

Noble Energy

CO, Weld County (NAD 83 NZ)
Sec 4 Twn 9 N Rng 58 W
Rohn State LD03-65-1HN Original Hole
05-123-37467
H&P 277



A Schlumberger Company

Final Survey Report

25-Sep-2014

Well Coordinates: NAD83 Colorado State Plane, Northern Zone, US Feet

N 40° 46' 43.75200"	W 103° 51' 40.86000"
1530650.26 usFt	3453806.93 usFt

Ground Level:	4699.00 ft MSL
TVD Reference:	KB 24ft @ 4723.00 ft MSL
Local Coordinate Origin:	Rohn State LD03-65-1HN well head
Vertical Section Azimuth:	85.730 ° (Grid North)
North Reference:	Grid North

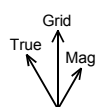
DOX Version: 2.8

Borehole: Original Hole	Well: Rohn State LD03-65-1HN	Field: CO, Weld County (NAD 83 NZ)	Structure: Noble 04-09N-58W (Rohn State LD03 Pad) - H&P 277
-----------------------------------	--	--	---

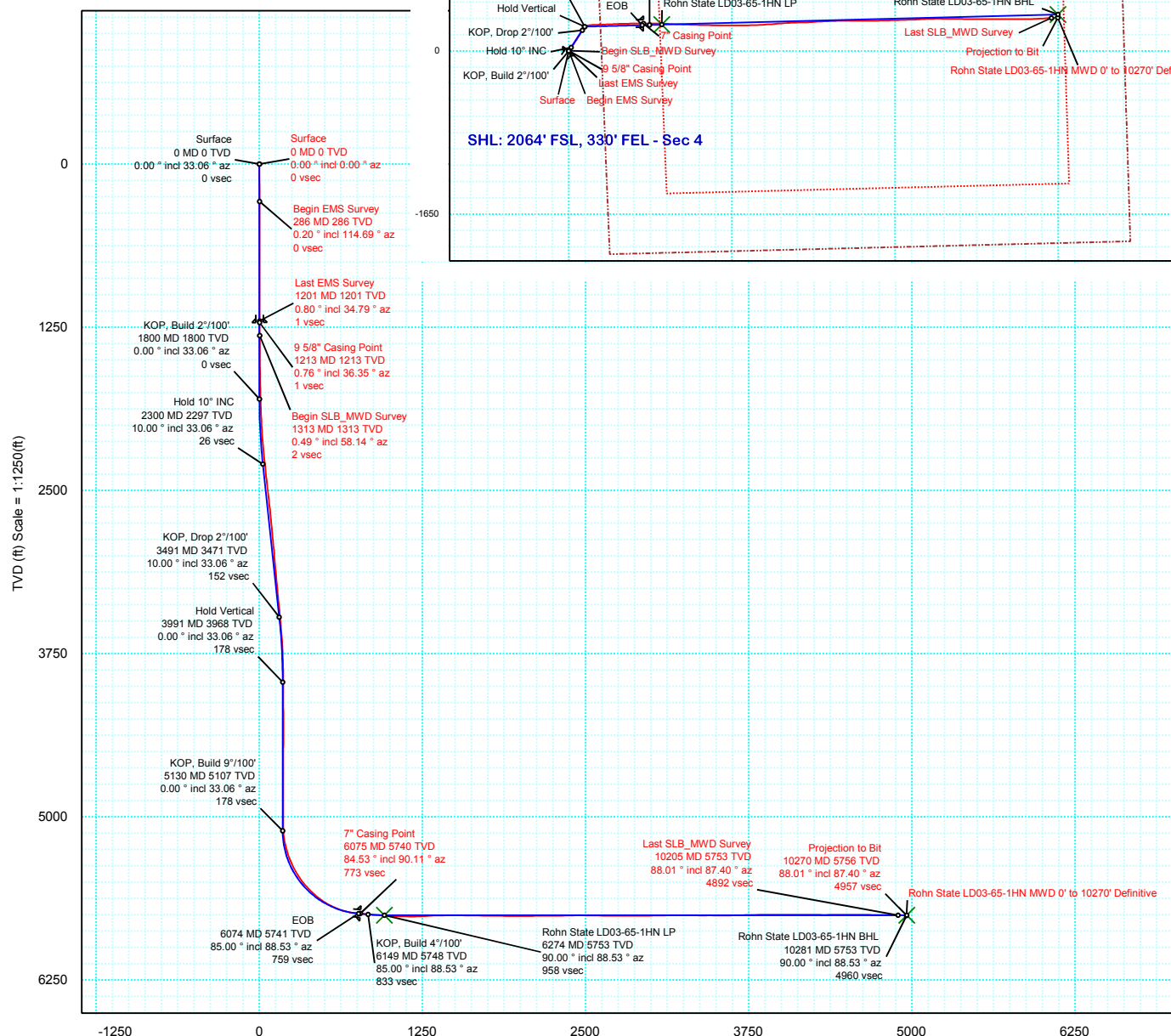
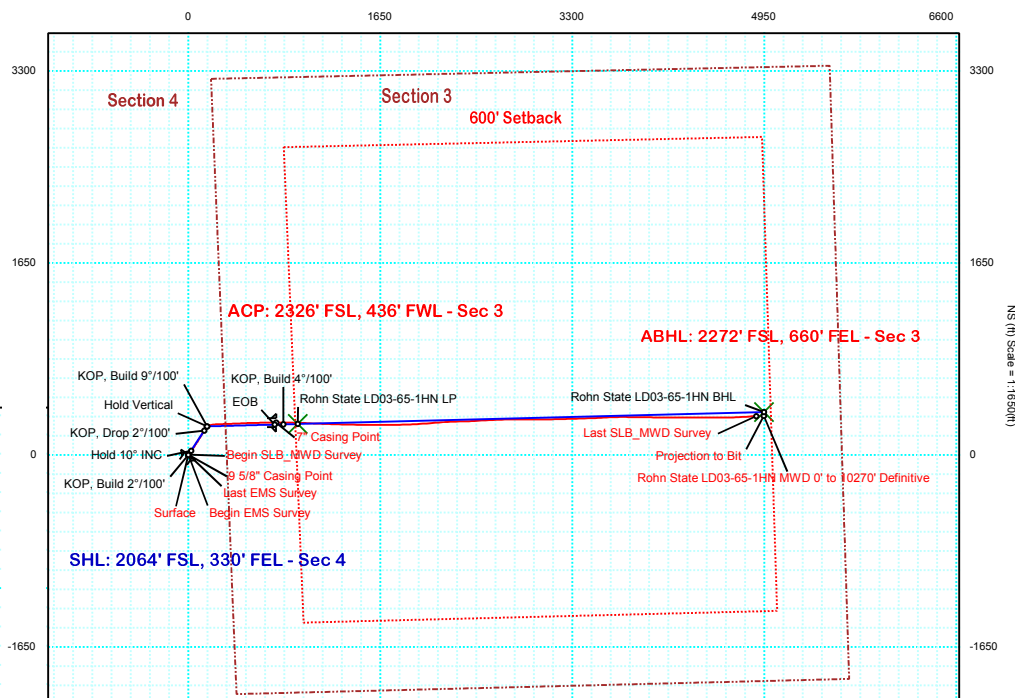
Gravity & Magnetic Parameters	Surface Location	NAD83 Colorado State Plane, Northern Zone, US Feet	Miscellaneous
Model: BGGM 2014 Dip: 67.378° Date: 31-Aug-2014	Lat: N 40 46 43.75	1530763.19ftU	Slot: Rohn State LD03-65-1HN
MagDec: 8.047° FS: 52976.685nT Gravity FS: 999.102mgn (9.80665 Based)	Lon: W 103 51 40.86	Easting: S 453804.84ftU	TVD Ref: KB 24ft(4723ft above MSL)
		Grid Conv: 1.0588°	Plan: Rohn State LD03-65-1HN MWD 0' to 10270' Definitive
		Scale Fact: 0.99999927	

PVA

EW (ft) Scale = 1:1650(ft)



Grid North
Tot Corr (M→G 6.988°)
Mag Dec (8.047°)
Grid Conv (1.059°)



Vertical Section (ft) Azim = 85.73° Scale = 1:1250(ft) Origin = 0N/-S, 0E/-W



Rohn State LD03-65-1HN MWD 0' to 10270' Definitive Survey Geodetic Report (Def Survey)



Report Date: September 25, 2014 - 09:19 AM
Client: Noble Energy
Field: CO, Weld County (NAD 83 NZ)
Structure / Slot: Noble 04-09N-58W (Rohn State LD03 Pad) - H&P 277 / Rohn State LD03-65-1HN
Well: Rohn State LD03-65-1HN
Borehole: Original Hole
UWI / API#: Unknown / Unknown
Survey Name: Rohn State LD03-65-1HN MWD 0' to 10270' Definitive
Survey Date: August 31, 2014
Tort / AHD / DDI / ERD Ratio: 198.660 ° / 5108.261 ft / 6.257 / 0.886
Coordinate Reference System: NAD83 Colorado State Plane, Northern Zone, US Feet
Location Lat / Long: N 40° 46' 43.75200", W 103° 51' 40.86000"
Location Grid N/E Y/X: N 1530763.186 ftUS, E 3453804.842 ftUS
CRS Grid Convergence Angle: 1.0588 °
Grid Scale Factor: 0.99999927
Version / Patch: 2.8.551.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 85.730 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB 24ft
TVD Reference Elevation: 4723.000 ft above MSL
Seabed / Ground Elevation: 4699.000 ft above MSL
Magnetic Declination: 8.047 °
Total Gravity Field Strength: 999.1024mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 52976.685 nT
Magnetic Dip Angle: 67.378 °
Declination Date: August 31, 2014
Magnetic Declination Model: BGGM 2014
North Reference: Grid North
Grid Convergence Used: 1.0588 °
Total Corr Mag North->Grid North: 6.9887 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Surface	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	1530763.19	3453804.84	N 40 46 43.75	W 103 51 40.86
Begin EMS	286.00	0.20	114.69	286.00	0.44	-0.21	0.45	0.07	1530762.98	3453805.30	N 40 46 43.75	W 103 51 40.85
Survey	571.00	0.10	27.39	571.00	1.00	-0.20	1.02	0.08	1530762.99	3453805.86	N 40 46 43.75	W 103 51 40.85
	855.00	0.30	287.79	855.00	0.44	0.25	0.43	0.12	1530763.44	3453805.27	N 40 46 43.75	W 103 51 40.85
Last EMS	1201.00	0.80	34.79	1200.99	1.13	2.51	0.94	0.27	1530765.70	3453805.78	N 40 46 43.78	W 103 51 40.85
Survey	1213.00	0.76	36.35	1212.98	1.23	2.65	1.04	0.36	1530765.83	3453805.88	N 40 46 43.78	W 103 51 40.85
9 5/8" Casing												
Point												
Begin												
SLB_MWD	1313.00	0.49	58.14	1312.98	2.04	3.41	1.79	0.36	1530766.59	3453806.64	N 40 46 43.79	W 103 51 40.84
Survey	1407.00	0.64	69.12	1406.97	2.90	3.80	2.62	0.20	1530766.99	3453807.47	N 40 46 43.79	W 103 51 40.82
	1502.00	0.52	64.96	1501.97	3.81	4.18	3.51	0.13	1530767.36	3453808.35	N 40 46 43.79	W 103 51 40.81
	1597.00	0.46	54.52	1596.97	4.54	4.58	4.21	0.12	1530767.77	3453809.06	N 40 46 43.80	W 103 51 40.80
	1691.00	1.83	34.93	1690.95	5.81	6.03	5.38	1.49	1530769.21	3453810.22	N 40 46 43.81	W 103 51 40.79
	1785.00	2.69	28.49	1784.87	7.95	9.20	7.29	0.96	1530772.38	3453812.13	N 40 46 43.84	W 103 51 40.76
	1880.00	3.75	36.14	1879.72	11.18	13.67	10.19	1.20	1530776.85	3453815.03	N 40 46 43.89	W 103 51 40.72
	1975.00	4.42	33.85	1974.48	15.45	19.22	14.06	0.72	1530782.40	3453818.90	N 40 46 43.94	W 103 51 40.67
	2069.00	6.10	32.73	2068.08	20.69	26.43	18.78	1.79	1530789.61	3453823.62	N 40 46 44.01	W 103 51 40.61
	2164.00	7.92	36.15	2162.37	27.98	35.96	25.37	1.96	1530799.15	3453830.21	N 40 46 44.10	W 103 51 40.52
	2258.00	10.01	35.20	2255.21	37.37	47.87	33.90	2.23	1530811.05	3453838.74	N 40 46 44.22	W 103 51 40.41
	2353.00	9.04	34.02	2348.90	47.25	60.80	42.84	1.04	1530823.99	3453847.68	N 40 46 44.34	W 103 51 40.29
	2448.00	10.67	33.54	2442.49	57.27	74.33	51.88	1.72	1530837.51	3453856.72	N 40 46 44.48	W 103 51 40.17
	2543.00	10.61	32.56	2535.86	67.90	89.03	61.44	0.20	1530852.22	3453866.29	N 40 46 44.62	W 103 51 40.04
	2638.00	10.29	32.55	2629.28	78.23	103.55	70.71	0.35	1530866.74	3453875.56	N 40 46 44.76	W 103 51 39.92
	2733.00	9.58	32.23	2722.86	88.02	117.39	79.50	0.74	1530880.58	3453884.34	N 40 46 44.90	W 103 51 39.80
	2827.00	8.54	31.80	2815.69	96.78	129.94	87.35	1.12	1530893.13	3453892.19	N 40 46 45.02	W 103 51 39.69
	2922.00	9.48	35.43	2909.51	105.93	142.31	95.60	1.16	1530905.49	3453900.44	N 40 46 45.14	W 103 51 39.58
	3017.00	8.09	29.52	3003.40	114.64	154.50	103.43	1.75	1530917.68	3453908.27	N 40 46 45.26	W 103 51 39.48
	3112.00	9.44	29.58	3097.29	122.70	167.09	110.57	1.43	1530930.28	3453915.41	N 40 46 45.38	W 103 51 39.38
	3206.00	9.63	27.10	3189.99	131.09	180.80	117.96	0.48	1530943.98	3453922.80	N 40 46 45.52	W 103 51 39.28
	3301.00	9.92	27.88	3283.61	139.58	195.11	125.40	0.33	1530958.29	3453930.24	N 40 46 45.66	W 103 51 39.18
	3396.00	10.31	27.32	3377.13	148.39	209.89	133.13	0.42	1530973.08	3453937.97	N 40 46 45.80	W 103 51 39.08
	3491.00	9.36	32.59	3470.74	157.48	223.95	141.19	1.37	1530987.14	3453946.04	N 40 46 45.94	W 103 51 38.97
	3585.00	7.82	37.04	3563.68	166.28	235.50	149.16	1.79	1530998.68	3453954.01	N 40 46 46.05	W 103 51 38.86
	3680.00	5.80	32.57	3658.01	173.43	244.70	155.64	2.19	1531007.89	3453960.48	N 40 46 46.14	W 103 51 38.78
	3775.00	2.53	58.35	3752.75	178.17	249.85	160.01	3.89	1531013.03	3453964.85	N 40 46 46.19	W 103 51 38.72
	3869.00	1.31	89.35	3846.70	181.08	250.95	162.84	1.66	1531014.13	3453967.69	N 40 46 46.20	W 103 51 38.68
	3964.00	0.45	139.06	3941.69	182.38	250.68	164.17	1.13	1531013.86	3453969.01	N 40 46 46.20	W 103 51 38.67
	4059.00	0.58	152.35	4036.68	182.80	249.97	164.64	0.19	1531013.15	3453969.48	N 40 46 46.19	W 103 51 38.66
	4154.00	1.00	156.26	4131.67	183.26	248.78	165.20	0.44	1531011.97	3453970.04	N 40 46 46.18	W 103 51 38.65
	4248.00	1.75	165.79	4225.65	183.79	246.63	165.88	0.84	1531009.82	3453970.72	N 40 46 46.16	W 103 51 38.64
	4343.00	1.76	173.49	4320.60	184.09	243.78	166.40	0.25	1531006.96	3453971.25	N 40 46 46.13	W 103 51 38.64
	4532.00	1.10	311.55	4509.57	182.94	242.11	165.37	1.42	1531005.29	3453970.22	N 40 46 46.11	W 103 51 38.65
	4627.00	0.76	332.95	4604.56	182.06	243.27	164.41	0.51	1531006.45	3453969.25	N 40 46 46.13	W 103 51 38.66
	4816.00	0.59	351.64	4793.55	181.51	245.34	163.70	0.15	1531008.52	3453968.54	N 40 46 46.15	W 103 51 38.67
	5006.00	0.89	354.43	4983.53	181.41	247.78	163.41	0.16	1531010.96	3453968.25	N 40 46 46.17	W 103 51 38.68
	5082.00	0.98	24.77	5059.52	181.71	248.96	163.63	0.66	1531012.14	3453968.47	N 40 46 46.18	W 103 51 38.67
	5105.00	0.96	25.86	5082.52	181.90	249.31	163.79	0.14	1531012.49	3453968.64	N 40 46 46.19	W 103 51 38.67
	5200.00	10.43	72.97	5176.96	190.71	252.55	172.38	10.31	1531015.73	3453977.22	N 40 46 46.22	W 103 51 38.56
	5295.00	17.67	76.71	5269.06	213.35	258.39	194.66	7.68	1531021.57	3453999.50	N 40 46 46.27	W 103 51 38.27
	5389.00	23.98	86.49	5356.90	246.58	262.84	227.64	7.64	1531026.02	3454032.49	N 40 46 46.31	W 103 51 37.84
	5484.00	31.92	87.94	5440.76	291.05	264.93	272.08	8.40	1531028.11	3454076.92	N 40 46 46.32	W 103 51 37.26
	5579.00	39.91	87.82	5517.63	346.70	266.99	327.73	8.40	1531030.18	3454132.57	N 40 46 46.33	W 103 51 36.54
	5673.00	47.83	88.09	5585.35	411.74	269.31	392.77	8.43	1531032.49	3454197.61	N 40 46 46.34	W 103 51 35.69
	5768.00	55.14	87.14	5644.47	485.97	272.43	466.99	7.73	1531035.62	3454271.83	N 40 46 46.36	W 103 51 34.73
	5815.00	61.18	87.87	5669.25	525.86	274.16	506.86	12.92	1531037.34	3454311.70	N 40 46 46.37	W 103 51 34.21
	5910.00	69.38	88.89	5708.95	611.99	276.57	593.04	8.69	1531039.76	3454397.88	N 40 46 46.38	W 103 51 33.09
	6029.00	84.60	90.06	5735.66	727.34	277.59	708.64	12.82	1531040.78	3454513.48	N 40 46 46.36	W 103 51 31.58
7" Casing Point	6075.00	84.53	90.14	5740.01	773.00	277.51	754.44	0.22	1531040.70	3454559.28	N 40 46 46.36	W 103 51 30.99
	6173.00	84.39	90.31	5749.47	870.25	277.13	851.98	0.22	1531040.31	3454656.82	N 40 46 46.33	W 103 51 29.72
	6267.00	85.98	91.43	5757.36	963.53	275.70	945.63	2.07	1531038.89	3454750.47	N 40 46 46.30	W 103 51 28.50
	6362.00	88.70	92.90	5761.77	1057.82	272.12	1040.45	3.25	1531035.30	3454845.29	N 40 46 46.25	W 103 51 27.27
	6456.00	89.62	92.05	5763.15	1151.16	268.06	1134.35	1.33	1531031.24	3454939.19	N 40 46 46.19	W 103 51 26.05
	6551.00	93.06	92.48	5760.93	1245.50	264.31	1229.23	3.65	1531027.49	3455034.07	N 40 46 46.14	W 103 51 24.82
	6645.00	92.24	91.64	5756.58	1338.83	260.93	1323.07	1.25	1531024.12	3455127.91	N 40 46 46.09	W 103 51 23.60
	6740.00	90.48	91.27	5754.32	1433.32	258.52	1418.01	1.89	1531021.71	3455222.85	N 40 46 46.05	W 103 51 22.37
	6834.00	89.49	91.36	5754.35	1526.88	256.36	1511.98	1.06	1531019.55	3455316.82	N 40 46 46.01	W 103 51 21.15
	6928.00	89.25	89.26	5755.38	1620.56	255.86	1605.97	2.25	1531019.04	3455410.81	N 40 46 45.99	W 103 51 19.93
	7022.00	88.56	90.25	5757.18	1714.31	256.26	1699.95	1.28	1531019.44	3455504.79	N 40 46 45.97	W 103 51 18.71
	7117.00	90.11	89.52	5758.28	1809.05	256.45	1794.94	1.80	1531019.63	3455599.78	N 40 46 45.96	W 103 51 17.47
	7211.00	88.32	88.27	5759.57	1902.90	258.26	1888.91	2.32	1531021.45	3455693.75	N 40 46 45.96	W 103 51 16.25
	7306.00	90.73	86.54	5760.36	1997.84	262.56	1983.80	3.12	1531025.75	3455788.63	N 40 46 45.98	W 103 51 15.01
	7400.00	91.03	85.67	5758.91	2091.83	268.95	2077.57</					

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	7781.00	89.52	86.87	5754.29	2472.55	286.79	2458.02	3.01	1531049.97	3456262.85	N 40 46 46.14 W 103 51 8.85	
	7876.00	88.56	87.38	5755.88	2567.50	291.55	2552.88	1.14	1531054.74	3456357.72	N 40 46 46.16 W 103 51 7.61	
	7970.00	89.62	87.51	5757.37	2661.45	295.74	2646.77	1.14	1531058.93	3456451.61	N 40 46 46.19 W 103 51 6.39	
	8065.00	90.52	89.42	5757.25	2756.33	298.29	2741.73	2.22	1531061.47	3456546.57	N 40 46 46.20 W 103 51 5.16	
	8160.00	90.04	89.56	5756.79	2851.13	299.13	2836.73	0.53	1531062.32	3456641.56	N 40 46 46.19 W 103 51 3.92	
	8254.00	89.83	91.34	5756.90	2944.81	298.39	2930.72	1.91	1531061.58	3456735.56	N 40 46 46.16 W 103 51 2.70	
	8349.00	91.38	89.34	5755.89	3039.48	297.83	3025.71	2.66	1531061.01	3456830.54	N 40 46 46.14 W 103 51 1.47	
	8444.00	90.69	88.93	5754.18	3134.30	299.26	3120.68	0.84	1531062.45	3456925.51	N 40 46 46.14 W 103 51 0.23	
	8538.00	90.35	88.38	5753.32	3228.17	301.47	3214.65	0.69	1531064.65	3457019.48	N 40 46 46.14 W 103 50 59.01	
	8632.00	88.94	88.49	5753.91	3322.07	304.04	3308.61	1.50	1531067.22	3457113.44	N 40 46 46.15 W 103 50 57.79	
	8728.00	90.35	87.93	5754.50	3417.97	307.04	3404.56	1.58	1531070.22	3457209.39	N 40 46 46.16 W 103 50 56.54	
	8822.00	89.18	87.73	5754.89	3511.91	310.59	3498.49	1.26	1531073.78	3457303.32	N 40 46 46.18 W 103 50 55.32	
	8917.00	91.31	86.46	5754.48	3606.87	315.41	3593.36	2.61	1531078.59	3457398.19	N 40 46 46.21 W 103 50 54.08	
	9012.00	91.00	88.82	5752.57	3701.79	319.32	3688.25	2.51	1531082.50	3457493.08	N 40 46 46.23 W 103 50 52.85	
	9106.00	91.38	91.00	5750.61	3795.51	319.47	3782.23	2.35	1531082.65	3457587.06	N 40 46 46.21 W 103 50 51.63	
	9201.00	90.38	90.44	5749.15	3890.14	318.27	3877.21	1.21	1531081.46	3457682.04	N 40 46 46.19 W 103 50 50.39	
	9296.00	88.87	90.81	5749.78	3984.79	317.24	3972.20	1.64	1531080.42	3457777.03	N 40 46 46.16 W 103 50 49.16	
	9391.00	91.21	89.99	5749.71	4079.47	316.57	4067.19	2.61	1531079.76	3457872.02	N 40 46 46.13 W 103 50 47.93	
	9485.00	89.93	89.78	5748.78	4173.21	316.76	4161.18	1.38	1531079.95	3457966.01	N 40 46 46.12 W 103 50 46.70	
	9580.00	88.97	90.74	5749.69	4267.91	316.33	4256.17	1.43	1531079.52	3458061.00	N 40 46 46.10 W 103 50 45.47	
	9675.00	90.42	89.36	5750.19	4362.63	316.25	4351.17	2.11	1531079.43	3458156.00	N 40 46 46.08 W 103 50 44.23	
	9770.00	90.59	90.04	5749.36	4457.40	316.75	4446.16	0.74	1531079.93	3458250.99	N 40 46 46.07 W 103 50 43.00	
	9865.00	89.32	91.17	5749.43	4552.06	315.74	4541.15	1.79	1531078.93	3458345.98	N 40 46 46.04 W 103 50 41.77	
	9959.00	89.87	88.92	5750.09	4645.78	315.67	4635.14	2.46	1531078.85	3458439.97	N 40 46 46.02 W 103 50 40.54	
	10054.00	89.87	87.00	5750.31	4740.70	319.05	4730.08	2.02	1531082.24	3458534.91	N 40 46 46.04 W 103 50 39.31	
	10149.00	88.70	86.55	5751.50	4835.68	324.39	4824.92	1.32	1531087.58	3458629.75	N 40 46 46.07 W 103 50 38.08	
Last SLB_MWD Survey	10205.00	88.01	87.39	5753.10	4891.64	327.35	4880.82	1.94	1531090.54	3458685.64	N 40 46 46.09 W 103 50 37.35	
Projection to Bit	10270.00	88.01	87.40	5755.36	4956.57	330.31	4945.71	0.02	1531093.49	3458750.54	N 40 46 46.11 W 103 50 36.50	

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
Surface	1	0.000	24.000	Act Stns	13.750	9.625	SLB_EMS-STD-Depth Only	Original Hole / Rohn State LD03-65-1HN MWD 0' to 10270'
Surface	1	24.000	1201.000	Act Stns	13.750	9.625	SLB_EMS-STD	Original Hole / Rohn State LD03-65-1HN MWD 0' to 10270'
Intermediate	1	1201.000	6029.000	Act Stns	8.750	7.000	SLB_MWD-STD	Original Hole / Rohn State LD03-65-1HN MWD 0' to 10270'
Lateral	1	6029.000	10205.000	Act Stns	6.125	4.500	SLB_MWD+DMAG	Original Hole / Rohn State LD03-65-1HN MWD 0' to 10270'
Bit Projection	1	10205.000	10270.000	Act Stns	6.125	4.500	SLB_BLIND+TREND	Original Hole / Rohn State LD03-65-1HN MWD 0' to 10270'