

Noble Energy

CO, Weld County (NAD 83 NZ)
Sec 4 Twn 9 N Rng 58 W
Rohn State LD03-64-1HN Original Hole
05-123-37462
H&P 277



A Schlumberger Company

Final Survey Report

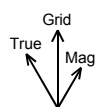
22-Sep-2014

Well Coordinates:	NAD83 CO State Plane,N Zone,US Ft
	N 40° 46' 42.99600" W 103° 51' 40.86000"
	1530650.26 usFt 3453806.93 usFt
Ground Level:	4703.00 ft MSL
TVD Reference:	KB 24ft @ 4727.00 ft MSL
Local Coordinate Origin:	Rohn State LD03-64-1HN well head
Vertical Section Azimuth:	92.466 ° (Grid North)
North Reference:	Grid North

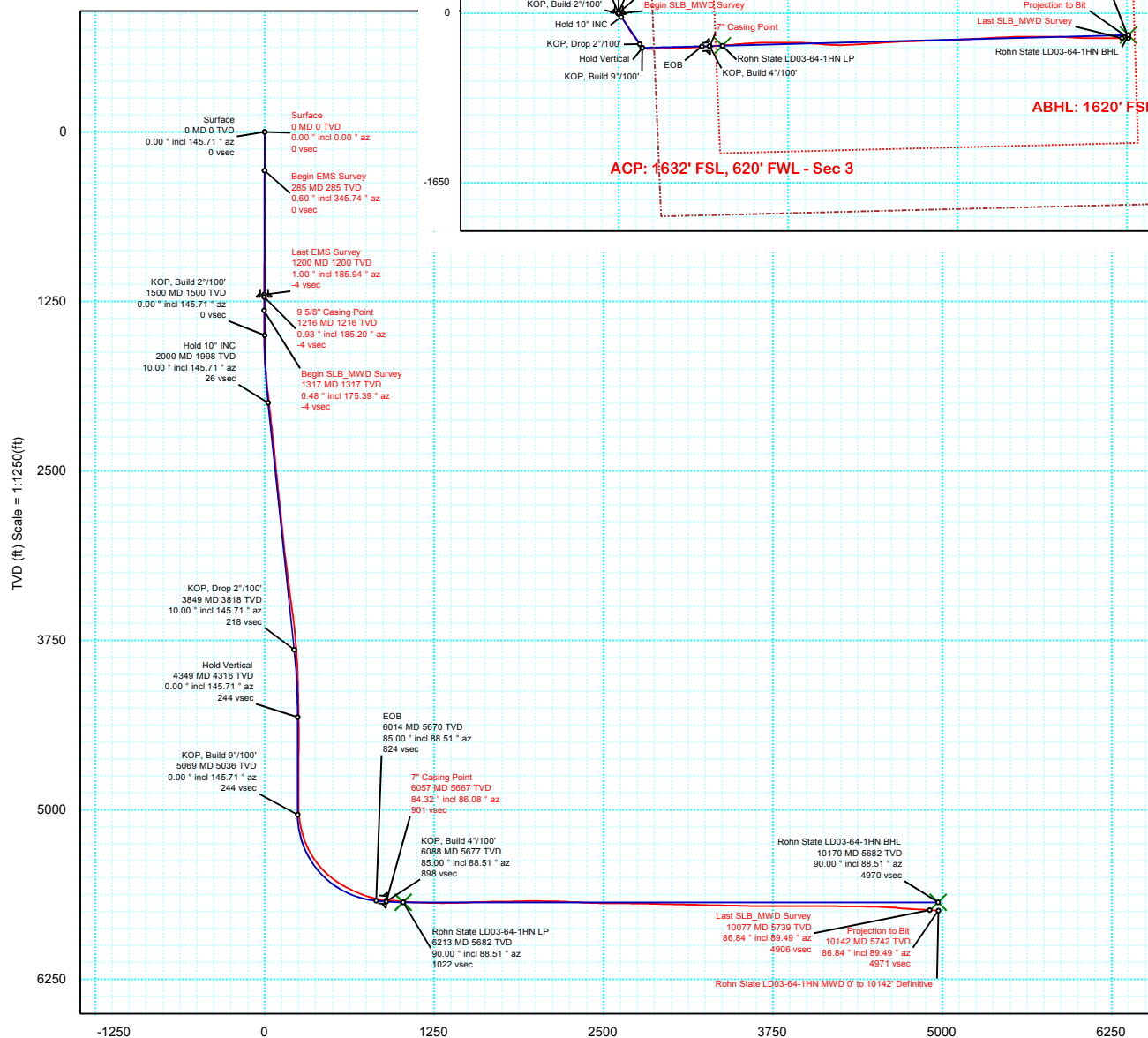
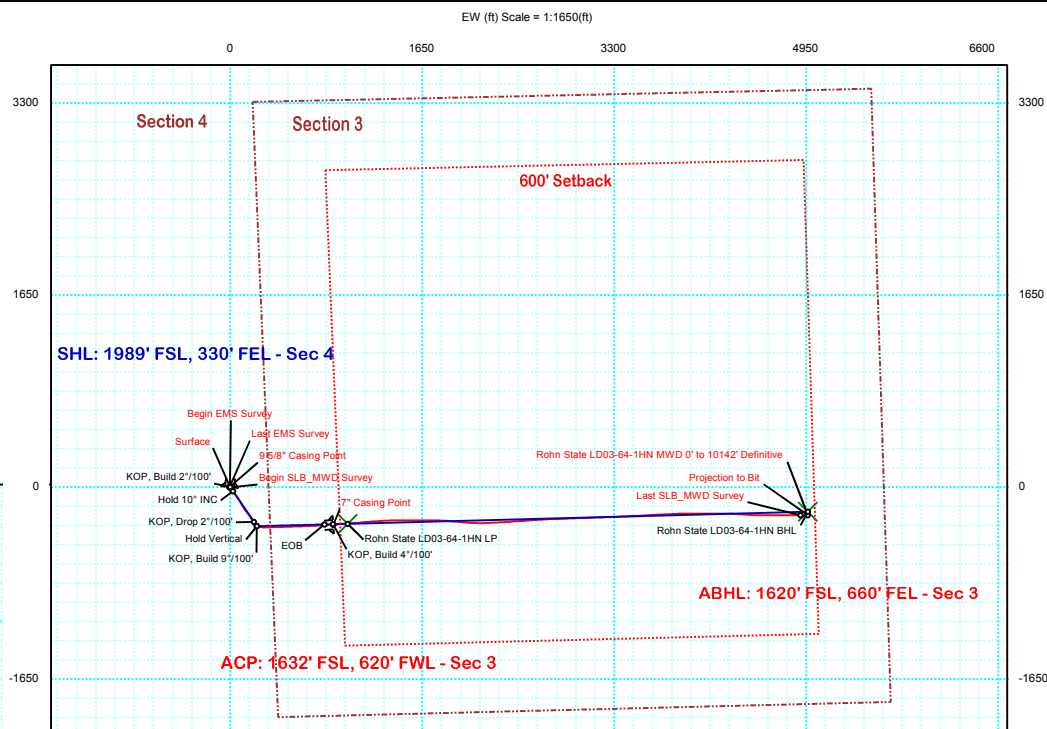
DOX Version: 2.8

Borehole: Original Hole	Well: Rohn State LD03-64-1HN	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: 67.375° Date: 18-Sep-2014 MagDec: 8.043° FS: 52969.862nT Gravity FS: 999.102mgn (9.80665 Based)		Surface Location NAD83 Colorado State Plane, Northern Zone, US Feet Lat: N 40 46 43.00 Northing: 1530686.69ftU Grid Conv: 1.0588° Lon: W 103 51 40.86 Easting: 3453806.26ftU Scale Fact: 0.99999924	
		Miscellaneous Slot: Rohn State LD03-64-1HN TVD Ref: KB 24ft(4727ft above MSL) Plan: Rohn State LD03-64-1HN MWD 0' to 10142' Definitive	

PvA



Grid North
Tot Corr (M->G 6.984°)
Mag Dec (8.043°)
Grid Conv (1.059°)



Vertical Section (ft) Azim = 92.47° Scale = 1:1250(ft) Origin = 0N/-S, 0E/-W



Rohn State LD03-64-1HN MWD 0' to 10142' Survey Geodetic Report

(Def Survey)

Report Date: September 19, 2014 - 03:46 PM
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 LD03-64-1HN
Well: Rohn State LD03-64-1HN
Borehole: Original Hole
UWI / API#: Unknown / Unknown
Survey Name: Rohn State LD03-64-1HN MWD 0' to 10142' Definitive
Survey Date: September 18, 2014
Tort / AHD / DDI / ERD Ratio: 199.258 ° / 5168.570 ft / 6.260 / 0.900
Coordinate Reference System: NAD83 Colorado State Plane, Northern Zone, US Feet
Location Lat / Long: N 40° 46' 42.99600", W 103° 51' 40.86000"
Location Grid N/E Y/X: N 1530686.688 ftUS, E 3453806.256 ftUS
CRS Grid Convergence Angle: 1.0588 °
Grid Scale Factor: 0.99999924
Version / Patch: 2.8.551.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 92.466 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB 24ft
TVD Reference Elevation: 4727.000 ft above MSL
Seabed / Ground Elevation: 4703.000 ft above MSL
Magnetic Declination: 8.043 °
Total Gravity Field Strength: 999.1020mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 52969.862 nT
Magnetic Dip Angle: 67.375 °
Declination Date: September 18, 2014
Magnetic Declination Model: BGGM 2014
North Reference: Grid North
Grid Convergence Used: 1.0588 °
Total Corr Mag North->Grid North: 6.9840 °
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	1530686.69	3453806.26	N 40 46 43.00 W 103 51 40.86	
Begin EMS	285.00	0.60	345.74	284.99	-0.43	1.45	-0.37	0.21	1530688.13	3453805.89	N 40 46 43.01 W 103 51 40.86	
Survey	630.00	0.30	155.14	629.99	-0.53	2.38	-0.43	0.26	1530689.07	3453805.82	N 40 46 43.02 W 103 51 40.87	
	940.00	0.70	262.24	939.98	-2.03	1.39	-1.97	0.27	1530688.07	3453804.29	N 40 46 43.01 W 103 51 40.89	
Last EMS	1200.00	1.00	185.94	1199.96	-3.73	-1.09	-3.78	0.41	1530685.60	3453802.48	N 40 46 42.99 W 103 51 40.91	
Survey	1216.00	0.93	185.20	1215.96	-3.74	-1.35	-3.80	0.46	1530685.33	3453802.45	N 40 46 42.98 W 103 51 40.91	
9 5/8" Casing												
Point												
Begin	1317.00	0.48	175.39	1316.95	-3.73	-2.59	-3.84	0.46	1530684.10	3453802.41	N 40 46 42.97 W 103 51 40.91	
SLB_MWD												
Survey	1411.00	0.45	176.99	1410.95	-3.64	-3.35	-3.79	0.03	1530683.34	3453802.46	N 40 46 42.96 W 103 51 40.91	
	1506.00	1.74	191.02	1505.93	-3.82	-5.14	-4.05	1.38	1530681.55	3453802.21	N 40 46 42.95 W 103 51 40.91	
	1600.00	2.86	137.89	1599.86	-2.39	-8.28	-2.75	2.43	1530678.41	3453803.51	N 40 46 42.91 W 103 51 40.90	
	1695.00	5.32	125.99	1694.61	2.95	-12.63	2.41	2.73	1530674.06	3453808.66	N 40 46 42.87 W 103 51 40.83	
	1789.00	6.83	134.97	1788.08	10.70	-19.14	9.89	1.89	1530667.55	3453816.14	N 40 46 42.81 W 103 51 40.74	
	1884.00	9.01	140.22	1882.17	19.87	-28.85	18.64	2.42	1530657.84	3453824.90	N 40 46 42.71 W 103 51 40.62	
	1979.00	10.33	145.04	1975.82	30.05	-41.55	28.28	1.63	1530645.14	3453834.54	N 40 46 42.58 W 103 51 40.50	
	2074.00	10.05	143.15	2069.32	40.47	-55.16	38.14	0.46	1530631.53	3453844.39	N 40 46 42.44 W 103 51 40.38	
	2168.00	10.67	145.65	2161.79	50.89	-68.91	47.97	0.81	1530617.78	3453854.22	N 40 46 42.31 W 103 51 40.25	
	2262.00	10.17	143.90	2254.24	61.27	-82.80	57.77	0.63	1530603.89	3453864.02	N 40 46 42.17 W 103 51 40.13	
	2356.00	9.70	143.16	2346.83	71.46	-95.84	67.40	0.52	1530590.85	3453873.66	N 40 46 42.04 W 103 51 40.01	
	2451.00	9.57	152.97	2440.50	80.42	-109.28	75.79	1.73	1530577.41	3453882.05	N 40 46 41.90 W 103 51 39.90	
	2546.00	11.59	150.79	2533.88	89.32	-124.65	84.04	2.17	1530562.04	3453890.29	N 40 46 41.75 W 103 51 39.80	
	2641.00	11.16	149.60	2627.01	99.32	-140.91	93.35	0.52	1530545.78	3453899.60	N 40 46 41.59 W 103 51 39.68	
	2735.00	10.85	150.71	2719.28	108.92	-156.47	102.28	0.40	1530530.22	3453908.53	N 40 46 41.43 W 103 51 39.57	
	2829.00	10.72	149.16	2811.62	118.37	-171.69	111.09	0.34	1530515.00	3453917.34	N 40 46 41.28 W 103 51 39.46	
	2924.00	9.79	147.26	2905.11	127.88	-186.07	119.99	1.04	1530500.62	3453926.24	N 40 46 41.14 W 103 51 39.35	
	3019.00	8.85	144.48	2998.85	137.04	-198.81	128.60	1.10	1530487.87	3453934.86	N 40 46 41.01 W 103 51 39.24	
	3113.00	11.02	141.09	3091.44	147.43	-211.69	138.45	2.39	1530475.00	3453944.70	N 40 46 40.88 W 103 51 39.11	
	3208.00	10.90	138.87	3184.70	159.62	-225.52	150.06	0.46	1530461.17	3453956.31	N 40 46 40.74 W 103 51 38.96	
	3302.00	10.96	143.63	3277.00	171.35	-239.41	161.20	0.96	1530447.28	3453967.46	N 40 46 40.60 W 103 51 38.82	
	3397.00	12.62	148.30	3370.00	182.85	-255.52	172.01	2.01	1530431.17	3453978.27	N 40 46 40.44 W 103 51 38.69	
	3492.00	13.27	146.86	3462.58	195.02	-273.47	183.43	0.76	1530413.21	3453989.68	N 40 46 40.26 W 103 51 38.54	
	3587.00	12.11	144.57	3555.26	207.49	-290.72	195.16	1.33	1530395.96	3454001.42	N 40 46 40.09 W 103 51 38.39	
	3681.00	9.68	140.47	3647.56	218.84	-304.86	205.91	2.71	1530381.83	3454012.17	N 40 46 39.95 W 103 51 38.26	
	3776.00	7.85	146.57	3741.45	227.99	-316.43	214.57	2.16	1530370.26	3454020.83	N 40 46 39.83 W 103 51 38.15	
	3871.00	6.99	145.37	3835.65	235.28	-326.60	221.43	0.92	1530360.09	3454027.68	N 40 46 39.73 W 103 51 38.06	
	3966.00	5.27	147.31	3930.10	241.28	-335.03	227.07	1.82	1530351.66	3454033.33	N 40 46 39.64 W 103 51 37.99	
	4060.00	2.50	144.98	4023.88	245.01	-340.35	230.58	2.95	1530346.34	3454036.84	N 40 46 39.59 W 103 51 37.95	
	4155.00	1.24	77.54	4118.84	247.27	-341.82	232.77	2.45	1530344.87	3454039.03	N 40 46 39.58 W 103 51 37.92	
	4250.00	1.27	97.17	4213.81	249.31	-341.73	234.82	0.45	1530344.96	3454041.08	N 40 46 39.58 W 103 51 37.89	
	4345.00	0.89	92.34	4308.80	251.09	-341.89	236.60	0.41	1530344.80	3454042.86	N 40 46 39.58 W 103 51 37.87	
	4439.00	0.56	176.36	4402.79	251.87	-342.38	237.36	1.06	1530344.31	3454043.62	N 40 46 39.57 W 103 51 37.86	
	4534.00	0.30	205.70	4497.79	251.82	-343.07	237.28	0.35	1530343.62	3454043.54	N 40 46 39.56 W 103 51 37.86	
	4629.00	0.25	295.99	4592.79	251.54	-343.20	236.99	0.41	1530343.49	3454043.24	N 40 46 39.56 W 103 51 37.86	
	4724.00	0.29	271.81	4687.79	251.11	-343.10	236.56	0.13	1530343.59	3454042.82	N 40 46 39.56 W 103 51 37.87	
	4818.00	0.23	305.88	4781.79	250.71	-342.98	236.17	0.17	1530343.71	3454042.43	N 40 46 39.56 W 103 51 37.87	
	4913.00	0.46	352.77	4876.78	250.49	-342.49	235.97	0.36	1530344.20	3454042.22	N 40 46 39.57 W 103 51 37.88	
	5007.00	0.12	57.54	4970.78	250.50	-342.07	236.01	0.45	1530344.62	3454042.26	N 40 46 39.57 W 103 51 37.88	
	5102.00	7.51	96.55	5065.51	256.79	-342.72	242.27	7.81	1530343.97	3454048.52	N 40 46 39.57 W 103 51 37.79	
	5197.00	14.46	97.52	5158.71	274.82	-344.99	260.21	7.32	1530341.70	3454066.47	N 40 46 39.54 W 103 51 37.56	
	5292.00	22.19	90.03	5248.84	304.60	-346.55	289.96	8.49	1530340.14	3454096.22	N 40 46 39.52 W 103 51 37.17	
	5386.00	31.06	89.76	5332.78	346.65	-346.46	332.05	9.44	1530340.23	3454138.30	N 40 46 39.51 W 103 51 36.63	
	5481.00	39.77	88.49	5410.13	401.54	-345.55	387.03	9.20	1530341.14	3454193.29	N 40 46 39.51 W 103 51 35.91	
	5576.00	48.62	88.03	5478.18	467.52	-343.52	453.16	9.32	1530343.17	3454259.42	N 40 46 39.52 W 103 51 35.05	
	5670.00	56.82	88.17	5535.07	542.04	-341.05	527.85	8.72	1530345.64	3454334.11	N 40 46 39.53 W 103 51 34.08	
	5765.00	63.37	88.01	5582.40	624.10	-338.30	610.11	6.90	1530348.39	3454416.37	N 40 46 39.54 W 103 51 33.01	
	5860.00	68.67	87.62	5621.00	710.59	-334.99	696.82	5.59	1530351.70	3454503.07	N 40 46 39.56 W 103 51 31.88	
	5954.00	75.74	86.17	5649.71	799.60	-330.12	786.13	7.66	1530356.57	3454592.38	N 40 46 39.59 W 103 51 30.72	
	6008.00	81.36	87.15	5660.43	852.24	-327.04	838.94	10.56	1530359.65	3454645.20	N 40 46 39.61 W 103 51 30.04	
7" Casing Point	6057.00	84.32	86.08	5666.53	900.60	-324.17	887.47	6.42	1530362.52	3454693.72	N 40 46 39.63 W 103 51 29.40	
	6078.00	85.59	85.62	5668.38	921.37	-322.66	908.33	6.42	1530364.03	3454714.59	N 40 46 39.64 W 103 51 29.13	
	6172.00	85.49	85.24	5675.69	1014.38	-315.19	1001.75	0.42	1530371.50	3454808.00	N 40 46 39.70 W 103 51 27.92	
	6266.00	86.46	85.81	5682.29	1107.46	-307.87	1095.23	1.20	1530378.82	3454901.48	N 40 46 39.75 W 103 51 26.70	
	6360.00	88.52	84.56	5686.40	1200.61	-299.99	1188.80	2.56	1530386.70	3454995.05	N 40 46 39.81 W 103 51 25.48	
	6455.00	89.52	86.38	5688.03	1294.88	-292.49	1283.49	2.19	1530394.20	3455089.74	N 40 46 39.87 W 103 51 24.25	
	6549.00	91.72	88.39	5687.01	1388.50	-288.20	1377.37	3.17	1530398.49	3455183.62	N 40 46 39.90 W 103 51 23.03	
	6644.00	91.89	90.23	5684.02	1483.30	-287.06	1472.31	1.94	1530399.63	3455278.57	N 40 46 39.89 W 103 51 21.79	
	6739.00	92.92	89.92	5680.03	1578.13	-287.18	1567.23	1.13	1530399.51	3455373.48	N 40 46 39.87 W 103 51 20.56	
	6834.00	90.14	90.12	5677.50	1673.00	-287.21	1662.19	2.93	1530399.47	3455468.44	N 40 46 39.85 W 103 51 19.33	
	6928.00	90.83	90.09	5676.70	1766.92	-287.39	1756.18	0.73	1530399.30	3455562.43	N 40 46 39.84 W 103 51 18.11	
	7023.00	91.65	94.39	5674.64	1861.87	-291.10	1851.06	4.61	1530395.59	3455657.31	N 40 46 39.78 W 103 51 16.87	
	7118.00	90.28	95.67	5673.04	1956.76	-299.43	1945.68	1.97	1530387.26	3455751.93	N 40 46 39	

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 ° ' ")
	7496.00	86.59	86.72	5683.27	2333.88	-304.43	2322.94	1.09	1530382.26	3456129.19	N 40 46 39.56	W 103 51 10.74
	7591.00	88.62	85.68	5687.24	2428.23	-298.14	2417.64	2.40	1530388.55	3456223.89	N 40 46 39.61	W 103 51 9.51
	7686.00	89.86	86.35	5688.50	2522.62	-291.54	2512.40	1.48	1530395.15	3456318.65	N 40 46 39.66	W 103 51 8.28
	7780.00	89.35	85.68	5689.15	2616.02	-285.00	2606.17	0.90	1530401.69	3456412.42	N 40 46 39.70	W 103 51 7.06
	7875.00	89.24	87.16	5690.32	2710.48	-279.07	2700.97	1.56	1530407.62	3456507.22	N 40 46 39.74	W 103 51 5.82
	7969.00	89.17	88.51	5691.62	2804.16	-275.52	2794.89	1.44	1530411.17	3456601.14	N 40 46 39.76	W 103 51 4.60
	8064.00	87.97	87.59	5693.99	2898.85	-272.29	2889.81	1.59	1530414.40	3456696.05	N 40 46 39.78	W 103 51 3.37
	8158.00	89.24	88.09	5696.28	2992.51	-268.75	2983.71	1.45	1530417.94	3456789.96	N 40 46 39.79	W 103 51 2.15
	8253.00	88.80	88.21	5697.91	3087.23	-265.68	3078.65	0.48	1530421.01	3456884.89	N 40 46 39.81	W 103 51 0.91
	8348.00	88.01	87.52	5700.55	3181.88	-262.14	3173.54	1.10	1530424.54	3456979.79	N 40 46 39.82	W 103 50 59.68
	8442.00	89.28	87.75	5702.77	3275.52	-258.27	3267.43	1.37	1530428.42	3457073.68	N 40 46 39.85	W 103 50 58.46
	8537.00	88.97	87.51	5704.23	3370.17	-254.34	3362.34	0.41	1530432.35	3457168.59	N 40 46 39.87	W 103 50 57.22
	8632.00	88.52	86.97	5706.31	3464.75	-249.77	3457.21	0.74	1530436.92	3457263.45	N 40 46 39.89	W 103 50 55.99
	8726.00	88.31	86.78	5708.91	3558.27	-244.64	3551.03	0.30	1530442.05	3457357.28	N 40 46 39.93	W 103 50 54.77
	8821.00	89.62	87.58	5710.62	3652.85	-239.97	3645.90	1.62	1530446.72	3457452.14	N 40 46 39.96	W 103 50 53.54
	8916.00	90.00	86.85	5710.94	3747.45	-235.35	3740.79	0.87	1530451.33	3457547.03	N 40 46 39.99	W 103 50 52.30
	9011.00	90.41	87.89	5710.60	3842.07	-231.00	3835.68	1.18	1530455.69	3457641.93	N 40 46 40.01	W 103 50 51.07
	9105.00	89.86	90.26	5710.38	3935.90	-229.48	3929.66	2.59	1530457.21	3457735.91	N 40 46 40.01	W 103 50 49.84
	9200.00	89.86	89.85	5710.61	4030.81	-229.57	4024.66	0.43	1530457.12	3457830.91	N 40 46 39.99	W 103 50 48.61
	9295.00	90.28	89.26	5710.49	4125.69	-228.83	4119.66	0.76	1530457.86	3457925.90	N 40 46 39.98	W 103 50 47.38
	9389.00	89.28	90.29	5710.85	4219.58	-228.46	4213.66	1.53	1530458.23	3458019.90	N 40 46 39.97	W 103 50 46.15
	9484.00	89.52	92.41	5711.85	4314.55	-230.70	4308.62	2.25	1530455.99	3458114.86	N 40 46 39.93	W 103 50 44.92
	9579.00	89.35	93.46	5712.78	4409.55	-235.56	4403.49	1.12	1530451.12	3458209.73	N 40 46 39.86	W 103 50 43.69
	9673.00	88.69	92.99	5714.39	4503.52	-240.85	4497.32	0.86	1530445.84	3458303.57	N 40 46 39.79	W 103 50 42.47
	9768.00	85.91	90.76	5718.87	4598.40	-243.96	4592.15	3.75	1530442.73	3458398.40	N 40 46 39.74	W 103 50 41.24
	9863.00	85.94	89.87	5725.62	4693.09	-244.48	4686.91	0.94	1530442.21	3458493.15	N 40 46 39.72	W 103 50 40.01
	9958.00	86.39	89.23	5731.97	4787.75	-243.73	4781.69	0.82	1530442.95	3458587.94	N 40 46 39.71	W 103 50 38.78
	10053.00	86.87	89.18	5737.56	4882.43	-242.42	4876.52	0.51	1530444.27	3458682.76	N 40 46 39.71	W 103 50 37.54
Last SLB_MWD Survey	10077.00	86.84	89.49	5738.87	4906.36	-242.14	4900.48	1.30	1530444.55	3458706.72	N 40 46 39.70	W 103 50 37.23
Projection to Bit	10142.00	86.84	89.49	5742.46	4971.18	-241.56	4965.38	0.00	1530445.13	3458771.62	N 40 46 39.70	W 103 50 36.39

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 (in)	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 LD03-64-1HN MWD 0' to 10142'
Surface	1	24.000	1200.000	Act Stns	13.750	9.625	SLB_EMS-STD	Original Hole / Rohn State LD03-64-1HN MWD 0' to 10142'
Intermediate	1	1200.000	6057.000	Act Stns	8.750	7.000	SLB_MWD-STD	Original Hole / Rohn State LD03-64-1HN MWD 0' to 10142'
Lateral	1	6057.000	10077.000	Act Stns	6.125	4.500	SLB_MWD-STD	Original Hole / Rohn State LD03-64-1HN MWD 0' to 10142'
Bit Projection	1	10077.000	10142.000	Act Stns	6.125	4.500	SLB_BLIND+TREND	Original Hole / Rohn State LD03-64-1HN MWD 0' to 10142'