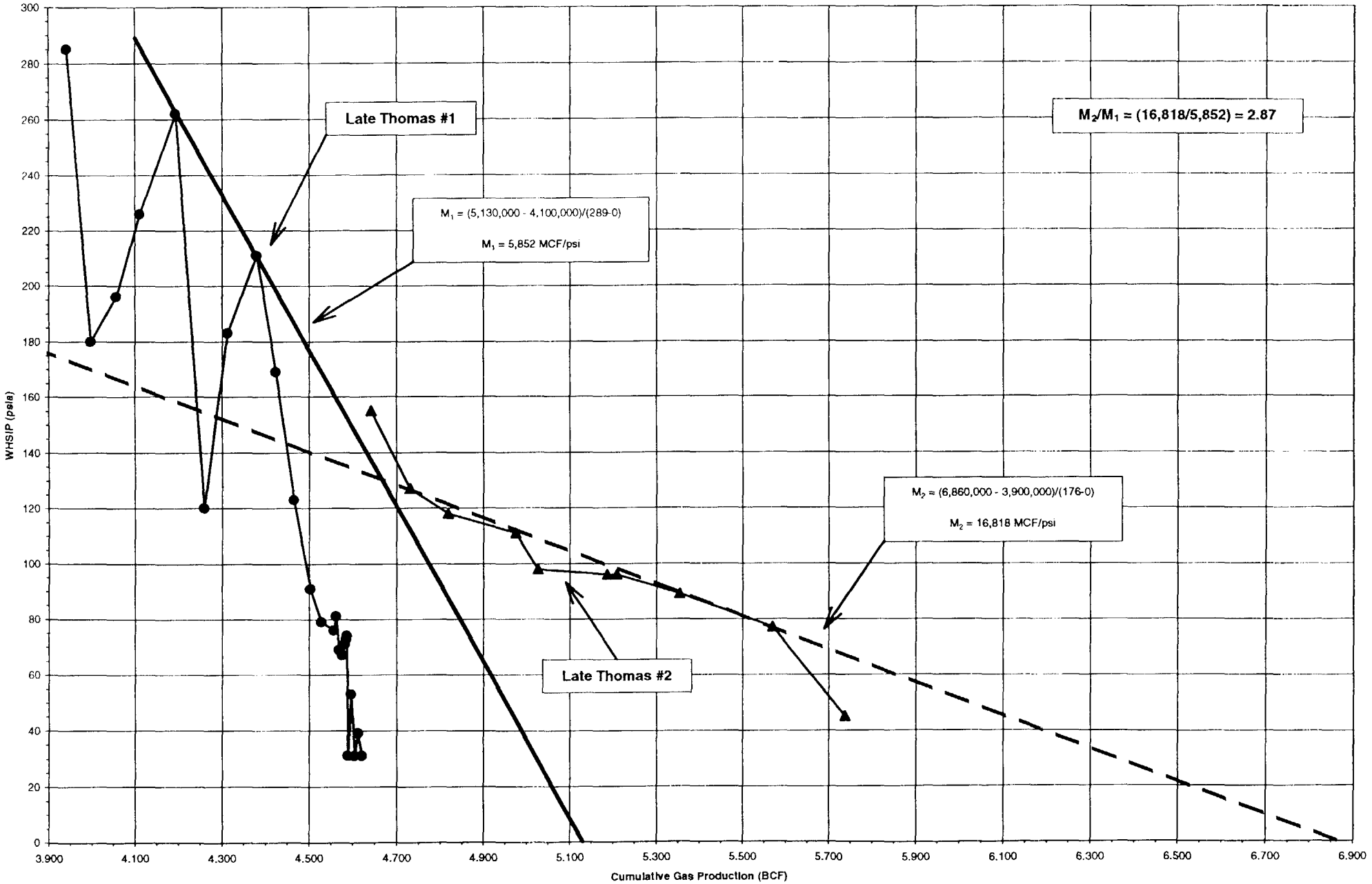
12/97: 6.231 BCF

Late Thomas Nos. 1 & 2

Jalmat Gas Pool

L-17-24S-37E

Gruy Petroleum Management Co.



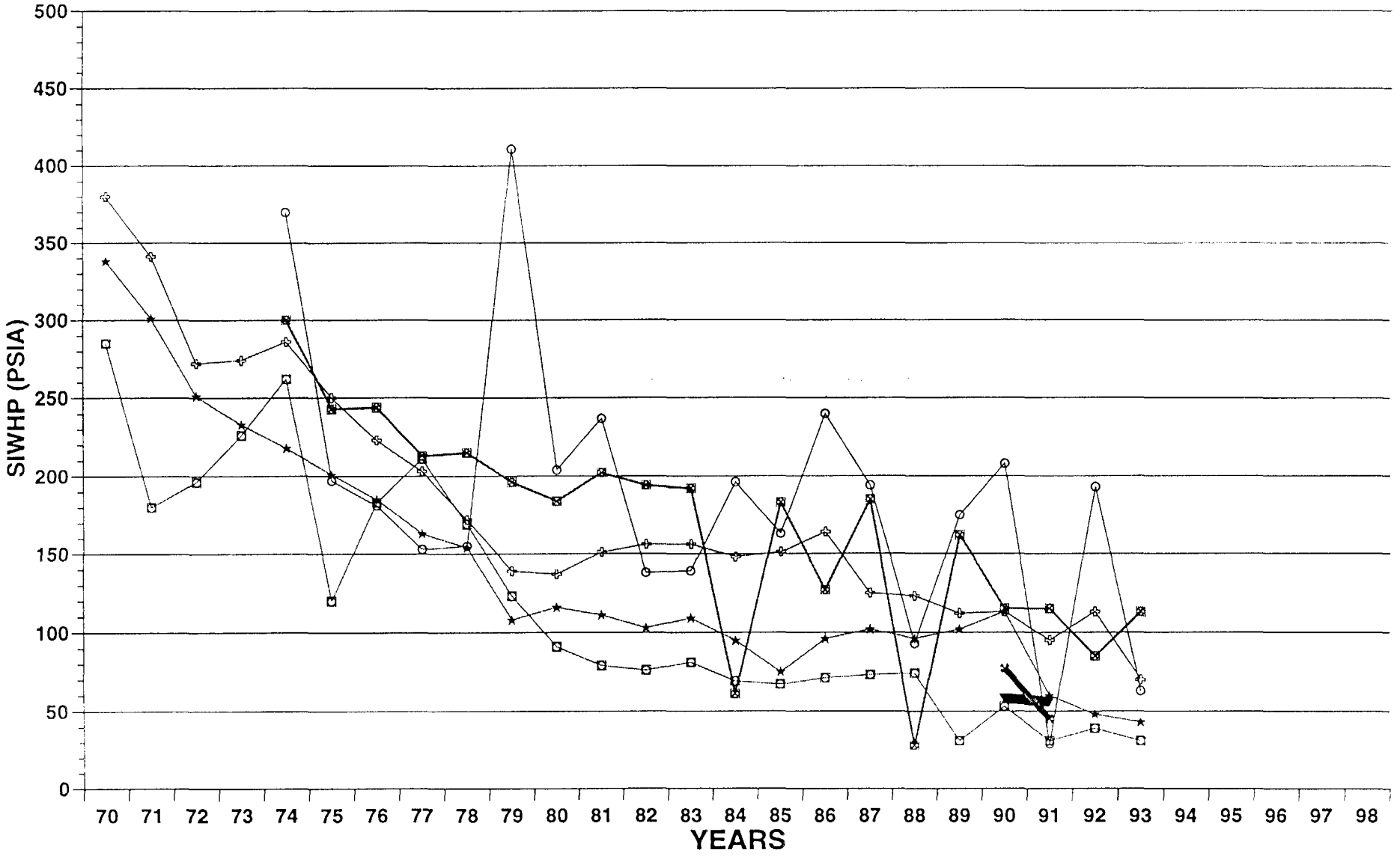
08/91: 5.737 BCF

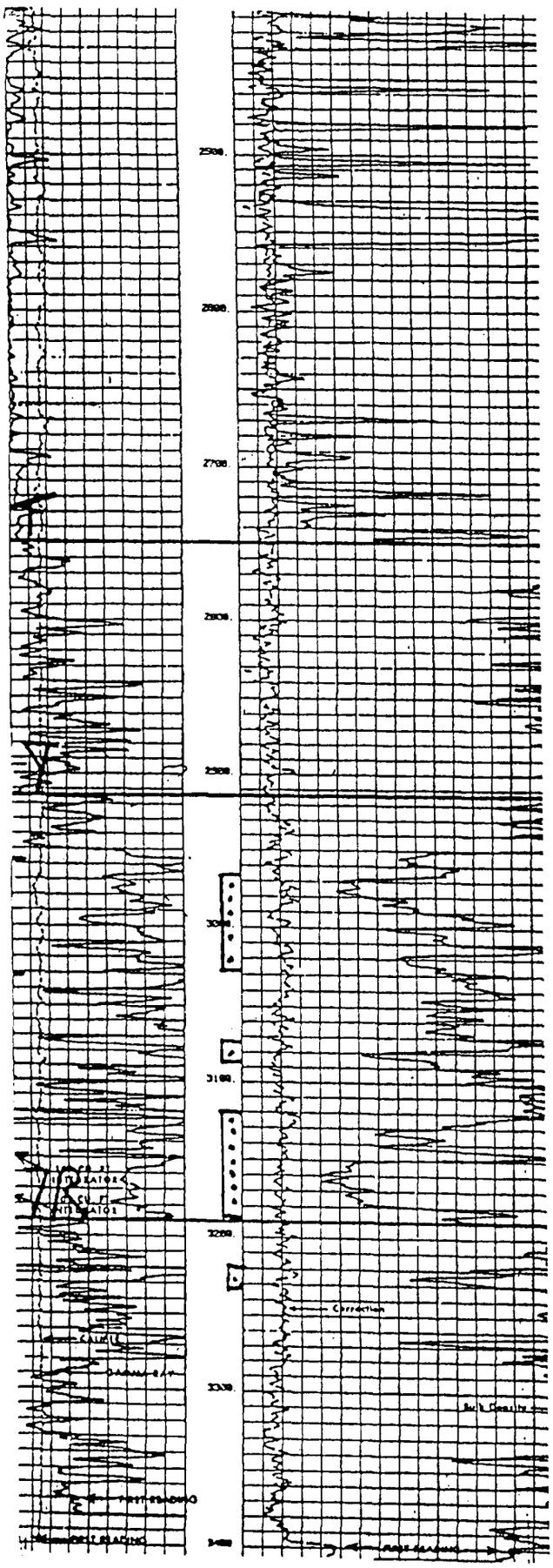
Jalmat (Tansill-Yates-Seven-Rivers) Pool

Late Thomas # 2, 3

Composite Pressure - Time Plot

Lea County, New Mexico





COMPANY Gruy Operating
(Doyle Hartman)
WELL Late-Thomas No. 2

FIELD Jalmat (Gas)
LOCATION 1980' FSL & 990' FWL (L)
Sec. 17, T-24-S, R-37-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB 3292
DF
GL 3282

COMPLETION RECORD

SPUD DATE 10-14-81 COMP. DATE 10-29-81
TD 3400 PBTD 3319
CASING RECORD:
9 5/8, 36# @ 425 w/225 (TOC @ Circ.)
7, 23# @ 3400 w/450 (TOC @ Circ.)
(TOC @)
(TOC @)
COMP. INTERVAL Perf 2957-3226 w/20

STIMULATION A/5500 15% MCA
ATR = 4.4 BPM
ATP = 1950 psi ISIP = 0 psi
POT IPP = 1497 MCFPD (After Frac)
GOR GR
TP CP 110 psi (SICP = 142 psi)
CHOKE 44/64 TUBING 2 3/8 @ 3265
REMARKS
10-27-81: SWF/72,000 + 175,000
ATR = 25 BPM
ATP = 1300 psi
ISIP = 900 psi
1.33-hr. SIP = 550 psi
60/64: FCP = 64, FTP = 108

10-28-81: SIP = 136 psig.

10-28-81: POP @ 8 ½ x 64 x 1 ¼

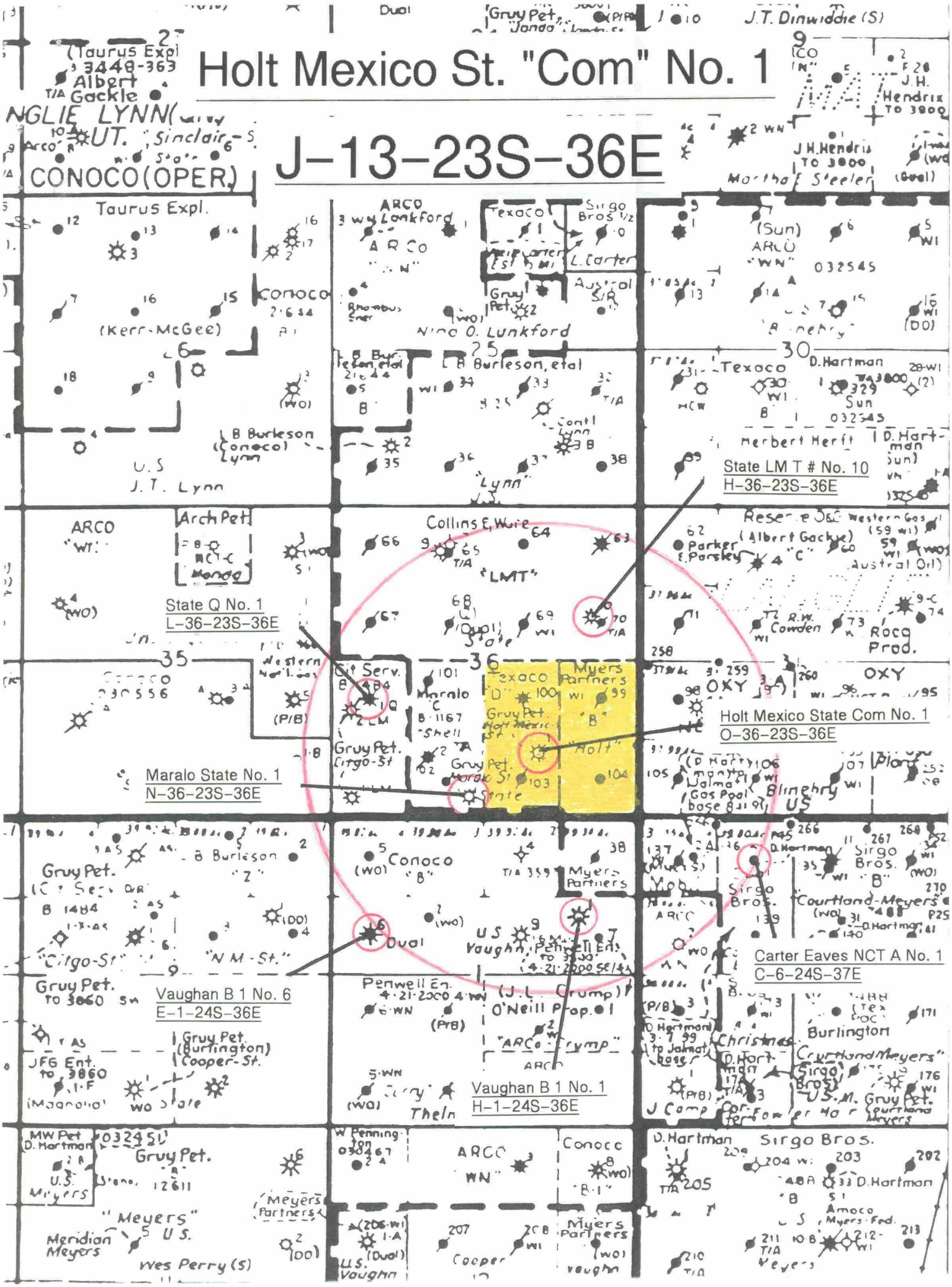
10-29-81: F/1497 MCFPD (Est.)
Choke = 44/64
FCP = 110 psig
Est. C = 181

01-01-98: Cum. = 1.5893 BCF
Est. Rem. = 119.5 MMCF
Est. Ult. = 1.7088 BCF
b = 0.221

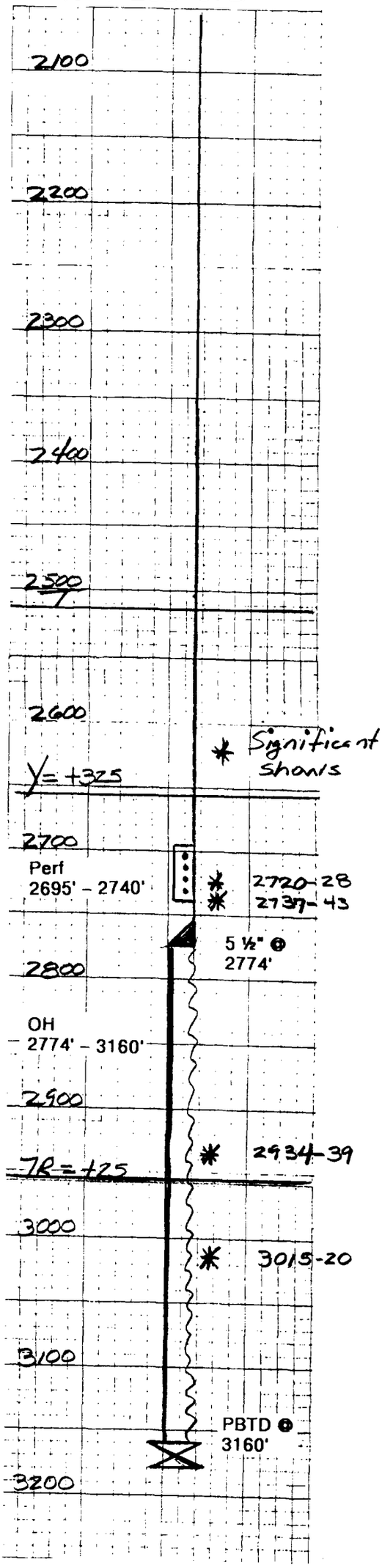
L-17-24S-37E

Holt Mexico St. "Com" No. 1

J-13-23S-36E



RFU # 41
(Farnsworth "C" # 1)
N-4-26S-37E



Original Pressure–Cum Slope = 16,923 MCF / psi

COMPANY Gruy Petroleum Management Company
(Stanolind Oil & Gas Co.)
WELL RFU No. 41
(C.M. Farnsworth "C" No. 1)
FIELD Rhodes Gas Pool
LOCATION 990' FSL & 1650' FWL (N)
Sec. 4, T-26-S, R-37-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB
DF
GL 2983'

COMPLETION RECORD

SPUD DATE 09-03-39 COMP. DATE 10-13-39
TD 3160' PBTD 3160'
CASING RECORD:
13" @ 290' w/200 sx (TOC @)
8 ⅝" @ 1077' w/325 sx (TOC @)
5 ½" @ 2774' w/100 sx (TOC @)
(TOC @)
COMP. INTERVAL OH: 2744 - 3160'
Perfs: 2695'- 2740' w/56
STIMULATION
POT F/4790 MCFPD
GOR GR
TP CP (ISIP = 1010 psi)
CHOKE TUBING 2 ⅞" @ 3028'
REMARKS
Gas Zones: 2720-2728 *
2737-2743
2934-2939
3015-3020

05-18-73: 4-day CAOF = 1868 MCFPD.
72-hr SITP = 394 psi.

07-09-79: Set 4 ½" L @ 2626-3160'(uncemented).
Perf 2690-3025' W/55 holes.

03-02-82: SW/4 Sec. 4 designated Rhodes Gas Pool single-well SPU.

02-08-91: SF/30,000 + 80,000.

03-02-91: Landed 2 ⅜" @ 2918'. 15-hr SITP = 112 psi.
Opened to Sales Line.

07-29-93: Sqz'd with 350 gal of scale converter.
A/6000 (acid + CO_2).

* Initial completion reported by G.F. Kendrick of EPNG.

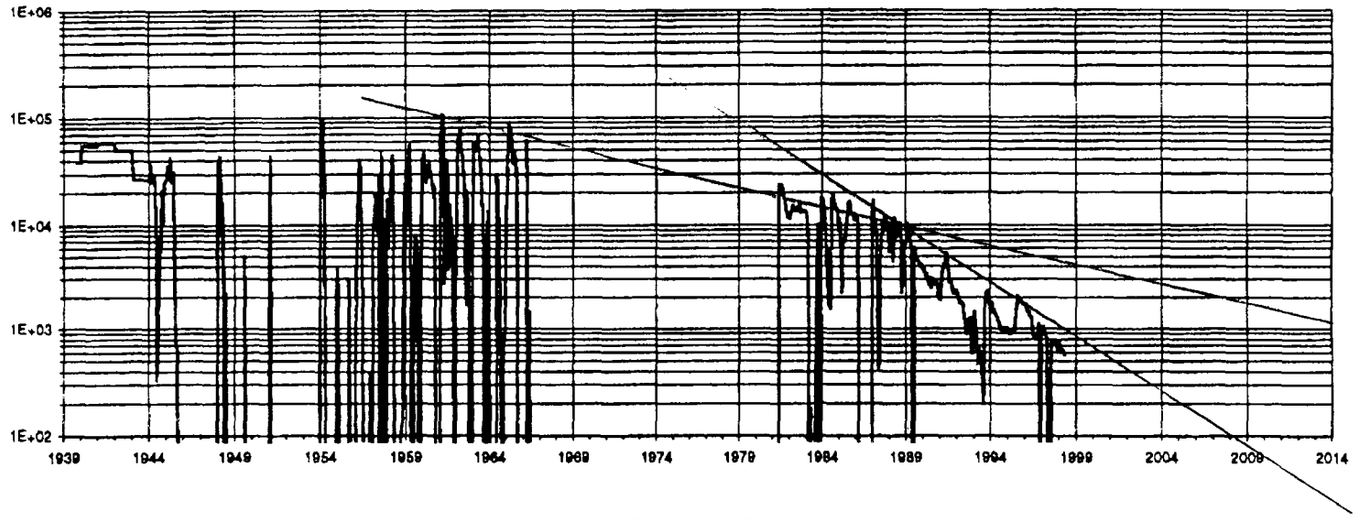
Farnsworth C #1

Rhodes (Yates-Seven Rivers) Gas Pool

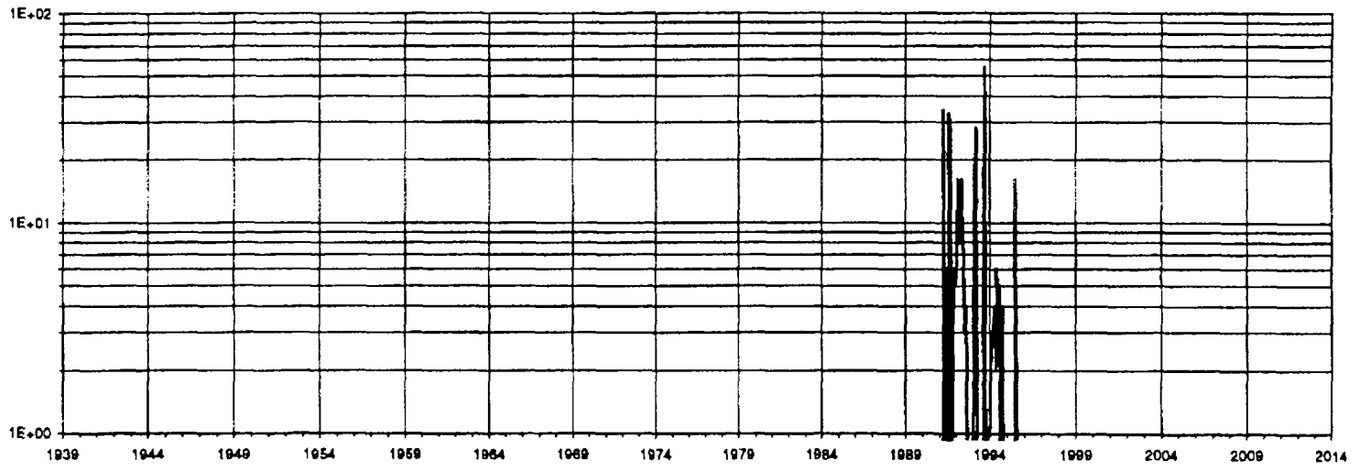
N-4-26S-37E

Gruy Petroleum Management Co.

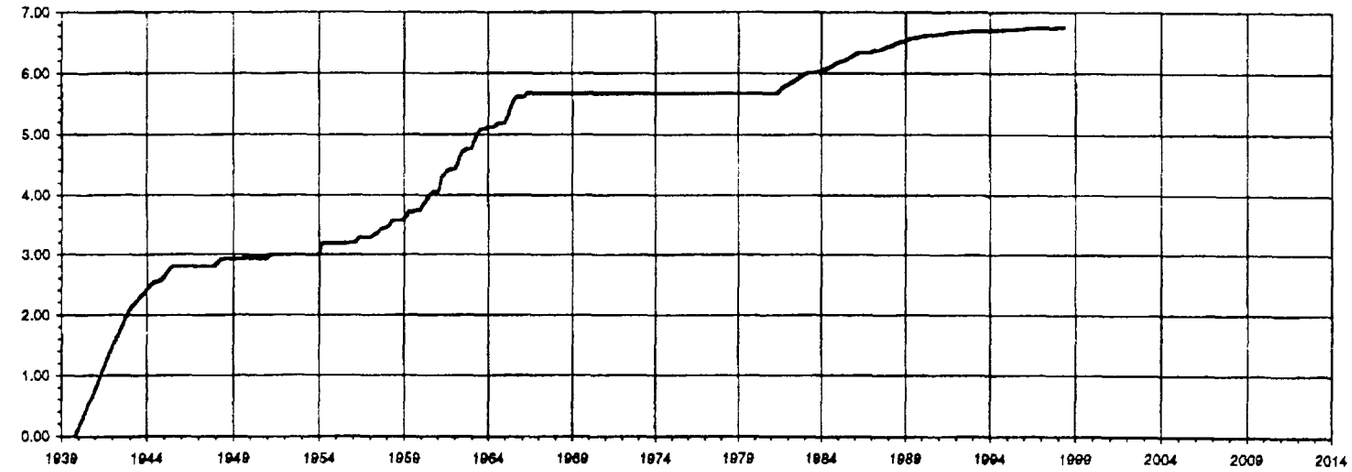
Gas Production (MCFPM)



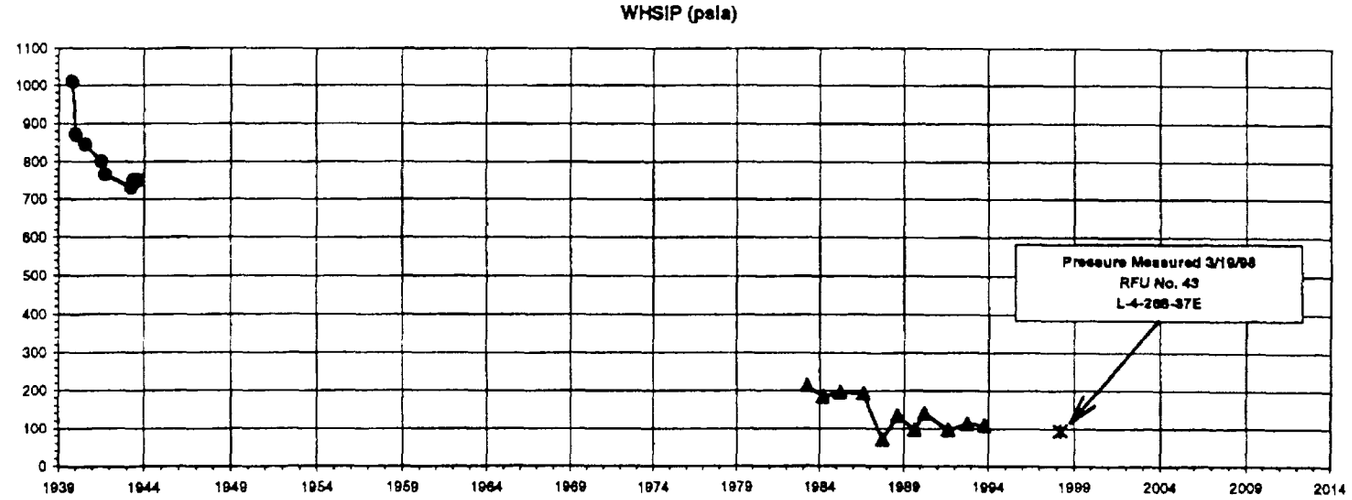
Water Production (BPM)



Cumulative Gas Production (BCF)



WHSIP (psia)



04/98: 6.755 BCF

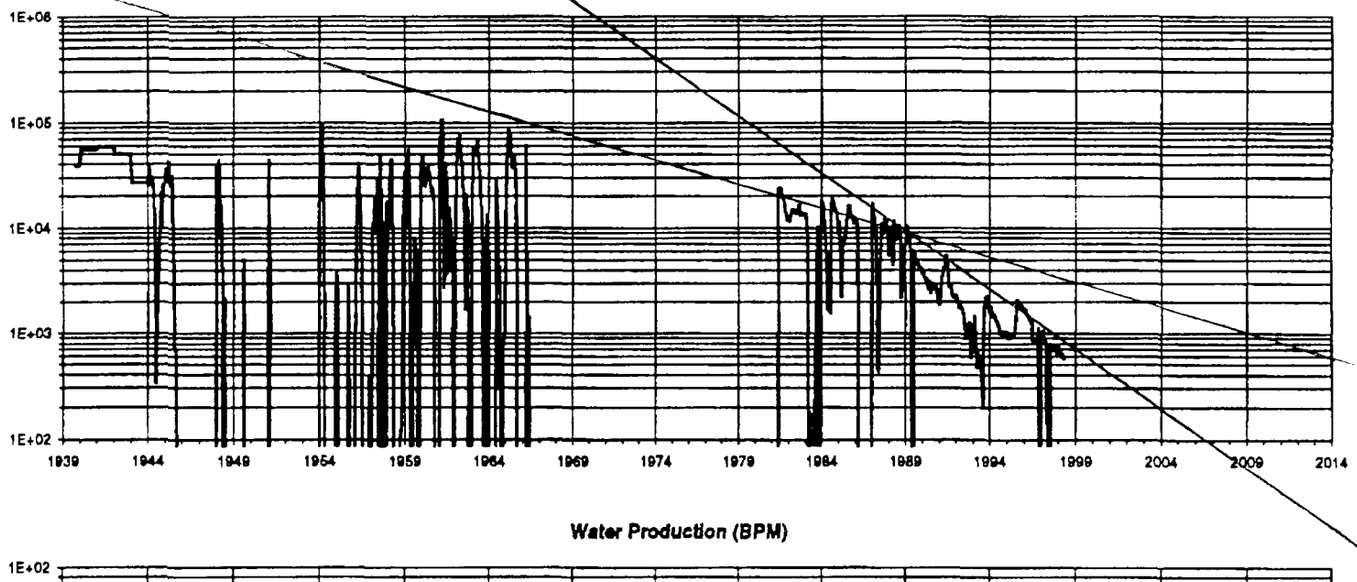
Farnsworth C #1

Rhodes (Yates-Seven Rivers) Gas Pool

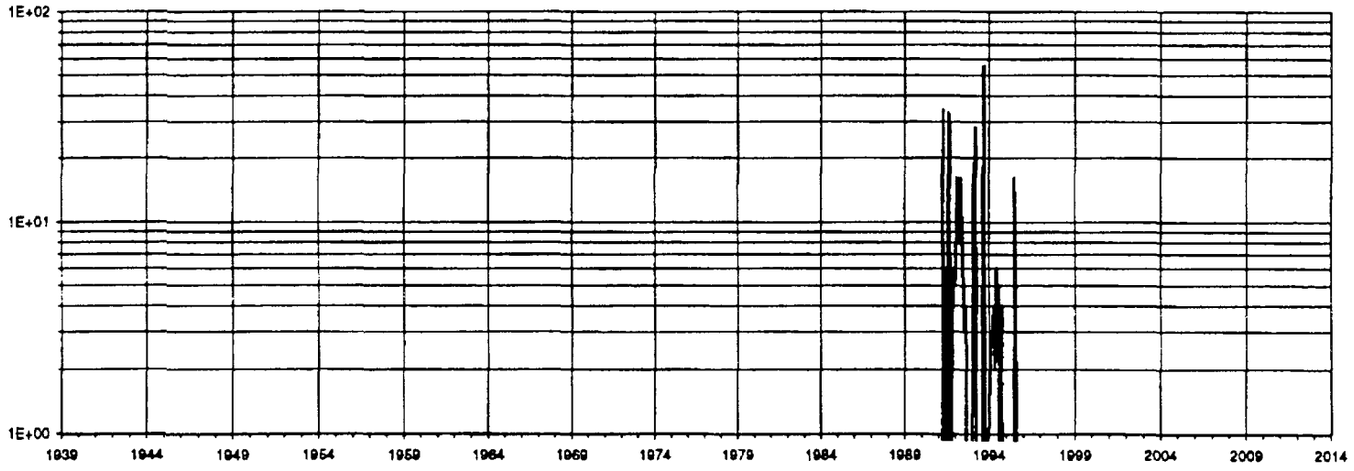
N-4-26S-37E

Gruy Petroleum Management Co.

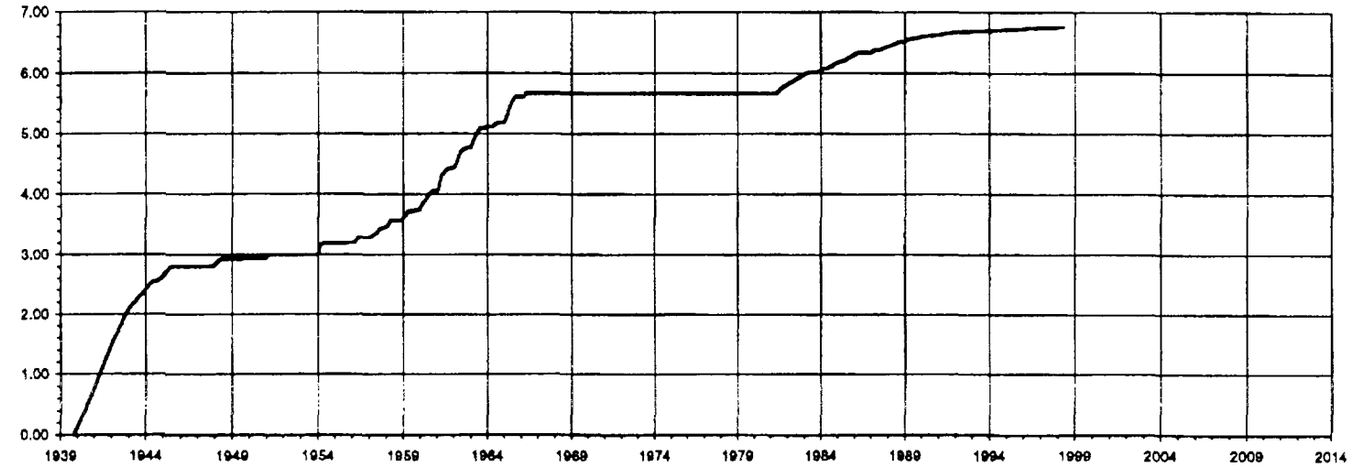
Gas Production (MCFPM)



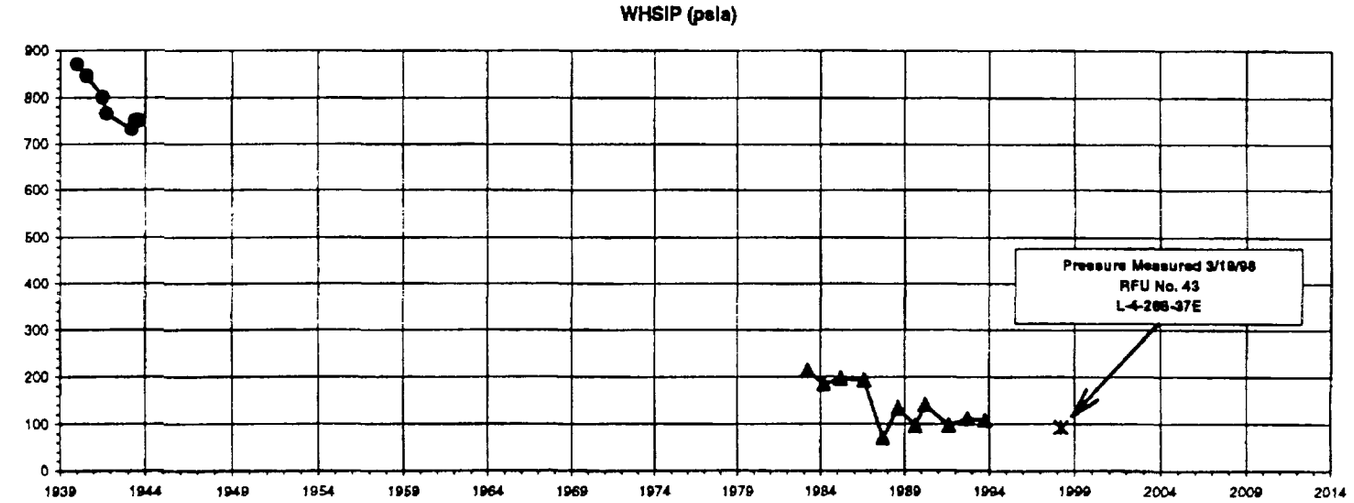
Water Production (BPM)



Cumulative Gas Production (BCF)

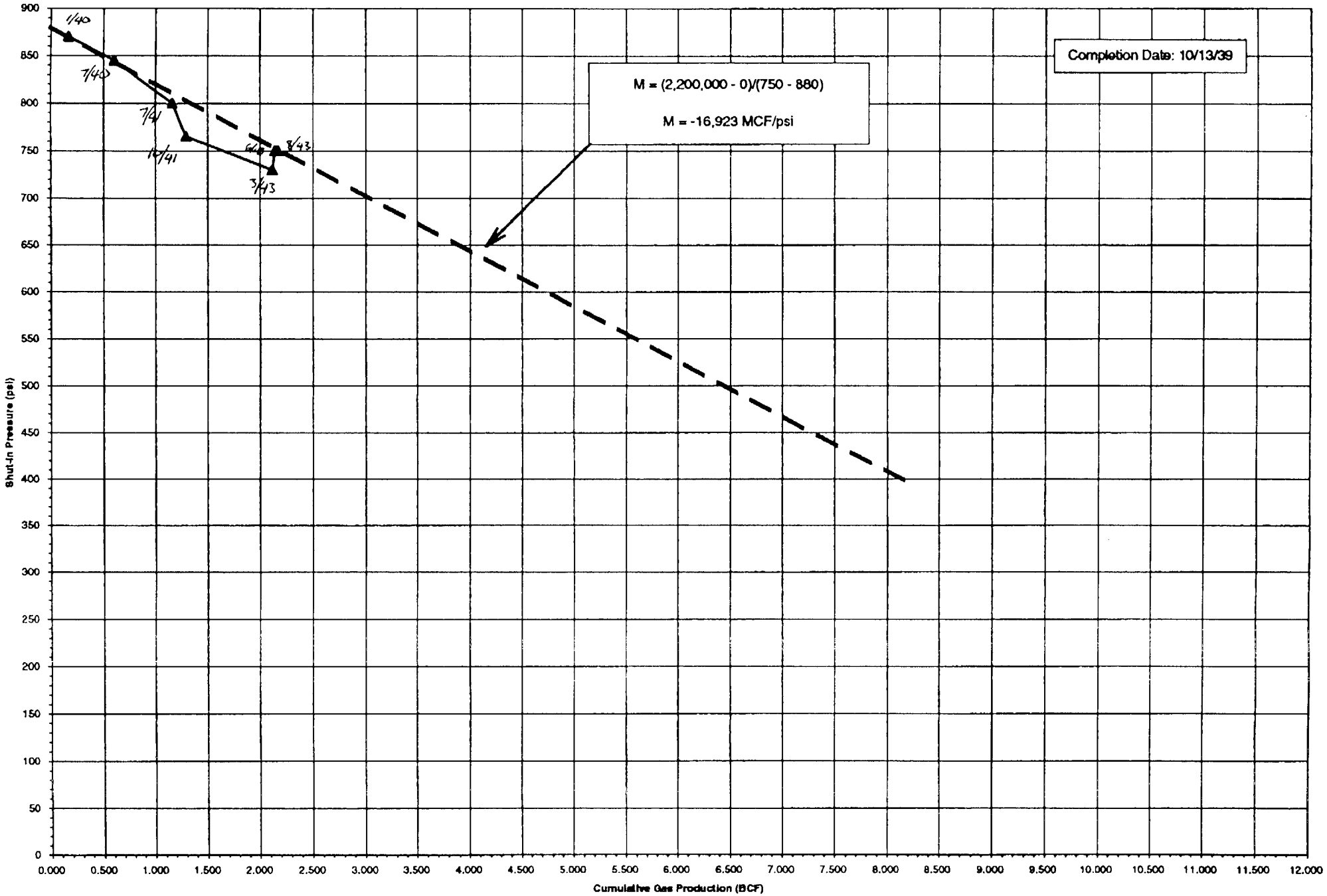


WHSIP (psia)



04/98: 6.755 BCF

Farnsworth C No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
N-04-26S-37E
Stanolind Oil Company

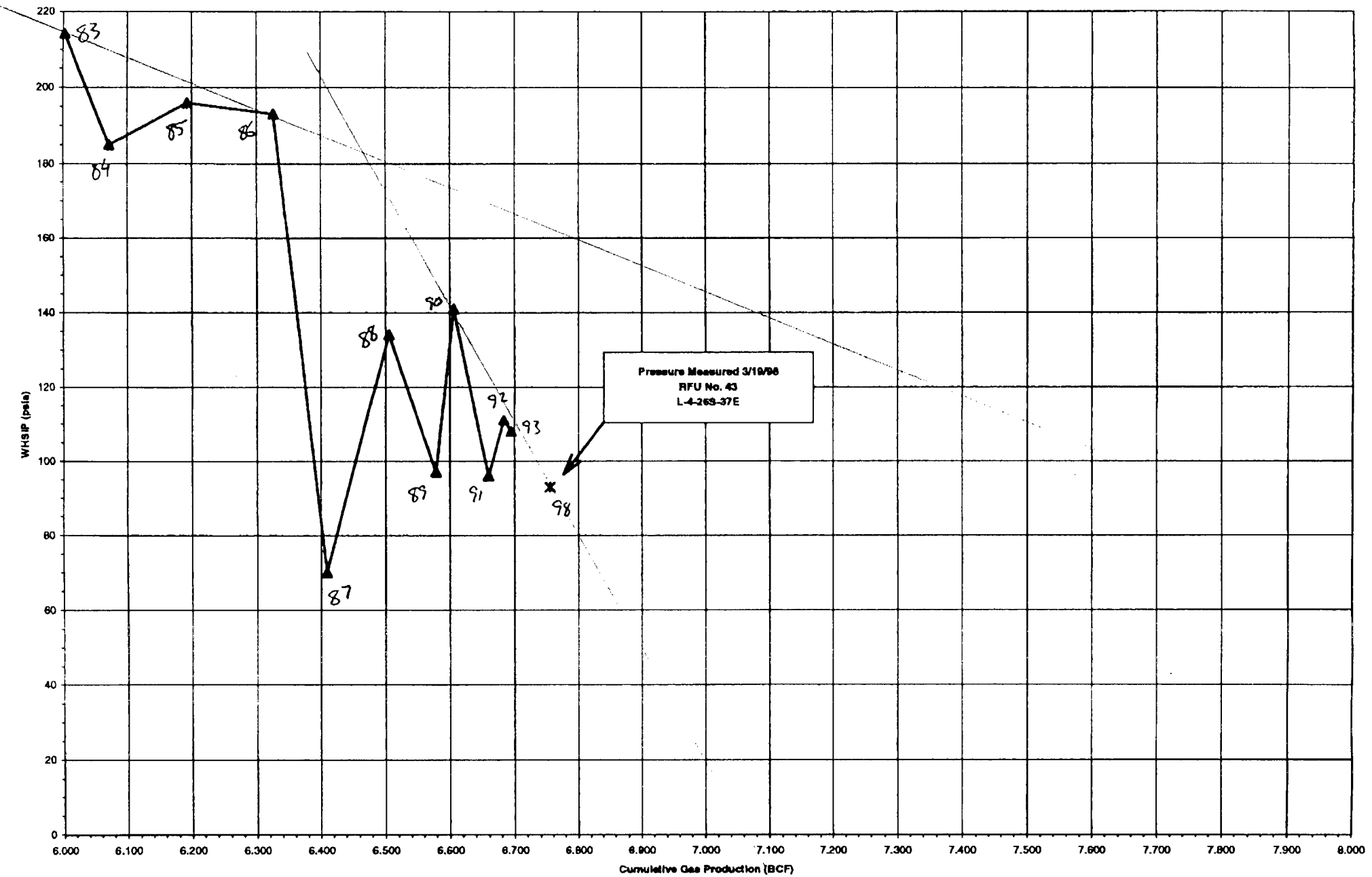


Farnsworth C #1

Rhodes (Yates-Seven Rivers) Gas Pool

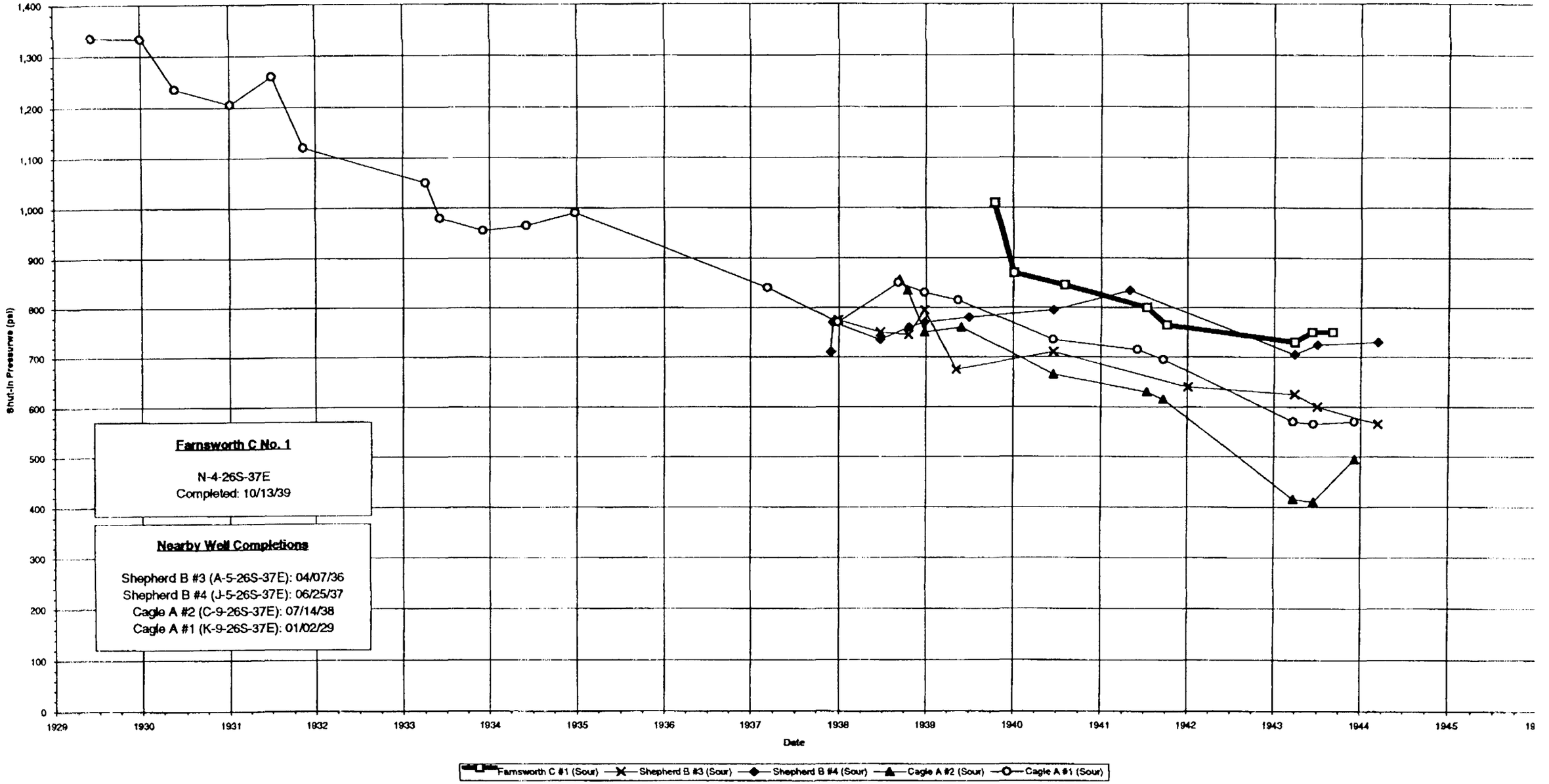
N-4-26S-37E

Gruy Petroleum Management Co.

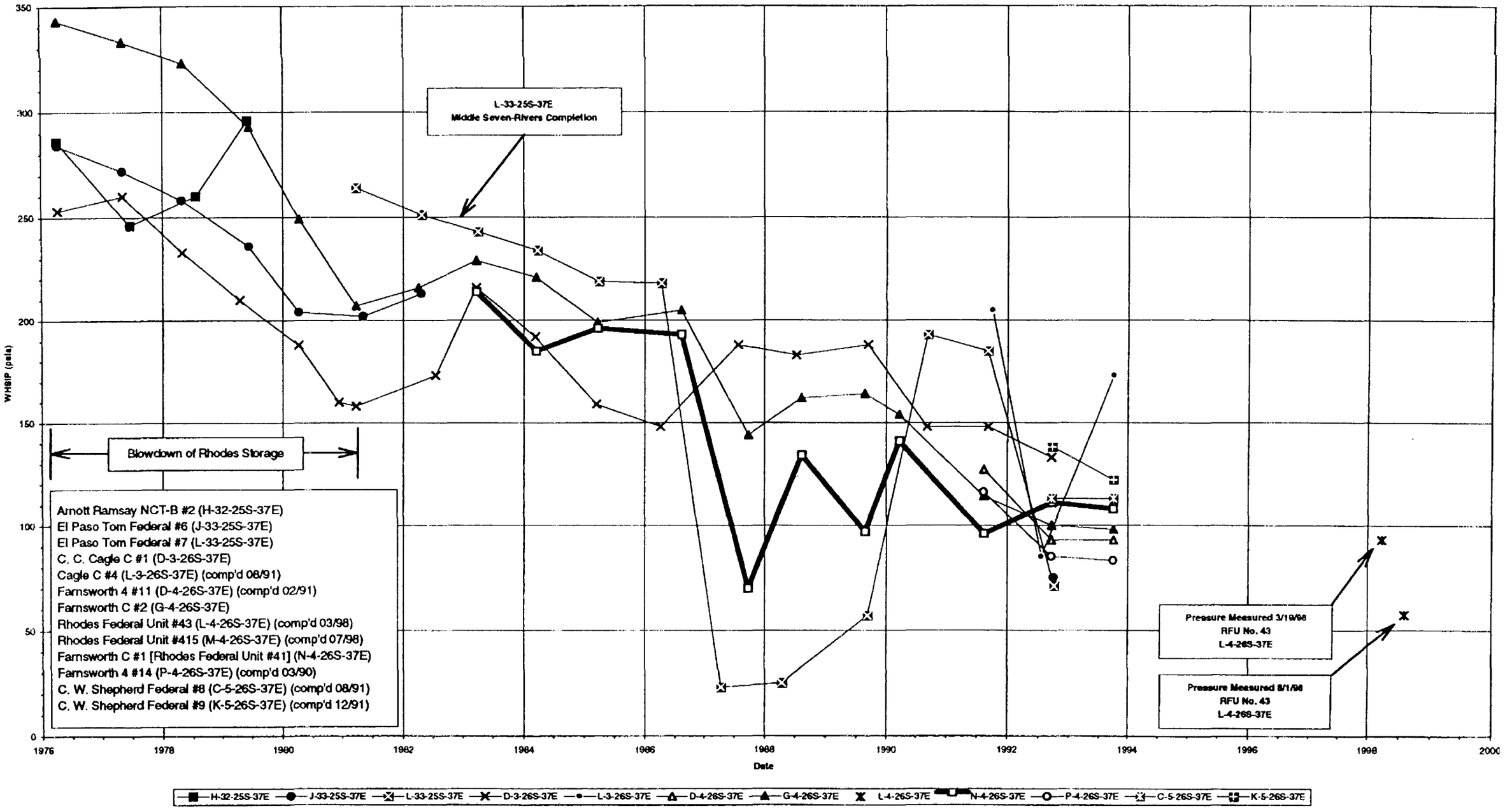


03/98: 6.755 BCF

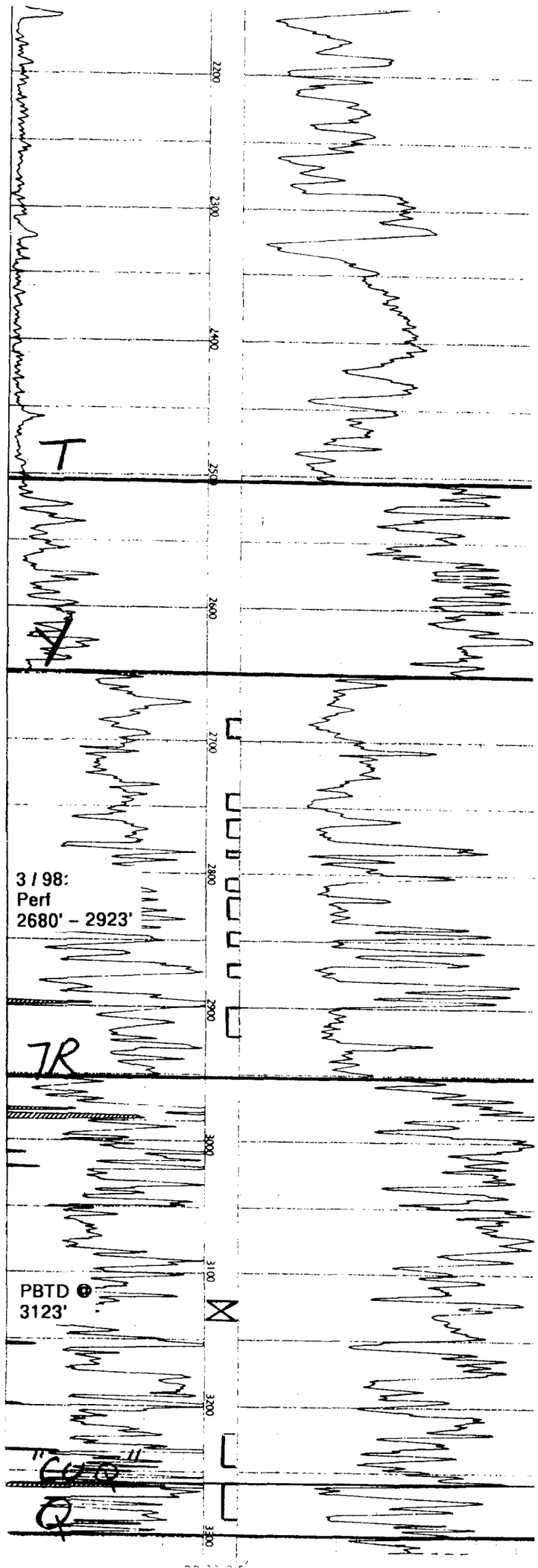
Pressure-Time Plot (1/1/29 to 12/31/45)
Farnsworth "C" No. 1 and Nearby Wells
Rhodes Yates-Seven Rivers Gas Pool
Secs. 4, 5 & 9, T-26-S, R-37-E



Pressure-Time Plot (1/1/76 to 12/31/99)
Jalmat & Rhodes Gas Pools
Secs. 32 & 33, T-25-S, R-37-E; Secs. 3, 4, & 5, T-26-S, R-37-E



RFU # 43
(Farnsworth "4" # 5)
L-4-26S-37E



COMPANY Gruy Petroleum Management Company
(R. Olsen)
WELL RFU No.43
(Farnsworth "4" No. 5)
FIELD Langlie Mattix/Rhodes (Gas)
LOCATION 2310' FSL & 990' FWL (L)
Sec. 4, T-26-S, R-37-E
COUNTY Lea
STATE New Mexico
ELEVATIONS: KB
DF 2997'
GL 2986'
(Recompleted to Rhodes (Gas) 3/98)

COMPLETION RECORD

SPUD DATE 3-18-58 COMP. DATE 4-20-58
TD 3312' PBTD 3308'
CASING RECORD:
9 5/8" @ 300' w/300 sx (TOC @)
7" @ 3309' w/500 sx (TOC @)
(TOC @)
(TOC @)
COMP. INTERVAL Perfs: 3260'- 3288'
(Langlie Mattix)
STIMULATION SOF/10,000 + 10,000

POT IPP = 50 BOPD + 50 BWPD
GOR GR 33.2
TP CP
CHOKE TUBING 2 3/8" @ 3250'
REMARKS
10-22-82: Perf 3220' - 3248'. A/3200.
IPP = 1 BOPD + 158 BWPD.
1983: TA'd.

03-05-98/ Tagged CIBP @ 3150'. Perf 2680'-2923' w/114
03-11-98: holes. Dumped 2 sx cmt. PBTD @ 3130'. A/2200
(8 stages). SF/54,431 + 77,200. ATR = 50.5 BPM.
ATP = 740 psi. ISIP = 499 psi. PBTD @ 3123'.
Landed 2 ⅜" tbg @ 2915'. Flow tested well.

03-12-98: Shut-in. WO Pipeline Connection.

03-13-98: Placed on production. CK = 30/64.
F/184 MCFPD. FTP = 52 psi. FCP = 52 psi.

03-16-98: Took gas sample. FTP = 21 psi. 13.9% CO_2.

03-19-98: 71-hr SIBHP = 85 psi.

05-29-98: 24-hr well test. F/240 MCFPD. FTP = 18 psi.

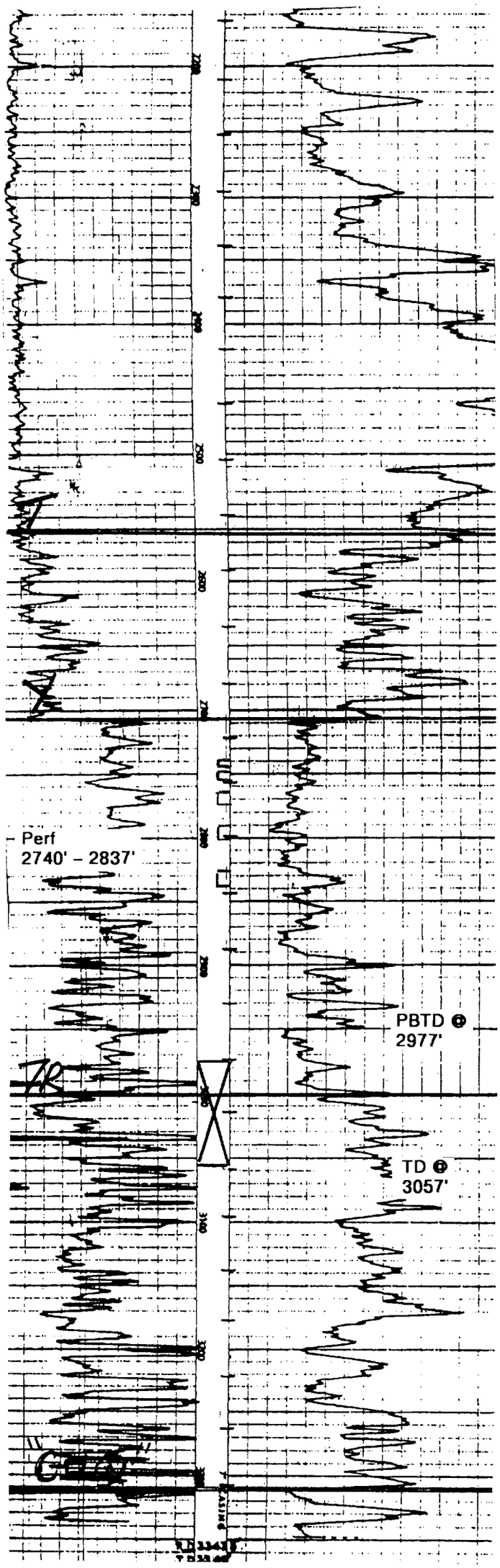
07-13-98: F/168 MCFPD (riding line).

07-14-98: Filed 3160-5 reporting Rhodes completion.

08-19-98: F/143 MCFPD (riding line). FTP = 18 psi.

08-26-98: Well shut in.

RFU # 415
M-4-26S-37E



Note:
Log from Farnsworth "4" # 6
(M-4-26S-37E)

COMPANY Gruy Petroleum Management Company

WELL RFU No. 415

FIELD Rhodes Gas Pool

LOCATION 660' FSL & 660' FWL (M)
Sec. 4, T-26-S, R-37-E

COUNTY Lea

STATE New Mexico

ELEVATIONS: KB *
DF
GL 2984'

COMPLETION RECORD

SPUD DATE 6-16-98 COMP. DATE 07-25-98

TD 3057' PBTD 2977'

CASING RECORD:

8 5/8" @ 771' w/475 (TOC @ Circ)

5 ½" @ 3005' w/850 (TOC @ Circ)

(DV Tool @ 2618') (TOC @)

(TOC @)

COMP. INTERVAL Perfs: 2740'- 2837'
(39 net feet)

STIMULATION A/200
SF/190,000 sd

POT F/260 MCFPD (08-20-98)

GOR GR

TP CP

CHOKE TUBING @

REMARKS

06-20-98: Well drilled without fluid loss control. Lost circulation at 3057'. Spotted 25 sx. PBTD @ 3005'. Ran 5 ½", 15.5# casing. Did not run open-hole logs.

06-24-98: Ran cased-hole log. Ran tbg. Shut down. Moved off.

07-23-98: SF/190,000. ATR = 21 BPM. ATP = 660 psi. 30-min SIP = 720 psi.

07-24-98: F/124 MCFPD. FTP = 40 psi.

08-20-98: F/260 MCFPD (Riding Line). FTP = 14 psi. FCP = 35 psi.

08-26-98: F/266 MCFPD (Riding Line). FTP = 12 psi. FCP = 35 psi.

* KB not available. Form 3160-4 not filed with BLM as of 8/26/98.

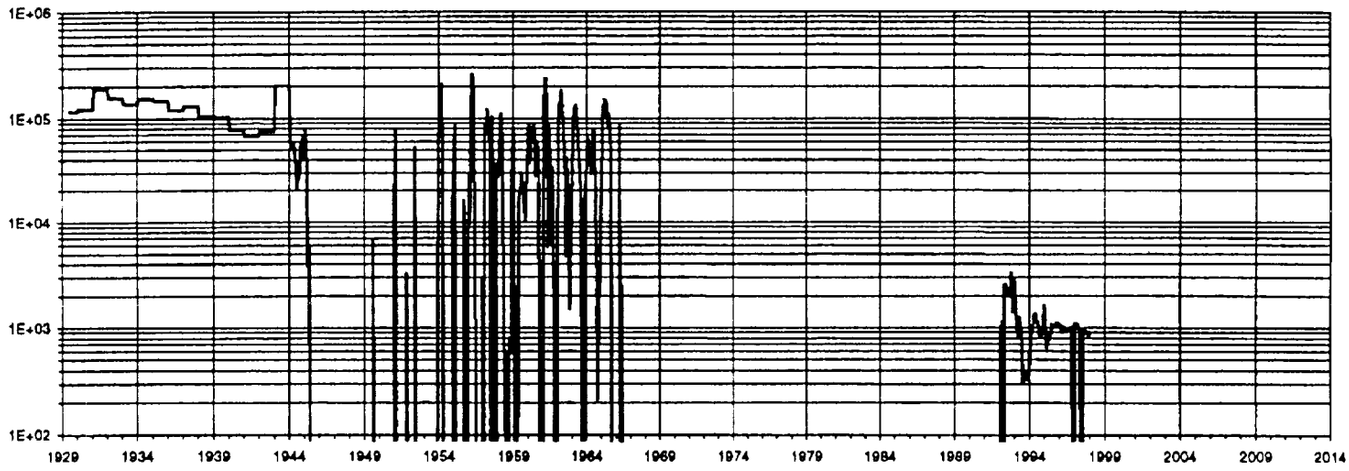
Cagle A #1

Rhodes (Yates-Seven-Rivers) Gas Pool

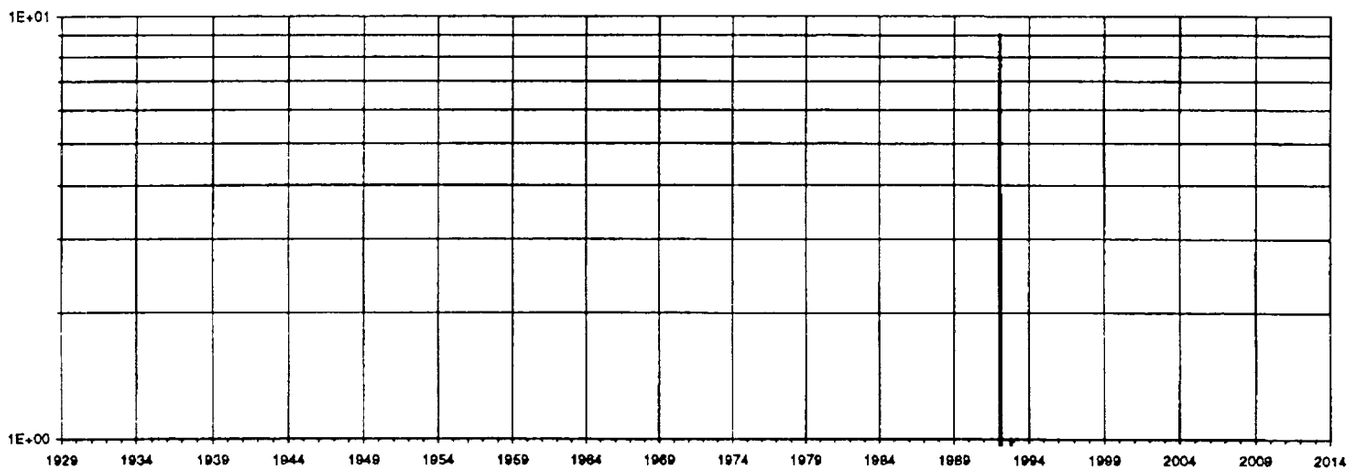
K-9-26S-37E

Gruy Petroleum Management Co.

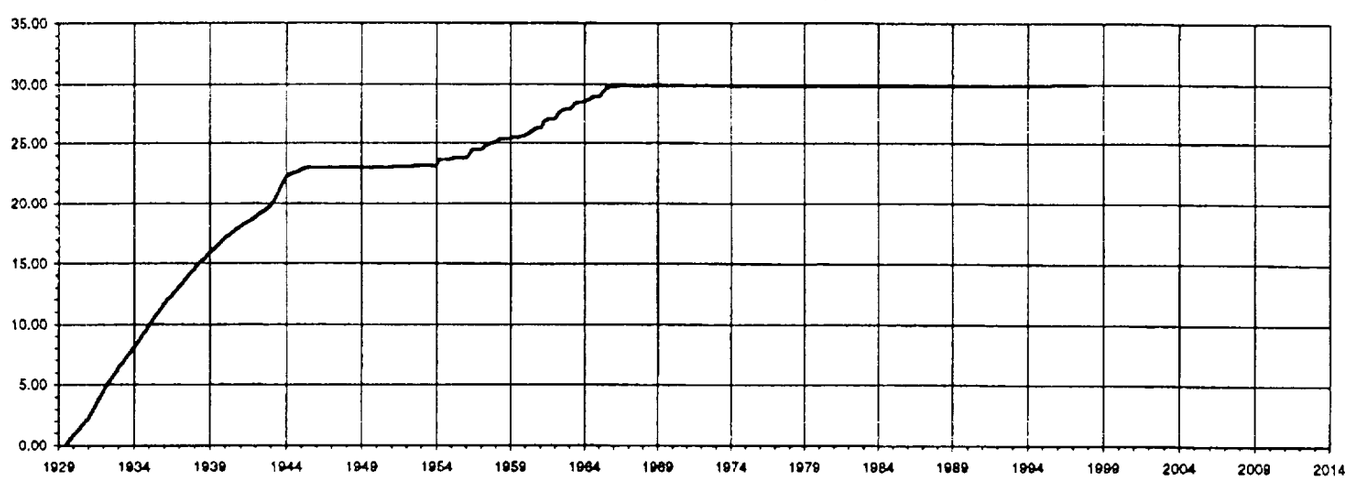
Gas Production (MCFPM)



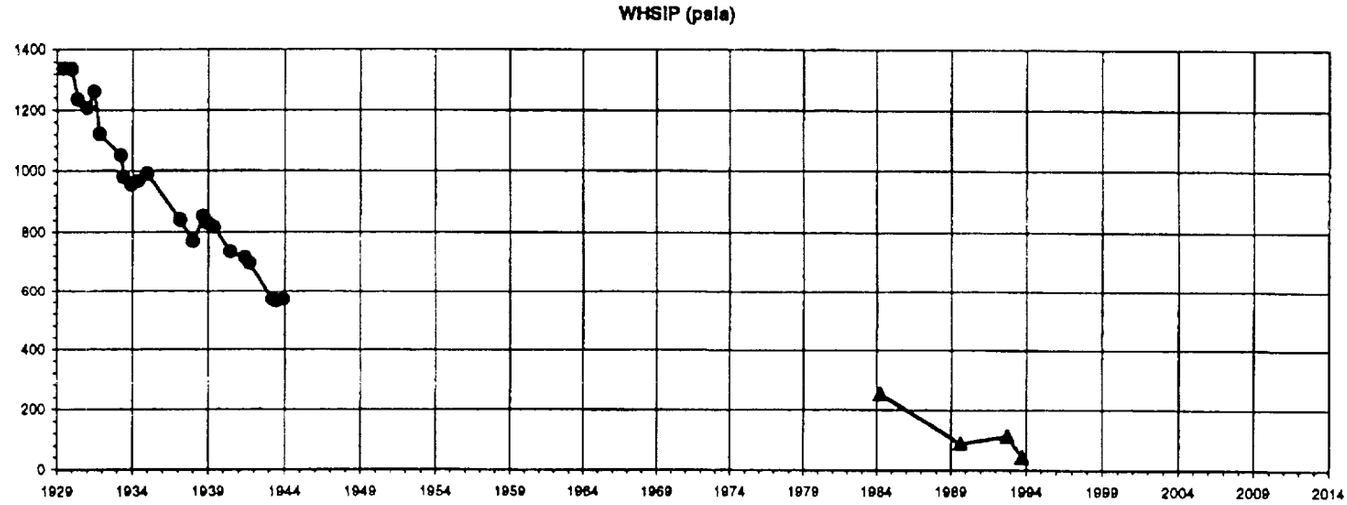
Water Production (BPM)



Cumulative Gas Production (BCF)

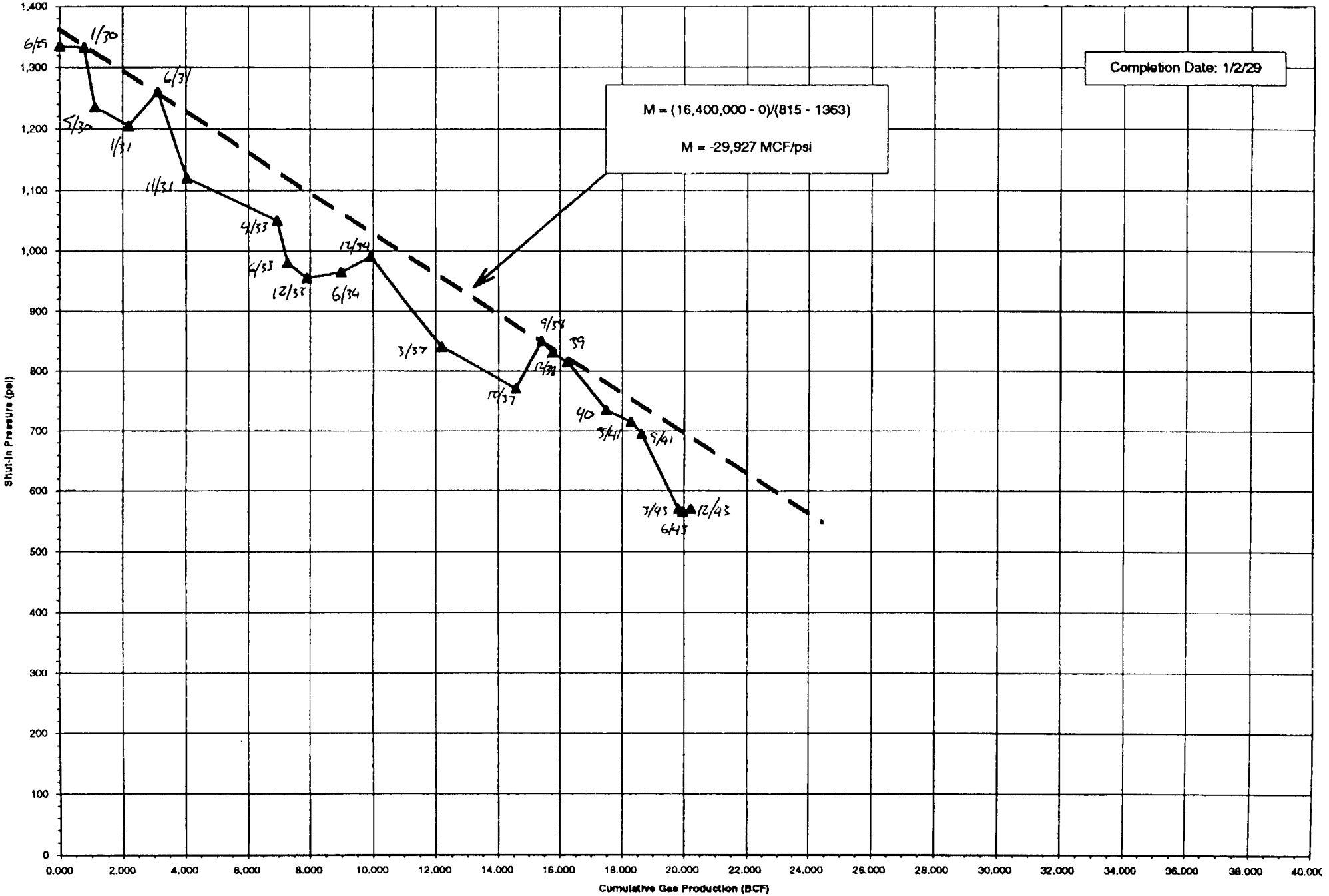


WHSIP (psia)



12/97: 29.939 BCF

Cagle A No. 1
Rhodes (Yates-Seven Rivers) Gas Pool
K-09-26S-37E
Texas Company

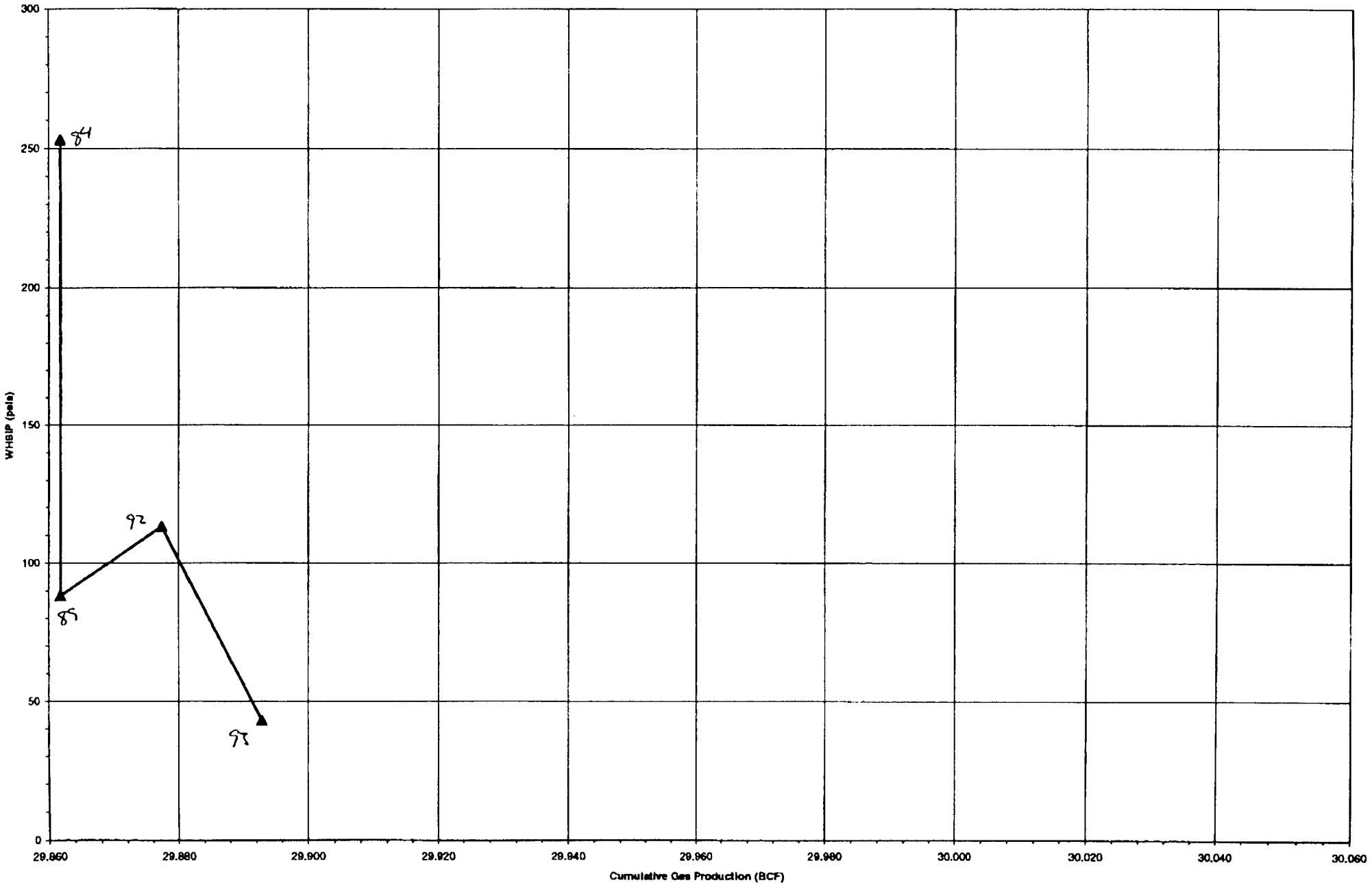


Cagle A #1

Rhodes (Yates-Seven-Rivers) Gas Pool

K-9-26S-37E

Gruy Petroleum Management Co.



10/93: 29.893 BCF

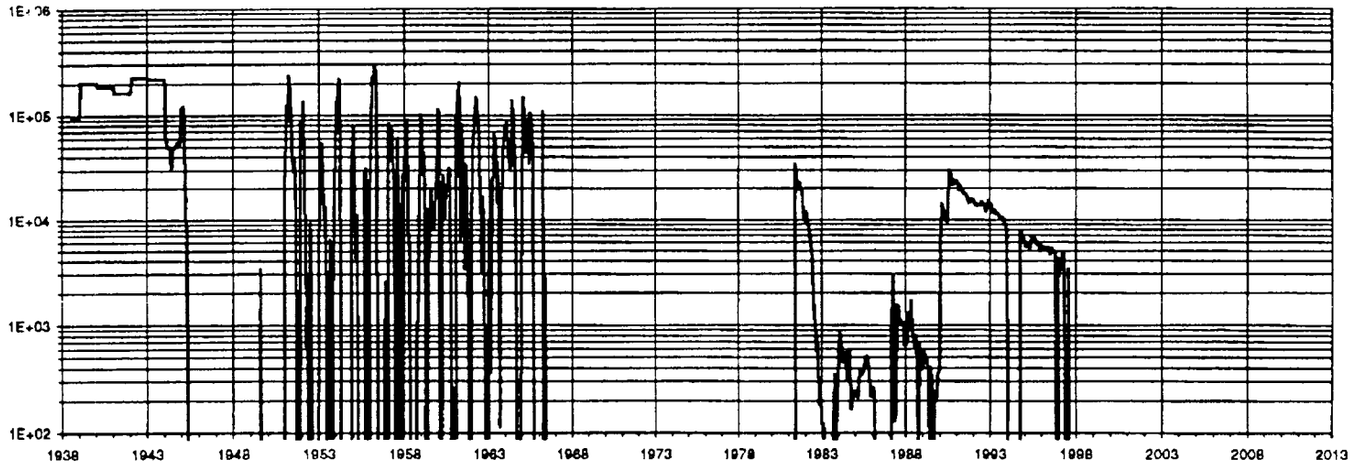
Cagle A #2

Rhodes (Yates-Seven-Rivers) Gas Pool

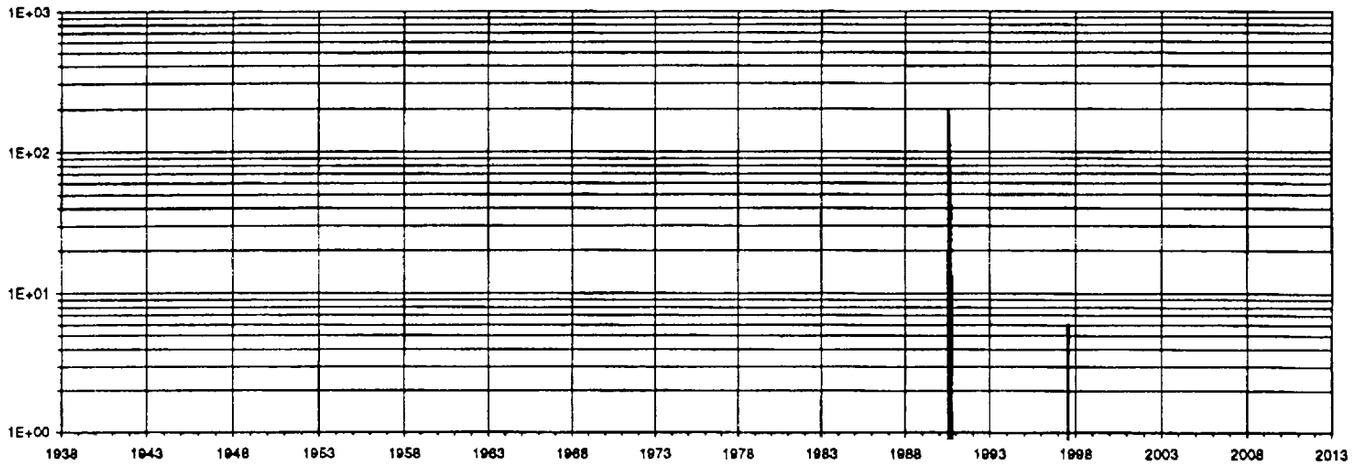
C-9-26S-37E

Gruy Petroleum Management Co.

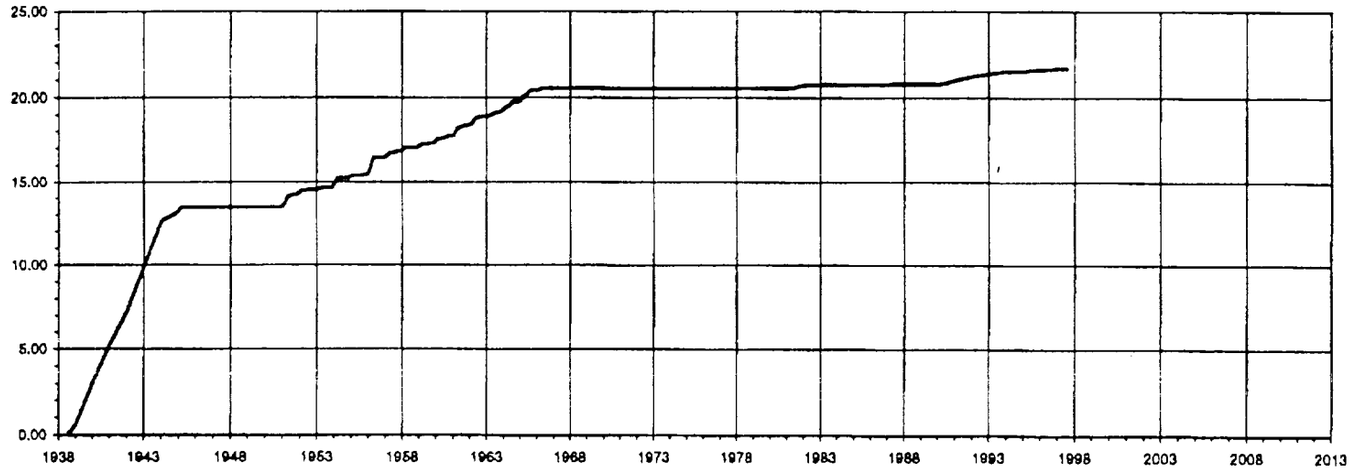
Gas Production (MCFPM)



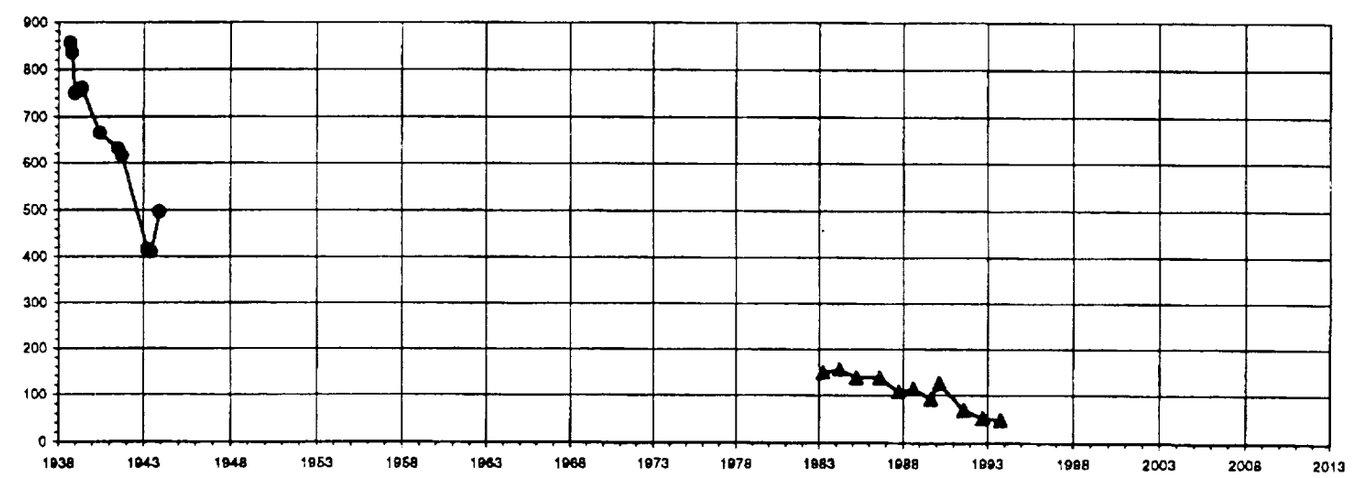
Water Production (BPM)



Cumulative Gas Production (BCF)

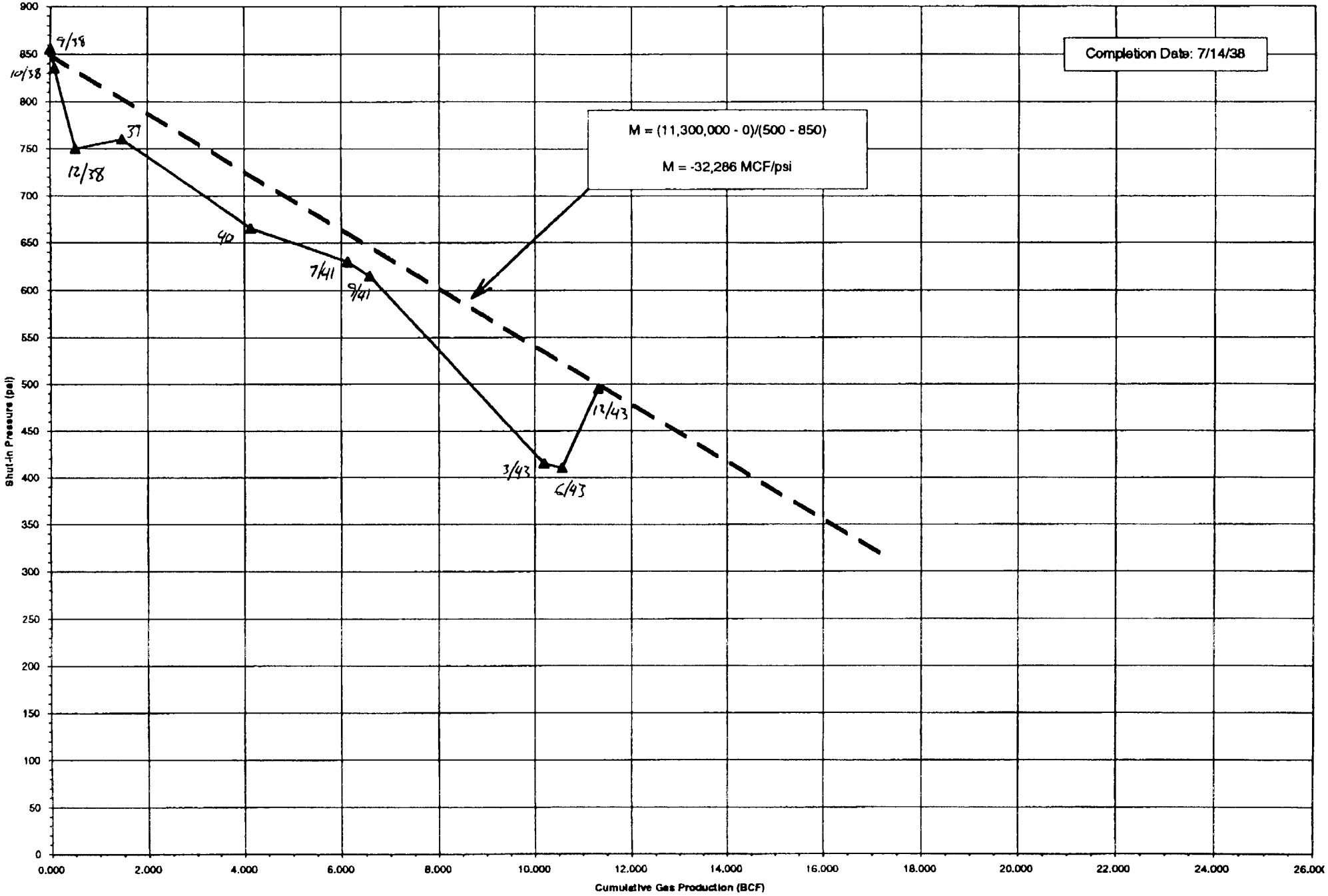


WHSIP (psia)



07/97: 21.869 BCF

Cagle A No. 2
Rhodes (Yates-Seven Rivers) Gas Pool
C-09-26S-37E
Texas Company

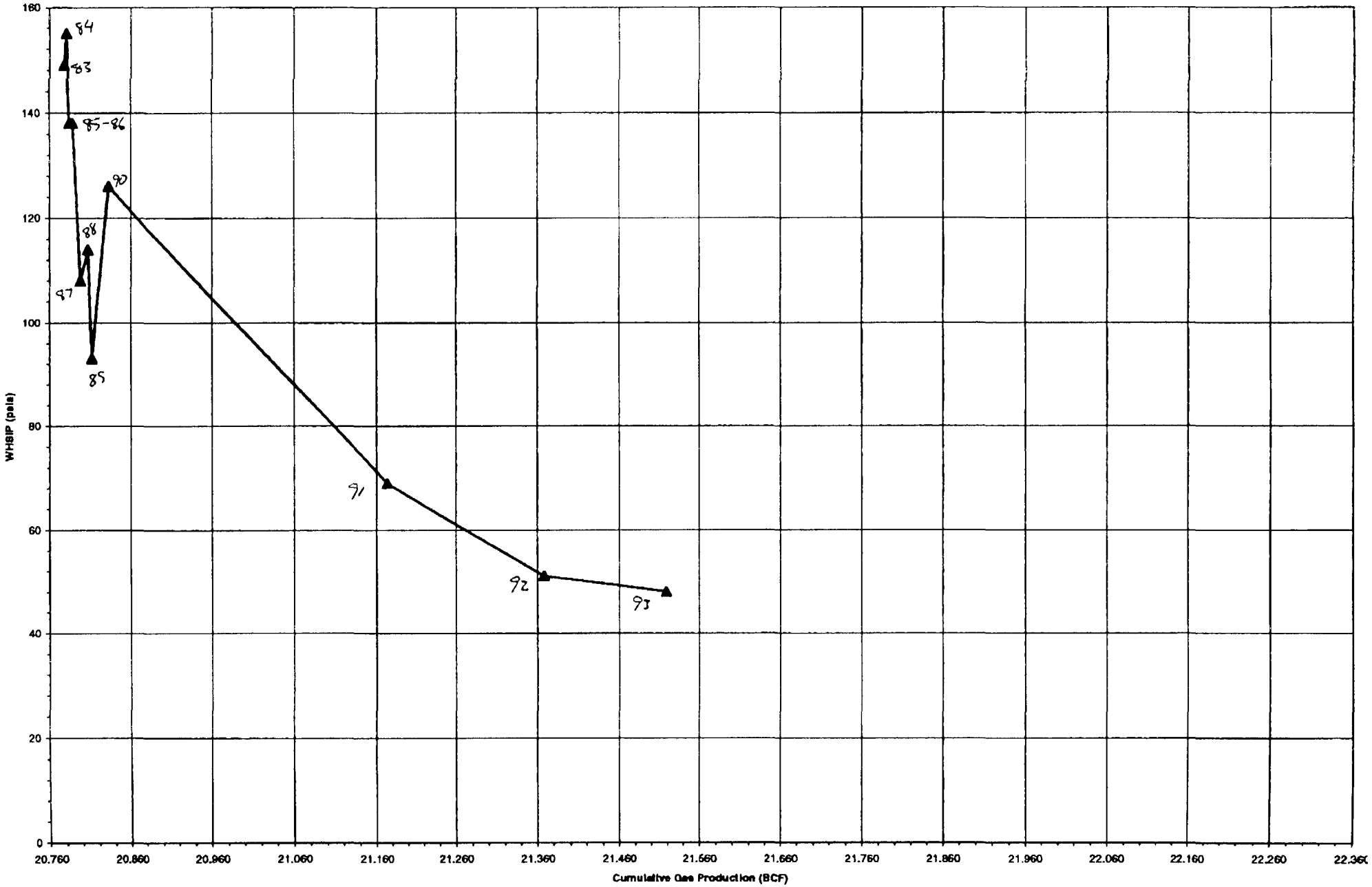


Cagle A #2

Rhodes (Yates-Seven-Rivers) Gas Pool

C-9-26S-37E

Gruy Petroleum Management Co.



10/93: 21.518 BCF

OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 34
CASE NOS. 12015 & 12017

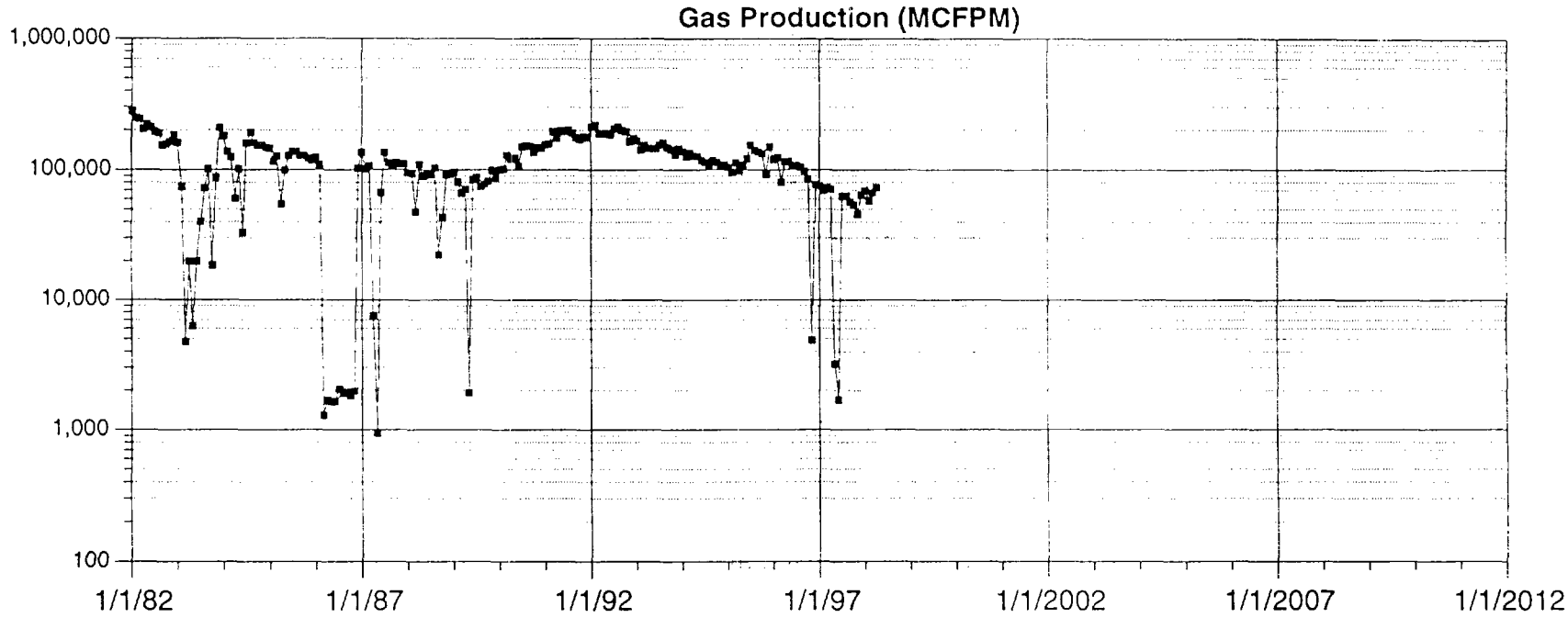
SUMMARY as of 4/98

RHODES (GAS) POOL

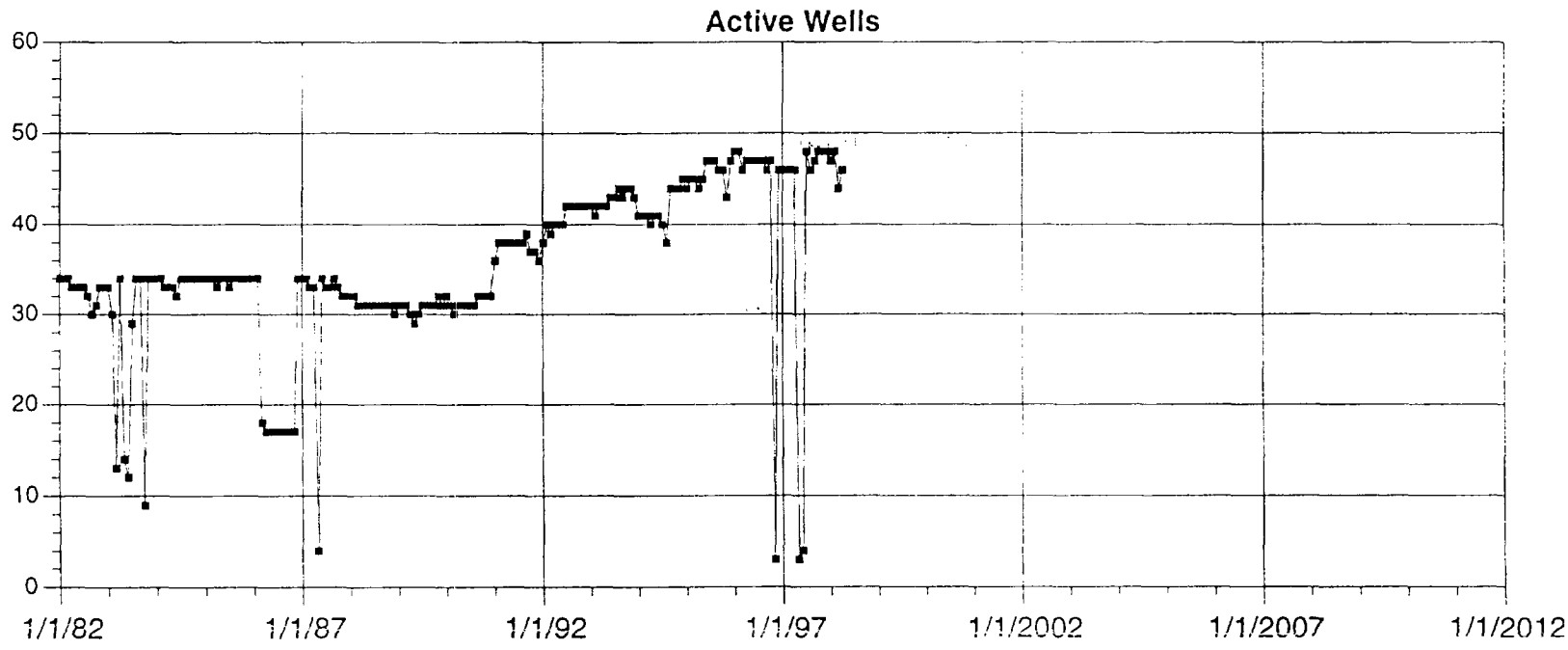
T-26S R-37E

LEA COUNTY, NM

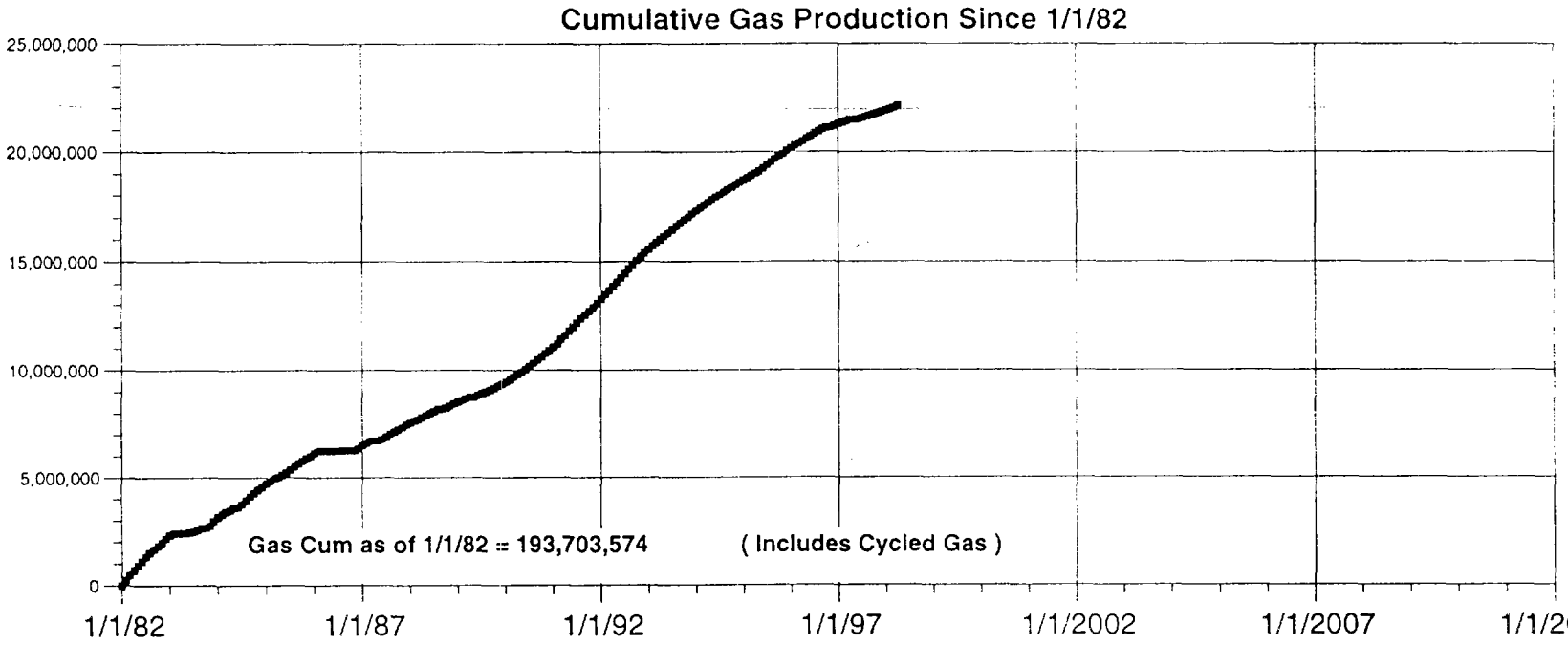
Gas Production (MCFPM)



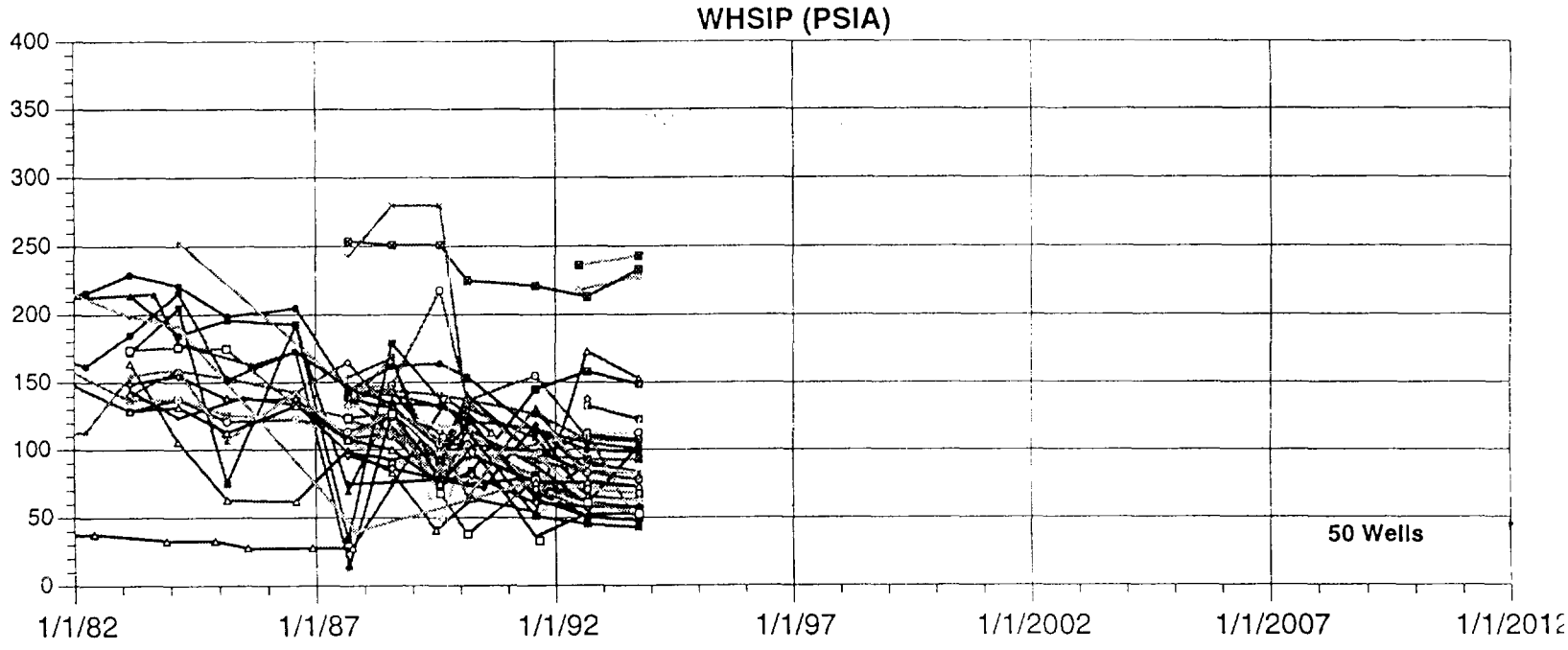
Active Wells



Cumulative Gas Production Since 1/1/82



WHSIP (PSIA)

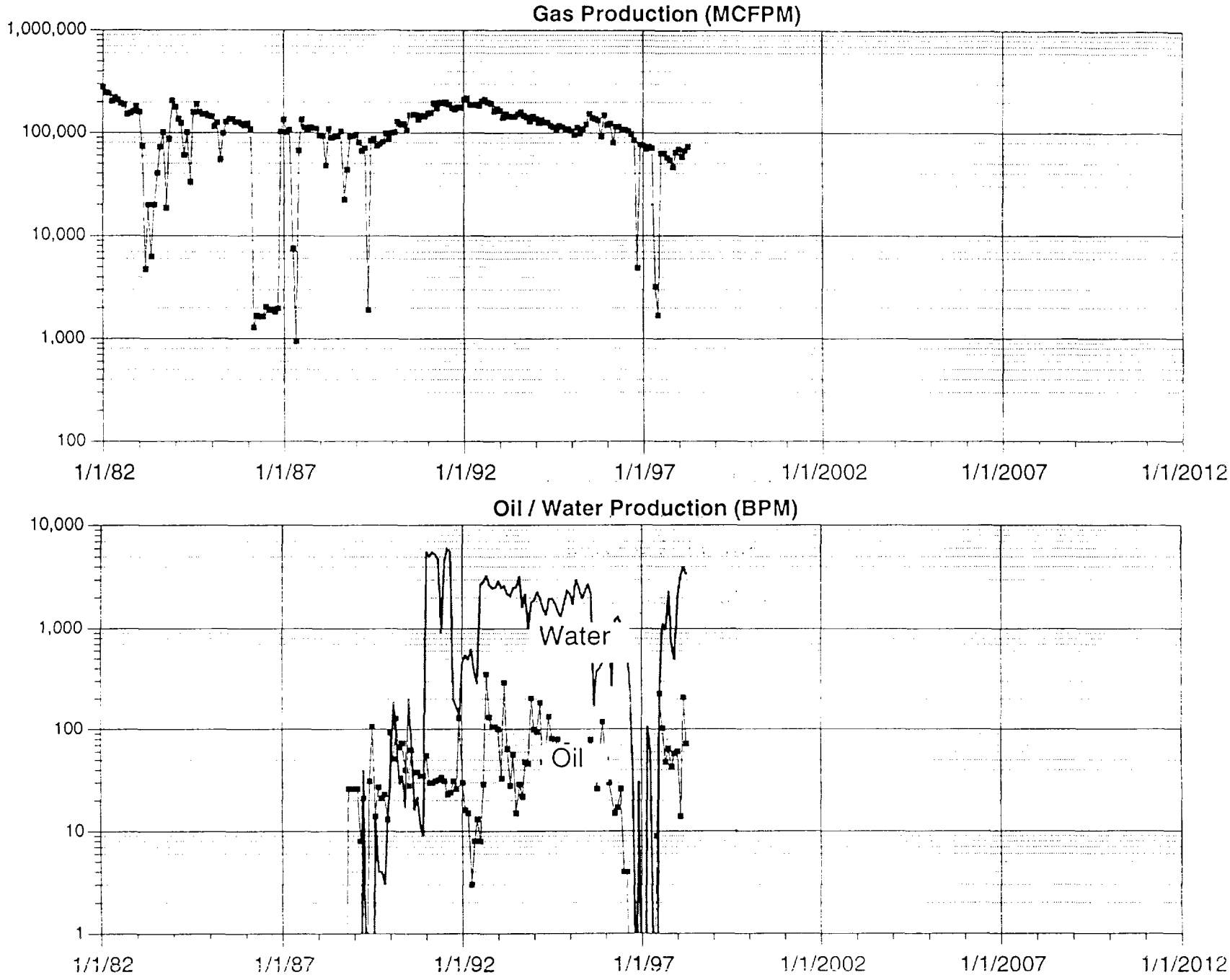


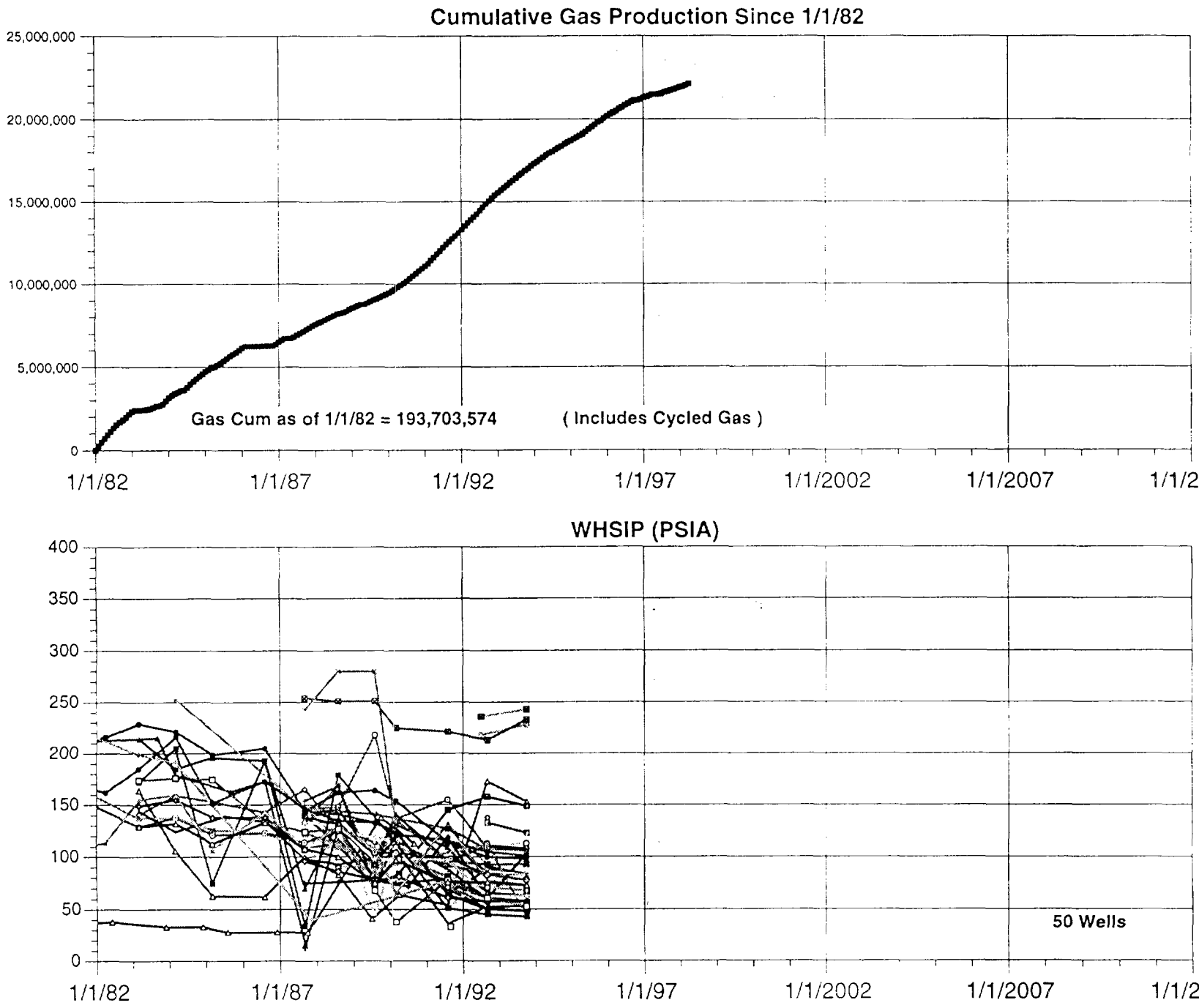
SUMMARY as of 4/98

RHODES (GAS) POOL

T-26S R-37E

LEA COUNTY, NM

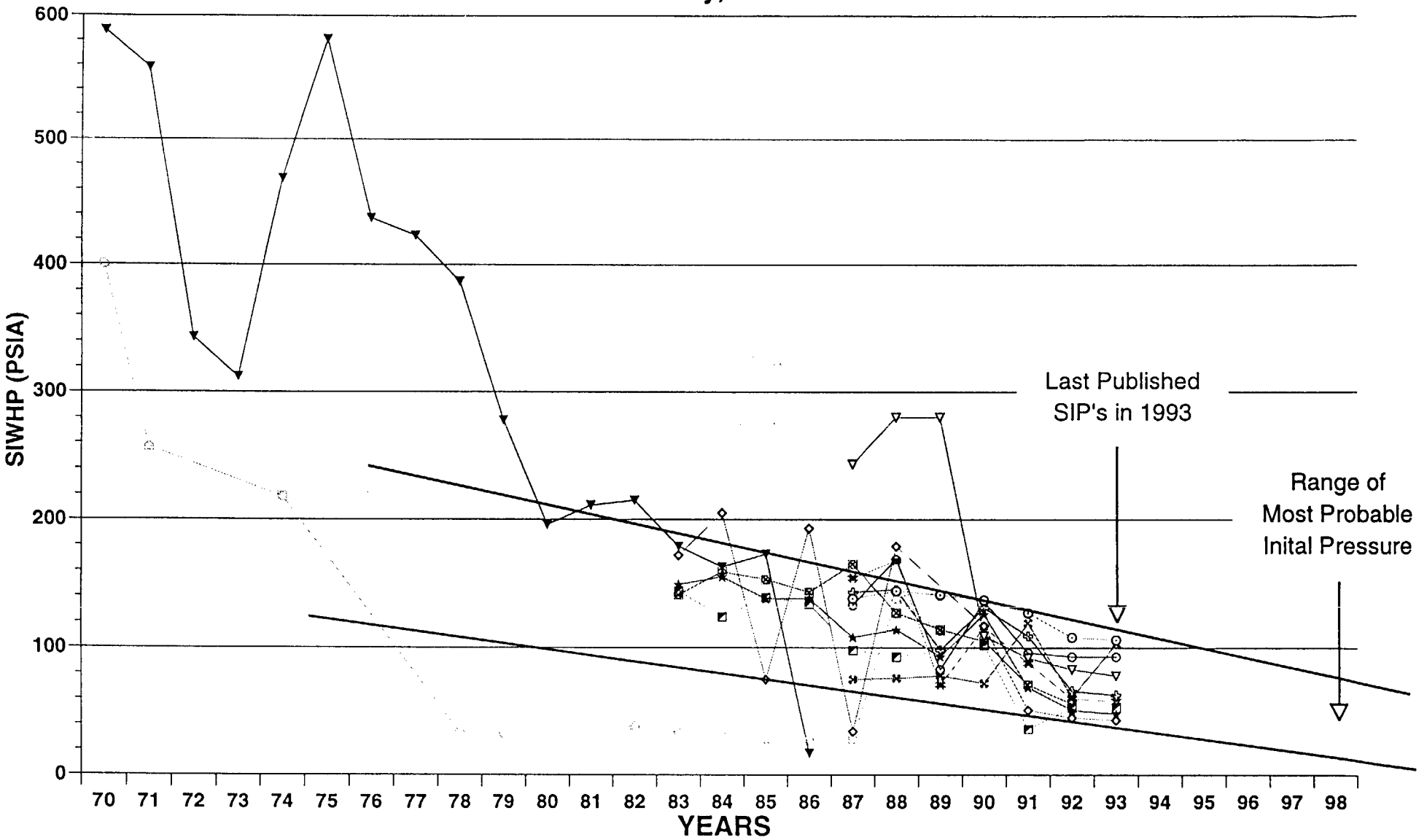




Rhodes (Yates - U7R) Pool

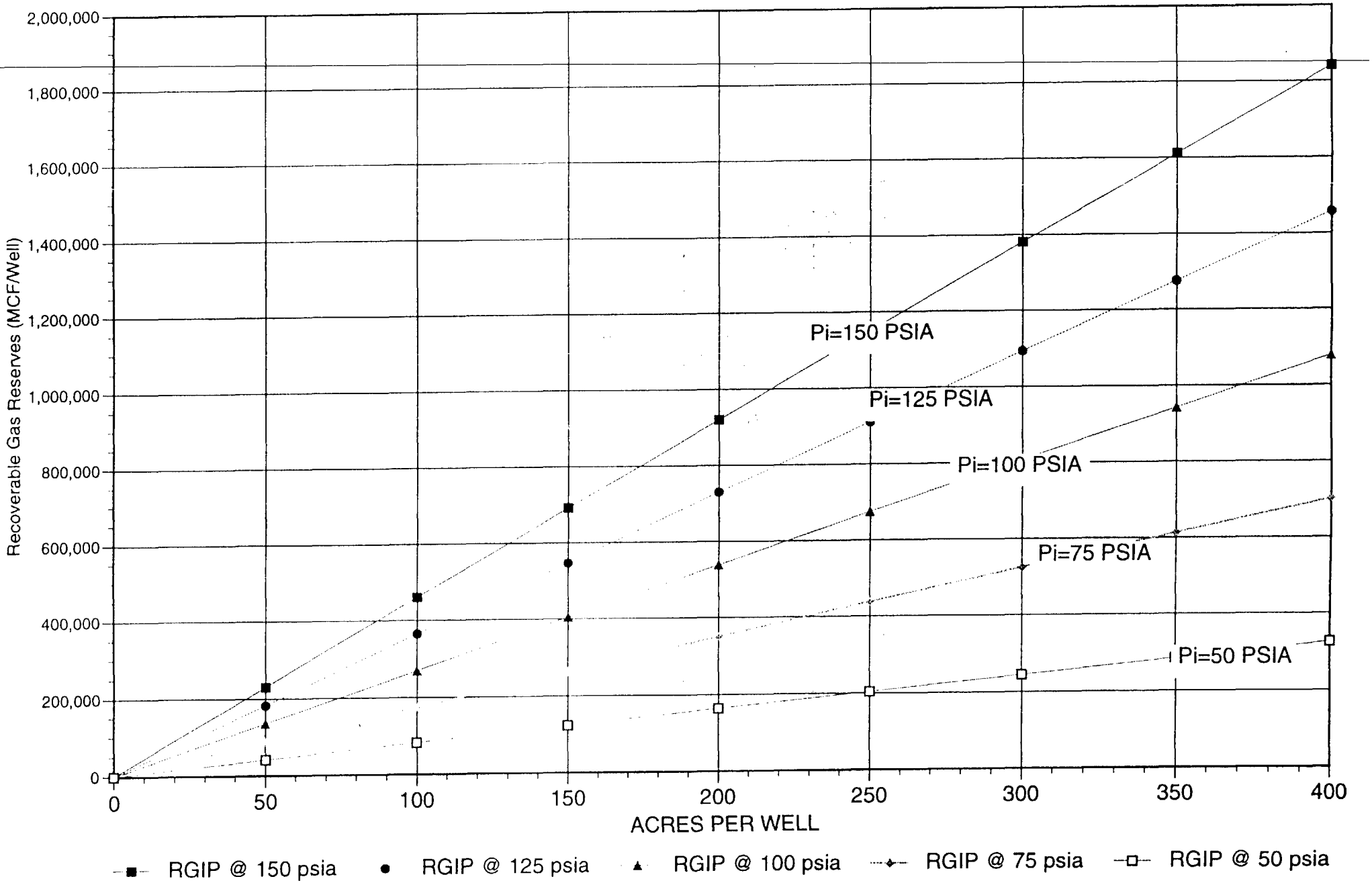
Composite Pressure - Time Plot

Secs. 9,10,14,15,16, T-26-S, R-37-E
Lea County, New Mexico



OIL CONSERVATION DIVISION
HARTMAN EXHIBIT NO. 35
CASE NOS. 12015 & 12017

RECOVERABLE GAS RESERVES FOR Rw = 0.03, Pa = 28 psia (15 psig) AND A TYPICAL RHODES (YATES-U7R) PAY SECTION T-26-S, R-37-E LEA COUNTY, NM



--GASVOL--
RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.03)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.976	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.225		pro =	0.0424	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0609
INITIAL PRESSURE	150 psia		Zi =	0.9760		f(pr)' =	1.4007	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15 psig)		Za =	0.9955		pro' =	0.0424	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	34.40 %					Z	BGI	G			
POROSITY	21.61 %				150	0.9760	0.1003	901394			
					28	0.9955	0.5479	164968			
GAS IN PLACE	901,394 MCF										
RECOVERABLE GAS	736,426 MCF		MCF/AC-FT	50.30							
RECOVERY	81.70%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--

RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.03)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.980	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.188		pro =	0.0352	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0507
INITIAL PRESSURE	125 psia		Zi =	0.9800		f(pr)' =	1.4122	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15 psig)		Za =	0.9955		pro' =	0.0352	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	34.40 %						Z	BGI	G		
POROSITY	21.61 %					125	0.9800	0.1208	748105		
						28	0.9955	0.5479	164968		
GAS IN PLACE	748,105 MCF										
RECOVERABLE GAS	583,137 MCF		MCF/AC-FT	39.83							
RECOVERY	77.95%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--
RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.03)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.984	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.150		pro =	0.0280	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0406
INITIAL PRESSURE	100 psia		Zi =	0.9840		f(pr)' =	1.4237	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15psig)		Za =	0.9955		pro' =	0.0280	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	34.40 %					Z	BGI	G			
POROSITY	21.61 %				100	0.9840	0.1516	596057			
GAS IN PLACE	596,057 MCF				28	0.9955	0.5479	164968			
RECOVERABLE GAS	431,089 MCF		MCF/AC-FT	29.45							
RECOVERY	72.32%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--
RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.03)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.988	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.113		pro =	0.0210	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0304
INITIAL PRESSURE	75 psia		Zi =	0.9880		f(pr)' =	1.4353	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15 psig)		Za =	0.9955		pro' =	0.0210	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	34.40 %					Z	BGI	G			
POROSITY	21.61 %				75	0.9880	0.2030	445237			
GAS IN PLACE	445,237 MCF				28	0.9955	0.5479	164968			
RECOVERABLE GAS	280,268 MCF		MCF/AC-FT	19.14							
RECOVERY	62.95%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--

RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.03)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.992	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pr =	0.075		pro =	0.0139	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0203
INITIAL PRESSURE	50 psia		Zi =	0.9920		f(pr)' =	1.4469	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15 psig)		Za =	0.9955		pro' =	0.0139	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	34.40 %					Z	BGI	G			
POROSITY	21.61 %				50	0.9920	0.3058	295630			
					28	0.9955	0.5479	164968			
GAS IN PLACE	295,630 MCF										
RECOVERABLE GAS	130,662 MCF		MCF/AC-FT	8.92							
RECOVERY	44.20%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

Laboratory Services
1331 Tasker Drive
Hobbs, New Mexico 88240

Telephone: (505) 397-3713

FOR: Pro Well Testing & Wireline
Attention: Mr. Leonard Abney
P. O. Box 791
Hobbs, New Mexico 88240

SAMPLE IDENTIFICATION: Gas Separator C.C. Cagle #1
COMPANY: Meridian Oil Co.
LEASE:
PLANT:

SAMPLE DATA: DATE SAMPLED: 9-30-91 3:15 PM GAS (XX) LIQUID ( )
ANALYSIS DATE: 10-01-91 SAMPLED BY: Abney-Pro Well
PRESSURE - PSIG 60.00 ANALYSIS BY: Vickie Walker
SAMPLE TEMP. °F
ATMOS. TEMP. °F 70.00

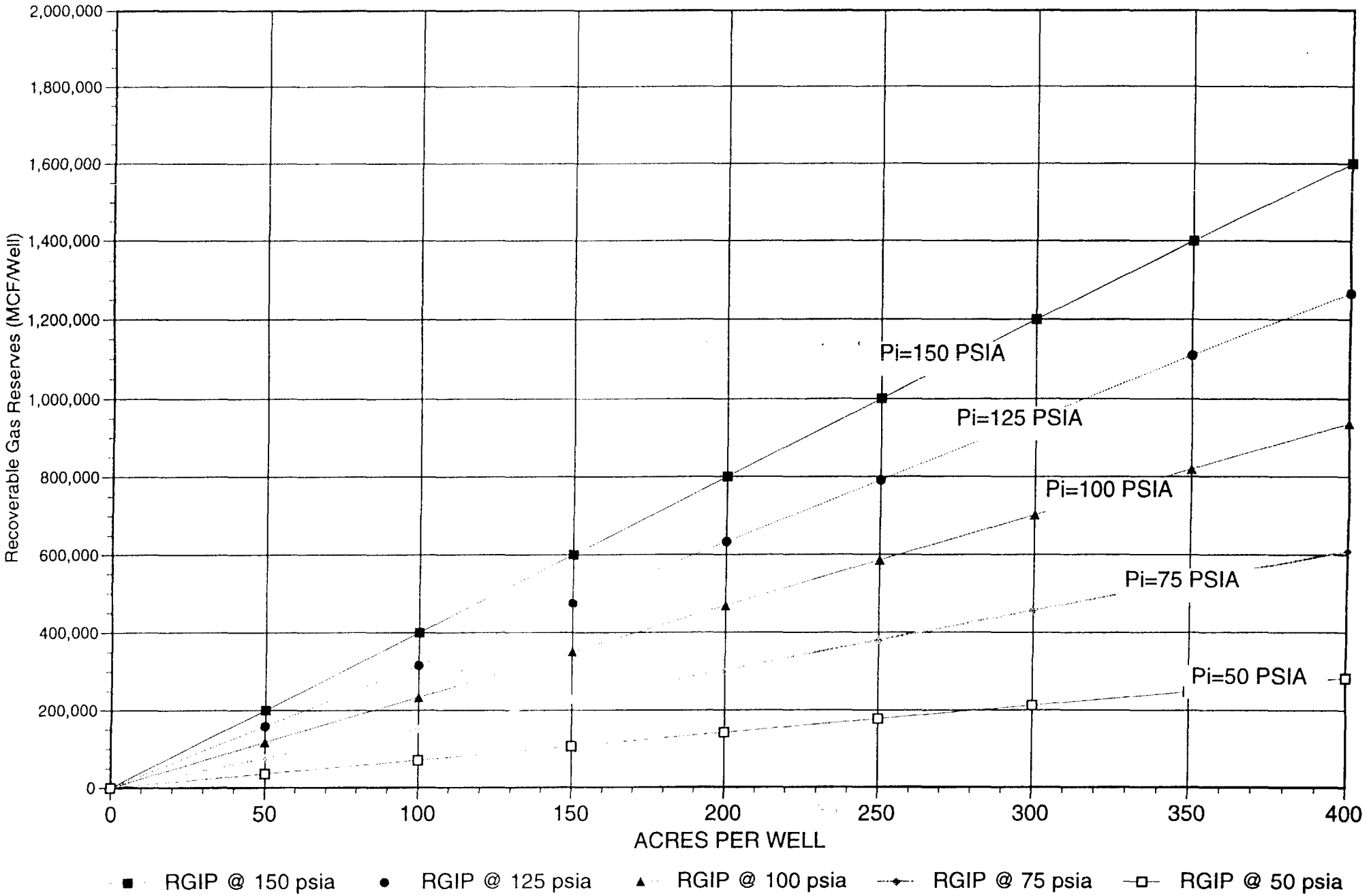
REMARKS:

COMPONENT ANALYSIS

COMPONENT		MOL PERCENT	GPM
Oxygen	(O2)		
Hydrogen Sulfide	(H2S)		
Nitrogen	(N2)	1.55	
Carbon Dioxide	(CO2)	1.32	
Methane	(C1)	84.91	
Ethane	(C2)	6.41	1.711
Propane	(C3)	3.28	0.902
I-Butane	(IC4)	0.56	0.184
N-Butane	(NC4)	1.03	0.323
I-Pentane	(IC5)	0.44	0.162
N-Pentane	(NC5)	0.19	0.069
Hexane	(C6)	0.31	0.127
Heptanes Plus	(C7+)	0.00	0.000
		100.00	3.478

BTU/CU.FT. - DRY	1145	MOLECULAR WT	19.6585
AT 14.650 DRY	1142		
AT 14.650 WET	1122	26# GASOLINE -	0.466
AT 15.025 DRY	1171		
AT 15.025 WET	1151		
SPECIFIC GRAVITY -			
CALCULATED	0.679		
MEASURED	0.000		

RECOVERABLE GAS RESERVES FOR Rw = 0.05, Pa = 28 psia (15 psig)
AND A TYPICAL RHODES (YATES-U7R) PAY SECTION
T-26-S, R-37-E
LEA COUNTY, NM



--GASVOL--
RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.05)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.976	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.225		pro =	0.0424	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0609
INITIAL PRESSURE	150 psia		Zi =	0.9760		f(pr)' =	1.4007	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15 psig)		Za =	0.9955		pro' =	0.0424	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	43.00 %					Z	BGI	G			
POROSITY	21.61 %				150	0.9760	0.1003	783224			
					28	0.9955	0.5479	143341			
GAS IN PLACE	783,224 MCF										
RECOVERABLE GAS	639,882 MCF		MCF/AC-FT	43.71							
RECOVERY	81.70%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--
RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.05)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.980	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.188		pro =	0.0352	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0507
INITIAL PRESSURE	125 psia		Zi =	0.9800		f(pr)' =	1.4122	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (<15 psig)		Za =	0.9955		pro' =	0.0352	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	43.00 %					Z	BGI	G			
POROSITY	21.61 %				125	0.9800	0.1208	650030			
					28	0.9955	0.5479	143341			
GAS IN PLACE	650,030 MCF										
RECOVERABLE GAS	506,689 MCF		MCF/AC-FT	34.61							
RECOVERY	77.95%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--
RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.05)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.984	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.150		pro =	0.0280	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0406
INITIAL PRESSURE	100 psia		Zi =	0.9840		f(pr)' =	1.4237	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15psig)		Za =	0.9955		pro' =	0.0280	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	43.00 %					Z	BGI	G			
POROSITY	21.61 %				100	0.9840	0.1516	517916			
GAS IN PLACE	517,916 MCF				28	0.9955	0.5479	143341			
RECOVERABLE GAS	374,574 MCF		MCF/AC-FT	25.59							
RECOVERY	72.32%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--

RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.05)			21-Jul-98							
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
GAS GRAVITY	0.68		Pc =	669.49		Tchc =	374.36			B =	0.1747
% N2	1.55 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% CO2	1.32 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
% H2S	0.00 %		Tr =	1.470		Z =	0.988	Z =	0.996	E =	0.3153
CONDENSATE (YES=1)	1		Pri =	0.113		pro =	0.0210	pro =	0.0078	F =	0.6845
RES. TEMPERATURE	86 'F		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0304
INITIAL PRESSURE	75 psia		Zi =	0.9880		f(pr)' =	1.4353	f(pr)' =	1.4572	Ga =	0.0114
ABANDONMENT PRES	28 psia (15 psig)		Za =	0.9955		pro' =	0.0210	pro' =	0.0078		
NET PAY	91.5 feet										
ACRES	160 acres										
WATER SAT	43.00 %					Z	BGI	G			
POROSITY	21.61 %				75	0.9880	0.2030	386867			
					28	0.9955	0.5479	143341			
GAS IN PLACE	386,867 MCF										
RECOVERABLE GAS	243,526 MCF		MCF/AC-FT	16.63							
RECOVERY	62.95%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

--GASVOL--

RECOVERABLE GAS RESERVES PROGRAM

WELL NAME:	C. T. Bates # 3 (Rw = 0.05)										
FIELD NAME:	Rhodes (Yates-Upr 7 Rvr) Interval			21-Jul-98							
GAS GRAVITY	0.68		Tc =	374.36		GAS Ghc =	0.66			A =	0.0642
% N2	1.55 %		Pc =	669.49		Tchc =	374.36			B =	0.1747
% CO2	1.32 %		Tc' =	372.04		Pchc =	666.85			C =	-0.8509
% H2S	0.00 %		Pc' =	665.33		CWA =	2.32			D =	1.4703
CONDENSATE (YES=1)	1		Tr =	1.470		Z =	0.992	Z =	0.996	E =	0.3153
RES. TEMPERATURE	86 'F		Pri =	0.075		pro =	0.0139	pro =	0.0078	F =	0.6845
INITIAL PRESSURE	50 psia		Pra =	0.042		f(pr) =	0.0000	f(pr) =	0.0000	Gi =	0.0203
ABANDONMENT PRES	28 psia (15psig)		Zi =	0.9920		f(pr)' =	1.4469	f(pr)' =	1.4572	Ga =	0.0114
NET PAY	91.5 feet		Za =	0.9955		pro' =	0.0139	pro' =	0.0078		
ACRES	160 acres										
WATER SAT	43.00 %						Z	BGI	G		
POROSITY	21.61 %										
					50		0.9920	0.3058	256873		
GAS IN PLACE	256,873 MCF				28		0.9955	0.5479	143341		
RECOVERABLE GAS	113,532 MCF		MCF/AC-FT	7.75							
RECOVERY	44.20%										

INSTRUCTIONS:

1) Input values in underlined cells

2) Press [Command] [=] to calculate

Laboratory Services
1331 Tasker Drive
Hobbs, New Mexico 88240

Telephone: (505) 397-3713

FOR: Pro Well Testing & Wireline
Attention: Mr. Leonard Abney
P. O. Box 791
Hobbs, New Mexico 88240

SAMPLE IDENTIFICATION: Gas Separator C.C. Cagle #1
COMPANY: Meridian Oil Co.
LEASE:
PLANT:

SAMPLE DATA: DATE SAMPLED: 9-30-91 3:15 PM
ANALYSIS DATE: 10-01-91
PRESSURE - PSIG 60.00
SAMPLE TEMP. °F
ATMOS. TEMP. °F 70.00

GAS (XX) LIQUID ( )
SAMPLED BY: Abney-Pro Well
ANALYSIS BY: Vickie Walker

REMARKS:

COMPONENT ANALYSIS

COMPONENT		MOL PERCENT	GPM
Oxygen	(O2)		
Hydrogen Sulfide	(H2S)		
Nitrogen	(N2)	1.55	
Carbon Dioxide	(CO2)	1.32	
Methane	(C1)	84.91	
Ethane	(C2)	6.41	1.711
Propane	(C3)	3.28	0.902
I-Butane	(IC4)	0.56	0.184
N-Butane	(NC4)	1.03	0.323
I-Pentane	(IC5)	0.44	0.162
N-Pentane	(NC5)	0.19	0.069
Hexane	(C6)	0.31	0.127
Heptanes Plus	(C7+)	0.00	0.000
		100.00	3.478

BTU/CU.FT. - DRY	1145	MOLECULAR WT	19.6585
AT 14.650 DRY	1142		
AT 14.650 WET	1122	26# GASOLINE -	0.466
AT 15.025 DRY	1171		
AT 15.025 WET	1151		

SPECIFIC GRAVITY -	
CALCULATED	0.679
MEASURED	0.000

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE

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