

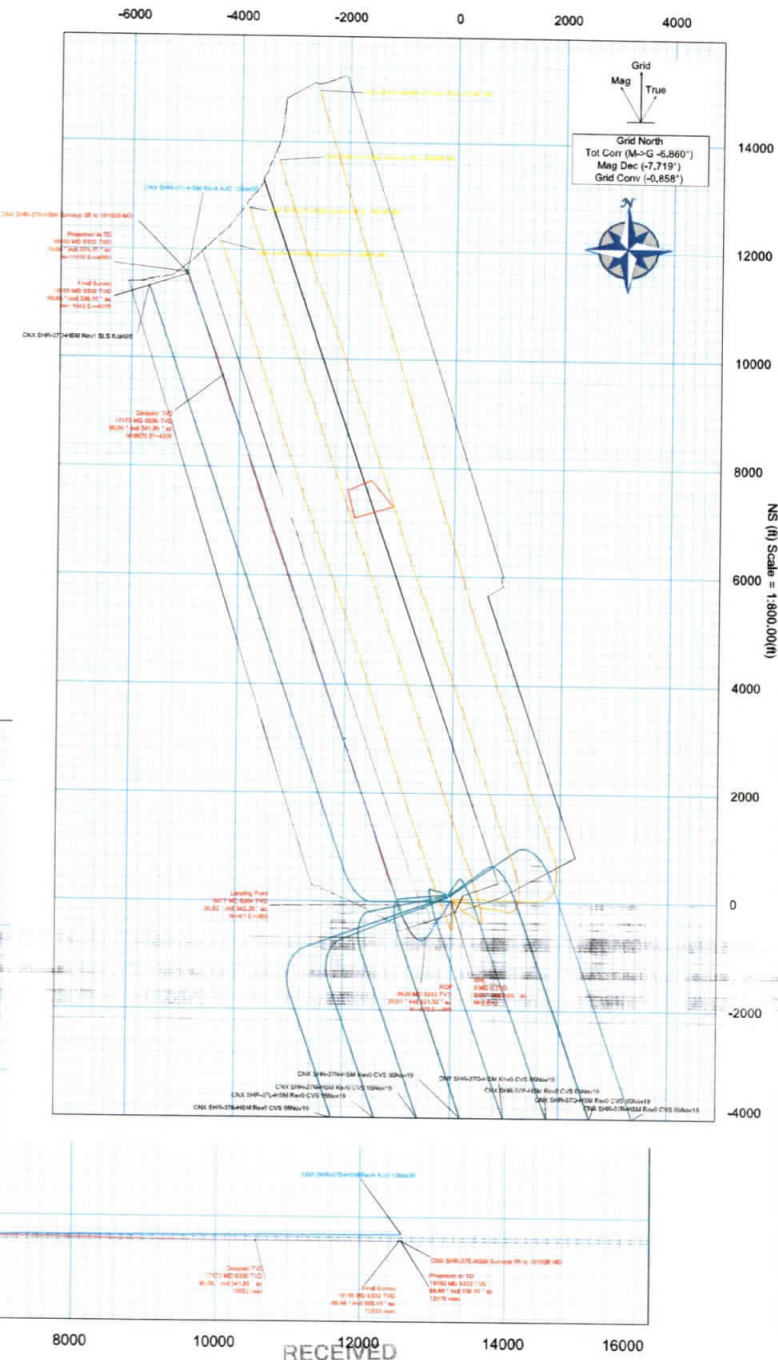
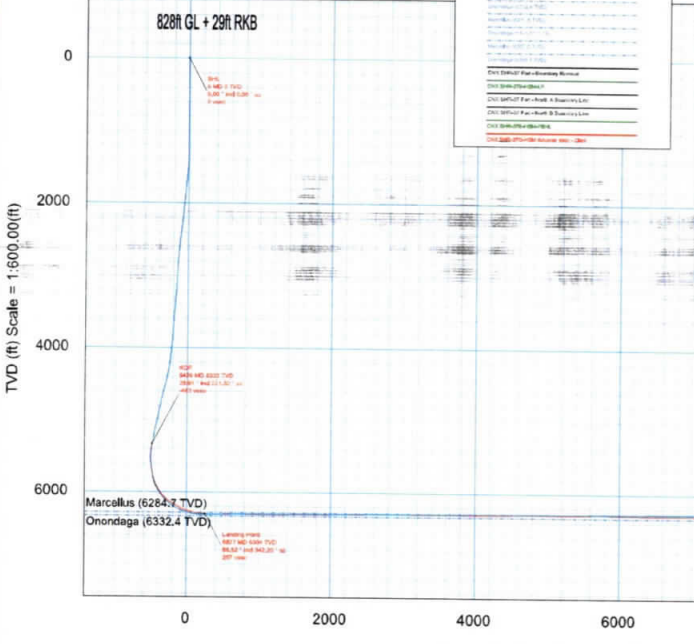
Borehole:		Well:		Field:		Structure:	
Original Borehole		SHR-37E-HSM		WV Tyler County (NAD 27)		Patterson 563	
Gravity & Magnetic Parameters				Surface Location			
Model:	HGDM 2019	Dip:	66.351°	Date:	12-Mar-2020	Lat:	N 39 21 11.27
MagDec:	-7.719°	FS:	51729.327nT	Gravity FS:	999.336mgn (R.0665 Based)	Northing:	313577.258US
						Grid Conv:	-0.8582°
						Scale Fact:	6.9995202
						Miscellaneous	
						Slot:	SHR-37E-HSM
						TVD Ref:	RKB(657R) above MSL
						Plan:	CNX SHR-37E-HSM Surveys 0R to 19192R MD

Critical Points							
MD	INCL	AZM	TVD	YSEC	N+V/E-1	E+V/W-4	DLS
5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
4733.61	76.85	398.47	8338.70	-485.63	-485.67	-485.71	1.33
8977.07	96.52	342.22	8338.31	227.43	-4.14	-486.23	6.46
16900.47	95.78	348.94	8332.85	-1001.21	979.93	-4155.73	0.87
17173.20	95.06	341.05	8334.24	1001.79	979.94	-4156.27	1.37
18068.07	95.25	336.61	8332.43	1467.73	1084.63	-4611.12	0.87
19192.00	95.88	335.10	8332.29	1933.62	1194.21	-4976.10	1.49
19192.00	95.88	335.10	8332.29	12476.60	11747.07	-4976.10	0.00

MD	INCL	AZM	TVD	YSEC	N+V/E-1	E+V/W-4	DLS
1	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0

Surface Location								
Target Name	Shape	Dimension	Altitude	Longitude	Northing	Easting	TVD	
CNX SHR37E-Fat-Boundary	PubN	N/A	N 39 24 52.85 W 80 50 44.70	30008.76	111933.13	857.00	21157.22	24234.4
CNX SHR37E-Fat-North A	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31472.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North B	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North C	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North D	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North E	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North F	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North G	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North H	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North I	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82
CNX SHR37E-Fat-North J	PubN	N/A	N 39 21 11.23 W 80 50 44.14	31372.86	111933.02	857.00	-11.26	47.82

- CNX SHR37E-Fat-Boundary
- CNX SHR37E-Fat-North A
- CNX SHR37E-Fat-North B
- CNX SHR37E-Fat-North C
- CNX SHR37E-Fat-North D
- CNX SHR37E-Fat-North E
- CNX SHR37E-Fat-North F
- CNX SHR37E-Fat-North G
- CNX SHR37E-Fat-North H
- CNX SHR37E-Fat-North I
- CNX SHR37E-Fat-North J
- CNX SHR37E-Fat-North K
- CNX SHR37E-Fat-North L
- CNX SHR37E-Fat-North M
- CNX SHR37E-Fat-North N
- CNX SHR37E-Fat-North O
- CNX SHR37E-Fat-North P
- CNX SHR37E-Fat-North Q
- CNX SHR37E-Fat-North R
- CNX SHR37E-Fat-North S
- CNX SHR37E-Fat-North T
- CNX SHR37E-Fat-North U
- CNX SHR37E-Fat-North V
- CNX SHR37E-Fat-North W
- CNX SHR37E-Fat-North X
- CNX SHR37E-Fat-North Y
- CNX SHR37E-Fat-North Z



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WV Department of
Environmental Protection

CONTROLLED

Drawn by: B. Shannon
Date: 11/08/2020
Scale: as shown

08/27/2021



CNX SHR-37E-HSM Surveys Off to 19192ft MD Survey Geodetic Report

(Def Survey)

Report Date:	March 17, 2020 - 03:37 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	CNX	Vertical Section Azimuth:	341.000 ° (Grid North)
Field:	WV Tyler County (NAD 27)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	CNX SHR-37 Pad / SHR-37E-HSM	TVD Reference Datum:	RKB
Well:	SHR-37E-HSM	TVD Reference Elevation:	857.000 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	828.000 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	-7.719 °
Survey Name:	CNX SHR-37E-HSM Surveys Off to 19192ft MD	Total Gravity Field Strength:	999.3376mgn (9.80665 Based)
Survey Date:	March 12, 2020	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	292.225 ° / 14054.844 ft / 7.095 / 2.218	Total Magnetic Field Strength:	51729.327 nT
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet	Magnetic Dip Angle:	66.353 °
Location Lat / Long:	N 39° 21' 11.26860", W 80° 50' 44.49871"	Declination Date:	March 12, 2020
Location Grid N/E / Y/X:	N 313577.250 RUS, E 1619475.600 HUS	Magnetic Declination Model:	HDGM 2019
CRS Grid Convergence Angle:	-0.8582 °	North Reference:	Grid North
Grid Scale Factor:	0.99995202	Grid Convergence Used:	-0.8582 °
Version / Patch:	2.10.794.0	Total Corr Mag North->Grid North:	-6.8603 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-857.00	0.00	0.00	0.00	N/A	54.71M	N/A	N/A	313577.25	1619475.60	39.35313017	-80.84569400	0.00
	100.00	0.37	54.71	100.00	-757.00	0.09	0.19	0.28	0.37	339.94M	0.37	0.00	313577.44	1619475.86	39.35313069	-80.84569316	0.00
	200.00	0.08	338.94	200.00	-657.00	0.25	0.44	0.50	0.36	347.44M	-0.29	-75.77	313577.69	1619476.10	39.35313139	-80.84569233	0.00
	300.00	0.09	347.44	300.00	-557.00	0.40	0.58	0.46	0.02	18.37M	0.01	8.50	313577.83	1619476.06	39.35313178	-80.84569249	0.00
	400.00	0.30	18.87	400.00	-457.00	0.68	0.90	0.53	0.23	80.31M	0.21	31.43	313578.15	1619476.13	39.35313267	-80.84569227	0.05
	504.00	0.18	80.31	504.00	-353.00	0.87	1.19	0.78	0.26	111.29M	-0.12	59.08	313578.44	1619476.38	39.35313346	-80.84569140	0.29
	599.00	0.34	111.29	599.00	-258.00	0.67	1.11	1.19	0.22	141.29M	0.17	32.61	313578.36	1619476.79	39.35313327	-80.84568995	0.46
	693.00	0.75	141.29	693.99	-184.01	-0.09	0.53	1.83	0.52	202.04M	0.44	31.91	313577.78	1619477.43	39.35313170	-80.84568764	0.74
	788.00	0.80	202.04	787.98	-90.02	-1.18	-0.57	1.97	0.83	243.05M	0.05	63.95	313576.69	1619477.57	39.35312889	-80.84568709	1.04
	882.00	2.06	243.05	881.96	24.96	-1.91	-1.94	0.22	1.65	251.64M	1.34	43.63	313575.31	1619475.82	39.35312484	-80.84569321	1.43
	977.00	3.38	251.64	976.85	119.85	-2.11	-3.60	-3.96	1.45	254.46M	1.39	9.04	313573.85	1619471.64	39.35312012	-80.84570790	1.78
	1071.00	4.65	254.46	1070.61	213.61	-1.85	-5.49	-10.26	1.37	255.62M	1.35	3.00	313571.78	1619465.34	39.35311487	-80.84573008	2.08
	1166.00	6.17	255.62	1165.19	308.19	-1.21	-7.79	-18.92	1.60	245.53M	1.60	1.22	313569.46	1619456.68	39.35310800	-80.84576056	2.35
	1354.00	7.34	245.53	1351.89	494.89	-1.54	-15.28	-39.64	0.88	230.52M	0.62	-5.37	313561.97	1619435.96	39.35308660	-80.84583342	2.69
	1449.00	6.78	230.52	1446.17	589.17	-4.08	-21.36	-49.49	2.02	210.21M	-0.59	-15.80	313555.89	1619426.11	39.35306951	-80.84586794	2.86
	1543.00	7.39	210.21	1539.47	682.47	-9.97	-30.11	-56.82	2.73	197.17M	0.65	-21.61	313547.14	1619418.79	39.35304518	-80.84589937	3.02
	1638.00	7.35	197.17	1633.69	776.69	-18.87	-41.20	-61.68	1.76	189.58M	-0.04	-13.73	313536.06	1619413.92	39.35301454	-80.84591000	3.13
	1732.00	7.56	189.58	1728.90	869.90	-29.15	-53.04	-64.49	1.07	199.67M	0.22	-8.07	313524.21	1619411.12	39.35298192	-80.84591929	3.22
	1827.00	7.41	199.67	1821.09	964.09	-39.42	-64.97	-67.59	1.39	208.25M	-0.16	10.62	313512.28	1619408.01	39.35294904	-80.84592962	3.30
	1921.00	7.30	208.25	1914.32	1057.32	-48.21	-75.94	-72.46	1.17	204.47M	-0.12	9.13	313501.32	1619403.15	39.35291873	-80.84594625	3.38
	2016.00	6.94	204.47	2008.59	1151.59	-56.47	-86.48	-77.69	0.62	211.19M	-0.38	-3.98	313490.78	1619397.91	39.35288957	-80.84596420	3.43
	2110.00	8.01	2101.79	2101.79	1244.79	-64.79	-97.25	-83.44	1.47	14.27R	1.14	7.15	313480.00	1619392.17	39.35285977	-80.84598394	3.50
	2204.00	9.24	213.13	2194.73	1337.73	-73.62	-109.17	-90.95	1.34	119.06L	1.31	2.06	313468.08	1619384.65	39.35282673	-80.84600988	3.56
	2275.00	8.67	205.37	2264.87	1407.87	-80.94	-118.78	-96.36	1.88	113.22L	-0.80	-10.93	313458.47	1619379.24	39.35280013	-80.84602850	3.62
	2401.00	8.03	189.37	2389.55	1502.55	-95.47	-136.05	-101.86	1.91	55.24R	-0.51	-12.70	313441.21	1619373.74	39.35275250	-80.84604704	3.70
	2495.00	8.99	197.44	2482.51	1625.51	-107.16	-149.54	-105.13	1.63	85.54R	1.02	8.59	313427.72	1619370.47	39.35271535	-80.84605789	3.76
	2589.00	9.53	212.97	2575.30	1718.30	-117.86	-163.07	-111.57	2.71	116.98R	0.57	16.52	313414.19	1619364.03	39.35267792	-80.84607993	3.83
	2684.00	9.25	216.62	2669.03	1812.03	-127.02	-175.80	-120.41	0.89	97.52L	-0.29	3.84	313401.46	1619355.20	39.35264262	-80.84611049	3.86
	2779.00	9.18	211.73	2762.81	1905.81	-136.13	-188.37	-128.95	0.83	167.87L	-0.07	-5.15	313388.89	1619346.66	39.35260775	-80.84614002	3.90
	2873.00	7.19	208.29	2855.84	1998.84	-144.87	-199.93	-135.68	2.18	221.22M	-2.12	-3.66	313377.33	1619339.93	39.35257575	-80.84616321	3.95
	2967.00	4.76	221.22	2949.33	2092.33	-150.79	-208.05	-141.04	2.94	232.87M	-2.59	13.76	313369.21	1619334.57	39.35253325	-80.84618173	4.00
	3061.00	6.51	232.87	3043.87	2186.87	-154.43	-214.26	-147.93	2.19	226.41M	1.84	12.26	313363.00	1619327.68	39.35250350	-80.84620576	4.04
	3155.00	9.26	226.41	3136.98	2279.98	-159.24	-222.70	-157.66	3.07	44.62L	2.93	-6.87	313354.57	1619317.95	39.35251395	-80.84623971	4.09
	3250.00	9.96	222.54	3230.64	2373.64	-166.33	-234.02	-168.75	1.00	174.68L	0.74	-4.07	313343.24	1619306.86	39.35248081	-80.84627833	4.12
	3344.00	7.99	221.22	3323.49	2466.49	-173.45	-244.92	-178.55	2.11	212.15M	-2.10	-1.40	313332.34	1619297.06	39.35245047	-80.84631241	4.16
	3438.00	6.91	221.25	3416.70	2559.70	-180.24	-254.63	-185.86	1.70	208.44M	-1.15	-9.65	313322.64	1619289.75	39.35242354	-80.84633775	4.20
	3532.00	6.72	208.44	3511.02	2654.02	-187.59	-264.35	-191.55	0.50	208.1M	-0.20	-3.91	313312.91	1619284.00	39.35239660	-80.84637435	4.21
	3626.00	6.27	208.10	3603.43	2746.43	-194.72	-273.62	-196.54	0.49	219.24M	-0.48	-0.37	313303.65	1619279.07	39.35237097	-80.84637448	4.23
	3720.00	6.23	219.24	3699.85	2842.85	-201.10	-282.37	-202.36	1.25	218.98M	-0.04	11.48	313294.90	1619273.25	39.35234671	-80.84639461	4.25
	3814.00	6.73	218.98	3794.25	2937.25	-206.77	-290.69	-209.12	0.53	217.69M	0.53	-0.27	313286.58	1619266.49	39.35232359	-80.84641808	4.27
	3913.00	8.32	217.69	3887.43	3030.43	-213.42	-300.35	-216.75	1.70	7.17R	1.69	-1.37	313276.92	1619258.87	39.35229675	-80.84644452	4.30
	4008.00	10.04	218.93	3981.21	3124.21	-221.59	-312.23	-226.15	1.82	7L	1.81	1.31	313265.03	1619249.46	39.35226374	-80.84647715	4.33
	4102.00	11.16	218.22	4073.61	3218.61	-230.87	-325.75	-236.93	1.20	11.88L	1.19	-0.76	313251.51	1619238.68	39.35222618	-80.84651453	4.36
	4196.00	13.17	216.37	4165.49	3308.49	-241.88	-341.52	-248.91	2.18	17.14L	2.14	-1.97	313235.74	1619226.70	39.35218240	-80.84655605	4.39

WV Department of Environmental Protection

JUL 12 2021

Comments	MD (ft)	Incl (°)	Azim (°)	Grid (ft)	TVD (ft)	TVSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DL3 (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index
	4291.00	15.53	213.67	213.67	4257.52	3400.52	-255.75	-380.83	-262.38	2.58	4.36L	2.48	-2.84	313218.44	1619213.23	39.35212866	-80.84660266	4.44
	4385.00	17.37	213.20	4347.67	3490.67	271.98	-383.04	-277.04	1.96	1.25L	1.96	-0.50		313194.23	1619198.57	39.35206727	-80.84665332	4.47
	4480.00	19.52	213.08	4437.79	3580.79	-290.43	-408.21	-293.46	2.26	106.14L	2.26	-0.15		313189.06	1619182.15	39.35199750	-80.84671006	4.52
	4574.00	19.09	207.69	4526.51	3669.51	-310.63	-434.99	-309.18	1.94	125.39L	-0.46	-5.71		313142.28	1619166.44	39.35192335	-80.84676410	4.55
	4669.00	18.00	202.39	4618.58	3759.58	-462.32	-321.99	-2.11	13.42R	2.11	-1.15	-5.58		313114.96	1619153.83	39.35184779	-80.84680803	4.59
	4763.00	18.17	202.52	4705.94	3849.94	-354.17	-489.29	-333.13	0.19	85.3R	0.18	0.14		313087.99	1619142.48	39.35177331	-80.84684601	4.61
	4857.00	18.36	207.43	4795.21	3938.21	-375.35	-515.97	-345.57	1.65	82.61R	0.20	5.22		313061.31	1619130.05	39.35169955	-80.84688856	4.64
	4955.00	19.00	211.02	4888.05	4031.05	-396.24	-543.34	-360.90	1.34	80.68R	0.65	3.66		313033.94	1619114.72	39.35162378	-80.84694132	4.67
	5049.00	19.37	216.38	4976.83	4119.83	-414.03	-569.00	-378.03	1.91	53.93R	0.39	5.70		313006.28	1619097.59	39.35155262	-80.84700053	4.70
	5144.00	20.36	220.20	5066.18	4209.18	-432.35	-594.32	-398.05	1.73	96.9L	1.06	4.02		312982.96	1619077.58	39.35148229	-80.84706998	4.73
	5238.00	20.32	218.60	5154.31	4297.31	-449.48	-619.58	-418.80	0.60	166.16R	-0.06	-1.70		312957.70	1619058.82	39.35141210	-80.84714200	4.76
KOP	5333.00	19.56	219.16	5243.62	4386.62	-466.70	-644.80	-439.14	0.82	29.98R	-0.80	0.59		312932.48	1619038.49	39.35134203	-80.84721255	4.78
	5428.00	20.91	221.32	5332.75	4475.75	-483.49	-669.87	-460.37	1.62	34.15L	1.42	2.27		312907.42	1619015.25	39.35127235	-80.84728631	4.81
	5471.00	22.01	219.35	5372.77	4515.77	-491.52	-681.86	-470.55	3.06	118.71R	2.96	-4.59		312885.42	1619005.07	39.35123900	-80.84732165	4.82
	5554.00	19.83	234.74	5450.35	4593.35	-503.83	-702.03	-491.92	7.10	125.17R	-2.63	18.54		312875.25	1618983.70	39.35118275	-80.84739616	4.87
	5648.00	18.30	262.34	5539.87	4682.87	-505.50	-713.02	-518.07	9.74	75.17R	-3.78	29.36		312864.27	1618957.55	39.35115151	-80.84748802	4.93
	5743.00	18.47	279.36	5630.58	4773.58	-495.73	-712.35	-546.15	5.79	41.14L	2.28	17.92		312864.94	1618929.47	39.35115220	-80.84758735	4.97
	5838.00	18.51	279.25	5720.68	4863.68	-481.44	-707.48	-575.89	0.06	78.8R	0.04	-0.12		312869.81	1618899.74	39.35110435	-80.84769273	4.98
	5932.00	21.40	299.33	5809.13	4952.13	-461.54	-696.66	-605.61	7.86	57.21R	3.07	21.36		312869.81	1618870.02	39.35119281	-80.84779283	5.03
	6027.00	26.50	314.38	5896.00	5039.00	-429.60	-673.31	-635.91	8.34	13.34R	5.37	15.84		312803.97	1618839.72	39.35125868	-80.84790077	5.08
	6121.00	35.38	317.98	5976.56	5119.56	-385.71	-638.35	-669.19	9.65	24.59R	9.45	3.83		312798.93	1618806.45	39.35135025	-80.84802628	5.13
	6216.00	43.58	323.32	6049.84	5192.84	-329.09	-591.57	-707.23	9.34	20.71R	8.63	5.82		312985.71	1618769.40	39.35147712	-80.84816326	5.19
	6310.00	52.29	327.43	6112.77	5255.77	-261.93	-534.12	-746.69	9.81	16.14R	9.27	4.37		313043.15	1618728.95	39.35163318	-80.84830581	5.24
	6404.00	60.07	330.01	6165.05	5308.05	-185.87	-467.40	-787.13	8.58	5.34R	8.28	2.74		313109.87	1618698.51	39.35181469	-80.84845235	5.30
	6498.00	61.10	330.12	6211.71	5354.71	-104.42	-396.69	-828.42	1.09	15.27R	1.08	0.12		313181.58	1618639.72	39.35200984	-80.84860215	5.33
	6593.00	70.04	332.70	6250.55	5393.55	-20.12	-320.59	-889.27	9.83	25.81R	9.51	2.74		313256.67	1618606.37	39.35221431	-80.84875057	5.39
8888.00	78.78	338.97	6276.07	5419.07	70.75	-237.84	-908.07	10.17	72.81R	9.20	4.49	313339.42	1618567.58	39.35243987	-80.84899213	5.44		
6782.00	80.38	342.08	6293.08	5496.08	163.14	-151.26	-940.39	5.61	1.12R	1.70	5.44	313425.99	1618535.28	39.35267821	-80.84901099	5.49		
6877.00	86.52	342.20	6303.91	5449.91	257.45	-81.48	-969.32	6.46	10.7L	6.46	0.13	313515.78	1618506.33	39.35292150	-80.84911805	5.53		
6971.00	90.28	341.49	6306.54	5449.54	351.39	27.79	-998.59	4.07	86.38L	4.00	-0.76	313605.04	1618477.06	39.35316534	-80.84922629	5.58		
7068.00	90.34	340.54	6306.02	5449.02	446.39	117.62	-1029.50	1.00	93.94L	0.06	-1.00	313694.87	1618446.16	39.35341067	-80.84934033	5.60		
7160.00	90.22	338.80	6305.58	5448.58	540.36	205.76	-1062.15	1.86	90.3L	-0.13	-1.85	313783.00	1618413.50	39.35365128	-80.84946048	5.63		
7256.00	89.64	337.09	6305.43	5448.43	635.22	381.88	-1097.82	1.82	99.93R	-0.29	-1.80	313871.04	1618377.83	39.35389150	-80.84959128	5.66		
7350.00	89.72	338.90	6305.71	5448.71	730.08	391.98	-1133.42	1.92	106.46L	-0.23	1.91	313959.11	1618342.24	39.35413181	-80.84972181	5.69		
7445.00	89.05	341.17	6306.73	5449.73	825.06	471.16	-1166.85	2.49	32.01L	2.39	3.39	314048.99	1618309.81	39.35437556	-80.84984123	5.72		
7539.00	89.61	340.82	6307.83	5450.83	919.05	560.03	-1196.46	0.70	71.57R	0.60	-0.37	314137.25	1618279.20	39.35461825	-80.84995418	5.74		
7634.00	89.89	341.66	6308.25	5451.25	1014.05	649.98	-1227.01	0.93	71.03R	0.29	0.88	314227.20	1618248.85	39.35486392	-80.85006096	5.77		
7728.00	90.00	341.98	6308.34	5451.34	1108.04	739.29	-1256.34	0.36	55.01R	0.12	0.34	314316.50	1618219.32	39.35510787	-80.85017543	5.79		
7823.00	90.28	342.38	6308.10	5451.10	1203.02	826.73	-1285.41	0.51	174.81L	0.29	0.42	314406.94	1618190.25	39.35535495	-80.85028303	5.81		
7917.00	90.06	342.36	6307.83	5450.83	1296.99	919.32	-1313.88	0.24	168.66L	1.05	-0.29	314496.52	1618161.78	39.35559969	-80.85038845	5.83		
8012.00	91.06	342.08	6306.90	5449.90	1391.96	1009.77	-1342.89	1.09	166.66L	1.05	-0.29	314586.97	1618132.78	39.35584861	-80.85049583	5.85		
8106.00	90.11	341.89	6305.94	5449.94	1485.94	1099.18	-1371.96	1.03	90L	-1.01	-0.20	314676.35	1618103.71	39.35609099	-80.85060336	5.87		
8201.00	90.11	341.47	6305.75	5449.75	1580.93	1189.34	-1401.82	0.44	93.11R	0.00	-0.44	314766.54	1618073.85	39.35633723	-80.85071374	5.89		
8296.00	90.06	342.36	6305.62	5449.62	1674.92	1278.71	-1430.97	0.98	79.81L	-0.05	0.98	314855.89	1618044.70	39.35658144	-80.85082159	5.91		
8390.00	90.22	341.50	6305.38	5449.38	1769.91	1369.03	-1460.42	0.95	83.77R	0.17	-0.94	314948.21	1618015.26	39.35682817	-80.85093050	5.93		
8483.00	90.28	342.05	6304.98	5449.98	1862.90	1457.36	-1489.50	0.59	47.9R	0.06	0.59	315034.54	1617986.17	39.35706920	-80.85103804	5.95		
8578.00	91.40	343.29	6303.58	5448.58	1957.84	1548.04	-1517.80	1.76	117.94L	1.18	1.31	315125.21	1617957.88	39.35731720	-80.85114290	5.97		
8673.00	90.45	341.50	6302.05	5448.05	2052.80	1638.57	-1546.53	2.13	15.84L	-1.00	-1.88	315215.74	1617929.15	39.35756454	-80.85124930	5.99		
8767.00	90.73	341.42	6301.08	5448.08	2148.79	1727.69	-1576.41	2.31	101.72L	0.30	-0.09	315304.85	1617899.27	39.35780794	-80.85135972	6.01		
8862.00	90.82	340.89	6299.96	5447.96	2244.78	1817.59	-1607.10	0.57	168.37L	-0.12	-0.58	315394.75	1617868.58	39.35805347	-80.85147300	6.03		
8956.00	90.82	340.82	6299.23	5447.23	2335.78	1906.39	-1637.92	0.37	32.47L	-0.36	-0.07	315483.54	1617837.76	39.35829596	-80.85158672	6.04		
9050.00	90.39	340.75	6298.12	5447.12	2524.77	2084.85	-1700.12	0.07	167.2R	0.06	-0.04	315572.20	1617806.80	39.35853831	-80.85170116	6.07		
9145.00	90.17	340.80	6297.66	5446.66	2619.77	2174.55	-1731.41	0.24	87.92L	-0.23	0.05	315660.80	1617775.56	39.35878331	-80.85181616	6.09		
9240.00																		

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	TDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Eastng (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index
	10656.00	90.06	340.53	6285.57	5438.97	4035.64	3509.41	-2203.80	0.18	12.90L	-0.12	-0.14	317086.48	1617272.11	39.36267309	-80.85367237	6.31
	10750.00	90.45	340.44	6295.55	5439.55	4129.63	3598.01	-2235.01	0.43	92.2R	0.41	-0.10	317175.08	1617240.71	39.36201501	-80.85378813	6.32
	10844.00	90.39	342.00	6294.86	5437.66	4223.62	3687.00	-2285.27	1.66	96.26L	-0.06	1.66	317264.07	1617210.45	39.36315905	-80.85389988	6.34
	10939.00	90.11	339.45	6294.45	5437.45	4318.62	3776.67	-2296.62	2.70	85.14R	-0.29	-2.68	317353.73	1617179.09	39.36340290	-80.85401555	6.35
	11033.00	90.28	341.45	6294.13	5437.13	4412.61	3865.24	-2326.08	2.14	78.56L	0.18	2.13	317442.30	1617147.64	39.36364475	-80.85413150	6.37
	11128.00	90.45	340.61	6293.52	5436.52	4507.60	3955.08	-2358.96	0.90	94.08R	0.18	-0.88	317532.13	1617116.76	39.36389009	-80.85424540	6.38
	11222.00	90.34	342.15	6292.87	5435.87	4601.60	4044.15	-2398.97	1.64	124.08L	-0.12	1.64	317621.20	1617086.75	39.36413337	-80.85435637	6.39
	11317.00	90.11	341.81	6292.50	5435.50	4696.58	4134.49	-2418.36	0.43	84.74L	-0.24	-0.36	317711.54	1617057.36	39.36438014	-80.85446511	6.40
	11411.00	90.34	339.31	6292.13	5435.13	4790.57	4223.13	-2449.64	2.67	127.12R	0.24	-2.66	317800.17	1617028.08	39.36462216	-80.85458045	6.42
	11506.00	90.06	339.68	6291.80	5434.80	4885.54	4312.11	-2482.92	0.49	107.67R	-0.29	0.39	317889.14	1616992.81	39.36486504	-80.85470288	6.43
	11601.00	89.94	340.05	6291.30	5434.30	4980.52	4401.30	-2515.62	0.41	90R	-0.13	0.39	317978.33	1616956.11	39.36510854	-80.85482328	6.44
	11696.00	89.94	341.35	6291.90	5434.90	5075.51	4490.96	-2547.02	1.37	41.05R	0.00	1.37	318067.99	1616929.21	39.36535377	-80.85493910	6.45
	11790.00	90.58	341.89	6291.49	5434.49	5169.51	4580.16	-2576.66	0.87	113.44L	0.66	0.57	318157.18	1618869.07	39.36559701	-80.85504867	6.46
	11884.00	89.94	340.48	6291.08	5434.08	5263.50	4669.13	-2606.99	1.66	81.57R	-0.66	-1.52	318246.15	1618888.74	39.36583999	-80.85516067	6.48
	11979.00	90.22	342.35	6290.95	5433.95	5358.50	4758.17	-2637.28	2.01	43.53L	0.29	1.99	318336.18	1618836.45	39.36608589	-80.85527260	6.49
	12073.00	90.62	341.97	6290.28	5433.28	5452.47	4846.65	-2666.07	0.59	109.82L	0.43	-0.40	318425.65	1618789.08	39.36633033	-80.85537921	6.50
	12168.00	90.00	340.25	6289.74	5432.74	5547.47	4936.52	-2696.83	1.02	78.69R	-0.65	-1.81	318515.53	1618779.81	39.36657578	-80.85549277	6.51
	12262.00	90.17	341.10	6289.61	5432.61	5641.47	5027.23	-2727.94	0.92	81.38L	0.18	0.90	318604.23	1618747.80	39.36681799	-80.85560751	6.52
	12356.00	90.22	340.77	6289.29	5432.29	5735.48	5116.07	-2758.64	0.36	172.35R	0.05	-0.35	318693.08	1618717.10	39.36706061	-80.85572083	6.53
	12451.00	89.55	340.86	6289.48	5432.48	5830.48	5205.79	-2789.80	0.71	112.17L	-0.71	0.09	318782.78	1618685.88	39.36730562	-80.85583602	6.54
	12545.00	89.22	340.05	6290.48	5433.48	5924.45	5294.37	-2821.30	0.93	87.86R	-0.35	-0.86	318871.36	1618654.44	39.36754747	-80.85595195	6.55
	12640.00	89.27	341.38	6291.74	5434.74	6019.44	5384.03	-2852.68	1.40	38.66L	0.05	1.40	318961.01	1618623.07	39.36779230	-80.85606789	6.57
	12734.00	89.72	341.02	6292.57	5435.57	6113.44	5473.01	-2882.97	0.61	106.15L	0.48	-0.38	319049.99	1618592.78	39.36803531	-80.85617966	6.57
	12828.00	89.50	340.26	6293.21	5436.21	6207.43	5561.69	-2914.13	0.84	90R	-0.23	-0.81	319138.67	1618561.62	39.36827748	-80.85629449	6.58
	12923.00	89.50	340.27	6294.03	5437.03	6302.42	5651.11	-2946.21	0.01	82.15R	0.00	0.01	319228.08	1618529.54	39.36852159	-80.85641271	6.59
	13017.00	89.66	341.43	6294.72	5437.72	6396.42	5739.90	-2977.04	1.25	96.87L	-0.17	1.23	319316.87	1618498.71	39.36876407	-80.85652850	6.60
	13111.00	89.44	340.02	6295.46	5438.46	6490.41	5828.63	-3008.07	1.52	88.98R	0.23	-1.50	319405.59	1618467.68	39.36900634	-80.85664097	6.61
	13206.00	89.78	340.82	6296.11	5439.11	6585.40	5918.13	-3038.90	0.91	135L	0.36	0.84	319495.09	1618436.85	39.36925072	-80.85675833	6.62
	13300.00	89.55	340.59	6296.66	5439.66	6679.40	6006.85	-3070.96	0.35	72.74R	-0.24	-0.24	319583.80	1618404.79	39.36949298	-80.85687292	6.63
	13395.00	89.78	341.33	6297.21	5440.21	6774.40	6096.65	-3101.95	0.82	94.29L	0.24	0.78	319673.60	1618373.80	39.36973821	-80.85698732	6.64
	13489.00	89.72	340.53	6297.82	5440.82	6869.39	6185.49	-3132.67	0.85	97.21R	-0.85	-0.85	319762.43	1618343.09	39.36998081	-80.85710068	6.65
	13583.00	89.81	341.40	6298.17	5441.17	6962.39	6274.35	-3163.32	0.93	96.54L	-0.12	0.93	319851.29	1618312.44	39.37022347	-80.85721384	6.66
	13678.00	89.50	340.44	6298.91	5442.91	7057.39	6364.13	-3194.36	1.02	124.88L	-0.12	-1.01	319941.06	1618281.38	39.37046683	-80.85732846	6.67
	13773.00	89.27	340.11	6299.63	5442.93	7152.37	6453.55	-3226.44	0.42	26.56L	-0.24	-0.35	320030.48	1618249.32	39.37071277	-80.85744663	6.68
	13868.00	89.55	339.97	6301.09	5444.09	7255.35	6559.75	-3265.01	0.28	81.63R	0.25	-0.12	320119.68	1618217.75	39.37095722	-80.85756472	6.69
	13962.00	89.50	341.74	6301.72	5444.72	7341.35	6631.55	-3296.93	2.33	87.82L	-0.06	-2.33	320208.46	1618186.83	39.37119876	-80.85768070	6.70
	14056.00	89.55	340.43	6302.50	5445.50	7435.34	6720.48	-3320.40	1.39	104.74L	0.05	-1.39	320297.38	1618155.36	39.37144159	-80.85779321	6.71
	14151.00	89.50	340.24	6303.29	5446.29	7530.33	6809.82	-3352.37	0.21	173.29L	-0.05	-0.20	320386.83	1618123.40	39.37168583	-80.85791105	6.72
	14245.00	89.33	340.22	6304.25	5447.25	7624.32	6899.38	-3384.16	0.18	72.56R	-0.18	-0.02	320475.28	1618091.81	39.37192733	-80.85802813	6.72
	14339.00	89.66	341.27	6305.08	5448.08	7718.31	6987.11	-3415.16	1.17	125.81R	0.35	1.12	320564.01	1618060.81	39.37216964	-80.85814260	6.73
	14434.00	89.22	341.88	6306.01	5449.01	7813.30	7077.24	-3445.18	0.79	76.12L	-0.48	0.64	320652.84	1618030.59	39.37241580	-80.85825630	6.74
	14529.00	89.44	340.99	6307.12	5450.12	7908.29	7167.29	-3475.43	0.98	162.72L	0.23	-0.94	320744.18	1618000.35	39.37266174	-80.85836638	6.75
	14623.00	89.99	340.85	6308.41	5451.41	8002.28	7256.11	-3505.15	0.50	6.71L	-0.48	-0.15	320833.00	1617969.62	39.37290431	-80.85847880	6.76
	14717.00	89.16	340.83	6309.92	5452.92	8096.27	7344.90	-3537.00	0.18	100.74R	0.18	-0.02	320921.78	1617938.76	39.37314675	-80.85859264	6.76
	14811.00	89.05	341.41	6311.39	5454.39	8190.26	7433.83	-3567.41	0.63	47.96L	-0.12	0.62	321010.71	1617908.38	39.37338961	-80.85870496	6.77
	14906.00	89.16	341.29	6312.88	5455.88	8285.24	7523.83	-3597.79	0.17	108.49L	-0.12	-0.13	321100.70	1617877.89	39.37363594	-80.85881721	6.78
	15000.00	89.05	340.97	6314.34	5457.34	8379.23	7612.76	-3628.19	0.36	84.73R	-0.12	-0.34	321189.63	1617847.59	39.37387829	-80.85892948	6.79
	15095.00	89.16	342.16	6315.83	5458.83	8474.21	7702.88	-3658.23	1.26	102.15L	0.12	1.25	321279.74	1617817.42	39.37412442	-80.85904054	6.80
	15190.00	89.99	341.37	6317.35	5460.35	8568.19	7792.14	-3687.64	0.86	19.98R	-0.18	-0.84	321369.00	1617786.15	39.37436824	-80.85914933	6.80
	15282.00	89.10	341.41	6318.90	5461.90	8661.18	7880.27	-3717.31	0.13	63.93L	0.12	0.04	321457.12	1617755.48	39.37460893	-80.85925900	6.81
	15377.00	89.33	341.88	6320.20	5463.20	8756.16	7970.43	-3747.22	0.55	48.18R	0.24	0.49	321545.28	1617725.56	39.37485518	-80.85936862	6.82
	15470.00	89.50	342.07	6322.13	5465.13	8845.13	8060.43	-3780.70	0.13	96.59R	0.09	0.10	321633.40	1617695.09	39.37510337	-80.85947814	6.83
	15565.00	89.38	343.11	6323.06	5466.06	8940.08	8150.14	-3814.13	1.10	86.97L	-0.13	1.09	321721.82	1617664.87	39.37535373	-80.85958745	6.84
	15659.00	89.44	341.98	6324.03	5467.03	9035.04	8240.78	-3848.62	1.19	62.79R	0.06	-1.19	321810.24	1617634.37	39.37560431	-80.85969708	6.85
	15754.00	89.34	343.73	6324.21	5467.21	9126.89	8321.22	-3880.33	2.09	108.31L	0.06	1.86	321898.05	1617603.77	39.37585722	-80.85980669	6.86
	15849.00	89.27	342.37	6324.02	5467.02	9218.09	8401.02	-3912.02	1.51	128.13L	-0.47	-1.43	321986.32	1617573.00	39.37611254	-80.85991621	6.87
	15944.00	89.80	341.58	6324.72	5467.72	9299.91	8481.91	-3947.42	1.06	90L	-0.65	-0.83	322074.65	1617542.36	39.37636997	-80.86002573	6.87
	16039.00	89.27	341.20	6327.13	5470.13	9381.89	8562.89	-3982.93	0.20	4.97L							

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index
	17267.00	90.22	342.72	6336.01	5479.01	10645.77	9765.88	-4336.88	0.94	96.12L	0.17	0.93	323342.64	1615138.94	39.37975940	-80.86155136	6.96
	17362.00	90.00	340.67	6335.83	5478.83	10740.75	9856.06	-4368.71	2.17	3.37R	-0.23	-2.16	323432.82	1615109.11	39.38000574	-80.86166172	6.97
	17456.00	90.17	340.68	6335.69	5478.69	10834.75	9944.77	-4397.82	0.18	95.27R	0.18	0.01	323521.52	1615078.00	39.38024795	-80.86177850	6.98
	17551.00	90.11	341.33	6335.46	5478.46	10929.75	10034.59	-4428.74	0.69	96.56L	-0.06	0.68	323611.34	1615047.08	39.38049324	-80.86189009	6.99
	17645.00	89.94	339.85	6335.42	5478.42	11023.75	10123.25	-4459.98	1.58	23.1R	-0.18	-1.57	323699.99	1615015.85	39.38073531	-80.86200594	6.99
	17739.00	90.62	340.14	6334.96	5477.96	11117.73	10211.58	-4492.13	0.79	115.64R	0.72	0.31	323768.32	1614983.69	39.38097644	-80.86212442	7.00
	17834.00	90.50	340.39	6334.03	5477.03	11212.72	10300.99	-4524.21	0.29	72.47L	-0.13	0.26	323877.73	1614951.62	39.38122057	-80.86224267	7.01
	17928.00	90.56	340.20	6333.16	5476.16	11306.71	10389.48	-4555.80	0.21	114.01L	0.06	-0.20	323966.21	1614919.92	39.38146217	-80.86235952	7.01
	18023.00	90.11	339.19	6332.61	5475.61	11401.68	10478.58	-4588.87	1.16	72.13R	-0.47	-1.06	324055.30	1614888.96	39.38170537	-80.86248091	7.02
	18118.00	90.50	340.40	6331.60	5474.60	11590.63	10655.94	-4654.14	0.67	109.54L	0.21	0.64	324232.66	1614821.69	39.38218953	-80.86272131	7.03
	18306.00	90.39	340.09	6330.87	5473.87	11684.62	10744.41	-4685.92	0.35	161.82L	-0.12	-0.33	324321.12	1614789.92	39.38243106	-80.86283844	7.04
	18401.00	89.83	339.79	6330.69	5473.69	11779.60	10833.64	-4718.50	0.87	81.19L	-0.59	-0.32	324410.35	1614757.34	39.38267486	-80.86295849	7.04
	18495.00	89.94	339.08	6330.88	5473.88	11868.57	10921.65	-4751.52	0.76	90R	0.12	-0.76	324498.35	1614724.32	39.38291489	-80.86308001	7.05
	18684.00	89.94	339.72	6331.07	5474.07	12062.49	11098.56	-4818.02	0.34	169.88L	0.00	0.34	324675.28	1614657.82	39.38339777	-80.86332472	7.06
	18778.00	89.66	339.67	6331.40	5474.40	12156.47	11186.72	-4850.64	0.30	71.42R	-0.30	-0.05	324763.41	1614625.21	39.38363841	-80.86344483	7.07
	18967.00	90.06	340.86	6331.86	5474.86	12345.45	11364.62	-4914.45	0.66	97.94L	0.21	0.63	324841.30	1614561.39	39.38412410	-80.86368013	7.08
Final Survey	19062.00	90.00	340.43	6331.81	5474.81	12440.45	11454.25	-4945.94	0.46	104.34L	-0.06	-0.45	325030.93	1614529.91	39.38436883	-80.86379631	7.09
	19155.00	89.66	339.10	6332.09	5475.09	12533.42	11541.51	-4978.10	1.48	HS	-0.37	-1.43	325118.18	1614467.74	39.38460702	-80.86391478	7.09
Projection to TD	19192.00	89.66	338.10	6332.31	5475.31	12570.40	11578.07	-4991.30	0.00		0.00	0.00	325152.74	1614484.55	39.38470136	-80.86396332	7.09

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)	BDU (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	29.000	1/68 425'	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / CNX SHR-37E-HSM Surveys Off to 19192ft MD
	1	29.000	29.000	Act Sins	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / CNX SHR-37E-HSM Surveys Off to 19192ft MD
	1	29.000	400.000	Act Sins	30.000	30.000	NAL_NSG+MSHOT	Original Borehole / CNX SHR-37E-HSM Surveys Off to 19192ft MD
	1	400.000	5428.000	Act Sins	30.000	30.000	NAL_MWD-NON_SLB	Original Borehole / CNX SHR-37E-HSM Surveys Off to 19192ft MD
	1	5428.000	19192.000	Act Sins	30.000	30.000	NAL_MWD_1.0_DEG	Original Borehole / CNX SHR-37E-HSM Surveys Off to 19192ft MD

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