Form 9-331 C
(May 1963)

COPY TO O. C.

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

30-025-26675

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

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

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

2. NAME OF OPERATOR: Estoril Producing Corporation

3. ADDRESS OF OPERATOR: Suite 1120 Vaughn Building Midland, Texas 79701

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 660' FSL and 660' FWL
At proposed prod. zone: Same

5. LEASE DESIGNATION AND SERIAL NO.: NM 14799

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Union Federal "A"

9. WELL NO.: 1

10. FIELD AND POOL, OR WILDCAT: ~~Undesignated~~ Lea Penn.

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: (D) Sec. 10, T20S, R34E

12. COUNTY OR PARISH: Lea — 13. STATE: New Mexico

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 43 miles east of Carlsbad, NM and 28 miles SW of Hobbs, NM

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any): 660'

16. NO. OF ACRES IN LEASE: 160

17. NO. OF ACRES ASSIGNED TO THIS WELL: 160

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.: None

19. PROPOSED DEPTH: 13,700'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 3644.4 GR

22. APPROX. DATE WORK WILL START*:

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17-1/2"	13-3/8"	56#	850' CIRCULATED	See attached letter from
12-1/4"	9-5/8"	36# }	~~5,200'~~	B-L Hughes, dated 2/1/79.
12-1/4"	9-5/8"	40# }	5,200' DV	TOOL @ 3800± CIRC. TO SUR.
8-3/4"	5-1/2"	9.5#, 11.6# 13.5#	13,700'	

Mud Program: See attached program prepared by Southwestern Drilling Mud Services Co., Inc., -- Exhibit "E".

BOP Program: Ram type preventers: Cameron 5,000# working QEC Preventers.
Annulus: GK Hydril 3000# working pressure preventer. See Exhib. "D".

Gas Sales are dedicated to Llano, Inc.

RECEIVED
DEC 5 1979
U. S. GEOLOGICAL SURVEY
HOBBS, NEW MEXICO

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 George K. Smith — Agent for: TITLE Estoril Producing Corp. — DATE Dec. 3, 1979

(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

"A" 1

M Lea

660

3644.4 Morrow Lea (Penn) 160

Not applicable

Yes

George R. Smith

Agent for:

Estoril Producing Corp.

November 30, 1979

Estoril-3.75% WI
Fred M. Allison-3.75% WI
Stringer Oil & Gas-7.50% WI
Lario Oil-15.00% WI
Resources Investment-30.00% WI
Union Oil of Calif-40.00% WI

Union Oil
NM 14799

November 9,1979

JOHN W WEST 676
PATRICK A ROMERO 6663
3239

APPLICATION FOR DRILLING

Estoril Producing Corporation
Union Federal "A" Well No. 1
660' FSL and 660' FWL, Sec. 10, T20S, R34E
Lea County, New Mexico
Lease: NM 14799

In conjunction with Form 9-331C, Application for permit to Drill subject well, Estoril Producing Corporation submits the following items of pertinent information in accordance with USGS requirements:

1. The geologic surface formation is alluvium and bolson deposits, and other surficial deposits.

2. The extimated tops of geologic markers are as follows:

Anhydrite	1600'	Wolfcamp	10900'
Yates	3440'	Strawn	12150'
Queen	4600'	Atoka	12400'
Cherry Canyon	5700'	Morrow Clastics	12900'
Bone Spring	8200'	Miss. Lime	13700'

3. The depths at which anticipated water, oil or gas formations are expected to be encountered:

   Water: At approx. 100' or less in alluviun and at about 1000' in Triassic.

   Oil: Bone Spring at approximately 8200'.
   Strawn at approximately 12150'

   Gas: Morrow Clastic at approximately 12900.

4. Proposed Casing Program: See Form 9-331C and Exhibit F.

5. Pressure Control Equipment: See Form 9-331C and Exhibit D.

6. Mud Program: See attached mud program, Exhibit E, recommended by Southwestern Drilling Mud Service.

7. Auxiliary Equipment: Kelly Cock; pit level indicators and flow sensor equipment; Blow out preventer; Inside blowout preventer.

8. Testing, Logging and Coring Program:

   Drill Stem Test: 1 possible in Bone Spring at approx. 8200'
   1 possible in Strawn at approx. 12150'
   1 possible in Atoka at approx. 12900

   Logging: Density-Neutron and D. I. Laterlog

   Coring: None

9. It is anticipated that there is a possibility that abnormally high pressure may be encountered. In that event, the proposed mud program will be modified to increase the mud weight to ± 11.0 lb/gal. See Exhibit E.

10. Anticipated starting date: 1/15/80
    Anticipated completion date: Approximately 75 days after starting date.

MULTI-POINT SURFACE USE AND OPERATIONS PLAN

Estoril Producing Corporation
Union Federal "A" - Well No. 1
660' FSL & 660' FWL, Sec. 10, T20S, R34E
Lea County, New Mexico
Lease: NM-14799

This plan is submitted with the Application for Permit to Drill the above described well. The purpose of the plan is to describe the location of the proposed well, the proposed construction activities and operations plan, to be followed in rehabilitating the surface after completion of the operation so that a complete appraisal can be made of the environmental effects associated with the operations.

1. EXISTING ROADS:

   A. Exhibit "A" is a portion of a USGS Topographic map showing the location of the proposed well as staked, approximately 43 miles East of Carlsbad on U. S. Highway 62/180, or approximately 29 miles Southwest of Hobbs, including approximately 3 miles of existing dirt access roads.

   B. The proposed wellsite is located approximately 43 miles east of the intersection of highways 285 and 62/180 in Carlsbad, New Mexico. Turn right (southeast) across a cattle guard onto a dirt road at a point approximately midway between mile markers 76 and 77. After crossing cattleguard, take left fork in the road and travel southeast for approximately 2.5 miles to the Estoril Union Federal Well No. 1 wellsite location.

   C. The proposed access will start at this point in a southeasterly direction for approximately 2,700 feet to the proposed well site and the proposed road is marked by surveyor stakes and ribbons.

2. PLANNED ACCESS ROADS:

   A. Length and Width: The new access road will be 12 feet wide (20' ROW) and approximately 2,700 feet long from the point of origin at the Union Federal # 1 wellsite to the edge of the proposed drilling pad. The new access road is labeled and color coded in red on Exhibit "A" and "B". The centerline of the new road has been staked and flagged.

   B. Construction: The new road will be constructed by grading and topping with compacted caliche. The surface will be crowned, with drainage both sides.

   C. Turnouts: At least two passing turnouts will be constructed approximately 1,000 feed apart. This will increase the width of the new road to 20 feet for a distance of 30 feet.

   C. Culverts: None required.

   E. Cuts and Fills: There will be some minor cuts and fills because of the gently rolling sand dunes up to 2-3 feet in height.

   F. Gates, Cattleguards: None required.

3. LOCATION OF EXISTING WELLS:

A. Other drilling activities or existing wells within a one-mile radius are shown on Exhibit "B".

4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES:

A. There are no production facilities on this lease at the present time.

B. If the well proves to be commercial, the necessary production facilities, gas separation-process equipment, buried flow lines, and tank battery, will be installed on the drilling pad.

5. LOCATION AND TYPE OF WATER SUPPLY:

A. It is planned to drill the proposed well with both fresh and brine water. The water will be obtained from commercial sources and will be trucked to the well site over the existing roads and the proposed access road, as shown on Exhibit "A" and "B". No water wells are to be drilled.

6. SOURCE OF CONSTRUCTION MATERIALS:

A. Caliche for surfacing the road and the well site pad will be obtained from an existing pit located on Federal land in the NW¼, NW¼, of Sec. 8, T20S, R34E. Top soil from the location will be stockpiled near the location for future rehabilitation use. No surface materials will be disturbed except for those necessary for actual grading and leveling of the drill site and access road. See Exhibit A for the caliche pit location.

7. METHODS OF HANDLING WASTE DISPOSAL:

A. Drill cuttings will be disposed of in the reserve pits, and covered.

B. Drilling fluids will be allowed to evaporate in the reserve pits until the pits are dry.

C. All pits will be fenced with normal fencing material to prevent livestock from entering the area.

D. Water produced during operations will be collected in tanks until hauled to an approved disposal system, or separate disposal application will be submitted to the USGS for approval.

E. Oil produced during operations will be stored in tanks until sold.

F. Current laws and regulations pertaining to the disposal of human waste will be complied with.

G. Trash, waste paper, garbage and other debris will be buried in a separate trash pit and covered with a minimum of 24 inches of dirt. All waste material will be contained to prevent scattering by the wind. If well is productive, maintenance waste will be placed in special trash cans and hauled away periodically.

7. H. All trash and debris will be buried or removed from the wellsite within 30 days after finishing drilling and/or completion operations.

8. ANCILLARY FACILITIES:

   A. No air strip, camp or other facilities will be required.

9. WELLSITE LAYOUT:

   A. Exhibit "C" shows the relative location and dimensions of the well pad, mud pits, reserve pits, trash pit, and major rig components. The pad and pit area has been surveyed, staked and flagged.

   B. Any unguarded pits containing fluids will be fenced until they are filled.

   C. The reserve pit will be plastic lined.

10. PLANS FOR RESTORATION OF THE SURFACE:

   A. After completion of drilling and/or completion operations all equipment and other material not needed for operations will be removed. Pits will be filled and location cleaned of all trash and junk to leave the wellsite in an aesthetically pleasing a condition as possible.

   B. Any unguarded pits containing fluids will be fenced until they are filled.

   C. If the proposed well is non-productive, all rehabilitation and/or vegetation requirements of the Burequ of Land Management and the United States Geological Survey will be complied with and will be accomplished as expeditiously as possible. All pits will be filled and leveled within 90 days after abandonment.

11. OTHER INFORMATION:

   A. Topography: The land surface in the vicinity of the wellsite and the access road is undulating to gently rolling sand dunes ranging in height from two to four feet.

   B. Soil: The topsoil is soft powdery sand.

   C. Flora and Fauna: The vegetative cover consists of very sparse miscellaneous grasses, mesquite, yucca, bear grass and shinnery oak along with other miscellaneous desert flowers and weeds. Antelope were seen in the area and other wildlife probably includes those typical of semi-arid desert land.

   D. Ponds and Streams: There are no rivers, streams, lakes or ponds in the area.

   E. Residences and Other Structures: There are no occupied dwellings within several miles of the wellsite. The nearest windmill is about a half mile south of the location, and one a half mile north.

11. F. Land Use: Cattle grazing.

G. Archaeological and Historical Sites: There is no evidence of any significant archaeological, historical or cultural sites in the area of the proposed wellsite or access roads. An archaeological survey has been conducted by New Mexico Archaeological Services, Inc., of Carlsbad, New Mexico and this report has been submitted to the appropriate government agencies.

12. OPERATOR'S REPRESENTATIVE:

A. The field representative responsible for assuring compliance with the approved surface use and operations plan for Estoril Producing Corporation is:

Bruce C. Monroe
Estoril Producing Corporation
Suite 1120 Vaughn Building
Midland, Texas 79701
Telephone: 915-683-6101 (office)
915-683-6859 (residence)

13. CERTIFICATION

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

DATE: December 3, 1979

George R. Smith, Agent for:
Estoril Producing Corporation

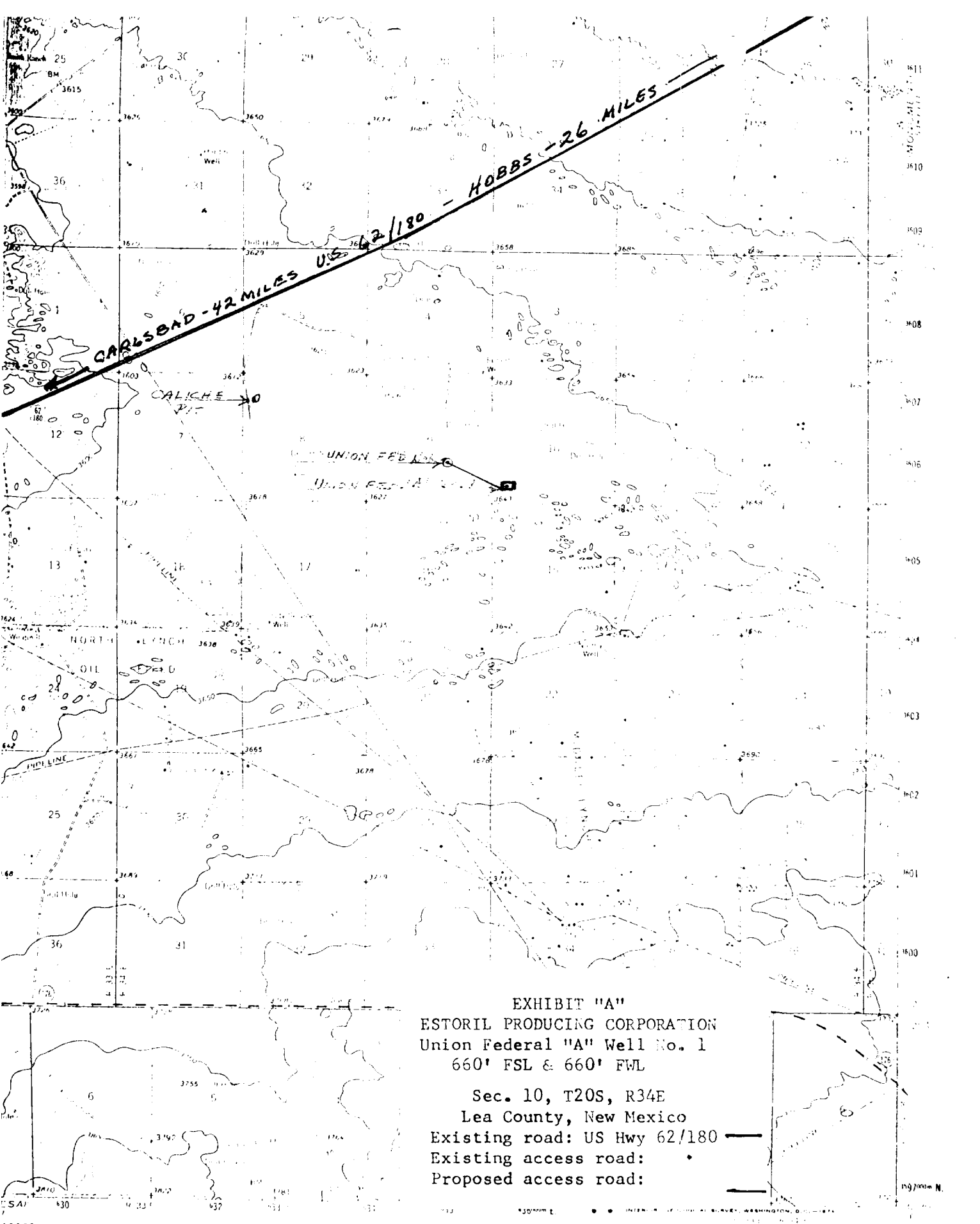

EXHIBIT "A"
ESTORIL PRODUCING CORPORATION
Union Federal "A" Well No. 1
660' FSL & 660' FWL

Sec. 10, T20S, R34E
Lea County, New Mexico
Existing road: US Hwy 62/180
Existing access road:
Proposed access road:

62500

ROAD CLASSIFICATION
Heavy Duty — Light Duty
Medium Duty — — — Unimproved dirt
U.S. Route State Route

VAL 10 FEET
SEA LEVEL

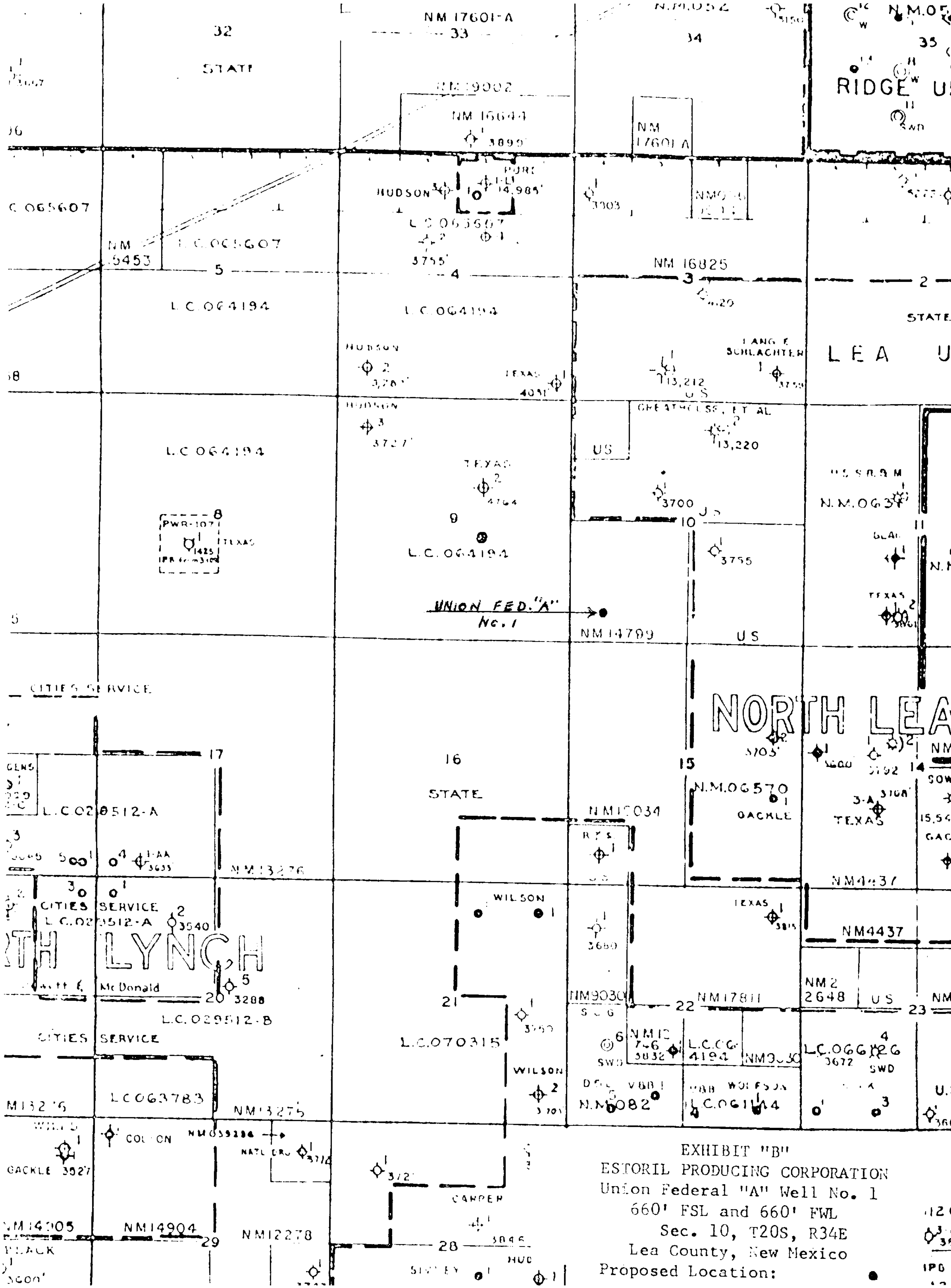

EXHIBIT "B"
ESTORIL PRODUCING CORPORATION
Union Federal "A" Well No. 1
660' FSL and 660' FWL
Sec. 10, T20S, R34E
Lea County, New Mexico
Proposed Location: ●

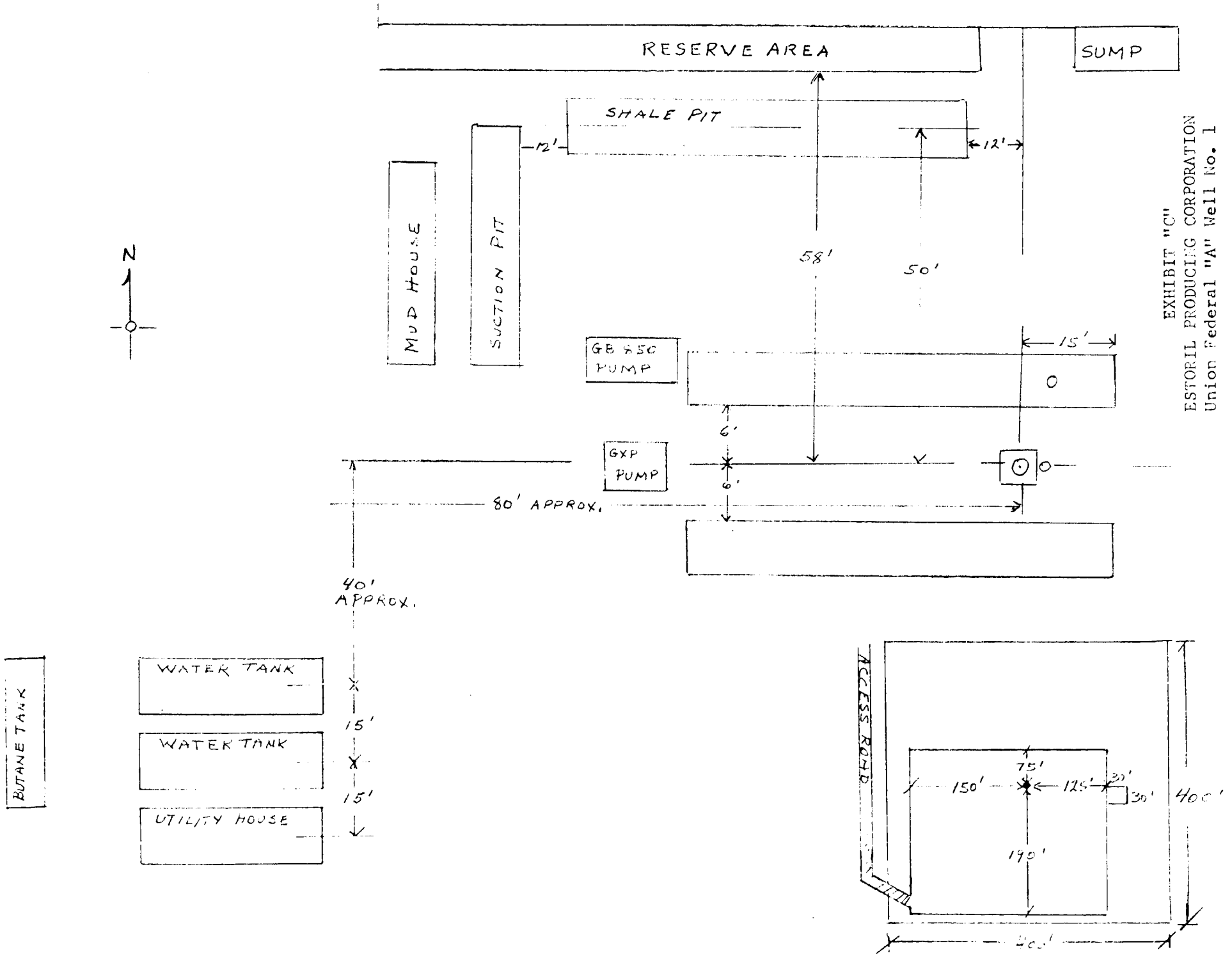

EXHIBIT "C"
ESTORIL PRODUCING CORPORATION
Union Federal "A" Well No. 1

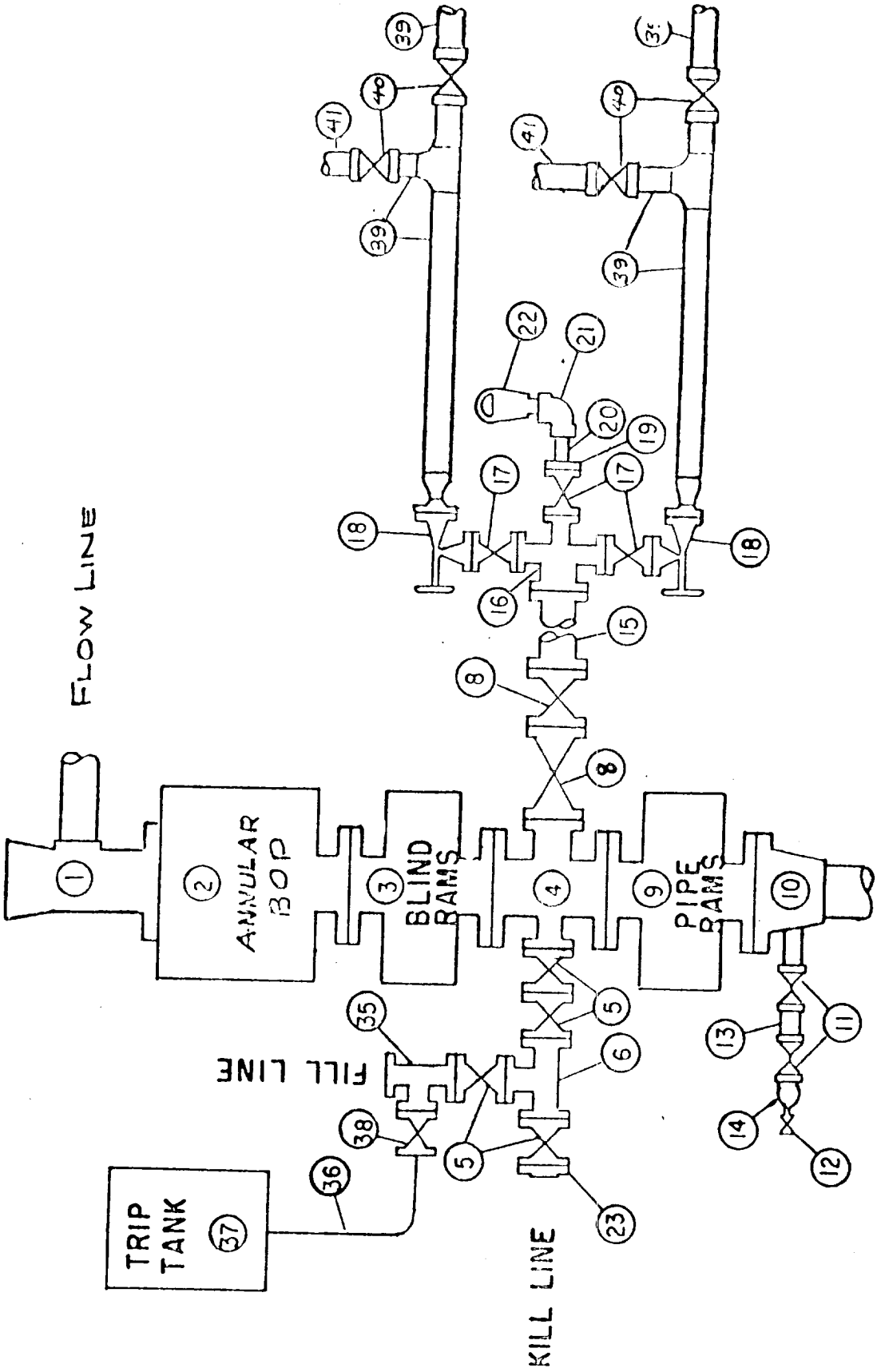

EXHIBIT "D"
ESTORIL PRODUCING CORPORATION
Union Federal "A" Well No. 1

9/15/73

Southwestern Drilling Mud Service, Inc.
P. O BOX 2477 • 915 683-2801 24 HOUR
MIDLAND, TEXAS 79702

July 5, 1979

Mr. Bruce Monroe
Estoril Producing Corp.
1120 Vaughn Building
Midland, Texas 79701

Dear Bruce:

Enclosed are our drilling fluid recommendations for your upcoming Union Federal "A" #1, a 13,700' Morrow test located in Section 10 Township 20 South, Range 34 East, Lea County, New Mexico.

Our recommendations are based on offset data from several nearby offset wells and our general knowledge of the area. As you requested, this program corresponds very closely to the program we used on your recent Union Federal No. 1.

Our program anticipates dry drilling in the intermediate hole due to severe loss of circulation at ±4000'. Fresh water drilling under intermediate is recommended to the top of the Wolfcamp, then a controlled brine system is recommended. The recommended mud up depth is 11,200' with a Salt Water Gel/Monpac/Starch mud system. Continual seepage throughout the production interval is anticipated. There is a slight possibility of abnormal pressure in the Strawn/Atoka/Morrow sequence.

Our estimated mud material cost for this well is $64,000 ($71,000 with tax and drayage) based on 51 days to total depth and no serious loss of circulation. Cost for oil and water are not included in the estimate. Also, no elevated mud weights are included in the above cost. We estimate an additional $13,000 if 11.0 lb/gal mud weights are required.

We appreciate the opportunity to submit these recommendations and look forward to working with you further on this well. If we can be of any further assistance, please contact us at 683-2801.

Sincerely,

Mike Lowrance

Mike Lowrance

cc: C.M. "Andy" Anderson

EXHIBIT "E"
ESTORIL PRODUCING CORPORATION
Union Federal "A" Well No. 1

Southwestern
Drilling Mud Service, Inc.

Drilling Fluids Recommendations

OPERATOR Estoril Producing Corp. LEGAL Sec. 10, T-20-S, R-34-E

WELL NAME Union Federal "A" #1 COUNTY Lea, New Mexico

ANTICIPATED FORMATION TOPS

Anhydrite	@	1550	ft.	Mississippian	@	13,500	f
Yates	@	3400	ft.		@		f
Queen	@	4200	ft.		@		f
Bone Springs	@	8200	ft.		@		f
Wolfcamp	@	10,400	ft.		@		f
Strawn	@	12,000	ft.		@		f
Morrow	@	13,000	ft.		@		f

ANTICIPATED DRILLING PROGRAM

CASING SIZE	DEPTH	BIT SIZE	NUMBER BITS	NUMBER DAYS
13-3/8"	850'	17-1/2"	1	2
9-5/8"	5200'	12-1/4"	4	14
5-1/2"	13,700'	8-1/2"	10	35
			Total Days	51

RECOMMENDED DRILLING FLUID PROPERTIES

DEPTH	MUD PROPERTIES		REMARKS
0-850'	Weight	8.6-9.0	Spud in with conventional Fresh Water Gel and Lime spud mud with sufficient viscosity to clean the large diameter hole. Use Paper and/or Cottonseed Hulls to control seepage losses in un-consolidated formations.
	Viscosity	36-40	
	Filtrate	NC	
	pH	--	

Southwestern
Drilling Mud Service, Inc.

Drilling Fluids Recommendations

OPERATOR Estoril Producing Corp. WELL NAME Union Federal "A" #1

Recommended Drilling Fluid Properties (cont'd)

DEPTH	MUD PROPERTIES		REMARKS
850- 5200	Weight	8.8-10.4	Drill out from surface casing with existing fresh water system. Circulate reserve pit for improved solids control. Use fresh water additions to maintain volume to 1500' then begin brine water additions. The additions of fresh water through the red beds will help stabilize the hole. We recommend brine additions after 1500' to minimize washout of the salt section. Use Paper and/or Multi-Seal, as necessary, to control seepage losses. There is a good possibility of encountering complete loss of circulation from 3600 to 4500'. The losses appear to be in highly fractured and porous zones. If these losses are encountered, we recommend dry drilling to casing seat using periodic viscous LCM sweeps to keep the hole clean and prevent pack off on connections. If a slug pit is available, we recommend using fresh water sweeps consisting of Fresh Water Gel, Lime, Cottonseed Hulls, Shur Plug and Multi-Seal. If a slug pit is not available, the brine water and Salt Gel will have to be used. An initial slug should be pre-mixed by 3500' and pumped as soon as losses are encountered while drilling. Frequency of sweeps after enountering the losses will depend on hole conditions, pump rates, drilling rate, etc.
	Viscosity	30-32	
	Filtrate	NC	
	pH	--	

Southwestern
Drilling Mud Service, Inc.

Drilling Fluids Recommendations

OPERATOR Estoril Producing Corp. WELL NAME Union Federal "A" #1

Recommended Drilling Fluid Properties (cont'd)

DEPTH	MUD PROPERTIES		REMARKS
5200-11,200'	Weight	8.4-9.0	Drill out from intermediate casing with fresh water. Circulate reserve pit for improved solids control. Use Paper, as necessary, to control seepage losses. Major loss of circulation is not expected in this interval.
	Viscosity	28	
	Filtrate	NC	
	pH	10-11	

Maintain pH in this interval with Lime to 10,000' then switch to Caustic Soda. This will facilitate mudding up at 11,200'.

Since fresh water is being used in this section, a corrosion inhibitor will be needed. We recommend using OS-12, an ammonium sulfite oxygen scavenger, at the rate of 5 gal/tour to inhibit the corrosive tendencies of dissolved oxygen. It would also be helpful to use a film forming amine to provide a protective coating on the drill string. For the inside of this drill string, batch treat daily with a 1 to 4 mixture of amine in diesel oil. Five gallons of amine (20 gal. of diesel) should be sufficient. A coating on the outside of the string can be obtained by spraying this mixture on the string on trips. The use of the amine must be discontinued after mud up as it will cause flocculation problems.

Two barite bins should be spotted and loaded soon after drilling out from intermediate casing.

Southwestern
Drilling Mud Service, Inc.

Drilling Fluids Recommendations

OPERATOR Estoril Producing Corp. WELL NAME Union Federal "A" #1

Recommended Drilling Fluid Properties (cont'd)

DEPTH	MUD PROPERTIES		REMARKS
5200-11,200' (Cont'd)			At 10,500' begin additions of brine water. Add brine water slowly to bring weight up to 9.0 lb/gal. Since the weak Bone Springs formation is open, we suggest maintaining approximately 2-4 lb/bbl of Paper and Multi-Seal while adding brine. This will minimize seepage losses while weighting up. The concentration may be altered depending on hole conditions.
11,200-13,000'	Weight Viscosity Filtrate pH	9.0-10.0 33-36 10-15 9.5-10	Staying in reserve pits, mud up with Salt Water Gel, Monpac and Starch for indicated properties. Pre-treat water with Soda Ash and D-76 Defoamer prior to mudding up. Maintain total hardness below 200ppm while on mud. Use Caustic Soda to maintai pH. Maintain lost circulation material in the system to retard seepage. Allow hole conditions to dictate actual concentration needed. Continue tourly additions of OS-12 for corrosion inhibition. Mud weight should be maintained a ±9.0 lb/gal to 12,000' with additions of brine and fresh water. At 12,000', begin additions of brine water only to increase weight to ±9.6/ lb/gal. At approximately 12,500', supplement brine water additions with sack salt to bring the weight up to ±10.0 lb/gal. Adjust content of lost circulation material according to hole conditions during weight up.

Southwestern
Drilling Mud Service, Inc.

Drilling Fluids Recommendations

OPERATOR Estoril Producing Corp. WELL NAME Union Federal "A" #1

Recommended Drilling Fluid Properties (cont'd)

DEPTH	MUD PROPERTIES		REMARKS
13,000-13, 700	Weight	10.0-11.0	Continue drilling with existing system lowering water loss as indicated, with increased additions of Monpac and Starch. Continue additions of Caustic Soda to maintain pH, Soda Ash to maintain low total hardness and OS-12 for corrosion inhibition. Continue additions of LCM, as necessary, to control seepage losses. Allow hole conditions to dictate any mud weight changes. There is a slight possibility of pressures being encountered that might require ±11.0 lb/gal mud. These pressures could occur as high as the Atoka formation. If weighting up is necessary, switch back to steel pits.
	Viscosity	38-44	
	Filtrate	8 or less	
	pH	9.5-10	

BJ-HUGHES Inc.

2135 SO. HOLIDAY HILL RD., P. O. BOX 7047 MIDLAND, TEXAS 79703 PHONE 915 694-6601

February 1, 1979

Mr. Bruce Monroe
Estoril Producing Corporation
Vaughn Building
Midland, Texas

Dear Mr. Monroe:

The following recommendation and cost estimate are submitted for your evaluation on the Union Federal "A" #1 well in Section 10, T 20 S, R34E in Lea County, New Mexico.

WELL DATA: Surface

Depth	850'
Casing Size	13 3/8"
Hole Size	17 1/2"
Desired Fill	Circulate
True Hole Volume-cu.ft.	591
Recommended Volume-cu.ft.	741
% Excess	126%

RECOMMENDATION: Surface

We recommend that the surface casing be cemented with:

A. Lead Slurry - 525 Sacks Class "C" cement containing 2% A-2 (lodense), 1/4 lb/sack Celloflake.

B. Tail Slurry - 200 Sacks Class "C" plus 2% A-7 (calcium chloride).

SLURRY PROPERTIES:	Lead	Tail
Slurry Yield-cuft/sack	2.14	1.32
Slurry Weight-lb/gal	12.4	14.8
Thickening Time: hrs:min	5:00+	3:10
Compressive Strength- 8 hours	150	1,200
24 hours	535	1,750
Mixing Water-gal/sack	12.4	6.31

EXHIBIT "F"
ESTORIL PRODUCING CORPORATION
Union Federal "A" Well No. 1

BJ-HUGHES Inc.

3135 SO. HOLIDAY HILL RD., P. O. BOX 7647, MIDLAND, TEXAS 79703 PHONE 915 694-6601

COST ESTIMATE:

One Pump Truck to 850'	$ 473.50
30 Miles on One Truck @ 1.20	36.00
One 13 3/8" Top Rubber Plug	114.00
725 Sacks Class "C" @ 4.32	2,936.25
987 Lbs. A-2 Lodense @ .65	641.55
400 Lbs. A-7 Calcium Chloride @ 14.75	59.00
132 Lbs. Celloflake @ .71	93.72
30 Miles on 34.8 Tons @ .40	417.60
Mixing Service Chrg on 733 cu.ft. @ .62	454.46
4% Price Increase	209.04
	$ 5,435.12

One 13 3/8" Guide Shoe	$ 211.00
One 13 3/8" Baffle Plate	43.80
Three 13 3/8" Centralizers @ 59.40	178.20
One Kit Bakerlok	12.15
	$ 445.15

INTERMEDIATE

WELL DATA:

Depth	5200'	
Casing Size	9 5/8"	
Hole Siz	12 1/4"	
Desired Fill	Circulate	
True Hole Volume-cu.ft.	1,754	
DV Tool @	3,800	
Recommended Volume-cu.ft.	1st Stage 1,128 cuft	1,800'
	2nd Stage 2,380	
% Excess	100%	

We recommend that the hole be calipered and that the cement volume be calculated 30% above the caliper volume. As an estimate, we are taking 100% above true hole calculated volume.

BJ-HUGHES Inc.

[illegible] P.O. BOX 7447 MIDLAND TEXAS [illegible] PHONE 915 694 6601

Estoril Producing Corp.
February 1, 1979
Page #3

1st Stage-A. Lead Slurry-410 units BJ-Lite 35:65:6, 2% A-7, 8 lbs. A-5 Salt, 5 lbs. D-7 Gilsonite, and 1/4 lb/sack Celloflake. Each unit of BJ-Lite to consist of 25.9 lbs. Diamix F, 61.1 lbs. Class "C", 5.22 lbs. Gel, 1.74 lbs. A-7 Calcium Chloride, 8 lbs. A-5 Salt, 5 lbs. D-7 Gilsonite and 1/4 lb. Celloflake.

B. Tail Slurry-200 Sacks Class "C" cement with 2% A-7 Calcium Chloride.

2nd Stage-C. Lead Slurry-1,065 Units BJ-Lite 35:65:6, 2% A-7, 8 lbs. A-5, 5 lbs. D-7, 1/4 lb/sack Celloflake.

D. Tail in with 100 sacks Class "C", 2% A-7.

SLURRY PROPERTIES: Intermediate

	A	B	C	D
Slurry Yield-cuft/unit	2.11	1.32	2.11	1.32
Slurry Weight-lb/gal	12.6	14.8	12.6	14.8
Thickening Time-hrs:min	10:10	2:40	9:30	2:50
Compressive Strength: 12 hrs.	125	1,700	140	1,600
24 hrs.	235	2,850	250	2,800
Mixing Water-gal/unit	11.29	6.31	11.29	6.31

COST ESTIMATE: Intermediate

One Pump Truck to 5,200'	$ 831.30
2nd Stage Pump Truck	459.00
30 Miles on one Truck @ 1.20	36.00
One 9 5/8" Top Rubber Plug	55.50
1,259 Sacks Class "C" Cement @ 4.32	5,438.88
516 Cu.ft. Diamix F @ 1.75	903.00
32 Sacks A-7 Calcium Chloride @ 14.75	472.00
118 Sacks A-5 Salt @ 14.50	1,711.00
74 Sacks D-7 Gilsonite @ 25.00	1,850.00
369 Lbs. Celloflake @ .71	261.99
6% Gel on 1,475 cu.ft. @ .52	767.00
30 Miles on 93.4995 Tons @ .40	1,121.99
Mixing Service Chrg on 2156 cu.ft. @ .62	1,336.72
4% Price Increase	609.78
	$15,395.16

COST ESTIMATE: Intermediate con't

One 9 5/8" Guide Shoe	$ 145.00
One 9 5/8" Insert Float	175.50
Five 9 5/8" Centralizers @ 41.30	206.50
One Kit Bakerlok	12.15
One Cement Basket	155.50
One 9 5/8" Model "J" Stage Collar	3,008.00
	$ 3,702.65

PRODUCTION

WELL DATA:

Depth	13,700'		
Casing Size	4 1/2"	or	5 1/2"
Hole Size	8 3/4"		
Desired Fill	8,900'		8,900'
True Hole Volume-cu.ft.	2,733		2,248
DV Tool Set @	8,000'		8,000'
Recommended Volume-cu.ft.			
1st Stage	2,995 cu.ft.		2,463 cu.ft.
			6,500'
2nd Stage	1,106 cu.ft.		909 cu.ft.
			2,400'
% Excess	50%		50%

RECOMMENDATION:

The cement should tie back into the intermediate at 5,600'. If you set 4 1/2", then pump:

A. Lead Slurry - 1st Stage-1,280 units BJ-Lite 35:65:6 (Fly Ash + Class "H"), 5 lbs. KCl (clay stabilizer), .5% D-19 fluid loss additive, 1/4 lb. Celloflake and .3% Gel (reduce free water). Each unit of BJ-Lite to consist of 25.9 lbs. Diamix F, 61.1 lbs. Class "H", 5.22 lbs. Gel, 5 lbs. KCl, .435 lbs. D-19, .25 lbs. Celloflake, .261 lbs. Gel.

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RECOMMENDATION: con't

B. Tail Slurry - 500 Sacks Class "H" Cement containing 1.2% D-19 (fluid loss) plus 5 lbs. KCl and .6 % D-31 (viscosity reducer), .3% Gel.

C. Slurry - 2nd Stage-600 Units of BJ-Lite 35:65:6, 5 lbs KCl, .5% D-19, 1/4 lb/sack Celloflake and .3% Gel.

SLURRY PROPERTIES:

	A	B	C
Slurry Yield-cuft/unit	1.87	1.2	1.87
Slurry Weight-lb/gal	12.9	15.87	12.9
Thickening Time-hrs:min	3:16	4:00	4:00
Compressive Strength-12 hours	423	1,910	350
24 hours	775	2,875	665
Mixing Water-gal/unit	9.9	5.19	9.9

If you set 5 1/2" casing, then you would need Slurry A-1,060 units BJ-Lite, Slurry B-400 sacks Class "H" and the 2nd Stage-Slurry C-500 units BJ-Lite.

COST ESTIMATE: 4 1/2"

One Pump Truck to 13,700'	$ 3,548.00
One Standby Truck	540.00
2nd Stage	459.00
30 Miles on Two Trucks @ 1.20	72.00
1,722 Sacks Class "H" @ 4.10	7,060.20
658 Cu.ft. Diamix F @ 1.75	1,151.50
119 Sacks KCl Clay Stabilizer @ 14.50	1,725.50
1,495 Lbs. D-19 Fluid Loss Agent @ 4.05	6,054.75
470 Lbs. Celloflake @ .71	333.70
.3% Gel on 2380 cu.ft. @ .26	618.80
282 Lbs. D-31 Viscosity Reducer @ 2.65	747.30
30 Miles on 112.669 Tons @ .40	1,352.03
Mixing Service Chrg on 2550 cu.ft. @ .62	1,581.00
4% Price Increase	1,009.59
	$26,249.37

Cement Evaluation Log