

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENTSubmit 8 FOR Tribal  
Interest, 7 for BLM\*  
(Other instructions on  
reverse side)FORM APPROVED  
Budget Bureau No. 1004-0136  
Expires: February 28, 1995

## APPLICATION FOR PERMIT TO DRILL OR DEEPEN

1a. Type of Work

DRILL ☒DEEPEN ☐

1b. TYPE OF WELL

OIL WELL ☐GAS WELL ☒OTHER ☐Single ☒Multiple ☐

Zone

Zone

2. NAME OF OPERATOR

Cross Timbers Operating Company

3. ADDRESS AND TELEPHONE NO.

6001 Highway 64, Farmington, NM 87401 915/682-8873 Mark Gosch

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)

At Surface:

655' FNL - 520' FEL

At proposed prod. zone&gt;

14. DISTANCE IN MILES AND DIRECTIONS FROM NEAREST TOWN OR POST OFFICE\*

Approximately 10.1 miles to La Plata, New Mexico. Use Program for further details

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

520'

16. NO. OF ACRES IN LEASE  
Approximation of this agreement does not warrant or certify that the operator thereof and other holders of operating rights hold legal or equitable title to those rights in the subject lease which are committed hereto...

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

1200'

19. PROPOSED DEPTH

8500'

20. ROTARY OR CABLE TOOLS

Rotary

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

5916' G.L.

22. APPROX. DATE WORK WILL START\*

01/99

## 23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12-1/4"	J-55, 8-5/8"	24#	850'	360 sx
7-7/8"	J-55, 4-1/2"	19.5#	8500'	1300 sx
	N-80	17.6		

Surface

8-5/8", 24#, J-55, STC casing at 850'.

Lead: 260 sx of 35:65 Pozmix/Class "H" cement w/ 8% Gel, 6 pps Gilsonite, &amp; 1/4 pps Celloflake (11.8 ppg, 2.26 cu.ft./sx, 12.32 gal/sx wtr.).

Production

Tail: 100 sx Class "H" cement w/ 2% CaCl (15.6 ppg, 1.20 cu.ft./sx, &amp; 5.25 gal/sx wtr.).

4-1/2", 10.5#, J-55, STC casing at 8,500', w/ DVT @ 3,000'

First Stage:

Lead - 700 sx of Class "H" cement w/ 0.6% FL-52 (15.6 ppg, 1.18 cu.ft./sx, &amp; 5.21 gal/sx wtr.) Estimate TOC @ +/-6000'.

Second Stage:

Lead - 450 sx of 35:65 Pozmix/Class "H" cement w/ 8% Gel, 6 pps Gilsonite and 1/4 pps Celloflake (11.8 ppg, 2.26 cu.ft./sx, &amp; 12.32 gal/sx wtr.). Tail - 150 sx of Class "H" cement (15.6 ppg, 1.18 cu.ft./sx, &amp; 5.23 gal/sx wtr.). Top of tail slurry to be +/-2500'.

Remarks: Use 20% excess over volume calculated from open hole logs to bring cement to +/-6000' on the first stage and to the surface on the second stage.

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 and vertical depths. Give blowout preventer program, if any.

24.

SIGNED:

TITLE Gary L. Markestad, P.E. VP Production

DATE: 12/21/98

(This space for Federal or State office use)

Permit Number:

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

SEE ATTACHED  
CONDITIONS OF APPROVALAPPROVED FOR A PERIOD  
NOT TO EXCEED 1 YEAR.

APPROVED BY

Ilyse K. Auringer

TITLE

MINERALS STAFF CHIEF

DATE MAR 1 1999

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

NSL-4170 (S)

NMOCD

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

Form C-102  
Revised February 21, 1994  
Instructions on back  
Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number <b>30-045-2986.5</b>		*Pool Code <b>86760</b>	*Pool Name <b>UTE DOME PARADOX</b>
*Property Code <b>24393</b>	*Property Name <b>MOUNTAIN UTE GAS COM N</b>		*Well Number <b>1</b>
*OGRID No. <b>167067</b>	*Operator Name <b>CROSS TIMBERS OPERATING COMPANY</b>		*Elevation <b>5916'</b>

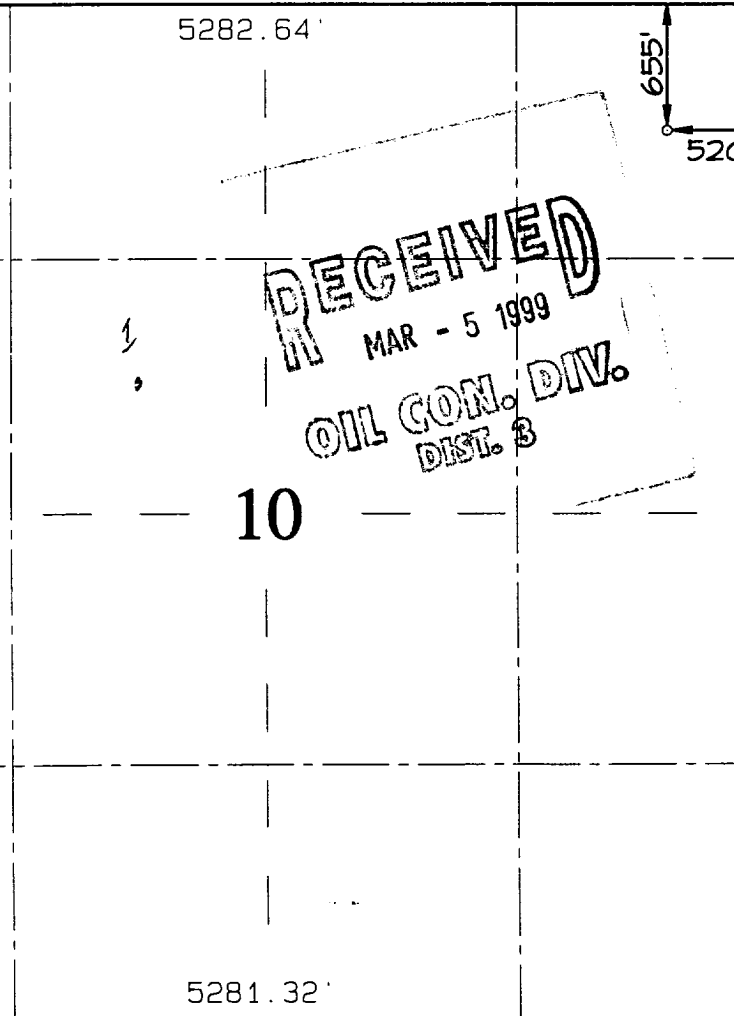
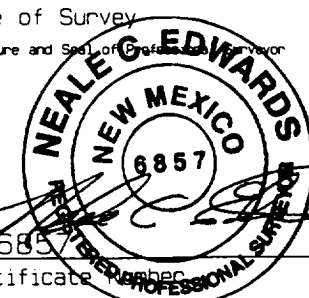
<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	10	31N	14W		655	NORTH	520	EAST	SAN JUAN

<sup>11</sup> 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
<sup>12</sup> Dedicated Acres <b>640</b>		<sup>13</sup> Joint or Infill		<sup>14</sup> Consolidation Code		<sup>15</sup> Order No.			

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

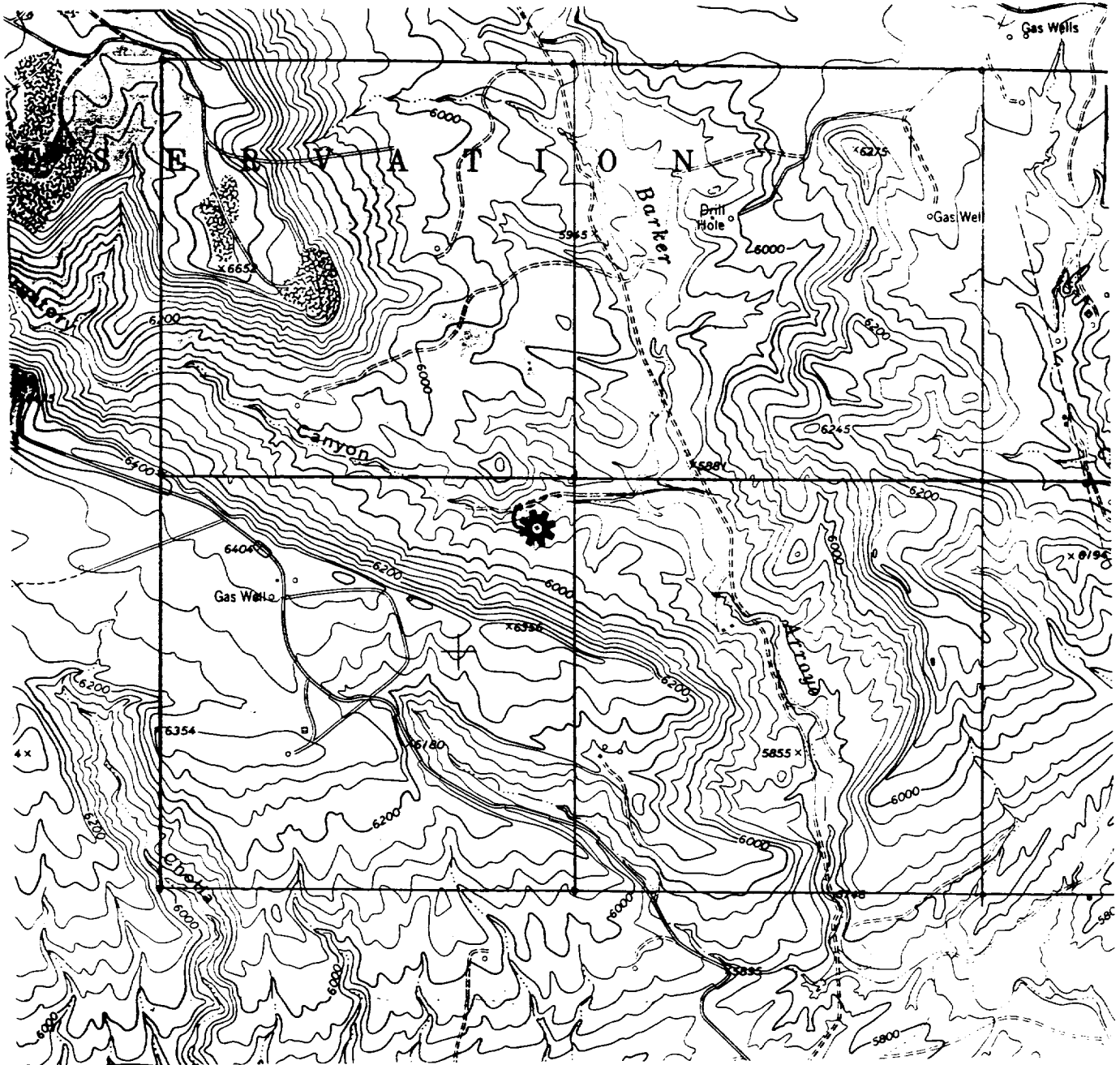
<sup>16</sup> 5280.00'	5282.64'		<sup>17</sup> OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.  Signature <u>Gary L. Markestad</u> Printed Name <u>Gary L. Markestad</u> Vice-President / Production Title Date <u>12/21/98</u>	
				<sup>18</sup> 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 supervision, and that the same is true and correct to the best of my belief.  OCTOBER 15, 1998 Date of Survey Signature and Seal of Registered Surveyor  Certificate Number
	5281.32'			

**CROSS TIMBERS OPERATING COMPANY**

**MOUNTAIN UTE GAS COM N #1**

655' FNL- 520' FEL, Sec. 10, T31N-R14W

Proposed Ute Dome Paradox Well



USGS Purgatory Canyon, New Mexico, CO // 7.5' Series // Scale 1:24000



NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 South Pacheco Street  
Santa Fe, New Mexico 87505  
(505) 827-7131

November 23, 1998

Cross Timbers Oil Company  
810 Houston Street - Suite 2000  
Fort Worth, Texas 76102-6298  
Attention: Edwin S. Ryan, Jr.

RECEIVED  
NOV 25 1998

OIL CON. DIV. *Administrative Order NSL-4170*  
DIST. 3

Dear Mr. Ryan:

Reference is made to your application dated November 16, 1998 for Cross Timbers Oil Company to drill its proposed Mountain Ute Gas Com. "N" Well No. 1 at an unorthodox gas well location in order to test the Ute Dome-Paradox Pool 655 feet from the North line and 520 feet from the East line (Unit A) of Section 10, Township 31 North, Range 14 West, NMPM, as projected into the unsurveyed Ute Mountain Indian Reservation, San Juan County, New Mexico. All of Section 10 is to be dedicated to this well in order to form a standard 640-acre, more or less, gas spacing and proration unit for this pool.

The subject application has been duly filed under the provisions of Rule 104.F of the New Mexico Oil Conservation Division Rules and Regulations.

The geologic interpretation submitted with this application indicates that a well drilled at the proposed unorthodox gas well location will be at a more favorable geologic position within the Paradox formation than a well drilled at a location considered to be standard for this 640-acre, more or less, unit.

This 640 acre, more or less, unit is currently dedicated to Cross Timbers Oil Company's Ute Mountain Tribal "D" Well No. 1 (API No. 30-045-10918), located at a standard gas well location 1650 feet from the North and West lines (Unit F) of Section 10. Per your application and Division Rule 104.D(3) the Ute Mountain Tribal "D" Well No. 1 is to cease producing gas from the Ute Dome-Paradox Pool at such time as the subject Mountain Ute Gas Com. "N" Well No. 1 is completed as a producing gas well within the Paradox formation and connected to a pipeline.

By the authority granted me under the provisions of the special pool rules governing the Ute Dome-Paradox Pool, set forth in Division Order No. R-46, dated December 29, 1950, Division Memorandum 4-86, dated June 2, 1986, and Division Rule 104.F(2), the above-described unorthodox gas well location for the proposed Mountain Ute Gas Com "N" No. 1 is hereby approved for gas production from the Ute Dome-Paradox Pool.

Sincerely,

Lori Wrotenberg  
Director

LW/MES/kv

cc: New Mexico Oil Conservation Division - Aztec  
U. S. Bureau of Land Management - Durango, Colorado



## Cross Timbers Oil Company

November 16, 1998

Bureau of Land Management  
San Juan Resource Area  
701 Camino Del Rio  
Durango, Colorado 81301  
Attention: Mr. Dan Rabinowitz

RECEIVED  
NOV 19 1998  
OIL CON. DIV.  
DIST. 3

Re: Application for Unorthodox Location  
Ute Dome Paradox Pool  
Mountain Ute Gas Com N #1  
Section 10-31N-14W  
San Juan County, New Mexico

Gentlemen:

Cross Timbers Operating Company hereby requests approval of the following unorthodox location:

Well Name:	Mountain Ute Gas Com N #1
Pool:	Ute Dome Paradox
Location:	655' FNL & 520' FEL
Acreage Dedication:	Section 10-31N-14W, containing 640 acres, more or less
County/State:	San Juan County, New Mexico
Pool Rules:	1650' from lease lines
Existing Well:	Ute Mountain Tribal D #1 (Cross Timbers will shut-in prior to producing the captioned well)

Attached is the following support and documentation for said application:

1. C-102 Plat
2. Geologic discussion
3. Copy of certified letter sent to offset operators/owners
  - A. Plat of offset operators
  - B. List of offset operators

We look forward to your approval and please call me at (817) 877-2336 with any questions.

Yours very truly,

Edwin S. Ryan, Jr.

District I  
PO Box 1380, Hobbs, NM 88241-1380

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102  
Revised February 21, 1994

District II  
PO Drawer DD, Artesia, NM 88211-0719

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

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1000 Rio Brazos Rd., Aztec, NM 87410

District IV  
PO Box 2088, Santa Fe, NM 87504-2088

☐ AMENDED REPORT

## WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30 045-29865		*Pool Code 86760	*Pool Name UTE DOME PARADOX	
*Property Code 24393	*Property Name MOUNTAIN UTE GAS COM N			*Well Number 1
*OGRID No. 167067	*Operator Name CROSS TIMBERS OPERATING COMPANY			*Elevation 5916


10 Surface Location

UL or lot no.	Section	Township	Range	Lot 1st	Feet from the	North/South line	Feet from the	East/West line	County
A	10	31N	14W		655	NORTH	520	EAST	SAN JUAN

<sup>11</sup> Bottom Hole Location If Different From Surface

U. or lot no.	Section	Township	Range	Lot 1st	Feet from the	North/South line	Feet from the	East/West line	County
10 Dedicated Acres		12 Joint or Infill		14 Consolidation Code		15 Order No.			

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

15 5280.00'	5282.64'	655' 520'	17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief
5280.00'	RECEIVED NOV 19 1998 OIL CON. DIV. DIST. 3 10	5280.00'	Signature Gary L. Markestad Printed Name Vice-President / Production Title Date
5281.32'	5281.32'	5281.32'	18 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 supervision and that the same is true and correct to the best of my belief OCTOBER 15, 1998 Date of Survey Signature and Seal of Graduate Surveyor  Certificate Number

## MOUNTAIN UTE GAS COM "N" #1 GEOLOGIC/GEOPHYSICAL DISCUSSION

The Mountain Ute Gas Com "N" #1 is a proposed 8500' Pennsylvanian Paradox Formation test to be located approximately 655' FNL and 520' FEL of Section 10-T31N-R14W, San Juan County, New Mexico.

The Paradox Formation at Ute Dome is approximately 700 ft. thick and composed mostly of algal and fossiliferous carbonates deposited in a shallow water, shelf environment. The Paradox has been subdivided into 5 members, which are, in ascending order, the Alkali Gulch, Barker Creek, Akah, Desert Creek and Ismay. All of these members are productive at Ute Dome. It is implied by Neil Whitehead (1993) that there is no natural vertical communication between the various members of the Paradox, as each appear to have their own unique gas/water contact.

The Ute Dome feature is a structural high formed at the crest of an asymmetrical, northeast plunging anticline. Steeper dips are found on the southern and eastern sides of the anticline, which forms the edge of the present day San Juan Basin. The attached seismic structure map on the top of the Akah Member was interpreted from a vibroseis 3-D seismic survey shot by Amoco in 1995, and reprocessed by Cross Timbers in 1998. It shows the current producing Paradox wells in sections 10 and 11 as being well off of the crest of the structure and at essentially the same subsea depth at the Akah level.

At the Barker Creek level, the Ute Mountain Tribal "D" #1 in Section 10 is structurally the 2nd lowest active producing well in the field. The top of the Barker Creek in this well is only 70 ft. above the original oil/water contact reported by Neil Whitehead (1993). Around 1971, production from this well plunged from over 50,000 MCF/month to around 2000 MCF/month. Numerous attempts have been made through the years to get the rate back up to where it should be according to its previous decline rate but all were unsuccessful. We believe that the major contributing factor is the influx of water and that the only way to recover the remaining hydrocarbons in Section 10 is to shut-in the existing well and drill another well as far up dip in the section as possible.

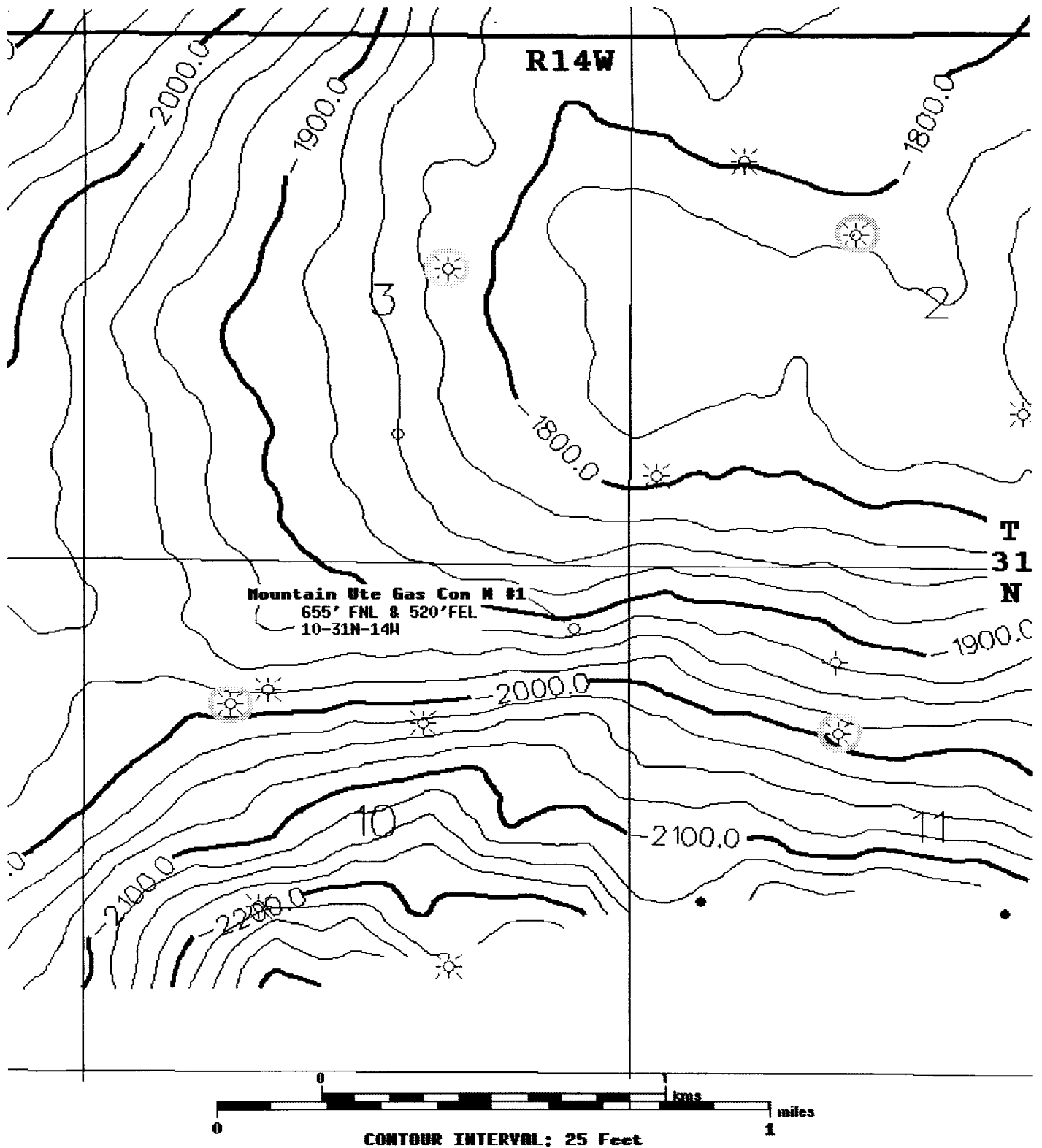
The lateral heterogeneity of the reservoir is exemplified by the Ute Mountain Gas Com "M" #1 well in Section 11. This well, when drilled in 1977 was offset by 4 high-rate wells drilled from 1957-1971, yet encountered essentially virgin pressures.

The primary reason for this is the presence of a 75 ft. thick porous carbonate buildup in the Basal Ismay Member which is not present in any of the offsetting wells. This well today, still produces at more than 3 times the rate of the best offset, primarily due to the laterally discontinuous buildup. Depending on depositional interpretations, this buildup could extend in a northwesterly direction into the northeast corner of Section 10, or northeasterly into the SE $\frac{1}{4}$  of Section 2. Other localized carbonate buildups may also underlie areas not penetrated by the current wells.

The proposed location was chosen because it is at or near the structurally highest position in the section, and it is in an area most likely to encounter the Basal Ismay porosity zone seen in the well in Section 11.

*Gary K. Burch*  
*Nov. 11, 1998*





Paradox Producer



**Cross Timbers Oil Company**

**UTE DOME FIELD**  
**San Juan County, New Mexico**

**STRUCTURE: Top of Akah**

**November, 1998**

**GKB/MSV**



## OFFSET OPERATORS/OWNERS

Cross Timbers Oil Company, Applicant, is the only offset operator.