

CNX SHR-38F-HSM Surveys Off to 16418ft MD Survey Geodetic Report

(Def Survey)

Report Date: July 17, 2019 - 04:17 PM
 Client: CNX Gas
 Fluid: WV Tyler County (NAD 27)
 Structure / Slot: CNX SHR-38F Pad / SHR-38F-HSM
 Well: SHR-38F-HSM
 Borehole: Original Borehole
 UWI / API#: Unknown / Unknown
 Survey Name: CNX SHR-38F-HSM Surveys Off to 16418ft MD
 Survey Date: June 19, 2019
 Tort / AHD / DDI / ERD Ratio: 284.081 / 11033.968 ft / 0.895 / 1.886
 Coordinates Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
 Location Lat / Long: N 30° 22' 10.76500" W 80° 52' 7.36657"
 Location Grid NE / YR: N 320182 544 NUS, E 1022401.120 RUS
 CR8 Grid Convergence Angle: -0.8517 °
 Grid Scale Factor: 0.99996067
 Version / Patch: 2.10.763.0

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Admitt: 161.000 " (Grid Norm)
 Vertical Section Origin: 0.000 R, 0.000 R
 TVD Reference Datum: KB
 TVD Reference Elevation: 1040.630 ft above MSL
 Subsoil / Ground Elevation: 1011.650 ft above MSL
 Magnetic Declination: -7.708 °
 Total Gravity Field Strength: 980.3213mgn (0.80065 Base)
 Gravity Model: GARM
 Total Magnetic Field Strength: 51825.908 nT
 Magnetic Dip Angle: 95.452 °
 Declination Date: June 18, 2019
 Magnetic Declination Model: HDQM2010
 North Reference: Grid North
 Grid Convergence Used: -0.8517 °
 Total Corr Mag North-Grid North: -0.8602 °
 Local Coord Reference To: Well Head

Comments	MD (ft)	Incl (°)	Asm Grid (ft)	TVD (ft)	TVDBS (ft)	VREB (ft)	NS (ft)	EW (ft)	DLS (ft)	TF (ft)	BR (ft)	TR (ft)	Northing (ft)	Easting (ft)	Latitude (ft)	Longitude (ft)	Directional
SHL	0.00	0.00	0.00	0.00	-1040.53	0.00	0.00	0.00	N/A	82.59M	N/A	N/A	320182.54	1022401.12	30.37133217	-80.83537780	0.00
	118.00	0.34	82.09	118.00	-825.53	0.06	0.06	0.24	0.20	87.29M	0.00	0.00	320182.56	1022401.48	30.37133231	-80.83537947	0.00
	215.00	0.26	67.29	215.00	-825.53	0.11	0.10	0.87	0.10	84.35M	-0.05	-14.80	320182.73	1022401.90	30.37133271	-80.83537481	0.00
	315.00	0.31	84.35	315.00	-726.53	0.20	0.20	1.37	0.14	130.61M	0.02	27.06	320182.89	1022402.48	30.37133284	-80.83537283	0.00
	415.00	0.22	130.97	415.00	-825.53	0.47	0.12	1.78	0.10	127.87M	-0.00	38.10	320182.89	1022402.90	30.37133286	-80.83537136	0.15
	515.00	0.09	127.97	515.00	-525.53	0.70	-0.08	1.90	0.13	109.36M	-0.13	-2.54	320182.40	1022401.11	30.37133209	-80.83537081	0.28
	615.00	0.15	106.35	614.00	-425.54	0.85	-0.15	2.18	0.07	246.23M	0.00	-18.02	320182.40	1022403.30	30.37133185	-80.83536965	0.35
	715.00	0.26	246.23	714.00	-325.54	0.91	-0.21	2.21	0.20	278.43M	-0.30	138.87	320182.23	1022403.37	30.37133168	-80.83536906	0.45
	815.00	0.00	278.43	814.00	-225.54	0.80	-0.22	2.13	0.06	196.77M	0.03	33.21	320182.32	1022403.25	30.37133165	-80.83537012	0.50
	915.00	0.10	196.77	914.00	-125.54	0.93	-0.20	2.02	0.12	204.98M	0.01	-80.05	320182.26	1022403.14	30.37133145	-80.83537040	0.60
	1015.00	0.08	204.98	1014.00	-25.54	1.04	-0.42	1.97	0.04	4.84M	-0.04	8.21	320182.12	1022403.00	30.37133100	-80.83537090	0.00
	1115.00	0.07	4.84	1114.00	74.40	1.02	-0.41	1.95	0.01	158.05	0.01	158.05	320182.14	1022402.87	30.37133113	-80.83537072	0.04
	1215.00	0.10	265.52	1214.00	174.40	0.94	-0.36	1.87	0.13	136.87M	0.03	-48.17	320182.19	1022402.90	30.37133127	-80.83537102	0.70
	1315.00	0.23	1314.99	1314.00	274.40	0.80	-0.51	1.62	0.20	147.98M	0.15	-128.65	320182.04	1022403.04	30.37133084	-80.83537053	0.90
	1415.00	0.29	147.06	1414.00	374.40	1.53	-0.80	2.20	0.08	175.37M	0.08	10.21	320181.98	1022402.32	30.37132998	-80.83536904	0.87
	1515.00	0.42	175.37	1514.00	474.40	2.13	-1.44	2.30	0.21	130.02M	0.13	28.20	320181.10	1022403.48	30.37133020	-80.83536922	0.08
	1615.00	0.34	130.02	1614.00	574.40	2.87	-2.06	2.24	0.27	138.08M	0.00	-45.26	320180.45	1022403.80	30.37132953	-80.83536786	1.12
	1715.00	0.78	138.08	1714.00	674.45	3.88	-2.75	3.53	0.28	138.21M	0.27	8.04	320180.09	1022404.05	30.37132939	-80.83536902	1.26
	1815.00	0.82	138.21	1814.87	774.44	5.17	-3.93	4.46	0.40	164.05M	0.04	0.15	320180.82	1022404.58	30.37132917	-80.83536167	1.36
	1915.00	0.41	164.05	1914.87	874.44	6.18	-4.81	5.03	0.49	134.22M	-0.41	28.84	320181.74	1022404.18	30.37133101	-80.83536560	1.47
	2015.00	0.30	134.22	2014.90	974.43	6.84	-5.30	5.37	0.21	148.75M	-0.02	-0.74	320181.76	1022404.40	30.37133159	-80.83536530	1.57
	2115.00	0.34	148.75	2114.85	1074.43	7.44	-6.86	5.77	0.10	200.95M	-0.06	14.53	320180.88	1022404.80	30.37133129	-80.83536599	1.63
	2215.00	0.26	200.95	2214.85	1174.43	7.93	-7.59	5.91	0.23	170.78M	0.00	51.81	320180.24	1022404.91	30.37133168	-80.83536541	1.70
	2315.00	0.10	170.75	2314.96	1274.43	7.83	-8.24	5.93	0.00	150.26M	0.09	-29.91	320180.31	1022404.05	30.37133129	-80.83536537	1.83
	2415.00	0.22	150.26	2414.90	1374.43	8.10	-8.40	6.04	0.13	224.37M	0.12	-20.40	320180.06	1022404.19	30.37133140	-80.83536567	1.96
	2515.00	0.12	224.37	2514.90	1474.43	8.34	-8.73	6.06	0.22	227.14M	-0.10	7.11	320180.81	1022404.17	30.37133194	-80.83536588	1.90
	2556.00	0.06	227.14	2555.90	1515.43	8.36	-8.78	6.01	0.16	211.44M	-0.15	16.76	320180.77	1022404.13	30.37133191	-80.83536604	1.70
	2648.00	0.11	211.44	2647.96	1607.43	8.44	-8.88	5.93	0.06	322.87M	0.06	-17.11	320180.58	1022404.07	30.37133151	-80.83536532	1.71
	2733.00	0.21	322.87	2732.95	1699.43	8.59	-9.15	5.82	0.16	318.18M	0.17	31.88	320180.24	1022404.04	30.37133108	-80.83537053	2.00
	2818.00	4.30	216.14	2817.82	1777.20	8.15	-10.00	2.11	3.19	310.76M	3.16	-7.60	320180.94	1022403.23	30.37133211	-80.83537000	2.18
	2903.00	5.27	310.75	2902.52	1861.96	-3.18	2.20	-3.11	1.16	307.88M	1.04	-5.34	320180.84	1022403.01	30.37133233	-80.83536876	2.38
	2988.00	3.07	307.88	2987.12	1946.69	-16.38	7.50	-9.40	0.78	307.17M	0.88	-3.47	320180.74	1022403.83	30.37133236	-80.83534180	2.54
	3072.00	7.45	307.17	3070.55	2030.02	-18.28	13.41	-17.21	1.91	306.58M	1.90	-0.75	320180.85	1022403.91	30.37133027	-80.83534922	2.71
	3168.00	8.50	306.58	3163.74	2113.21	-27.82	20.36	-26.54	1.25	214.88M	1.25	-0.80	320180.94	1022404.58	30.37133076	-80.83547250	2.86
	3242.00	8.94	307.81	3238.74	2198.21	-38.74	28.25	-36.94	0.55	131.81M	0.51	1.29	320180.79	1022404.18	30.37134021	-80.83536070	2.97
	3327.00	10.52	300.84	3322.50	2281.87	-50.08	37.30	-48.19	2.03	7.00L	1.98	2.02	320180.84	1022442.83	30.37143259	-80.83556004	3.10
	3411.00	12.26	308.88	3404.83	2364.30	-66.14	47.89	-61.08	1.87	6.51L	1.95	-1.14	320210.40	1022260.80	30.37148105	-80.83569182	3.26
	3495.00	14.20	340.88	3407.61	2447.66	-81.41	58.14	-78.20	0.92	2.02L	1.96	0.67	320210.24	1022241.92	30.37148105	-80.83569182	3.42
	3582.00	15.70	306.61	3570.73	2530.20	-96.74	73.22	-102.70	2.02	0.81L	1.98	-0.80	320230.76	1022307.40	30.37152933	-80.83671300	3.60
	3608.00	17.81	305.52	3051.21	2610.08	-119.47	87.38	-113.20	2.30	1.14L	2.27	-1.30	320249.82	1022377.93	30.37156741	-80.83672590	3.87
	3758.00	18.45	305.41	3736.54	2690.01	-142.74	103.87	-136.49	2.04	0.12L	2.04	-0.12	320296.61	1022354.64	30.37181201	-80.83586585	3.57
	3842.00	18.43	301.33	3817.83	2777.10	-169.03	120.58	-150.81	0.05	164.89L	-0.02	0.12	320283.11	1022331.32	30.37189504	-80.83584817	3.74
	3928.00	18.48	306.32	3909.67	2858.44	-188.89	138.96	-182.43	1.15	35.82R	-1.10	0.94	320299.40	1022308.70	30.37170099	-80.83593000	3.80
	4011.00	19.21	304.88	3977.83	2937.52	-210.74	152.75	-203.89	0.37	3.78R	0.30	0.67	320315.28	1022291.44	30.37174319	-80.83591000	3.85
	4095.00	19.28	308.99	4057.06	3016.52	-233.40	168.18	-225.55	0.00	20.83L	0.05	0.13	320331.72	1022266.58	30.37178739	-80.83618420	3.91
	4180.00	19.80	308.11	4137.15	3096.83	-256.84	186.11	-249.30	0.70	58.37L	0.81	-1.04	320348.65	1022242.74	30.37182393	-80.83625563	3.92
	4268.00	20.11	311.77	4217.80	3177.27	-281.11	202.70	-273.22	2.24	88.28L	1.24	-5.35	320365.24	1022217.91	30.37187748	-80.83634482	4.02
	4352.00	21.00	296.84	4296.13	3257.80	-303.30	217.43	-300.16	2.30	106.75L	0.15	-6.06	320379.90	1022190.98	30.37191678	-80.83645024	4.20
	4438.00	20.27	290.02	4378.73	3338.20	-323.12	228.90	-327.44	2.58	130.19R	-0.75	-6.03	320391.53	1022163.70	30.37194742	-80.83647475	4.15
	4522.00	19.01	295.24	4457.70	3417.17	-342.32	240.09	-346.18	2.66	123.70R	-1.58	0.67	320402.82	1022138.90	30.37197978	-80.83642860	4.21
	4608.00	18.87	298.80	4537.20	3499.07	-361.51	252.00	-378.55	0.74	79.24R	0.50	1.93	320414.53	1022115.59	30.37200840	-80.83709770	4.24
	4691.00	19.04	301.78	4617.95	3577.12	-382.02	265.45	-402.47	1.92	81.93R	0.44	5.79	320427.88	1022098.67	30.37206443	-80.83706122	4.28
	4778.00	20.21	315.25	4697.75	3657.22	-401.00	283.19	-424.80	0.49	117.85L	1.38	15.86	320445.12	1022076.54	30.37209223	-80.83696424	4.26
	4861.00	19.57	315.20	4777.05	3737.12	-422.11	303.77	-445.02	0.84	125.63L	-0.64	-0.07	320460.30	1022054.12	30.37214789	-80.83706822	4.30
	4948.00	18.93	311.80	4857.88	3817.35	-457.03	323.13	-466.36	1.56	8.94R	-0.87	-3.80	320486.88	1022025.78	30.37220200	-80.83704049	4.42
	5031.00	19.82	312.14	4938.11	3897.58	-481.58	341.91	-480.21	0.82	4.55R	0.81	0.20	320504.44	1022004.94	30.37225090		

Comments	MD (ft)	Incl (°)	Asm Grid (ft)	TVD (ft)	TVD85 (ft)	VSEC (ft)	NS (ft)	EW (ft)	DL8 (ft/100ft)	TF (ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ft)	Easting (ft)	Latitude (ft)	Longitude (ft)	Directional
	7630.00	00.00	168.51	6520.71	5489.18	5604.04	-700.20	-462.30	0.13	83.54L	-0.08	0.12	319203.36	1622008.84	30.26670214	-80.83062670	6.65
	7730.00	00.72	157.98	6530.22	5489.99	674.83	-467.43	-417.00	0.56	81.60R	0.00	-0.56	319205.10	1622074.06	30.26690137	-80.83067022	5.87
	7827.00	00.85	160.02	6530.73	5490.20	786.89	-445.18	-383.40	2.17	136.17R	-0.00	-2.17	319217.41	1622107.74	30.26872186	-80.83068388	5.70
	7922.00	00.16	180.50	6531.71	5491.18	863.85	-1004.80	-361.32	0.73	72.55L	-0.63	0.51	319218.00	1622136.82	30.26847772	-80.83066772	6.72
	8018.00	00.55	159.28	6532.77	5492.24	957.82	-1122.85	-348.99	1.38	86.09R	0.41	-1.32	319208.75	1622172.15	30.26823878	-80.83064872	5.75
	8111.00	00.80	164.20	6533.23	5492.70	1032.78	-1212.03	-289.22	0.21	85.27L	0.36	5.20	319049.57	1622201.92	30.26799042	-80.83052000	6.18
	8206.00	00.76	190.07	6533.50	5492.97	1148.74	-1302.71	-291.00	3.44	119.54L	-0.12	-3.44	318850.90	1622230.05	30.26774330	-80.83052549	5.81
	8298.00	00.51	190.27	6534.00	5493.47	1240.74	-1391.48	-230.00	0.27	87.71R	-0.18	-0.26	318771.12	1622260.93	30.26750203	-80.83041181	6.83
	8388.00	00.55	182.77	6534.70	5494.17	1335.70	-1481.30	-199.23	0.63	117.96L	-0.00	-0.63	318681.32	1622291.90	30.26726787	-80.83030455	5.85
	8488.00	00.38	190.96	6535.58	5495.05	1429.73	-1570.23	-189.80	0.39	87.16L	-0.18	-0.34	318592.30	1622322.33	30.26703333	-80.83019826	6.87
	8583.00	00.83	159.88	6536.23	5495.70	1524.72	-1660.73	-136.65	1.22	112.09R	0.47	-1.13	318502.90	1622354.17	30.26677000	-80.83007733	5.90
	8677.00	00.27	161.26	6536.67	5496.44	1618.71	-1748.37	-106.00	1.58	80.89R	-0.00	-1.47	318414.28	1622385.44	30.26652833	-80.83005690	6.80
	8772.00	00.38	181.56	6538.09	5497.56	1713.70	-1838.41	-76.40	0.34	60.64R	0.12	0.32	318329.23	1622416.72	30.26628240	-80.83004772	5.83
	8868.00	00.72	161.98	6538.83	5498.30	1807.80	-1927.88	-45.98	0.55	82.90L	0.36	0.43	318244.09	1622447.14	30.26603653	-80.83003853	6.86
	8961.00	00.86	161.02	6539.34	5498.81	1902.88	-2017.77	-15.83	0.80	111.11R	-0.00	-0.98	318154.88	1622478.20	30.26579247	-80.83002875	5.90
	9055.00	00.44	161.80	6540.08	5499.55	1998.08	-2108.81	14.28	0.95	85.82L	-0.23	0.01	318065.84	1622508.40	30.26554626	-80.83001840	6.00
	9150.00	00.55	180.78	6540.98	5500.43	2091.87	-2198.73	44.81	0.87	85.43R	0.00	-0.86	317976.92	1622539.03	30.26530096	-80.83000836	5.98
	9244.00	00.06	161.13	6541.85	5501.12	2185.07	-2288.56	75.58	0.41	88.99R	0.17	0.37	317887.00	1622569.70	30.26505100	-80.83000022	6.04
	9338.00	00.72	164.37	6542.16	5501.83	2279.01	-2378.34	103.45	3.45	84.84L	0.00	3.45	317797.32	1622600.67	30.264801674	-80.83000004	6.01
	9433.00	00.89	182.49	6542.48	5502.56	2374.55	-2468.38	130.56	1.98	105.32L	0.18	-0.31	317708.28	1622631.08	30.26454686	-80.83000000	6.05
	9527.00	00.84	158.02	6543.44	5503.81	2468.50	-2558.12	181.52	3.83	133.05L	-1.01	-3.80	317619.55	1622662.83	30.26429250	-80.83001715	6.08
	9622.00	00.22	158.71	6544.14	5503.81	2563.43	-2643.70	199.77	1.30	80.98R	1.35	-0.30	317531.85	1622694.86	30.26404276	-80.83001663	6.00
	9718.00	00.11	180.29	6543.86	2957.40	2657.40	-2731.77	228.80	1.86	81.24L	-0.12	1.88	317443.80	1622726.81	30.26379241	-80.83001663	6.03
	9811.00	00.17	158.04	6543.83	2563.10	2757.07	-2820.85	281.70	3.22	102.91R	0.00	-0.32	317354.84	1622758.07	30.26354222	-80.83003032	6.10
	9906.00	00.06	158.52	6543.44	2562.81	2848.33	-2908.77	294.08	0.52	80L	-0.12	0.51	317265.92	1622789.67	30.26329247	-80.83018170	6.14
	9996.00	00.05	158.42	6543.35	2562.82	2940.29	-2998.80	327.93	0.11	83.94L	0.00	-0.11	317176.90	1622821.03	30.263041862	-80.83000800	6.16
	10084.00	00.17	160.45	6543.15	3036.27	3036.27	-3086.03	380.52	1.00	81.36R	0.12	1.02	317087.62	1622852.62	30.26279247	-80.83004050	6.18
	10188.00	00.22	160.78	6542.83	3032.29	3129.27	-3174.70	391.72	0.36	100.67R	0.06	0.35	316998.01	1622884.82	30.26254215	-80.83002588	6.10
	10285.00	00.83	162.85	6542.79	3032.29	3224.26	-3263.85	421.37	0.61	81.24R	-0.12	0.61	316908.28	1622916.14	30.26229247	-80.83001663	6.28
	10378.00	00.86	163.24	6542.63	3032.60	3319.16	-3353.82	447.07	0.42	79.80L	0.06	0.41	316819.00	1622947.10	30.26204276	-80.83001663	6.21
	10472.00	00.11	162.01	6543.35	3032.60	3413.18	-3443.53	477.14	1.33	102.41R	0.23	-1.13	316730.17	1622978.24	30.26180217	-80.83005029	6.20
	10567.00	00.00	162.51	6542.03	3032.60	3508.13	-3534.01	508.00	0.54	80L	-0.12	0.53	316641.26	1622999.18	30.26155250	-80.83002100	6.24
	10661.00	00.00	161.80	6542.90	3032.60	3602.11	-3624.51	534.81	0.85	104.74R	0.00	-0.85	316552.22	1623030.51	30.26130281	-80.83002501	6.25
	10756.00	00.78	161.98	6543.12	3032.60	3697.10	-3713.83	564.28	0.24	81.11L	-0.23	0.23	316463.01	1623061.37	30.26105311	-80.83002577	6.27
	10849.00	00.84	161.97	6543.35	3032.60	3791.00	-3803.19	594.82	0.35	86.89R	-0.17	0.31	316373.81	1623092.71	30.26080345	-80.83001663	6.20
	10944.00	00.06	163.86	6543.35	3032.62	3884.04	-3894.91	624.17	2.33	94.16L	0.13	2.00	316284.64	1623124.55	30.26055366	-80.83001663	6.20
	11089.00	00.84	162.21	6543.35	3032.62	3979.07	-3986.77	654.19	1.74	83.29L	-0.13	-1.74	316195.98	1623156.27	30.26030345	-80.83002757	6.31
	11133.00	00.80	160.34	6543.49	3032.62	4073.89	-4073.89	684.86	1.88	81.24L	-0.12	-1.88	316107.20	1623188.87	30.26005311	-80.83002757	6.32
	11228.00	00.11	161.31	6544.13	3032.80	4168.90	-4168.90	714.00	1.00	72.72L	-0.59	-0.03	316018.21	1623220.00	30.25980345	-80.83002588	6.30
	11322.00	00.81	160.41	6545.00	3032.80	4262.80	-4262.80	739.82	1.50	104.46R	0.30	-0.60	315929.81	1623251.00	30.25955366	-80.83002588	6.35
	11417.00	00.44	159.07	6545.79	3032.80	4357.95	-4357.95	771.16	0.78	86.78L	-0.18	0.80	315840.64	1623282.24	30.25930345	-80.83002588	6.30
	11511.00	00.55	159.12	6546.82	3032.80	4451.93	-4451.93	803.18	2.02	89.46R	0.12	0.97	315751.70	1623313.48	30.25905311	-80.83002757	6.37
	11606.00	00.84	160.16	6547.04	3032.80	4545.80	-4545.80	835.80	1.18	100.00L	0.41	1.11	315662.76	1623344.62	30.25880345	-80.83002588	6.38
	11699.00	00.83	159.84	6547.23	3032.80	4639.86	-4639.86	868.24	0.87	116.80R	-0.12	0.87	315573.81	1623375.76	30.25855366	-80.83002588	6.41
	11794.00	00.86	159.24	6547.85	3032.80	4734.16	-4734.16	901.44	1.18	83.3L	-0.18	0.01	315484.80	1623406.90	30.25830345	-80.83002588	6.46
	11889.00	00.72	158.82	6548.16	3032.80	4828.80	-4828.80	935.20	0.77	86.84R	0.00	-0.77	315395.71	1623438.04	30.25805311	-80.83002588	6.42
	11983.00	00.11	158.48	6548.30	3032.80	4923.75	-4923.75	968.87	0.80	131.35R	0.41	0.88	315306.67	1623469.18	30.25780345	-80.83002588	6.43
	12078.00	00.80	158.71	6548.30	3032.80	5018.72	-5018.72	1001.81	0.35	83.7R	-0.23	0.20	315217.62	1623500.32	30.25755366	-80.83002588	6.44
	12172.00	00.06	161.23	6548.34	3032.80	5112.71	-5112.71	1035.21	1.85	80.09R	0.18	1.84	315128.58	1623531.46	30.25730345	-80.83002588	6.45
	12267.00	00.28	162.51	6548.00	3032.80	5207.70	-5207.70	1068.70	1.35	90.92R	0.23	1.33	315039.54	1623562.60	30.25705366	-80.83002588	6.48
	12361.00	00.27	160.21	6547.95	3032.80	5301.52	-5301.52	1102.10	3.84	98.45L	-0.00	3.84	314950.46	1623593.74	30.25680345	-80.83002588	6.48
	12456.00	00.56	166.94	6547.00	3032.80	5395.15	-5395.15	1135.80	0.46	92.72L	0.36	-0.28	314861.27	1623624.88	30.25655366	-80.83002588	6.40
	12550.00	00.36	162.38	6548.22	3032.80	5489.80	-5489.80	1169.51	1.39	83.82L	-0.18	-1.39	314772.12	1623656.02	30.25630345	-80.83002588	