STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

May 15, 1997

Texaco Exploration and Production, Inc.
P. O. Box 3109
Midland, Texas 79702
Attention: C. Wade Howard

Administrative Order DD-173(H)
High Angle/Horizontal

Dear Mr. Howard:

Reference is made to your application dated April 17, 1997 for authorization to initiate a high angle/horizontal directionally drilling project within the NW/4 of Section 15, Township 17 South, Range 34 East, NMPM, North Vacuum-Abo Pool, North Vacuum Abo West Unit, Lea County, New Mexico.

The Division Director Finds That:

(1) The application of Texaco Exploration and Production, Inc. ("Texaco") as operator of the North Vacuum Abo West Unit (approved by Division Order No. R-6822, dated November 18, 1981) has been duly filed under the provisions of Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995;

(2) The proposed high angle/horizontal directionally drilling project is within the applicant's North Vacuum Abo West Unit Waterflood Project Area (established by Division Order No. R-6857, as amended) and as such Division General Rule 701.G(4) applies, which states that wells within waterflood project areas are not subject to an oil allowable;

(3) All of said Section 15 is within the horizontal limits of the North Vacuum-Abo Pool, said pool is subject to the "*Special Rules and Regulations for the North Vacuum-Abo (Oil) Pool*", as promulgated by Division Order No. R-2421, as amended, which provides for 80-acre oil spacing and proration units, or drilling units, and requires that wells be located within a 200 foot radius of the center of a governmental quarter-quarter section or lot, provided that the first well on the

80-acre unit is located in either the NW/4 or SE/4 of a governmental quarter section;

(4) Texaco is seeking to initiate a high angle/horizontal directional drilling project within this portion of the North Vacuum-Abo Pool, which is a heterogeneous reservoir where vertical segregation is common, in an attempt to drain laterally discontinuous lenses that would not otherwise be exploited without dense vertical well spacing [see files for Division Administrative Orders DD-153(H), DD-154(H], DD-167(H), and DD-168(H)];

(5) Texaco is currently developing the North Vacuum-Abo Pool within the NW/4 of said Section 15 with water injection into its North Vacuum Abo West Unit Well No. 2 (**API No. 30-025-24679**), located at a standard Abo well location 1980 feet from the North and West lines (Unit F) of said Section 15 and producing from its North Vacuum Abo West Unit Well No. 1 (**API No. 30-025-25652**), located within a standard 80-acre oil spacing and proration unit comprising the N/2 NW/4 of said Section 15 at a standard oil well location 460 feet from the North line and 660 feet from the West line (Unit D) of said Section 15;

(6) The "project area" proposed by Texaco would consist of an over-sized spacing unit comprising 160 acres (two standard lay-down 80-acre units) underlying the NW/4 of said Section 15;

(7) It is Texaco's intent to place its North Vacuum Abo West Unit Well No. 31 at a standard North Vacuum-Abo Pool oil well location 660 feet from the North line and 1980 feet from the West line (Unit C) of said Section 15, drill vertically to an approximate depth of 8,600 feet, kick-off in a southwesterly direction with a short radius wellbore (57.3 degrees/100 feet), and drill in a somewhat horizontal fashion a lateral distance of approximately 2,000 feet through the Abo formation;

(8) The applicable drilling window or "producing area" for said wellbore should include that area within the NW/4 of said Section 15 that is no closer than 560 feet to the outer boundary of the 160-acre project area; and,

(9) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

IT IS THEREFORE ORDERED THAT:

(1) Texaco Exploration and Production, Inc. ("Texaco") is hereby authorized to initiate a high angle/horizontal directional drilling project within a non-standard 160-acre oil spacing and proration unit comprising the NW/4 of Section 15, Township 17 South, Range 34 East, NMPM, North Vacuum-Abo Pool, North Vacuum Abo West Unit, North Vacuum Abo West Unit Waterflood Project Area, Lea County, New Mexico, by drilling its North Vacuum Abo West Unit Well No. 31 at a standard North Vacuum-Abo Pool surface oil well location 660 feet from the North and West lines (Unit C) of said Section 15, drill vertically to an approximate depth of 8,600 feet, kick-off in a southwesterly direction with a short radius wellbore (57.3 degrees/100 feet), and drill in a somewhat horizontal fashion a lateral distance of approximately 2,000 feet through the Abo formation;

PROVIDED HOWEVER THAT prior to commencing directional drilling operations in said wellbore, the applicant shall establish the location of the kick-off point by means of a directional survey acceptable to the Division.

PROVIDED FURTHER THAT during or upon completion of said directional drilling operations, the applicant shall conduct an accurate wellbore survey from the kick-off point to total depth in order that the subsurface bottomhole location, as well as the wellbore's true depth and course, may be determined.

(2) The applicant shall notify the supervisor of the Hobbs District office of the Division of the date and time said wellbore surveys are to be conducted so that they may be witnessed. The applicant shall further provide a copy of said wellbore surveys to the Santa Fe and Hobbs offices of the Division upon completion.

(3) The "project area" for said horizontal well shall consist of an oversized 160-acre non-standard oil spacing and proration unit for said pool comprising the NW/4 of said Section 15.

(4) The "producing area" for said horizontal wellbore shall include that area within the NW/4 of said Section 15 that is no closer than 560 feet from the outer boundary of said quarter section.

(5) The operator shall comply with all requirements and conditions set forth in Division General Rule 111.E(2) and any applicable requirements in 111.D and F.

(6) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth (TVD) in addition to measured depths (MVD).

(7) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

By _____ Deputy Director
WILLIAM J. LEMAY
Director

S E A L

cc: Oil Conservation Division - Hobbs
New Mexico State Land Office - Santa Fe

DD-TEX.H8

Rec: 4-28-97
Susp: 5-19-97
Released: 5/15/97

May 15, 1997

Texaco Exploration and Production, Inc.
P. O. Box 3109
Midland, Texas 79702

Attention: C. Wade Howard

Administrative Order DD-173(H)
High Angle/Horizontal

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The Division Director Finds That:

(1) The application of Texaco Exploration and Production, Inc. ("Texaco") as operator of the North Vacuum Abo West Unit (approved by Division Order No. R-6822, dated November 18, 1981) has been duly filed under the provisions of Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995;

(2) The proposed high angle/horizontal directionally drilling project is within the applicant's North Vacuum Abo West Unit Waterflood Project Area (established by Division Order No. R-6857, as amended) and as such Division General Rule 701.G(4) applies, which states that wells within waterflood project areas are not subject to an oil allowable;

(3) All of said Section 15 is within the horizontal limits of the North Vacuum-Abo Pool, said pool is subject to the "*Special Rules and Regulations for the North Vacuum-Abo (Oil) Pool*", as promulgated by Division Order No. R-2421, as amended, which provides for 80-acre oil spacing and proration units, or drilling units, and requires that wells be located within a 200 foot radius of the center of a governmental quarter-quarter section or lot, provided that the first well on the 80-acre unit is located in either the NW/4 or SE/4 of a governmental quarter

5-19-97

section;

(4) Texaco is seeking to initiate a high angle/horizontal directional drilling project within this portion of the North Vacuum-Abo Pool, which is a heterogeneous reservoir where vertical segregation is common, in an attempt to drain laterally discontinuous lenses that would not otherwise be exploited without dense vertical well spacing [see files for Division Administrative Orders DD-153(H), DD-154(H], DD-167(H), and DD-168(H)];

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(6) The "project area" proposed by Texaco would consist of an over-sized spacing unit comprising 160 acres (two standard lay-down 80-acre units) underlying the NW/4 of said Section 15;

(7) It is Texaco's intent to place its North Vacuum Abo West Unit Well No. 31 at a standard North Vacuum-Abo Pool oil well location 660 feet from the North line and 1980 feet from the West line (Unit C) of said Section 15, drill vertically to an approximate depth of 8,600 feet, kick-off in a southwesterly direction with a short radius wellbore (57.3 degrees/100 feet), and drill in a somewhat horizontal fashion a lateral distance of approximately 2,000 feet through the Abo formation;

(8) The applicable drilling window or "producing area" for said wellbore should include that area within the NW/4 of said Section 15 that is no closer than 560 feet to the outer boundary of the 160-acre project area; and,

(9) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

IT IS THEREFORE ORDERED THAT:

(1) Texaco Exploration and Production, Inc. ("Texaco") is hereby authorized to initiate a high angle/horizontal directional drilling project within a non-standard 160-acre oil spacing and proration unit comprising the NW/4 of Section 15, Township 17 South, Range 34 East, NMPM, North Vacuum-Abo Pool, North Vacuum Abo West Unit, North Vacuum Abo

West Unit Waterflood Project Area, Lea County, New Mexico, by drilling its North Vacuum Abo West Unit Well No. 31 at a standard North Vacuum-Abo Pool surface oil well location 660 feet from the North and West lines (Unit C) of said Section 15, drill vertically to an approximate depth of 8,600 feet, kick-off in a southwesterly direction with a short radius wellbore (57.3 degrees/100 feet), and drill in a somewhat horizontal fashion a lateral distance of approximately 2,000 feet through the Abo formation;

PROVIDED HOWEVER THAT prior to commencing directional drilling operations in said wellbore, the applicant shall establish the location of the kick-off point by means of a directional survey acceptable to the Division.

PROVIDED FURTHER THAT during or upon completion of said directional drilling operations, the applicant shall conduct an accurate wellbore survey from the kick-off point to total depth in order that the subsurface bottomhole location, as well as the wellbore's true depth and course, may be determined.

(2) The applicant shall notify the supervisor of the Hobbs District office of the Division of the date and time said wellbore surveys are to be conducted so that they may be witnessed. The applicant shall further provide a copy of said wellbore surveys to the Santa Fe and Hobbs offices of the Division upon completion.

(3) The "project area" for said horizontal well shall consist of an oversized 160-acre non-standard oil spacing and proration unit for said pool comprising the NW/4 of said Section 15.

(4) The "producing area" for said horizontal wellbore shall include that area within the NW/4 of said Section 15 that is no closer than 560 feet from the outer boundary of said quarter section.

(5) The operator shall comply with all requirements and conditions set forth in Division General Rule 111.E(2) and any applicable requirements in 111.D and F.

(6) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth (TVD) in addition to measured depths (MVD).

(7) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY

Director

S E A L

cc: Oil Conservation Division - Hobbs
New Mexico State Land Office - Santa Fe

4/28/97	5/19/97	MS	W	DD

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

ADMINISTRATIVE APPLICATION COVERSHEET

THIS COVERSHEET IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS

Application Acronyms:

[NSP-Non-Standard Proration Unit] [NSL-Non-Standard Location]
[DD-Directional Drilling] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

RECEIVED
APR 28 1997
OIL CONSERVATION DIVISION

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Directional Drilling
☐ NSL ☒ NSP ☒ DD ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ☐ Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☒ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **INFORMATION / DATA SUBMITTED IS COMPLETE** - Statement of Understanding

I hereby certify that I, or personnel under my supervision, have read and complied with all applicable Rules and Regulations of the Oil Conservation Division. Further, I assert that the attached application for administrative approval is accurate and complete to the best of my knowledge and where applicable, verify that all interest (WI, RI, ORRI) is common. I further verify that all applicable API Numbers are included. I understand that any omission of data, information or notification is cause to have the application package returned with no action taken.

Note: Statement must be completed by an individual with supervisory capacity.

C. WADE HOWARD	C. Wade Howard	ENGINEER ASSISTANT	4/24/97
Print or Type Name	Signature	Title	Date

Texaco Exploration
and Production Inc

500 North Loraine
Midland TX 79701

P O Box 3109
Midland TX 79702

April 17, 1997

GOV - STATE AND LOCAL GOVERNMENTS
Directional Drilling - Horizontal
Non-Standard Proration Unit
North Vacuum Abo West Unit Well No. 31
Vacuum Abo, North Field
Lea County, New Mexico

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

Attention: Mr. Michael E. Stogner

Gentlemen:

Administrative approval, Rule 104.D, and Rule 111.D, is requested to directionally drill a horizontal well in a non-standard proration unit in the Abo formation.

The North Vacuum Abo West Unit is a candidate for horizontal wells due to the heterogeneous nature of the reservoir. This Unit was designated a "Project Area" for horizontal drilling in 1996 (see Administrative Orders DD-153H and DD-154H). We have completed one successful horizontal well in this Unit (Well No. 26) and are currently completing second horizontal well (No. 27).

Attached for your information is a copy of our directional plans, a type log section, and Form C-102.

The "affected" offset operator to this well has been notified of this request. (See attached offset operator's list and certified mail receipts.)

Any questions concerning this request should be directed to me at (915) 688-4606.

Yours very truly,

C. Wade Howard

C. W. Howard
Engineer Assistant

CWH:
CC: NMOCD, P. O. Box 1980, Hobbs, NM 88240
Attachments

DISTRICT I
P. O. Box 1980, Hobbs, NM 88240

DISTRICT II
P. O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P. O. Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Form C-102
Revised February 10, 1994

Instructions on back

Submit to Appropriate District Office

State Lease-4 copies
Fee Lease-3 copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
	61760	Vacuum Abo, North

[4] Property Code	[5] Property Name	[6] Well Number
11123	North Vacuum Abo West Unit	31

[7] OGRID No.	[8] Operator Name	[9] Elevation
22351	TEXACO EXPLORATION & PRODUCTION, INC.	4052'

[10] Surface Location

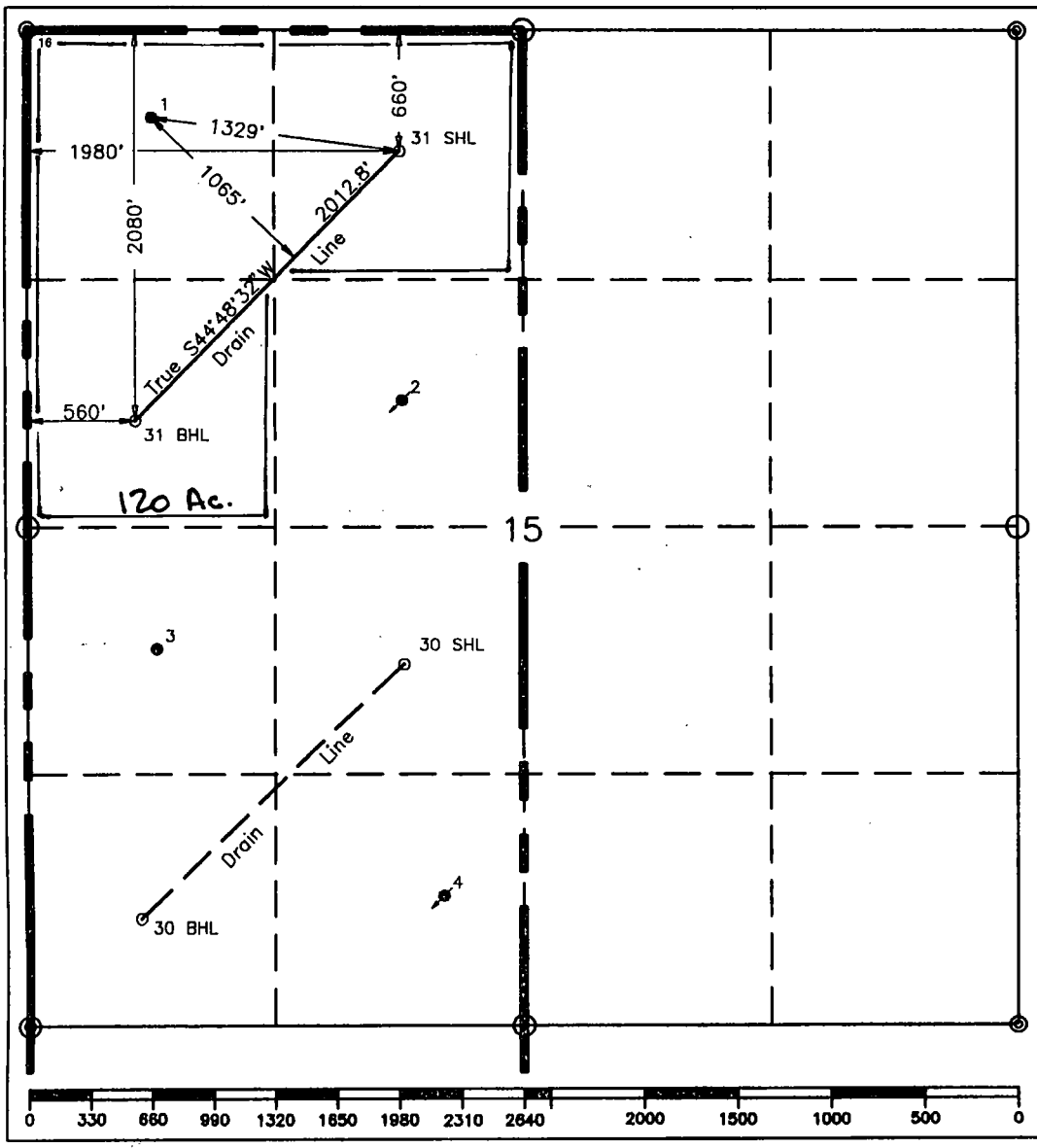
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	[7] County
C	15	17-S	34-E		660'	North	1980'	West	Lea

[11] 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	[7] County
E	15	17-S	34-E		2080'	North	560'	West	Lea

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
120			

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.



[17] OPERATOR CERTIFICATION

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

Signature: C. Wade Howard

Printed Name: C. Wade Howard

Position: Engineer's Assistant

Company: Texaco Expl. & Prod. Inc.

Date: April 7, 1997

[18] SURVEYOR CERTIFICATION

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

Date Surveyed: April 2, 1997

Signature & Seal of Professional Surveyor

Certificate No. 7254 John S. Piper

Sheet

○ = Staked Location ● = Producing Well ⚡ = Injection Well ○ = Water Supply Well ✚ = Plugged & Abandon Well

Texaco Exploration
and Production Inc

500 North Loraine
Midland TX 79701

P O Box 3109
Midland TX 79702

April 17, 1997

GOV - STATE AND LOCAL GOVERNMENTS
Directional Drilling - Horizontal
Non-Standard Location
North Vacuum Abo West Unit Well No. 31
Sec. 15, T-17-S, R-34-E
Lea County, New Mexico

TO THE OFFSET OPERATORS:

Gentlemen:

As an offset operator to the captioned unit, you are being furnished with a copy of our Application to directionally drill a horizontal well. If you have no objection, please sign the waiver at the bottom of this letter and return in the enclosed envelope.

Any questions concerning this request should be directed to me at (915) 688-4606.

Yours very truly,

C. Wade Howard

C. W. Howard
Engineer Assistant

CWH:cwh

File

WAIVER APPROVED:

COMPANY: _____

BY: _____

DATE: _____

OFFSET OPERATOR'S LIST
North Vacuum Abo West Unit Well No. 31
LEA COUNTY, NEW MEXICO

Mobil Exploration and Producing US Inc.
P. O. Box 633
Midland, Texas 79702

Mack C. Chase &
Chase Oil Corporation
P. O. Box 1767
Artesia, New Mexico 88211

M. J. Harvey, Jr.
P. O. Box 12705
Dallas, Texas 75225

Sage Energy Company
P. O. Box 3068
Midland, Texas 79702

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- 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:
M. J. Harvey, Jr.
P. O. Box 12705
Dallas, Texas 75225

4a. Article Number
P 497 362 881

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

7. Date of Delivery
4-22-97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X M J Harvey Jr

DALLAS TX PRESTON STA APR 22 1997 USPO

PS Form **3811**, December 1994 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.
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1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mack C. Chase &
Chase Oil Corporation
P. O. Box 1767
Artesia, NM 88211

4a. Article Number
P 497 362 884

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

7. Date of Delivery
4-18-97

5. Received By: *(Print Name)*
Sylvia Hensley

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Sylvia Hensley

PS Form **3811**, December 1994 Domestic Return Receipt

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1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mobil Exploration and
Producing US Inc.
P. O. Box 633
Midland, TX 79702

4a. Article Number
P 497 363 312

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

7. Date of Delivery
APR 18 1997

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 Domestic Return Receip

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1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Sage Energy Company
P. O. Box 3068
Midland, Texas 79702

4a. Article Number
P 497 362 882

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

7. Date of Delivery
4-18-97

5. Received By: *(Print Name)*
Tonya Stress

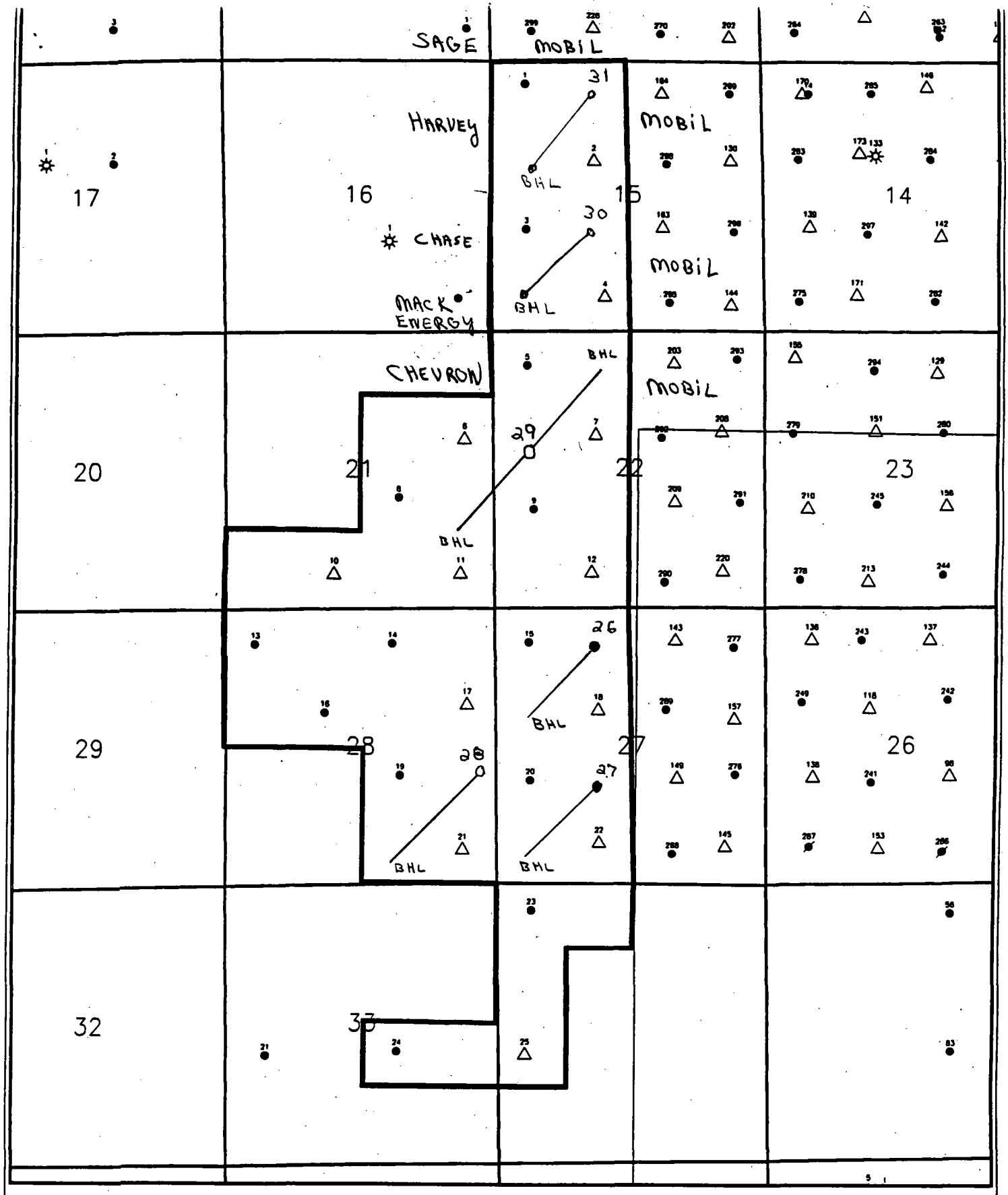
8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 Domestic Return Receipt

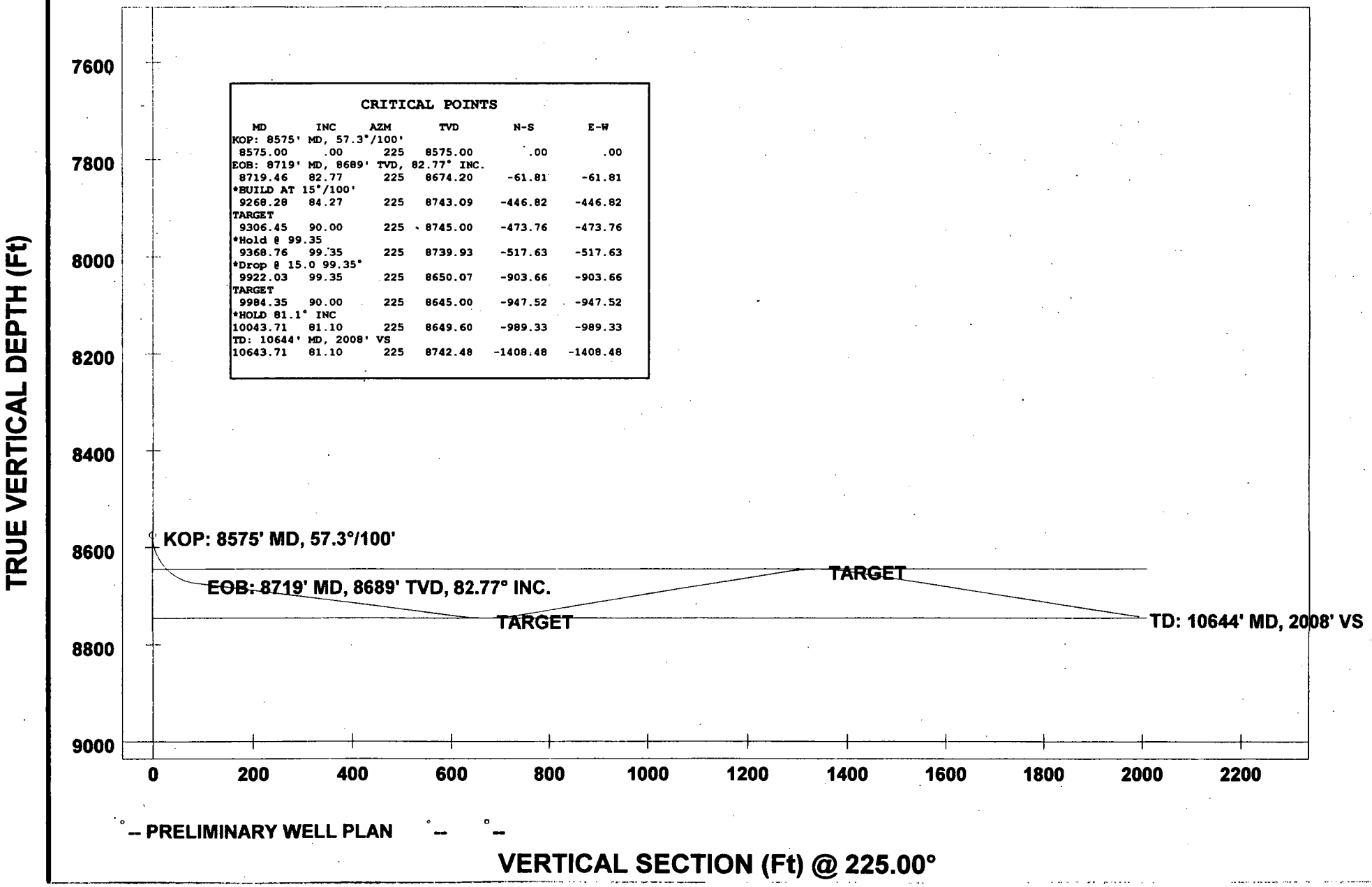
Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.



Texaco Exploration & Production, In		
North Vacuum Abo West Unit Base Map, Wells > 8,000' TD		
		9/1999
	Scale 1:30000.	

Company: TEXACO E & P, INC.
Lease/Well: NVAWU #31
Location: LEA CO., NEW MEXICO
Declination:
File name: C:\WINSERVE\NVAWU30.SVY
Date/Time: 15-Apr-97 / 16:59



CRITICAL POINTS

MD	INC	AZM	TVD	N-S	E-W
KOP: 8575' MD, 57.3°/100'					
8575.00	.00	225	8575.00	.00	.00
EOB: 8719' MD, 8689' TVD, 82.77° INC.					
8719.46	82.77	225	8674.20	-61.81	-61.81
*BUILD AT 15°/100'					
9268.28	84.27	225	8743.09	-446.82	-446.82
TARGET					
9306.45	90.00	225	8745.00	-473.76	-473.76
*Hold @ 99.35					
9368.76	99.35	225	8739.93	-517.63	-517.63
*Drop @ 15.0 99.35°					
9922.03	99.35	225	8650.07	-903.66	-903.66
TARGET					
9984.35	90.00	225	8645.00	-947.52	-947.52
*HOLD 81.1° INC					
10043.71	81.10	225	8649.60	-989.33	-989.33
TD: 10644' MD, 2008' VS					
10643.71	81.10	225	8742.48	-1408.48	-1408.48

Job Number:	**State/Country:**
Company: TEXACO E & P, INC.	**Declination:**
Lease/Well: NVAWU #31	**Grid:**
Location: LEA CO., NEW MEXICO	**File name: C:\WINSERVE\NVAWU31.SVY**
Rig Name:	**Date/Time: 16-Apr-97 / 08:19**
RKB:	**Curve Name: PRELIMINARY WELL PLAN**
G.L. or M.S.L.:	

PHOENIX DRILLING SERVICES, INC.

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method

Vertical Section Plane 225.00

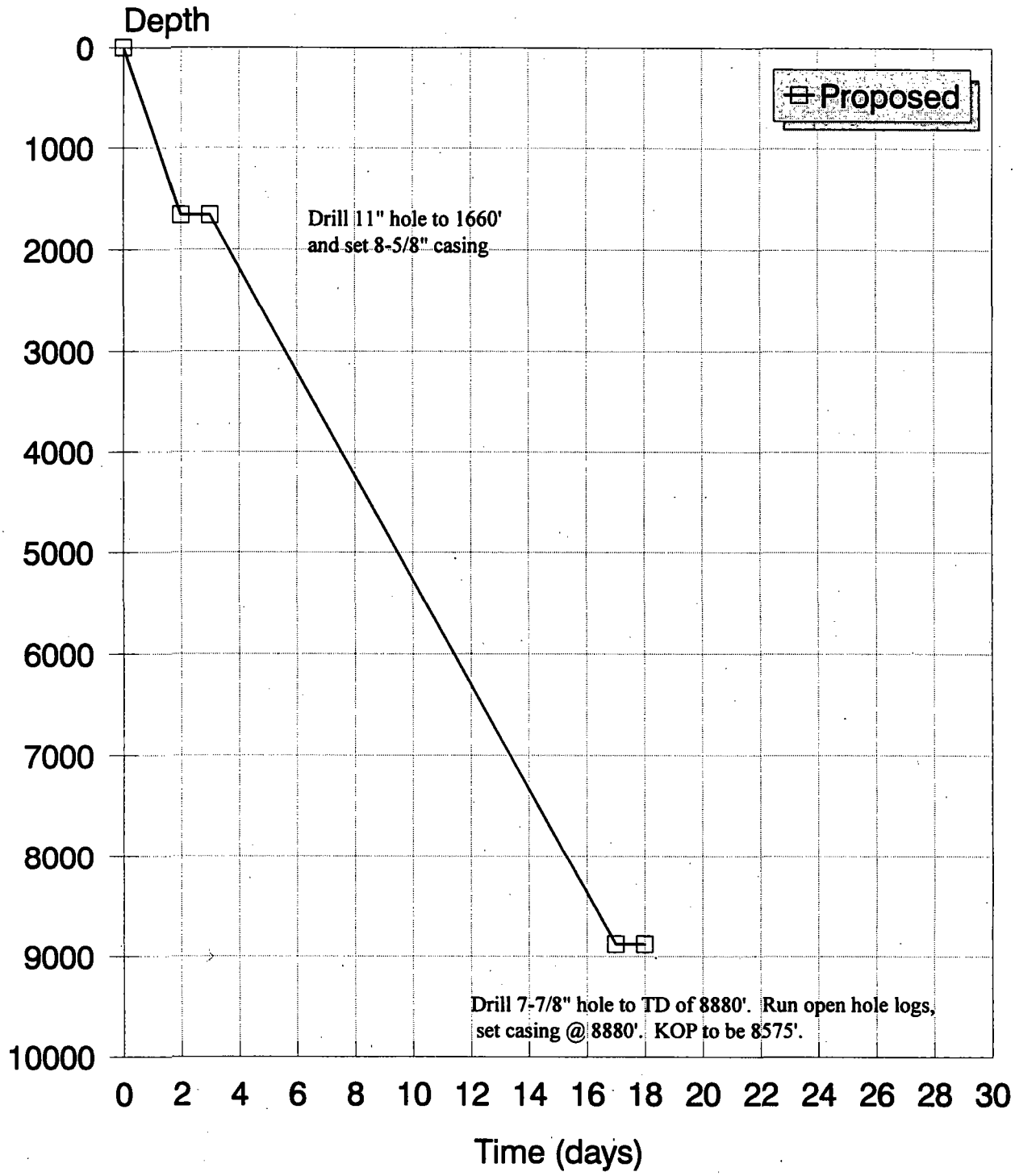
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
KOP: 8575' MD, 57.3°/100'										
8575.00	.00	225.00	8575.00	8575.00	.00	.00	.00	.00	.00	.00
8585.00	5.73	225.00	8584.98	8584.98	-.35	-.35	.50	.50	225.00	57.30
8595.00	11.46	225.00	8594.87	8594.87	-1.41	-1.41	1.99	1.99	225.00	57.30
8605.00	17.19	225.00	8604.55	8604.55	-3.16	-3.16	4.47	4.47	225.00	57.30
8615.00	22.92	225.00	8613.94	8613.94	-5.58	-5.58	7.89	7.89	225.00	57.30
8625.00	28.65	225.00	8622.94	8622.94	-8.66	-8.66	12.24	12.24	225.00	57.30
8635.00	34.38	225.00	8631.46	8631.46	-12.35	-12.35	17.47	17.47	225.00	57.30
8645.00	40.11	225.00	8639.42	8639.42	-16.63	-16.63	23.52	23.52	225.00	57.30
8655.00	45.84	225.00	8646.73	8646.73	-21.45	-21.45	30.33	30.33	225.00	57.30
8665.00	51.57	225.00	8653.33	8653.33	-26.76	-26.76	37.84	37.84	225.00	57.30
8675.00	57.30	225.00	8659.14	8659.14	-32.51	-32.51	45.97	45.97	225.00	57.30
8685.00	63.03	225.00	8664.12	8664.12	-38.64	-38.64	54.64	54.64	225.00	57.30

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
8695.00	68.76	225.00	8668.20	8668.20	-45.09	-45.09	63.77	63.77	225.00	57.30
8705.00	74.49	225.00	8671.35	8671.35	-51.80	-51.80	73.25	73.25	225.00	57.30
8715.00	80.22	225.00	8673.54	8673.54	-58.70	-58.70	83.01	83.01	225.00	57.30
EOB: 8719' MD, 8674' TVD, 82.77° INC.										
8719.46	82.77	225.00	8674.20	8674.20	-61.81	-61.81	87.42	87.42	225.00	57.30
9258.28	82.77	225.00	8741.97	8741.97	-439.79	-439.79	621.96	621.96	225.00	.00
BUILD AT 15°/100'										
9268.28	84.27	225.00	8743.09	8743.09	-446.82	-446.82	631.89	631.89	225.00	15.00
9278.28	85.77	225.00	8743.96	8743.96	-453.86	-453.86	641.86	641.86	225.00	15.00
9288.28	87.27	225.00	8744.57	8744.57	-460.92	-460.92	651.84	651.84	225.00	15.00
9298.28	88.77	225.00	8744.91	8744.91	-467.99	-467.99	661.83	661.83	225.00	15.00
TARGET										
9306.45	90.00	225.00	8745.00	8745.00	-473.76	-473.76	670.00	670.00	225.00	15.00
9316.45	91.50	225.00	8744.87	8744.87	-480.83	-480.83	680.00	680.00	225.00	15.00
9326.45	93.00	225.00	8744.48	8744.48	-487.90	-487.90	689.99	689.99	225.00	15.00
9336.45	94.50	225.00	8743.82	8743.82	-494.95	-494.95	699.97	699.97	225.00	15.00
9346.45	96.00	225.00	8742.91	8742.91	-501.99	-501.99	709.93	709.93	225.00	15.00
9356.45	97.50	225.00	8741.73	8741.73	-509.02	-509.02	719.86	719.86	225.00	15.00
9366.45	99.00	225.00	8740.30	8740.30	-516.01	-516.01	729.75	729.75	225.00	15.00
Hold @ 99.35										
9368.76	99.35	225.00	8739.93	8739.93	-517.63	-517.63	732.04	732.04	225.00	15.00
9468.76	99.35	225.00	8723.69	8723.69	-587.40	-587.40	830.71	830.71	225.00	.00
9568.76	99.35	225.00	8707.45	8707.45	-657.17	-657.17	929.38	929.38	225.00	.00
9668.76	99.35	225.00	8691.21	8691.21	-726.94	-726.94	1028.05	1028.05	225.00	.00
9768.76	99.35	225.00	8674.96	8674.96	-796.72	-796.72	1126.73	1126.73	225.00	.00
9868.76	99.35	225.00	8658.72	8658.72	-866.49	-866.49	1225.40	1225.40	225.00	.00
Drop @ 15.0 99.35°										
9922.03	99.35	225.00	8650.07	8650.07	-903.66	-903.66	1277.96	1277.96	225.00	.00
9922.04	99.35	225.00	8650.07	8650.07	-903.66	-903.66	1277.97	1277.97	225.00	15.00
9924.35	99.00	225.00	8649.70	8649.70	-905.27	-905.27	1280.25	1280.25	225.00	15.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
9934.35	97.50	225.00	8648.27	8648.27	-912.27	-912.27	1290.14	1290.14	225.00	15.00
9944.35	96.00	225.00	8647.09	8647.09	-919.29	-919.29	1300.07	1300.07	225.00	15.00
9954.35	94.50	225.00	8646.18	8646.18	-926.33	-926.33	1310.03	1310.03	225.00	15.00
9964.35	93.00	225.00	8645.52	8645.52	-933.39	-933.39	1320.01	1320.01	225.00	15.00
9974.35	91.50	225.00	8645.13	8645.13	-940.45	-940.45	1330.00	1330.00	225.00	15.00
TARGET										
9984.35	90.00	225.00	8645.00	8645.00	-947.52	-947.52	1340.00	1340.00	225.00	15.00
9994.35	88.50	225.00	8645.13	8645.13	-954.59	-954.59	1350.00	1350.00	225.00	15.00
10004.35	87.00	225.00	8645.52	8645.52	-961.66	-961.66	1359.99	1359.99	225.00	15.00
10014.35	85.50	225.00	8646.18	8646.18	-968.71	-968.71	1369.97	1369.97	225.00	15.00
10024.35	84.00	225.00	8647.09	8647.09	-975.76	-975.76	1379.93	1379.93	225.00	15.00
10034.35	82.50	225.00	8648.27	8648.27	-982.78	-982.78	1389.86	1389.86	225.00	15.00
HOLD 81.1° INC										
10043.71	81.10	225.00	8649.60	8649.60	-989.33	-989.33	1399.12	1399.12	225.00	15.00
10143.71	81.10	225.00	8665.08	8665.08	-1059.19	-1059.19	1497.92	1497.92	225.00	.00
10243.71	81.10	225.00	8680.56	8680.56	-1129.05	-1129.05	1596.71	1596.71	225.00	.00
10343.71	81.10	225.00	8696.04	8696.04	-1198.91	-1198.91	1695.51	1695.51	225.00	.00
10443.71	81.10	225.00	8711.52	8711.52	-1268.76	-1268.76	1794.30	1794.30	225.00	.00
10543.71	81.10	225.00	8727.00	8727.00	-1338.62	-1338.62	1893.10	1893.10	225.00	.00
TD: 10644' MD, 2008' VS										
10643.71	81.10	225.00	8742.48	8742.48	-1408.48	-1408.48	1991.89	1991.89	225.00	.00

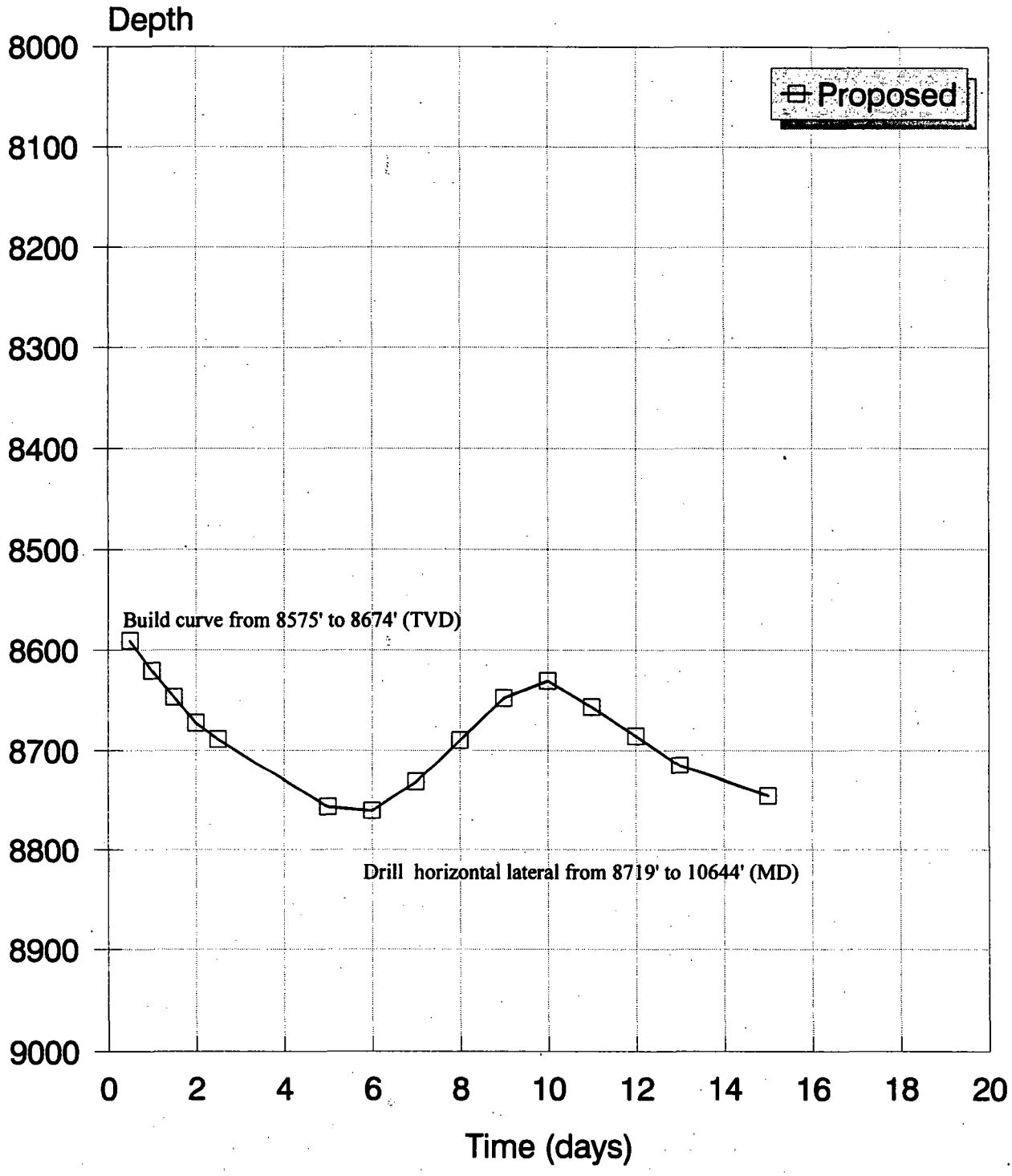
VERTICAL DRILLING CURVE

North Vacuum Abo West Unit # 31H, Lea Co., NM.



HORIZONTAL DRILLING CURVE

North Vacuum Abo West Unit 31H, Lea Co., NM.



ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

ADMINISTRATIVE APPLICATION COVERSHEET

THIS COVERSHEET IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS

Application Acronyms:

[NSP-Non-Standard Proration Unit] [NSL-Non-Standard Location]
[DD-Directional Drilling] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Directional Drilling

❑ NSL ☒ NSP ☒ DD ❑ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement

❑ DHC ❑ CTB ❑ PLC ❑ PC ❑ OLS ❑ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery

❑ WFX ❑ PMX ❑ SWD ❑ IPI ❑ EOR ❑ PPR

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ❑ Does Not Apply

[A] ❑ Working, Royalty or Overriding Royalty Interest Owners

[B] ☒ Offset Operators, Leaseholders or Surface Owner

[C] ❑ Application is One Which Requires Published Legal Notice

[D] ❑ Notification and/or Concurrent Approval by BLM or SLO

U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ❑ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ❑ Waivers are Attached

[3] **INFORMATION / DATA SUBMITTED IS COMPLETE** - Statement of Understanding

I hereby certify that I, or personnel under my supervision, have read and complied with all applicable Rules and Regulations of the Oil Conservation Division. Further, I assert that the attached application for administrative approval is accurate and complete to the best of my knowledge and where applicable, verify that all interest (WI, RI, ORRI) is common. I further verify that all applicable API Numbers are included. I understand that any omission of data, information or notification is cause to have the application package returned with no action taken.

Note: Statement must be completed by an individual with supervisory capacity.

C. WADE HOWARD	C. Wade Howard	ENGINEER ASSISTANT	4/24/97
Print or Type Name	Signature	Title	Date

Texaco Exploration
and Production Inc

500 North Loraine
Midland TX 79701

P O Box 3109
Midland TX 79702

April 17, 1997

GOV - STATE AND LOCAL GOVERNMENTS
Directional Drilling - Horizontal
Non-Standard Proration Unit
North Vacuum Abo West Unit Well No. 31
Vacuum Abo, North Field
Lea County, New Mexico

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

Attention: Mr. Michael E. Stogner

Gentlemen:

Administrative approval, Rule 104.D, and Rule 111.D, is requested to directionally drill a horizontal well in a non-standard proration unit in the Abo formation.

The North Vacuum Abo West Unit is a candidate for horizontal wells due to the heterogeneous nature of the reservoir. This Unit was designated a "Project Area" for horizontal drilling in 1996 (see Administrative Orders DD-153H and DD-154H). We have completed one successful horizontal well in this Unit (Well No. 26) and are currently completing second horizontal well (No. 27).

Attached for your information is a copy of our directional plans, a type log section, and Form C-102.

The "affected" offset operator to this well has been notified of this request. (See attached offset operator's list and certified mail receipts.)

Any questions concerning this request should be directed to me at (915) 688-4606.

Yours very truly,

C. Wade Howard

C. W. Howard
Engineer Assistant

CWH:
CC: NMOCD, P. O. Box 1980, Hobbs, NM 88240
Attachments

DISTRICT I
P. O. Box 1980, Hobbs, NM 88240

DISTRICT II
P. O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P. O. Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Form C-102
Revised February 10, 1994

Instructions on back

Submit to Appropriate District Office

State Lease-4 copies
Fee Lease-3 copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
	61760	Vacuum Abo, North

[4] Property Code	[5] Property Name	[6] Well Number
11123	North Vacuum Abo West Unit	31

[7] OGRID No.	[8] Operator Name	[9] Elevation
22351	TEXACO EXPLORATION & PRODUCTION, INC.	4052'

[10] Surface Location

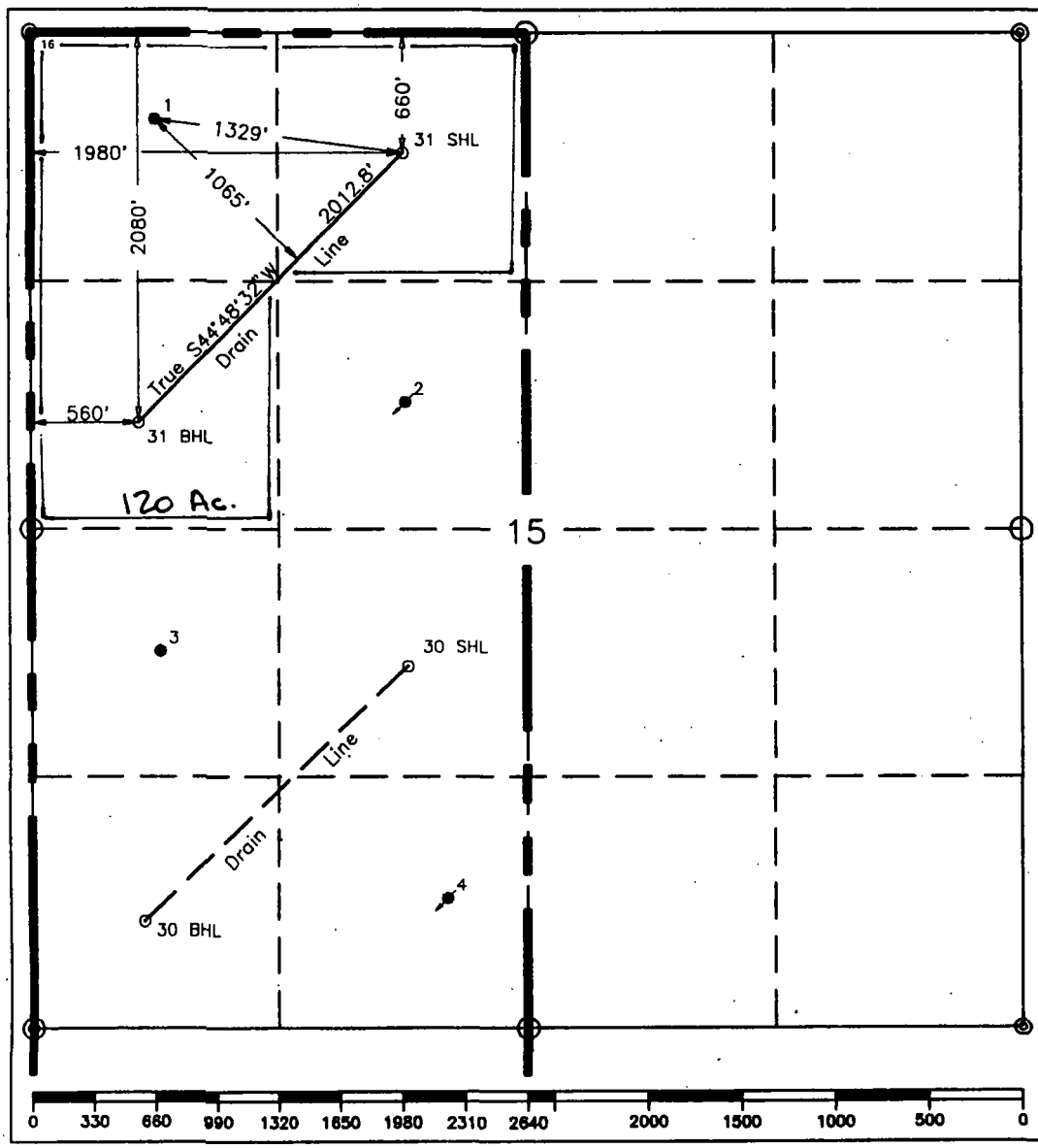
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	[7] County
C	15	17-S	34-E		660'	North	1980'	West	Lea

[11] 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	[7] County
E	15	17-S	34-E		2080'	North	560'	West	Lea

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
120			

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.



[17] OPERATOR CERTIFICATION

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

Signature: C. Wade Howard

Printed Name: C. Wade Howard

Position: Engineer's Assistant

Company: Texaco Expl. & Prod. Inc.

Date: April 7, 1997

[18] SURVEYOR CERTIFICATION

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

Date Surveyed: April 2, 1997

Signature & Seal of Professional Surveyor: John S. Piper

Certificate No. 7254 John S. Piper

Sheet

○ = Staked Location ● = Producing Well ⚷ = Injection Well ⟲ = Water Supply Well ✚ = Plugged & Abandon Well

Texaco Exploration
and Production Inc

500 North Loraine
Midland TX 79701

P O Box 3109
Midland TX 79702

April 17, 1997

GOV - STATE AND LOCAL GOVERNMENTS
Directional Drilling - Horizontal
Non-Standard Location
North Vacuum Abo West Unit Well No. 31
Sec. 15, T-17-S, R-34-E
Lea County, New Mexico

TO THE OFFSET OPERATORS:

Gentlemen:

As an offset operator to the captioned unit, you are being furnished with a copy of our Application to directionally drill a horizontal well. If you have no objection, please sign the waiver at the bottom of this letter and return in the enclosed envelope.

Any questions concerning this request should be directed to me at (915) 688-4606.

Yours very truly,

C. Wade Howard

C. W. Howard
Engineer Assistant

CWH:cwh

File

WAIVER APPROVED:

COMPANY: _____

BY: _____

DATE: _____

OFFSET OPERATOR'S LIST
North Vacuum Abo West Unit Well No. 31
LEA COUNTY, NEW MEXICO

Mobil Exploration and Producing US Inc.
P. O. Box 633
Midland, Texas 79702

Mack C. Chase &
Chase Oil Corporation
P. O. Box 1767
Artesia, New Mexico 88211

M. J. Harvey, Jr.
P. O. Box 12705
Dallas, Texas 75225

Sage Energy Company
P. O. Box 3068
Midland, Texas 79702

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- 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:
M. J. Harvey, Jr.
P. O. Box 12705
Dallas, Texas 75225

4a. Article Number
P 497 362 881

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

7. Date of Delivery
4-22-97

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)
X M J Harvey

PS Form 3811, December 1994 Domestic Return Receipt

DALLAS, TX PRESTON STA APR 22 1997 USPS

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, 4a, and 4b.
- 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:
Mack C. Chase &
Chase Oil Corporation
P. O. Box 1767
Artesia, NM 88211

4a. Article Number
P 497 362 884

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

7. Date of Delivery
4-18-97

5. Received By: (Print Name)
Sylvia Hensley

8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)
X Sylvia Hensley

PS Form 3811, December 1994 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, 4a, and 4b.
- 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:
Mobil Exploration and
Producing US Inc.
P. O. Box 633
Midland, TX 79702

4a. Article Number
P 497 363 312

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

7. Date of Delivery
APR 18 1997

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 Domestic Return Receip

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, 4a, and 4b.
- 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:
Sage Energy Company
P. O. Box 3068
Midland, Texas 79702

4a. Article Number
P 497 362 882

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

7. Date of Delivery
4-18-97

5. Received By: *(Print Name)*
Tonya Stream

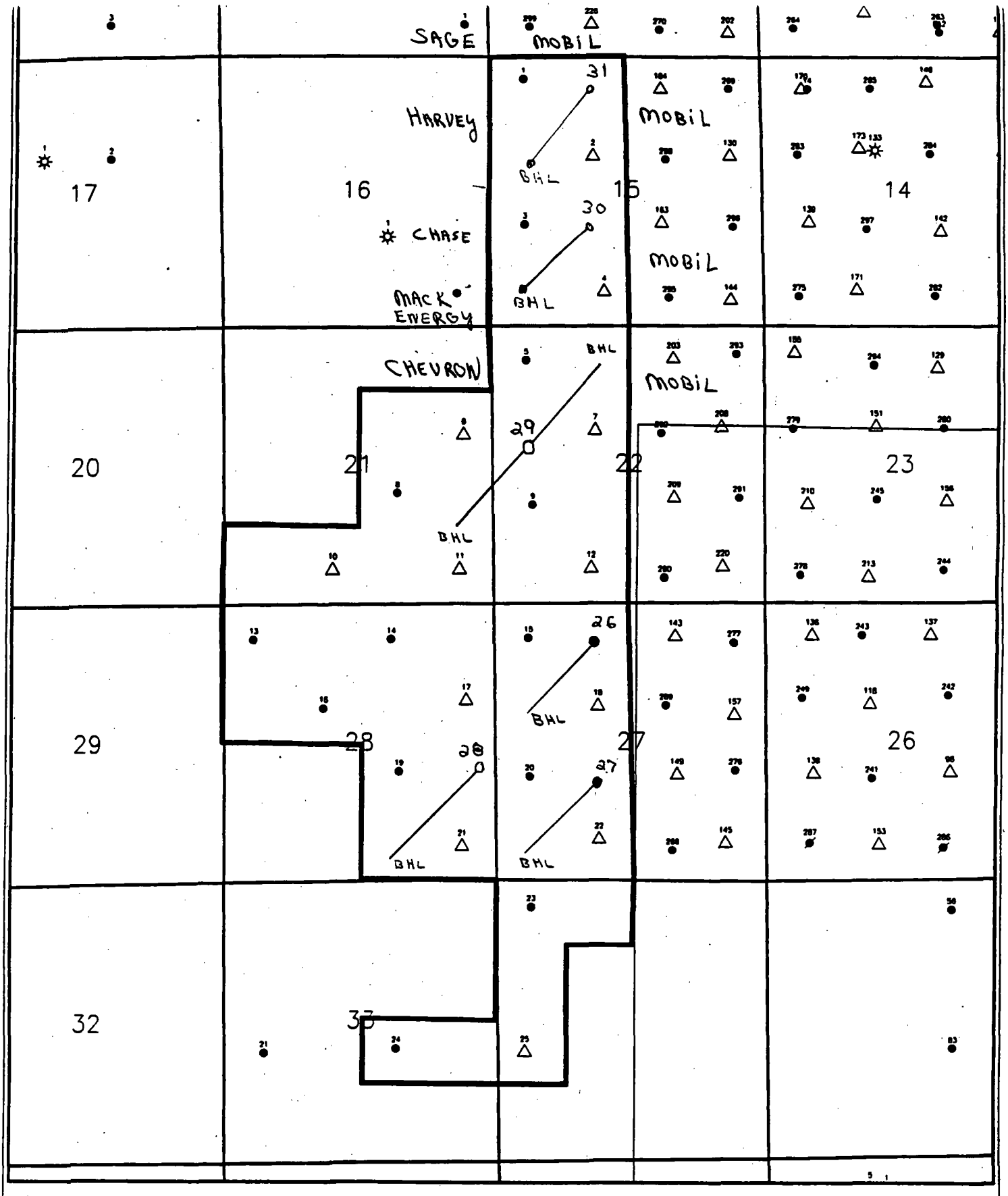
8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 Domestic Return Receipt

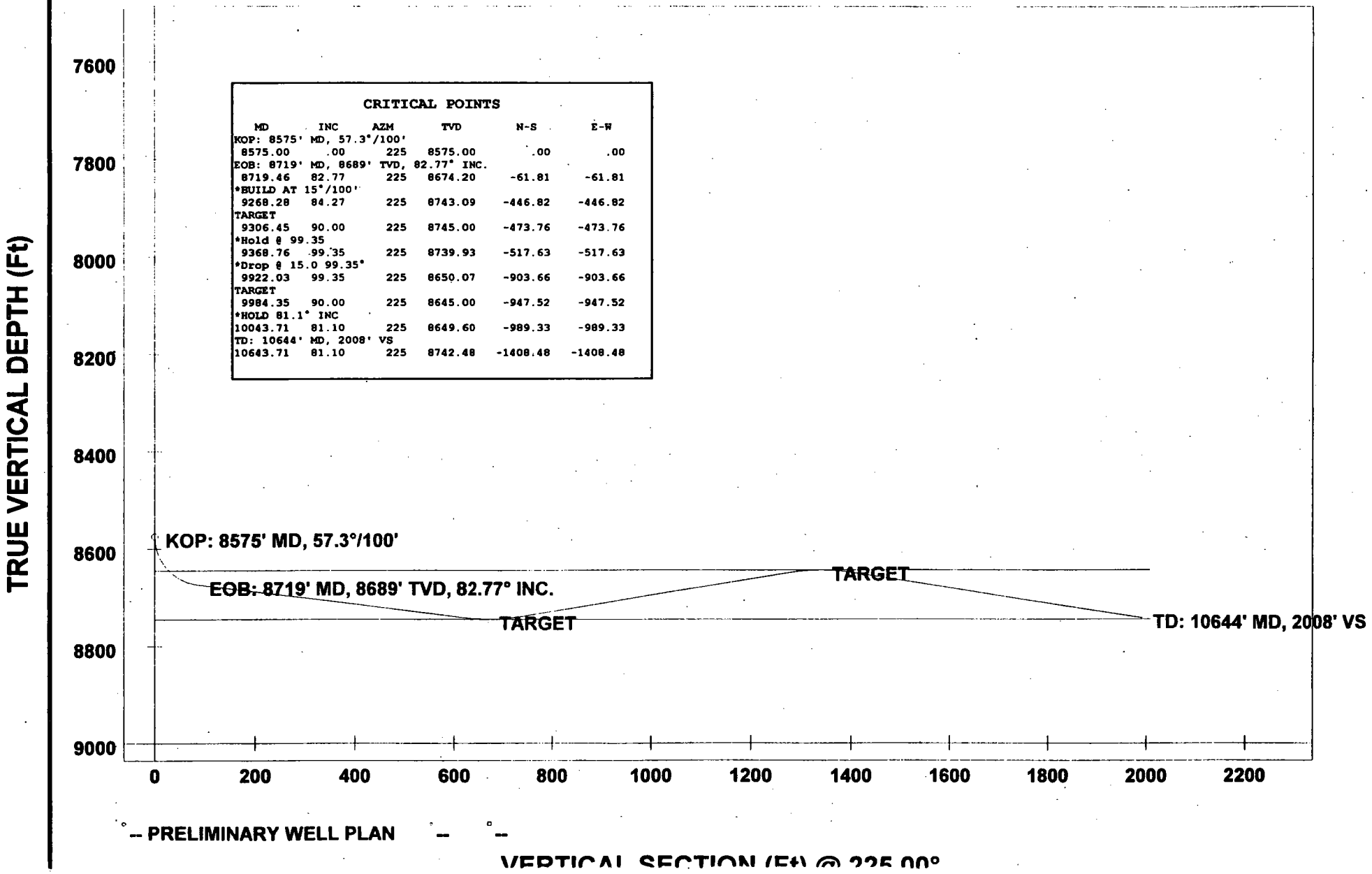
Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.



Texaco Exploration & Production, In		
North Vacuum Abo West Unit Base Map, Wells > 8,000' TD		
	Scale 1:30000.	

Company: TEXACO E & P, INC.
Lease/Well: NVAWU #31
Location: LEA CO., NEW MEXICO
Declination:
File name: C:\WINSERVE\NVAWU30.SVY
Date/Time: 15-Apr-97 / 16:59



CRITICAL POINTS

MD	INC	AZM	TVD	N-S	E-W
KOP: 8575' MD, 57.3°/100'					
8575.00	.00	225	8575.00	.00	.00
EOB: 8719' MD, 8689' TVD, 82.77° INC.					
8719.46	82.77	225	8674.20	-61.81	-61.81
*BUILD AT 15°/100'					
9268.28	84.27	225	8743.09	-446.82	-446.82
TARGET					
9306.45	90.00	225	8745.00	-473.76	-473.76
*Hold @ 99.35					
9368.76	99.35	225	8739.93	-517.63	-517.63
*Drop @ 15.0 99.35°					
9922.03	99.35	225	8650.07	-903.66	-903.66
TARGET					
9984.35	90.00	225	8645.00	-947.52	-947.52
*HOLD 81.1° INC					
10043.71	81.10	225	8649.60	-989.33	-989.33
TD: 10644' MD, 2008' VS					
10643.71	81.10	225	8742.48	-1408.48	-1408.48

Job Number:	**State/Country:**
Company: TEXACO E & P, INC.	**Declination:**
Lease/Well: NVAWU #31	**Grid:**
Location: LEA CO., NEW MEXICO	**File name: C:\WINSERVE\NVAWU31.SVY**
Rig Name:	**Date/Time: 16-Apr-97 / 08:19**
RKB:	**Curve Name: PRELIMINARY WELL PLAN**
G.L. or M.S.L.:	

PHOENIX DRILLING SERVICES, INC.

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method

Vertical Section Plane 225.00

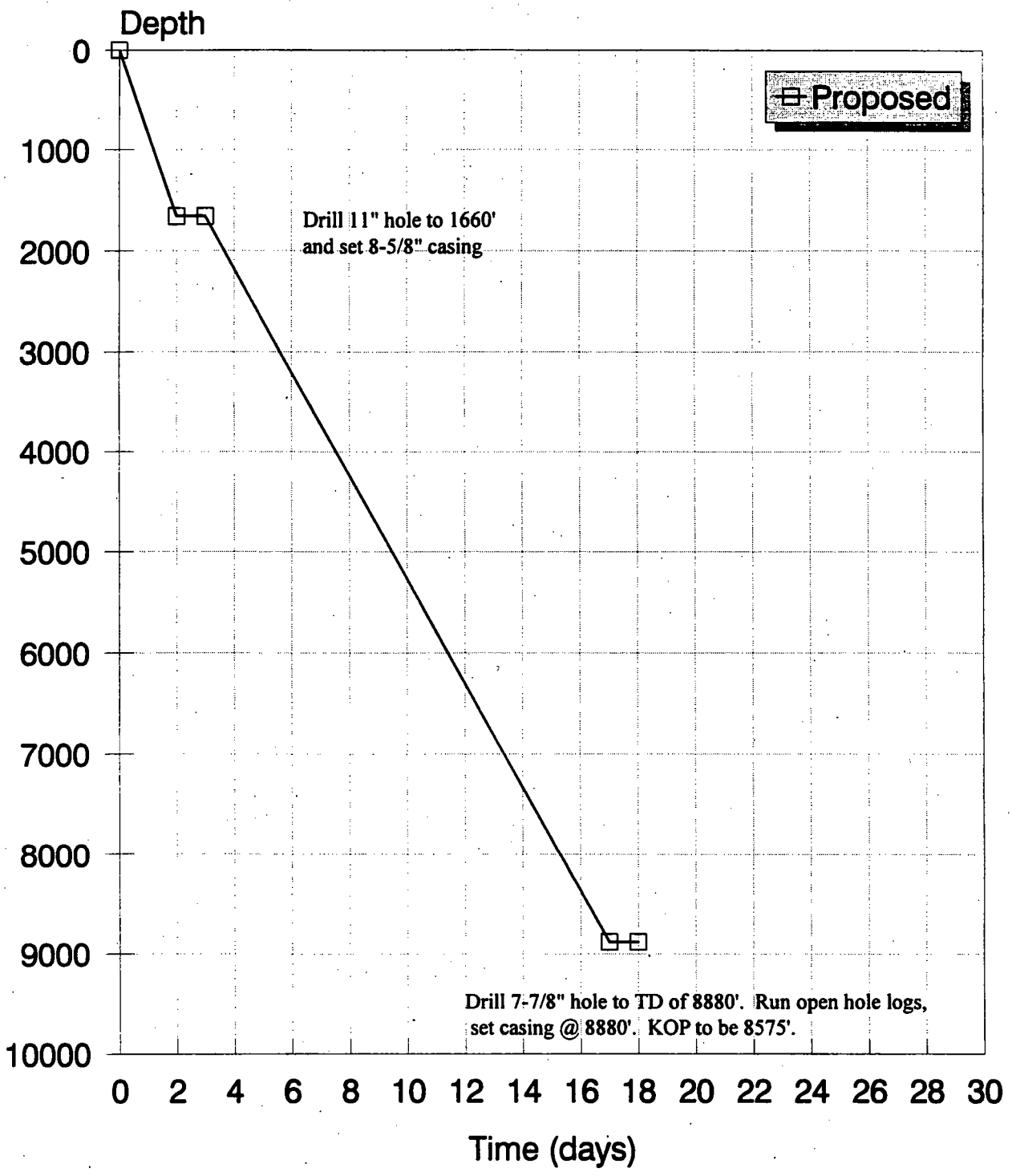
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
KOP: 8575' MD, 57.3°/100'										
8575.00	.00	225.00	8575.00	8575.00	.00	.00	.00	.00	.00	.00
8585.00	5.73	225.00	8584.98	8584.98	-.35	-.35	.50	.50	225.00	57.30
8595.00	11.46	225.00	8594.87	8594.87	-1.41	-1.41	1.99	1.99	225.00	57.30
8605.00	17.19	225.00	8604.55	8604.55	-3.16	-3.16	4.47	4.47	225.00	57.30
8615.00	22.92	225.00	8613.94	8613.94	-5.58	-5.58	7.89	7.89	225.00	57.30
8625.00	28.65	225.00	8622.94	8622.94	-8.66	-8.66	12.24	12.24	225.00	57.30
8635.00	34.38	225.00	8631.46	8631.46	-12.35	-12.35	17.47	17.47	225.00	57.30
8645.00	40.11	225.00	8639.42	8639.42	-16.63	-16.63	23.52	23.52	225.00	57.30
8655.00	45.84	225.00	8646.73	8646.73	-21.45	-21.45	30.33	30.33	225.00	57.30
8665.00	51.57	225.00	8653.33	8653.33	-26.76	-26.76	37.84	37.84	225.00	57.30
8675.00	57.30	225.00	8659.14	8659.14	-32.51	-32.51	45.97	45.97	225.00	57.30
8685.00	63.03	225.00	8664.12	8664.12	-38.64	-38.64	54.64	54.64	225.00	57.30

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
8695.00	68.76	225.00	8668.20	8668.20	-45.09	-45.09	63.77	63.77	225.00	57.30
8705.00	74.49	225.00	8671.35	8671.35	-51.80	-51.80	73.25	73.25	225.00	57.30
8715.00	80.22	225.00	8673.54	8673.54	-58.70	-58.70	83.01	83.01	225.00	57.30
EOB: 8719' MD, 8674' TVD, 82.77° INC.										
8719.46	82.77	225.00	8674.20	8674.20	-61.81	-61.81	87.42	87.42	225.00	57.30
9258.28	82.77	225.00	8741.97	8741.97	-439.79	-439.79	621.96	621.96	225.00	.00
BUILD AT 15°/100'										
9268.28	84.27	225.00	8743.09	8743.09	-446.82	-446.82	631.89	631.89	225.00	15.00
9278.28	85.77	225.00	8743.96	8743.96	-453.86	-453.86	641.86	641.86	225.00	15.00
9288.28	87.27	225.00	8744.57	8744.57	-460.92	-460.92	651.84	651.84	225.00	15.00
9298.28	88.77	225.00	8744.91	8744.91	-467.99	-467.99	661.83	661.83	225.00	15.00
TARGET										
9306.45	90.00	225.00	8745.00	8745.00	-473.76	-473.76	670.00	670.00	225.00	15.00
9316.45	91.50	225.00	8744.87	8744.87	-480.83	-480.83	680.00	680.00	225.00	15.00
9326.45	93.00	225.00	8744.48	8744.48	-487.90	-487.90	689.99	689.99	225.00	15.00
9336.45	94.50	225.00	8743.82	8743.82	-494.95	-494.95	699.97	699.97	225.00	15.00
9346.45	96.00	225.00	8742.91	8742.91	-501.99	-501.99	709.93	709.93	225.00	15.00
9356.45	97.50	225.00	8741.73	8741.73	-509.02	-509.02	719.86	719.86	225.00	15.00
9366.45	99.00	225.00	8740.30	8740.30	-516.01	-516.01	729.75	729.75	225.00	15.00
Hold @ 99.35										
9368.76	99.35	225.00	8739.93	8739.93	-517.63	-517.63	732.04	732.04	225.00	15.00
9468.76	99.35	225.00	8723.69	8723.69	-587.40	-587.40	830.71	830.71	225.00	.00
9568.76	99.35	225.00	8707.45	8707.45	-657.17	-657.17	929.38	929.38	225.00	.00
9668.76	99.35	225.00	8691.21	8691.21	-726.94	-726.94	1028.05	1028.05	225.00	.00
9768.76	99.35	225.00	8674.96	8674.96	-796.72	-796.72	1126.73	1126.73	225.00	.00
9868.76	99.35	225.00	8658.72	8658.72	-866.49	-866.49	1225.40	1225.40	225.00	.00
Drop @ 15.0 99.35°										
9922.03	99.35	225.00	8650.07	8650.07	-903.66	-903.66	1277.96	1277.96	225.00	.00
9922.04	99.35	225.00	8650.07	8650.07	-903.66	-903.66	1277.97	1277.97	225.00	15.00
9924.35	99.00	225.00	8649.70	8649.70	-905.27	-905.27	1280.25	1280.25	225.00	15.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
9934.35	97.50	225.00	8648.27	8648.27	-912.27	-912.27	1290.14	1290.14	225.00	15.00
9944.35	96.00	225.00	8647.09	8647.09	-919.29	-919.29	1300.07	1300.07	225.00	15.00
9954.35	94.50	225.00	8646.18	8646.18	-926.33	-926.33	1310.03	1310.03	225.00	15.00
9964.35	93.00	225.00	8645.52	8645.52	-933.39	-933.39	1320.01	1320.01	225.00	15.00
9974.35	91.50	225.00	8645.13	8645.13	-940.45	-940.45	1330.00	1330.00	225.00	15.00
TARGET										
9984.35	90.00	225.00	8645.00	8645.00	-947.52	-947.52	1340.00	1340.00	225.00	15.00
9994.35	88.50	225.00	8645.13	8645.13	-954.59	-954.59	1350.00	1350.00	225.00	15.00
10004.35	87.00	225.00	8645.52	8645.52	-961.66	-961.66	1359.99	1359.99	225.00	15.00
10014.35	85.50	225.00	8646.18	8646.18	-968.71	-968.71	1369.97	1369.97	225.00	15.00
10024.35	84.00	225.00	8647.09	8647.09	-975.76	-975.76	1379.93	1379.93	225.00	15.00
10034.35	82.50	225.00	8648.27	8648.27	-982.78	-982.78	1389.86	1389.86	225.00	15.00
HOLD 81.1° INC										
10043.71	81.10	225.00	8649.60	8649.60	-989.33	-989.33	1399.12	1399.12	225.00	15.00
10143.71	81.10	225.00	8665.08	8665.08	-1059.19	-1059.19	1497.92	1497.92	225.00	.00
10243.71	81.10	225.00	8680.56	8680.56	-1129.05	-1129.05	1596.71	1596.71	225.00	.00
10343.71	81.10	225.00	8696.04	8696.04	-1198.91	-1198.91	1695.51	1695.51	225.00	.00
10443.71	81.10	225.00	8711.52	8711.52	-1268.76	-1268.76	1794.30	1794.30	225.00	.00
10543.71	81.10	225.00	8727.00	8727.00	-1338.62	-1338.62	1893.10	1893.10	225.00	.00
TD: 10644' MD, 2008' VS										
10643.71	81.10	225.00	8742.48	8742.48	-1408.48	-1408.48	1991.89	1991.89	225.00	.00

VERTICAL DRILLING CURVE

North Vacuum Abo West Unit # 31H, Lea Co., NM.



HORIZONTAL DRILLING CURVE

North Vacuum Abo West Unit 31H, Lea Co., NM.