

51-01629



Noble Energy MND9FHS Gyro+MWD 0ft to 15598ft MD Survey Report

(Def Survey)

Report Date: October 29, 2013 - 04:24 PM
 Client: Noble Energy
 Field: WV Marshall County (NAD 27)
 Structure / Slot: Noble Energy MND9 Pad / MND9FHS
 Well: MND9FHS
 Borehole: Original Borehole
 UWI / API#: Unknown / Unknown
 Survey Name: Noble Energy MND9FHS Gyro+MWD 0ft to 15598ft MD
 Survey Date: October 17, 2013
 Tort / AHD / DDI / ERD Ratio: 242.306 / 9710.479 ft / 6.761 / 1.527
 Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
 Location Lat / Long: N 39° 49' 53.69712", W 80° 47' 14.05615"
 Location Grid NE Y/C: N 487585.396 IJUS, E 1638501.000 IJUS
 CRS Grid Convergence Angle: -0.8210 *
 Grid Scale Factor: 0.99994716
 Version / Patch: 2.7.998.0

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 326.638 * (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: KB
 TVD Reference Elevation: 1245.500 ft above MSL
 Seabed / Ground Elevation: 1219.620 ft above MSL
 Magnetic Declination: -7.500 *
 Total Gravity Field Strength: 999.3452mgm (g 80655 Based)
 Gravity Model: GARM
 Total Magnetic Field Strength: 52852.991 nT
 Magnetic Dip Angle: 67.357 *
 Declination Date: October 17, 2013
 Magnetic Declination Model: HDGM 2013
 North Reference: Grid North
 Grid Convergence Used: -0.8210 *
 Total Corr Mag North-Grid North: -6.7680 *
 Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grad (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1245.59	0.00	0.00	0.00	N/A	N/A	N/A	487585.40	1638501.00	N 39 49 53.70 W	80 47 14.05	0.00
	76.00	0.27	46.12	76.00	-1169.59	0.03	0.12	0.13	0.36	0.36	0.00	487585.52	1638501.13	N 39 49 53.70 W	80 47 14.06	0.00
	126.00	0.24	22.40	126.00	-1119.59	0.11	0.30	0.25	0.22	-0.06	-47.44	487585.70	1638501.25	N 39 49 53.70 W	80 47 14.05	0.00
	176.00	0.12	58.40	176.00	-1069.59	0.17	0.43	0.34	0.32	-0.24	72.00	487585.82	1638501.34	N 39 49 53.70 W	80 47 14.05	0.00
	226.00	0.07	277.56	226.00	-1019.59	0.19	0.46	0.35	0.36	-0.10	-281.68	487585.85	1638501.35	N 39 49 53.70 W	80 47 14.05	0.00
		0.16	81.58	276.00	-969.59	0.18	0.47	0.39	0.46	0.18	328.04	487585.87	1638501.39	N 39 49 53.70 W	80 47 14.05	0.00
	326.00	0.30	58.25	326.00	-919.59	0.15	0.55	0.57	0.33	-0.28	-49.66	487585.95	1638501.57	N 39 49 53.70 W	80 47 14.05	0.00
	376.00	0.16	49.67	376.00	-869.59	0.15	0.67	0.74	0.29	-0.28	-17.16	487586.06	1638501.74	N 39 49 53.70 W	80 47 14.05	0.12
	426.00	0.24	47.93	426.00	-819.59	0.18	0.78	0.87	0.16	0.16	-3.48	487586.18	1638501.87	N 39 49 53.70 W	80 47 14.05	0.22
	476.00	0.15	36.93	476.00	-769.59	0.21	0.90	0.98	0.19	-0.18	-22.00	487586.30	1638501.98	N 39 49 53.71 W	80 47 14.05	0.30
		0.11	20.06	526.00	-719.59	0.26	1.00	1.04	0.11	-0.08	-33.74	487586.40	1638502.04	N 39 49 53.71 W	80 47 14.05	0.35
	526.00	0.25	11.13	526.00	-669.59	0.37	1.15	1.08	0.28	0.28	-17.86	487586.55	1638502.08	N 39 49 53.71 W	80 47 14.04	0.44
	576.00	0.26	9.30	576.00	-619.59	0.53	1.37	1.12	0.03	0.02	-3.66	487586.77	1638502.12	N 39 49 53.71 W	80 47 14.04	0.49
	626.00	0.23	25.14	626.00	-569.59	0.71	1.57	1.18	0.15	-0.06	31.68	487586.97	1638502.18	N 39 49 53.71 W	80 47 14.04	0.56
	676.00	0.44	52.30	726.00	-519.59	0.73	1.78	1.37	0.52	0.42	54.32	487587.18	1638502.37	N 39 49 53.71 W	80 47 14.04	0.68
		0.82	73.29	775.99	-469.60	0.65	2.00	1.87	0.88	0.76	41.98	487587.40	1638502.87	N 39 49 53.72 W	80 47 14.03	0.85
	826.00	0.38	64.17	825.99	-419.60	0.52	2.18	2.39	0.90	-0.88	-18.24	487587.57	1638503.36	N 39 49 53.72 W	80 47 14.03	1.00
	876.00	0.26	7.17	875.99	-369.60	0.26	2.36	2.52	0.65	-0.24	-114.00	487587.76	1638503.52	N 39 49 53.72 W	80 47 14.03	1.07
	926.00	0.71	336.08	925.99	-319.60	0.08	2.76	2.41	1.01	0.90	-62.18	487588.15	1638503.41	N 39 49 53.72 W	80 47 14.03	1.15
	976.00	1.08	325.77	975.98	-269.61	1.76	3.43	2.02	0.90	0.74	-20.62	487588.83	1638503.02	N 39 49 53.73 W	80 47 14.03	1.30
	1026.00	1.00	333.70	1025.97	-219.62	2.66	4.21	1.56	0.33	-0.16	15.86	487589.61	1638502.56	N 39 49 53.74 W	80 47 14.04	1.39
	1076.00	1.30	334.18	1075.96	-169.63	3.65	5.11	1.12	0.60	0.69	0.96	487590.51	1638502.12	N 39 49 53.75 W	80 47 14.04	1.49
	1126.00	1.10	339.14	1125.95	-119.64	4.71	6.10	0.69	0.35	-0.28	9.92	487591.49	1638501.69	N 39 49 53.76 W	80 47 14.05	1.57
	1176.00	1.22	340.64	1175.94	-69.65	5.72	7.07	0.34	0.14	-0.12	3.00	487592.47	1638501.34	N 39 49 53.77 W	80 47 14.06	1.63
	1226.00	1.18	348.96	1225.93	-19.66	6.72	8.08	0.05	0.28	0.08	12.64	487593.47	1638501.04	N 39 49 53.78 W	80 47 14.06	1.69
		0.88	351.52	1275.92	30.33	7.55	8.95	-0.13	0.62	-0.60	9.12	487594.35	1638500.87	N 39 49 53.79 W	80 47 14.08	1.78
	1326.00	0.60	344.11	1325.92	80.33	8.15	9.50	-0.26	0.59	-0.56	-14.82	487594.98	1638500.74	N 39 49 53.79 W	80 47 14.06	1.81
	1376.00	0.62	340.34	1375.91	130.32	8.66	10.10	-0.42	0.09	0.04	-7.54	487595.49	1638500.58	N 39 49 53.80 W	80 47 14.07	1.83
	1426.00	0.32	330.76	1425.91	180.32	9.06	10.47	-0.58	0.62	-0.60	-19.16	487595.87	1638500.42	N 39 49 53.80 W	80 47 14.07	1.87
	1476.00	0.23	321.55	1475.91	230.32	9.30	10.67	-0.71	0.20	-0.18	-18.42	487596.07	1638500.29	N 39 49 53.80 W	80 47 14.07	1.88
		0.32	314.31	1525.91	280.32	9.54	10.85	-0.87	0.19	0.10	-14.48	487596.24	1638500.13	N 39 49 53.80 W	80 47 14.07	1.90
	1526.00	0.74	296.59	1525.91	330.32	9.96	11.09	-1.25	0.89	0.64	-35.44	487596.49	1638499.74	N 39 49 53.81 W	80 47 14.08	1.94
	1576.00	0.63	281.12	1525.91	380.32	10.43	11.29	-1.82	0.43	-0.22	-30.94	487596.68	1638499.18	N 39 49 53.81 W	80 47 14.08	1.98
	1626.00	0.42	264.80	1625.90	430.31	10.71	11.32	-2.27	0.51	-0.42	-33.04	487596.72	1638498.73	N 39 49 53.81 W	80 47 14.09	2.01
	1676.00	0.27	248.31	1625.90	480.31	10.82	11.26	-2.56	0.36	-0.30	-32.58	487596.66	1638498.44	N 39 49 53.81 W	80 47 14.09	2.03
		0.31	235.72	1775.90	530.31	10.84	11.14	-2.78	0.15	0.08	-25.18	487596.54	1638498.22	N 39 49 53.81 W	80 47 14.10	2.04
	1826.00	0.45	211.41	1825.90	580.31	10.75	10.90	-3.00	0.42	0.28	-48.62	487596.30	1638498.00	N 39 49 53.80 W	80 47 14.10	2.06
	1876.00	0.31	203.80	1875.90	630.31	10.60	10.61	-3.15	0.10	-0.28	-15.22	487596.00	1638497.85	N 39 49 53.80 W	80 47 14.10	2.08
	1926.00	0.31	203.18	1925.90	680.31	10.45	10.36	-3.26	0.01	0.00	-1.24	487595.76	1638497.74	N 39 49 53.80 W	80 47 14.10	2.08
	1976.00	0.31	226.91	1975.90	730.31	10.35	10.14	-3.41	0.25	0.00	47.46	487595.54	1638497.59	N 39 49 53.80 W	80 47 14.10	2.10
		0.30	227.08	2025.90	780.31	10.31	9.96	-3.61	0.02	-0.02	0.34	487595.36	1638497.39	N 39 49 53.80 W	80 47 14.11	2.11
	2026.00	0.35	229.56	2025.90	830.31	10.26	9.77	-3.82	0.10	0.10	5.00	487595.17	1638497.18	N 39 49 53.79 W	80 47 14.11	2.12
	2076.00	0.14	249.71	2125.90	880.31	10.26	9.65	-3.99	0.45	-0.42	40.26	487595.05	1638497.01	N 39 49 53.79 W	80 47 14.11	2.13
	2126.00	0.15	281.23	2175.90	930.31	10.15	9.65	-4.12	0.16	0.02	63.04	487595.04	1638496.88	N 39 49 53.79 W	80 47 14.11	2.14
	2226.00	0.06	290.77	2225.90	980.31	10.39	9.67	-4.20	0.18	-0.18	19.08	487595.06	1638496.80	N 39 49 53.79 W	80 47 14.11	2.15
		0.15	301.99	2275.90	1030.31	10.47	9.71	-4.28	0.18	0.18	22.44	487595.11	1638496.72	N 39 49 53.79 W	80 47 14.11	2.16
	2326.00	0.21	291.49	2325.90	1080.31	10.60	9.78	-4.43	0.14	0.12	-21.00	487595.18	1638496.57	N 39 49 53.79 W	80 47 14.12	2.19
	2376.00	0.16	301.11	2375.90	1130.31	10.74	9.85	-4.57	0.12	-0.10	19.24	487595.24	1638496.43	N 39 49 53.79 W	80 47 14.12	2.17
	2426.00	0.20	285.69	2425.89	1180.30	10.87	9.91	-4.71	0.12	0.08	-30.84	487595.30	1638496.29	N 39 49 53.79 W	80 47 14.12	2.18
	2476.00	0.31	313.88	2475.89	1232.30	11.07	10.03	-4.90	0.31	0.21	54.21	487595.43	1638496.10	N 39 49 53.80 W	80 47 14.12	2.19
		0.28	266.43	2531.89	1286.30	11.28	10.12	-5.14	0.44	-0.06	-87.87	487595.52	1638495.86	N 39 49 53.80 W	80 47 14.13	2.21
	2527.00	0.29	137.66	2526.86	1336.30	11.27	10.33	-5.33	3.25	2.76	-135.55	487595.73	1638495.75	N 39 49 53.78 W	80 47 14.11	2.39
	2721.00	5.44	129.93	2720.60	1475.01	2.41	3.71	1.27	2.76	2.70	-82.43	487596.27	1638502.27	N 39 49 53.73 W	80 47 14.04	2.50
	2816.00	4.12	121.29	2815.27	1569.68	-4.99	-0.95	7.64	1.58	-1.39	-0.09	487584.45	1638508.64	N 39 49 53.69 W	80 47 13.96	2.75
	2909.00	4.86	125.03	2907.98	1662.39	-11.67	-4.94	13.72	0.86	0.80	4.02	487580.45	1638514.72	N 39 49 53.65 W	80 47 13.88	2.86
		5.38	114.69	3002.60	1757.01	-19.19	-9.12	21.06	1.11	0.55	-10.88	487576.28	1638522.06	N 39 49 53.51 W	80 47 13.79	2.96
	3098.00	4.04	127.95	3096.29	1850.70	-28.07	-12.99	27.67	1.83	-1.43	14.11	487572.40	1638528.67	N 39 49 53.57 W	80 47 13.70	3.05
	3193.00	3.05	166.92	3191.12	1945.53	-31.61	-17.51	30.89	2.67	-1.04	41.02	487567.88	1638531.88	N 39 49 53.61 W	80 47 13.65	3.15
	3288.00	0.62	195.22	3286.06	2040.47	-34.32	-20.47	31.32	2.65	-2.56	29.79	487564.93	1638532.32	N 39 49 53.50 W	80 47 13.65	3.22
	3383.00															

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Comments	MD (ft)	Incl (°)	Adm Grid (ft)	TVD (ft)	TVD88 (ft)	YSEC (ft)	NS (ft)	EW (ft)	DL8 (ft/100m)	BR (ft/100m)	TR (ft/100m)	Northing (MUS)	Easting (MUS)	Latitude (N/S °'")	Longitude (E/W °'")	Directional Difficulty Index
	5845.00	18.71	30.90	5822.56	4578.97	-85.61	-15.16	150.85	8.65	1.02	-30.36	487570.24	1638851.84	N 39 48 53.37 W	80 47 12.12	4.27
	5893.00	18.41	18.83	5868.34	4822.75	-87.77	-13.98	158.60	9.55	3.54	-29.50	487568.42	1638851.50	N 39 48 53.37 W	80 47 12.05	4.32
	5940.00	21.26	7.48	4686.97	4686.97	-78.57	-1.58	165.85	9.07	6.08	-19.84	487568.08	1638850.85	N 39 48 53.85 W	80 47 12.01	4.37
	5997.00	23.01	2.44	5056.95	4710.38	-82.39	31.55	161.37	8.97	5.64	-10.68	487616.94	1638862.36	N 39 49 54.03 W	80 47 12.00	4.41
	6035.00	26.20	356.10	5009.43	4765.84	-85.25	51.88	161.07	7.42	4.86	-13.02	487637.27	1638862.08	N 39 49 54.23 W	80 47 12.00	4.46
	6082.00	30.30	349.56	5040.81	4795.22	-85.26	73.94	158.24	8.63	6.53	-14.06	487659.23	1638859.53	N 39 49 54.51 W	80 47 12.00	4.51
	6130.00	35.06	347.15	5081.20	4825.61	-85.18	90.31	153.98	10.28	9.02	-5.08	487684.70	1638853.97	N 39 49 54.70 W	80 47 12.12	4.57
	6177.00	38.80	345.27	5118.82	4873.23	25.36	126.66	148.24	7.90	7.53	-4.00	487712.05	1638847.24	N 39 49 54.97 W	80 47 12.21	4.62
	6224.00	43.20	342.36	5154.20	4908.70	54.82	156.24	137.82	10.97	10.19	-8.19	487741.63	1638835.61	N 39 49 55.26 W	80 47 12.32	4.68
	6271.00	48.41	339.35	5186.99	4941.40	87.52	188.10	128.52	11.63	10.88	-6.40	487773.48	1638827.51	N 39 49 55.57 W	80 47 12.47	4.73
	6319.00	52.09	337.19	5217.86	4972.00	123.96	222.36	113.84	8.41	7.87	-4.50	487807.75	1638813.84	N 39 49 55.81 W	80 47 12.65	4.78
	6366.00	56.50	332.40	5245.08	4900.40	161.44	256.88	96.58	12.55	9.57	-10.00	487842.26	1638797.57	N 39 49 56.25 W	80 47 12.87	4.84
	6414.00	61.24	331.00	5269.86	5024.27	202.37	293.09	77.14	10.00	9.89	-8.02	487878.47	1638785.14	N 39 49 56.60 W	80 47 13.12	4.89
	6461.00	64.92	330.43	5291.13	5045.54	244.16	329.65	56.87	7.93	7.83	-1.40	487915.03	1638767.87	N 39 49 56.98 W	80 47 13.39	4.93
	6508.00	68.61	329.47	5309.67	5064.08	287.27	367.02	35.05	6.07	7.85	-2.04	487952.40	1638756.04	N 39 49 57.33 W	80 47 13.68	4.98
	6555.00	71.97	330.11	5325.82	5079.93	331.44	405.26	12.79	7.26	7.15	1.36	487990.63	1638743.70	N 39 49 57.70 W	80 47 13.97	5.02
	6603.00	75.82	330.42	5338.91	5093.32	377.43	445.27	-10.07	7.63	7.00	0.85	488030.64	1638730.93	N 39 49 58.10 W	80 47 14.27	5.06
	6650.00	79.85	328.01	5348.90	5103.31	423.29	484.90	-33.26	9.53	9.00	-3.21	488070.27	1638718.74	N 39 49 58.48 W	80 47 14.57	5.10
	6697.00	84.36	328.15	5358.35	5109.78	469.80	524.60	-57.56	9.73	8.60	-1.82	488109.98	1638706.44	N 39 49 58.87 W	80 47 14.89	5.14
	6744.00	87.82	328.89	5358.68	5113.00	516.67	564.14	-82.73	7.24	6.72	-2.68	488149.50	1638694.27	N 39 49 59.26 W	80 47 15.22	5.18
	6793.00	90.72	327.02	5350.28	5113.69	555.06	508.62	-104.00	8.21	6.21	0.33	488182.18	1638682.01	N 39 49 59.56 W	80 47 15.50	5.21
	6838.00	90.86	327.12	5357.86	5112.27	656.85	683.28	-150.98	0.17	0.14	0.10	488268.62	1638670.33	N 39 50 0.43 W	80 47 16.23	5.26
	6890.00	90.69	326.12	5356.58	5110.99	752.63	782.84	-210.32	1.06	-0.18	1.06	488347.99	1638659.69	N 39 50 1.20 W	80 47 16.89	5.31
	6937.00	91.00	326.87	5356.18	5109.50	847.54	843.97	-250.39	1.68	0.33	1.63	488420.32	1638241.63	N 39 50 2.00 W	80 47 17.54	5.36
	6985.00	90.65	326.86	5353.82	5108.23	942.48	924.75	-300.35	2.08	-0.37	-2.06	488510.00	1638191.67	N 39 50 2.70 W	80 47 18.19	5.40
	7040.00	90.65	326.86	5352.75	5107.16	1006.47	1007.45	-360.73	0.00	0.00	0.00	488588.80	1638140.29	N 39 50 3.54 W	80 47 18.87	5.44
	7090.00	90.69	327.90	5351.64	5106.05	1131.46	1083.48	-411.94	0.10	0.10	1.09	488665.80	1638095.81	N 39 50 4.26 W	80 47 19.54	5.48
	7144.00	90.41	327.29	5350.73	5105.14	1226.44	1183.67	-482.85	0.71	-0.29	-0.64	488749.00	1638035.18	N 39 50 5.13 W	80 47 20.20	5.51
	7199.00	90.14	324.65	5350.27	5104.68	1321.43	1242.48	-515.87	2.58	-0.28	-2.57	488827.61	1637985.16	N 39 50 6.00 W	80 47 20.90	5.55
	7244.00	90.72	326.40	5349.56	5103.97	1416.41	1320.89	-560.50	1.74	0.61	1.83	488906.21	1637931.53	N 39 50 6.87 W	80 47 21.60	5.58
	7290.00	90.78	326.46	5348.34	5102.75	1510.40	1399.20	-621.48	0.04	0.04	0.08	488984.52	1637879.58	N 39 50 7.44 W	80 47 22.28	5.61
	7336.00	90.86	327.27	5347.28	5101.33	1605.39	1478.74	-686.46	0.84	0.84	0.84	489064.08	1637827.04	N 39 50 8.21 W	80 47 22.94	5.64
	7382.00	90.83	323.10	5345.45	5099.86	1700.32	1559.89	-727.05	4.44	-0.14	-4.44	489144.00	1637773.90	N 39 50 8.97 W	80 47 23.68	5.68
	7429.00	91.13	323.12	5343.82	5098.23	1794.13	1631.86	-784.07	0.32	0.32	0.02	489217.17	1637719.98	N 39 50 9.71 W	80 47 24.41	5.70
	7476.00	90.70	322.86	5342.25	5096.66	1887.93	1708.91	-840.84	0.46	-0.38	-0.28	489292.21	1637666.40	N 39 50 10.45 W	80 47 25.15	5.73
	7523.00	91.07	324.86	5340.71	5095.12	1982.80	1793.82	-906.86	1.13	0.68	1.13	489368.81	1637612.51	N 39 50 11.20 W	80 47 25.88	5.76
	7570.00	91.07	323.97	5338.03	5093.34	2077.71	1880.86	-951.93	0.94	0.00	-0.04	489446.16	1637559.12	N 39 50 11.95 W	80 47 26.60	5.78
	7617.00	90.86	323.40	5337.33	5091.74	2172.57	1937.44	-1008.12	0.55	-0.22	-0.51	489522.73	1637505.93	N 39 50 12.70 W	80 47 27.34	5.80
	7664.00	90.82	323.80	5335.95	5090.36	2266.42	2013.04	-1063.97	0.12	0.12	0.12	489599.33	1637451.05	N 39 50 13.44 W	80 47 28.07	5.82
	7711.00	90.65	323.77	5334.74	5089.15	2361.20	2109.23	-1120.23	0.24	-0.04	0.18	489674.86	1637397.28	N 39 50 14.26 W	80 47 28.80	5.84
	7758.00	90.83	323.63	5333.43	5087.84	2456.16	2184.24	-1178.33	0.30	0.20	0.20	489751.51	1637343.73	N 39 50 14.94 W	80 47 29.53	5.86
	7805.00	90.86	323.96	5331.96	5086.37	2550.05	2242.17	-1231.71	0.16	-0.07	0.14	489827.45	1637289.35	N 39 50 15.68 W	80 47 30.28	5.88
	7852.00	90.72	323.95	5330.65	5085.06	2644.03	2318.98	-1287.61	0.15	-0.15	-0.01	489904.25	1637235.18	N 39 50 16.43 W	80 47 30.99	5.90
	7899.00	90.86	324.24	5329.27	5083.88	2738.83	2395.11	-1343.79	0.40	0.26	0.31	489980.37	1637181.34	N 39 50 17.17 W	80 47 31.71	5.92
	7946.00	91.27	323.88	5327.42	5081.63	2833.72	2472.05	-1398.42	0.44	0.33	-0.20	490057.31	1637127.65	N 39 50 17.93 W	80 47 32.44	5.94
	7993.00	91.24	323.84	5325.34	5079.75	2928.50	2548.70	-1454.38	0.13	-0.03	-0.13	490134.05	1637074.70	N 39 50 18.68 W	80 47 33.17	5.96
	8040.00	91.34	324.97	5323.20	5077.81	3023.49	2626.02	-1509.66	1.19	0.11	1.19	490211.27	1637021.42	N 39 50 19.43 W	80 47 33.89	5.98
	8087.00	91.31	324.07	5321.03	5075.44	3117.40	2702.54	-1564.21	0.98	-0.03	-0.06	490288.79	1636968.68	N 39 50 20.18 W	80 47 34.60	5.99
	8134.00	90.42	323.68	5319.72	5074.13	3212.26	2779.27	-1620.21	1.17	-1.09	-0.41	490364.51	1636915.88	N 39 50 20.93 W	80 47 35.34	6.01
	8181.00	90.56	324.54	5319.04	5073.45	3307.18	2856.23	-1675.90	0.95	0.29	0.61	490441.47	1636862.15	N 39 50 21.68 W	80 47 36.06	6.03
	8228.00	90.27	323.88	5318.37	5072.78	3401.06	2932.48	-1730.67	0.78	-0.20	-0.70	490517.71	1636807.23	N 39 50 22.43 W	80 47 36.78	6.05
	8275.00	90.21	324.65	5317.89	5072.30	3496.01	3009.50	-1786.35	0.61	0.04	0.61	490594.82	1636754.75	N 39 50 23.18 W	80 47 37.51	6.06
	8322.00	90.34	323.88	5317.43	5071.84	3589.93	3089.88	-1841.26	0.84	-0.07	-0.84	490671.11	1636702.04	N 39 50 23.93 W	80 47 38.23	6.08
	8369.00	90.82	324.68	5316.72	5071.13	3684.84	3163.00	-1896.74	0.95	0.40	0.86	490748.22	1636649.37	N 39 50 24.68 W	80 47 38.95	6.10
	8416.00	90.72	323.67	5315.61	5070.02	3779.75	3240.02	-1952.34	1.07	1.00	-1.06	490825.24	1636596.44	N 39 50 25.44 W	80 47 39.68	6.11
	8463.00	90.86	324.14	5314.47	5068.88	3874.83	3316.78	-2008.30	0.50	-0.07	0.49	490901.89	1636543.17	N 39 50 26.19 W	80 47 40.41	6.13
	8510.00	90.72	325.13	5313.35	5067.78	3968.57	3393.42	-2062.70	0.84	1.05	0.60	490978.63	1636489.81	N 39 50 26.94 W	80 47 41.12	6.14
	8557.00	90.86	325.23	5312.04	5066.45	4063.53	3471.61	-2116.94	0.19	0.15	0.11	491056.61	1636436.17	N 39 50 27.70 W	80 47 41.83	6.16
	8604.00	90.89	324.96	5310.50	5065.00	4158.42	3549.32	-2171.29	0.27	0.03	-0.26	491134.52	1636382.84	N 39 50 28.46 W	80 47 42.54	6.17
	8651.00	90.86	325.30	5309.07	5063.48	4253.44	3627.04	-2227.00	0.35	0.07	0.34	491211.64	1636329.12	N 39 50 29.22 W	80 47 43.25	6.19
	8698.00	91.61	324.86	5307.61	5061.35	4347.41	3705.31	-2277.00	0.82	0.68	1.70	491289.				

51-01629

Comments MD (ft) Incl (°) Adm Grid (°) TVD (ft) TVDSS (ft) VSEC (ft) NS (ft) EW (ft) DLS (°/100ft) BR (°/100ft) TR (°/100ft) Northing (ftUS) Easting (ftUS) Latitude (N/S ° °') Longitude (E/W ° °') Directional Difficulty Index

Survey Type: Def Survey

Survey Error Model: ISCVSA 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
	1	0.000	25.970	Act Strs	30.000	30.000	SLB_HSG+MSHOT-Depth Only	Original Borehole / Noble Energy MND9FHS Gyro+MWD 0ft to 15598ft MD
	1	25.970	2478.000	Act Strs	30.000	30.000	SLB_HSG+MSHOT	Original Borehole / Noble Energy MND9FHS Gyro+MWD 0ft to 2478ft MD
	1	2478.000	2816.000	Act Strs	30.000	30.000	SLB_MWD-RIC_ONLY	Original Borehole / Noble Energy MND9FHS Gyro+MWD 0ft to 2816ft MD
	1	2816.000	15507.000	Act Strs	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy MND9FHS Gyro+MWD 0ft to 15507ft MD
	1	15507.000	15598.000	Act Strs	30.000	30.000	SLB_BLND+TREND	Original Borehole / Noble Energy MND9FHS Gyro+MWD 0ft to 15598ft MD

12/12/2014

