

Results of Directional Survey

DD

API number:	30-025-05492		
OGRID:		Operator:	OCCIDENTAL PERMIAN LTD
		Property:	NORTH HOBBS G/SA UNIT # 431

surface	ULSTR:	I	25	T 18S	R 37E
				2310 FSL	330 FEL

BH Loc	ULSTR:	I	25	T 18S	R 37E
4674 MD			4373.0 TVD	2463 FSL	1108 FEL

Top Perf/OH	ULSTR:	I	25	T 18S	R 37E
4456 MD			4209.5 TVD	2451 FSL	964 FEL

Bot Perf/OH	ULSTR:	I	25	T 18S	R 37E
4620 MD			4332.0 TVD	2460 FSL	1072 FEL

	MD	N/S	E/W	VD
	4443	139.81	-624.93	4199.76
TOP PERFS/OH	4456	140.57	-633.87	4209.45
	4475	141.69	-646.93	4223.61
	4614	149.87	-738.11	4327.54
BOT PERFS/OH	4620	150.18	-742.07	4332.04
	4666.48	152.56	-772.72	4366.89

NEXT TO LAST	4666.48	152.56	-772.72	4366.89
LAST READING	4674.11	152.96	-777.76	4372.61
TD	4674.11	152.96	-777.76	4372.61

Surface Location	2310 FS	330 FE
Projected BHL	2463 FS	1108 FE
Location of		
Top Perfs/OH	2451 FS	964 FE
Bottom Perfs/OH	2460 FS	1072 FE

SUMMARY of Subsurface Locations

Surface Location	I-25-18S-37E	2310 FS	330 FE	Vert. Depth
Top Perfs/OH	I-25-18S-37E	2451 FS	964 FE	4209.45
Bottom Perfs/OH	I-25-18S-37E	2460 FS	1072 FE	4332.04
Projected TD	I-25-18S-37E	2463 FS	1108 FE	4372.61

APR 17 2012



OXY Permian

Lea County, NM

NHU 25-431

NHU 25-431

ST1

Design: ST1

PathFinder X&Y Report

25 July, 2011

SUR: I-25-18s-37e, 2310/S & 330/E
BHL: I-25-18s-37e, 2463/S & 1108/E
Api # 30-025-05492

PATHFINDER®

A Schlumberger Company



Pathfinder

PathFinder X&Y Report



Company: OXY Permian
Project: Lea County, NM
Site: NHU 25-431
Well: NHU 25-431
Wellbore: ST1
Design: ST1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well NHU 25-431
RKB to MSL @ 3662.60ft
RKB to MSL @ 3662.60ft
Grid
Minimum Curvature
1 Smith Database

Project Lea County, NM

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site NHU 25-431

Site Position:
From: Map
Position Uncertainty: 0.00 ft

Northing: 626,568.30 ft
Easting: 849,556.40 ft
Slot Radius: "

Latitude: 32.7173813
Longitude: -103.1968062
Grid Convergence: 0.61 °

Well NHU 25-431

Well Position +N/-S 0.00 ft
+E/-W 0.00 ft
Position Uncertainty 0.00 ft

Northing: 626,568.30 ft
Easting: 849,556.40 ft
Wellhead Elevation: ft

Latitude: 32.7173813
Longitude: -103.1968062
Ground Level: 3,658.60 ft

Wellbore ST1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	07/08/11	7.44	60.70	48,946

Design ST1

Audit Notes:
Version: 1.0
Phase: ACTUAL
Tie On Depth: 3,200.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	280.44



Pathfinder
PathFinder X&Y Report

PATHFINDER
A Schlumberger Company

Company:	OXY Permian	Local Co-ordinate Reference:	Well NHU 25-431
Project:	Lea County, NM	TVD Reference:	RKB to MSL @ 3662.60ft
Site:	NHU 25-431	MD Reference:	RKB to MSL @ 3662.60ft
Well:	NHU 25-431	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	1 Smith Database

Survey Program	Date 07/25/11				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
104.00	3,200.00	Survey #1 (AWB)	NS-GYRO-MS	North sensing gyrocompassing m	
3,312.00	4,674.11	Survey #2 - MWD (ST1)	MWD	MWD - Standard	

Survey										
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
0.00	0.00	0.00	0.00	-3,662.60	0.00	0.00	0.00	0.00	626,568.30	849,556.40
104.00	0.12	109.03	104.00	-3,558.60	-0.04	0.10	-0.11	0.12	626,568.26	849,556.50
204.00	0.23	137.21	204.00	-3,458.60	-0.22	0.34	-0.37	0.14	626,568.08	849,556.74
304.00	0.24	186.45	304.00	-3,358.60	-0.57	0.45	-0.55	0.20	626,567.73	849,556.85
404.00	0.24	193.40	404.00	-3,258.60	-0.98	0.38	-0.55	0.03	626,567.32	849,556.78
504.00	0.67	190.03	503.99	-3,158.61	-1.76	0.23	-0.54	0.43	626,566.54	849,556.63
604.00	0.79	231.04	603.99	-3,058.61	-2.77	-0.41	-0.10	0.52	626,565.53	849,555.99
704.00	0.30	261.20	703.98	-2,958.62	-3.25	-1.20	0.60	0.55	626,565.05	849,555.20
804.00	0.73	201.33	803.98	-2,858.62	-3.88	-1.69	0.96	0.63	626,564.42	849,554.71
904.00	0.30	210.73	903.97	-2,758.63	-4.70	-2.06	1.17	0.44	626,563.60	849,554.34
1,004.00	0.60	201.82	1,003.97	-2,658.63	-5.41	-2.39	1.37	0.31	626,562.89	849,554.01
1,104.00	0.30	357.71	1,103.97	-2,558.63	-5.63	-2.59	1.53	0.88	626,562.67	849,553.81
1,204.00	0.64	345.97	1,203.97	-2,458.63	-4.83	-2.74	1.82	0.35	626,563.47	849,553.66
1,304.00	0.90	335.25	1,303.96	-2,358.64	-3.58	-3.20	2.50	0.30	626,564.72	849,553.20
1,404.00	0.52	5.53	1,403.95	-2,258.65	-2.41	-3.49	2.99	0.52	626,565.89	849,552.91
1,504.00	0.53	28.01	1,503.95	-2,158.65	-1.55	-3.23	2.89	0.20	626,566.75	849,553.17
1,604.00	0.67	53.67	1,603.94	-2,058.66	-0.80	-2.54	2.35	0.30	626,567.50	849,553.86
1,704.00	0.94	59.33	1,703.93	-1,958.67	-0.03	-1.36	1.33	0.28	626,568.27	849,555.04
1,804.00	1.15	40.45	1,803.91	-1,858.69	1.15	-0.01	0.21	0.40	626,569.45	849,556.39
1,904.00	0.69	68.55	1,903.90	-1,758.70	2.13	1.21	-0.80	0.63	626,570.43	849,557.61
2,004.00	0.92	60.48	2,003.89	-1,658.71	2.75	2.46	-1.93	0.26	626,571.05	849,558.86



Pathfinder
PathFinder X&Y Report

PATHFINDER
A Schlumberger Company

Company: OXY Permian
Project: Lea County, NM
Site: NHU 25-431
Well: NHU 25-431
Wellbore: ST1
Design: ST1

Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference:

Survey Calculation Method:

Database:

Well NHU 25-431

RKB to MSL @ 3662.60ft

RKB to MSL @ 3662.60ft

Grid

Minimum Curvature

1 Smith Database

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
2,104.00	0.94	62.52	2,103.88	-1,558.72	3.52	3.89	-3.19	0.04	626,571.82	849,560.29
2,204.00	1.21	81.05	2,203.86	-1,458.74	4.07	5.66	-4.83	0.44	626,572.37	849,562.06
2,304.00	1.83	79.95	2,303.83	-1,358.77	4.51	8.28	-7.32	0.62	626,572.81	849,564.68
2,404.00	2.25	82.14	2,403.76	-1,258.84	5.06	11.79	-10.68	0.43	626,573.36	849,568.19
2,504.00	2.30	86.29	2,503.68	-1,158.92	5.46	15.74	-14.49	0.17	626,573.76	849,572.14
2,604.00	2.03	81.21	2,603.61	-1,058.99	5.86	19.49	-18.11	0.33	626,574.16	849,575.89
2,704.00	2.46	87.27	2,703.53	-959.07	6.23	23.39	-21.87	0.49	626,574.53	849,579.79
2,804.00	3.16	74.40	2,803.41	-859.19	7.07	28.19	-26.44	0.94	626,575.37	849,584.59
2,904.00	2.86	80.39	2,903.28	-759.32	8.23	33.30	-31.26	0.43	626,576.53	849,589.70
3,004.00	3.96	54.33	3,003.10	-659.50	10.66	38.57	-36.00	1.87	626,578.96	849,594.97
3,104.00	3.79	48.81	3,102.88	-559.72	14.85	43.86	-40.44	0.41	626,583.15	849,600.26
3,200.00	2.67	24.96	3,198.73	-463.87	18.97	47.19	-42.97	1.80	626,587.27	849,603.59
3,312.00	11.61	274.18	3,309.98	-352.62	22.17	37.01	-32.38	11.43	626,590.47	849,593.41
3,343.00	14.42	278.40	3,340.18	-322.42	22.96	30.08	-25.42	9.56	626,591.26	849,586.48
3,375.00	16.97	278.93	3,370.99	-291.61	24.27	21.52	-16.77	7.98	626,592.57	849,577.92
3,406.00	18.47	278.49	3,400.52	-262.08	25.70	12.20	-7.34	4.86	626,594.00	849,568.60
3,438.00	19.70	279.11	3,430.76	-231.84	27.30	1.86	3.12	3.90	626,595.60	849,558.26
3,469.00	21.63	281.65	3,459.76	-202.84	29.28	-8.90	14.06	6.86	626,597.58	849,547.50
3,501.00	24.18	284.91	3,489.24	-173.36	32.16	-21.01	26.49	8.90	626,600.46	849,535.39
3,532.00	27.79	287.10	3,517.10	-145.50	35.92	-34.06	40.00	12.05	626,604.22	849,522.34
3,561.00	31.22	286.40	3,542.33	-120.27	40.03	-47.73	54.20	11.89	626,608.33	849,508.67
3,593.00	34.65	284.82	3,569.19	-93.41	44.70	-64.49	71.52	11.05	626,613.00	849,491.91
3,624.00	38.34	284.47	3,594.11	-68.49	49.36	-82.33	89.91	11.92	626,617.66	849,474.07
3,656.00	42.30	284.99	3,618.50	-44.10	54.62	-102.35	110.55	12.42	626,622.92	849,454.05
3,688.00	43.97	284.64	3,641.85	-20.75	60.22	-123.50	132.36	5.27	626,628.52	849,432.90
3,720.00	43.62	284.20	3,664.95	2.35	65.73	-144.95	154.46	1.45	626,634.03	849,411.45
3,751.00	43.18	284.03	3,687.47	24.87	70.93	-165.60	175.71	1.47	626,639.23	849,390.80



Pathfinder
PathFinder X&Y Report

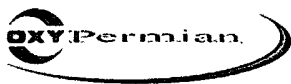
PATHFINDER
A Schlumberger Company

Company: OXY Permian
Project: Lea County, NM
Site: NHU 25-431
Well: NHU 25-431
Wellbore: ST1
Design: ST1

Local Co-ordinate Reference: Well NHU 25-431
TVD Reference: RKB to MSL @ 3662.60ft
MD Reference: RKB to MSL @ 3662.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: 1 Smith Database

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
3,782.00	42.74	284.55	3,710.16	47.56	76.14	-186.07	196.79	1.82	626,644.44	849,370.33
3,814.00	42.30	284.38	3,733.74	71.14	81.54	-207.02	218.37	1.42	626,649.84	849,349.38
3,845.00	42.56	282.80	3,756.63	94.03	86.46	-227.34	239.25	3.54	626,654.76	849,329.06
3,877.00	42.47	281.23	3,780.21	117.61	90.96	-248.49	260.86	3.33	626,659.26	849,307.91
3,909.00	42.12	282.09	3,803.88	141.28	95.31	-269.58	282.39	2.11	626,663.61	849,286.82
3,940.00	42.03	280.42	3,826.89	164.29	99.37	-289.96	303.16	3.62	626,667.67	849,266.44
3,972.00	42.12	279.72	3,850.65	188.05	103.11	-311.07	324.60	1.49	626,671.41	849,245.33
4,003.00	42.03	279.72	3,873.66	211.06	106.62	-331.54	345.38	0.29	626,674.92	849,224.86
4,035.00	41.68	279.72	3,897.49	234.89	110.23	-352.59	366.73	1.09	626,678.53	849,203.81
4,066.00	41.59	279.63	3,920.66	258.06	113.69	-372.89	387.32	0.35	626,681.99	849,183.51
4,097.00	41.94	278.31	3,943.78	281.18	116.91	-393.29	407.96	3.05	626,685.21	849,163.11
4,127.00	42.74	276.73	3,965.96	303.36	119.55	-413.32	428.14	4.44	626,687.85	849,143.08
4,159.00	42.74	276.29	3,989.46	326.86	122.01	-434.90	449.81	0.93	626,690.31	849,121.50
4,190.00	42.56	276.12	4,012.26	349.66	124.28	-455.78	470.75	0.69	626,692.58	849,100.62
4,222.00	42.65	275.41	4,035.82	373.22	126.46	-477.33	492.34	1.53	626,694.76	849,079.07
4,254.00	42.47	275.24	4,059.39	396.79	128.47	-498.88	513.90	0.67	626,696.77	849,057.52
4,285.00	42.21	275.15	4,082.30	419.70	130.36	-519.67	534.69	0.86	626,698.66	849,036.73
4,317.00	42.12	275.24	4,106.02	443.42	132.30	-541.06	556.08	0.34	626,700.60	849,015.34
4,348.00	41.86	274.97	4,129.06	466.46	134.15	-561.72	576.73	1.02	626,702.45	848,994.68
4,380.00	41.94	275.59	4,152.88	490.28	136.11	-583.00	598.01	1.32	626,704.41	848,973.40
4,411.00	41.94	274.97	4,175.94	513.34	138.02	-603.63	618.65	1.34	626,706.32	848,952.77
4,443.00	41.86	274.62	4,199.76	537.16	139.81	-624.93	639.91	0.77	626,708.11	848,931.47
4,475.00	41.77	275.50	4,223.61	561.01	141.69	-646.18	661.16	1.85	626,709.99	848,910.22
4,505.00	41.59	275.06	4,246.01	583.41	143.52	-666.04	681.02	1.15	626,711.82	848,890.36
4,537.00	41.68	275.41	4,269.93	607.33	145.46	-687.21	702.20	0.78	626,713.76	848,869.19
4,569.00	41.59	275.06	4,293.84	631.24	147.40	-708.39	723.37	0.78	626,715.70	848,848.01
4,600.00	41.50	274.62	4,317.05	654.45	149.14	-728.87	743.83	0.99	626,717.44	848,827.53



Pathfinder
PathFinder X&Y Report

PATHFINDER
A Schlumberger Company

Company:	OXY Permian	Local Co-ordinate Reference:	Well NHU 25-431
Project:	Lea County, NM	TVD Reference:	RKB to MSL @ 3662.60ft
Site:	NHU 25-431	MD Reference:	RKB to MSL @ 3662.60ft
Well:	NHU 25-431	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	1 Smith Database

Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
4,614.00	41.42	274.45	4,327.54	664.94	149.87	-738.11	753.05	0.99	626,718.17	848,818.29	
4,666.48	41.42	274.45	4,366.89	704.29	152.56	-772.72	787.58	0.00	626,720.86	848,783.68	
BHL											
4,674.11	41.42	274.45	4,372.61	710.01	152.96	-777.76	792.60	0.00	626,721.26	848,778.64	

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
BHL	0.00	0.00	4,372.60	141.40	-767.10	626,709.70	848,789.30	32.7177925	-103.1992949
- actual wellpath misses target center by 13.74ft at 4666.48ft MD (4366.89 TVD, 152.56 N, -772.72 E)									
- Circle (radius 50.00)									

Checked By: _____ Approved By: _____ Date: _____