

Noble Energy

CO, Weld County (NAD 83 NZ)
Sec 4 Twn 9 N Rng 58 W
Rohn State LD03-63HN Original Hole
05-123-37453
H&P 277



A Schlumberger Company

Final Survey Report

29-Sep-2014

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

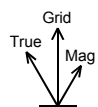
N 40° 46' 42.63600"	W 103° 51' 40.86000"
1530650.26 usFt	3453806.93 usFt

Ground Level:	4705.00 ft MSL
TVD Reference:	KB 24ft @ 4729.00 ft MSL
Local Coordinate Origin:	Rohn State LD03-63HN well head
Vertical Section Azimuth:	95.840 ° (Grid North)
North Reference:	Grid North

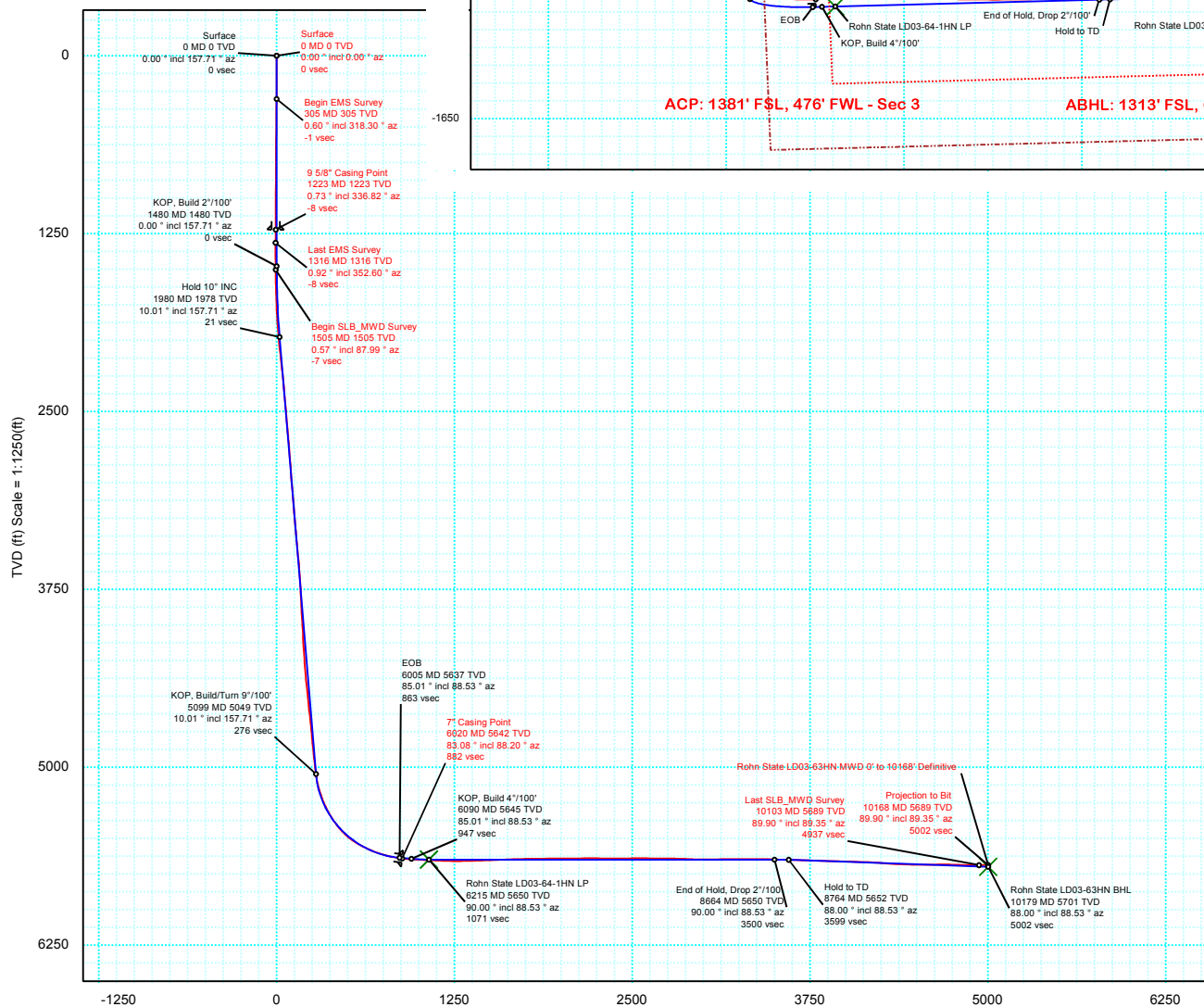
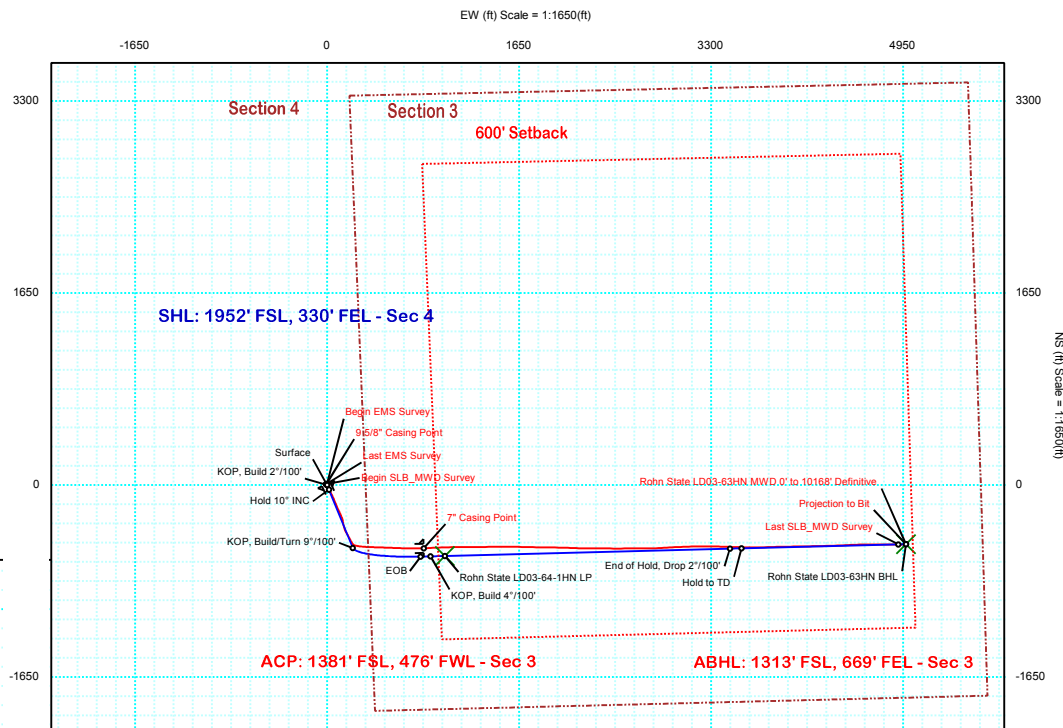
DOX Version: 2.8

Borehole: Original Hole	Well: Rohn State LD03-63HN	Field: CO, Weld County (NAD 83 NZ)	Structure: 04-09N-58W (Rohn State LD03 Pad) - H&P 277
Gravity & Magnetic Parameters Model: BGGM 2014 Dip: 67.374° Date: 29-Sep-2014 MagDec: 8.04° FS: 52965.71nT Gravity FS: 999.102mgn (9.80665 Based)		Surface Location NAD83 Colorado State Plane, Northern Zone, US Feet Lat: N 40 46 42.64 Northing: 1530650.26ftU Grid Conv: 1.0588° Lon: W 103 51 40.86 Easting: 3453806.93ftU Scale Fact: 0.99999922	
		Miscellaneous Slot: Rohn State LD03-63HN TVD Ref: KB 24ft(4729ft above MSL) Plan: Rohn State LD03-63HN MWD 0' to 10168' Definitive	

PvA



Grid North
Tot Corr (M->G 6.981°)
Mag Dec (8.040°)
Grid Conv (1.059°)



Vertical Section (ft) Azim = 95.84° Scale = 1:1250(ft) Origin = 0N/-S, 0E/-W



Rohn State LD03-63HN MWD 0' to 10168' Definitive Survey Geodetic Report (Def Survey)



Report Date: October 06, 2014 - 09:31 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 LD03-63HN
Well: Rohn State LD03-63HN
Borehole: Original Hole
UWI / API#: Unknown / Unknown
Survey Name: Rohn State LD03-63HN MWD 0' to 10168' Definitive
Survey Date: September 29, 2014
Tort / AHD / DDI / ERD Ratio: 186.666 ° / 5339.872 ft / 6.251 / 0.939
Coordinate Reference System: NAD83 Colorado State Plane, Northern Zone, US Feet
Location Lat / Long: N 40° 46' 42.63600", W 103° 51' 40.86000"
Location Grid N/E Y/X: N 1530650.261 ftUS, E 3453806.929 ftUS
CRS Grid Convergence Angle: 1.0588 °
Grid Scale Factor: 0.99999922
Version / Patch: 2.8.551.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 95.840 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB 24ft
TVD Reference Elevation: 4729.000 ft above MSL
Seabed / Ground Elevation: 4705.000 ft above MSL
Magnetic Declination: 8.040 °
Total Gravity Field Strength: 999.1018mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 52965.710 nT
Magnetic Dip Angle: 67.374 °
Declination Date: September 29, 2014
Magnetic Declination Model: BGGM 2014
North Reference: Grid North
Grid Convergence Used: 1.0588 °
Total Corr Mag North->Grid North: 6.9811 °
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	1530650.26	3453806.93	N 40 46 42.64	W 103 51 40.86
Begin EMS	305.00	0.60	318.30	304.99	-1.18	1.19	-1.06	0.20	1530651.45	3453805.87	N 40 46 42.65	W 103 51 40.87
Survey	602.00	0.60	270.40	601.98	-3.87	2.36	-3.65	0.16	1530652.63	3453803.28	N 40 46 42.66	W 103 51 40.91
	885.00	0.20	295.40	884.97	-5.81	2.59	-5.58	0.15	1530652.85	3453801.35	N 40 46 42.66	W 103 51 40.93
	1202.00	0.70	332.20	1201.96	-7.41	4.54	-6.98	0.17	1530654.80	3453799.95	N 40 46 42.68	W 103 51 40.95
9 5/8" Casing	1223.00	0.73	336.82	1222.96	-7.54	4.77	-7.10	0.31	1530655.03	3453799.83	N 40 46 42.68	W 103 51 40.95
Point												
Last EMS	1316.00	0.92	352.60	1315.95	-8.00	6.06	-7.42	0.31	1530656.32	3453799.50	N 40 46 42.70	W 103 51 40.96
Survey												
Begin												
SLB_MWD	1505.00	0.57	87.99	1504.94	-7.42	7.59	-6.68	0.59	1530657.85	3453800.25	N 40 46 42.71	W 103 51 40.95
Survey												
	1600.00	1.98	153.37	1599.92	-6.07	6.14	-5.47	1.92	1530656.40	3453801.46	N 40 46 42.70	W 103 51 40.93
	1695.00	4.08	155.42	1694.78	-3.47	1.59	-3.33	2.21	1530651.85	3453803.60	N 40 46 42.65	W 103 51 40.90
	1789.00	5.62	158.78	1788.44	0.31		-0.27	1.67	1530644.52	3453806.66	N 40 46 42.58	W 103 51 40.86
	1884.00	8.06	156.14	1882.76	5.73	-16.18	4.11	2.59	1530634.08	3453811.04	N 40 46 42.48	W 103 51 40.81
	1979.00	9.54	154.20	1976.64	13.16	-29.36	10.23	1.58	1530620.91	3453817.16	N 40 46 42.34	W 103 51 40.73
	2074.00	10.14	148.77	2070.24	22.33	-43.59	17.99	1.16	1530606.67	3453824.92	N 40 46 42.20	W 103 51 40.64
	2168.00	9.89	144.61	2162.81	32.64	-57.25	26.95	0.82	1530593.01	3453833.88	N 40 46 42.07	W 103 51 40.52
	2262.00	10.42	154.76	2255.34	42.35	-71.53	35.26	1.98	1530578.74	3453842.18	N 40 46 41.92	W 103 51 40.42
	2356.00	10.24	155.62	2347.82	50.95	-86.83	42.33	0.26	1530563.43	3453849.26	N 40 46 41.77	W 103 51 40.33
	2451.00	10.17	155.37	2441.32	59.45	-102.14	49.31	0.09	1530548.12	3453856.24	N 40 46 41.62	W 103 51 40.24
	2641.00	10.39	158.16	2628.27	75.91	-133.29	62.67	0.29	1530516.97	3453869.60	N 40 46 41.31	W 103 51 40.08
	2735.00	9.56	154.21	2720.85	83.94	-148.18	69.22	1.15	1530502.08	3453876.15	N 40 46 41.16	W 103 51 40.00
	2829.00	9.61	159.11	2813.54	91.56	-162.54	75.41	0.87	1530487.72	3453882.34	N 40 46 41.02	W 103 51 39.92
	2924.00	9.24	157.98	2907.26	98.69	-177.01	81.10	0.43	1530473.25	3453888.03	N 40 46 40.87	W 103 51 39.85
	3018.00	9.25	157.04	3000.03	105.86	-190.97	86.88	0.16	1530459.30	3453893.81	N 40 46 40.73	W 103 51 39.78
	3113.00	8.99	156.61	3093.83	113.16	-204.81	92.81	0.28	1530445.45	3453899.73	N 40 46 40.60	W 103 51 39.70
	3207.00	8.98	154.28	3186.68	120.59	-218.16	98.90	0.39	1530432.10	3453905.83	N 40 46 40.46	W 103 51 39.63
	3302.00	9.59	154.52	3280.44	128.58	-231.98	105.53	0.64	1530418.28	3453912.45	N 40 46 40.32	W 103 51 39.54
	3396.00	10.38	155.74	3373.01	136.90	-246.77	112.37	0.87	1530403.49	3453919.30	N 40 46 40.18	W 103 51 39.46
	3491.00	10.69	154.96	3466.41	145.71	-262.55	119.62	0.36	1530387.71	3453926.55	N 40 46 40.02	W 103 51 39.37
	3586.00	10.77	156.29	3559.75	154.61	-278.66	126.92	0.27	1530371.60	3453933.85	N 40 46 39.86	W 103 51 39.28
	3681.00	10.48	166.18	3653.13	161.90	-295.18	132.55	1.94	1530355.08	3453939.48	N 40 46 39.70	W 103 51 39.21
	3775.00	10.18	169.46	3745.61	167.12	-311.65	136.11	0.71	1530338.61	3453943.04	N 40 46 39.53	W 103 51 39.17
	3870.00	9.61	172.69	3839.19	171.29	-327.77	138.66	0.83	1530322.50	3453945.58	N 40 46 39.37	W 103 51 39.14
	3965.00	10.02	165.25	3932.81	176.00	-343.62	141.77	1.40	1530306.64	3453948.70	N 40 46 39.22	W 103 51 39.10
	4060.00	9.44	163.31	4026.44	181.89	-359.07	146.11	0.70	1530291.19	3453953.04	N 40 46 39.06	W 103 51 39.05
	4154.00	8.91	163.77	4119.24	187.57	-373.44	150.36	0.56	1530276.82	3453957.28	N 40 46 38.92	W 103 51 39.00
	4249.00	8.01	163.73	4213.20	192.83	-386.86	154.27	0.95	1530263.41	3453961.19	N 40 46 38.79	W 103 51 38.95
	4344.00	8.57	152.10	4307.22	199.25	-399.47	159.43	1.86	1530250.80	3453966.36	N 40 46 38.66	W 103 51 38.88
	4439.00	10.32	149.73	4400.93	208.20	-413.07	167.04	1.88	1530237.19	3453973.96	N 40 46 38.52	W 103 51 38.79
	4533.00	9.05	146.60	4493.59	217.84	-426.52	175.35	1.46	1530223.75	3453982.28	N 40 46 38.39	W 103 51 38.68
	4628.00	10.94	153.78	4587.14	227.35	-440.84	183.45	2.37	1530209.42	3453990.37	N 40 46 38.25	W 103 51 38.58
	4723.00	10.47	151.88	4680.49	236.95	-456.54	191.49	0.61	1530193.72	3453998.42	N 40 46 38.09	W 103 51 38.48
	4818.00	9.37	151.16	4774.07	246.17	-470.93	199.29	1.17	1530179.34	3454006.22	N 40 46 37.95	W 103 51 38.38
	4912.00	9.27	149.25	4866.83	255.04	-484.14	206.85	0.35	1530166.13	3454013.78	N 40 46 37.82	W 103 51 38.29
	5007.00	10.83	148.38	4960.37	265.03	-498.31	215.45	1.64	1530151.95	3454022.37	N 40 46 37.67	W 103 51 38.18
	5102.00	10.17	139.14	5053.78	276.56	-512.25	225.61	1.90	1530138.01	3454032.54	N 40 46 37.53	W 103 51 38.05
	5196.00	15.90	101.90	5145.48	295.45	-521.20	243.68	10.52	1530129.06	3454050.61	N 40 46 37.44	W 103 51 37.82
	5291.00	20.98	99.13	5235.57	325.39	-526.59	273.23	5.44	1530123.67	3454080.16	N 40 46 37.38	W 103 51 37.44
	5386.00	29.85	94.47	5321.30	366.09	-531.14	313.67	9.56	1530119.12	3454120.60	N 40 46 37.33	W 103 51 36.91
	5480.00	36.24	92.20	5400.06	417.26	-534.03	364.82	6.93	1530116.23	3454171.74	N 40 46 37.29	W 103 51 36.25
	5575.00	46.17	91.88	5471.44	479.63	-536.24	427.28	10.46	1530114.02	3454234.21	N 40 46 37.26	W 103 51 35.44
	5670.00	58.40	92.10	5529.44	554.47	-538.86	502.25	12.87	1530111.40	3454309.17	N 40 46 37.22	W 103 51 34.46
	5764.00	65.65	92.21	5573.51	637.26	-541.98	585.15	7.72	1530108.28	3454392.08	N 40 46 37.17	W 103 51 33.39
	5859.00	71.67	91.52	5608.06	725.49	-544.85	673.55	6.37	1530105.41	3454480.48	N 40 46 37.13	W 103 51 32.24
	5972.00	80.47	89.36	5635.24	834.56	-545.64	783.11	8.00	1530104.62	3454590.03	N 40 46 37.10	W 103 51 30.81
7" Casing Point	6020.00	83.08	88.20	5642.11	881.70	-544.63	830.60	5.95	1530105.63	3454637.52	N 40 46 37.10	W 103 51 30.20
	6078.00	86.25	86.83	5647.50	938.84	-542.13	888.28	5.95	1530108.14	3454695.21	N 40 46 37.12	W 103 51 29.45
	6172.00	87.01	87.99	5653.02	1031.66	-537.89	982.02	1.48	1530112.37	3454788.95	N 40 46 37.14	W 103 51 28.23
	6266.00	87.90	88.69	5657.20	1124.76	-535.17	1075.89	1.20	1530115.09	3454882.82	N 40 46 37.15	W 103 51 27.01
	6360.00	88.69	90.19	5659.99	1218.13	-534.25	1169.84	1.81	1530116.01	3454976.77	N 40 46 37.14	W 103 51 25.79
	6455.00	91.17	89.39	5660.10	1312.59	-533.91	1264.83	2.74	1530116.35	3455071.76	N 40 46 37.13	W 103 51 24.55
	6549.00	91.68	89.51	5657.76	1405.98	-533.01	1358.80	0.56	1530117.25	3455165.72	N 40 46 37.12	W 103 51 23.33
	6644.00	92.03	88.84	5654.68	1500.29	-531.65	1453.74	0.79	1530118.62	3455260.66	N 40 46 37.12	W 103 51 22.10
	6739.00	93.03	90.23	5650.49	1594.62	-530.87	1548.64	1.80	1530119.39	3455355.56	N 40 46 37.11	W 103 51 20.86
	6834.00	91.41	91.52	5646.82	1689.18	-532.32	1643.55	2.18	1530117.94	3455450.47	N 40 46 37.08	W 103 51 19.63
	6928.00	90.76	91.09	5645.04	1782.87	-534.47	1737.51	0.83	1530115.80	3455544.43	N 40 46 37.04	W 103 51 18.41
	7023.00	90.83	90.75	5643.73	1877.51	-535.99	1832.49	0.36	1530114.27	3455639.41	N 40 46 37.01	W 103 51 17.17
	7118.00	90.65	91.04	5642.50	1972.15	-537.48	1927.47	0.35	1530112.79	3455734.39	N 40 46 36.97	W 103 51 15.94
	7212.00	89.90	91.24	5642.05	2065.83	-539.35	2021.45	0.83	1530110.92	3455828.37	N 40 46 36.94	W 103 51 14.72
	7307.00	91.07	92.47	5641.25	2160.60	-542.42	2116.39	1.79	1530107.84	3455923.31	N 40 46 36.89	W 103 51 13.49

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 ° ' ")
	7780.00	89.21	89.80	5641.65	2631.46	-546.36	2589.31	1.08	1530103.91	3456396.23	N 40 46 36.76 W 103 51 7.34	
	7875.00	89.90	89.37	5642.39	2725.90	-545.66	2684.31	0.85	1530104.60	3456491.23	N 40 46 36.75 W 103 51 6.11	
	7969.00	88.21	89.47	5643.94	2819.29	-544.71	2778.28	1.79	1530105.55	3456585.21	N 40 46 36.75 W 103 51 4.88	
	8064.00	88.07	87.09	5647.02	2913.41	-541.87	2873.18	2.51	1530108.40	3456680.11	N 40 46 36.76 W 103 51 3.65	
	8158.00	89.83	86.56	5648.74	3006.23	-536.66	2967.02	1.95	1530113.60	3456773.94	N 40 46 36.79 W 103 51 2.43	
	8253.00	91.03	87.47	5648.03	3100.10	-531.72	3061.89	1.59	1530118.54	3456868.81	N 40 46 36.82 W 103 51 1.20	
	8348.00	90.76	89.33	5646.54	3194.28	-529.07	3156.83	1.98	1530121.19	3456963.75	N 40 46 36.83 W 103 50 59.96	
	8442.00	89.86	90.63	5646.04	3287.79	-529.04	3250.83	1.68	1530121.22	3457057.75	N 40 46 36.81 W 103 50 58.74	
	8537.00	90.00	90.16	5646.15	3382.36	-529.70	3345.83	0.52	1530120.56	3457152.75	N 40 46 36.79 W 103 50 57.51	
	8632.00	87.87	92.27	5647.92	3477.02	-531.72	3440.78	3.16	1530118.55	3457247.70	N 40 46 36.75 W 103 50 56.27	
	8726.00	87.87	91.34	5651.42	3570.72	-534.68	3534.67	0.99	1530115.59	3457341.58	N 40 46 36.71 W 103 50 55.05	
	8821.00	89.17	90.92	5653.87	3665.37	-536.55	3629.61	1.44	1530113.72	3457436.53	N 40 46 36.67 W 103 50 53.82	
	8916.00	87.73	88.82	5656.43	3759.81	-536.33	3724.57	2.68	1530113.93	3457531.49	N 40 46 36.65 W 103 50 52.58	
	9011.00	87.97	88.27	5660.00	3853.98	-533.92	3819.47	0.63	1530116.34	3457626.39	N 40 46 36.66 W 103 50 51.35	
	9105.00	89.52	88.91	5662.05	3947.20	-531.61	3913.42	1.78	1530118.65	3457720.34	N 40 46 36.67 W 103 50 50.13	
	9200.00	87.83	88.90	5664.25	4041.48	-529.79	4008.37	1.77	1530120.47	3457815.29	N 40 46 36.67 W 103 50 48.89	
	9295.00	88.18	89.27	5667.55	4135.76	-528.28	4103.30	0.53	1530121.98	3457910.22	N 40 46 36.66 W 103 50 47.66	
	9389.00	85.60	88.79	5672.66	4228.95	-526.69	4197.14	2.79	1530123.57	3458004.06	N 40 46 36.66 W 103 50 46.44	
	9484.00	86.49	88.06	5679.22	4322.93	-524.08	4291.88	1.22	1530126.18	3458098.79	N 40 46 36.67 W 103 50 45.21	
	9579.00	87.63	88.15	5684.09	4416.94	-520.94	4386.70	1.20	1530129.32	3458193.62	N 40 46 36.68 W 103 50 43.98	
	9673.00	89.62	87.06	5686.35	4509.94	-517.01	4480.58	2.42	1530133.25	3458287.50	N 40 46 36.71 W 103 50 42.75	
	9768.00	91.13	88.57	5685.72	4604.00	-513.38	4575.51	2.25	1530136.88	3458382.42	N 40 46 36.72 W 103 50 41.52	
	9863.00	89.97	89.87	5684.81	4698.35	-512.09	4670.49	1.84	1530138.18	3458477.41	N 40 46 36.72 W 103 50 40.29	
	9958.00	87.70	90.41	5686.75	4792.86	-512.32	4765.46	2.46	1530137.95	3458572.38	N 40 46 36.70 W 103 50 39.05	
	10053.00	89.59	89.03	5689.00	4887.28	-511.85	4860.43	2.47	1530138.41	3458667.34	N 40 46 36.69 W 103 50 37.82	
Last SLB_MWD Survey	10103.00	89.90	89.35	5689.22	4936.95	-511.14	4910.42	0.90	1530139.12	3458717.34	N 40 46 36.68 W 103 50 37.17	
Projection to Bit	10168.00	89.90	89.35	5689.34	5001.53	-510.41	4975.42	0.01	1530139.86	3458782.33	N 40 46 36.68 W 103 50 36.32	

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	13.250	9.625	SLB_EMS-STD-Depth Only	Original Hole / Rohn State LD03-63HN MWD 0' to 10168' Definitive
Surface	1	24.000	1316.000	Act Stns	13.250	9.625	SLB_EMS-STD	Original Hole / Rohn State LD03-63HN MWD 0' to 10168' Definitive
Intermediate	1	1316.000	6020.000	Act Stns	8.750	7.000	SLB_MWD-STD	Original Hole / Rohn State LD03-63HN MWD 0' to 10168' Definitive
Lateral	1	6020.000	10103.000	Act Stns	6.125	4.500	SLB_MWD-STD	Original Hole / Rohn State LD03-63HN MWD 0' to 10168' Definitive
Bit Projection	1	10103.000	10168.000	Act Stns	6.125	4.500	SLB_BLIND+TREND	Original Hole / Rohn State LD03-63HN MWD 0' to 10168' Definitive