

INFILL DRILLING FINDINGS PURSUANT TO  
SECTION 271.305(b) OF THE FEDERAL ENERGY REGULATORY  
COMMISSION REGULATIONS, NATURAL GAS POLICY ACT OF 1978  
AND OIL CONSERVATION DIVISION ORDER NO. R-6013-A

I.

Operator B. H. Keyes Well Name and No. Maxey Federal Well No. 1-J

Location: Unit H Sec. 24 Twp. 29N Rng. 12W Cty. San Juan

II.

THE DIVISION FINDS:

(1) That Section 271.305(b) of the Federal Energy Regulatory Commission Regulations promulgated pursuant to the Natural Gas Policy Act of 1978 provides that, in order for an infill well to qualify as a new onshore production well under Section 103 of said Act, the Division must find that the infill well is necessary to effectively and efficiently drain a portion of the reservoir covered by the proration unit which cannot be so drained by any existing well within that unit.

(2) That by Order No. R-6013-A, dated February 8, 1980, the Division established an administrative procedure whereby the Division Director and the Division Examiners are empowered to act for the Division and find that an infill well is necessary.

(3) That the well for which a finding is sought is completed in the Fulcher Kutz - Pictured Cliffs Pool, and the standard spacing unit in said pool is 160 acres.

(4) That a 155.02 -acre proration unit comprising the SE/4 NE/4, N/2 NE/4, NE/4 SE/4 of Sec. 24, Twp. 29N, Rng. 12W, is currently dedicated to the Maxey Federal Well No. 1 located in Unit A of said section.

(5) That this proration unit is ( ) standard (x) nonstandard; if nonstandard, said unit was previously approved by Order No. R-1003.

(6) That said proration unit is not being effectively and efficiently drained by the existing well(s) on the unit.

(7) That the drilling and completion of the well for which a finding is sought should result in the production of an additional 111,000 MCF of gas from the proration unit which would not otherwise be recovered.

(8) That all the requirements of Order No. R-6013-A have been complied with, and that the well for which a finding is sought is necessary to effectively and efficiently drain a portion of the reservoir covered by said proration unit which cannot be so drained by any existing well within the unit.

(9) That in order to permit effective and efficient drainage of said proration unit, the subject application should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant is hereby authorized to drill the well described in Section I above as an infill well on the existing proration unit described in Section II(4), above. The authorization for infill drilling granted by this order is necessary to permit the drainage of a portion of the reservoir covered by said proration unit which cannot be effectively and efficiently drained by any existing well thereon.

(2) 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 this 7<sup>th</sup> day of April, 1982.

DIVISION DIRECTOR \_\_\_\_\_ EXAMINER \_\_\_\_\_

cc: OCD Aztec  
OCD Machine Acct. S.F.  
NMO & GEC Hobbs  
MMS (USGS) Farmington

# A. R. "Al" Kendrick

P. O. BOX 516 • AZTEC, NEW MEXICO 87410 • (505) 334-2555

March 5, 1982

Mr. Joe D. Ramey  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87501

RE: Application for Designation of Infill Well

Dear Mr. Ramey:

We respectfully request that the B. H. Keyes Maxey #1-J well located 1820' FNL and 730' FEL of Section 24, T29N, R12W be designated as a necessary infill well in order to effectively and efficiently drain the spacing unit in the Fulcher Kutz-Pictured Cliffs Gas Pool.

The standard spacing unit in the Fulcher Kutz-Pictured Cliffs Pool is 160 acres.

Enclosed for your consideration are the following: A. Well Data Sheet, B. Permit to Drill, C. Acreage Dedication Plat, D. Structure Map, E. Plat showing distances between the Maxey #1 well and the offset wells, F. Plat showing the theoretical drainage areas for 160-acre spaced wells, G. Plat showing spacing units in the area, H. Plat showing operators of wells, I. Data Sheet showing the calculations of additional area to be drained by the infill well.

A copy of this application is being sent by certified mail to the operators of each developed offset spacing unit at the time of this mailing.

If further information is desired, please contact us.

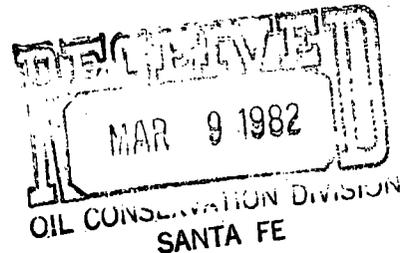
Yours very truly,



A. R. Kendrick

Enclosures

xc: Offset operators





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DATA SHEET

ORIGINAL WELL:

Operator: B. H. Keyes  
Lease: Maxey #1  
Location: 890' FNL and 990' FEL of Section 24, T29N, R12W  
Spud: 4/08/57 Completed: 4/15/57  
Stimulation: Sand/water fractured with 25,000 pounds of sand and 21,000 gallons of water.  
Mechanical problems: none  
Current production rate: 2875 MCF during 1981

REASONS that the existing well cannot effectively and efficiently drain the spacing unit is because of the relatively narrow radius of effective stimulation by the low-volume fracture treatment and because the concept of "drainage and counter-drainage" is not applicable in this instance due to the absence of wells in the west one-half of Section 19, T29N, R11W; and thus, the distances between wells. A high-volume fracture treatment is not feasible due to the possibility of casing rupture.

INFILL WELL:

Operator: B. H. KEYES  
Lease: Maxey #1-J  
Location: 1820' FNL and 730' FEL of Section 24, T29N, R12W  
Spud: 12/08/80 Completed: 1/27/81  
Stimulation: Sand/foam fractured with 68,000 pounds of sand and 60,000 gallons of water used in 70 quality foam.

VOLUME of expected additional recovery: 111 MMCF

BASED upon the concept of each well draining 160 acres, the additional well will drain 64.96 acres of reserves that would not otherwise be recovered. The Maxey #1 well produced 188,409 MCF while having a pressure decline of 330 psi. This calculates to an original reserve value of 274 MMCF. Therefore, the additional recoverable reserves will be  $64.96/160$  times 274 or 111 MMCF.

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

(Other instructions on reverse side)

30-045-24690

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK DRILL [X] DEEPEN [ ] PLUG BACK [ ]

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

2. NAME OF OPERATOR Manana Gas, Inc.

3. ADDRESS OF OPERATOR Box 145, Farmington, NM 87401 (505) 325-3066

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.) At surface 1820' FNL, 730' FEL Section 24 At proposed prod. zone

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE 4 miles west and 1 mile north of Bloomfield, NM

10. DISTANCE FROM PROPOSED LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any) 568

18. DISTANCE FROM PROPOSED LOCATION TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 965

21. ELEVATIONS (Show whether DF, RT, GR, etc.) 5678 GR

23. PROPOSED CASING AND CEMENTING PROGRAM

Table with 5 columns: SIZE OF HOLE, SIZE OF CASING, WEIGHT PER FOOT, SETTING DEPTH, QUANTITY OF CEMENT. Includes rows for 7 3/4 and 4 3/4 hole sizes.

5. LEASE DESIGNATION AND SERIAL NO. NM 013885
6. IF INDIAN, ALLOTTEE OR TRIBE NAME
7. UNIT AGREEMENT NAME
8. FARM OR LEASE NAME Maxey Federal
9. WELL NO. 1J
10. FIELD AND POOL, OR WILDCAT Fulcher Kutz P.C.
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA H-24-T29N-R12W
12. COUNTY OR PARISH San Juan
13. STATE NM
17. NO. OF ACRES ASSIGNED TO THIS WELL (Order R-1003) 155.55 ac
20. ROTARY OR CABLE TOOLS Rotary
22. APPROX. DATE WORK WILL START 12/1/80

16. NO. OF ACRES IN LEASE 320
19. PROPOSED DEPTH 1900
20. ROTARY OR CABLE TOOLS Rotary

This well will be logged and if productive casing will be run, cemented and perforated. The well will be fracture treated. Bag type, 3000 psi, BOP equipment will be used after surface casing is run and until the well is completed. Formation tops: Ojo Alamo - 502'; Kirtland - 627'; Fruitland - 1360'; Pictured Cliffs - 1755'.

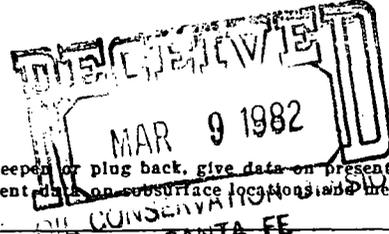
The Gas is dedicated. This action is subject to administrative approval under 30 CFR 290.

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

24. SIGNED [Signature] TITLE Vice President DATE 11/5/80

(This space for Federal or State use) APPROVED AS AMENDED APPROVAL DATE

APPROVED BY CONDITIONS OF APPROVAL [Signature] TITLE DISTRICT ENGINEER DATE NOV 24 1980



NWLL R-1003

B

All distances must be from the outer boundaries of the Section.

Operator <b>MANANA GAS, INCORPORATED</b>			Lease <b>MAXEY FEDERAL</b>		Well No. <b>1 J</b>
Unit Letter <b>H</b>	Section <b>24</b>	Township <b>29N</b>	Range <b>12W</b>	County <b>San Juan</b>	

Actual Footage Location of Well  
**1820** feet from the **North** line and **730** feet from the **East** line

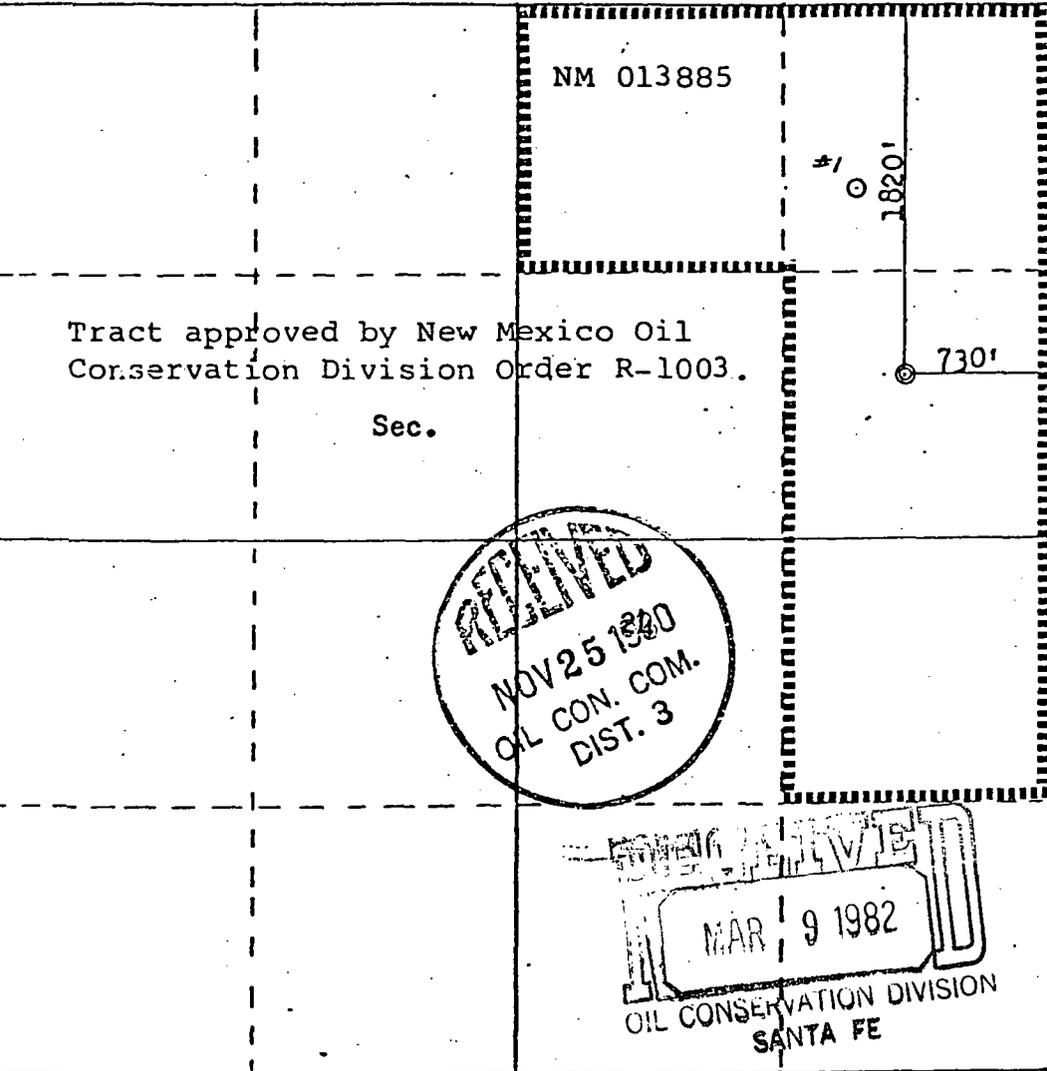
Ground Level Elev: <b>5678</b>	Producing Formation <b>Pictured Cliffs</b>	Pool <b>Fulcher Kutz-P.C.</b>	Dedicated Acreage: <b>155.55 02</b> Acres
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1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.
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.



Scale: 1"=1000'

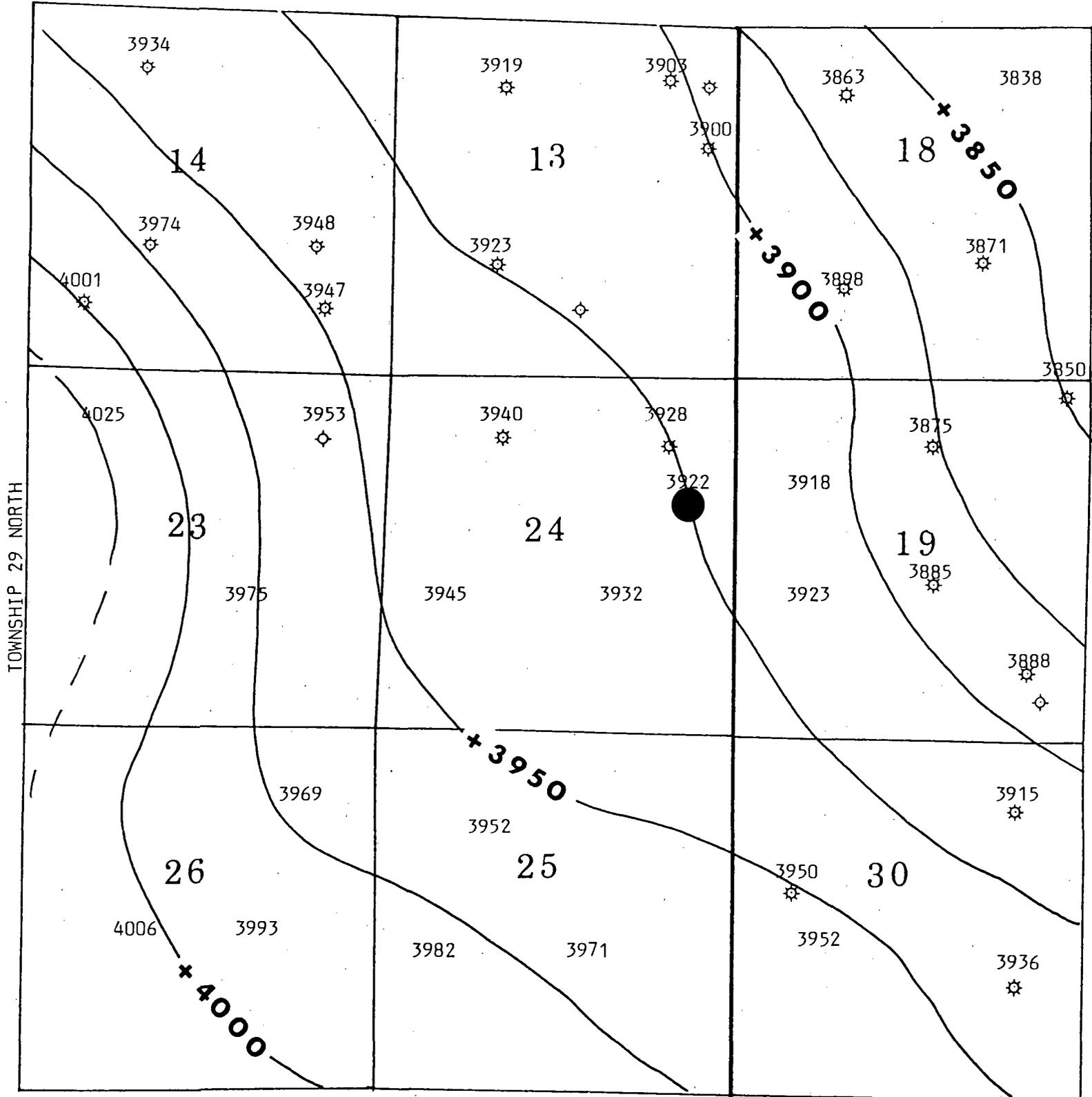
<b>CERTIFICATION</b>	
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.	
Name	<i>W.R. Kesdick</i>
Position	Vice President
Company	Manana Gas, Inc.
Date	11/5/80
I hereby certify that the well location shown on this plat was plotted from 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 30, 1980
Registered Professional Engineer and Land Surveyor	<i>Fred B. Kerr, Jr.</i>
Certificate No.	3950

**C**

TOP OF PICTURED CLIFFS SAND

RANGE 12 WEST

RANGE 11 WEST



TOWNSHIP 29 NORTH

⊛ GAS WELL

⊛ PLUGGED GAS WELL

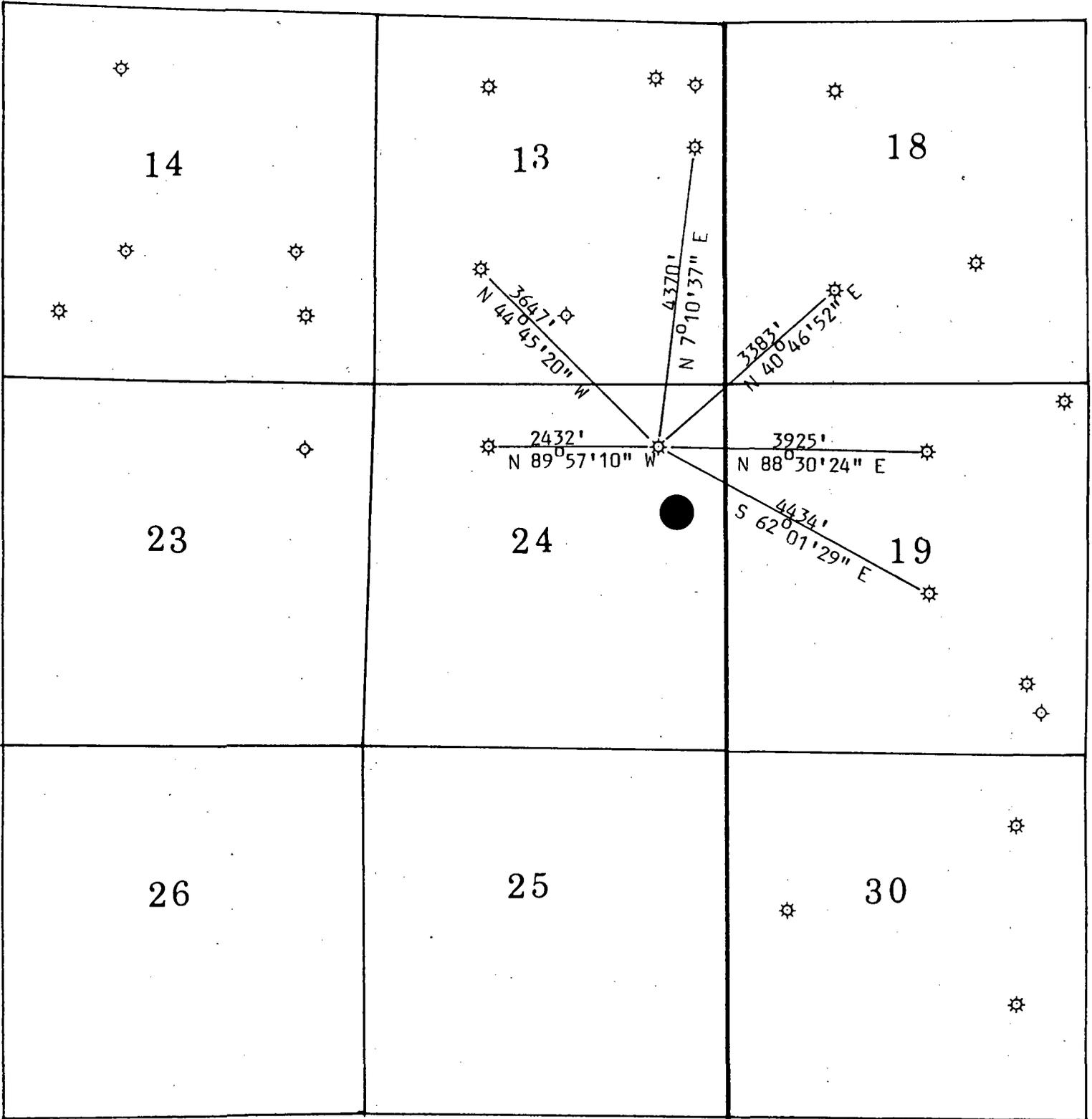
◇ DRY HOLE

**D**

RANGE 12 WEST

RANGE 11 WEST

TOWNSHIP 29 NORTH



⊗ GAS WELL

⊗ PLUGGED GAS WELL

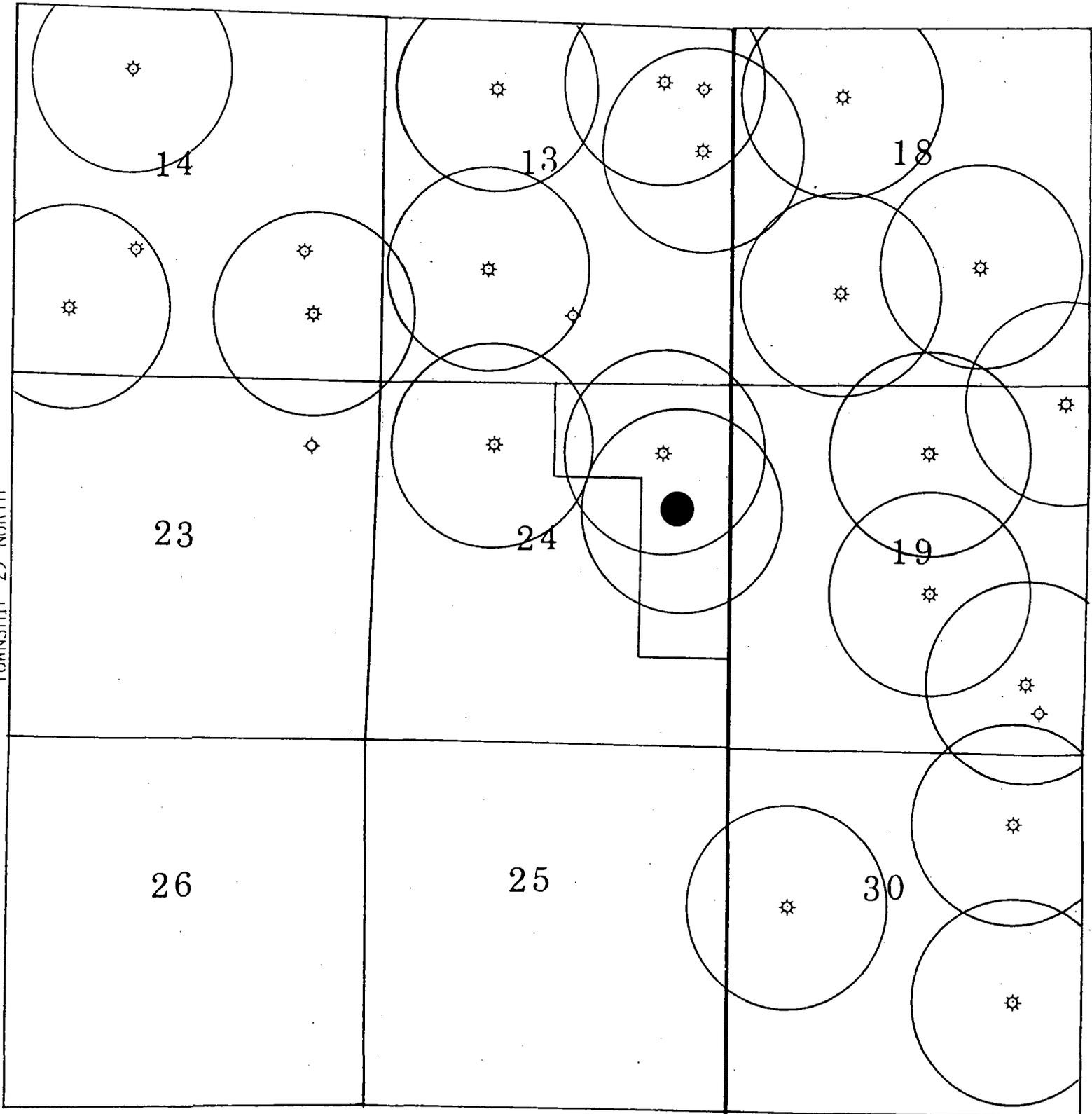
◇ DRY HOLE

E

160-ACRE CIRCLES AROUND PICTURED CLIFFS WELLS

RANGE 12 WEST

RANGE 11 WEST



⊛ GAS WELL

⊛ PLUGGED GAS WELL

⊛ DRY HOLE

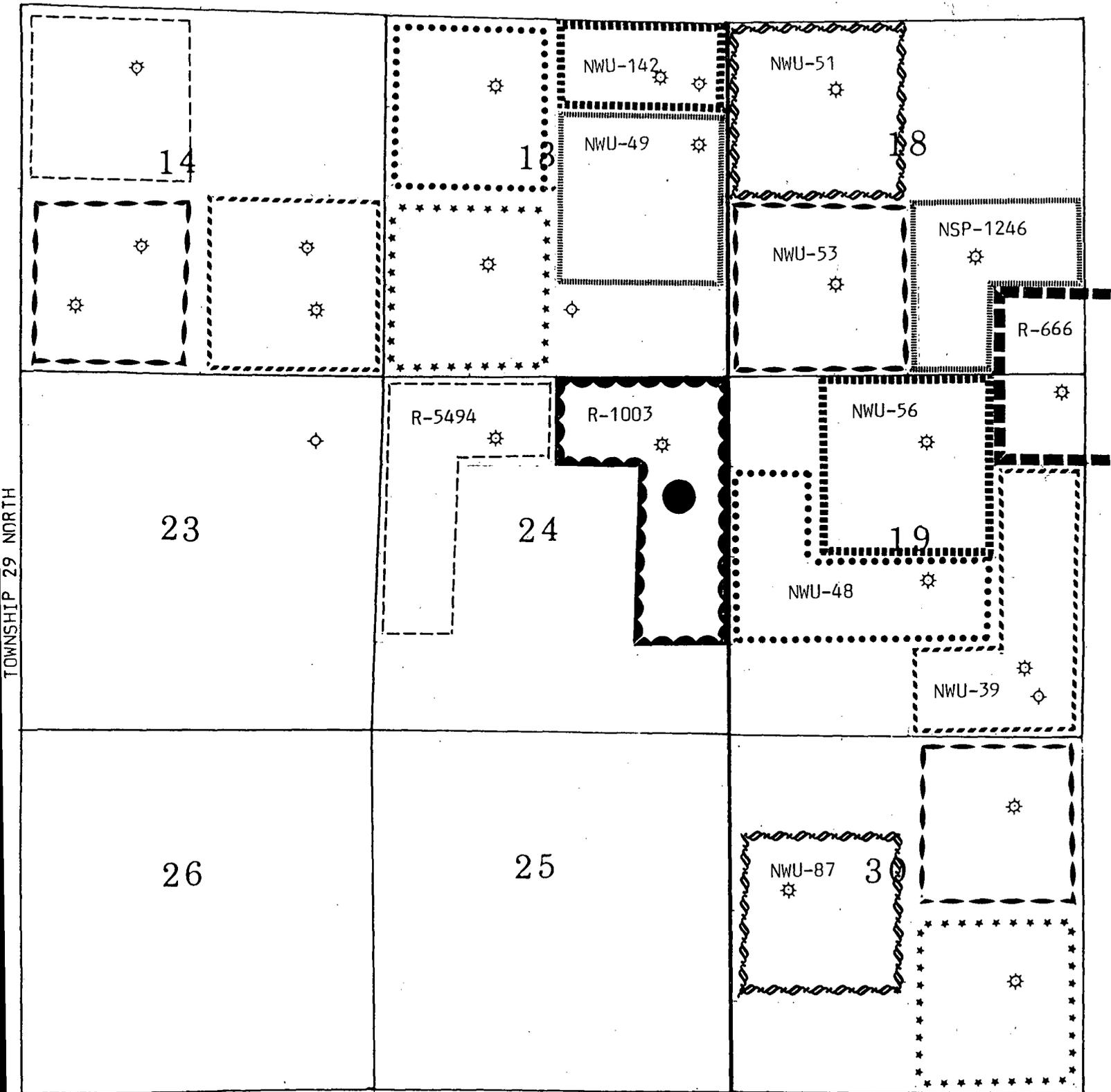
**F**

PICTURED CLIFFS SPACING UNITS

(NON-STANDARD ORDERS SHOWN)

RANGE 12 WEST

RANGE 11 WEST



⚙ GAS WELL

⚙• PLUGGED GAS WELL

◇ DRY HOLE

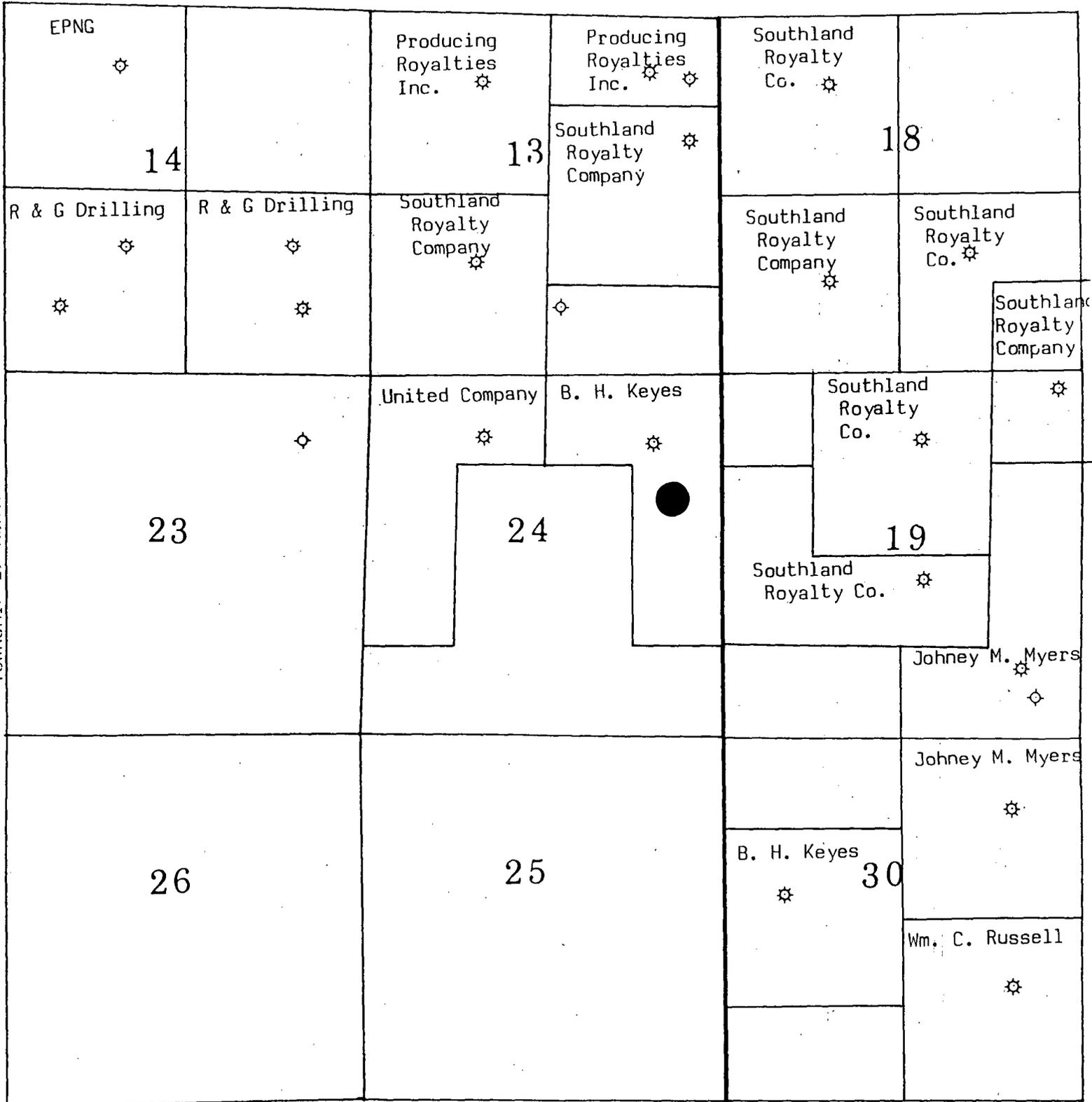
G

OPERATORS OF PICTURED CLIFFS WELLS

RANGE 12 WEST

RANGE 11 WEST

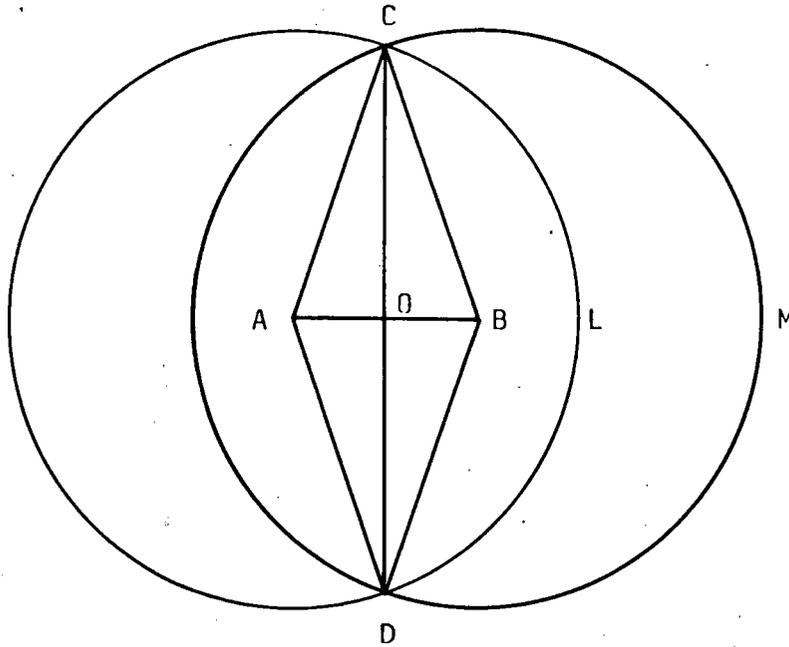
TOWNSHIP 29 NORTH



⊗ GAS WELL      ⊗ PLUGGED GAS WELL      ⊖ DRY HOLE

**H**

ADDITIONAL AREA TO BE DRAINED



Area of each circle is 160 acres

A = Location of Maxey #1, 890' FNL and 990' FEL

B = Location of Maxey #1-J, 1820' FNL and 730' FEL

AC = Radius of 160-acre circle = 1489 feet

AB = Distance between wells = 966 feet

AO =  $\frac{1}{2}$ AB = 483 feet

CO = 1408 feet

$\angle CAO = \sin^{-1} 1408/1489 = 71.0145^\circ = 71^\circ 00' 52''$

$\angle CAD = 2(\angle CAO) = 142.0291^\circ = 142^\circ 01' 44''$

Area of trapezoid ACBD =  $2(\frac{1}{2})(AB)(CO) = 2(\frac{1}{2})(966)(1408) = 1360128$  sq. ft. =  $A_1$

Area of segment of circle ACLD =  $3.1416 (1489)^2 (142.0291/360) = 2747983$  sq. ft. =  $A_2$

Obtuse angle CBD =  $360 - 142.0291 = 217.9709^\circ = 217^\circ 58' 15''$

Area of segment of circle BCMD =  $3.1416 (1489)^2 (217.9709/360) = 4217308$  sq. ft. =  $A_3$

Area of crescent CMDL =  $A_3 - (A_1 - A_2) = 2829453$  sq. ft. = 64.96 Acres

ADDITIONAL AREA TO BE DRAINED IS 64.96 ACRES



INFILL DRILLING FINDINGS PURSUANT TO  
SECTION 271.305(b) OF THE FEDERAL ENERGY REGULATORY  
COMMISSION REGULATIONS, NATURAL GAS POLICY ACT OF 1978  
AND OIL CONSERVATION DIVISION ORDER NO. R-6013-A

I.

Operator B. H. Keyes Well Name and No. Maxey Federal Well No. 1-J

Location: Unit H Sec. 24 Twp. 29N Rng. 12W Cty. San Juan

II.

THE DIVISION FINDS:

(1) That Section 271.305(b) of the Federal Energy Regulatory Commission Regulations promulgated pursuant to the Natural Gas Policy Act of 1978 provides that, in order for an infill well to qualify as a new onshore production well under Section 103 of said Act, the Division must find that the infill well is necessary to effectively and efficiently drain a portion of the reservoir covered by the proration unit which cannot be so drained by any existing well within that unit.

(2) That by Order No. R-6013-A, dated February 8, 1980, the Division established an administrative procedure whereby the Division Director and the Division Examiners are empowered to act for the Division and find that an infill well is necessary.

(3) That the well for which a finding is sought is completed in the Fulcher Kutz - Pictured Cliffs Pool, and the standard spacing unit in said pool is 160 acres.

(4) That a 155.02-acre proration unit comprising the SE/4 NE/4, N/2 NE/4, NE/4 SE/4 of Sec. 24, Twp. 29N, Rng. 12W, is currently dedicated to the Maxey Federal Well No. 1 located in Unit A of said section.

(5) That this proration unit is ( ) standard (x) nonstandard; if nonstandard, said unit was previously approved by Order No. R-1003.

(6) That said proration unit is not being effectively and efficiently drained by the existing well(s) on the unit.

(7) That the drilling and completion of the well for which a finding is sought should result in the production of an additional 111,000 MCF of gas from the proration unit which would not otherwise be recovered.

(8) That all the requirements of Order No. R-6013-A have been complied with, and that the well for which a finding is sought is necessary to effectively and efficiently drain a portion of the reservoir covered by said proration unit which cannot be so drained by any existing well within the unit.

(9) That in order to permit effective and efficient drainage of said proration unit, the subject application should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant is hereby authorized to drill the well described in Section I above as an infill well on the existing proration unit described in Section II(4), above. The authorization for infill drilling granted by this order is necessary to permit the drainage of a portion of the reservoir covered by said proration unit which cannot be effectively and efficiently drained by any existing well thereon.

(2) 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 this 7th day of April, 1982.

DIVISION DIRECTOR \_\_\_\_\_ EXAMINER \_\_\_\_\_

cc: OCD Aztec  
OCD Machine Acct. S.F.  
NMO & GEC Hobbs  
MMS (USGS) Farmington

# A. R. "Al" Kendrick

P. O. BOX 516 • AZTEC, NEW MEXICO 87410 • (505) 334-2555

March 5, 1982

Mr. Joe D. Ramey  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87501

RE: Application for Designation of Infill Well

Dear Mr. Ramey:

We respectfully request that the B. H. Keyes Maxey #1-J well located 1820' FNL and 730' FEL of Section 24, T29N, R12W be designated as a necessary infill well in order to effectively and efficiently drain the spacing unit in the Fulcher Kutz-Pictured Cliffs Gas Pool.

The standard spacing unit in the Fulcher Kutz-Pictured Cliffs Pool is 160 acres.

Enclosed for your consideration are the following: A. Well Data Sheet, B. Permit to Drill, C. Acreage Dedication Plat, D. Structure Map, E. Plat showing distances between the Maxey #1 well and the offset wells, F. Plat showing the theoretical drainage areas for 160-acre spaced wells, G. Plat showing spacing units in the area, H. Plat showing operators of wells, I. Data Sheet showing the calculations of additional area to be drained by the infill well.

A copy of this application is being sent by certified mail to the operators of each developed offset spacing unit at the time of this mailing.

If further information is desired, please contact us.

Yours very truly,



A. R. Kendrick

Enclosures

xc: Offset operators

DATA SHEET

ORIGINAL WELL:

Operator: B. H. Keyes  
Lease: Maxey #1  
Location: 890' FNL and 990' FEL of Section 24, T29N, R12W  
Spud: 4/08/57 Completed: 4/15/57  
Stimulation: Sand/water fractured with 25,000 pounds of sand and 21,000 gallons of water.  
Mechanical problems: none  
Current production rate: 2875 MCF during 1981

REASONS that the existing well cannot effectively and efficiently drain the spacing unit is because of the relatively narrow radius of effective stimulation by the low-volume fracture treatment and because the concept of "drainage and counter-drainage" is not applicable in this instance due to the absence of wells in the west one-half of Section 19, T29N, R11W; and thus, the distances between wells. A high-volume fracture treatment is not feasible due to the possibility of casing rupture.

INFILL WELL:

Operator: B. H. KEYES  
Lease: Maxey #1-J  
Location: 1820' FNL and 730' FEL of Section 24, T29N, R12W  
Spud: 12/08/80 Completed: 1/27/81  
Stimulation: Sand/foam fractured with 68,000 pounds of sand and 60,000 gallons of water used in 70 quality foam.

VOLUME of expected additional recovery: 111 MMCF

BASED upon the concept of each well draining 160 acres, the additional well will drain 64.96 acres of reserves that would not otherwise be recovered. The Maxey #1 well produced 188,409 MCF while having a pressure decline of 330 psi. This calculates to an original reserve value of 274 MMCF. Therefore, the additional recoverable reserves will be  $64.96/160$  times 274 or 111 MMCF.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

30-045-24690

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK  
 DRILL  DEEPEN  PLUG BACK

b. TYPE OF WELL  
 OIL WELL  GAS WELL  OTHER   
 SINGLE ZONE  MULTIPLE ZONE

2. NAME OF OPERATOR  
 Manana Gas, Inc.

3. ADDRESS OF OPERATOR  
 Box 145, Farmington, NM 87401 (505) 325-3066

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*  
 At surface  
 1820' FNL, 730' FEL Section 24  
 At proposed prod. zone

5. LEASE DESIGNATION AND SERIAL NO.  
 NM 013885

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
 Maxey Federal

9. WELL NO.  
 1J

10. FIELD AND POOL, OR WILDCAT  
 Fulcher Kutz P.C.

11. SEC. T. R. M. OR BLK. AND SURVEY OR AREA  
 H-24-T29N-R12W

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
 4 miles west and 1 mile north of Bloomfield, NM

12. COUNTY OR PARISH 13. STATE  
 San Juan NM

16. NO. OF ACRES IN LEASE  
 320

17. NO. OF ACRES ASSIGNED TO THIS WELL  
 155.55 02 (Order R-1003)

18. DISTANCE FROM PROPOSED LOCATION\* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.  
 965

19. PROPOSED DEPTH  
 1900

20. ROTARY OR CABLE TOOLS  
 Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)  
 5678 GR

22. APPROX. DATE WORK WILL START\*  
 12/1/80

23. PROPOSED CASING AND CEMENTING PROGRAM

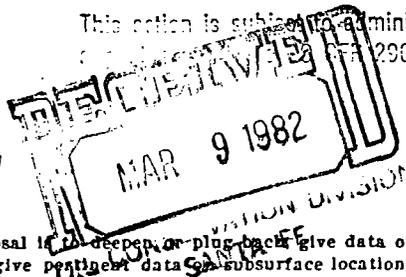
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
7 3/4	5 1/2	15.5	100	100 Sx to Surface
4 3/4	2 7/8	6.5	1800	275 Sx to Surface

This well will be logged and if productive casing will be run, cemented and perforated. The well will be fracture treated. Bag type, 3000 psi, BOP equipment will be used after surface casing is run and until the well is completed.

Formation tops: Ojo Alamo - 502'; Kirtland - 627'; Fruitland - 1360'; Pictured Cliffs - 1755'.

The Gas is dedicated.

This action is subject to administrative review.



APPROVED ARE SUPERSEDED BY PERMITS WITH ATTACHED "GENERAL REQUIREMENTS"

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

24. SIGNED Al Kendrick TITLE Vice President DATE 11/5/80

(This space for Federal or State use)  
 APPROVED AS AMENDED

APPROVAL DATE

APPROVED BY CONDITIONS OF APPROVAL  
 NOV 24 1980  
 JAMES F. SIMS  
 DISTRICT ENGINEER

TITLE

NWL R-1003

B

All distances must be from the outer boundaries of the Section.

Operator <b>MANANA GAS, INCORPORATED</b>			Lease <b>MAXEY FEDERAL</b>			Well No. <b>1 J</b>		
Unit Letter <b>H</b>	Section <b>24</b>	Township <b>29N</b>	Range <b>12W</b>	County <b>San Juan</b>				

Actual Footage Location of Well:  
**1820** feet from the **North** line and **730** feet from the **East** line

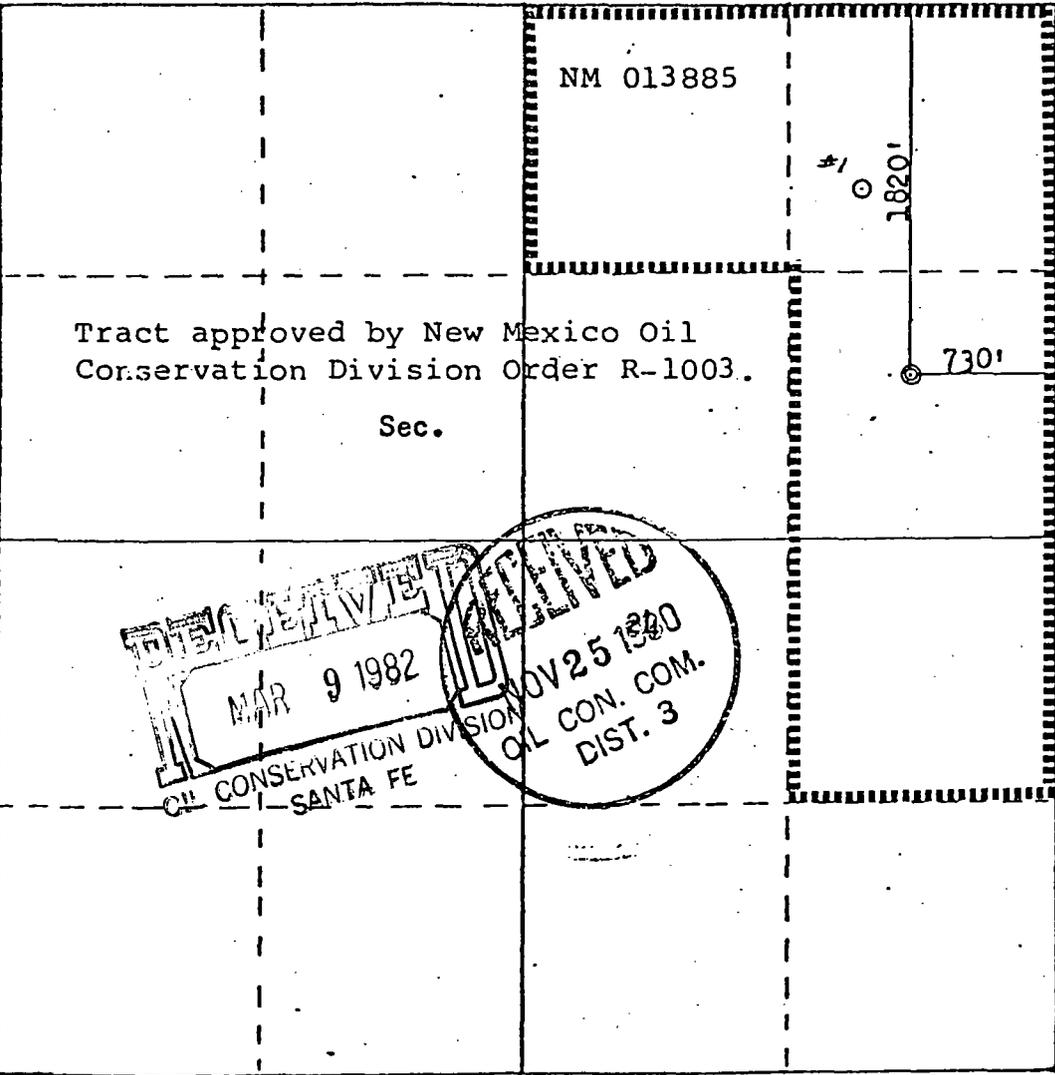
Ground Level Elev: <b>5678</b>	Producing Formation <b>Pictured Cliffs</b>	Pool <b>Fulcher Kutz-P.C.</b>	Dedicated Acreage: <b>155.55-02</b> Acres
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1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.
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.



Scale: 1"=1000'

**CERTIFICATION**

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

Name <i>W.R. Kendrick</i>
Position <b>Vice President</b>
Company <b>Manana Gas, Inc.</b>
Date <b>11/5/80</b>

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.

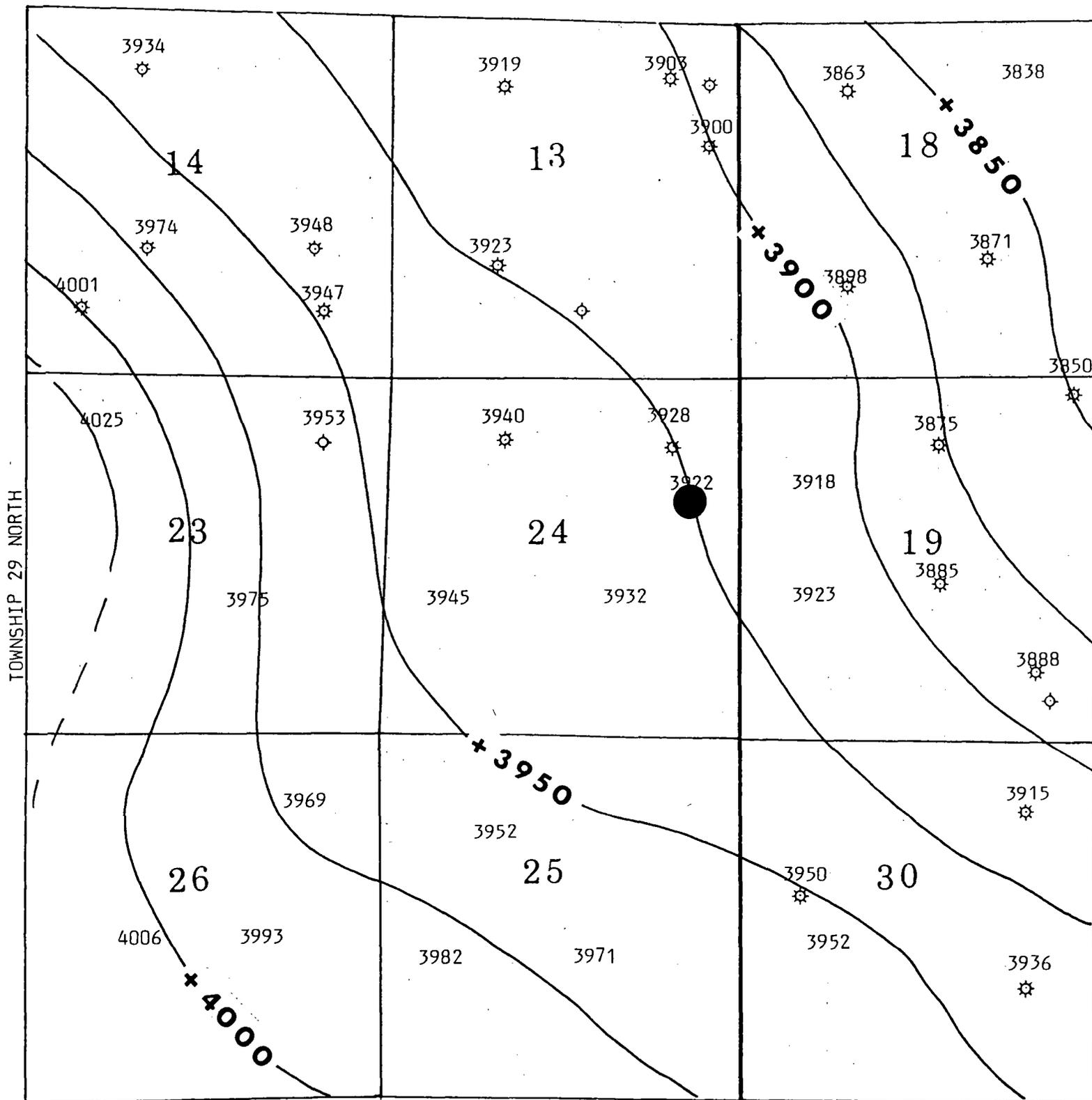
Date Surveyed <b>October 30, 1980</b>
Registered Professional Engineer and Land Surveyor <i>Fred B. Kerr, Jr.</i>
Certificate No. <b>3950</b>

**C**

TOP OF PICTURED CLIFFS SAND

RANGE 12 WEST

RANGE 11 WEST



⊗ GAS WELL

⊗ PLUGGED GAS WELL

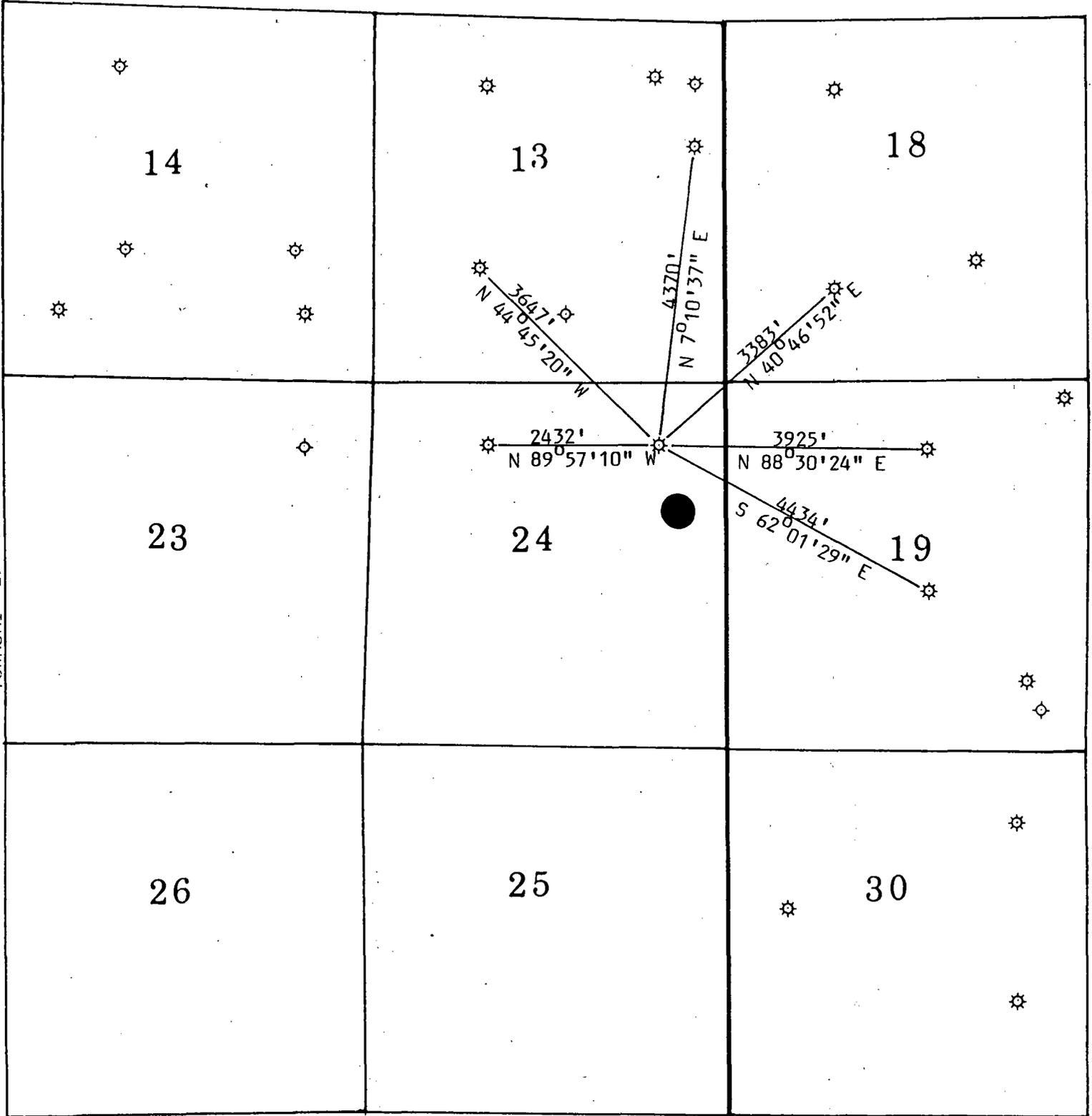
◇ DRY HOLE

D

RANGE 12 WEST

RANGE 11 WEST

TOWNSHIP 29 NORTH



⊗ GAS WELL

⊗ PLUGGED GAS WELL

⊗ DRY HOLE

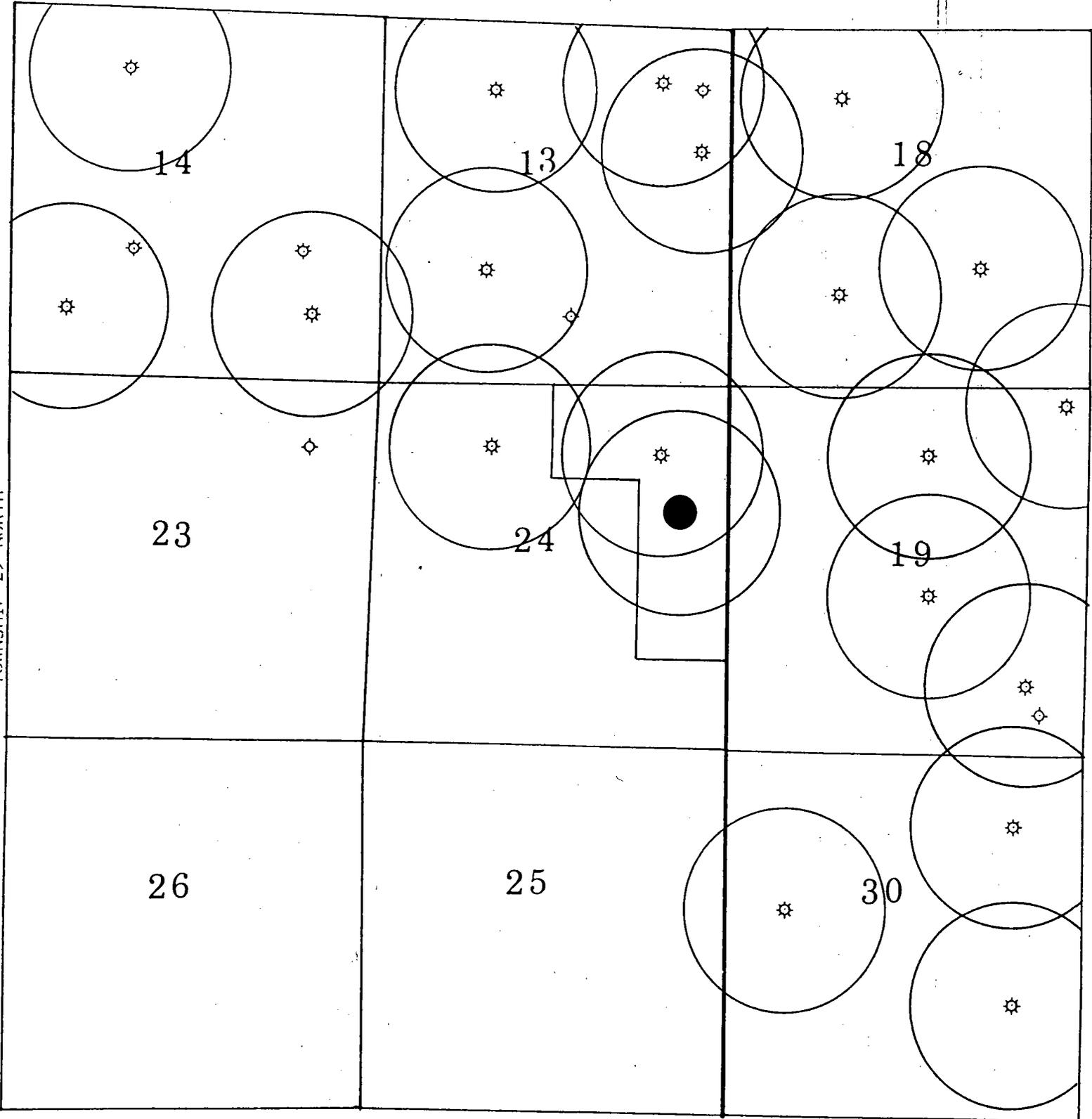
E

160-ACRE CIRCLES AROUND PICTURED CLIFFS WELLS

RANGE 12 WEST

RANGE 11 WEST

TOWNSHIP 29 NORTH



⚙ GAS WELL

⚙ PLUGGED GAS WELL

◇ DRY HOLE

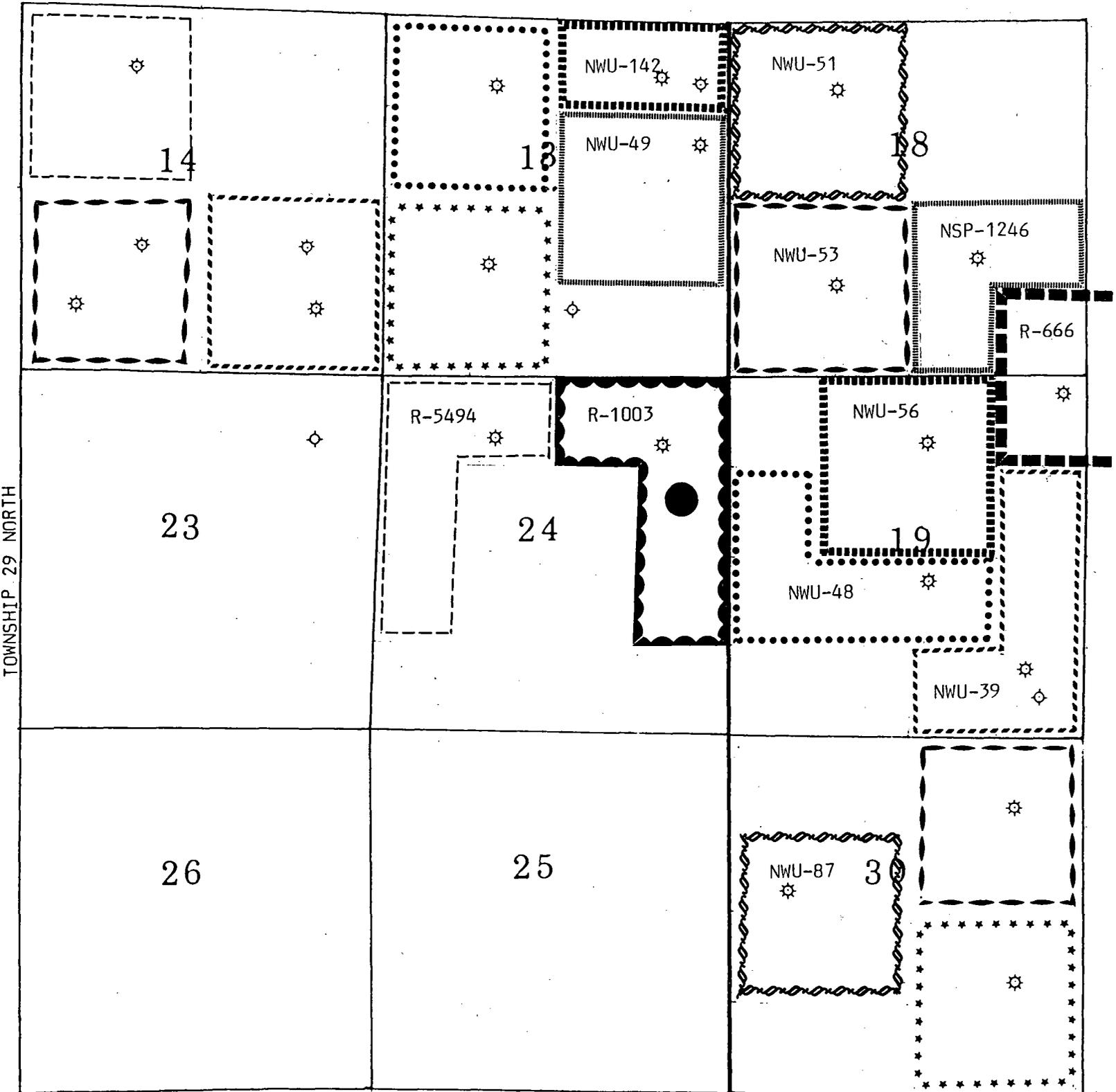
**F**

PICTURED CLIFFS SPACING UNITS

(NON-STANDARD ORDERS SHOWN)

RANGE 12 WEST

RANGE 11 WEST



⊗ GAS WELL

⊗ PLUGGED GAS WELL

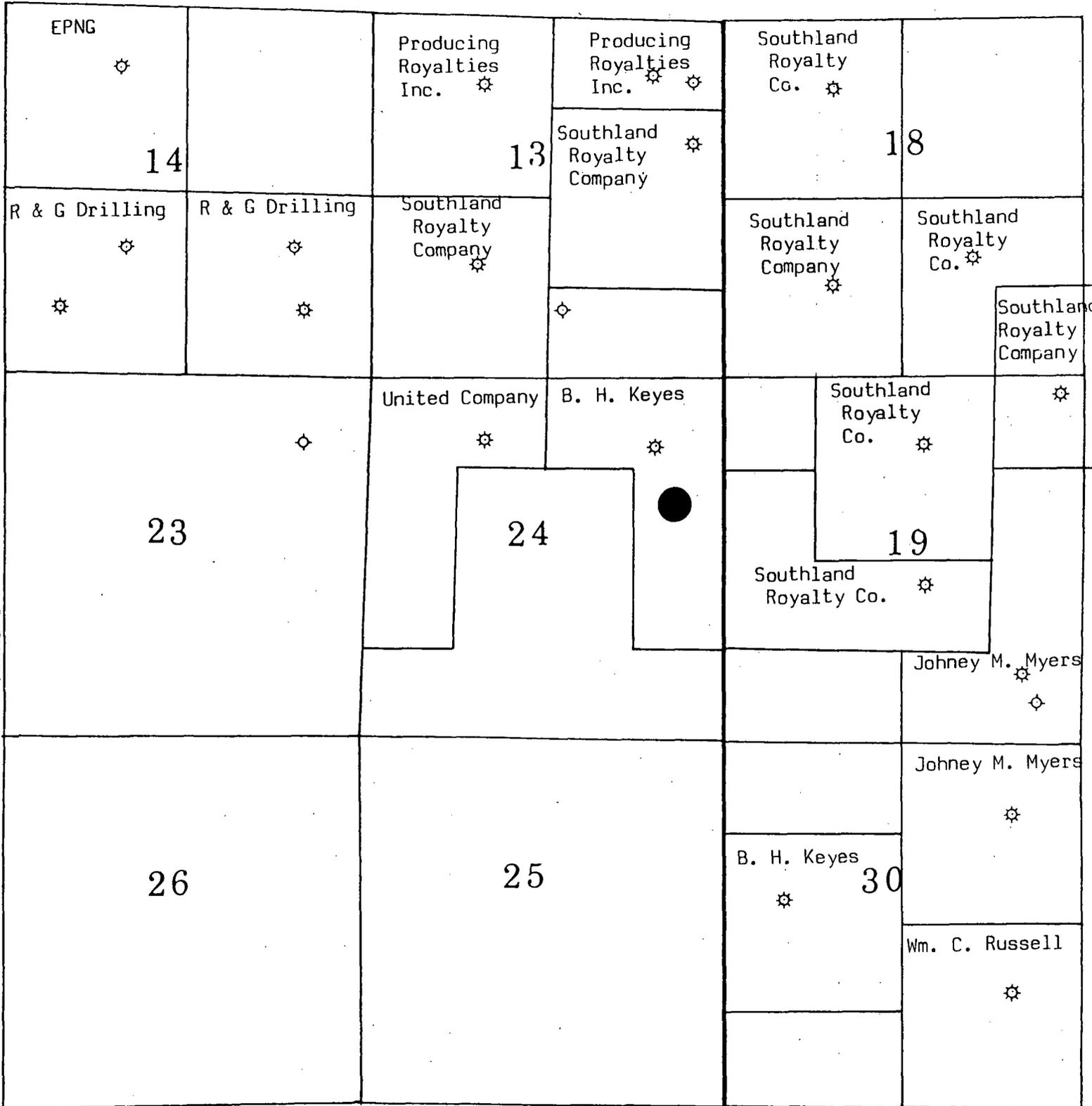
◇ DRY HOLE

OPERATORS OF PICTURED CLIFFS WELLS

RANGE 12 WEST

RANGE 11 WEST

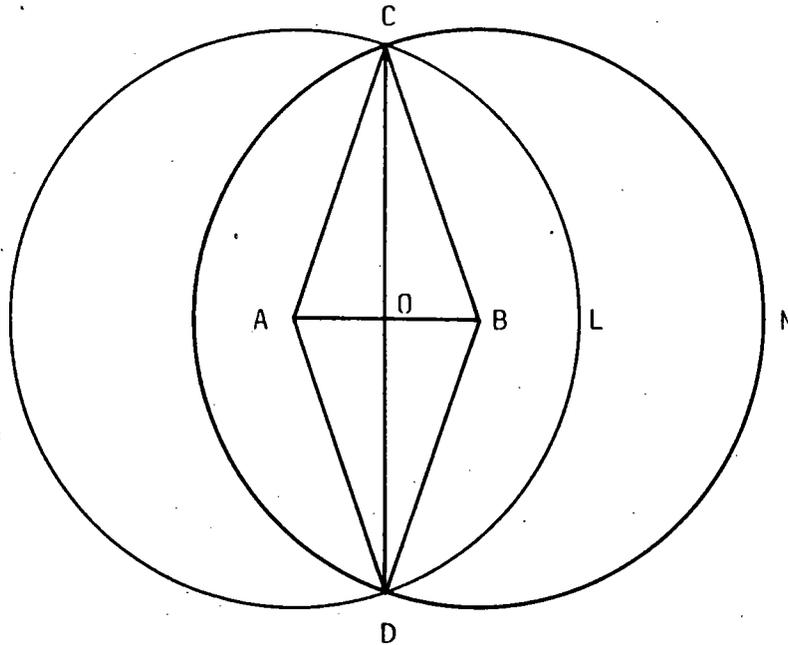
TOWNSHIP 29 NORTH



⊗ GAS WELL      ⊗ PLUGGED GAS WELL      ⊕ DRY HOLE

**H**

ADDITIONAL AREA TO BE DRAINED



Area of each circle is 160 acres

A = Location of Maxey #1, 890' FNL and 990' FEL

B = Location of Maxey #1-J, 1820' FNL and 730' FEL

AC = Radius of 160-acre circle = 1489 feet

AB = Distance between wells = 966 feet

AO =  $\frac{1}{2}$ AB = 483 feet

CO = 1408 feet

$\angle CAO = \sin^{-1} 1408/1489 = 71.0145^\circ = 71^\circ 00' 52''$

$\angle CAD = 2(\angle CAO) = 142.0291^\circ = 142^\circ 01' 44''$

Area of trapezoid ACBD =  $2(\frac{1}{2})(AB)(CO) = 2(\frac{1}{2})(966)(1408) = 1360128$  sq. ft. =  $A_1$

Area of segment of circle ACLD =  $3.1416 (1489)^2 (142.0291/360) = 2747983$  sq. ft. =  $A_2$

Obtuse angle CBD =  $360 - 142.0291 = 217.9709^\circ = 217^\circ 58' 15''$

Area of segment of circle BCMD =  $3.1416 (1489)^2 (217.9709/360) = 4217308$  sq. ft. =  $A_3$

Area of crescent CMDL =  $A_3 - (A_1 - A_2) = 2829453$  sq. ft. = 64.96 Acres

ADDITIONAL AREA TO BE DRAINED IS 64.96 ACRES