

DEVON ENERGY

Willow Lake
Eddy County, NM
Cooter 16 State #5H
VH - Job #32K0810587

30-015-37875

Survey: Actual

SDI Standard Survey Report

30 August, 2010

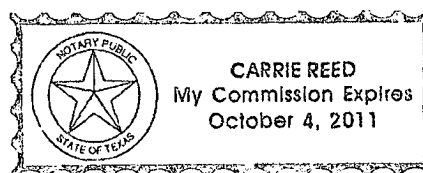
This survey is correct to the best of my knowledge and is supported by actual field data.

Richard

Notorized this date 31st of August, 2010.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.

SDI Standard Survey Report

Company: DEVON ENERGY
Project: Willow Lake
Site: Eddy County, NM
Well: Cooter 16 State #5H
Wellbore: VH Job #32K0810587
Design: VH Job #32K0810587

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

Well Cooter 16 State #5H
 WELL @ 0.0usft (Original Well Elev)
 WELL @ 0.0usft (Original Well Elev)
 Grid
 Minimum Curvature
 EDM-Regulatory

Project	Willow Lake		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Well	Cooter 16 State #5H, Directional (Weatherford)				
Well Position	+N/-S	0.0 usft	Northing:	408,870.64 usft	Latitude: 32° 7' 25.075 N
	+E/-W	0.0 usft	Easting:	606,788.62 usft	Longitude: 103° 59' 18.187 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level: 0.0 usft

Wellbore	VH Job #32K0810587				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2000	12/31/2004	8.75	60.26	49,335

Design	VH Job #32K0810587				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	0.59	

Survey Program	Date	8/29/2010			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	6,422.0	Actual (VH Job #32K0810587)	Keeper	Keeper Gyro	

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0
100.0	0.50	92.96	100.0	0.0	0.4	92.96	0.4
200.0	0.91	38.25	200.0	0.6	1.4	67.00	1.5
300.0	1.43	24.12	300.0	2.3	2.4	45.29	3.3
400.0	1.61	17.02	399.9	4.8	3.3	34.26	5.8
500.0	0.93	355.94	499.9	7.0	3.6	27.55	7.9
600.0	0.61	272.38	599.9	7.8	3.1	21.34	8.4
700.0	1.14	272.26	699.9	7.9	1.5	10.96	8.0
800.0	1.23	272.38	799.9	8.0	-0.5	356.10	8.0
900.0	1.29	280.94	899.8	8.2	-2.7	341.67	8.6
1,000.0	1.12	288.90	999.8	8.7	-4.7	331.48	9.9
1,100.0	1.13	272.00	1,099.8	9.1	-6.7	323.78	11.3
1,200.0	1.11	269.62	1,199.8	9.1	-8.6	316.64	12.5
1,300.0	1.01	255.72	1,299.8	8.9	-10.4	310.45	13.7
1,400.0	1.21	259.39	1,399.8	8.5	-12.3	304.54	15.0
1,500.0	1.08	259.08	1,499.7	8.1	-14.3	299.58	16.4
1,600.0	1.10	257.42	1,599.7	7.7	-16.2	295.56	17.9

Scientific Drilling International, Inc.
SDI Standard Survey Report

Company: DEVON ENERGY
Project: Willow Lake
Site: Eddy County, NM
Well: Cooler 16 State #5H
Wellbore: VH Job #32K0810587
Design: VH Job #32K0810587

Local Co-ordinate Reference: Well Cooler 16 State #5H
TVD Reference: WELL @ 0.0usft (Original Well Elev)
MD Reference: WELL @ 0.0usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,700.0	1.05	249.24	1,699.7	7.7	-17.9	291.83	19.3
1,800.0	1.02	249.63	1,799.7	6.6	-19.6	288.46	20.7
1,900.0	0.78	265.84	1,899.7	6.2	-21.2	286.33	22.0
2,000.0	0.86	256.41	1,999.7	6.0	-22.6	284.82	23.3
2,100.0	0.66	253.68	2,099.6	5.6	-23.8	283.29	24.5
2,200.0	0.26	241.31	2,199.6	5.4	-24.6	282.30	25.2
2,300.0	0.89	97.98	2,299.6	5.1	-24.0	282.09	24.6
2,400.0	1.80	106.77	2,399.6	4.6	-21.8	281.90	22.2
2,500.0	1.67	111.87	2,499.6	3.6	-18.9	280.75	19.2
2,600.0	2.36	112.28	2,599.5	2.3	-15.6	278.24	15.8
2,700.0	3.28	112.57	2,699.4	0.4	-11.1	271.99	11.1
2,800.0	3.62	110.66	2,799.2	-1.8	-5.5	251.53	5.8
2,900.0	3.09	108.96	2,899.0	-3.8	0.0	179.99	3.8
3,000.0	2.61	113.68	2,998.9	-5.6	4.6	140.52	7.3
3,100.0	2.36	113.81	3,098.8	-7.4	8.6	130.59	11.3
3,200.0	2.24	118.30	3,198.7	-9.1	12.2	126.79	15.2
3,300.0	1.69	117.41	3,298.7	-10.7	15.2	125.16	18.6
3,400.0	1.71	117.20	3,398.6	-12.1	17.9	124.09	21.6
3,500.0	1.50	117.07	3,498.6	-13.4	20.4	123.29	24.4
3,600.0	1.69	127.19	3,598.5	-14.9	22.7	123.20	27.1
3,700.0	1.36	139.07	3,698.5	-16.6	24.7	124.03	29.8
3,800.0	1.00	132.17	3,798.5	-18.1	26.1	124.80	31.8
3,900.0	1.13	151.53	3,898.5	-19.6	27.2	125.75	33.5
4,000.0	0.89	141.84	3,998.5	-21.1	28.1	126.80	35.2
4,100.0	0.75	149.22	4,098.5	-22.2	29.0	127.51	36.5
4,200.0	0.81	160.75	4,198.4	-23.5	29.5	128.47	37.7
4,300.0	0.72	162.48	4,298.4	-24.7	30.0	129.54	38.8
4,400.0	0.69	171.38	4,398.4	-25.9	30.2	130.61	39.8
4,500.0	0.57	175.52	4,498.4	-27.0	30.4	131.66	40.6
4,600.0	0.39	192.89	4,598.4	-27.8	30.3	132.56	41.2
4,700.0	0.44	161.71	4,698.4	-28.5	30.4	133.22	41.7
4,800.0	0.41	169.50	4,798.4	-29.3	30.6	133.75	42.3
4,900.0	0.56	163.22	4,898.4	-30.1	30.8	134.35	43.0
5,000.0	0.57	172.48	4,998.4	-31.0	31.0	135.06	43.8
5,100.0	0.47	180.85	5,098.4	-31.9	31.0	135.83	44.5
5,200.0	0.60	220.02	5,198.4	-32.8	30.7	136.87	44.9
5,300.0	0.93	211.15	5,298.4	-33.8	29.9	138.52	45.2
5,400.0	1.05	212.70	5,398.4	-35.3	29.0	140.59	45.7
5,500.0	1.09	212.30	5,498.4	-36.9	28.0	142.79	46.3
5,600.0	1.22	211.90	5,598.3	-38.6	26.9	145.08	47.1
5,700.0	1.25	214.51	5,698.3	-40.4	25.8	147.48	47.9
5,800.0	1.02	211.33	5,798.3	-42.1	24.7	149.60	48.8
5,900.0	0.96	229.89	5,898.3	-43.4	23.6	151.47	49.4
6,000.0	1.09	228.91	5,998.3	-44.5	22.2	153.48	49.8

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SDI Standard Survey Report

Company: DEVON ENERGY
Project: Willow Lake
Site: Eddy County, NM
Well: Cooter 16 State #5H
Wellbore: VH Job #32K0810587
Design: VH Job #32K0810587

Local Co-ordinate Reference: Well Cooter 13 State #5H
TVD Reference: WELL @ 0.0usft (Original Well Elev)
MD Reference: WELL @ 0.0usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
6,100.0	0.81	228.82	6,098.2	-45.3	21.0	155.31	50.2
6,200.0	1.12	220.66	6,198.2	-46.8	19.8	157.08	50.8
6,300.0	1.18	215.02	6,298.2	-48.4	18.6	159.01	51.8
6,400.0	1.35	203.89	6,398.2	-50.3	17.5	160.82	53.3
6,422.0	1.36	217.76	6,420.2	-50.8	17.2	161.24	53.6



Scientific Drilling
Directional Drilling Operations

Project: Willow Lake
Eddy County, NM
Well: Cooter 16 State #5H
Wellbore: VH - Job #32K0810587
Design: VH - Job #32K0810587

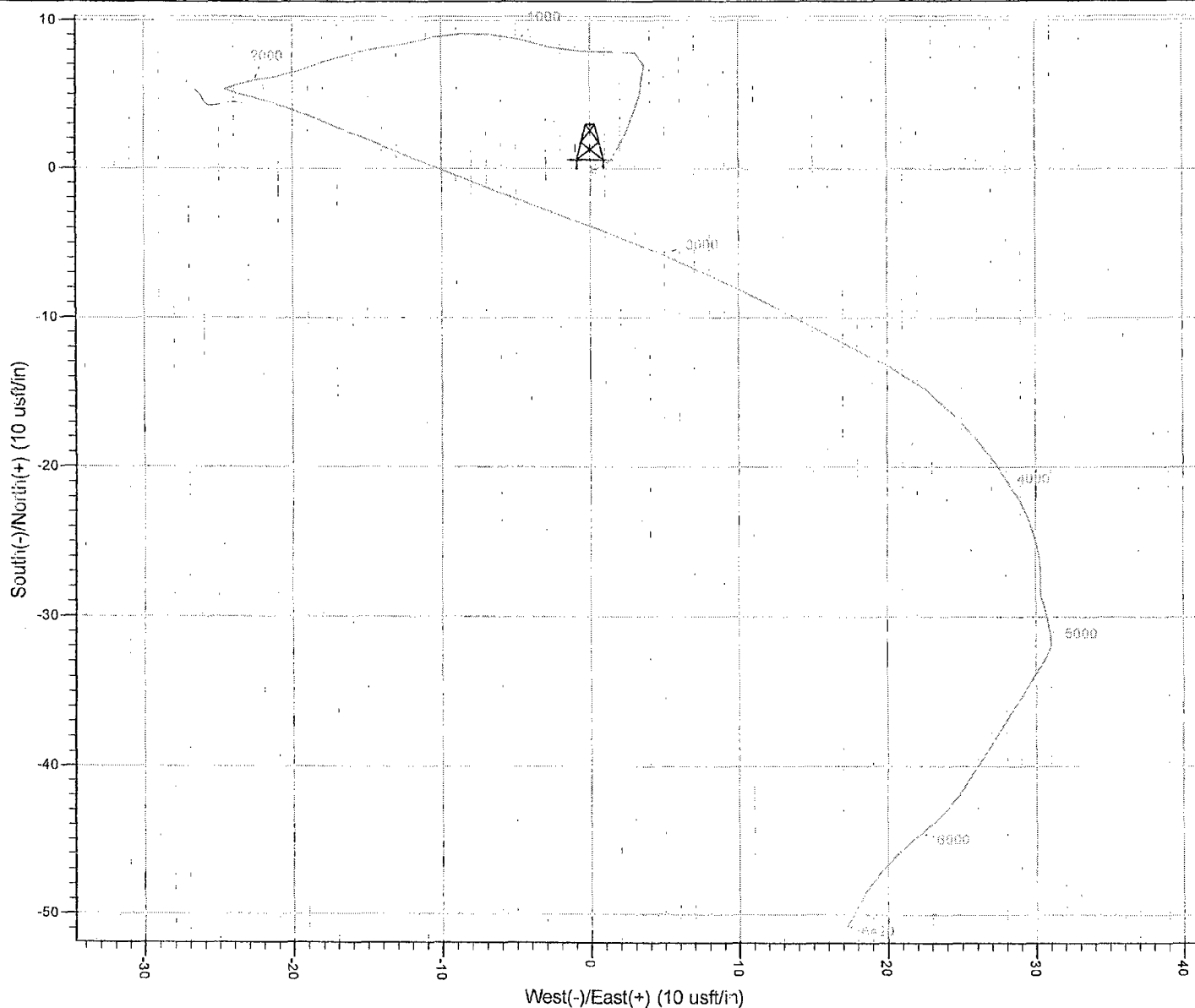


Azimuth to Grid North
True North: -0.18°
Magnetic North: 2.59°

Magnetic Field
Strength: 49394.5 nT
Dip Angle: 60.26°
Date: 12/31/2004
Model: IGRF2000

WELL DETAILS: Cooter 16 State #5H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	408870.64	606788.62	$32^\circ 7' 25.075 \text{ N}$	$103^\circ 59' 18.187 \text{ W}$	



PROJECT DETAILS: Willow Lake
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: $32^\circ 7' 22.800 \text{ N}$
Longitude: $103^\circ 59' 16.800 \text{ W}$
Positional Uncertainty: 0.0
Convergence: 0.18
Local North: Grid