MARATHON OIL COMPANY

DRILLING OPERATIONS PLAN

DATE: December 2, 1980

WELL NAME: Jicarilla Apache #12-E

LOCATION: 1,685' FSL & 1,685 FEL, Unit J, Sec. 33, T26N, R5W, Rio Arriba Co., New Mexic

1. Geologic name of the surface formation:

   Tertiary - Undifferentiated

2. Estimated tops of important geological markers:

Formation	Depth	Datum	Formation	Depth	Datum
Undifferentiated	Surface		Niobrara	6,233'	(+340')
Kirtland	2,483'	(+4,090')	Basal Niobrara	6,459'	(+114')
Fruitland	2,676'	(+3,897')	Sanastee	6,680'	(-107')
Pictured Cliffs	2,883'	(+3,690')	Greenhorn	6,993'	(-420')
Chacra	3,780'	(+2,793')	Graneros	7,068'	(-495')
Cliffhouse	4,593'	(+1,980')	Dakota	7,163'	(-590')
Menefee	4,730'	(+1,843')	Morrison	7,318'	(-745')
Mancos	5,283'	(+1,290')	T.D.	7,428'	(-855')

3. Estimated depths at which oil, water, gas or other mineral bearing formations are expected to be encountered:

Formation	Depth	Datum	Content
Fruitland	2,676'	(+3,897')	Gas
Pictured Cliffs	2,883'	(+3,690')	Gas
Chacra	3,780'	(+2,793')	Gas
Cliffhouse	4,593'	(+1,980')	Gas
Graneros	7,068'	(- 495')	Gas
Dakota	7,163'	(- 590')	Gas - Primary Objective

4. The Proposed Casing Program:

Casing Design

CASING STRING	HOLE SIZE	INTERVAL	SECTION LENGTH	SIZE (OD)	WEIGHT, GRADE AND JOINT	NEW OR USED	MUD WEIGHT	TENSION LOAD	SF_t	SF_c	SF_b
Surface	13-3/4"	0' - 500'	500'	9-5/8"	36.0#, K55, STC	New	8.5-9.0	18,000#	10	7.96	10
Production	7-7/8"	500' - 5,000'	5,000'	7"	23.0#, K55, STC	New	8.5-9.0	178,000#	1.73	1.19	1.27
		5,000' - 7,428'	2,428'	7"	26.0#, K55, STC	New	8.5-9.0	63,000#	5.80	1.18	1.40

9 5/8" Casing

Cement Program:

Cement Volume: 500 ft. x .5259 cu. ft./ft x 2.0 excess = 525 cu.ft.
Slurry: 500 ft. calculated plus 100% excess - 450 sacks of class "B" cement containing 2% $CaCl_2$.
Slurry Yield: 1.18 cu.ft./SK
Slurry Density: 15.6 16/gal.
Water Requirement: 5.2 gal/SK
Casing Equipment: Guide shoe, insert flapper valve, 3 centralizers. WOC time will be a minimum of 6 hours. If insert valve holds, closed-in pressure after completion of cement job is not recommended.

7" Casing

1st Stage
Cement Volume: 3330 ft. x .1503 cu.ft./ft x 1.20 excess = 600 cu.ft.
Lead Slurry: 2755 ft. calculated plus 20% excess from logs - 270 sacks of high yield cement (BJLite, Halliburton Lite, etc.) containing 0.8% fluid loss additive (D-19, Halad 9, etc.)
Slurry Yield: 1.84 cu.ft/SK
Slurry Density: 12.7 lb/gal.
Water Requirement: 9.9 gal./SK

Tail Slurry: 575' calculated plus 20% excess from logs - 100 sacks of class "B" cement containing .8% fluid loss additive (D-19, Halad 9, etc.)

2nd Stage
Cement Volume: 1600 ft x .1503 cu.ft/ft. x 1.20 excess = 290 cu.ft.
Slurry: 1600 ft. calculated plus 20% excess from logs = 230 sacks of 50/50 pozzolan cement containing 2% bentonite, 6% KCL, 0.6% dispersant (D-31, CFR-2, etc.) and 1.0% fluid loss additive (D-19, Halad 9, etc.)
Slurry Yield: 1.26 cu.ft./SK
Slurry Density: 14.15 lb/gal.
Water Requirement: 5.75 gal/SK

Cement Program cont.:

Casing Equipment: Locate stage collar at 4,100 ft. A guide shoe, flapper type float collar, 2 cement baskets, and 8 centralizers will be used. If float holds, closed-in pressure after completion of cement job is not recommended. Set casing on slips as soon as possible following cement job.

Slurry Preflush: 1st Stage - 800 gal.
2nd Stage - 800 gal.

5. Pressure Control Equipment:
BOP equipment will include a double-ram type preventer with pipe and blind rams and a rotating head (API arrangement SRdG). All equipment will have a 3,000 psi or greater working pressure. Rams, valves, lines, choke manifold and casing will be tested to 1,000 psi for 5 minutes prior to drilling out from under 9 5/8" surface casing. After drilling casing shoe and 5 ft. of additional hole, a shoe test will be performed to 11.0 ppg equivalent mud weight or leakoff, which ever occurs first. The accumulator should be of a sufficient capacity to meet the following requirements:

1. Ability of immediate closure to all members of the stack without recharging.
2. A total of 50% of the original fluid should remain as a reserve after accumulator activation.
3. A minimum pressure of 1,200 psi is required to insure that the preventers remain closed.

Visual checks of the equipment will be made tourly. Function pipe rams daily and blind rams on trips.

6. Drilling Mud Program:

From	To	Type Mud	Weight	% Oil	Water Loss
0'	500'	Spud	8.5 - 9.0	0	No control
500'	T.D.	Gel & Soltex	8.5 - 9.0	0	12 cc

The Fruitland, Pictured Cliffs, and Chacra formations may require additional mud weight to control gas influx. Sufficient barite should be on location in order to increase mud weight to 10.5 ppg if required.
The anticipated maximum bottom-hole pressure is 2800 psi.

7. Auxillary Equipment Required:

A drilling rate recorder, calibrated to record drilling time for each one foot interval will be used.
The mud system will include a desander/desilter, gas buster or degasser, and pit level monitor. Both a remote adjustable and manual choke will be used.
A kelly cock will be used and a full opening manual safety valve will be available on the rig floor. A vented flapper valve will be in use at all times while drilling under surface casing.
A single shot drift indicator will be used.

From	To	Maximun Distance Between Surveys	Maximum Deviation From Vertical	Maximum Change Per 100' of Depth
0'	500'	250'	1^{o}	1^{o}
500'	T.D.	500'	5^{o}	1^{o}

8. Testing, Logging, Coring and Fracing Program:

From T.D. to 500 ft. run: SP-DIL, CNL, FDC, Caliper
From T.D. to surface run: GR
Samples will be taken every 60 ft. from 500 ft. to 6,500 ft.
Samples will be taken every 30 ft. from 6,500 ft. to T.D.

No DST's or cores are anticipated.

8. Testing, Logging, Coring and Fracing Program (cont'd):

Fracing Program:

After the casing is run and cemented, the zones of interest will be perforated. If stimulation is necessary, the well will be fraced with felled water and sand. Fracing with volatile liquids is not planned.

See Diagram "E"

9. Abnormal Conditions:

A normal pressure gradient is anticipated, however, abnormal pressure requiring mud weight as high as 10.5 ppg is possible in the Fruitland, Pictured Cliffs, and Chacra formations.
A normal temperature gradient is anticipated.

10. Anticipated starting date and duration:

Starting Date: 1st Quarter, 1981

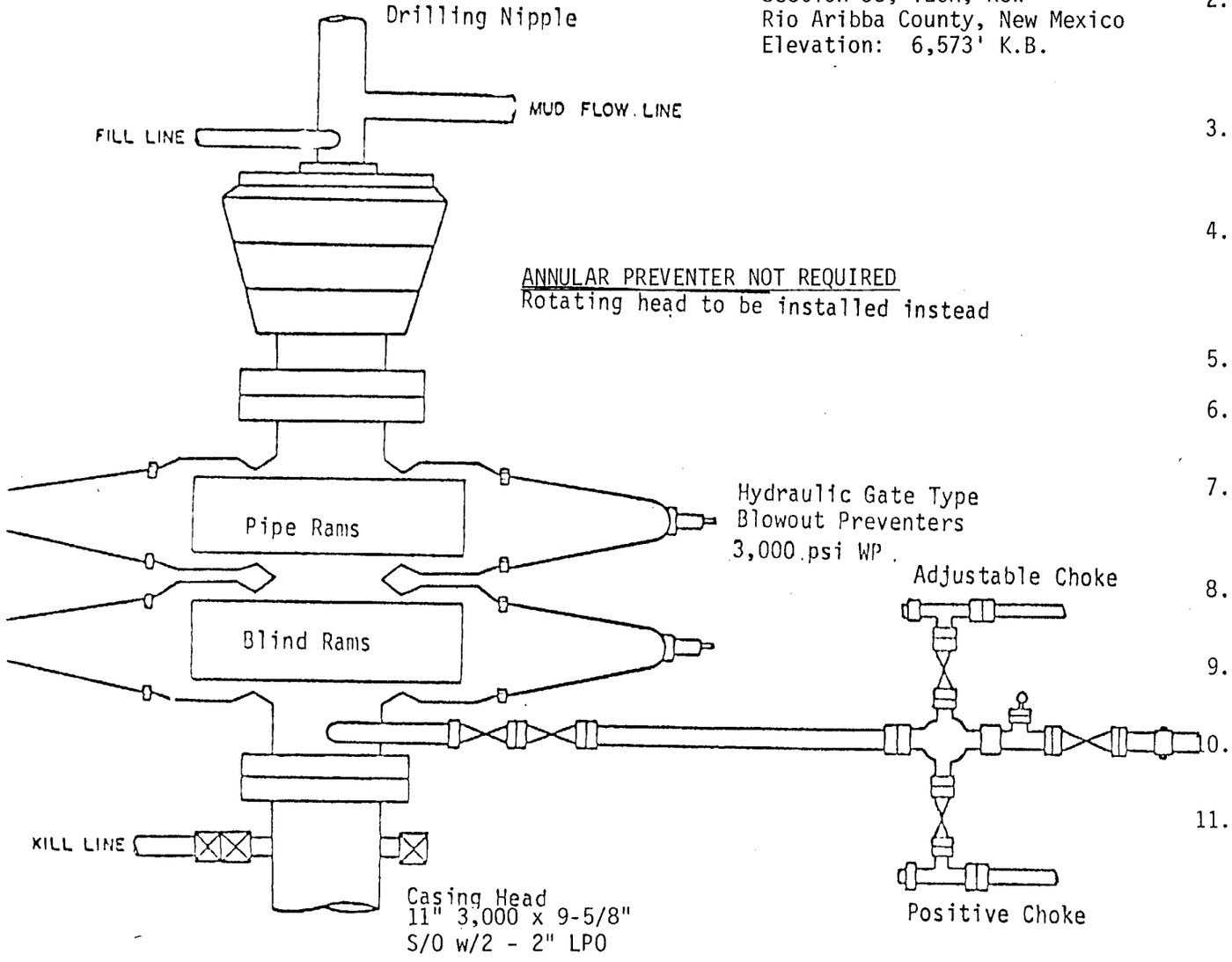
Duration: 18 days

Name M E Kugh

Title Drilling Supt.

Date 12-3-80

Jicarilla Apache #12E Unit J
1,685' FSL, 1,685' FEL
Section 33, T26N, R5W
Rio Arriba County, New Mexico
Elevation: 6,573' K.B.



9-5/8", 24.0#, K55
Casing to 500'

1. Blowout preventers, master valve, plug valve and all fittings must be in good condition. Use new API Seal Rings.
2. All fittings (gates, valves, etc.) to be of equivalent pressure rating as preventers. Valves to be flanged and at least 2" unless otherwise specified. Valves next to BOP to be plug type and nominal 3".
3. Equipment through which bit must pass shall be as large as the inside diameter of the casing that is being drilled through.
4. Safety valve (Omsco or equivalent) must be available on rig floor at all times and with proper connections. The I.D. of safety valves should be as great as I.D. of tool joints on drill pipe.
5. Kelly safety valve installed, same working pressure as BOP's.
6. All lines and controls to preventers must be connected and tested before drilling out of surface pipe.
7. BOP's must be fluid operated, complete with accumulator. Controls may be either on floor or ground near steps from rig floor.
8. Fillup line tied to drilling nipple, the connection must be below and approximately 90^{0} to the flow line.
9. Gauge will be installed for testing but removed while drilling.
10. Spool not required, but when side outlet on BOP's is used, it must be below bottom ram.
11. Casinghead and casinghead fittings to be furnished by Marathon Oil Company.

MARATHON OIL COMPANY
SURFACE USE & OPERATIONS PLAN

DATE: November 24, 1980

WELL NAME: Jicarilla Apache #12-E

LOCATION: 1,685' FEL & 1,685' FSL, Unit J, Sec. 33, T26N, R5W, Rio Arriba Co., New Mexico

#1 Existing Roads:

A. Proposed well site as staked. (Actual staking should include two each 200-foot directional reference stakes).

See attached survey plat.

B. Route and distance from nearest town and locatable reference point to where well access route leaves main road.

See attached map Diagram "A".

C. Access road(s) to location color-coded or labeled.

See attached map Diagram "A" colored coded green.

D. If exploratory well, all existing roads within a 3-mile radius (including type of surface, conditions, etc.).

Not applicable.

E. If development well, all existing roads within a 1-mile radius of well site.

See diagram "A".

F. Plans for improvement and/or maintenance of existing roads.

Blade and gravel where needed.

#2 Planned Access Roads:

Map showing all necessary access roads to be constructed or reconstructed, showing:

(1) Width 16'

(2) Maximum grades 0% - 6%

(3) Turnouts None required

(4) Drainage design Ditched and crowned

(5) Location and size of culverts and brief description of any major cuts and fills.

There will be no cuts, fills or culverts on access road.

(6) Surfacing material

Gravel where needed.

(7) Necessary gates, cattleguards, or fence cuts.

None required

(8) (New or reconstructed roads are to be center-line flagged at time of location staking).

New access road is center-line flagged w/hot blue & orange flagging material and walked 50' on each side by an archeologist from San Juan College, Farmington, NM.

#3 Location of Existing Wells:

Two-mile radius map if exploratory, or 1-mile radius map if development well, showing and identifying existing:

(1) Water wells — None

(2) Abandoned wells — None

(3) Temporary abandoned wells — None

(4) Disposal wells — None

(5) Drilling wells — None

(6) Producing wells — See Map Diagram "A"

(7) Shut-in wells — None

(8) Injection wells — None

(9) Monitoring or observation wells for other resources.

None

#4 Location of Existing and/or Proposed Facilities:

A. Within 1-mile radius of location show the following existing facilities owned or controlled by lessee/operator:

(1) Tank Batteries — See Map Diagram "A"

(2) Production Facilities — See Map Diagram "A"

(3) Gathering Lines — None

(4) Gas Gathering Lines — None

(5) Injection Lines (Indicate if any of the above lines are buried).

None

(6) Disposal Lines — None

B. If new facilities are contemplated, in the event of production, show:

(1) Proposed location and attendant lines by flagging if off of well pad.

Adjacent to the road and as close to the proposed drill site as possible without setting on any fill.
See Diagram "B".

(2) Dimensions of Facilities

See Diagram "B".

(3) Construction methods and materials:

Good engineering practices will be used in the construction of these facilities and materials will be obtained through local vendors and contractors.

B. If new facilities are contemplated, in the event of production, show: (cont'd)

(4) Protective measures and devices to protect livestock and wildlife.

Woven wire fences of the pit areas and flagging, if necessary.

C. Plans for rehabilitation of disturbed areas no longer needed for operations after construction completed.
Restoration of the drill site and tank battery areas will be reshaped to conform with the topography. The top soil will be redistributed at the proper time. The sites will be reseeded as per the recommended seed mixture.

#5 Location and Type of Water Supply:

A. Show location and type of water supply either on map or by written description.
Water supply is a water hole on the Tapicito Creek, located in the NW/4 of Sec. 28, T26N, R5W. See map Diagram "A", color coded blue.

B. State method of transporting water, and show any roads or pipelines needed.
Water will be hauled by truck to the well site. See map Diagram "A" color coded blue for water haul route.

C. If water well is to be drilled on lease, so state. (No APD for water well necessary, however, unless it will penetrate potential hydrocarbon horizons).
No water well will be drilled.

#6 Source of Construction Materials:

A. Show information either on map or by written description.
Construction materials will be native soil or purchased from a Jobber and hauled to the well site by same.

B. Identify if from Federal or Indian Land.
None.

C. Describe where materials, such as sand, gravel, stone and soil material, are to be obtained and used.

Any needed materials will be purchased from a Jobber and hauled to the well site.

D. Show any needed access roads crossing Federal or Indian Lands under Item 2.
None

#7 Methods of handling Waste Disposal:

Describe methods and location of proposed containment and disposal of waste material, including:

(1) Cuttings Reserve Pit

#7 Methods of Handling Waste Disposal: (cont'd)

(4) Sewage Porta Poty

(5) Garbage and other waste material (Trash pits will be completely contained with small mesh wire to prevent wind scattering trash before being burned or buried).
There will be a 10' x 10' burn pit on the drill site, and it will be fenced.

(6) Statement regarding proper cleanup of well site area when rig moves out.
At the completion of drilling, the site and surrounding area will be cleaned up and all burnable material will be put in the burn pit and burned. All foreign material will be buried.

#8 Ancillary Facilities:

Identify all proposed camps and airstrips on a map as to their location, area required and construction methods. (Camp center and airstrip center lines to be staked on the ground).

None

#9 Wellsite Layout:

A plat (not less than 1" = 50') showing:

(1) Cross sections of drill pad with cuts and fills.

See Diagram "C:

(2) Location of mud tanks, reserve, burn and trash pits, pipe racks, living facilities and soil material stockpiles.

See Diagram "D"

(3) Rig orientation, parking areas and access roads.

See Diagram "D"

(4) Statement as to whether pits are to be lined or unlined. (Approval as used in this section means field approval of location. All necessary staking of facilities may be done at time of field inspection). A registered surveyor is not mandatory for such operations.

Pits will not be lined.

#10 Plans for Restoration of Surface:

State restoration program upon completion of operations, including:

(1) Backfilling, leveling, contouring and waste disposal; segregation of spoils materials as needed.
The drill site will be cleaned and waste material will be put in the trash burn pit, which will be covered at the finish of the drilling operation. The reserve pit will be back filled as soon as it is dry.
(2) Revegetation and rehabilitation - including access roads (normally per BLM recommendations).
The top soil will be redistributed and at the proper season and a seed mixture of BLM requirements will be drilled planted.

#10 Plans for Restoration of Surface: (cont'd)

(3) Prior to rig release, pits will be fenced and so maintained until cleanup.

The reserve pit will be fenced on 3 sides during drilling. At the completion of the drilling, all pits will be fenced on the one remaining side.

(4) If oil on pit, remove oil or install overhead flagging.

If there is oil on the reserve pit, it will be removed or flagged with overhead flagging.

(5) Timetable for commencement and completion of rehabilitation operations.

Depending upon climatic conditions, restoration should be completed from six months to one year after spud date.

#11 Other Information:

General Description of:

(1) Topography, soil characteristics, geologic features, flora and fauna.
Topo is sagebrush and scrub pine covered hills, occasionally dissected by drainage features.
Flora is pinon, juniper sage, prickly pear cacti, galleta, Indian rice grass.
Fauna is deer, rabbits, fox, cattle and sheep.

(2) Other surface use activities and surface ownership of all involved lands.
The drill site and access road are owned by the Jicarilla Apache Nation.

(3) Proximity of water, occupied dwellings, archeological, historical or cultural sites.
There is no water or occupied dwellings in the area. Archeological services were to be performed by San Juan College, Farmington, NM.

#12 Lessee's or Operator's Representative:

Mr. Mike E. Krugh
Marathon Oil Company
P.O. Box 2659
Casper, WY 82602
(307) 235-2511 Ext. 484

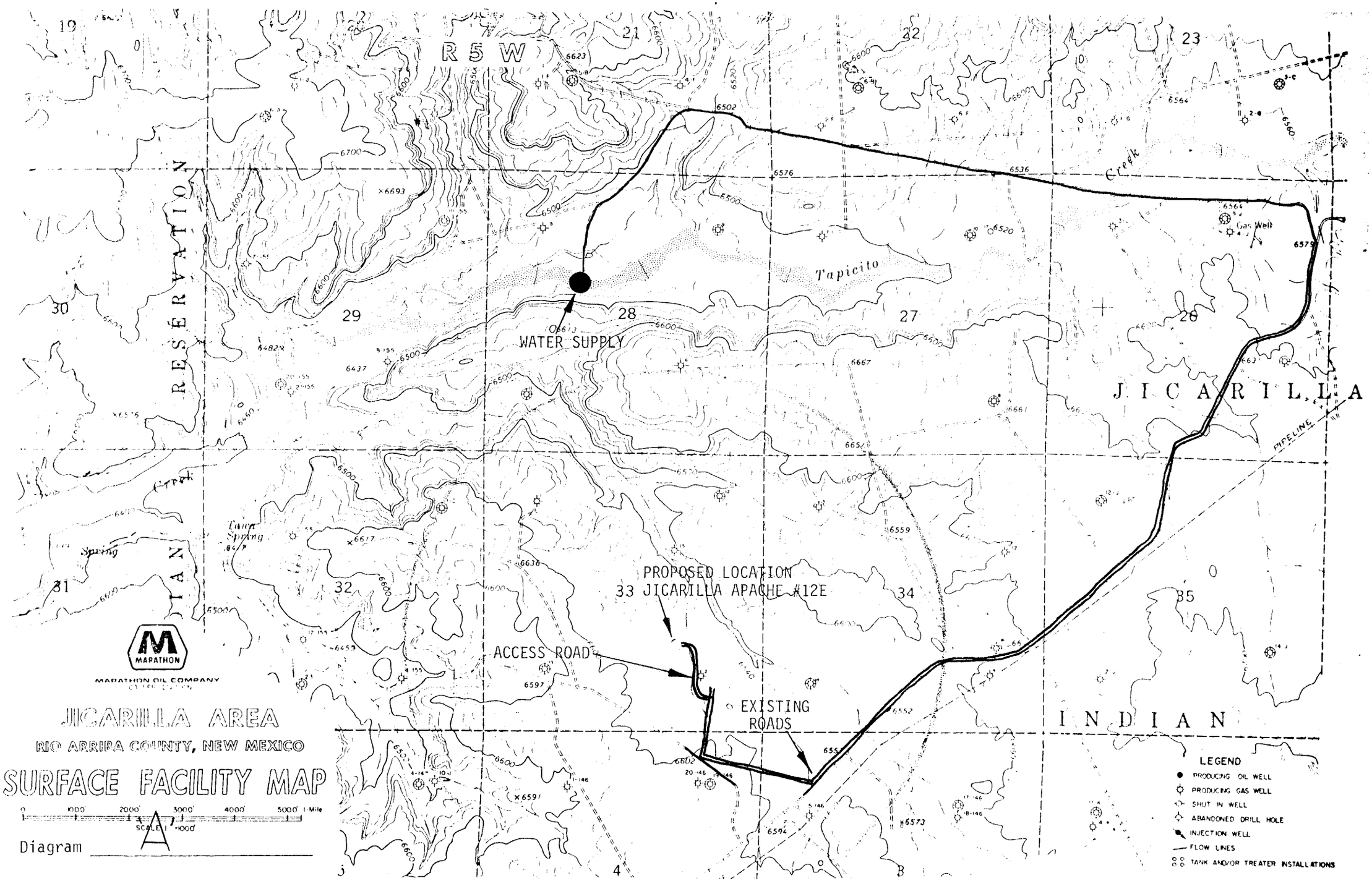
#13 Certification: The following statement is to be incorporated in the plan and must be signed by the lessee's or operator's field representative who is identified in item No. 12 of the plan:

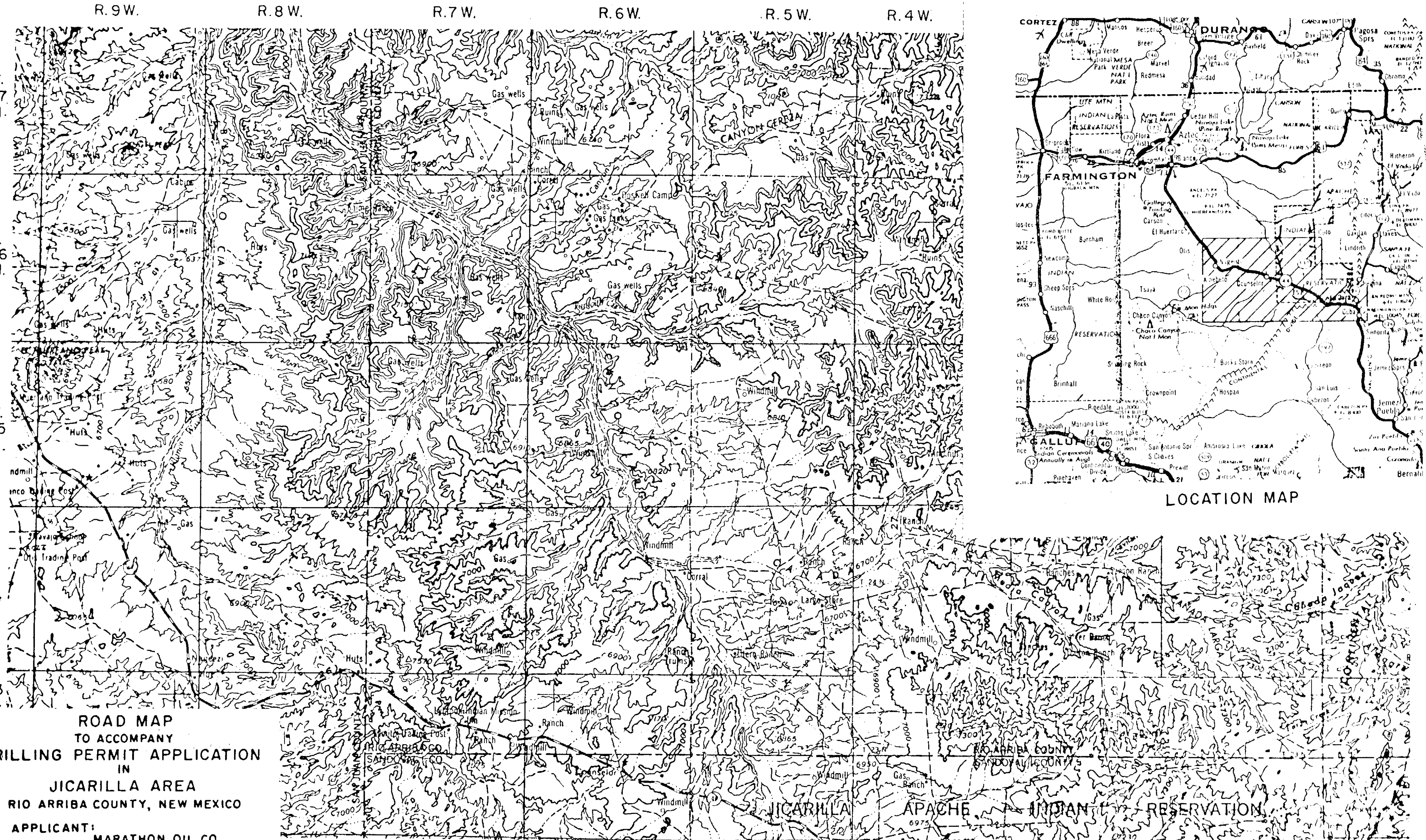
I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and, that the work associated with the operations proposed herein will be performed by Marathon Oil Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

12-3-80
Date

ME Krugh
Name

Drilling Supt.
Title


R 5 W
T 26 N
T 25 N
RESERVATION
JICARILLA
INDIAN
WATER SUPPLY
PROPOSED LOCATION
33 JICARILLA APACHE #12E
ACCESS ROAD
EXISTING ROADS
PIPELINE
Tapicito
Gas Well
MARATHON
MARATHON OIL COMPANY
JICARILLA AREA
RIO ARRIBA COUNTY, NEW MEXICO
SURFACE FACILITY MAP
SCALE 1" = 1000'
Diagram
LEGEND
PRODUCING OIL WELL
PRODUCING GAS WELL
SHUT IN WELL
ABANDONED DRILL HOLE
INJECTION WELL
FLOW LINES
TANK AND/OR TREATER INSTALLATIONS

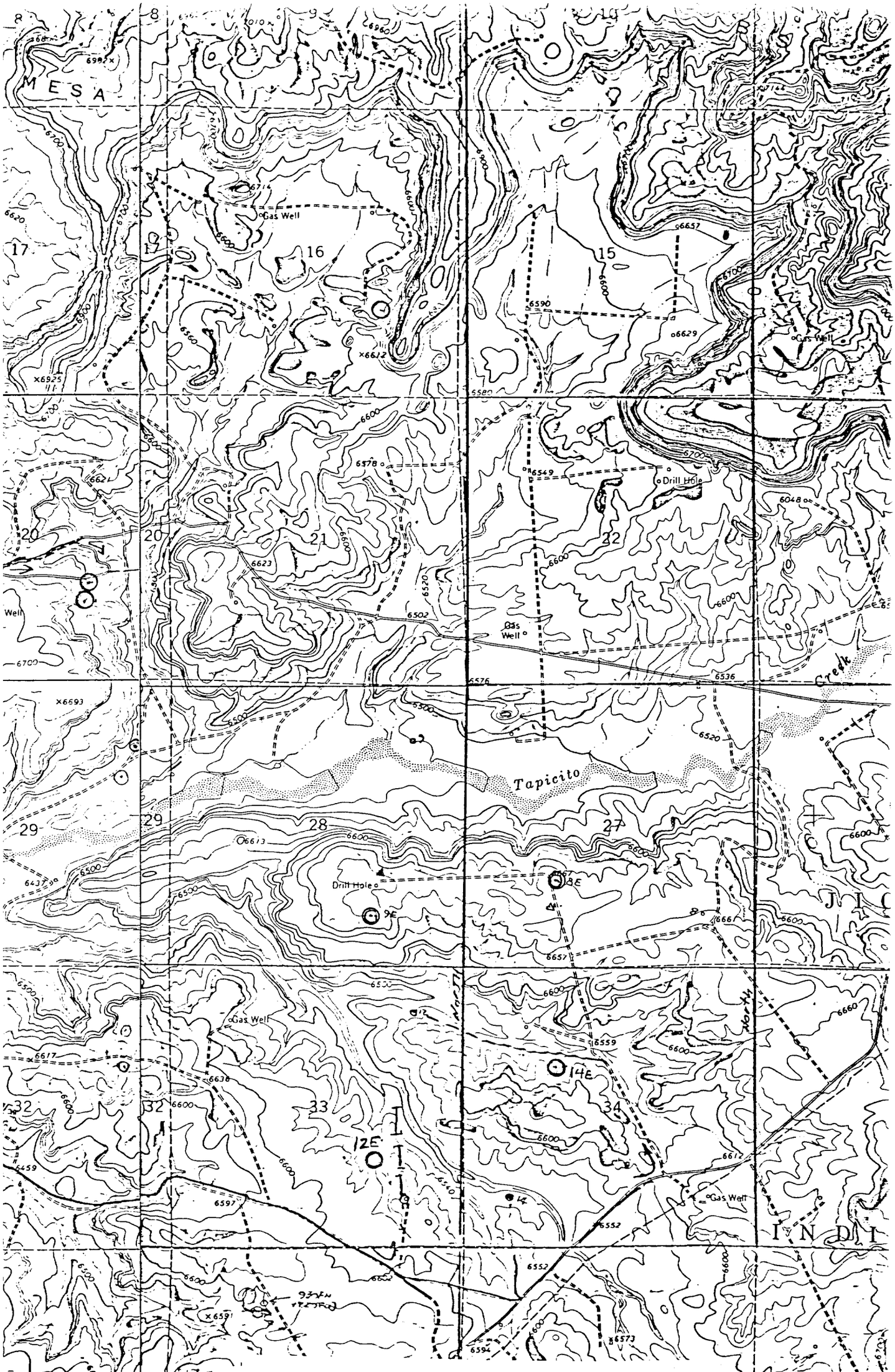


LOCATION MAP

ROAD MAP
TO ACCOMPANY
DRILLING PERMIT APPLICATION
IN
JICARILLA AREA
RIO ARRIBA COUNTY, NEW MEXICO

APPLICANT: MARATHON OIL CO.
CASPER, WYO. 82601

Part of Diagram



Vicinity Map for
MARATHON OIL COMPANY #12E JICARILLA APACHE
1685'FSL 1685'FEL Sec. 33-T26N-R5W
RIO ARRIBA COUNTY, NEW MEXICO