COPY TO O. C. C.

Form 9-331 C
(May 1963)

SUBMIT IN TRIPLICATE
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

30-025-26242

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 [X] 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: 1980' FSL and 1980' FEL
At proposed prod. zone: Same

5. LEASE DESIGNATION AND SERIAL NO.: [illegible]-064194

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Union Federal

9. WELL NO.: 1

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

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 9-T20S-R34E

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

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: Approximately 32.3 miles east of Carlsbad, New Mexico

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)	1980'	16. NO. OF ACRES IN LEASE	2080	17. NO. OF ACRES ASSIGNED TO THIS WELL	320
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.	None	19. PROPOSED DEPTH	14500'	20. ROTARY OR CABLE TOOLS	Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 3636.5' GR

22. APPROX. DATE WORK WILL START*: March 15, 1979

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"	54#	400'	CIRCULATE
12-1/4"	9-5/8"	36#	4000'	CIRCULATE
12-1/4"	7-5/8"	40#	13500'	To tieback to 9 5/8" csg
8-3/4"	*4-1/2"	9.5#, 11.6#, and 13.5#		

Attached letter dated [illegible] from B-Hughes Inc.

*If any abnormal pressure problems are encountered, 7" casing will be run from 5600' to 13,500'; and 5" casing will be run from 13500' to 14500' in the 6-1/2" hole.

Mud program: See attached mud program prepared by Baroid Division of National Lead Company.

BOP program: Ram type preventers: Cameron 5000# working pressure preventers.
Annulus: GK Hydril 5000# working pressure preventer.
See Exhibit D.

DEDICATED

Gas sales are not dedicated.

RECEIVED
FEB 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: Edward N. Lueking — TITLE: Agent for Estoril Producing Corporation — DATE: 2/5/79

(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

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
Estoril Producing Corp.	Union Federal	1

Unit Letter	Section	Township	Range	County
J	9	20 South	34 East	Lea

Actual Footage Location of Well:
1980 feet from the South line and 1980 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3636.5	Siluro-Devonian	Wildcat	320 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

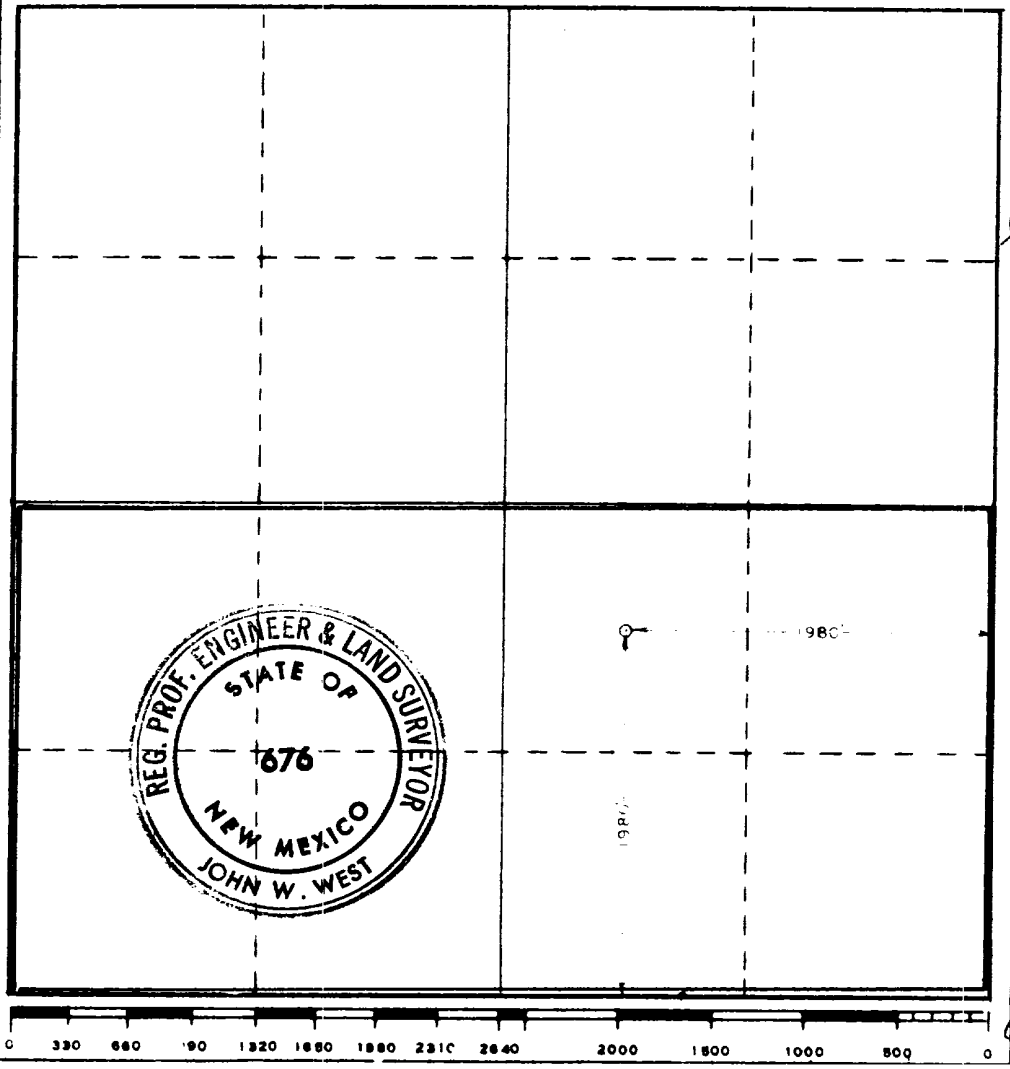
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

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

Edward N. Lucking

Name: Edward N. Lucking

Position: Agent for Estoril Producing Corporation

Company:

Date: 2/5/79

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed: January 9, 1979

Registered Professional Engineer and/or Land Surveyor

John W. West

Certificate No. John W. West 676
Ronald J. Eidson 3239

APPLICATION FOR DRILLING

Estoril Producing Corporation
Union Federal Well #1
1980' FSL and 1980' FWL
Section 9-T20S-R34E
Lea County, New Mexico

In conjunction with Form 9-331C, Estoril Producing Corporation submits the following ten items of pertinent information:

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

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

Anhydrite	1600'	Strawn	12150'
Yates	3440'	Atoka	12400'
Queen	4600'	Morrow Clastics	12900'
Cherry Canyon	5700'	Miss. Lime	13750'
Bone Spring	8200'	Woodford	14350'
Wolfcamp	10900'	Siluro-Devonian	14500'

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

Water: Probably at less than 400' in alluvium and at about 1000' in Triassic.

Oil or Gas: Bone Spring at approximately 8200' (oil)
Strawn at approximately 12150' (oil)
Atoka at approximately 12400' (gas)
Morrow Clastics at approximately 12900' (gas)
Siluro-Devonian at approximately 14500' (gas)

4. Proposed casing program: See Form 9-331C.

5. Pressure control equipment: See Form 9-331C and Exhibit D.

6. Mud program: See attached mud program recommended by Southwestern Drilling Mud Service, Inc.

7. Auxiliary equipment: Blowout preventer, Double blowout preventer, Kelly cock.

8. Testing, logging and coring programs:

Testing: 1 possible DST in Bone Spring at approximately 8200'
1 possible DST in Strawn at approximately 12150'
1 possible DST in Atoka at approximately 12400'
1 possible DST in Morrow Clastics at approximately 12900'
1 DST in Siluro-Devonian at approximately 14500'

Logging: Density-Neutron and D. I. Laterlog
Mud logging from 4800' to TD

Coring: None

9. It is anticipated that there is a possibility that abnormally high pressure may be encountered. In that event, the proposed casing program will be modified as indicated on Form 9-331C.

10. Anticipated starting date: March 15, 1979.
Anticipated completion of drilling operations: Approximately 75 days after starting date.

MULTI-POINT SURFACE USE AND OPERATIONS PLAN

Estoril Producing Corporation
Union Federal Well #1
1980' FSL and 1980' FWL
Section 9-T20S-R34E
Lea County, New Mexico

This plan is submitted with Form 9-331C, Application for Permit to Drill, covering the above described well. The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the necessary surface disturbance involved, and the procedures to be followed in rehabilitating the surface after completion of the operations, so that a complete appraisal can be made of the environmental effects associated with the operation.

1. EXISTING ROADS.

A. The proposed wellsite is located approximately 40.0 miles east of the intersection of Highways 285 and 62/180 in Carlsbad, New Mexico (exclusive of the length of the proposed new access road).

(1) Proceed east on highway 62/180 for a distance of approximately 40.0 miles. Turn right (southeast) across a cattleguard onto a dirt road at a point approximately midway between mile posts 76 and 77 on highway 62/180. Details of the roads in this area are shown in Exhibit A.

(2) After crossing the cattleguard, take the left fork in the road and continue in a southeast direction for approximately 1.7 miles.

(3) At this point, turn right (south) on an existing dirt road for a distance of approximately 3000 feet. The road ends at this point, adjacent to an unidentified dry hole marker. The new access road to the location will begin at this point in a continuing southbound direction and is clearly marked with surveyor's ribbons.

B. Some work will be required to improve the surface of the road referred to, in paragraph 1A(2), above, and the entire length of the road referred to, in paragraph 1A(3) will require blade scraping and an adequate topping with compacted caliche. It is planned to install two turnouts in the latter road, each approximately 10' by 100'.

2. PLANNED ACCESS ROAD.

A. The proposed new access road will be built in a north-to-south direction and will be approximately 1200 feet in length. The driving surface will be 12 feet in width. The ground surface over the route of the proposed road is relatively level, with gentle sand dunes ranging in height to approximately five feet. The surface of the road will be covered with an adequate thickness of compacted caliche and the center of the road will be crowned, with drainage on both sides of the road. One turnout will be constructed midway in the length of the road. No culverts will be necessary, and no cattle guards or fences are involved.

B. The center line of the proposed new road has been staked and flagged, and the route of the road is clearly visible.

3. LOCATION OF EXISTING WELLS.

A. Other drilling activities in the vicinity of the proposed well are indicated in Exhibit B.

4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES.

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

B. In the event that the well is productive, the necessary production facilities will be installed on the drilling pad. If the well is productive of oil, a gas or diesel self-contained unit will be used to provide the necessary power. No power will be required if the well is productive of gas.

5. LOCATION AND TYPE OF WATER SUPPLY.

A. It is planned to drill the proposed well with a fresh and brine water system. The water will be obtained from privately owned or commercial sources and will be hauled to the location by truck over the existing and proposed roads described above.

6. SOURCE OF CONSTRUCTION MATERIALS.

A. It is planned to obtain the caliche necessary for construction of the drilling pad and the new access road from an existing pit on federally owned surface, in the NW/4 NW/4 of Section 8-T20S-R34E. It will be hauled to the proposed location by truck over existing roads shown in Exhibit A.

7. METHODS OF HANDLING WASTE DISPOSAL.

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

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

C. 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.

D. Oil produced during operations will be collected in tanks until sold.

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

F. Trash, waste paper, garbage and junk will be buried in a separate trash pit and covered with a minimum of 24 inches of dirt. All waste materials will be contained to prevent scattering by the wind.

G. All trash and debris will be buried or removed from the wellsite within 30 days after drilling and/or completion operations have been finished.

8. ANCILLARY FACILITIES.

A. None required.

9. WELLSITE LAYOUT.

A. Exhibit C shows the relative location and dimensions of the well pad, reserve pits, and major rig components.

B. Only minor cut and fill will be necessary to level the drillsite location. It is estimated that a cut of approximately 2 feet will be required along the southern edge of the pad area and that approximately 3 feet of fill will be required along the northern edge. The pad area is generally flat, with occasional sand dunes of two or three feet in height.

C. The reserve pits will be plastic-lined.

D. The pad and pit area has been surveyed, staked and flagged.

10. PLANS FOR RESTORATION OF THE SURFACE.

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

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

C. If the proposed well is non-productive, all rehabilitation and/or vegetation requirements of the BLM and the USGS 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 proposed wellsite is located in a generally level area, with sand dunes ranging in height to approximately two or three feet, in the pad area, and approximately five feet over the route of the proposed access road.

B. The topsoil at the wellsite is soft sand.

C. Flora and Fauna: The vegetation cover at the location is moderate, consisting of miscellaneous grass and weeds, shinnery, bear grass, mesquite and a few yucca plants. No wildlife was observed, but there were evidences of habitation by typical semi-arid desert wildlife. The area is used for cattle grazing.

D. There are no occupied dwellings within several miles of the location. The nearest windmill is about a mile east and south of the drillsite.

E. There are no ponds, lakes, or flowing rivers or streams in the vicinity of the wellsite.

F. Surface ownership: The wellsite is on land owned by the federal government, with federal ownership of the minerals. A portion of the existing access road is on privately owned surface, and an agreement has been reached between Estoril Producing Corporation and the surface owner concerning improvement and use of this existing road.

G. There is no evidence of any significant archaeological, historical or cultural sites in the area of the proposed drillsite. An archaeological survey has been conducted by New Mexico Archaeological Services, Inc., P. O. Box 1341, Carlsbad, New Mexico, and their report has been submitted to the appropriate government agencies.

12. OPERATOR'S REPRESENTATIVE.

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

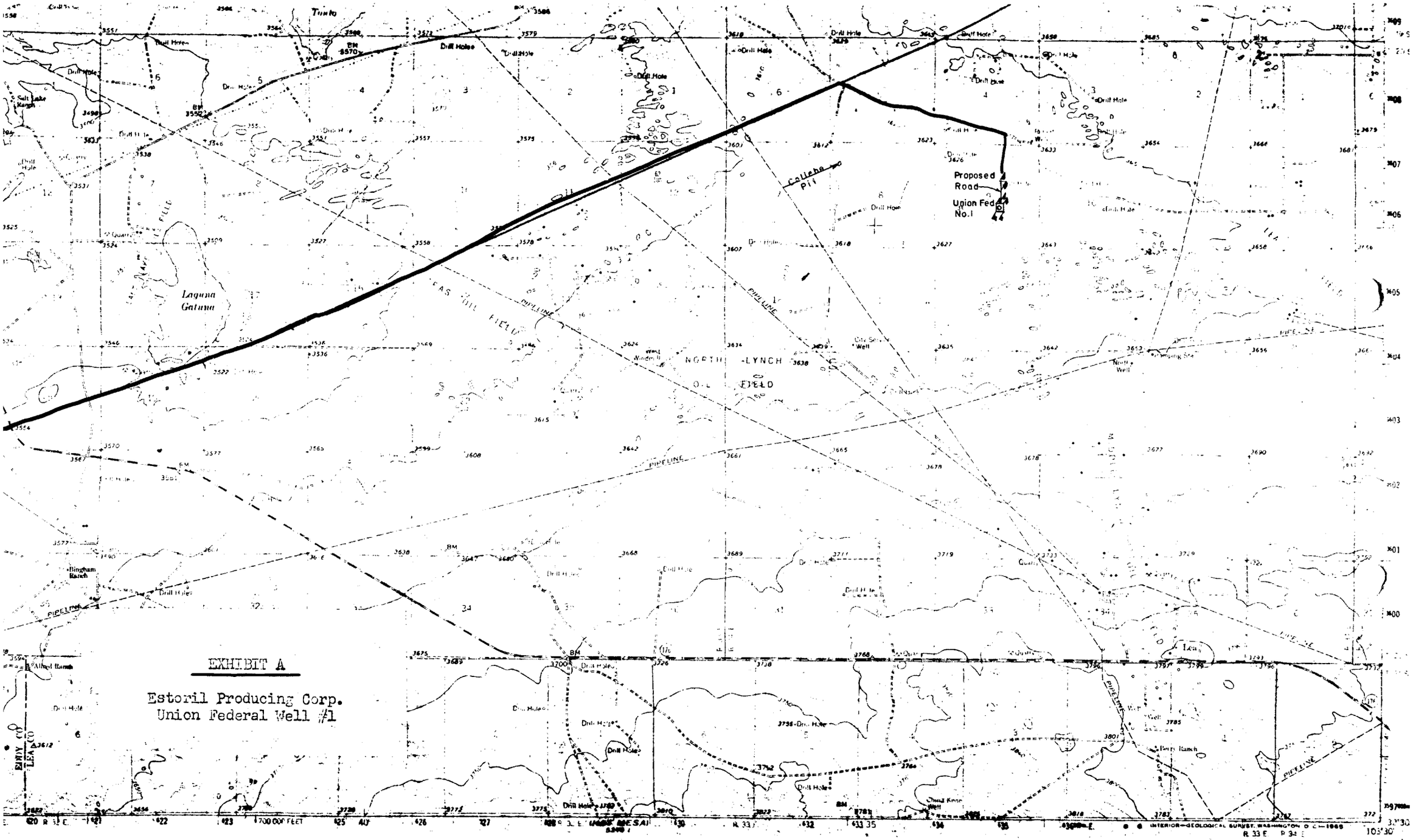
Bruce C. Monroe
Estoril Producing Corporation
Suite 1120 Vaughn Building
Midland, Texas 79701
Telephone: 915-683-6101 (office)
915-683-6859 (residence)

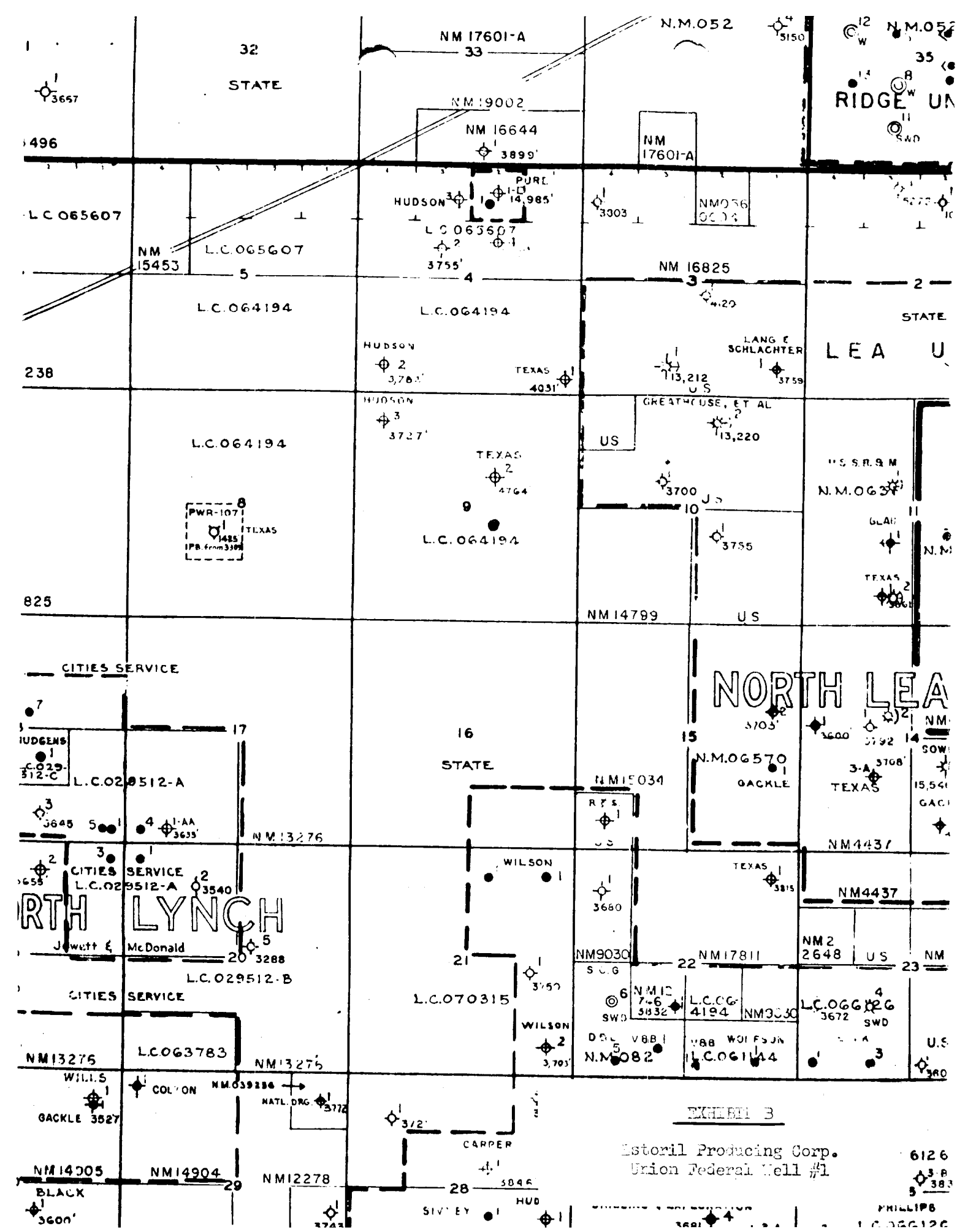
13. CERTIFICATION.

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.

2/5/79
Date

Edward N. Lucking
Agent for Estoril Producing Corporation


Proposed Road
Union Fed No.1
Caliche Pit
Laguna Gatuna
PIPELINE
Bingham Ranch
Allred Ranch
Perry Ranch
Drill Hole
EXHIBIT A
Estoril Producing Corp.
Union Federal Well #1


NM 17601-A
N.M.052
32
33
STATE
NM 19002
NM 16644
3899'
NM 17601-A
RIDGE UN
496
PURE
HUDSON
14,985'
L C 065607
L.C.065607
NM 15453
3755'
NM 16825
4,29
L.C.064194
L.C.064194
STATE
HUDSON
LANG & SCHLACHTER
LEA U
238
TEXAS
4031'
13,212
3759
HUDSON
GREATHOUSE, ET AL
13,220
US
L.C.064194
TEXAS
4764
3700
U.S.S.R.S.M
N.M.063
PWR-107
TEXAS
1485'
PB. from 3395
L.C.064194
3755
825
NM 14789
US
CITIES SERVICE
NORTH LEA
17
16
15
14
STATE
3705'
3600
N.M.06570
GACKLE
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3-A
TEXAS
3645
NM13276
NM4437
CITIES SERVICE
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3540
WILSON
TEXAS
3815
3680
RTH LYNCH
NM4437
Jewett & McDonald
20
3288
NM9030
22
NM17811
NM2
2648
US
23
L.C.029512-B
21
3760
L.C.070315
CITIES SERVICE
SWD
NM13275
L.C.063783
NM13275
WILSON
2
3,703'
WILLIS
COLLINSON
NM 039286
NATL. DRG.
3772
GACKLE 3527
3/2'
CARPER
NM14905
NM14904
NM12278
28
3846
29
BLACK
3600'
SIVLEY
HUD
PHILLIPS
EXHIBIT B
Estoril Producing Corp.
Union Federal Well #1
6126

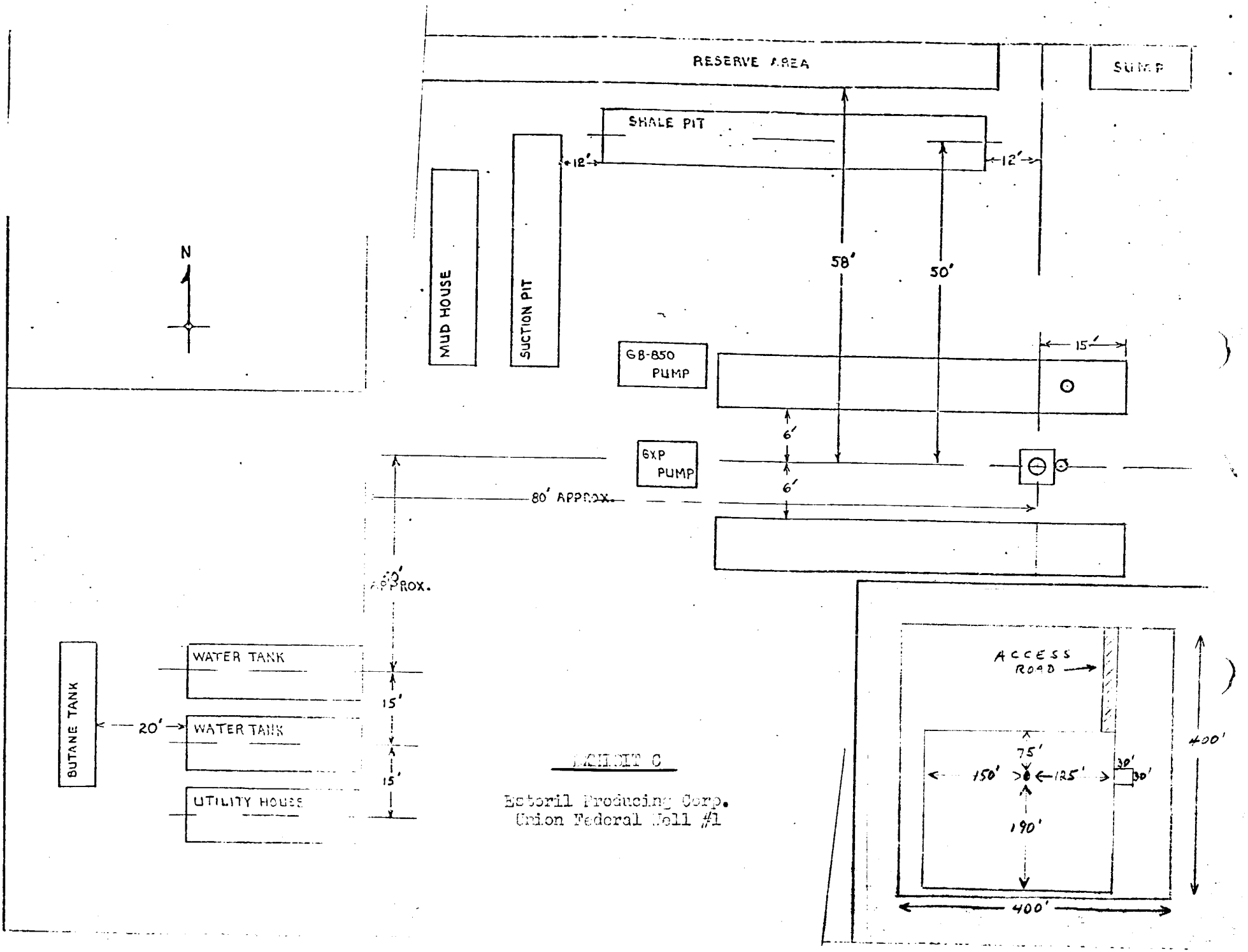
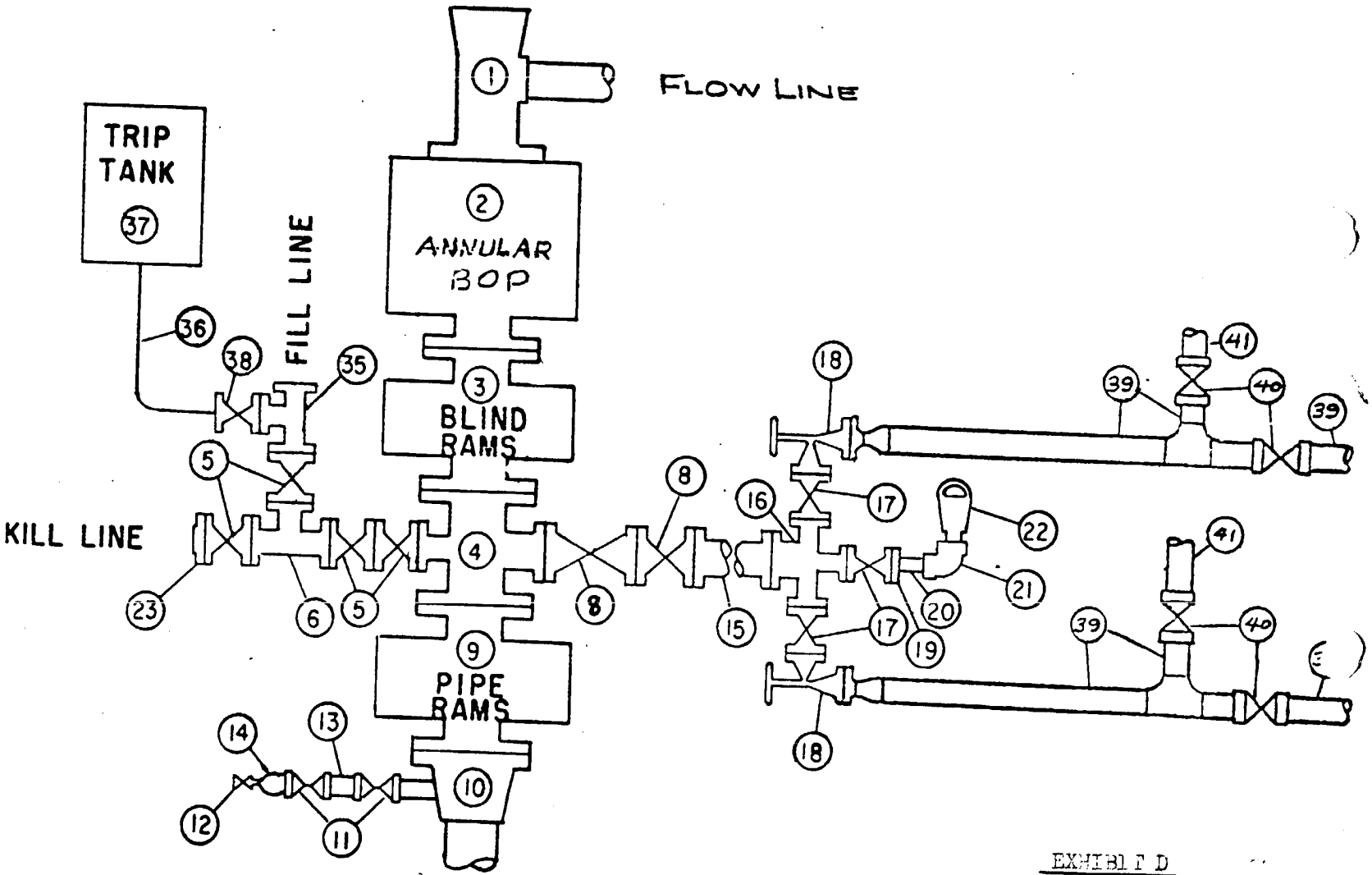


EXHIBIT C

Estoril Producing Corp.
Union Federal Well #1



9/15/73

EXHIBIT D
Estoril Producing Corp.
Union Federal Well #1

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

January 29, 1979

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

Dear Mr. Monroe,

Enclosed are our drilling fluid recommendations for your upcoming Union Federal No. 1 well, a 14,500' Devonian test located in Section 9, Township 20 South, Range 34 East, Lea County, New Mexico.

Our program is based on information gained from several nearby offset wells and our general knowledge of the area. Available information for the offsets is included with the program.

Our research indicates that possible problems on this well are as follows:

1) Loss of circulation in the intermediate hole. These losses could be serious enough to require dry drilling to casing depth.

2) Abnormal pressures in the Strawn/Atoka/Morrow sequence of formations. There is a slight possibility that these pressures may cause loss of circulation problems since the Bone Springs is not cased off. If these problems occur and are severe enough, we recommend setting a drilling liner.

Our estimated mud material cost for this well is $74,500. This cost is based on 56 days to total depth and a maximum 11.0 ppg mud weight below 11,200'. Also included in the cost is an estimate for loss of circulation in the intermediate hole.

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 in your pre-well planning, please contact us.

Sincerely,

Mike Lowrance

Mike Lowrance

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

DRILLING FLUIDS RECOMMENDATIONS

Estoril Producing Corp.
Union Federal No. 1

Sec. 9, T-20-S, R-34-E
Lea County, New Mexico

RECOMMENDED DRILLING FLUID PROPERTIES

DEPTH	WEIGHT	VISCOSITY	API FILTRATE	pH
0-850	8.6-9.0	32-34	NC	10-11

Spud in with conventional Fresh Water Gel and Lime spud mud with sufficient viscosity to clean the large diameter hole. Use Paper, as necessary, to control seepage losses in unconsolidated formations.

850-~~5200~~ 5600	8.8-10.0	28-30	NC	10-11

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

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

of fresh water through the red beds will help stabilize the hole. We recommend brine water additions after 1500' to minimize washout of the salt section.

Use Lime to maintain pH of 10-11 for corrosion inhibition. Use Paper, 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. We recommend dry drilling until drilling rate appears to show consolidated formations. While dry drilling, we recommend using viscous LCM sweeps tourly. The sweeps should consist of either Salt Water Gel or Super Visbestos as the viscosifier and Cottonseed Hulls, Shur Plug and Multi-Seal as the loss of circulation material.

If the losses are encountered, dry drilling to casing depth is possible. Should you desire returns for running casing, we would recommend using 3-4 pills (same as above) to seal of the loss zone. If this does restore at least partial returns, then we would recommend a cement squeeze. Hole conditions may require mudding up to maintain full circulation. If mudding up is required, we recommend using Salt Water Gel and Starch with appropriate amounts of lost circulation material.

~~5200~~ 5600-11,200	8.4-8.5	28	NC	10-11

Drill out from intermediate casing with fresh water. Circulate reserve pit for improved solids control. Use Paper, as necessary, to control any seepage losses. Major loss of circulation is not expected in this interval.

Maintain pH in this interval with Lime until 10,000', then switch to Caustic Soda. This will facilitate mudding up at 11,200'. Since fresh water is being used in this section, we recommend that OS-12 (approximately 5 gal/tour) be used to scavenge out all oxygen.

11,200-14,500	8.8-11.0	38-44	6-10	10-10.5

Return to working pits at 11,200' and begin fresh water mud-up. Pre-treat water with Soda Ash to lower total hardness to less than 200 ppm. Then, mud-up with Fresh Water Gel and CMC for above viscosity and water loss. Maintain these properties with daily additions of Fresh Gel, CMC and Caustic Soda. Small amounts of Desco should be used, as necessary, to stabilize flow properties and water loss values. Continue additions of OS-12 for corrosion inhibition.

Mud weight should be maintained as low as possible. Hole conditions should be allowed to dictate any mud weight increases. Offset wells in this area

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

have used mud weights ranging from 10.8 to 12.0 lb/gal in the Strawn/ Atoka/Morrow section. We should expect hole conditions to require 11.0 lb/gal during this section. For this reason, we recommend having bulk barite bins on location and loaded at 10,000'.

This elevated mud weight could possibly cause some hole problems (i.e. - loss of circulation) since intermediate is set at 5[redacted]00'. Should hole problems become extremely severe, we would recommend running a string of 7[redacted]" protective pipe to control the problem. It is worth noting, however, that none of the offset wells considered in this program, had to run a long protective string.

BJ-HUGHES Inc.

2135 SO. HOLIDAY HILL RD., P. O. BOX 7647, 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 #1 well in Section 9, T 205, 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

BJ-HUGHES Inc.

2135 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	5,600'	
Casing Size	9 5/8"	
Hole Size	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.

2135 SO. HOLIDAY HILL RD., P. O. BOX 7647, MIDLAND, TEXAS 79703 · PHONE: 915 694-6601

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 5,600'	$ 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

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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	14,500'		
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 14,500'	$ 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

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COST ESTIMATE: con't

One 4 1/2" Float Shoe	$ 114.00
One 4 1/2" Float Collar Type P-110	298.00
Twenty 4 1/2" Centralizers @ 26.80	536.00
One Kit Baker Lok	12.15
One 4 1/2" Model "J" Stage Collar	1,295.00
One 4 1/2" Cement Basket	89.00
	$2,344.15

COST ESTIMATE: if 5 1/2"

One Pump Truck to 14,500'	$ 3,548.00
One Standby Truck	540.00
2nd Stage	459.00
30 Miles on Two Trucks @ 1.20	72.00
1,414 Class "H" @ 4.10	5,797.40
546 Cu.ft. Diamix F @ 1.75	955.50
98 Sacks KCl Clay Stabilizer @ 14.50	1,421.00
1,129 Lbs. D-19 Fluid Loss @ 4.05	4,572.45
390 Lbs. Celloflake @ .71	276.90
.3% Gel on 1960 cu.ft. @ .26	509.60
226 Lbs. D-31 @ 2.65	598.90
30 Miles on 92.579 Tons @ .40	1,110.95
Mixing Service Chrg on 2100 cu.ft. @ .62	1,302.00
4% Price Increase	846.55
	$ 22,010.25

One 5 1/2" Float Shoe	$ 138.00
One 5 1/2 Float Collar Type P-110	341.00
Twenty 5 1/2" Centralizers @ 29.00	580.00
One Kit Baker Lok	12.15
One Model "J" Stage Collar	1,608.00
One 5 1/2" Cement Basket	98.00
	$2,777.15

In the event you run into high gas pressure and volume, when you drill into the Atoka Morrow, you may have to run 7" casing to 13,500', then drill a 6 1/2" hole to 14,500' to test the Devonian.

Cement Bond Log
4/8/83

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WELL DATA: 7" Casing to ~~12,300'~~ 13,500'

Depth		~~12,300'~~ 13,500'
Casing Size		7"
Hole Size		8 3/4"
Desired Fill		~~6,700'~~ 7,900'
True Hole Volume-cu.ft.		1,007
DV Tool Set @		8,000'
Recommended Volume-cu.ft.	1st Stage	970' ~~4,300'~~
	2nd Stage	~~541'~~ 812' ~~2,400'~~ 3,600'

RECOMMENDATION:

A. Lead Slurry - 1st Stage-325 units BJ-Lite 35:65:6, 5 lbs. KCl, .5% D-19, 1/4 lb. Celloflake and .3% Gel.

B. Tail Slurry - 300 Sacks Class "H" containing 1.2% D-19, 5 lbs. KCl, .6% D-31 and .3% Gel.

C. 2nd Stage - 290 Units BJ-Lite 35:65:6, 5 lbs. KCl, .5% D-19, 1/4 Celloflake and .3% Gel.

SLURRY PROPERTIES:

	A	B	C
Slurry Yield-cu.ft./unit	1.87	1.2	1.87
Slurry Weight-lb/gal	12.9	15.87	12.9
Thickening Time-hrs:min	3:35	4:30	4:00
Compressive Strength-12 hrs	423	1,910	350
24 hrs	775	2,875	665
Mixing Water-gal/unit	9.9	5.19	9.9

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COST ESTIMATE: 7"

One Pump Truck to 12,300'	$ 2,403.00
One Standby Truck	540.00
30 Miles on Two Trucks @ 1.20	72.00
2nd Stage	459.00
700 Sacks Class "H" @ 4.10	3,269.75
215 Cu.ft. Diamix F @ 1.75	376.25
46 Sacks KCl @ 14.50	667.00
607 Lbs. D-19 @ 4.05	2,458.35
164 Lbs. Celloflake @ .71	116.44
170 Lbs. D-31 @ 2.65	450.50
.3% Gel on 915 cu.ft. @ .26	237.90
30 Miles on 43.748 Tons @ .40	524.98
Mixing Service Chrg on 981 cu.ft. @ .62	608.22
4% Price Increase	487.34
	$ 12,670.73

One 7" Float Shoe	$ 174.00
One 7" Float Collar Type P-110	450.00
One Kit Baker Lok	12.15
One 7" Cement Basket	117.50
Twenty 7" Centralizers @ 31.70	634.00
One 7" Model "J" Stage Collar	1,885.00
	$3,272.65

LINER JCB

WELL DATA:

Hole Size	6 1/2"
Liner Size	5"
Depth	14,500'
Cement from	14,500 to 7" Casing + 500' Lap
	~~2,700'~~ 1500'
True Hole Volume-cu.ft.	272
Recommended Volume-cu.ft.	372
% Excess	36%

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RECOMMENDATION:

We recommend that the 5" liner be cemented with 310 sacks Class "H" containing 1.2% D-19 fluid loss, 5 lbs. KCl, .6% D-31 and .3% Gel.

SLURRY PROPERTIES: Liner

Slurry Yield-cu.ft./sack	1.2
Slurry Weight-lb/gal	15.87
Thickening Time-hrs:min	4:00
Compressive Strength - 12 hours	1,910
24 hours	2,875
Mixing Water-gal/sack	5.19

COST ESTIMATE:

One Cement Pump Truck to 14,500'	$ 3,836.50
One Standby Truck	540.00
30 Miles on Two Trucks @ 1.20	72.00
310 Sacks Class "H" @ 4.10	1,271.00
350 Lbs. D-19 @ 4.05	1,417.50
15 Sacks KCl @ 14.50	217.50
175 Lbs D-31 @ 2.65	463.75
.3% Gel on 310 cu.ft. @ .26	80.60
30 Miles on 15.63 Tons @ .40	187.51
Mixing Service Chrg. on 332 cu.ft. @ .62	205.84
4% Price Increase	331.69
	$ 8,623.89

Service Point: Hobbs, New Mexico
563-1884

District Supt: Sammie Hodges

Cement Bond Log
4/8/83