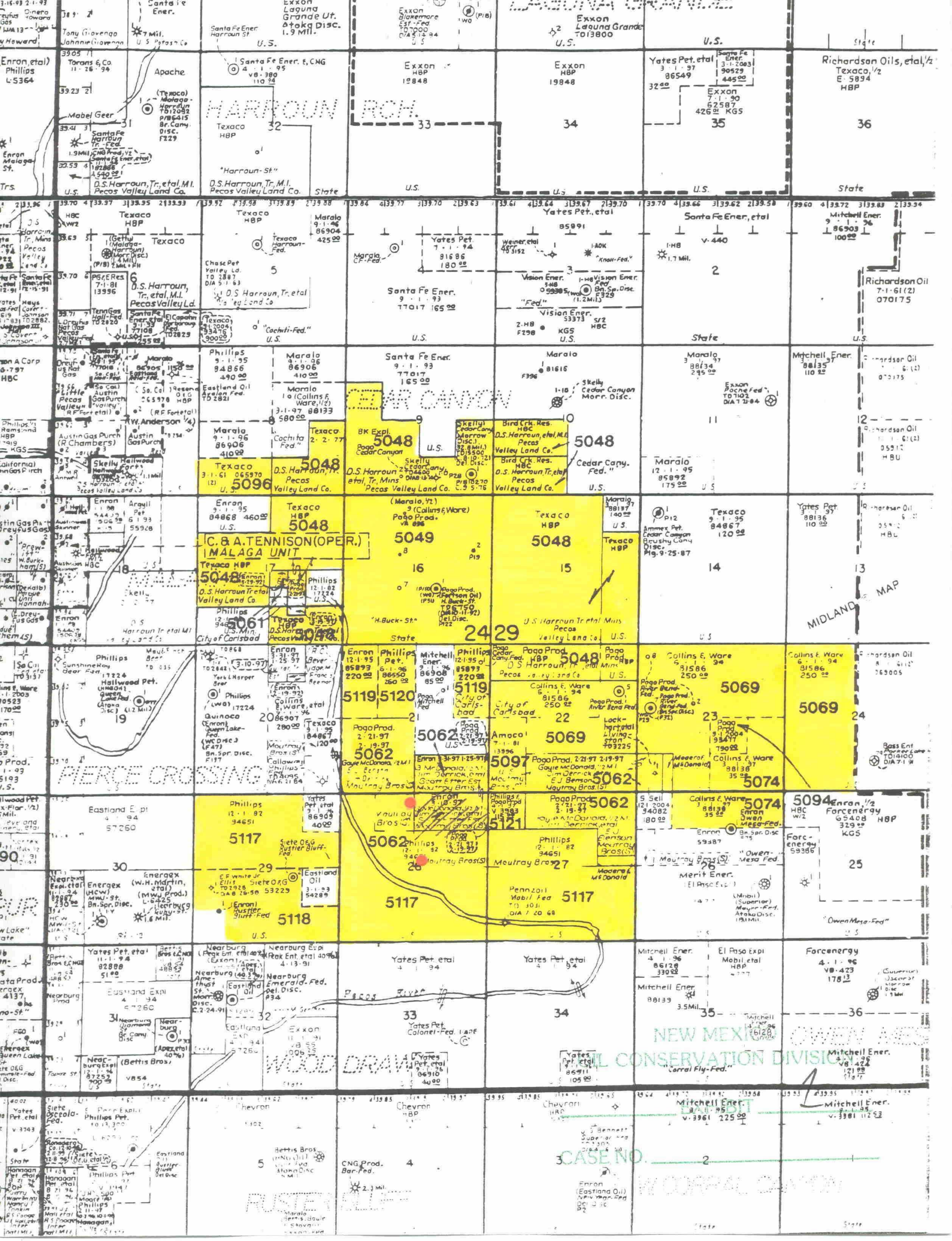

HARROUN RCH.
CEDAR CANYON
PIERCE CROSSING
WOOD DRAW
RUSTLER BLUFF
W. CORRAL CANYON
C. & A. TENNISON (OPER.) MALAGA UNIT
MIDLAND MAP
Pecos River
NEW MEXICO OIL CONSERVATION DIVISION
EXHIBIT
CASE NO.
Exxon Laguna Grande TO13800
Harroun-St.
D.S. Harroun, Tr., etal, M.I. Pecos Valley Land Co.
Richardson Oils, etal, 1/2 Texaco, 1/2 E-5894 HBP
Richardson Oil 7-1-61 (2) 070175
Yates Pet., etal 85891
Santa Fe Ener., etal
Santa Fe Ener. 9-1-93 77017 165 00
Vision Ener.
Texaco HBP 5048
Pogo Prod. 5049
5096
5061
5119
5120
5062
5069
5074
5094
5097
5121
5117
5118
City of Carlsbad
Collins & Ware 81586 250 00
Eastland Oil
Siete O&G Rustler Bluff-Fed.
Phillips 12-1-82 94651
Pennzoil Mobil Fed.
Yates Pet. etal 4-1-94
Mitchell Ener. 88139
El Paso Expl.
Forcenergy 4-1-96 VB-423
Owen Mesa Fed.
Chevron HBP
Bettis Bros
CNG Prod. Bar-Fed.
Nearburg Expl. Emerald-Fed.
Exxon
Moutray Bros (S)
Meyer-Fed.

Filed: 9/28/95

Form 3160-3
(November 1983)
(formerly 9-331C)

SUBMIT IN [illegible]LICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-0136
Expires August 31, 1985

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

5. LEASE DESIGNATION AND SERIAL NO.: NM-94651

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Cedar Canyon "28" Federal

9. WELL NO.: 1

10. FIELD AND POOL, OR WILDCAT: Wildcat (Bone Springs)

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 28, T-24S, R-29E

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

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

2. NAME OF OPERATOR: Pogo Producing Company ✓

3. ADDRESS OF OPERATOR: P.O.Box 10340, Midland, Texas 79702

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 230' FNL & 2510' FWL of Section 28
At proposed prod. zone: Same

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 5 miles east southeast of Malaga, N.M.

12. COUNTY OR PARISH: Eddy Co. | 13. STATE: N.M.

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
230'	1400	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**
2200'	9200'	Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 2919' Ground Level

22. APPROX. DATE WORK WILL START*: Upon Approval

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
14 3/4"	10 3/4"	40.5#	500'	Sufficient to circulate
9 7/8"	7 5/8"	26.4#	2900'	Sufficient to circulate
6 3/4"	4 1/2"	11.6#	9200'	700 sx

The operator proposes to drill to a depth sufficient to test the Delaware and Bone Springs for oil. Specific programs are outlined in the following attachments:

DRILLING PROGRAM
SURFACE USE AND OPERATING PLAN
EXHIBIT A - ROAD MAP
EXHIBIT B - EXISTING WELL MAP
EXHIBIT C - LOCATION AND ACREAGE DEDICATION PLAT
EXHIBIT C-1 - TOPO MAP
EXHIBIT D - DRILLING AND RIG LAYOUT
EXHIBIT E - 3M BOP EQUIPMENT

2A

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 [signature] TITLE Agent DATE 9/28/95

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions On Reverse Side

DRILLING PROGRAM

Attached to Form 3160-3

Pogo Producing Company

Cedar Canyon "28" Federal No. 1
230' FNL & 2510' FWL
Unit Letter C, NE/NW
Section 28, T24S, R29E
Eddy County, New Mexico

1. **Geologic Name of Surface Formation:** Permian

2. **Estimated Tops of Important Geologic Markers and**
3. **Estimated Depths of Fresh Water, Oil, and Gas:**

Formation	Depth	Fluid Content
Permian	Surface	Fresh water at +250'
Rustler Anhydrite	500'	-----
Top of Salt	900'	-----
Base of Salt	2800'	-----
Lamar Lime	3250'	-----
Delaware Sands	3400'	-----
Bone Spring	7800'	Oil
Total Depth	9200'	

No other formations are expected to give up oil, gas, or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 10 3/4" casing at 500' into the Rustler anhydrite and circulating cement to surface. Potash will be protected by setting 7-5/8" intermediate casing at 2900' and circulating cement to surface. 4-1/2" production casing will be set at TD, and cement will be brought back to at least 2000', thus ensuring that all zones are adequately isolated. The pore pressure gradient is normal (+8.4 ppg) down through the Bone Springs. No abnormal pressures are anticipated.

4. **Casing and Cementing Program**

Hole Size	Casing From	To	Casing OD	Weight, Grade, Coupling, Cond.
14 3/4"	0'	500'	10-3/4"	40.5# J-55 STC
9 7/8"	0'	2,900'	7-5/8"	26.40# K55 LTC
6 3/4"	0	TD	4-1/2"	11.60# J-55 & N-80 LTC

All used casing will be drifted and hydrostatically tested to at least 90% of new pipe rating.

Minimum Design Factors: Collapse 1.125, Burst 1.1, Tension 1.7

10-3/4" surface casing set at 500'
The surface casing will be set into the Rustler anhydrite to protect all fresh water formations.
Centralize the bottom 3 joints and every 4th joint to surface.
Cement to surface with 200 sx of Class C with 4% gel, 2% CaCl2 (13.5 ppg, 1.74 ft3/sx) followed by 200 sx Class C with 2% CaCl2 (14.8 ppg, 1.32 ft3/sx).

7-5/8" intermediate casing set at 2900'
The intermediate casing will be set within 100' of the top of the Delaware to isolate all salt stringers.
Centralize the bottom 3 joints.
Cement to surface with 500 sx of 35/65 Pozmix Class H with 6% gel, 5% salt, 1/4# FC (12.8 ppg, 1.94 ft3/sx) followed by 200 sx Class C with 1% CaCl2 (15.6 ppg, 1.19 ft3/sx).

4-1/2" production casing set at TD'
Centralize every joint from TD to bottom of the intermediate casing.
Top of cement to be at 2000'
A 2-stage cement job will be required with a DV tool at +6000'.
Stage 1: 350 sx 50/50 Pozmix Class H with 2% gel, 5% salt, 1/4# FC (14.2 ppg, 1.34 ft3/sx).
Stage 2: 250 sx 50/50 Pozmix Class H with 2% gel, 5% salt, 1/4# FC (14.2 ppg, 1.34 ft3/sx) followed by 100 sx Class H (15.6 ppg, 1.19 ft3/sx).

5. **Minimum Specifications for Pressure Control:**

12 1/4" hole

The following BOP equipment will be nippled up on the 10-3/4" casing and used continuously until TD is reached for the 9 7/8" hole.

The blowout preventer equipment (BOP) shown in Exhibit E will consist of a 3000 psi WP double ram type preventer and a 3M annular (bag type) preventer with rotating head. Both BOP's will be hydraulically operated. At the drilling contractor's option, 5M BOP's may be substituted. H2S trim will not be required.

Before drilling out from under the 10-3/4" casing, all BOP's and accessory equipment will be tested to 1000 psi with the rig pump. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

BLM method to calculate minimum BOP requirements:
(.052)(10 ppg)(2900') - (0.22 psi/ft)(2900') = 870 psi
Minimum BOP requirements: 2M BOP stack and manifold system

6-3/4" hole

The following BOP equipment will be nippled up on the 7-5/8" casing and used continuously until TD is reached for the 6-3/4" hole.

The blowout preventer equipment (BOP) shown in Exhibit E will consist of a 3000 psi WP double ram type preventer and a 3M annular (bag type) preventer with rotating head. Both BOP's will be hydraulically operated. At the drilling contractor's option, 5M BOP's may be substituted. H2S trim will not be required.

Before drilling out from under the 8-5/8" intermediate casing, all BOP's and accessory equipment will be tested to 1000 psi with the rig pump. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

BLM method to calculate minimum BOP requirements:
(.052)(8.4 ppg)(9200') - (0.22 psi/ft)(9200') = 1994 psi
Minimum BOP requirements: 2M BOP stack and manifold system

6. **Proposed Mud System:**

The well will be drilled to TD with a combination of fresh water and 10# brine. The applicable depths and properties of this system are as follows:

Depth	Type	Weight (ppg)	Viscosity (sec)	Water Loss (cc)
0-500'	Fresh water	8.5	28	NC
500-2900'	Brine	10.0	29	NC
2900-TD	Fresh	8.5	28-32	16

Sufficient mud materials to maintain mud properties and meet minimum lost circulation requirements will be kept at the wellsite at all times.

7. **Auxiliary Well Control and Monitoring Equipment:**

a) A kelly cock will be kept in the string at all times.

b) A full opening drill pipe stabbing valve (TIW/inside BOP) with proper drill pipe connections will be on the rig floor at all times.

c) An electronic pit volume totalizer system will NOT be used. The drilling fluids system will be visually monitored at all times.

d) A mudlogging unit will be continuously monitoring drilling penetration rate and hydrocarbon shows from 2900' to TD.

8. **Logging, Testing, and Coring Program:**

a) Drillstem tests will be run on the basis of drilling shows.

b) The electric logging program will consist of:
   1) 6-3/4" hole - Gamma ray, dual induction log, compensated neutron and litho-density logs.

c) No conventional cores are planned. Selected intervals may be sidewall cored based upon shows and openhole logs.

d) Further testing procedures will be determined after the 4-1/2" production casing has been cemented at TD.

9. **Abnormal Conditions, Pressures, Temperatures, and Potential Hazards:**

No abnormal pressures, temperatures, or other potential hazard are anticipated.

No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported, or are known to exist at this depth in this area. No major lost circulation zones have been reported in offsetting wells.

The maximum anticipated bottom hole pressure is approximately 3918 psi. (9200' x .433 psi/ft = 3956 psi.)
The maximum anticipated bottom hole temperature is 130 deg F.

10. **Anticipated Starting Date and Duration of Operations:**

Road and location work will not begin until approval has been received from the BLM. The anticipated spud date is October 31, 1995. Once commenced, the drilling operation should be complete in 15 days. If the well is productive, an additional 30 days will be required for completion, testing, and installation of permanent facilities.

SURFACE USE AND OPERATING PLAN

Attached to Form 3160-3

Pogo Producing Company

Cedar Canyon "28" Federal No. 1
230' FNL & 2510' FWL
Unit Letter C, NE/NW
Section 28, T24S, R29E
Eddy County, New Mexico

Located:	5 miles east southeast of Loving, New Mexico
Federal Lease Number:	NM-94651
Lease Issued:	12/1/72
Acres in Lease:	1400 acres
Record Lessee:	Pogo Producing Company
Surface Ownership:	Ellen Madera P.O. Box 1686 Carlsbad, N.M. 88221
Grazing Permittee:	Raymond McDonald P.O. Box 66 Loving, New Mexico 88265
Pool:	Wildcat (Bone Springs)
Pool Rules:	The 40 acre oil well spacing rules apply to this location, being 330' to the nearest side boundary or 1/4-1/4 section line, nor closer than 330' to the nearest well capable of producing from the same formation.
Exhibits:	A. Road Map B. Existing Wells Map C. Well Location and Acreage Dedication Plat C-1. Topo Map D. Drilling Rig Layout Diagram E. BOP Equipment

1. **Existing Roads:**

a) The well site and elevation plat for the proposed well is shown in Exhibit C. It was staked by John West Engineering, Hobbs, N.M.

b) All roads to the location are shown on Exhibit B. The existing roads are illustrated in black and are adequate for travel during drilling and production operations. Upgrading of the road prior to drilling will be done where necessary as determined during the onsite inspection.

c) Directions to Location: Go east of Malaga approximately 1 mile. Turn south and go approximately 3/4 mile to where road veers to the southeast. Follow road approximately 2.2 miles to where road splits. Take right split east southeast approximately 2.2 miles to Pierce Canyon Crossing. Cross river and turn west and follow ditch to proposed location.

d) Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

2. **Proposed Access Road:**

Exhibit B shows the new access road to be constructed and is illustrated in green. The proposed access road as shown in Exhibit B has been centerline flagged by John West Engineering, Hobbs, N.M. The road will be constructed as follows:

a) Length and Width: 4200' of new access road will be constructed. The maximum width of the running surface will be 15'. See Exhibit B.

b) Surfacing Material: Caliche material will be used to surface the proposed road. It will be watered, compacted, and graded. Caliche will be obtained from either the reserve pit or a borrow pit on the proposed location as described in Item 6 of the Surface Use and Operating Plan.

c) Maximum Grade: An approximate grade of less than two percent will be encountered from the existing road to the proposed well pad.

d) Turnouts: No turnouts are planned.

e) Drainage Design: The new road will be crowned at the center to direct drainage to ditches on both sides of the roadway with turnout ditches to be constructed as required. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns. BLM may specify any additions or changes during the onsite inspections.

f) Culverts: None required.

g) Cuts and Fills: A slight amount of leveling will be required as the road crosses several small size sand dunes to the proposed well pad.

h) Gates and Cattle Guards: A cattleguard will be installed, as a fence cut will be necessary.

3. **Location of Existing Wells:**

Exhibit No. B shows all existing wells within a one-mile radius of this well.

4. **Location of Existing and/or Proposed Facilities:**

a) Pogo Producing Company does not operate a production facility on the Cedar Canyon "28" Federal lease.

b) If the well is productive, contemplated facilities will be as follows:

A battery will be installed on location.

c) An electric power line will be constructed as shown on Exhibit B.

5. **Location and Type of Water Supply:**

The well will be drilled with a combination of brine and fresh water mud system as outlined in the drilling program.

The water necessary for drilling operations will be purchased and trucked to the wellsite, or will be moved to the wellsite by way of a temporary pipeline laid on the ground alongside existing and proposed roads.

6. **Source of Construction Materials:**

Caliche needed for the road and well pad will be taken from the proposed reserve pit. An alternate plan will be to obtain caliche from a borrow pit located within the 400' x 400' archaeologically cleared tract at the proposed well site. If sufficient quality or quantity of caliche is not available, it will be transported to the proposed road and well site from an existing BLM approved caliche pit. The BLM will be notified and consulted if caliche must be obtained off location.

7. **Method of Handling Waste Disposal:**

a) Drill cuttings will be disposed into the reserve pit.

b) Drilling fluids will be contained in the reserve pit. The reserve pit will be an earthen pit, approximately 150' x 150' x 6' deep and fenced on three sides prior to drilling. The fourth side will be fenced immediately following rig removal. The reserve pit will be lined with plastic (5-7 mil thickness) to minimize loss of drilling fluids.

c) Water produced from the well during completion may be disposed into the reserve pit or a steel tank (depending upon rates).

d) Drilling fluids will be allowed to evaporate in the drilling pits until the pits are dry.

e) Oil produced during testing will be stored in steel test tanks until sold.

f) Trash, waste paper, garbage, and junk will be placed in a trash bin located on the drill site pad. It will be transported to an approved landfill for disposal within 30 days after completion of drilling and/or completion of operations. All waste material will be contained to prevent scattering by the wind.

g) A portable chemical toilet will be provided on the location for human waste during the drilling and completion operations.

8. **Ancillary Facilities:**

No other facilities will be built as a result of the operations on this well.

9. **Well Site Layout:**

a) Exhibit D shows the relative location and dimensions of the well pad, mud pits, reserve pit, location of the major rig components, and location of parking areas.

b) Cut and fill requirements will be minor, but clearing and leveling of the well site will be necessary. Top soil, if available, will be stockpiled per BLM specifications as determined at the on-site inspection.

c) The reserve pit will be lined with a high quality plastic sheeting (5-7 mil thickness).

d) The pad and pit area are staked and flagged.

10. **Plans for Reclamation of the Surface:**

a) After completion of drilling and/or completion of operations, all equipment and other material not needed for operations will be removed. The pit area will be allowed to dry before reclamation. If the borrow pit is constructed, the cuttings in the reserve pit will be deep buried in the borrow pit, and the reserve pit and borrow pit will be broken out, filled, and leveled. The location will be cleaned of all trash and junk to leave the well site in an as aesthetically pleasing condition as possible.

b) Three sides of the reserve pit will be fenced prior to and during drilling operations. The borrow pit will be fenced on all four sides after the location is built. At the time the rig is removed, the reserve pit will be fenced on the fourth side to prevent livestock or wildlife from being entrapped in the pits. The fencing will remain in place until the pits are cleaned up and leveled.

c) After abandonment, all equipment, trash, and junk will be removed and the well site will be cleaned.

d) Topsoil removed from the drill site will be used to recontour the pit area to the original natural level. The disturbed area will be revegetated by reseeding during the proper growing season with a seed mixture of native grasses as recommended by the BLM.

11. **Other Information:**

a) Topography: The land surface in the area is undulating with small sand dunes. In the immediate area of the well site, the land slope is to the northwest.

b) Soil: Top soil at the well site is loamy sand.

c) Flora and Fauna: The vegetation cover is moderate. It includes range grasses, weeds, scrub oak bushes, and mesquite bushes. Wildlife in the area is that typical of a semi-arid desert land and includes coyotes, rabbits, rodents, reptiles, hawks, dove, quail, and other small birds.

d) Ponds and Streams: The Pecos River is 250 feet to the south of this location.

e) Residences and Other Structures: There is an abandoned ranch house approximately 4400' east of this location.

f) Archaeological, Historical, or other Cultural Sites: None are known of in the area. An Archaeological survey has been conducted.

g) Land Use: Grazing, oil and gas production, and wildlife habitat.

h) Surface Ownership: Ellen Madera

12. **Operator's Representative:**

Richard L. Wright
Division Operations Supervisor
Pogo Producing Company
P.O. Box 10340
Midland, Texas 79702
(915) 682-6822

13. **Certification**:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; 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 Pogo Producing Company and its contractors and sub-contractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U. S. C. 1001 for the filing of false statement.

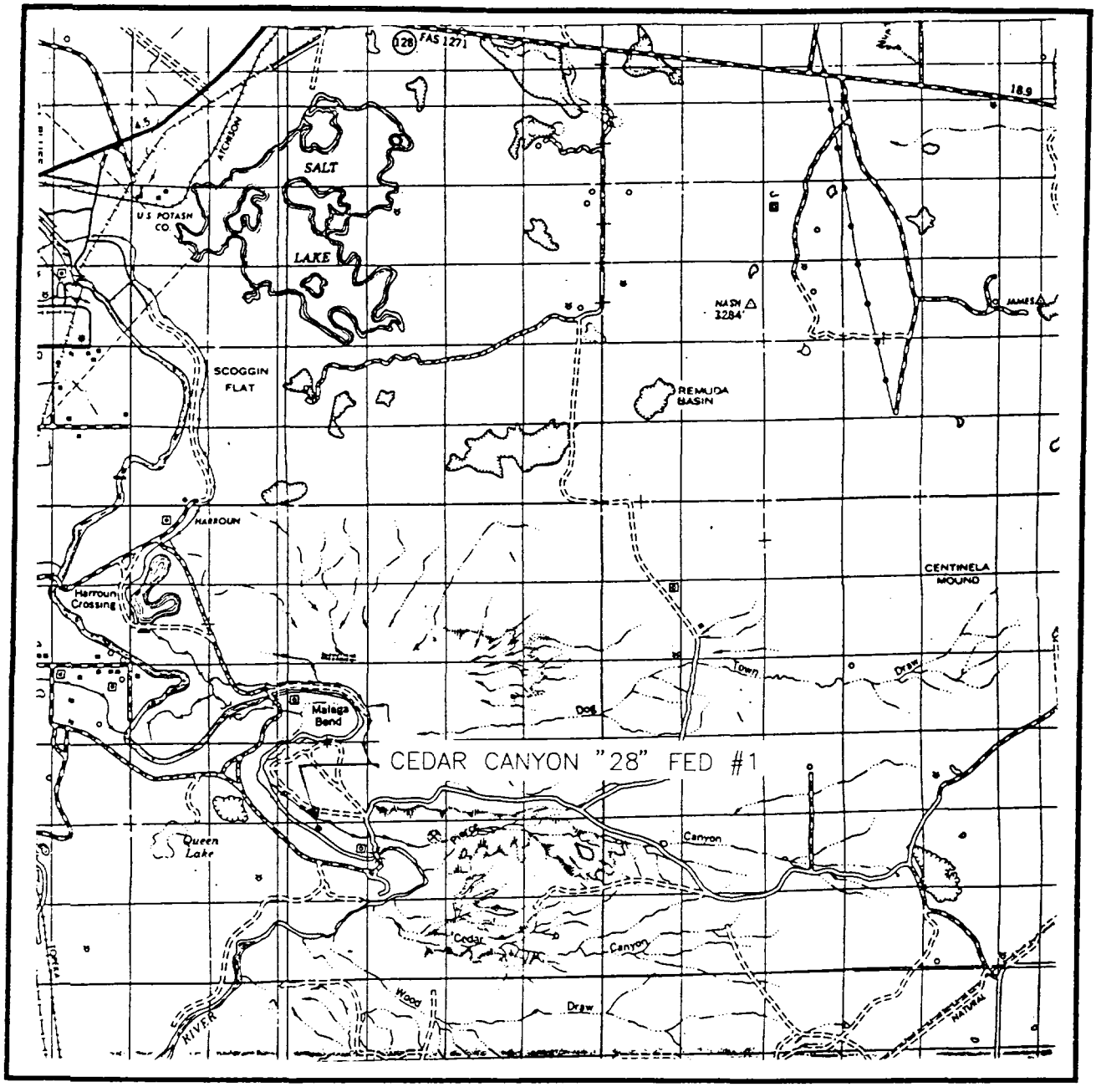
9/28/95
Date

James M.C. Ritchie, Jr.
Agent

Enclosures

VICINITY MA.

ROAD MAP



SCALE: 1" = 2 MILES

SEC. 28 TWP. 24-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 230' FNL & 2510' FWL

ELEVATION 2919

OPERATOR POGO PRODUCING CO.

LEASE CEDAR CANYON "28" FED.

EXHIBIT "A"

JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
(505) 393-3117

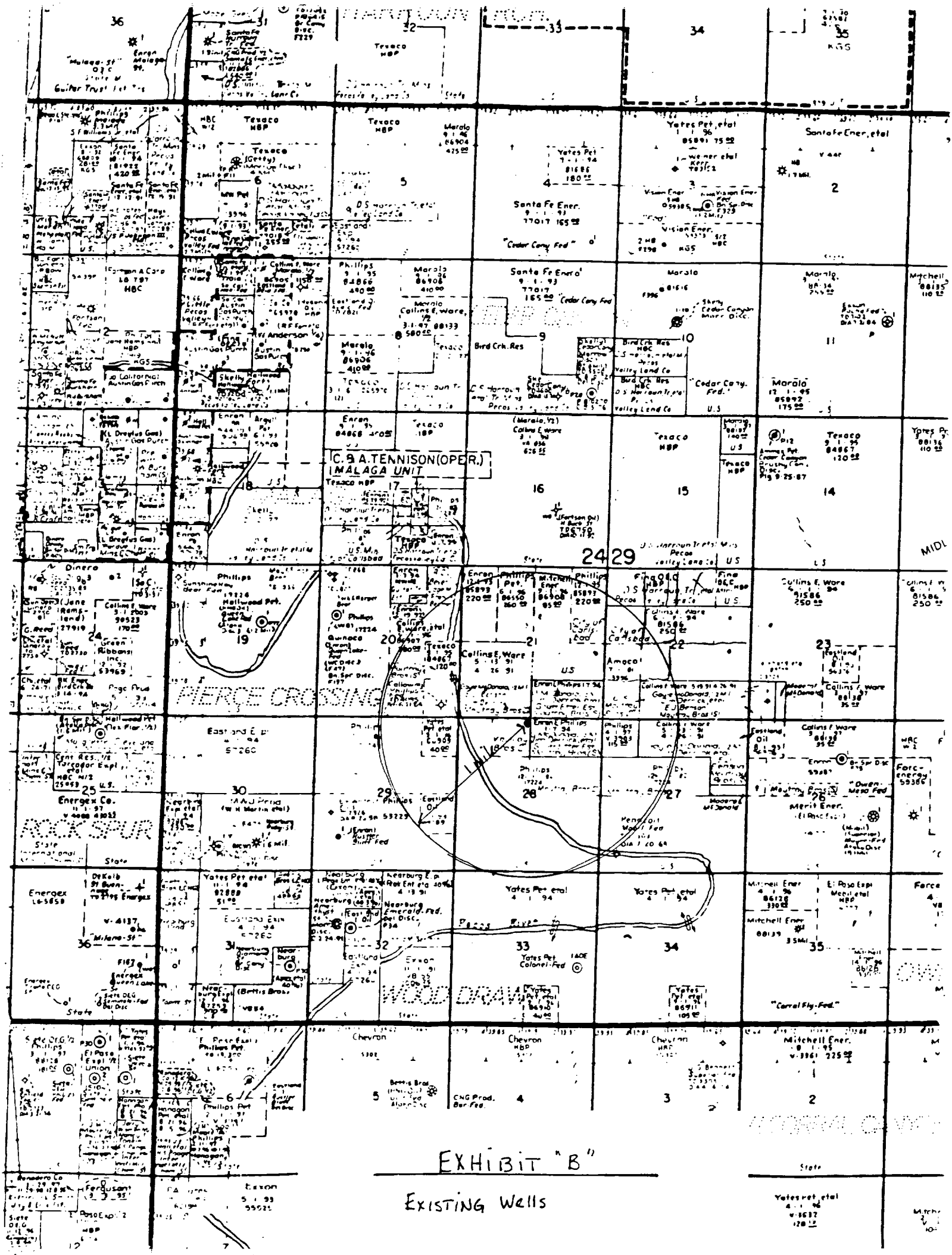


EXHIBIT "B"

EXISTING WELLS

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
		Wildcat (Bone Springs)

Property Code	Property Name	Well Number
	CEDAR CANYON "28" FEDERAL	1

OGRID No.	Operator Name	Elevation
017891	POGO PRODUCING CO.	2919

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	28	24 S	29 E		230	NORTH	2510	WEST	EDDY

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.

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

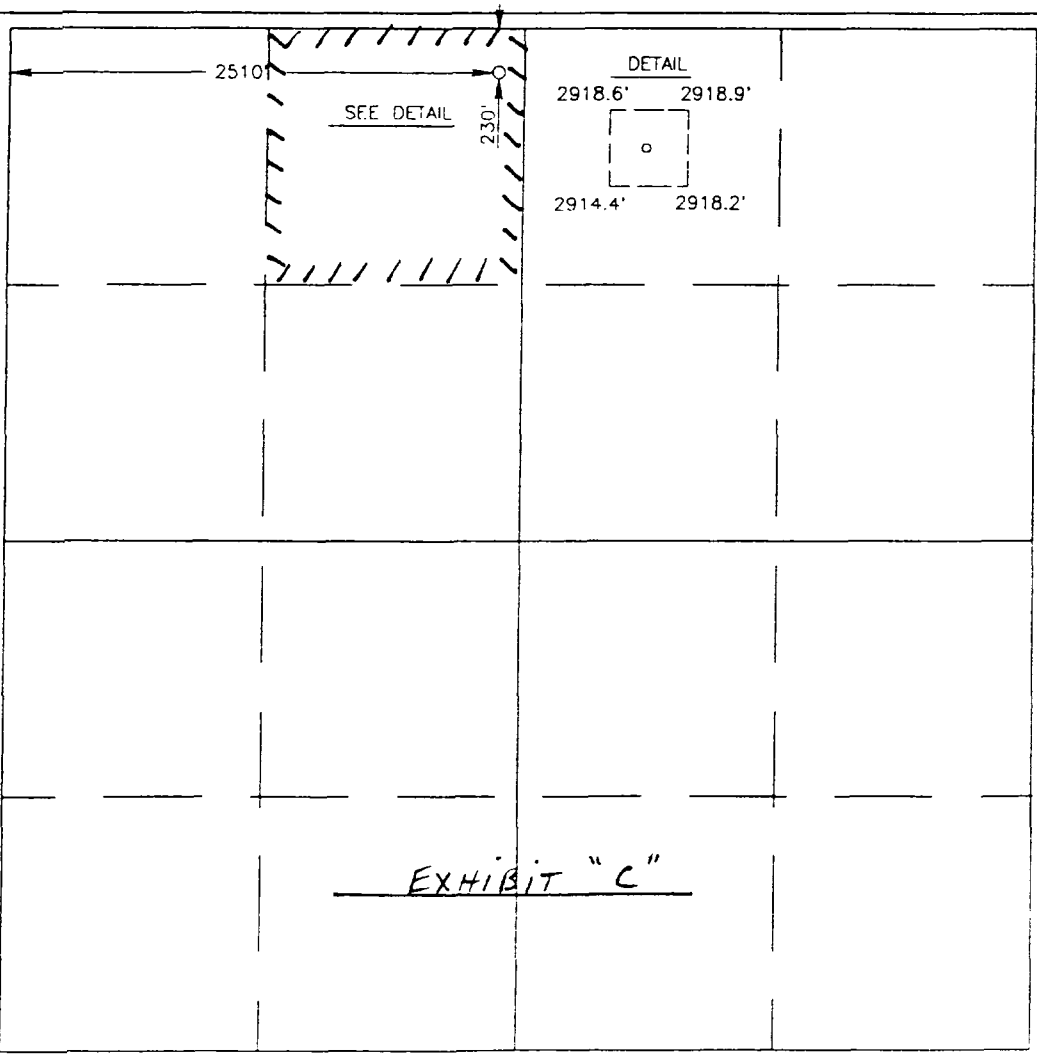


EXHIBIT "C"

OPERATOR CERTIFICATION

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

Signature

James M.C. Ritchie, Jr.
Printed Name

Agent
Title

9/21/95
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.

SEPT. 11, 1995
Date Surveyed

Signature & Seal of Professional Surveyor

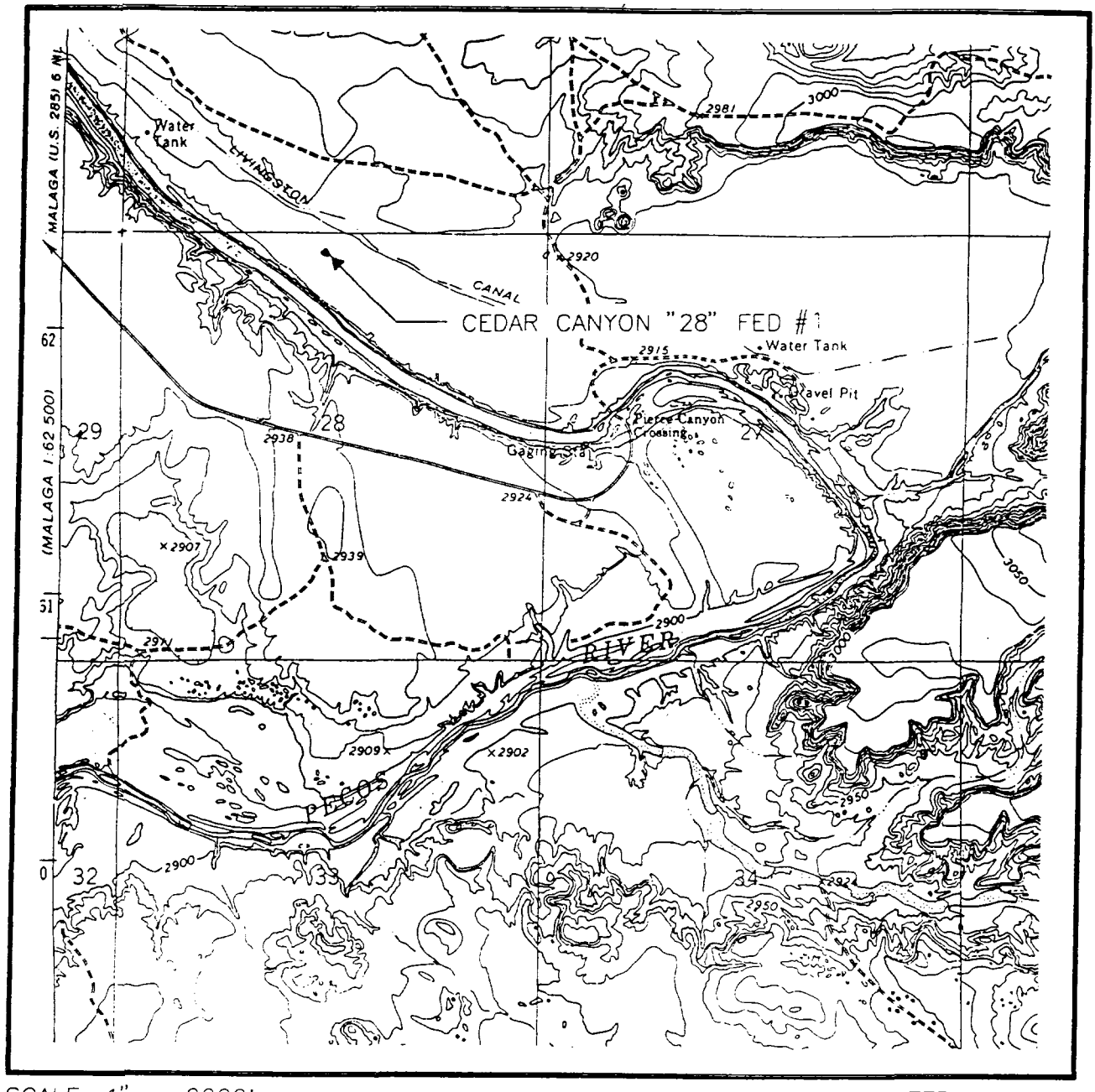
DMCC

W.O. Num. 95-11-1377

Certificate No. JOHN W. WEST 676
RONALD J. EIDSON 3239
GARY L. EIDSON 12641

LOCATION VERIFICATION MAP

TOPO MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
PIERCE CANYON – 10'

SEC. 28 TWP. 24-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 230' FNL & 2510' FWL

ELEVATION 2919

OPERATOR POGO PRODUCING CO.

LEASE CEDAR CANYON "28" FED.

U.S.G.S. TOPOGRAPHIC MAP
PIERCE CANYON, N.M.

EXHIBIT "C-1"

JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
(505) 393-3117

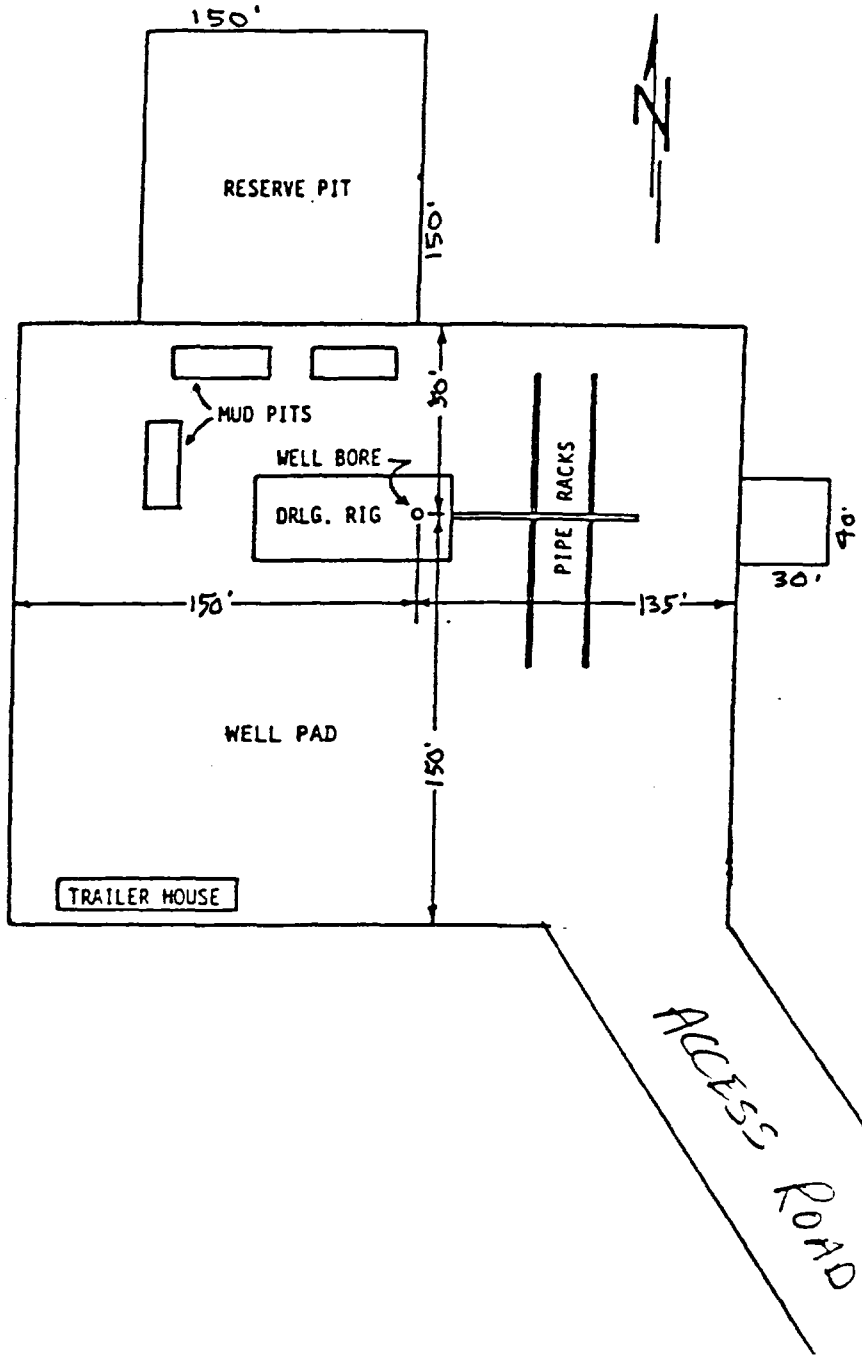


EXHIBIT "D"

Pogo Producing Company

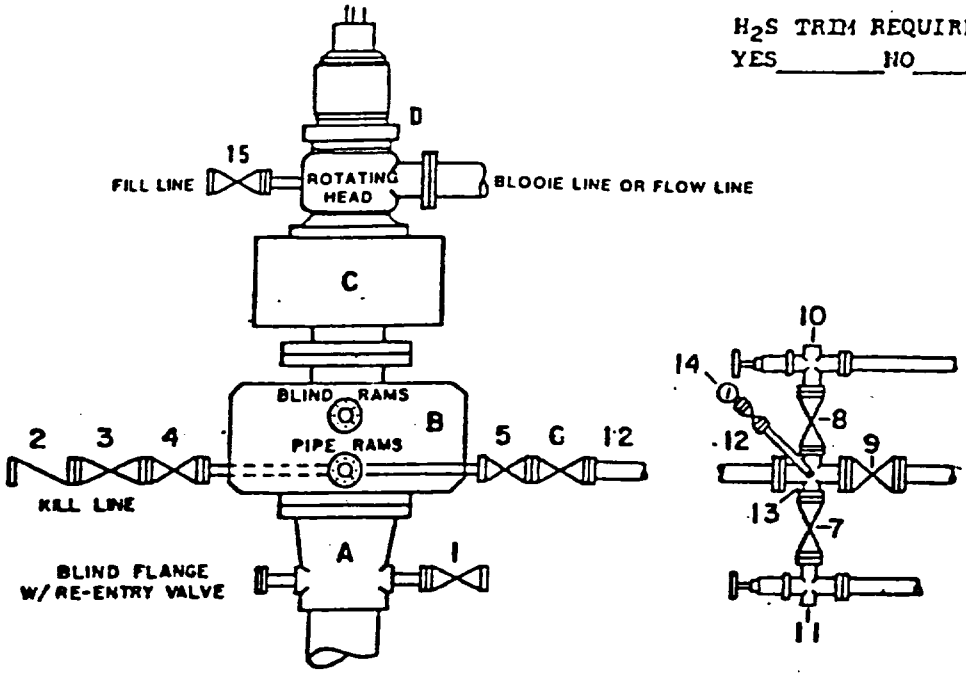
Federal "28" #1

DRILLING RIG LAYOUT
SCALE: None

DRILLING CONTROL

CONDITION III-B 3000 PSI WP

H_2S TRIM REQUIRED
YES_____NO_____



DRILLING CONTROL

MATERIAL LIST - CONDITION III - B

A	Wellhead
B	3000# W.P. Dual ram type preventer, hydraulic operated with 1" steel, 3000# W.P. control lines (where substructure height is adequate, 2 - 3000# W.P. single ram preventers may be utilized with 3000# W.P. drilling spool with 2" minimum flanged outlet for kill line and 3" minimum flanged outlet for choke line. The drilling spool is to be installed below the single ram type preventers).
C	3000# W.P. Annular Preventer with 1" steel, 3000# W.P. control lines.
D	Rotating Head with fill up outlet and extended Blooie line.
1,3,4, 7,8,	2" minimum 3000# W.P. flanged full opening steel gate valve, or Halliburton Lo Torc Plug valve.
2	2" minimum 3000# W.P. back pressure valve.
5,6,9	3" minimum 3000# W.P. flanged full opening steel gate valve, or Halliburton Lo Torc Plug valve.
12	3" minimum Schedule 80, Grade B, seamless line pipe.
13	2" minimum x 3" minimum 3000# W.P. flanged cross.
10,11	2" minimum 3000# W.P. adjustable choke bodies.
14	Cameron Mud Gauge or equivalent (location optional in Choke line).
15	2" minimum 3000# W.P. flanged or threaded full opening steel gate valve, or Halliburton Lo Torc Plug valve.

SCALE	DATE	EST NO	DRG NO	
DRAWN BY				
CHECKED BY				EXHIBIT E
APPROVED BY				

Filed: 9/28/95

Form 3160-3
(November 1983)
(formerly 9-331C)

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-0136
Expires August 31, 1985

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

5. LEASE DESIGNATION AND SERIAL NO.: NM-94651

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

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

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

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Cedar Canyon "28" Federal

2. NAME OF OPERATOR: Pogo Producing Company ✓

9. WELL NO.: 2

3. ADDRESS OF OPERATOR: P.O.Box 10340, Midland, Texas 79702

10. FIELD AND POOL, OR WILDCAT: Wildcat (Bone Springs)

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 2410' FNL & 2310' FEL of Section 28

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA

At proposed prod. zone: Same

Sec. 28, T-24S, R-29E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 5 miles east southeast of Malaga, N.M.

12. COUNTY OR PARISH: Eddy Co. | 13. STATE: N.M.

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
2310'	1400	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**
1500'	9200'	Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 2925' Ground Level

22. APPROX. DATE WORK WILL START*: Upon Approval

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
14 3/4"	10 3/4"	40.5#	500'	Sufficient to circulate
9 7/8"	7 5/8"	26.4#	2900'	Sufficient to circulate
6 3/4"	4 1/2"	11.6#	9200'	700 sx

The operator proposes to drill to a depth sufficient to test the Delaware and Bone Springs for oil. Specific programs are outlined in the following attachments:

DRILLING PROGRAM
SURFACE USE AND OPERATING PLAN
EXHIBIT A - ROAD MAP
EXHIBIT B - EXISTING WELL MAP
EXHIBIT C - LOCATION AND ACREAGE DEDICATION PLAT
EXHIBIT C-1 - TOPO MAP
EXHIBIT D - DRILLING AND RIG LAYOUT
EXHIBIT E - 3M BOP EQUIPMENT

2B

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 [signature] TITLE Agent DATE 9/28/95

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*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 United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

DRILLING PROGRAM

Attached to Form 3160-3

Pogo Producing Company

Cedar Canyon "28" Federal No. 2
2410' FNL & 2310' FEL
Unit Letter G, SW/NE
Section 28, T24S, R29E
Eddy County, New Mexico

1. **Geologic Name of Surface Formation:** Permian

2. **Estimated Tops of Important Geologic Markers and**
3. **Estimated Depths of Fresh Water, Oil, and Gas:**

Formation	Depth	Fluid Content
Permian	Surface	Fresh water at +250'
Rustler Anhydrite	500'	-----
Top of Salt	900'	-----
Base of Salt	2800'	-----
Lamar Lime	3250'	-----
Delaware Sands	3400'	-----
Bone Spring	7800'	Oil
Total Depth	9200'	

No other formations are expected to give up oil, gas, or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 10-3/4" casing at 500' into the Rustler anhydrite and circulating cement to surface. Potash will be protected by setting 7-5/8" intermediate casing at 2900' and circulating cement to surface. 4-1/2" production casing will be set at TD, and cement will be brought back to at least 2000', thus ensuring that all zones are adequately isolated. The pore pressure gradient is normal (+8.4 ppg) down through the Bone Springs. No abnormal pressures are anticipated.

4. **Casing and Cementing Program**

Hole Size	Casing From	To	Casing OD	Weight, Grade, Coupling, Cond.
14-3/4"	0'	500'	10-3/4"	40.5# J-55 STC
9-7/8"	0'	2,900'	7-5/8"	26.4# J-55 LTC
6-3/4"	0	TD	4-1/2"	11.6# J-55 & N-80 LTC

All used casing will be drifted and hydrostatically tested to at least 90% of new pipe rating.

Minimum Design Factors: Collapse 1.125, Burst 1.1, Tension 1.7

10-3/4" surface casing set at 500'
The surface casing will be set into the Rustler anhydrite to protect all fresh water formations.
Centralize the bottom 3 joints and every 4th joint to surface.
Cement to surface with 200 sx of Class C with 4% gel, 2% CaCl2 (13.5 ppg, 1.74 ft3/sx) followed by 200 sx Class C with 2% CaCl2 (14.8 ppg, 1.32 ft3/sx).

7-5/8" intermediate casing set at 2900'
The intermediate casing will be set within 100' of the top of the Delaware to isolate all salt stringers.
Centralize the bottom 3 joints.
Cement to surface with 500 sx of 35/65 Pozmix Class H with 6% gel, 5% salt, 1/4# FC (12.8 ppg, 1.94 ft3/sx) followed by 200 sx Class C with 1% CaCl2 (15.6 ppg, 1.19 ft3/sx).

4-1/2" production casing set at TD'
Centralize every joint from TD to bottom of the intermediate casing.
Cement to be broght back to 2000'.
A 2-stage cement job will be required with a DV tool at +6000'.
Stage 1: 350 sx 50/50 Pozmix Class H with 2% gel, 5% salt, 1/4# FC (14.2 ppg, 1.34 ft3/sx).
Stage 2: 250 sx 50/50 Pozmix Class H with 2% gel, 5% salt, 1/4# FC (14.2 ppg, 1.34 ft3/sx) followed by 100 sx Class H (15.6 ppg, 1.19 ft3/sx).

5. **Minimum Specifications for Pressure Control:**

9-7/8" hole

The following BOP equipment will be nippled up on the 10-3/4" casing and used continuously until TD is reached for the 9-7/8" hole.

The blowout preventer equipment (BOP) shown in Exhibit E will consist of a 3000 psi WP double ram type preventer and a 3M annular (bag type) preventer with rotating head. Both BOP's will be hydraulically operated. At the drilling contractor's option, 5M BOP's may be substituted. H2S trim will not be required.

Before drilling out from under the 10-3/4" casing, all BOP's and accessory equipment will be tested to 1000 psi with the rig pump. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

BLM method to calculate minimum BOP requirements:
(.052)(10 ppg)(2900') - (0.22 psi/ft)(2900') = 870 psi
Minimum BOP requirements: 2M BOP stack and manifold system

6-3/4" hole

The following BOP equipment will be nippled up on the 7-5/8" casing and used continuously until TD is reached for the 6-3/4" hole.

The blowout preventer equipment (BOP) shown in Exhibit E will consist of a 3000 psi WP double ram type preventer and a 3M annular (bag type) preventer with rotating head. Both BOP's will be hydraulically operated. At the drilling contractor's option, 5M BOP's may be substituted. H2S trim will not be required.

Before drilling out from under the 7-5/8" intermediate casing, all BOP's and accessory equipment will be tested to 1000 psi with the rig pump. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

BLM method to calculate minimum BOP requirements:
(.052)(8.4 ppg)(9200') - (0.22 psi/ft)(9200') = 1994 psi
Minimum BOP requirements: 2M BOP stack and manifold system

6. **Proposed Mud System:**

The well will be drilled to TD with a combination of fresh water and 10# brine. The applicable depths and properties of this system are as follows:

Depth	Type	Weight (ppg)	Viscosity (sec)	Water Loss (cc)
0-500'	Fresh water	8.5	28	NC
500-2900'	Brine	10.0	29	NC
2900-TD	Fresh	8.5	28-32	16

Sufficient mud materials to maintain mud properties and meet minimum lost circulation requirements will be kept at the wellsite at all times.

7. **Auxiliary Well Control and Monitoring Equipment:**

a) A kelly cock will be kept in the string at all times.

b) A full opening drill pipe stabbing valve (TIW/inside BOP) with proper drill pipe connections will be on the rig floor at all times.

c) An electronic pit volume totalizer system will NOT be used. The drilling fluids system will be visually monitored at all times.

d) A mudlogging unit will be continuously monitoring drilling penetration rate and hydrocarbon shows from 2900' to TD.

8. **Logging, Testing, and Coring Program:**

a) Drillstem tests will be run on the basis of drilling shows.

b) The electric logging program will consist of:
   1) 6-3/4" hole - Gamma ray, dual induction log, compensated neutron and litho-density logs.

c) No conventional cores are planned. Selected intervals may be sidewall cored based upon shows and openhole logs.

d) Further testing procedures will be determined after the 4-1/2" production casing has been cemented at TD.

9. **Abnormal Conditions, Pressures, Temperatures, and Potential Hazards:**

No abnormal pressures, temperatures, or other potential hazard are anticipated.

No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported, or are known to exist at this depth in this area. No major lost circulation zones have been reported in offsetting wells.

The maximum anticipated bottom hole pressure is approximately 3918 psi. (9200' x .433 psi/ft = 3956 psi.)
The maximum anticipated bottom hole temperature is 130 deg F.

10. **Anticipated Starting Date and Duration of Operations:**

Road and location work will not begin until approval has been received from the BLM. The anticipated spud date is October 31, 1995. Once commenced, the drilling operation should be complete in 15 days. If the well is productive, an additional 30 days will be required for completion, testing, and installation of permanent facilities.

SURFACE USE AND OPERATING PLAN

Attached to Form 3160-3

Pogo Producing Company

Cedar Canyon "28" Federal No. 2
2410' FNL & 2310' FEL
Unit Letter G, SW/NE
Section 28, T24S, R29E
Eddy County, New Mexico

Located:	5 miles east southeast of Loving, New Mexico
Federal Lease Number:	NM-94651
Lease Issued:	12/1/72
Acres in Lease:	1400 acres
Record Lessee:	Pogo Producing Company
Surface Ownership:	Ellen Madera P.O. Box 1686 Carlsbad, New Mexico 88221
Grazing Permittee:	Raymond McDonald P.O. Box 66 Loving, New Mexico 88265
Pool:	Wildcat (Bone Springs)
Pool Rules:	The 40 acre oil well spacing rules apply to this location, being 330' to the nearest side boundary or 1/4-1/4 section line, nor closer than 330' to the nearest well capable of producing from the same formation.
Exhibits:	A. Road Map B. Existing Wells Map C. Well Location and Acreage Dedication Plat C-1. Topo Map D. Drilling Rig Layout Diagram E. BOP Equipment

1. **Existing Roads:**

a) The well site and elevation plat for the proposed well is shown in Exhibit C. It was staked by John West Engineering, Hobbs, N.M.

b) All roads to the location are shown on Exhibit B. The existing roads are illustrated in black and are adequate for travel during drilling and production operations. Upgrading of the road prior to drilling will be done where necessary as determined during the onsite inspection.

c) Directions to Location: Go east of Malaga approximately 1 mile. Turn south and go approximately 3/4 mile to where road veers to the southeast. Follow road approximately 2.2 miles to where road splits. Take right split east southeast approximately 1.6 miles. Location is north approximately 300'.

d) Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

2. **Proposed Access Road:**

Exhibit B shows the new access road to be constructed and is illustrated in green. The proposed access road as shown in Exhibit B has been centerline flagged by John West Engineering, Hobbs, N.M. The road will be constructed as follows:

a) Length and Width: 300' of new access road will be constructed. The maximum width of the running surface will be 15'. See Exhibit B.

b) Surfacing Material: Caliche material will be used to surface the proposed road. It will be watered, compacted, and graded. Caliche will be obtained from either the reserve pit or a borrow pit on the proposed location as described in Item 6 of the Surface Use and Operating Plan.

c) Maximum Grade: An approximate grade of less than two percent will be encountered from the existing road to the proposed well pad.

d) Turnouts: No turnouts are planned.

e) Drainage Design: The new road will be crowned at the center to direct drainage to ditches on both sides of the roadway with turnout ditches to be constructed as required. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns. BLM may specify any additions or changes during the onsite inspections.

f) Culverts: None required.

g) Cuts and Fills: A slight amount of leveling will be required as the road crosses several small size sand dunes to the proposed well pad.

h) Gates and Cattle Guards: No gate nor cattleguard will be necessary, as no fence cut will be necessary.

3. **Location of Existing Wells:**

Exhibit No. B shows all existing wells within a one-mile radius of this well.

4. **Location of Existing and/or Proposed Facilities:**

a) Pogo Producing Company does not operate a production facility on the Cedar Canyon "28" Federal lease.

b) If the well is productive, contemplated facilities will be as follows:

A battery will be installed on location.

c) An electric power line will be constructed as shown on Exhibit B.

5. **Location and Type of Water Supply:**

The well will be drilled with a combination of brine and fresh water mud system as outlined in the drilling program.

The water necessary for drilling operations will be purchased and trucked to the wellsite, or will be moved to the wellsite by way of a temporary pipeline laid on the ground alongside existing and proposed roads.

6. **Source of Construction Materials:**

Caliche needed for the road and well pad will be taken from the proposed reserve pit. An alternate plan will be to obtain caliche from a borrow pit located within the 400' x 400' archaeologically cleared tract at the proposed well site. If sufficient quality or quantity of caliche is not available, it will be transported to the proposed road and well site from an existing BLM approved caliche pit. The BLM will be notified and consulted if caliche must be obtained off location.

7. **Method of Handling Waste Disposal:**

a) Drill cuttings will be disposed into the reserve pit.

b) Drilling fluids will be contained in the reserve pit. The reserve pit will be an earthen pit, approximately 150' x 150' x 6' deep and fenced on three sides prior to drilling. The fourth side will be fenced immediately following rig removal. The reserve pit will be lined with plastic (5-7 mil thickness) to minimize loss of drilling fluids.

c) Water produced from the well during completion may be disposed into the reserve pit or a steel tank (depending upon rates).

d) Drilling fluids will be allowed to evaporate in the drilling pits until the pits are dry.

e) Oil produced during testing will be stored in steel test tanks until sold.

f) Trash, waste paper, garbage, and junk will be placed in a trash bin located on the drill site pad. It will be transported to an approved landfill for disposal within 30 days after completion of drilling and/or completion of operations. All waste material will be contained to prevent scattering by the wind.

g) A portable chemical toilet will be provided on the location for human waste during the drilling and completion operations.

8. **Ancillary Facilities:**

No other facilities will be built as a result of the operations on this well.

9. **Well Site Layout:**

a) Exhibit D shows the relative location and dimensions of the well pad, mud pits, reserve pit, location of the major rig components, and location of parking areas.

b) Cut and fill requirements will be minor, but clearing and leveling of the well site will be necessary. Top soil, if available, will be stockpiled per BLM specifications as determined at the on-site inspection.

c) The reserve pit will be lined with a high quality plastic sheeting (5-7 mil thickness).

d) The pad and pit area are staked and flagged.

10. **Plans for Reclamation of the Surface:**

a) After completion of drilling and/or completion of operations, all equipment and other material not needed for operations will be removed. The pit area will be allowed to dry before reclamation. If the borrow pit is constructed, the cuttings in the reserve pit will be deep buried in the borrow pit, and the reserve pit and borrow pit will be broken out, filled, and leveled. The location will be cleaned of all trash and junk to leave the well site in an as aesthetically pleasing condition as possible.

b) Three sides of the reserve pit will be fenced prior to and during drilling operations. The borrow pit will be fenced on all four sides after the location is built. At the time the rig is removed, the reserve pit will be fenced on the fourth side to prevent livestock or wildlife from being entrapped in the pits. The fencing will remain in place until the pits are cleaned up and leveled.

c) After abandonment, all equipment, trash, and junk will be removed and the well site will be cleaned.

d) Topsoil removed from the drill site will be used to recontour the pit area to the original natural level. The disturbed area will be revegetated by reseeding during the proper growing season with a seed mixture of native grasses as recommended by the BLM.

11. **Other Information:**

a) Topography: The land surface in the area is undulating with small sand dunes. In the immediate area of the well site, the land slope is to the northwest.

b) Soil: Top soil at the well site is loamy sand.

c) Flora and Fauna: The vegetation cover is moderate. It includes range grasses, weeds, scrub oak bushes, and mesquite bushes. Wildlife in the area is that typical of a semi-arid desert land and includes coyotes, rabbits, rodents, reptiles, hawks, dove, quail, and other small birds.

d) Ponds and Streams: The Pecos River is 350 feet to the north of this location.

e) Residences and Other Structures: There is an abandoned ranch house approximately 3500' east northeast of this location.

f) Archaeological, Historical, or other Cultural Sites: None are known of in the area. An Archaeological survey has been conducted.

g) Land Use: Grazing, oil and gas production, and wildlife habitat.

h) Surface Ownership: Ellen Madera

12. **Operator's Representative:**

Richard L. Wright
Division Operations Supervisor
Pogo Producing Company
P.O. Box 10340
Midland, Texas 79702
(915) 682-6822

13. **Certification**:

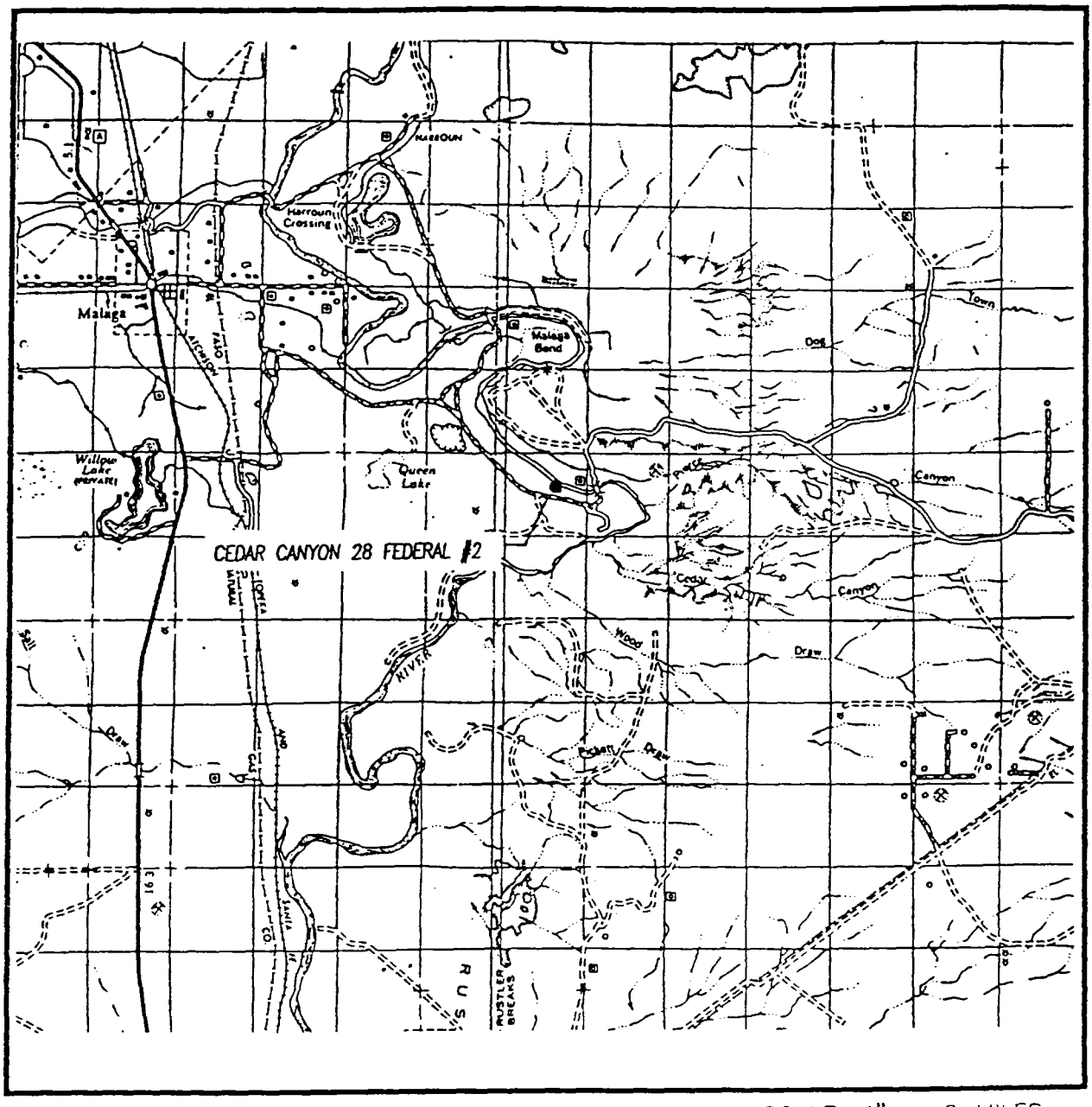
I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that the statements made in this plan are, to the best of my knowledge, true and correct; and, that the work associated with the operations proposed herein will be performed by Pogo Producing Company and its contractors and sub-contractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U. S. C. 1001 for the filing of false statement.

9/28/95
Date

James M.C. Ritchie, Jr.
Agent

Enclosures

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 28 TWP. 24-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 2410' FNL & 2310' FEL

ELEVATION 2925

OPERATOR POGO PRODUCING COMPANY

LEASE CEDAR CANYON "28" FEDERAL

EXHIBIT "A"

JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
(505) 393-3117

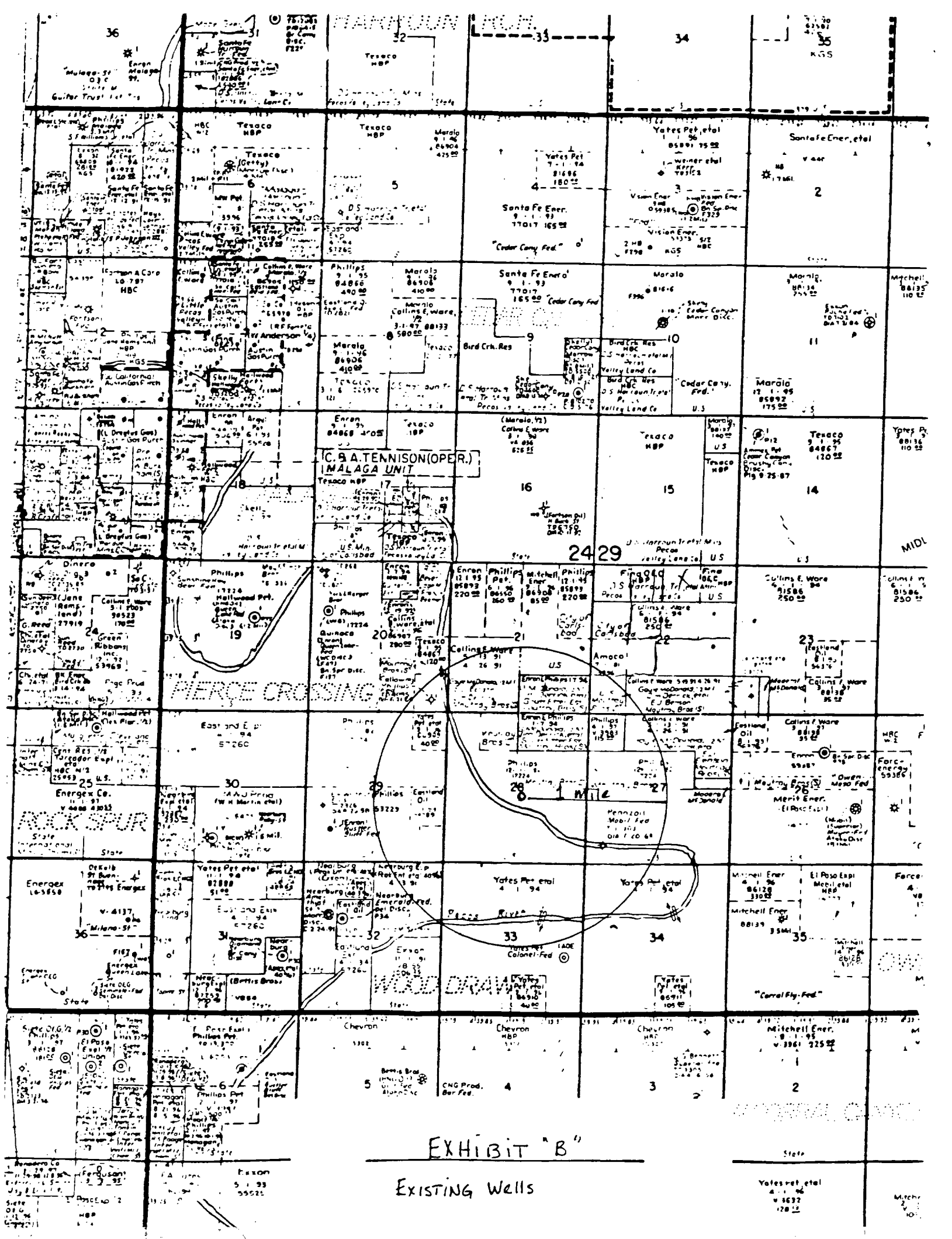


EXHIBIT "B"

EXISTING WELLS

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
		Wildcat (Bone Springs)

Property Code	Property Name	Well Number
	CEDAR CANYON "28" FEDERAL	2

OGRID No.	Operator Name	Elevation
017891	POGO PRODUCING COMPANY	2925

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	28	24 S	29 E		2410	NORTH	2310	EAST	EDDY

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.

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

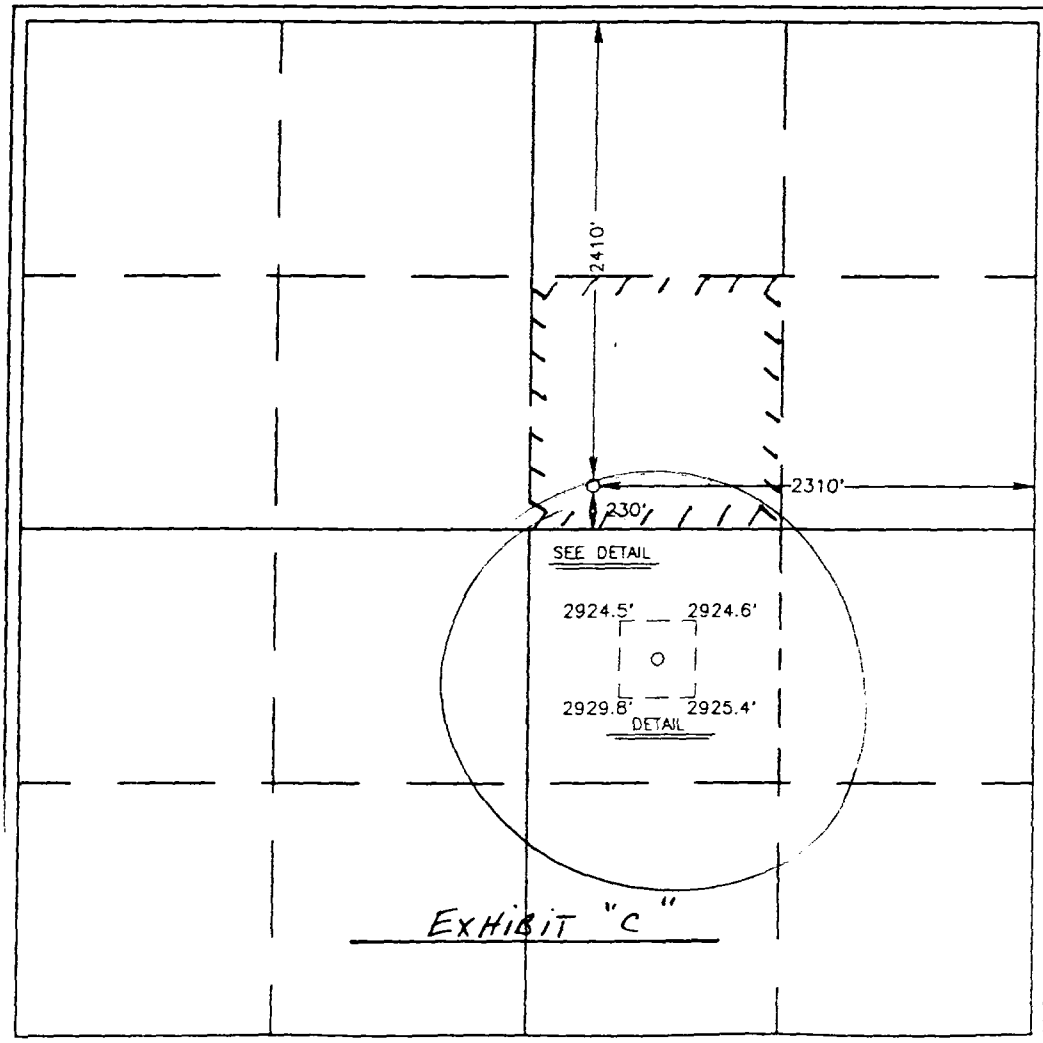


EXHIBIT "C"

OPERATOR CERTIFICATION

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

Signature

James M.C. Ritchie, Jr.
Printed Name

Agent
Title

9/28/95
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.

SEPTEMBER 22, 1995
Date Surveyed SJA

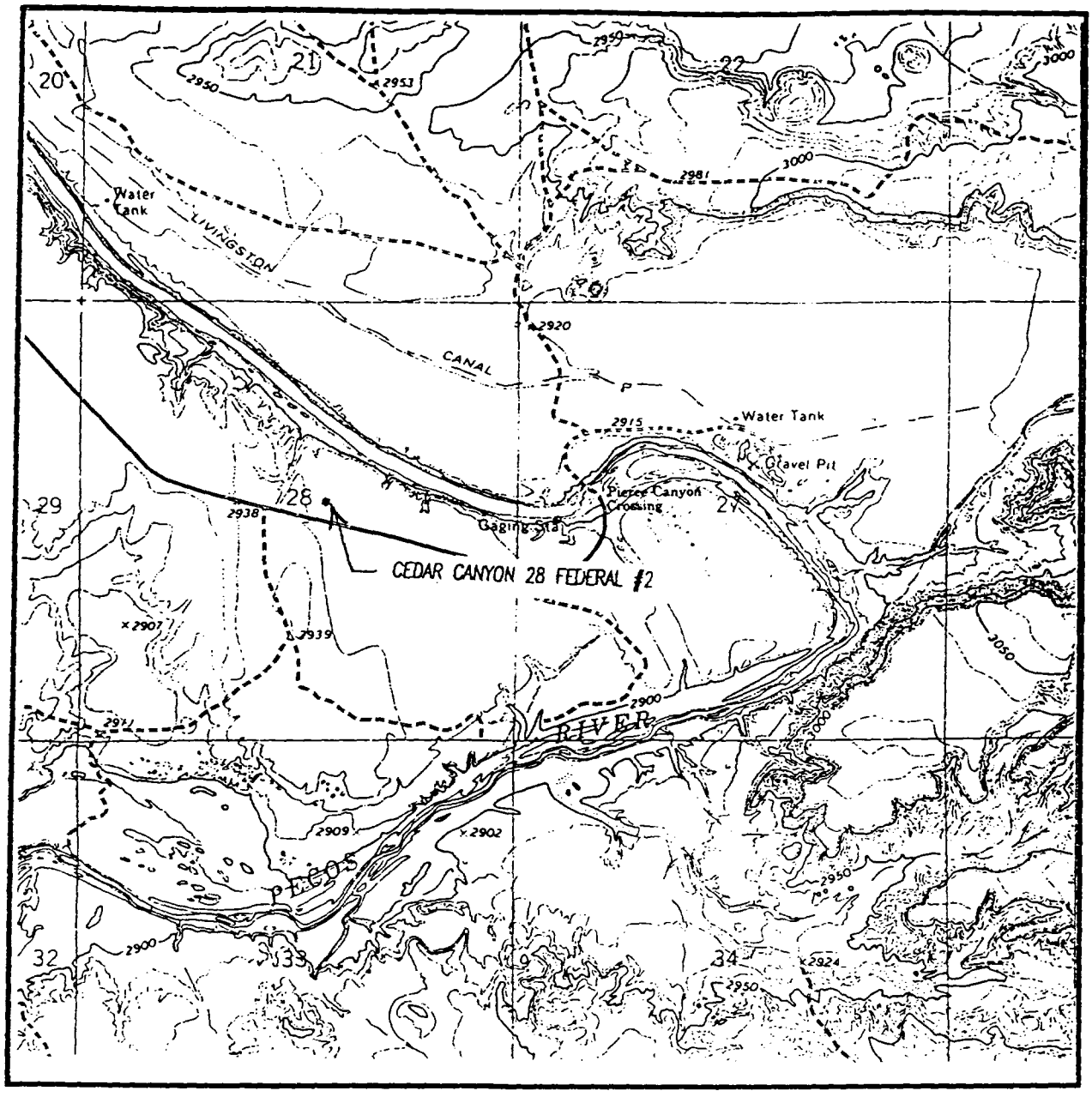
Signature & Seal of Professional Surveyor

Ronald J. Eidson 9-26-95

W.O. Num. 95-11-1378

Certificate No. JOHN W. WEST 676
RONALD J. EIDSON 3239
GARY L. JONES 12641

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL – 10'
W.5'S.1.

SEC. 28 TWP. 24-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 2410' FNL & 2310' FEL

ELEVATION 2925

OPERATOR POGO PRODUCING COMPANY

LEASE CEDAR CANYON "28" FEDERAL

U.S.G.S. TOPOGRAPHIC MAP
PIERCE CANYON, N.M.

EXHIBIT "C-1"

JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
(505) 393-3117

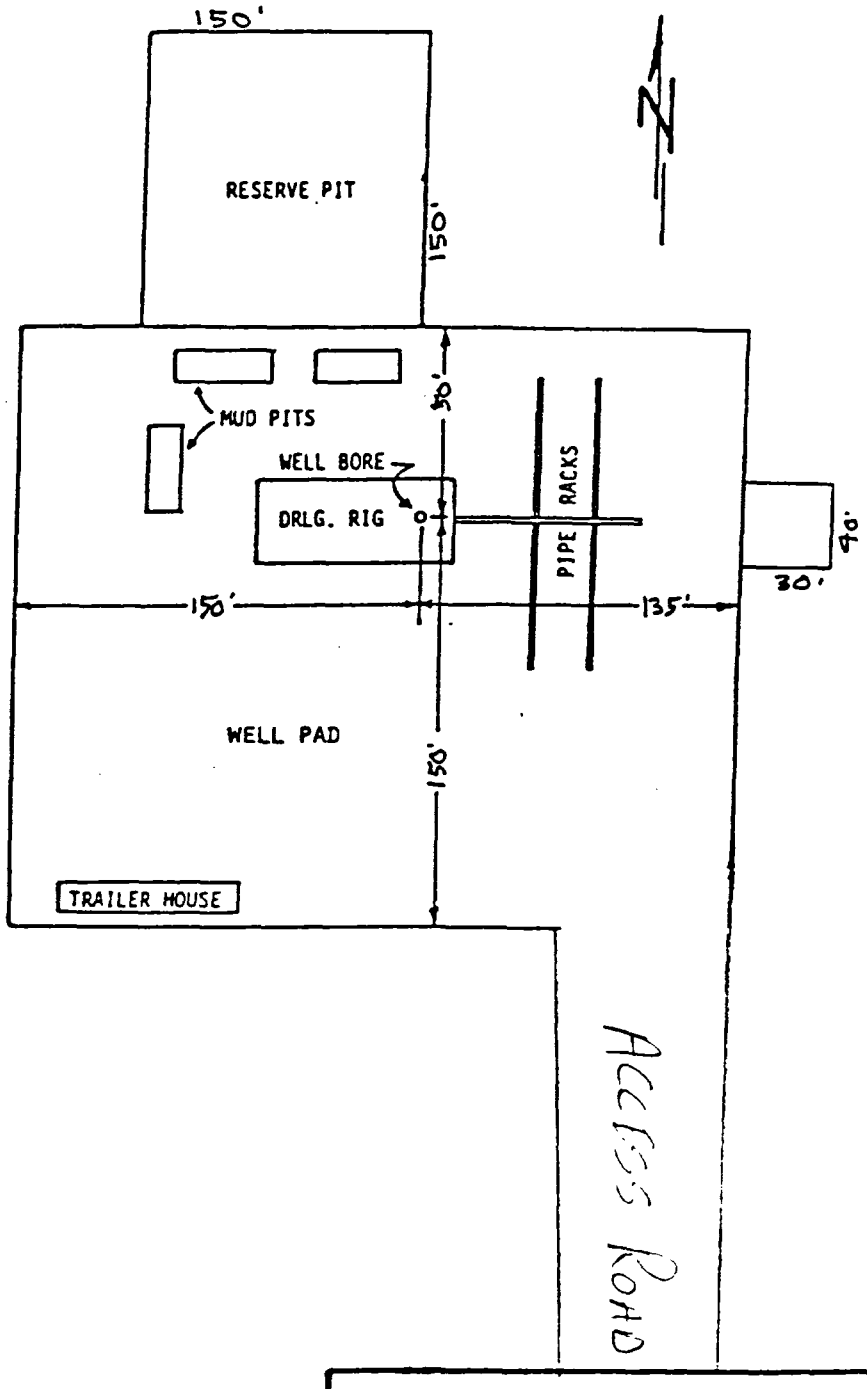


EXHIBIT "D"

Pogo Producing Company

Federal "28" # 2

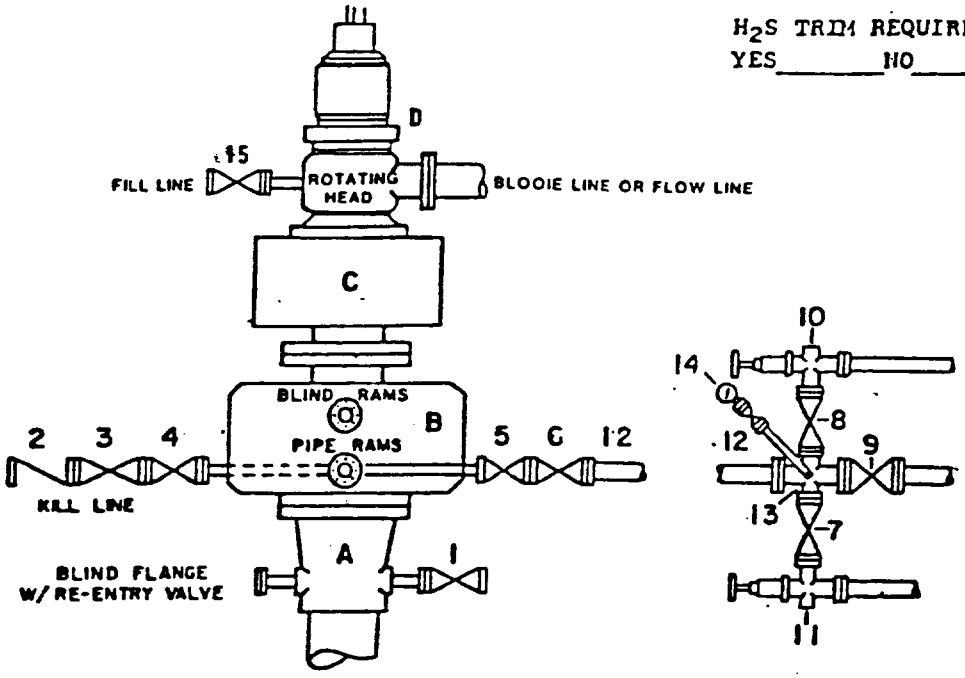
DRILLING RIG LAYOUT

SCALE: None

DRILLING CONTROL

CONDITION III-B 3000 PSI WP

H_2S TRIM REQUIRED
YES_____NO_____



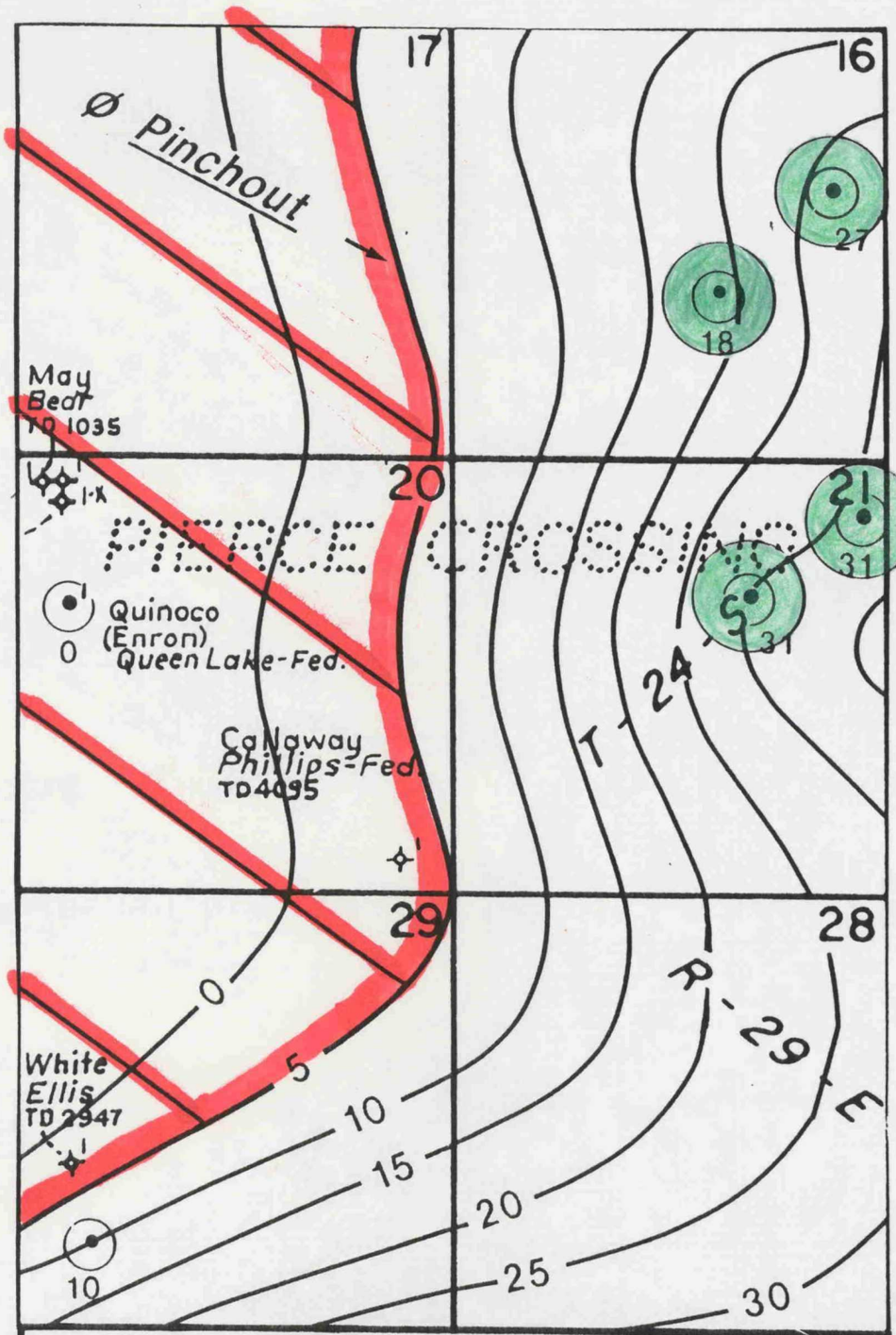
DRILLING CONTROL

MATERIAL LIST - CONDITION III - B

A	Wellhead
B	3000# W.P. Dual ram type preventer, hydraulic operated with 1" steel, 3000# W.P. control lines (where sub-structure height is adequate, 2 - 3000# W.P. single ram preventers may be utilized with 3000# W.P. drilling spool with 2" minimum flanged outlet for kill line and 3" minimum flanged outlet for choke line. The drilling spool is to be installed below the single ram type preventers).
C	3000# W.P. Annular Preventer with 1" steel, 3000# W.P. control lines.
D	Rotating Head with fill up outlet and extended Blooie line.
1,3,4, 7,8,	2" minimum 3000# W.P. flanged full opening steel gate valve, or Halliburton Lo Torc Plug valve.
2	2" minimum 3000# W.P. back pressure valve.
5,6,9	3" minimum 3000# W.P. flanged full opening steel gate valve, or Halliburton Lo Torc Plug valve.
12	3" minimum Schedule 80, Grade B, seamless line pipe.
13	2" minimum x 3" minimum 3000# W.P. flanged cross.
10,11	2" minimum 3000# W.P. adjustable choke bodies.
14	Cameron Mud Gauge or equivalent (location optional in Choke line).
15	2" minimum 3000# W.P. flanged or threaded full opening steel gate valve, or Halliburton Lo Torc Plug valve.

SCALE	DATE	EST NO	ORG NO
DRAWN BY			
CHECKED BY			
APPROVED BY			

EXHIBIT E



POGO PRODUCING COMPANY

WESTERN DIVISION

MIDLAND, TEXAS

CEDAR CANYON PROSPECT

EDDY COUNTY, NEW MEXICO

BRUSHY CANYON

G-3 SAND

NET FT. Ø MAP

C.I.: = 5'

ϕ Data=Net Ft. $\phi \geq 14\%$

31

DATE: 7/94
Revised: 10/95

SCALE: 1"=2000'

The G-3 Sand is one of the many turbidite flow sands that make up the Brushy Canyon Formation of the Delaware Sands. This particular sand is near the top of the Brushy Canyon and produces oil where indicated in green. The trap results from the up dip pinchout of the sand and reservoir. The sand is not expected to produce commercially with less than 5 feet of net porosity.

4

BEFORE THE NEW MEXICO OIL CONSERVATION DIVISION

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

APPLICATION OF POGO PRODUCING COMPANY FOR TWO UNORTHODOX OIL WELL LOCATIONS, EDDY COUNTY, NEW MEXICO **Case No. 11402**

AFFIDAVIT REGARDING NOTICE

STATE OF TEXAS)
)ss.
COUNTY OF MIDLAND)

SCOTT McDANIEL, being duly sworn upon his oath, deposes and states:

1. I am over the age of 18 and have personal knowledge of the matters stated herein.

2. I am a landman for Applicant.

3. Applicant has conducted a good faith, diligent effort to find the correct addresses of interest owners entitled to receive notice of the Application herein.

4. Notice of the Application was provided to the interest owners at their correct addresses by mailing each of them, by certified mail, notice of the Application. Copies of the notice letter and certified return receipts are attached hereto.

5. Applicant has complied with the notice provisions of Division Rule 104 and Rule 1207.

SCOTT McDANIEL

SUBSCRIBED AND SWORN TO before me this ____ day of October, 1995 by SCOTT McDANIEL.

_____
Notary Public

My Commission Expires:

_____

mcdaniel.aff

POGO PRODUCING COMPANY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 29, 1995

TO: See Attached List

Re: Cedar Canyon Prospect NM-615
Eddy County, New Mexico
Application for Unorthodox Well Locations

Gentlemen:

Pogo Producing Company has filed an application with the New Mexico Oil Conservation Division for approval of two unorthodox oil well locations for its proposed Cedar Canyon "28" Federal Well No. 1, located 230 feet from the North line and 2510 feet from the West line of Section 28, and its proposed Cedar Canyon "28" Federal Well No. 2, located 2410' feet from the North line and 2310 feet from the East line of Section 28, both in Township 24 South, Range 29 East, N.M.P.M., Eddy County, New Mexico, due to topographic reasons. The wells will be drilled to test the Delaware and Bone Spring formations.

500 WEST ILLINOIS, SUITE 600 • POST OFFICE BOX 10340 • MIDLAND, TEXAS 79702-7340 • 915/682-6822 • FAX 915/682-9139

This matter has been scheduled for hearing at 8:15 A.M. on October 19, 1995 at the Division's office at 2040 South Pacheco Street, Santa Fe, New Mexico. Failure to appear and object at that time will preclude you from objecting to this matter at a later date. In the event that you do not object to such wells' location, please evidence your waiver to object by executing and returning one (1) copy of this letter.

Very truly yours,

POGO PRODUCING COMPANY

Terry Gant
Senior Landman

TG:lf/c:NM615.713

cc: Mr. Jim Bruce
Hinkle, Cox, Eaton, Coffield and Hensley
218 Montezuma
Santa Fe, New Mexico 87504-2068

The undersigned hereby waives its right to object to the above described unorthodox locations, this _____ day of _____, 1995.

By:_____
Name:_____
Title:_____

Attached to Letter dated September 29, 1995 from
Pogo Producing Company to Phillips Petroleum Company, et al

Phillips Petroleum Company
4001 Penbrook
Odessa, Texas 79762
Attention: Mr. Jamie Welin

Enron Oil & Gas Company
P. O. Box 2267
Midland, Texas 79702
Attention: Mr. Steve Wentworth

Laura Jean Hofer, Trustee of the Laura Jean Hofer Trust
337 Monarch Bay
South Laguna, California 92677

Guy Pittman Witherspoon, III
4704 Birchman Avenue
Fort Worth, Texas 76107

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Phillips Petroleum Company
4001 Penbrook
Odessa, Texas 79762
Attn: Mr. Jamie Welin

4a. Article Number
Z 296 652 433

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
10-7-95

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)
Cedar Canyon Prospect
(Application)

6. Signature (Agent)
X D Shepard

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Enron Oil & Gas Co.
P.O. Box 2267
Midland, Texas 79702
Attention: Mr. Steve Wentworth

4a. Article Number
Z 296 652 435

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
OCT - 2 1995

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)
Cedar Canyon Prospect
(Application)

6. Signature (Agent)
Julie A. Earl

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

Z 296 652 436

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

PS Form 3800, March 1993

Sent to Guy P. Witherspoon, III	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 9/29/95	
Cedar Canyon Prospect (Application)	

Z 296 652 434

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

PS Form 3800, March 1993

Sent to Laura Jean Hofer	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 9/29/95	
Cedar Canyon Prospect (Application	

POGO PRODUCING COMPANY

OCT 12 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 29, 1995

5

TO: See Attached List

Re: Cedar Canyon Prospect NM-615
Eddy County, New Mexico
Application for Unorthodox Well Locations

Gentlemen:

Pogo Producing Company has filed an application with the New Mexico Oil Conservation Division for approval of two unorthodox oil well locations for its proposed Cedar Canyon "28" Federal Well No. 1, located 230 feet from the North line and 2510 feet from the West line of Section 28, and its proposed Cedar Canyon "28" Federal Well No. 2, located 2410' feet from the North line and 2310 feet from the East line of Section 28, both in Township 24 South, Range 29 East, N.M.P.M., Eddy County, New Mexico, due to topographic reasons. The wells will be drilled to test the Delaware and Bone Spring formations.

500 WEST ILLINOIS, SUITE 600 • POST OFFICE BOX 10340 • MIDLAND, TEXAS 79702-7340 • 915/682-6822 • FAX 915/682-9139

This matter has been scheduled for hearing at 8:15 A.M. on October 19, 1995 at the Division's office at 2040 South Pacheco Street, Santa Fe, New Mexico. Failure to appear and object at that time will preclude you from objecting to this matter at a later date. In the event that you do not object to such wells' location, please evidence your waiver to object by executing and returning one (1) copy of this letter.

Very truly yours,

POGO PRODUCING COMPANY

Terry Gant
Senior Landman

TG:lf/c:NM615.713

cc: Mr. Jim Bruce
Hinkle, Cox, Eaton, Coffield and Hensley
218 Montezuma
Santa Fe, New Mexico 87504-2068

The undersigned hereby waives its right to object to the above described unorthodox locations, this 17th day of October, 1995.

By: James S. Welin
Name: JAMES S. WELIN
Title: LAND MANAGER
PHILLIPS PETROLEUM COMPANY

This matter has been scheduled for hearing at 8:15 A.M. on October 19, 1995 at the Division's office at 2040 South Pacheco Street, Santa Fe, New Mexico. Failure to appear and object at that time will preclude you from objecting to this matter at a later date. In the event that you do not object to such wells' location, please evidence your waiver to object by executing and returning one (1) copy of this letter.

Very truly yours,

POGO PRODUCING COMPANY

Terry Gant
Senior Landman

TG:lf/c:NM615.713

cc: Mr. Jim Bruce
Hinkle, Cox, Eaton, Coffield and Hensley
218 Montezuma
Santa Fe, New Mexico 87504-2068

The undersigned hereby waives its right to object to the above described unorthodox locations, this 6th day of October, 1995.

Enron Oil & Gas Company

By: _____
Name: Gary L. Thomas
Title: Vice President

Attached to Letter dated September 29, 1995 from
Pogo Producing Company to Phillips Petroleum Company, et al

Phillips Petroleum Company
4001 Penbrook
Odessa, Texas 79762
Attention: Mr. Jamie Welin

Enron Oil & Gas Company
P. O. Box 2267
Midland, Texas 79702
Attention: Mr. Steve Wentworth

Laura Jean Hofer, Trustee of the Laura Jean Hofer Trust
337 Monarch Bay
South Laguna, California 92677

Guy Pittman Witherspoon, III
4704 Birchman Avenue
Fort Worth, Texas 76107

Powers Elevation Co., Inc.

P.O. Box 440889, Aurora, CO 80044-0889
Phone 303-321-2217
Toll Free 1-800-824-2550
FAX 303-321-2218

October 13, 1995

Mr. Bucky Ritchie
WTWT, Inc.
P. O. Box 1401
Midland, TX 79702

Dear Mr. Ritchie:

Enclosed is the cultural resources survey report for the following Pogo Producing Company locations:

Federal "17" No. 1,
Mitchell "21" Fed. No. 2,
Mitchell "21" Fed. No. 3,
Gaines Mitchell "21" No. 3,
Fed. "28" No. 1,
Fed. "28" No. 2,
Fed. "28" No. 3,
Cedar Canyon "27" Fed. No. 1, and the
Cedar Canyon "27" Fed. No. 2
Eddy County, New Mexico

A Class III cultural resources inventory and an inspection of existing records were performed for this location by Powers Elevation Co., Inc. A files search of Sections 17, 21, 27, and 28 of T.24S., R.29E., revealed five previously recorded prehistoric sites and two known, but unrecorded sites within one mile of the project area. During the survey, eight prehistoric isolates were found and recorded in the field, thereby exhausting their research potential. Two sites were found and recorded, and a previously recorded site was revisited and additional site notes were taken.

Archaeological clearance has been recommended for the proposed Federal "17" No. 1, the Mitchell "21" Federal No. 3, the Gaines Mitchell "21" No. 3, the Federal "28" No. 1, the Federal "28" No. 3, and the Cedar Canyon "27" Federal No. 2 well locations and access roads without stipulations. Archaeological clearance for the Mitchell "21" Federal No. 2 is recommended **with the stipulation that the proposed well location be moved 200 ft south in order to avoid Site LA110664.** Archaeological clearance for the proposed Federal "28" No. 2 is recommended **with the stipulation that the well location be moved 100 ft south, and a fence be erected that trends 50 ft west from the northeast corner of the location in**

order to protect Site LA110908. Archaeological clearance for the proposed Cedar Canyon "27" Federal No. 1 **is not recommended.** It lies in the middle of Site LA58931, whose NRHP eligibility is undetermined and which is likely to contain significant buried cultural materials.

If you have any questions regarding this report, please feel free to contact this office. Thank you.

Sincerely,

Gordon C. Tucker Jr., Ph.D.
Manager
Archaeology Department

cc: Bureau of Land Management, Carlsbad Resource Area (2)
Richard Wright, Pogo Producing Company

Cultural Resource Management Report

Federal "17" No. 1, Mitchell "21" Fed. No. 2, Mitchell "21" Fed. No. 3, Gaines Mitchell "21" No. 3, Fed. "28" No. 1, Fed. "28" No. 2, Fed. "28" No. 3, Cedar Canyon "27" Fed. No. 1, and the Cedar Canyon "27" Fed. No. 2
Proposed Well Locations and Access Roads
Cultural Resources Inventory,
Eddy County, New Mexico

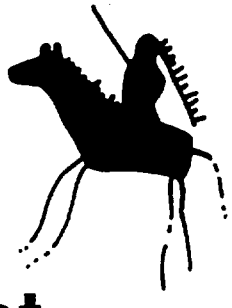
Written By
Joe Ben Sanders
Project Archaeologist

Gordon C. Tucker Jr., Ph.D.
Principal Investigator

Prepared For:
POGO PRODUCING COMPANY
P.O. Box 10340
Midland, Texas 79702

POWERS ELEVATION CO., INC.
P.O. Box 440889
Aurora, CO 80044-0889
(303) 321-2217

Date:
October 11, 1995
NMCRIS Activity Number 49842
Project # 95-NM-48



Archaeology Department

ABSTRACT

Between September 19 and 22, 1995, Joe Ben Sanders, of Powers Elevation Co., Inc., performed an archaeological survey of nine proposed well locations and four associated access roads in Eddy County, New Mexico. The work was conducted at the request of Pogo Producing Company. Most of the proposed well locations and access roads occur on private surface/federal mineral lands administered by the Bureau of Land Management, Roswell District, Carlsbad Resource Area. The Mitchell "21" Federal Nos. 2 and 3 well locations differ in land status in that they both occur on federal surface and mineral lands. Although the Gaines Mitchell "21" No. 3 well location occurs entirely on private surface and minerals land, a portion of the proposed access road occurs on federal surface and minerals land. As a result, the access road and the well location were surveyed. The archaeological survey was performed according to provisions of Cultural Resources Use Permit 8-2920-95-P (part f), which expires on December 31, 1996. A project total of 49.0 acres was intensively surveyed for the nine proposed well locations and access roads. During the survey, eight prehistoric isolated artifacts were found and recorded. None of the isolates are considered significant, and their research potential was exhausted upon recordation. One previously recorded site, LA58931, was revisited, and additional site notes were taken or updated. Two newly discovered prehistoric sites, LA110664 and LA110908, were found and recorded. Archaeological clearance is recommended for the proposed Federal "17" No. 1, the Mitchell "21 Federal No. 3, the Gaines Mitchell "21" No. 3, the Federal "28" No. 1, the Federal "28" No. 3, and the Cedar Canyon "27" Federal No. 2 well locations and associated access roads without any stipulations. Archaeological clearance for the Mitchell "21" Federal No. 2 is recommended with the stipulation that the proposed well location be moved 200 ft south. Archaeological clearance for the proposed Federal "28" No. 2 is recommended with the stipulation that the well location be moved 100 ft south and that a barbed wire fence be erected that trends from the northeast corner west of the well location. This is necessary to ensure that the site is not inadvertently impacted, because the well location could not be moved any closer to the McDonald Road, a major traffic artery for the area. Archaeological clearance for the proposed Cedar Canyon "27" Federal No. 1 is not recommended.

INTRODUCTION

An archaeological survey has been completed for nine proposed well locations and four associated access roads in Eddy County, New Mexico (Figure 1). The archaeological survey was performed by Powers Elevation Co., Inc., at the request of Pogo Producing Company. Proposed impacts occur on private surface and private minerals, private surface and federal minerals, and federal surface and federal mineral lands. The public lands are administered by the Bureau of Land Management, Roswell District, Carlsbad Resource Area.

The proposed well locations and access roads are located on the Pierce Canyon, New Mex. (1968) USGS topographic quadrangle map, 7.5' series (Figure 2).

A project total of 49.0 acres was examined for cultural resources. For each of the proposed well locations, a 400 ft long and 400 ft wide (3.7 acres) area was examined for cultural resources. Two well locations required additional acreage to avoid two newly discovered archaeological sites. For the proposed access roads, an area measuring 100 ft wide and of varying lengths was examined.

The proposed Federal "17" No. 1 well location is positioned at 1980 ft FSL and 330 ft FEL of Section 17, T.24S., R.29E., in and adjacent to a recently abandoned irrigated field on the west side of the Pecos River. Access to the proposed well location is provided by an existing county road.

The proposed Mitchell "21" Fed. No. 2 well location is positioned at 2310 ft FSL and 1650 ft FEL of Section 21, T.24S., R.29E. An additional 400 ft long and 200 ft wide (1.8 acres) area was inventoried south of the proposed location in order to move the proposed well location and avoid newly discovered site LA110664. An area measuring 850 ft long and 100 ft wide (1.9 acres) was inventoried for the proposed access road. The road begins on the southeast corner of an existing well location in the NE¼ of Section 21, T.24S., R.29E., and trends 850 ft due south, ending on the northeast corner of the proposed well location.

The proposed Mitchell "21" Fed. No. 3 well location is positioned at 1737 ft FSL and 929 ft FEL, Section 21, T. 24S., R.29E. For the associated access road, an area measuring 550 ft long and 100 ft wide (1.1 acres) was inventoried for cultural materials. The proposed access road leaves the southeast corner of the proposed Mitchell "21" Fed. No. 2 well location, trends 150 ft south, then 350 ft east, and ends on the northwest corner of the proposed well location. This location is in a coppice dune area with no mechanical disturbance.

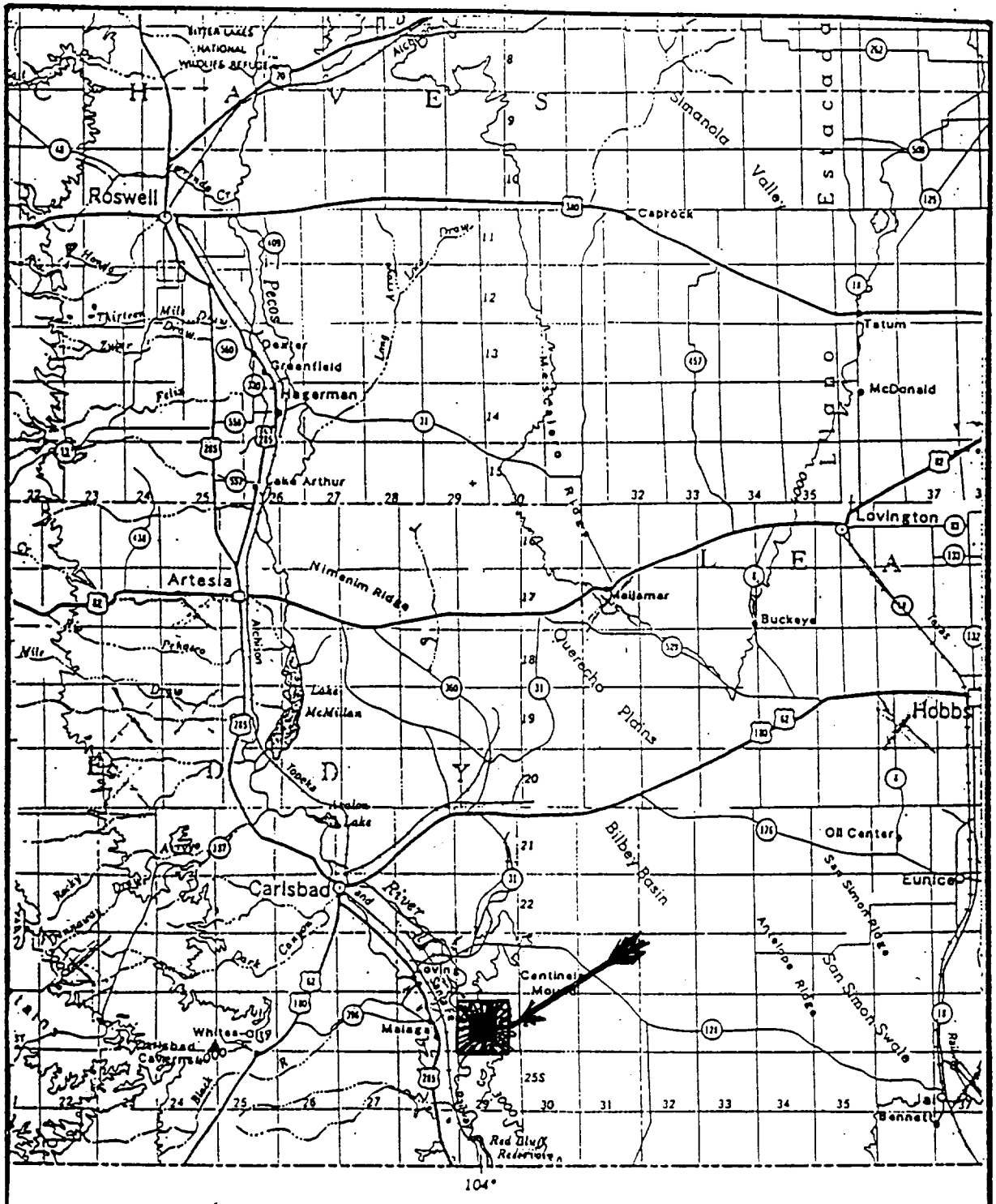


Figure 1. Project Area

1 inch equals approximately 16 mi

10 0 10 20 30 40 mi

10 0 10 20 30 40 50 km

NORTH

Powers Elevation Co., Inc.

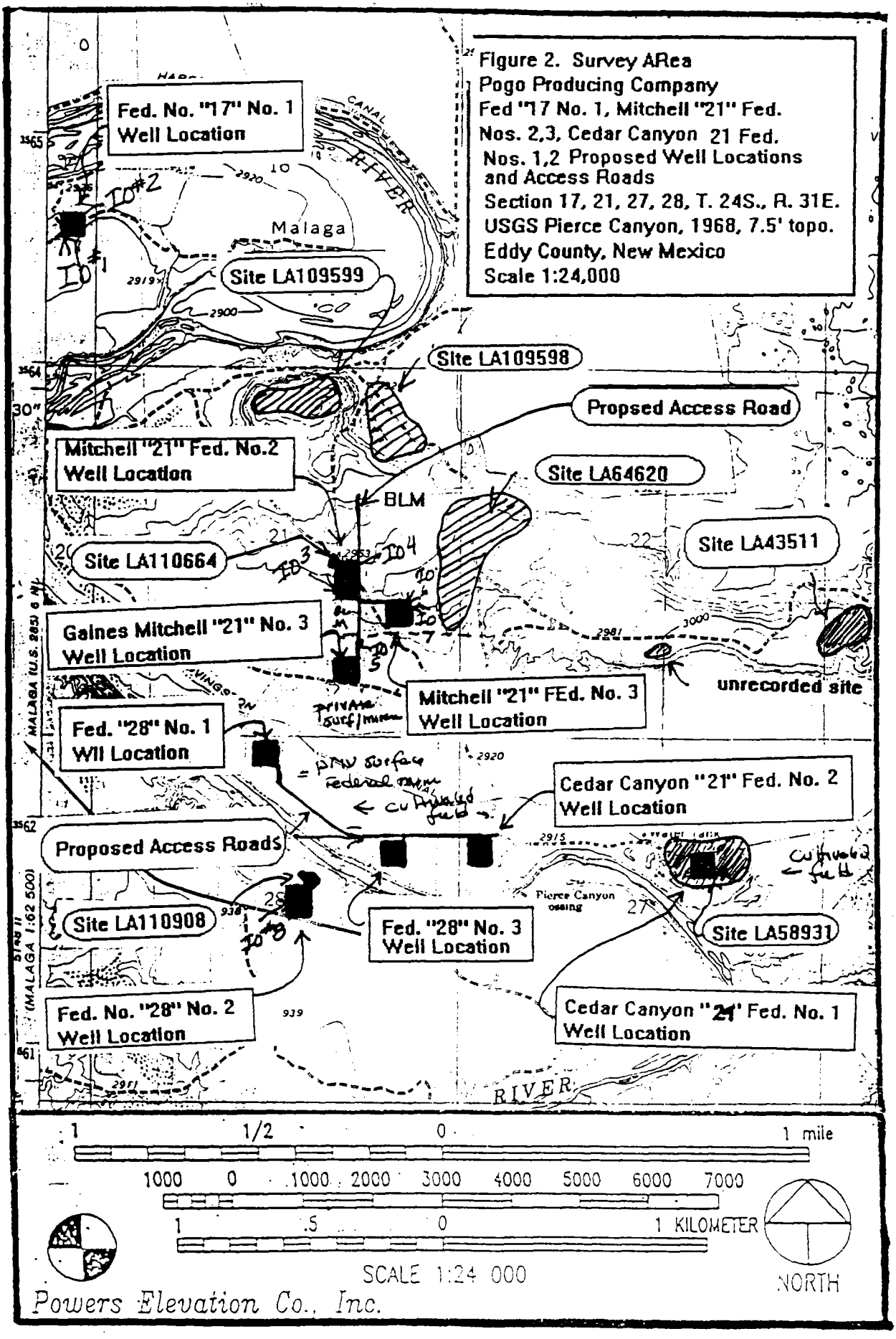


Figure 2. Survey ARea
Pogo Producing Company
Fed "17 No. 1, Mitchell "21" Fed.
Nos. 2,3, Cedar Canyon 21 Fed.
Nos. 1,2 Proposed Well Locations
and Access Roads
Section 17, 21, 27, 28, T. 24S., R. 31E.
USGS Pierce Canyon, 1968, 7.5' topo.
Eddy County, New Mexico
Scale 1:24,000
Fed. No. "17" No. 1
Well Location
Site LA109599
Site LA109598
Propsed Access Road
Mitchell "21" Fed. No.2
Well Location
Site LA64620
BLM
Site LA110664
Site LA43511
Gaines Mitchell "21" No. 3
Well Location
unrecorded site
Mitchell "21" FEd. No. 3
Well Location
Fed. "28" No. 1
Wll Location
Cedar Canyon "21" Fed. No. 2
Well Location
Proposed Access Roads
Site LA110908
Fed. "28" No. 3
Well Location
Site LA58931
Fed. No. "28" No. 2
Well Location
Cedar Canyon "21" Fed. No. 1
Well Location
Malaga
RIVER
Pierce Canyon
1 1/2 0 1 mile
1000 0 1000 2000 3000 4000 5000 6000 7000
1 .5 0 1 KILOMETER
SCALE 1:24 000
NORTH
Powers Elevation Co., Inc.

The proposed Gaines Mitchell "21" No. 3 well location is positioned at 990 ft FSL and 1650 ft FEL of Section 21, T.24S., R.29E., on private surface and private minerals land. For the associated access road, an area measuring 850 ft long and 100 ft wide (1.9 acres) was inventoried. The proposed access road trends approximately 850 ft north from the northeast corner of the proposed well pad and intersects the proposed Mitchell "21" Fed. No. 3 access road. The southern segment, measuring 330 ft long and 100 ft wide (0.7 acre) occurs on private surface and private mineral land. The northern segment, measuring 550 ft long and 100 ft wide (1.2 acres) occurs on federal surface and federal mineral lands.

The proposed Federal "28" No. 1 well location is positioned at 230 ft FNL and 2510 ft FWL of Section 28, T.24S., R.29E., in the midst of an abandoned irrigated farm field. An area measuring approximately 3,400 ft long and 100 ft wide (7.8 acres) was inventoried for the proposed access road. The entire road is confined to the disturbed surface of an abandoned cultivated field and trends southeast 2,000 ft, continues 1,300 ft generally east, and ends at an existing county road in the NW¼ of Section 27, T.24S., R.29E. Approximately 1,600 ft (3.7 acres) of this proposed road (Segment 2) occurs on private surface and private mineral lands. Segment 1 is 200 ft long and 100 ft wide (0.5 acre) and occurs on private surface and federal mineral. Segment 3, which is 1,600 ft long and 100 ft wide (3.7 acres), occurs on private surface and federal mineral land.

The proposed Federal "28" No. 2 well location is positioned at 2310 ft FNL and 2310 ft FEL of Section 28, T.24S., R.29E., in a relatively undisturbed area of desert flanking the Pecos River. An additional area measuring 400 ft long and 100 ft wide (0.9 acre) was inventoried south of the proposed well location to avoid newly discovered prehistoric site LA110908, which occurs on the extreme northeast corner of the proposed well location. An existing county road that traverses the southwest corner of the proposed relocated well location will provide access to the proposed well location.

The proposed Federal "28" No. 3 well location is positioned at 1650 ft FNL and 990 ft FEL of Section 28, T.24S., R.29E. For the proposed access road, an area measuring 130 ft long and 100 ft wide (0.3 acre) was inventoried. The proposed access road begins on the northeast corner of the proposed well location, trends 130 ft due north and ends at the access road to the Federal "28" No. 1 well location. The entire well location and access road occur in an abandoned cultivated field.

The proposed Cedar Canyon "27" No. 1 well location is positioned at 1830 ft FNL and 1780 ft FEL of Section 27, T.24S., R.29E. Access to the proposed well location is provided by an existing bladed road that traverses the southwest portion of the proposed well

location along the south end of an abandoned cultivated field. The proposed well location occurs in an abandoned cultivated field. An abandoned canal occurs on the north end of the location.

The proposed Cedar Canyon "27" No. 2 well location is positioned at 1650 ft FNL and 330 ft FWL in Section 27, T.24S., R.29E. The proposed access road to the Federal "28" No. 1 well crosses the northwest corner of the proposed well location.

The fieldwork was performed by Joe Ben Sanders between September 19 and 22, 1995, under the conditions of Cultural Use Permit 8-2920-95-P, which expires on December 31, 1996.

CULTURAL SETTING

The project area falls within the Pecos Valley archaeological region, as described by the Bureau of Land Management (Sebastian and Larralde 1989). Their cultural and temporal framework includes the following periods: Paleoindian (ca. 11,700-7000 B.P.), Archaic (ca. 7000 B.P. - A.D. 900 or 1000), Ceramic (after ca. A.D. 600 - 1540), Protohistoric and Spanish Colonial (pre-A.D. 1400- 1821), and Mexican and American Historical (A.D. 1822 - early 1900s).

ENVIRONMENTAL SETTING

The project area is located within the Lower Pecos Valley Subsection of the Pecos Valley section, a southern expression of the Great Plains physiographic province (Williams 1986). The project area is on either side of the Pecos River, south of the Malaga Bend landform. Most of the proposed well locations occur on a relict floodplain, within the confines of abandoned cultivated fields lying on the east or north bank of the Pecos River. Immediately to the north is the Malaga Bend landform of the Pecos River, to the northwest is the Black River Valley, and to the east is the Los Medanos, an extensive area of sheet sand and coppice dunes on an erosional sandy plain. Pierce Canyon empties into the Pecos River less than a mile southeast of the project area.

According to the Soil Conservation Service classification (Chugg et al. 1971), the project contains soils of the Arno-Harkey-Anthony assocation. They are characterized as deep, loamy soils formed from recent mixed alluvium. The predominant soil is the Arno silty clay loam, which generally forms on slopes of less than 1 to 3 percent near the floodplain of the Pecos River.

According to Williams (1986), the project is in the Chihuahua Grassland Community with burrograss dominant. Typical floral species associated with this grassland community include burrograss, tobosa grass, fluff grass, gyp dropseed, and gyp grama,

along with gyp coldenia. This plant community extends north into Chaves County and south-central Eddy County, but pinches out southward into Texas.

Previous disturbances in the project area include agricultural activities, specifically that of clearing, leveling, and deep plowing on the relict floodplain, which has been, until just recently, subjected to flood irrigation. At present, the land is abandoned and desert species are reestablishing themselves. Cattle trails, evidence of grazing, and several bladed roads occur on the uplands north and south of the cultivated fields. Cultivation is the most severe impact in the irrigated lowlands skirting the Pecos River. Away from the river, wind erosion appears to be the most severe natural impact, and desertification caused by overgrazing is suspected.

FIELD METHODS

The Class III survey was performed by one archaeologist walking eight parallel transects over each well location and two zigzag transects, spaced no more than 15 m (50 ft) apart, parallel to each access road. The ground surface was carefully examined for cultural resources. Dirt from insect and rodent burrows, and vertical faces, were especially scrutinized for indications of buried cultural materials. These efforts were made to maximize the opportunity to observe cultural materials that may otherwise be buried.

Prior to fieldwork, a records check was completed at the Bureau of Land Management, Carlsbad Resource Area office and the State of New Mexico Archaeological Records Management Section. The records check of Sections 17, 21, 27, and 28 of T.24S., R.29E., revealed four previously recorded prehistoric sites and one unrecorded site within one mile of the project area. The nearest site (LA58931), is located within the project area on the proposed Cedar Canyon "27" Fed. No. 1. The nearest other site is Site LA64620, found approximately 800 ft northeast of the Mitchell "21" Fed. No. 3 well location. A records check within one mile of the project revealed one other recorded site, LA43511, and another unrecorded site. The nearest of these sites is 3,000 ft northwest of the project area.

RESULTS

During the survey, eight prehistoric isolates were found and recorded in the field, thereby exhausting their research potential. Two sites were found and recorded. A previously recorded site was revisited and additional site notes were taken. Each of these resources is described below; their locations are depicted on Figure 2.

ISOLATED OCURRENCES

IO #1

The isolate consists of nine pieces of 2 to 4 cm-sized, thermally altered caliche, found in a 15 m long and 15 m wide area, in an area of 1 m-tall coppice dunes on the first terrace flanking the west side of the Pecos River. Soils consist of silty, water-laid sand. Vegetation consists of mesquite with frequent areas barren of vegetation. It is found in the NE¼NW¼SE¼NE¼SE¼ of Section 17, T.24S., R.29E., on the Fed. "17" No. 1 well location.

IO #2

The isolate consists of a primary core reduction flake and one piece of 4 cm size, burned caliche, which were found in an area of 10 sq. m area on the southeast side of a 1 m-tall coppice dune, on the first terrace west of the Pecos River. Soils are easily eroded silty sand. Vegetation consists of mesquite with frequent barren areas. It was found in the SE¼SE¼NE¼NE¼SE¼ of Section 17, T.24S., R.29E., on the Fed. "17" No. 1 well location.

IO #3

The isolate consists of twelve pieces of 8 to 10 cm size, thermally altered caliche found in an area of 3 m-long and 3 m-wide, in an area of 1 m-tall coppice dunes, on the southeast side of a low rise, about 3/4-mile east of the Pecos River. Soils are sheet washed and consist of aeolian sand in a 1 to 2 m-tall coppice dune field. Vegetation consists of mesquite. It is found in the NW¼NE¼NE¼NW¼SE¼ of Section 21, T.24S., R.29E., on the Mitchell"21" Fed. No. 2 well location.

IO #4

The isolate consists of one piece of 5 cm size, thermally altered caliche, found in an area of 1 m-tall coppice dunes, on the southeast side of a low rise, about 3/4-mile east of the Pecos River. Soils are sheet washed and consist of aeolian sand in a 1 to 2 m-tall coppice dune field. Vegetation consists of mesquite and various grasses. It is found in the SW¼NE¼NE¼NW¼SE¼ of Section 21, T.24S., R.29E., on the Mitchell "21" Fed. No. 2 well location.

IO #5

The isolate consists of a tertiary core reduction flake, which was detached from a cobble of reddish-purple, quartzite material of the

Ogallala Formation. It is associated with twelve pieces of fist-sized, thermally altered caliche in an area 30 m long and 30 m wide of 1 m-tall coppice dunes, on the southeast slope a low rise, on the east side of the Pecos River. The flake measures 52 mm long, 32 mm wide, and 12 mm thick. It exhibits a cortical platform and shows no wear or use. Soils consist of eroded and sheet-washed aeolian sand. Vegetation consists of mesquite, creosote, broom snakeweed, and various grasses. It is found in the SW¼SE¼SE¼NW¼SE¼ of Section 21, T.24S., R.29E., along the access road for the Gaines Mitchell "21" No. 3 well location.

IO #6

The isolate consists of one piece of 8 cm size, thermally altered caliche, which was washed into a 1/2 m-deep arroyo,in an area of 1 m-tall coppice dunes on a low rise east of the Pecos River. Soils consist of wind- and sheet-washed aeolian sand. Vegetation consists of mesquite, creosote, broom snakeweed, and various grasses. It is found in the NE¼NE¼SW¼NE¼SE¼ of Section 21, T.24S., R.29E., on the Mitchell "21" Fed. No. 3 well location.

IO #7

The isolate consists of six pieces of 10 to 15 cm size, thermally altered caliche, found in an area 7 m long and 9 m wide, in an area of 1 m-tall coppice dunes, on the east side of a coppice dune, on a low sandy rise, about 3/4-mile east of the Pecos River. Vegetation consists of mesquite with frequent areas barren of vegetation. It is found in the NE¼NE¼SW¼NE¼SE¼ of Section 21, T.24S., R.29E., on the Mitchell "21" Fed. No. 3 well location.

IO #8

The isolate consists of the proximal fragment of a tertiary core reduction flake, manufactured from a waxy beige chalcedony material with small (1 mm), white inclusions. The fragments exhibit a multi-faceted platform with no cortex and a snap fracture. Found in an area of flat-to-gently sloping silt loams, on a low, undulating erosional plain, flanking the south side of the Pecos River. Soils consist of fine-grained silts and loamy clays. Vegetation consists of mesquite and creosote with frequent areas barren of vegetation. It is found in the NW¼SW¼SW¼SW¼NE¼ of Section 28, T.24S., R.29E., on the Fed. "28" No. 2 well location.

SITES

Site LA58931

Site LA58931 was first recorded by New Mexico Archaeological Services (NMAS) on November 12, 1986, during a Class III cultural resources inventory of a road to a proposed well location (original site form and map are included in the appendix). It occupies 16,200 sq. m immediately above the Pecos River, on a nearly flat, silty floodplain immediately north of Pierce Canyon. The site is identified as a widely dispersed, temporary prehistoric campsite of undetermined cultural affiliation. It consists of a low density scatter of predominantly tertiary core reduction flakes, rarely a groundstone tool, hammerstones, cores, tested cobbles, and shellfish fragments associated with a scatter of hundreds of pieces of 1 to 6 cm size, thermally altered caliche (Figure 3). All of the site has been repeatedly disturbed by cultivation of the floodplain in previous years, and just recently been abandoned to the elements. Materials are highly disturbed within the plow zone sand. No surface features remain intact due to erosion and mechanical disturbances. Nonetheless, the site may contain additional buried materials or buried earlier cultural horizons, because it lies so close to the Pecos River in an area made desirable by the nearness of Pierce Canyon, a prominent landmark.

A sample of cultural materials lying on the surface of the west half of the proposed Cedar Canyon "27" Fed. No 1 well location was inventoried for the current undertaking. The analysis revealed a higher proportion of chert flakes on the site than is usually normal for this area, outnumbering, by a factor of 3 to 1, the usually dominant and locally available quartzite, which is derived from detrital Ogallala Formation. The site also contains a greater quantity of shellfish from the Pecos River than is usual for sites in this area.

The site was not evaluated by NMAS, but we believe that more work needs to be undertaken to determine if buried deposits exist. The site is close to the river and was likely used many times over the millennia. Even though the surface assemblage is highly disturbed, the site contains additional data not recorded in the current work that relates to prehistoric lithic reduction techniques and settlement patterns. Until more work is done on the site, its eligibility for the National Register of Historic Places (NRHP) is undetermined.

Site LA110664

Site LA110664 is characterized as a temporary prehistoric campsite of undetermined age or cultural affiliation. It consists of four discrete, though highly eroded, thermal features of burned caliche associated with two uniface lateral scrapers of chert, one proximal

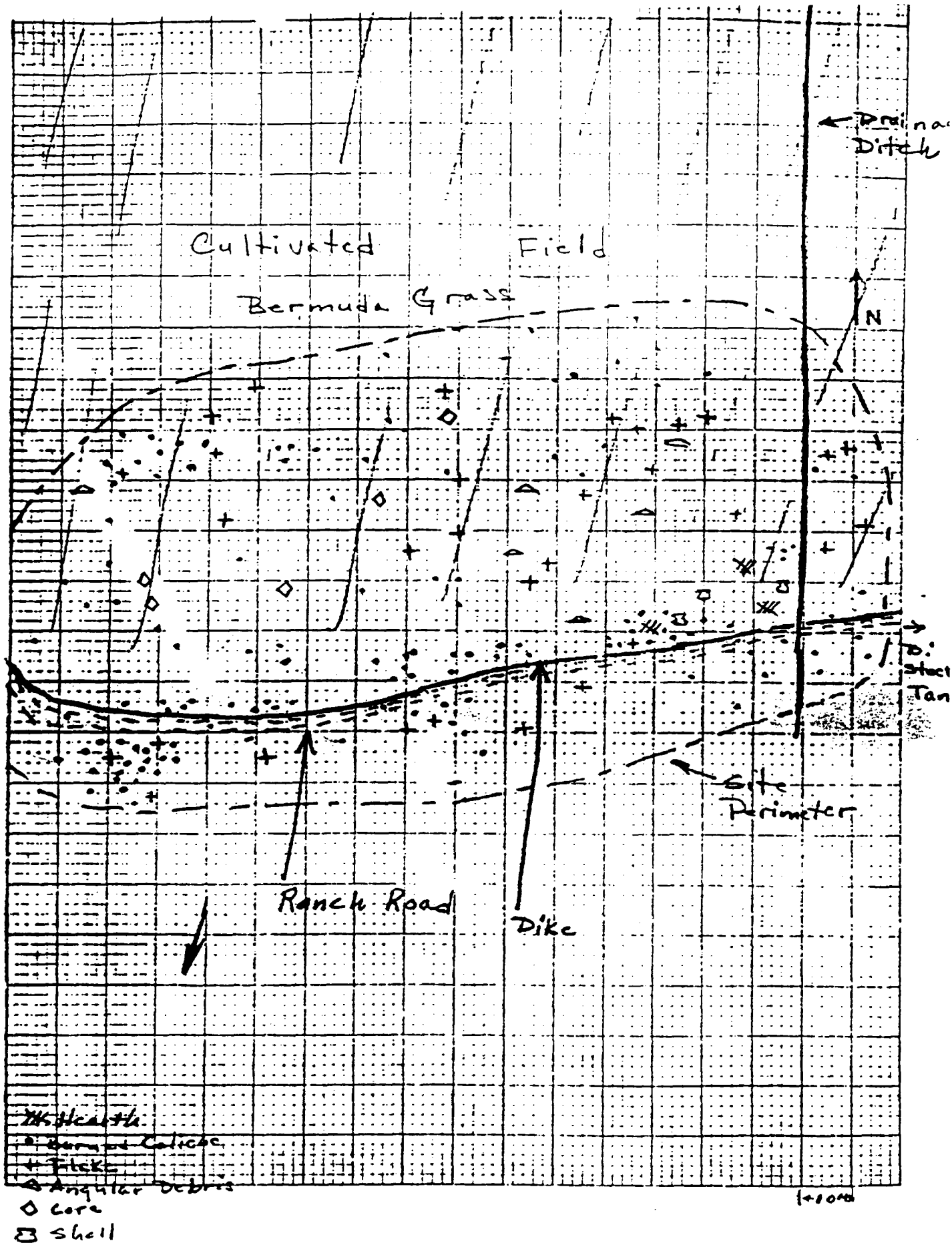


Figure 3. Plan view sketch map of Site LA58931. (Taken from original site form).

portion of a tertiary core reduction flake of San Andres chert, two tertiary core reduction flakes of locally available siltstone, and one siltstone core fragment (Figure 3). The Pecos River is less than a mile west of the site and Pierce Canyon is about 1.3 miles southeast. The site is situated in a fairly dynamic coppice dune area on a locally prominent sandy ridge. Soils are unconsolidated light tan sands, which are sheetwashed and winderoded. Vegetation consists primarily of mesquite, creosote, broom snakeweed, and various grasses. The caliche hearth features vary in diameter from 2 sq. m to 5 sq. m. and each contains 20 to 70 pieces of caliche. The caliche pieces range in size from 1 to 15 cm, but cluster between 4 and 8 cm. Two of the hearth features occur near the center of the site within 8 m of each other. The other two caliche hearth features are located 20 to 30 m from the two central hearths. A trowel probe to 15 cm below the surface in all of the features proved negative. These partially deflated hearths occur on a sheet-washed, wind-eroded deflation basin in an area of 1 m-tall coppice dunes. Scrutiny of surrounding deflation basins revealed no additional cultural materials except the six lithic artifacts. The two unifacial tools appear to be scrapers, based on edge angles of 50 and 70 degrees. Although the potential for subsurface deposits is considered low due to the presence of widespread deflation from sheet and wind erosion and the paucity of artifacts, it is still possible that buried cultural remains are present. All surface artifacts were analyzed in the field and the potential for buried deposits is low based on the surface assemblage, but until more work is undertaken to determine if buried deposits remain, its NRHP eligibility is undetermined.

Site LA110908

Site LA110908 is located on a gently north sloping terrace immediately south of the Pecos River. Pierce Canyon is situated approximately one mile east. The site is characterized as a scatter of prehistoric lithic materials with hearth features (Figure 5). Artifacts include one unifacial mano, several cores, and approximately 200 core reduction flakes. The flakes are predominantly made of locally available quartzites, with lesser frequencies of local cherts. These artifacts are found in several adjacent deflation basins and associated with six eroded and dispersed hearth features of slightly oxidized river cobbles. All of the hearth features are currently eroding, and probes placed in each had negative results. Approximately 1,000 pieces of highly scattered, oxidized cobbles cover the site surface in addition to the six thermal features. These suggest other hearth features once existed but have been eroded and scattered. The cobble hearths vary in diameter from 2 sq. m to 10 sq. m, and contain 16 to 70 pieces of 4 to 10 cm-size, thermally altered rock. No mussel shells were noted on the site, as is common to other sites in this area. The soils are eroded, silty sands of aeolian origins. Sheet and wind erosion have displaced the cultural materials both

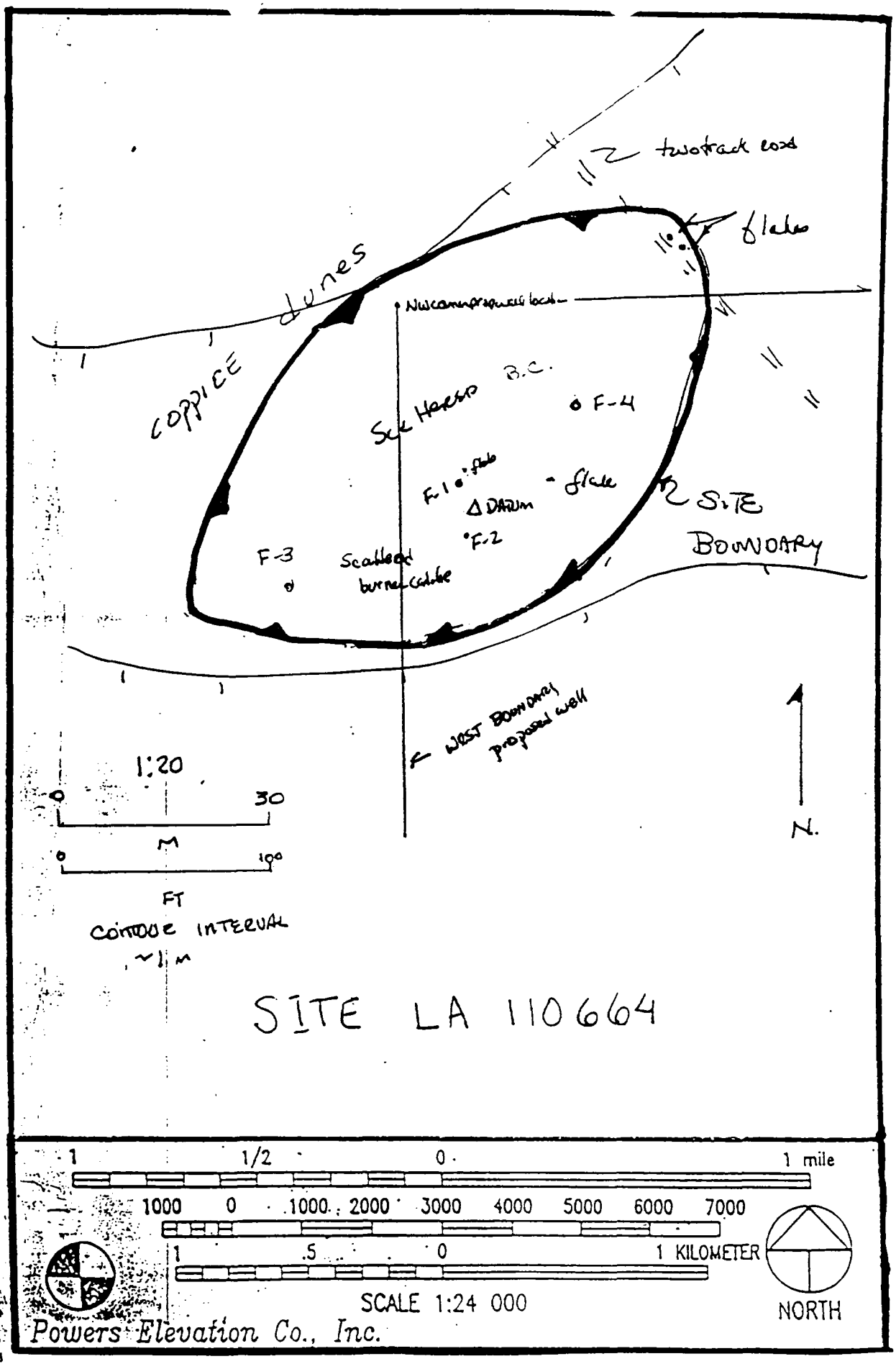


Figure 4. Plan view sketch map of Site 110664.

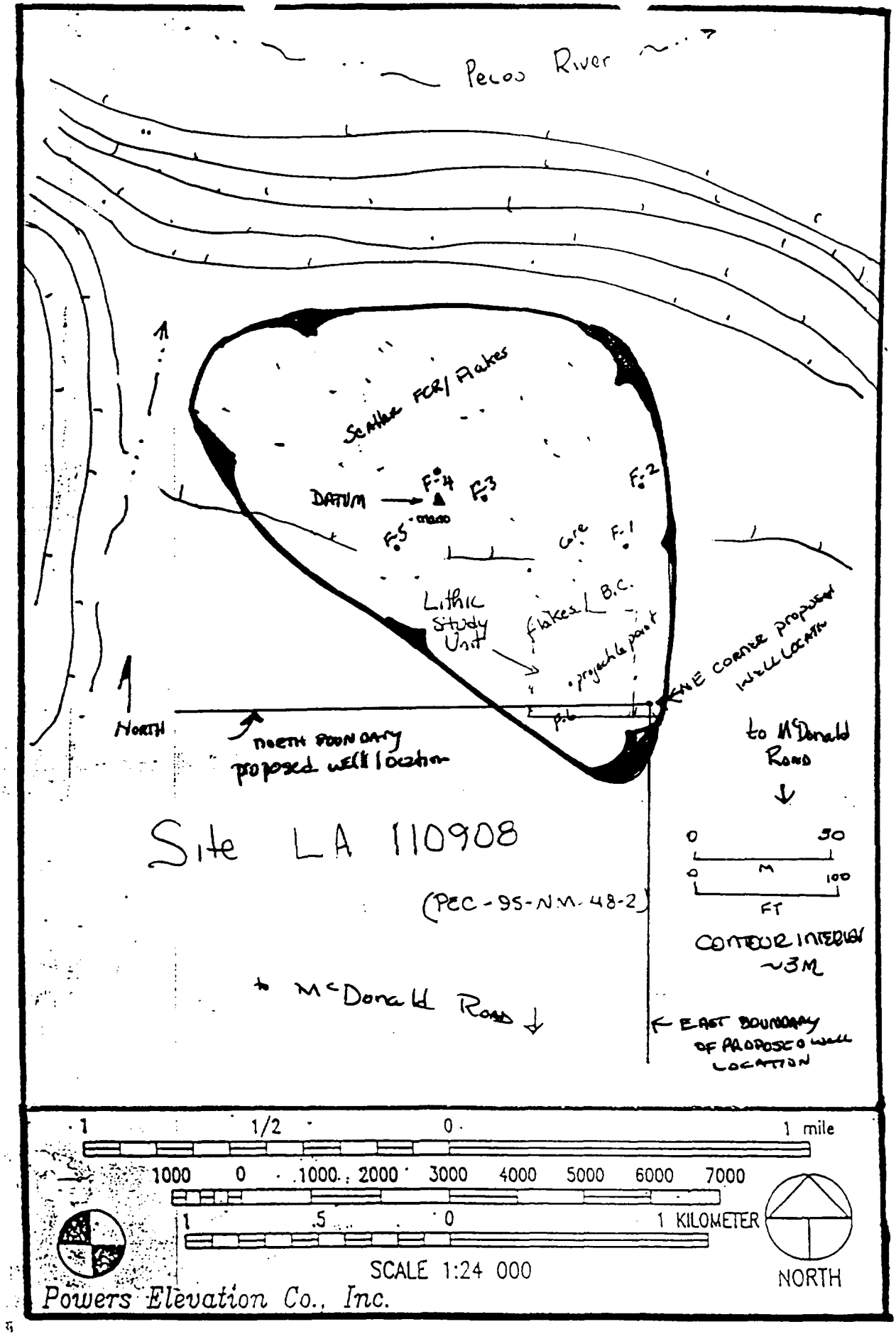


Figure 5. Plan view sketch map of Site 110908.

horizontally and vertically. Cultural materials occur on the site with a ratio of about one item per 3 sq. m. No charcoal or carbon stains were noted. Lithic artifacts are the most common artifact type, and about 200 flakes are estimated to be on the surface. A lithic analysis unit measuring 20 m long and 20 m wide revealed a total of 20 artifacts, including one projectile fragment, four angular debris artifacts, one multi-directional core, and 14 tertiary core reduction flakes. Only three reduction flakes retained any cortex. Outside the analytical unit, a single mano of a brown, coarse-grained sandstone was noted. It is unifacial and measures 16 cm long, 10 cm wide, and 4 cm thick. No hammerstones or ceramic sherds were noted.

The possibility exists that additional artifacts are buried in the silty and sandy soils that cover most of the site. The exposed and eroded hearths, combined with the negative trowel probes in the various features, suggest a low potential for intact buried deposits. However, the site has information potential beyond that recorded in the current undertaking. Lithic studies may provide additional knowledge about prehistoric use of the lower Pecos River area and procurement areas. A program of subsurface testing may reveal intact, datable, cultural deposits. Until more information is gleaned from the site through a subsurface testing program, its NRHP eligibility is undetermined.

RECOMMENDATIONS

Archaeological clearance is recommended for the proposed Federal "17" No. 1, the Mitchell "21" Federal No. 3, the Gaines Mitchell "21" No. 3, the Federal "28" No. 1, the Federal "28" No. 3, and the Cedar Canyon "27" Federal No. 2 well locations and associated access roads without any stipulations. Archaeological clearance for the Mitchell "21" Federal No. 2 is recommended with the stipulation that the proposed well location be moved 200 ft south in order to avoid Site LA110664. Archaeological clearance for the proposed Federal "28" No. 2 is recommended with the stipulation that the well location be moved 100 ft south, and a fence be erected that trends 50 ft west from the northeast corner of the location in order to protect Site LA110908. Archaeological clearance for the proposed Cedar Canyon "27" Federal No. 1 is not recommended, because it lies in the middle of Site LA58931, whose NRHP eligibility is undetermined and which is likely to contain significant buried cultural materials.

REFERENCES CITED

Chugg, J. C., G. W. Anderson, D. L. King, and L. Jones
1971 Soil Survey Eddy County, New Mexico. United States Department of Agriculture, Soil Conservation Service.

Sebastian, L., and S. Larralde
1989 Living on the Land: 11,000 Years of Human Adaptations in Southeastern New Mexico, An Overview of Cultural Resources in the Roswell District, Bureau of Land Management. Cultural Resources Series No. 6, New Mexico Bureau of Land Management, Santa Fe.

Williams, Jerry L.(editor)
1986 New Mexico in Maps. 2nd ed. The University of New Mexico Press, Albuquerque.

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Principal Investigator Date

APPENDIX

LABORATORY OF ANTHROPOLOGY SITE RECORDS FORMS