

DATE IN 8/14/03	SUSPENSE NA	ENGINEER WVS	LOGGED IN LSR	TYPE NSL	APP NO. PLR0322640855
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ABOVE THIS LINE FOR DIVISION USE ONLY

## NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

1220 South St. Francis Drive, Santa Fe, NM 87505



### ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

#### Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [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 - Simultaneous Dedication  
☒ NSL ☐ NSP ☐ 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

[D] Other: Specify \_\_\_\_\_

#### [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] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate and complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

STEVEN F. MILLICAN  
 Print or Type Name

*[Signature]*  
 Signature

ENGINEERING  
 Title

8/13/03  
 Date

SFMillican@MarathonOil.com  
 e-mail Address

Oil Conservation Division

AUG 14 2003

RECEIVED



**Marathon  
Oil Company**

P.O. Box 552  
Midland, TX 79702-C552  
Telephone 915/682-1626

August 12, 2003

Mr. Richard Ezeanyim  
Oil Conservation Division  
1220 S. St. Francis Dr.  
Santa Fe, New Mexico 87504

**RECEIVED**

AUG 14 2003

**Oil Conservation Division**

***RE: Indian Hills Unit Well No. 9 Horizontal Re-entry Unorthodox Location  
990' FNL & 1980' FEL, Sec. 33, Township 21 South, Range 24 East (SHL),  
50' FNL & 975' FEL, Sec. 33, Township 21 South, Range 24 East (BHL)  
Indian Basin Upper Pennsylvanian Associated Pool***

Dear Mr. Stogner,

By means of this application, Marathon Oil Company respectfully requests non-standard location approval for the proposed re-entry of Indian Hills Unit Well No. 9 (API No. 30-015-28754) with a surface location of 990' FNL & 1980' FEL, Section 33, Township 21 South, Range 24 East, and a bottom hole location of 50' FNL & 975' FEL, Section 33, Township 21 South, Range 24 East, and to be dedicated to a standard spacing unit consisting of the north half of Section 33. Marathon is proposing to reenter and horizontally drill this producing vertical well to an unorthodox location in the Upper Pennsylvanian formation.

Marathon proposes to recompleat the Indian Hills Unit Well No. 9 in the "Indian Basin Upper Pennsylvanian Associated Pool" as promulgated by the New Mexico Oil Conservation Division Order Nos. R-9922, R-9922-A, R-9922-B, R-9922-C, R-9922-D and R-9922-E and the general rules for the Associated Gas Pools of Southeast New Mexico as promulgated by Division Order No. R-5353. These rules require wells to be located no closer than 660 feet to the outer boundary of the proration/spacing unit and no closer than 330 feet to the governmental quarter/quarter section line. The Indian Hills Unit Well No. 9 horizontal is unorthodox because the terminus of the lateral is within the 660 foot setback from the northern outer boundary of the 320-acre "lay-down" gas proration unit dedicated to the north half of Section 33 (please see Attachments #1 - Well Location and Acreage Dedication Plat). Based on the proposed directional plan, it is expected the lateral will terminate in the Upper Pennsylvanian formation at 50' FNL & 975' FEL in Section 33, (please see Attachment #2 - Directional Plat supplied by Baker Inteq, Marathon's proposed directional drilling company for the well).

## **Participating Area**

The proposed re-entry is located within the Indian Hills Unit Upper Pennsylvanian Participating Area (please see Attachment #3). The Indian Hills Unit is operated by Marathon. The Indian Hills Unit Well No. 9 is currently dedicated to a standard proration unit consisting of the north half of Section 33, Township 21 South, Range 24 East. Three other wells, the Indian Hills Unit Well Nos. 12 (API No. 30-015-28813), 22 (API No. 30-015-31150), and 44 (API No. 30-015-32656), also produce from the same proration unit. The ownership of the proposed proration unit is identical to Section 28 which offsets the proposed unorthodox location in the Upper Pennsylvanian formation. Marathon Oil Company has a 99.54544% working interest while Nearburg Exploration has a 0.45456% working interest.

## **Geologic Issues:**

The Indian Basin Upper Pennsylvanian Associated Pool is predominantly composed of dolomite and limestone sequences. With current technology, only the fractured, vuggy dolomite sequences have proven productive and economic. The proposed lateral in Indian Hills Unit Well No. 9 is an attempt to further develop the eastern extent of the oil bearing dolomite horizons within the Indian Hills Unit (please see Attachment #4 - Upper Pennsylvanian Structure map) by connecting the wellbore with more of the productive fractured, vuggy reservoir.

Based on Formation Micro Imager open hole logs, Indian Hills Unit Well No. 9 vertical wellbore failed to properly connect to a fracture network in the oil leg of the Upper Pennsylvanian formation. This data is supported by current oil production rates in offset wells that can be two to three times higher than Indian Hills Unit Well No. 9.

Marathon has two geologic goals in drilling the proposed lateral. The first is to increase connectivity to the fracture network in the oil leg. A horizontal wellbore will provide this by greatly increasing the amount of reservoir cut by the wellbore. The second goal is to expose the wellbore to potentially heterogeneous layers of the oil column. Marathon suspects that there may be oil bearing porosity developments within the dolomite sequences that are poorly connected to the existing vertical and deviated wellbores due to the discontinuous porosity and permeability development in some areas of the Upper Pennsylvanian formation. A cross section between Indian Hills Unit Well Nos. 9 & 44 has been included to help illustrate this variability between two wells that are only 80 acres apart (please see Attachment #5).

## **Reservoir Management Plan:**

Over the last two years, Marathon has focused on developing the oil potential of the Upper Pennsylvanian formation in the Indian Hills Unit. This has been accomplished primarily by infilling the well density to 80-acres in prospective oil areas. Marathon is now looking at horizontal well technology as a method to improve oil recoveries from poorly drained areas of the reservoir.

Recently completed directional wellbores have confirmed strong oil potential in the eastern portion of the Indian Hills Unit. The terminus of the proposed lateral is targeted to improve drainage from an area along the eastern region of the Unit that Marathon believes is not being effectively drained by the existing wellbores.

It is Marathon's belief that the proposed unorthodox location represents a superior location in regards to both reservoir drainage and geologic risk. Firstly, the proposed azimuth for the wellbore will maximize the distance between the lateral and the existing wells thereby minimizing potential for well-to-well interference. Secondly, by extending the lateral to the proposed unorthodox terminus location, additional reservoir rock will be exposed to the wellbore, hence increasing the likelihood to encounter fractures and productive dolomite and ultimately increasing reserves recovery.

**Notifications:**

Based on the proposed terminus, the new lateral does not infringe on Sections 27 and 34 of Township 21 South, Range 24 East because the lateral does not enter the area of infringement for those sections. Further, as the ownership of Sections 28 and 33, Township 21 South, Range 24 East, are identical, no waivers or notifications are required.

Should you have any questions/comments/concerns, please contact me at (432) 687-8306.

Respectfully,

A handwritten signature in black ink, appearing to read 'SMillican', with a long horizontal flourish extending to the right.

Steven F. Millican  
Operations Engineer  
Indian Basin Asset Team  
Marathon Oil Company

DISTRICT I  
P.O. Box 1980, Hobbs, NM 88241-1980

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102  
Revised February 10, 1994  
Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

DISTRICT II  
P.O. Drawer DD, Artesia, NM 88211-0719

ATTACHMENT # 1

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

OIL CONSERVATION DIVISION  
P.O. Box 2088

Santa Fe, New Mexico 87504-2088

DISTRICT IV  
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
	33685	Indian Basin Upper Penn. Assoc.
Property Code	Property Name	Well Number
	INDIAN HILLS UNIT	9
OGRID No.	Operator Name	Elevation
14021	MARATHON OIL COMPANY	4121

Surface Location

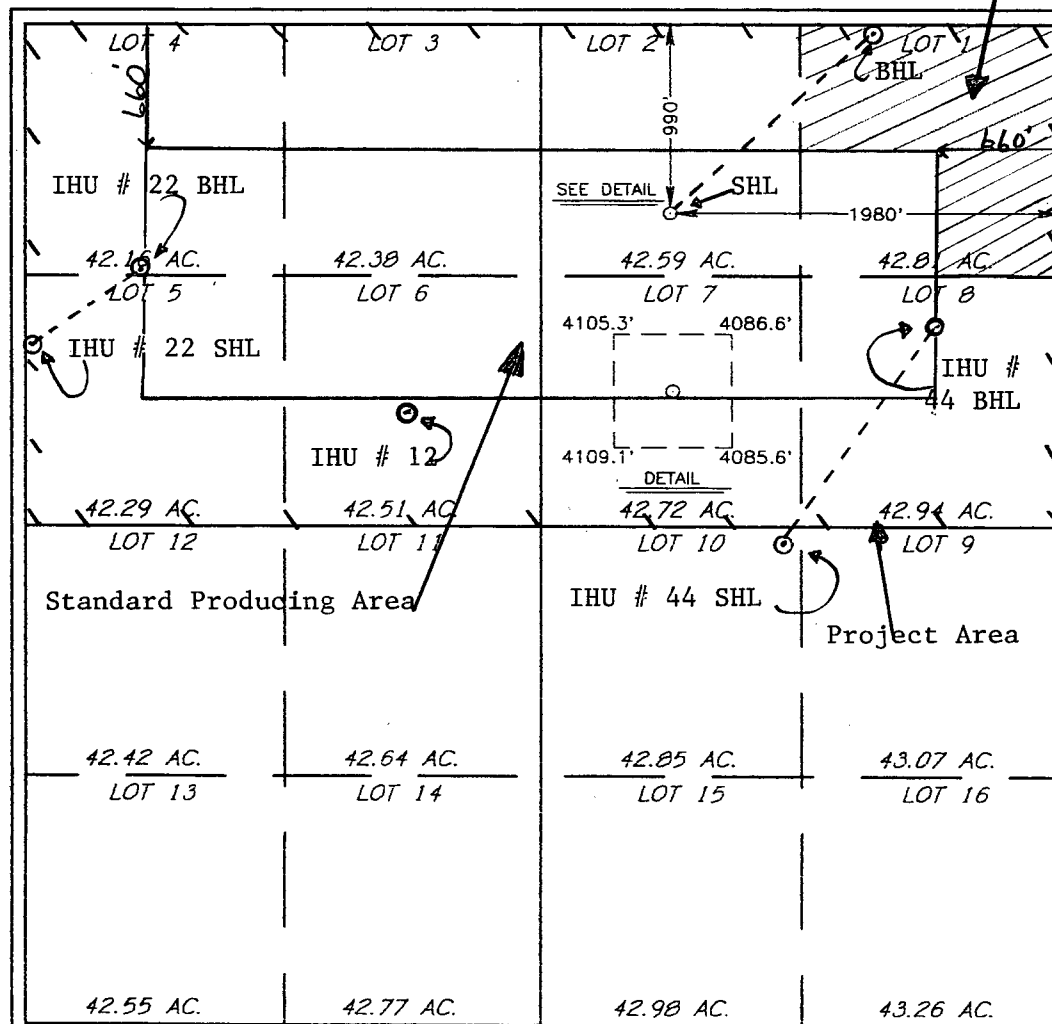
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
2	33	21 S	24 E		990	NORTH	1980	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	33	21 S	24 E		50	NORTH	975	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
320 N/2			Non-Standard Producing Area

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



OPERATOR CERTIFICATION

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

*Jerry Fletcher*  
Signature

Jerry Fletcher

Printed Name

Engineer Tech.

Title

August 13, 2003

Date

SURVEYOR CERTIFICATION

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

SEPTEMBER 27, 1995

Date Surveyed  
Signature & Seal of  
Professional Surveyor

SJA

*David E. Eison*  
W.O. Num. 95-11-1471

Certificate No. JOHN W. WEST 676  
RONALD G. EIDSON 3239  
PROFESSIONAL SURVEYOR EIDSON 12641



Structure : IHU #9 Slot : slot #1  
Field : INDIAN BASIN Location : Eddy County New Mexico

**BAKER  
HUGHES**

**INTEQ**

# WELL PROFILE DATA

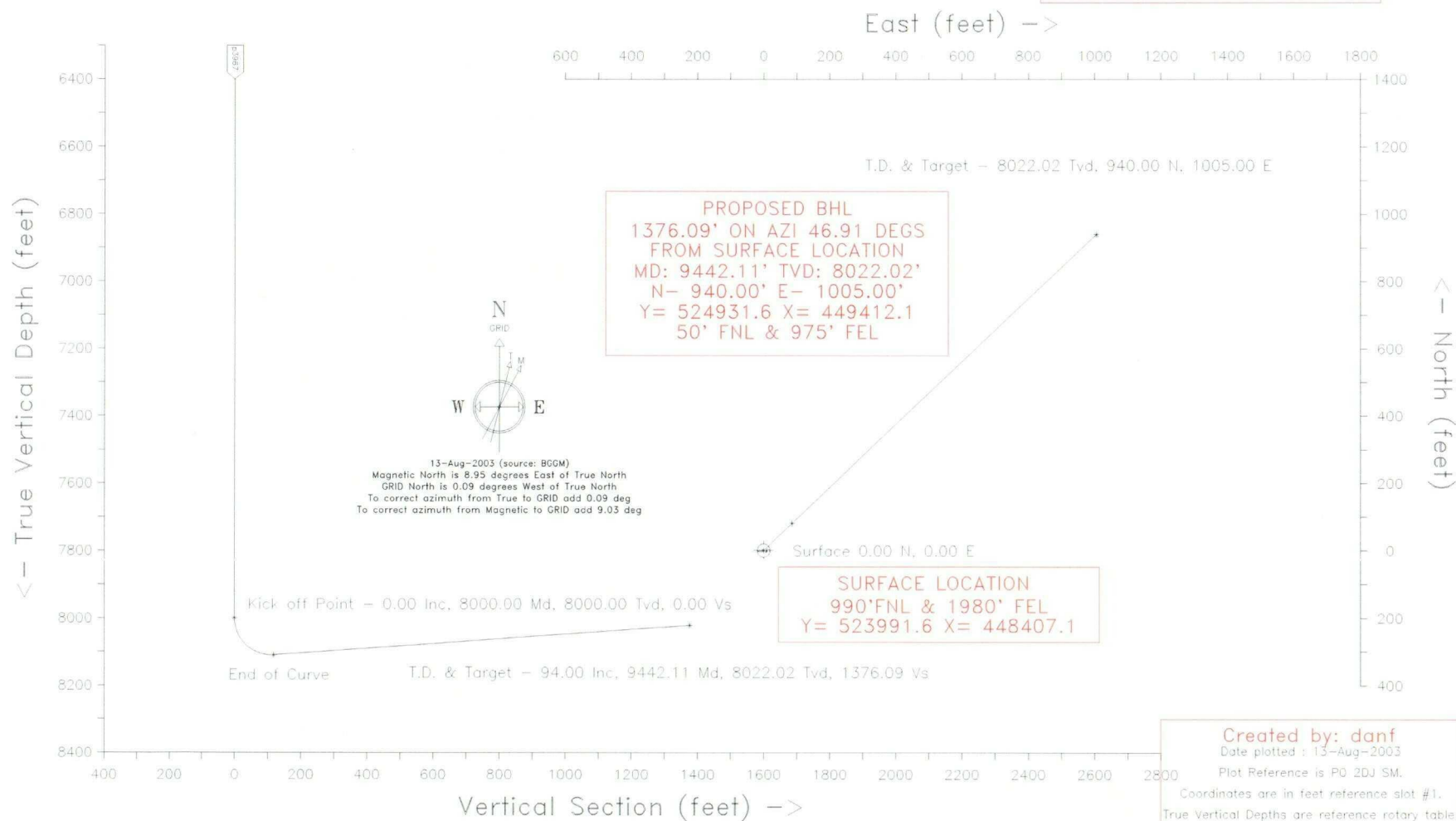
Point	MD	Inc	Dir	TVD	North	East	V. Sect	Deg/100
Tie on	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP	8000.00	0.00	46.91	8000.00	0.00	0.00	0.00	0.00
Target End of Curve	8180.90	94.00	46.91	8110.00	80.58	86.14	117.95	51.96
T.D. & Target	9442.11	94.00	46.92	8022.02	940.00	1005.00	1376.09	0.00

## STRUCTURE SET-UP REFERENCE

LAT : 32 26 25.637 N  
LONG: 104 30 2.049 W  
X= 448407.1 Y= 523991.6

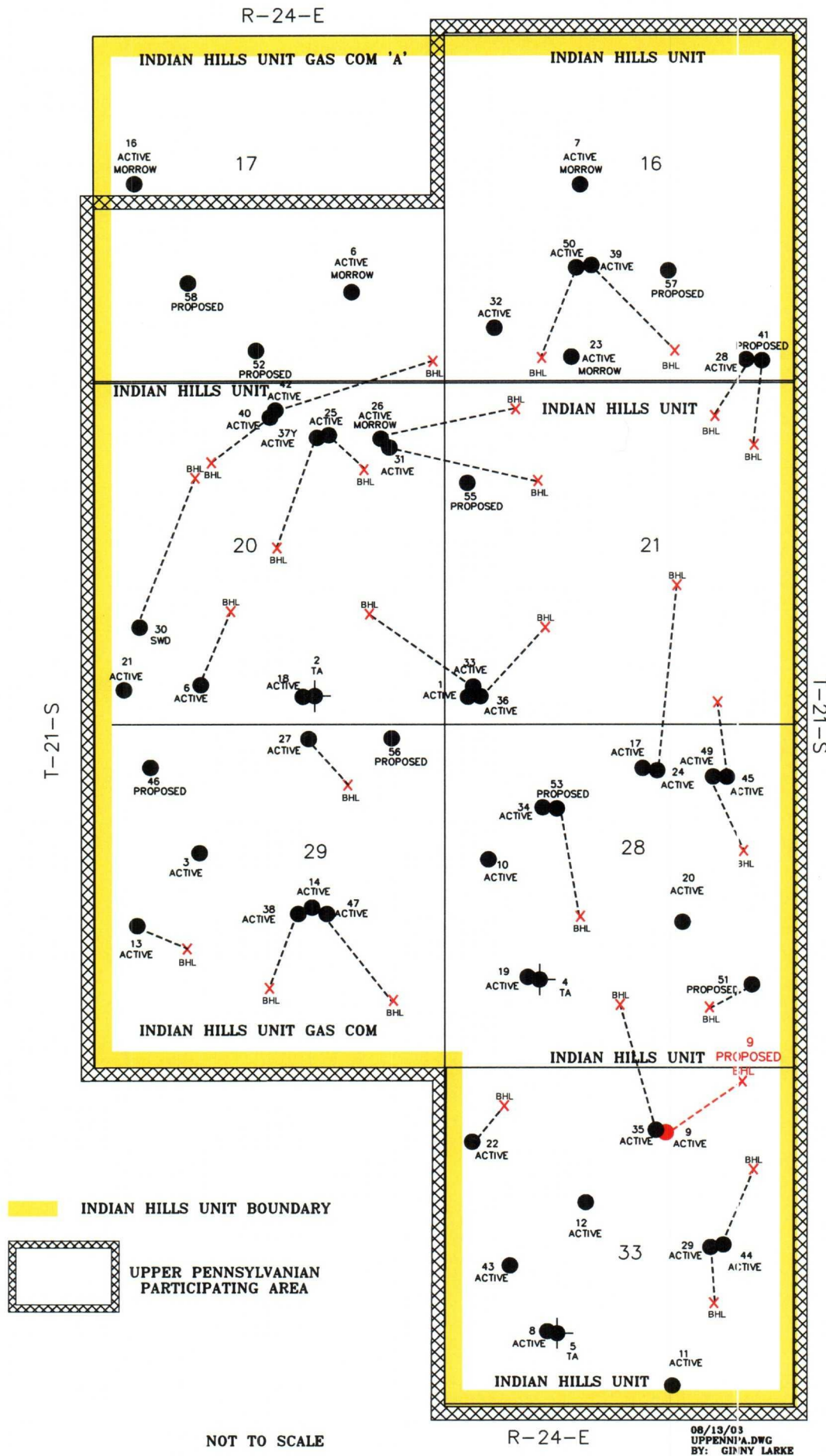
PROJECTION: MERCATOR  
Mercator Zone: New Mexico East  
Spheroid Used: Clarke - 1866

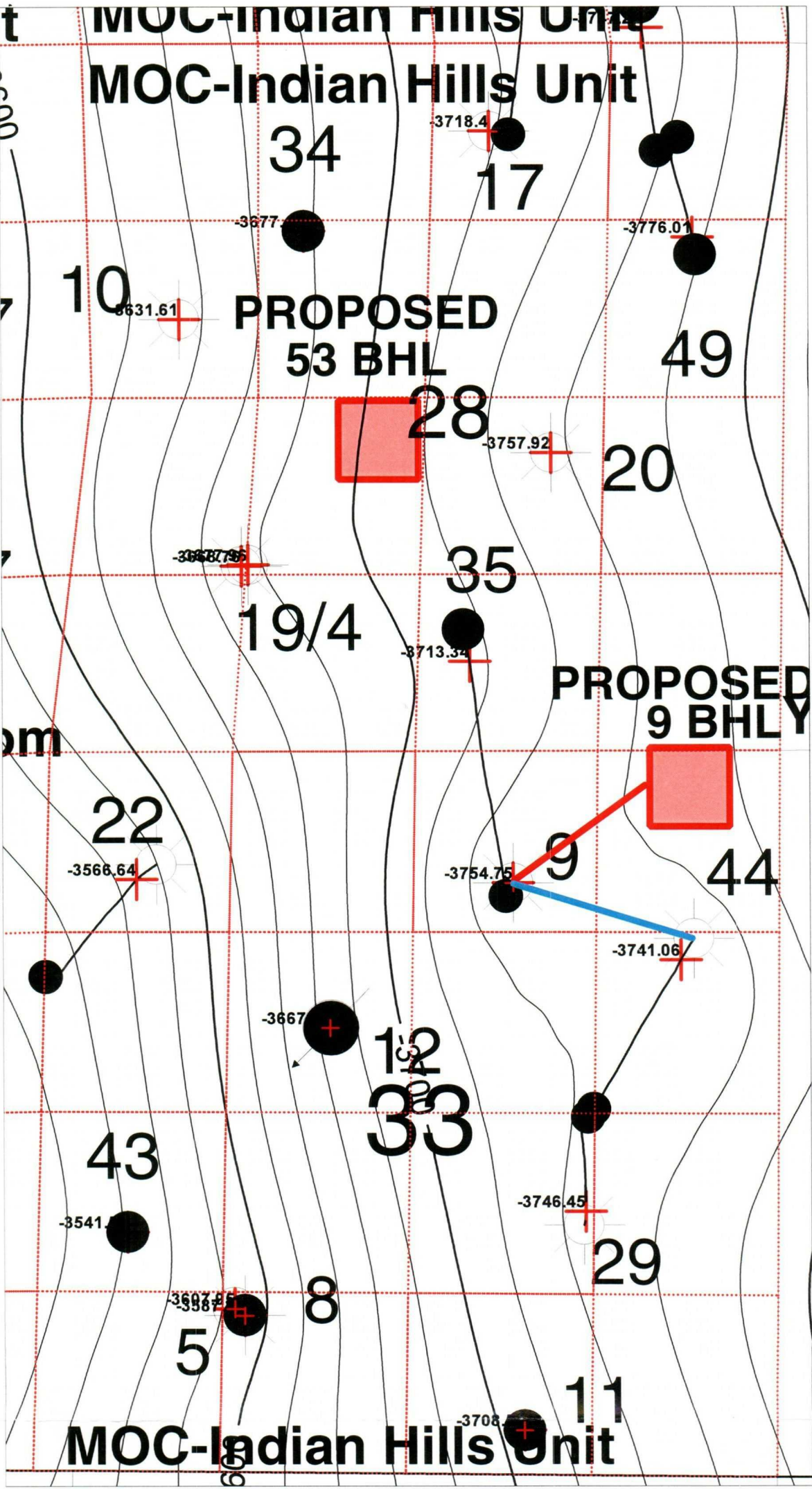
Data Source: BGGM  
Dip Angle: 60.40 deg  
Field Strength: 49483.78 nT



Created by: danf  
Date plotted : 13-Aug-2003  
Plot Reference is PD 2DJ SM.  
Coordinates are in feet reference slot #1.  
True Vertical Depths are reference rotary table.  
Ilu #000

## Attachment 3





PENETRATION POINT OF  
UPPER PENN FORMATION



PROPOSED LATERAL PATH



CROSS-SECTION



QUARTER/QUARTER SECTION LINES

## INDIAN HILLS UNIT 9

## INDIAN HILLS UNIT 44

**TOP OIL****DISCONTINUOUS  
POROSITY ZONE****TOP WATER**

INTERVAL WITH DENSITY  
POROSITY > 2%



NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 South Pacheco Street  
Santa Fe, New Mexico 87505  
(505) 827-7131

December 4, 1998

Marathon Oil Company  
c/o W. Thomas Kellahin  
P. O. Box 2265  
Santa Fe, New Mexico 87504-2265

***Administrative Order NSL-4175(SD)***

Dear Mr. Kellahin:

Reference is made to your application dated September 2, 1998 on behalf of the operator, Marathon Oil Company ("Marathon"), for a non-standard oil/gas well location in an existing standard 340.40-acre spacing and proration unit for the Indian Basin-Upper Pennsylvanian Associated Pool comprising Lots 1 through 8 (N/2 equivalent) of Section 33, Township 21 South, Range 24 East, NMPM, Eddy County, New Mexico.

The subject application has been duly filed under the provisions of Rule 104.F of the General Rules and Regulations of the New Mexico Oil Conservation Division.

By the authority granted me under the provisions of: (i) **Rule 2(c)** of the "*Special Rules and Regulations for the Indian Basin-Upper Pennsylvanian Associated Pool*," as promulgated by Division Order Nos. R-9922, R-9922-A, R-9922-B, and R-9922-C and the "*General Rules and Regulations for the Associated Oil and Gas Pools of Northwest New Mexico and Southeast New Mexico*," as promulgated by Division Order No. R-5353, as amended; and, (ii) Division General Rule 104.F(2), the following described well, which was drilled and completed by Marathon in 1996 at an unorthodox oil/gas well location within the Indian Basin-Upper Pennsylvanian Associated Pool is hereby approved:

***Indian Hills Unit Well No.12  
(API No. 30-015-28813)  
2080' FNL - 2130' FWL (Lot 6/Unit F) of Section 33.***

Also, Marathon is hereby authorized to simultaneously dedicate production attributed to the Indian Basin-Upper Pennsylvanian Associated Pool from the Indian Hills Unit Well No. 12 with its Indian Hills Unit Well No. 9 (API No. 30-015-28754), located at a standard location 990 feet from the North line and 1980 feet from the East line (Lot 2/Unit B) of Section 33. Furthermore, Marathon is permitted to produce the allowable assigned the subject 340.40-acre spacing and proration unit from both wells in any proportion.

Sincerely,

*Lori Wrotenbery* by *DEC*

Lori Wrotenbery  
Director

LW/MES/kv

cc: New Mexico Oil Conservation Division - Artesia  
U. S. Bureau of Land Management - Carlsbad

Sec : 33 Twp : 21S Rng : 24E Section Type : NORMAL

4 42.16  Federal owned U	3 42.38  Federal owned U	2 42.59  Federal owned U A A	1 42.81  Federal owned U
5 42.29  Federal owned U A	6 42.51  Federal owned U A	7 42.72  Federal owned U A	8 42.94  Federal owned U
12 42.42  Federal owned U A	11 42.64  Federal owned U	10 42.85  Federal owned U A	9 43.07  Federal owned U
13 42.55  Federal owned U	14 42.77  Federal owned U A A	15 42.98  Federal owned U A	16 43.20  Federal owned U