



Noble Energy Inc.

**Weld County, CO
Sec 9, T8N, R59W, 6th PM
McClellan LG09-72HN**

Wellbore #1

Design: Wellbore #1 FINAL

DDC Survey Report

17 June, 2013



Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well McClellan LG09-72HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4859.0usft (H&P #326)
Site:	Sec 9, T8N, R59W, 6th PM	MD Reference:	WELL @ 4859.0usft (H&P #326)
Well:	McClellan LG09-72HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec 9, T8N, R59W, 6th PM			
Site Position:		Northing:	1,495,346.39 usft	Latitude:	40° 40' 59.189 N
From:	Lat/Long	Easting:	3,423,526.02 usft	Longitude:	103° 58' 22.310 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.99 °

Well	McClellan LG09-72HN					
Well Position	+N-S	0.0 usft	Northing:	1,495,346.39 usft	Latitude:	40° 40' 59.189 N
	+E-W	0.0 usft	Easting:	3,423,526.02 usft	Longitude:	103° 58' 22.310 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,829.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/3/2013	8.20	67.34	53,162

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	184.64	

Survey Program	Date 6/17/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
260.0	1,268.0	GYRO (Wellbore #1)	Good_gyro	Good Gyro
1,495.0	10,307.0	MWD (Wellbore #1)	MWD default	MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
260.0	0.20	273.70	260.0	0.0	-0.5	0.0	0.08	0.08	0.00
449.0	0.10	162.40	449.0	-0.1	-0.7	0.2	0.13	-0.05	-58.89
638.0	0.00	7.20	638.0	-0.3	-0.7	0.3	0.05	-0.05	0.00
827.0	0.20	46.70	827.0	0.0	-0.4	0.1	0.11	0.11	0.00
1,016.0	0.40	238.20	1,016.0	-0.2	-0.8	0.2	0.32	0.11	-89.15
TIE IN @ 1268' MD / 1268' TVD									
1,268.0	0.30	352.20	1,268.0	0.0	-1.6	0.1	0.23	-0.04	45.24
1,495.0	0.40	2.80	1,495.0	1.4	-1.6	-1.3	0.05	0.04	4.67
1,774.0	0.20	354.90	1,774.0	2.9	-1.6	-2.7	0.07	-0.07	-2.83

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well McClellan LG09-72HN
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Well:	McClellan LG09-72HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,867.0	1.90	12.30	1,867.0	4.5	-1.3	-4.4	1.84	1.83	18.71
1,960.0	2.80	327.30	1,959.9	8.0	-2.2	-7.7	2.13	0.97	-48.39
2,052.0	5.10	319.70	2,051.7	13.0	-6.1	-12.4	2.56	2.50	-8.26
2,144.0	6.60	301.50	2,143.2	18.8	-13.2	-17.7	2.57	1.63	-19.78
2,236.0	7.60	308.80	2,234.5	25.4	-22.5	-23.5	1.46	1.09	7.93
2,329.0	9.90	313.10	2,326.4	34.7	-33.1	-31.9	2.57	2.47	4.62
2,422.0	11.70	310.10	2,417.8	46.3	-46.2	-42.4	2.03	1.94	-3.23
2,514.0	13.90	311.00	2,507.5	59.5	-61.6	-54.4	2.40	2.39	0.98
2,606.0	14.50	310.40	2,596.7	74.3	-78.8	-67.6	0.67	0.65	-0.65
2,698.0	14.90	310.10	2,685.6	89.3	-96.6	-81.2	0.44	0.43	-0.33
2,791.0	14.90	309.90	2,775.5	104.7	-114.9	-95.1	0.06	0.00	-0.22
2,886.0	13.60	309.50	2,867.6	119.6	-132.9	-108.5	1.37	-1.37	-0.42
2,980.0	12.70	311.00	2,959.1	133.5	-149.2	-120.9	1.02	-0.96	1.60
3,075.0	11.30	308.70	3,052.0	146.1	-164.4	-132.4	1.56	-1.47	-2.42
3,171.0	13.00	314.30	3,145.9	159.5	-179.4	-144.5	2.15	1.77	5.83
3,265.0	14.50	313.40	3,237.2	175.0	-195.5	-158.6	1.61	1.60	-0.96
3,360.0	15.60	313.80	3,328.9	192.0	-213.4	-174.1	1.16	1.16	0.42
3,455.0	15.90	309.50	3,420.4	209.2	-232.7	-189.6	1.27	0.32	-4.53
3,550.0	14.70	305.90	3,512.0	224.5	-252.5	-203.3	1.61	-1.26	-3.79
3,645.0	13.40	307.10	3,604.2	238.2	-271.0	-215.5	1.40	-1.37	1.26
3,740.0	10.90	306.00	3,697.0	250.1	-287.1	-226.1	2.64	-2.63	-1.16
3,835.0	8.40	302.70	3,790.7	259.2	-300.2	-234.0	2.69	-2.63	-3.47
3,930.0	6.60	305.30	3,884.9	266.1	-310.5	-240.1	1.93	-1.89	2.74
4,025.0	4.80	295.10	3,979.4	270.9	-318.5	-244.2	2.17	-1.89	-10.74
4,120.0	3.30	298.50	4,074.2	273.9	-324.5	-246.7	1.60	-1.58	3.58
4,215.0	1.30	333.30	4,169.1	276.2	-327.4	-248.8	2.48	-2.11	36.63
4,310.0	2.50	297.60	4,264.0	278.1	-329.7	-250.5	1.72	1.26	-37.58
4,405.0	3.10	307.40	4,358.9	280.6	-333.6	-252.7	0.81	0.63	10.32
4,500.0	2.50	304.50	4,453.8	283.3	-337.4	-255.1	0.65	-0.63	-3.05
4,595.0	3.90	296.40	4,548.6	286.0	-342.0	-257.3	1.55	1.47	-8.53
4,690.0	3.50	304.80	4,643.4	289.0	-347.2	-260.0	0.71	-0.42	8.84
4,784.0	3.60	307.80	4,737.3	292.5	-351.9	-263.1	0.22	0.11	3.19
4,879.0	4.20	310.60	4,832.0	296.6	-356.9	-266.7	0.66	0.63	2.95
4,974.0	1.90	301.50	4,926.9	299.7	-360.9	-269.5	2.47	-2.42	-9.58
5,069.0	2.10	311.60	5,021.8	301.6	-363.6	-271.2	0.43	0.21	10.63
5,164.0	1.80	310.30	5,116.8	303.8	-366.0	-273.2	0.32	-0.32	-1.37
5,259.0	1.00	304.80	5,211.8	305.2	-367.8	-274.5	0.85	-0.84	-5.79
5,354.0	0.90	312.70	5,306.8	306.2	-369.0	-275.3	0.17	-0.11	8.32
5,449.0	3.30	177.00	5,401.7	304.0	-369.4	-273.1	4.20	2.53	-142.84
5,544.0	14.20	170.50	5,495.5	289.7	-367.4	-259.0	11.50	11.47	-6.84
5,639.0	22.90	180.90	5,585.5	259.7	-365.7	-229.2	9.76	9.16	10.95
5,734.0	32.90	180.50	5,669.3	215.3	-366.3	-184.9	10.53	10.53	-0.42
5,829.0	40.50	178.40	5,745.4	158.5	-365.6	-128.4	8.11	8.00	-2.21

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,924.0	46.20	180.00	5,814.5	93.4	-364.8	-63.5	6.11	6.00	1.68
6,019.0	51.50	183.00	5,877.0	21.9	-366.7	7.8	6.06	5.58	3.16
6,114.0	55.00	179.80	5,933.8	-54.2	-368.5	83.8	4.57	3.68	-3.37
6,209.0	61.40	179.30	5,983.9	-134.9	-367.9	164.2	6.75	6.74	-0.53
6,305.0	65.70	177.70	6,026.6	-220.8	-365.6	249.6	4.72	4.48	-1.67
CROSSED HARD LINE @ 6330' MD / 6036' TVD									
6,330.0	68.46	177.70	6,036.3	-243.8	-364.7	272.5	11.05	11.05	0.00
6,400.0	76.20	177.70	6,057.6	-310.4	-362.0	338.6	11.05	11.05	0.00
6,432.0	80.60	178.40	6,064.0	-341.7	-360.9	369.8	13.92	13.75	2.19
Actual 7" Casing Point @ 6481' MD / 6071' TVD									
6,481.0	82.37	178.77	6,071.3	-390.1	-359.7	418.0	3.69	3.61	0.76
6,551.0	84.90	179.30	6,079.0	-459.7	-358.6	487.2	3.69	3.61	0.75
6,647.0	86.80	180.70	6,086.0	-555.4	-358.6	582.6	2.46	1.98	1.46
6,742.0	88.80	182.10	6,089.6	-650.3	-360.9	677.4	2.57	2.11	1.47
6,837.0	92.70	181.60	6,088.4	-745.2	-364.0	772.2	4.14	4.11	-0.53
6,932.0	89.80	181.10	6,086.3	-840.2	-366.2	867.1	3.10	-3.05	-0.53
7,027.0	89.70	180.50	6,086.7	-935.2	-367.5	961.8	0.64	-0.11	-0.63
7,122.0	89.00	179.60	6,087.8	-1,030.2	-367.6	1,056.5	1.20	-0.74	-0.95
7,217.0	91.00	180.70	6,087.8	-1,125.2	-367.8	1,151.2	2.40	2.11	1.16
7,312.0	89.10	179.50	6,087.7	-1,220.2	-368.0	1,245.9	2.37	-2.00	-1.26
7,407.0	91.10	180.70	6,087.5	-1,315.1	-368.2	1,340.6	2.46	2.11	1.26
7,502.0	90.80	180.50	6,086.0	-1,410.1	-369.2	1,435.4	0.38	-0.32	-0.21
7,597.0	90.30	179.60	6,085.1	-1,505.1	-369.3	1,530.1	1.08	-0.53	-0.95
7,692.0	90.00	178.20	6,084.8	-1,600.1	-367.4	1,624.6	1.51	-0.32	-1.47
7,786.0	90.00	178.10	6,084.8	-1,694.1	-364.4	1,718.0	0.11	0.00	-0.11
7,881.0	89.10	175.80	6,085.6	-1,788.9	-359.3	1,812.1	2.60	-0.95	-2.42
7,976.0	88.10	175.10	6,087.9	-1,883.6	-351.8	1,905.9	1.28	-1.05	-0.74
8,071.0	91.30	176.80	6,088.4	-1,978.3	-345.1	1,999.8	3.81	3.37	1.79
8,166.0	91.30	179.50	6,086.2	-2,073.2	-342.0	2,094.1	2.84	0.00	2.84
8,261.0	91.20	179.80	6,084.1	-2,168.2	-341.5	2,188.7	0.33	-0.11	0.32
8,356.0	91.20	180.90	6,082.2	-2,263.2	-342.0	2,283.4	1.16	0.00	1.16
8,451.0	91.10	179.80	6,080.2	-2,358.2	-342.6	2,378.2	1.16	-0.11	-1.16
8,546.0	90.50	183.50	6,078.9	-2,453.1	-345.4	2,473.0	3.95	-0.63	3.89
8,641.0	88.30	183.90	6,079.9	-2,547.9	-351.5	2,568.0	2.35	-2.32	0.42
8,736.0	88.00	183.00	6,083.0	-2,642.7	-357.2	2,662.9	1.00	-0.32	-0.95
8,831.0	89.40	182.60	6,085.1	-2,737.5	-361.8	2,757.8	1.53	1.47	-0.42
8,926.0	89.20	182.30	6,086.3	-2,832.4	-365.9	2,852.8	0.38	-0.21	-0.32
9,021.0	90.80	181.90	6,086.3	-2,927.4	-369.4	2,947.7	1.74	1.68	-0.42
9,116.0	90.60	181.40	6,085.1	-3,022.3	-372.1	3,042.5	0.57	-0.21	-0.53
9,211.0	89.60	180.50	6,085.0	-3,117.3	-373.7	3,137.3	1.42	-1.05	-0.95
9,306.0	88.60	180.20	6,086.5	-3,212.3	-374.3	3,232.0	1.10	-1.05	-0.32
9,401.0	90.00	179.30	6,087.6	-3,307.3	-373.9	3,326.7	1.75	1.47	-0.95
9,495.0	91.20	179.10	6,086.6	-3,401.3	-372.5	3,420.3	1.29	1.28	-0.21
9,590.0	90.50	178.10	6,085.2	-3,496.2	-370.2	3,514.7	1.28	-0.74	-1.05

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Well:	McClellan LG09-72HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,685.0	90.20	177.70	6,084.7	-3,591.2	-366.7	3,609.1	0.53	-0.32	-0.42	
9,780.0	90.50	178.10	6,084.1	-3,686.1	-363.3	3,703.4	0.53	0.32	0.42	
9,875.0	90.40	178.40	6,083.3	-3,781.0	-360.4	3,797.8	0.33	-0.11	0.32	
9,970.0	90.40	179.60	6,082.7	-3,876.0	-358.7	3,892.3	1.26	0.00	1.26	
10,065.0	90.00	179.80	6,082.3	-3,971.0	-358.2	3,987.0	0.47	-0.42	0.21	
10,160.0	90.20	180.50	6,082.2	-4,066.0	-358.5	4,081.7	0.77	0.21	0.74	
10,254.0	90.00	180.50	6,082.0	-4,160.0	-359.3	4,175.4	0.21	-0.21	0.00	
ABHL @ 10307' MD / 6082' TVD										
10,307.0	90.00	180.50	6,082.0	-4,213.0	-359.7	4,228.3	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,268.0	1,268.0	0.0	-1.6	TIE IN @ 1268' MD / 1268' TVD	
6,330.0	6,036.3	-243.8	-364.7	CROSSED HARD LINE @ 6330' MD / 6036' TVD	
6,481.0	6,071.3	-390.1	-359.7	Actual 7" Casing Point @ 6481' MD / 6071' TVD	
10,307.0	6,082.0	-4,213.0	-359.7	ABHL @ 10307' MD / 6082' TVD	

Checked By: _____	Approved By: _____	Date: _____
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Survey Certification Sheet

Noble Energy Inc
Company

RM-13435
Job Number

6/21/13
Date

Sec9,T8N,R59W,6thPM
Lease

McClellan LG09-72HN
Well Name

Weld, CO
County & State

API: 05-123-36972

Surveyed from a depth of: 1268 feet to 10307 feet MD

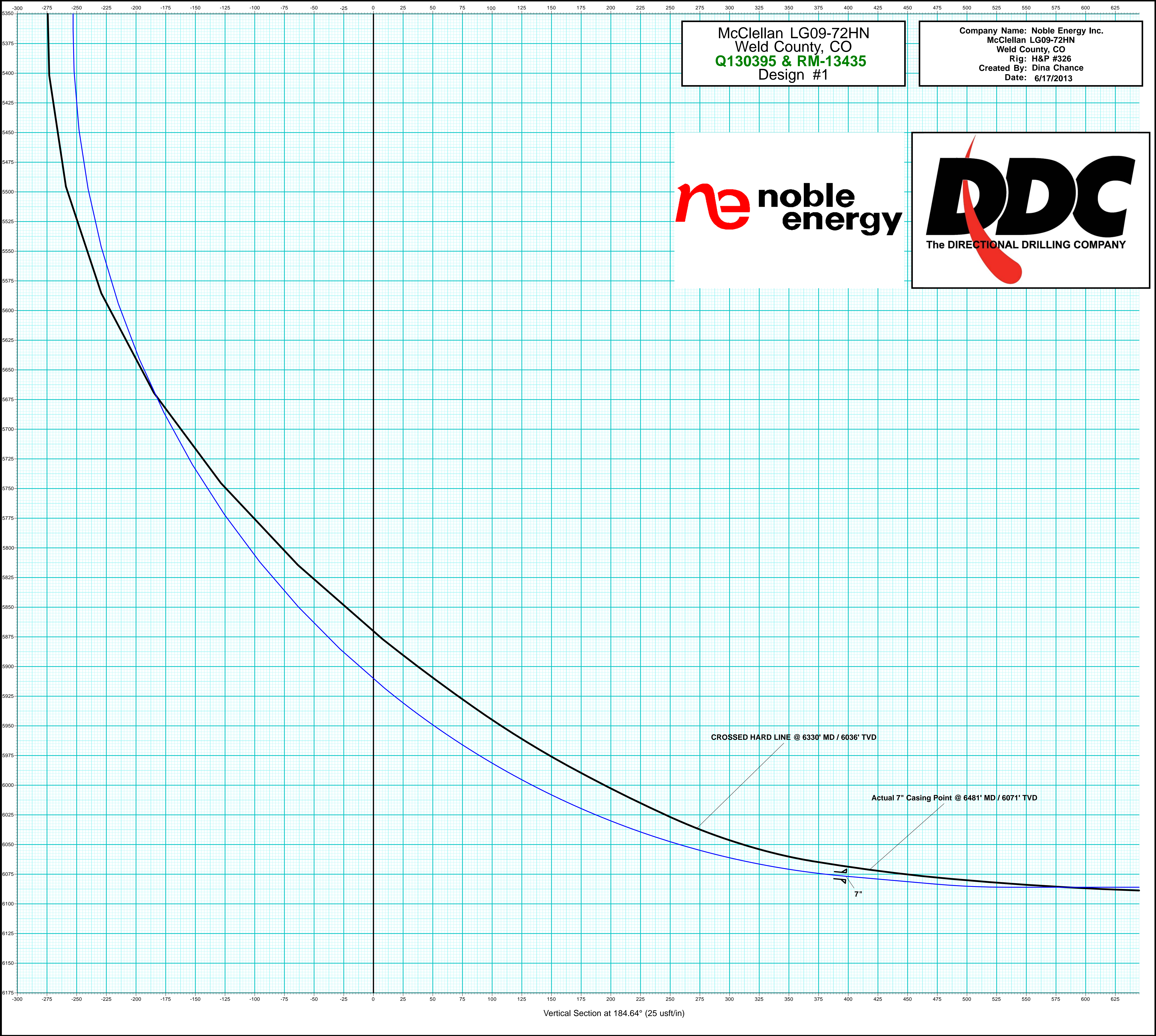
Type of Survey: MWD

Directional Supervisor/Surveyor: Bob Kubistek

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company,
ou=GM of Guidance Services,
email=larryw@directionaldrillers
.com, c=US
Date: 2013.06.25 15:12:22 -05'00'

Larry Wright
MWD General Manager



McClellan LG09-72HN
Weld County, CO
Q130395 & RM-13435
Design #1

Company Name: Noble Energy Inc.
McClellan LG09-72HN
Weld County, CO
Rig: H&P #326
Created By: Dina Chance
Date: 6/17/2013



Vertical Section at 184.64° (25 usft/in)

Company Name: Noble Energy Inc.
McClellan LG09-72HN
Weld County, CO
Rig: H&P #326
Created By: Dina Chance
Date: 6/17/2013

McClellan LG09-72HN
Weld County, CO
Q130395 & RM-13435
Design #1

PROJECT DETAILS: Weld County, CO	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	Colorado Northern Zone
System Datum:	Mean Sea Level



T

G

M

Azimuths to Grid North

Magnetic North: 7.21°

Magnetic Field

Strength: 53161.6snT

Dip Angle: 67.34°

Date: 5/3/2013

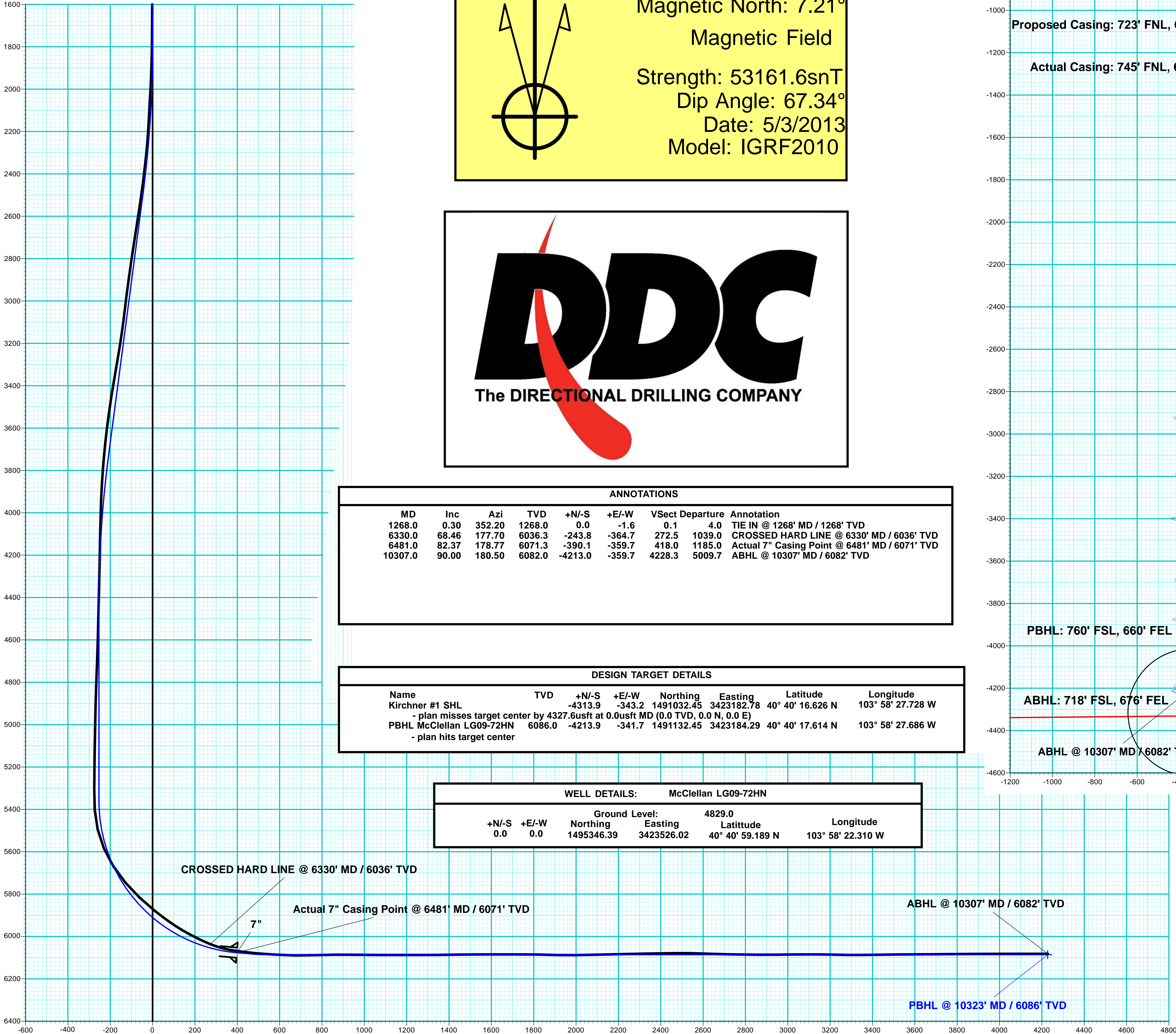
Model: IGRF2010



ANNOTATIONS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	V	Sect	Departure
1268.0	0.30	352.20	1268.0	0.0	-1.6	0.1	4.0	TIE IN @ 1268' MD / 1268' TVD
6330.0	68.46	177.70	6036.3	-243.8	-364.7	272.5	1039.0	CROSSED HARD LINE @ 6330' MD / 6036' TVD
6481.0	82.37	178.77	6071.3	-390.1	-359.7	418.0	1185.0	Actual 7" Casing Point @ 6481' MD / 6071' TVD
10307.0	90.00	180.50	6082.0	-4213.0	-359.7	4228.3	5009.7	ABHL @ 10307' MD / 6082' TVD

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Kirchner #1 SHL	-4313.9	-343.2	1491032.45	3423182.78	40° 40' 16.626 N	103° 58' 27.728 W	
- plan misses target center by 4327.6usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)							
PBHL McClellan LG09-72HN	6086.0	-4213.9	-341.7	1491132.45	3423184.29	40° 40' 17.614 N	103° 58' 27.686 W
- plan hits target center							

WELL DETAILS: McClellan LG09-72HN					
Ground Level:		4829.0			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1495346.39	3423526.02	40° 40' 59.189 N	103° 58' 22.310 W



Vertical Section at 184.64° (200 usft/in)

