



DIRECTIONAL SERVICES, LLC.

Job #			Operator							Rig Name				
181338			Caza Oil & Gas							Bison 17				
Start Date			Well Name		Legal Well Name AFE					Company Man				
09-Feb-2018			Eagleclaw Federal #2H		Eagleclaw Federal #2H NMNM132945									
Play			State		County					Well Path Name				
Permian Basin			New Mexico		Lea					Eagleclawfederal-OH				
Lat			Long		Rig Floor Elevation (ft)					VS Plane AZI				
32.609071			-103.481016		3719					180.11				
MD (ft)	INC	AZI	TVD (ft)	North (ft)	East (ft)	V Section (ft)	Clos Dist (ft)	Clos Azi	Dogleg (°/100)	B Rate (°/100)	T Rate (°/100)	Bit to Sensor	Calc TF	
0.00	0.00	0.00	0.00	0.00	0.00	0.00								
171.00	0.51	26.91	171.00	0.68	0.34	-0.68	0.76	26.91	0.30	0.30	15.74	80.00	26.91	
295.00	0.57	17.42	294.99	1.76	0.78	-1.76	1.92	23.88	0.09	0.05	-7.65	80.00	-60.95	
382.00	0.77	21.37	381.99	2.72	1.12	-2.72	2.94	22.43	0.24	0.23	4.54	80.00	14.98	
470.00	0.84	27.96	469.98	3.84	1.64	-3.84	4.17	23.13	0.13	0.08	7.49	80.00	56.23	
561.00	0.79	22.87	560.97	5.00	2.20	-5.01	5.46	23.69	0.10	-0.05	-5.59	80.00	-127.16	
652.00	0.88	13.90	651.96	6.26	2.61	-6.27	6.78	22.61	0.17	0.10	-9.86	80.00	-59.99	
747.00	0.68	12.08	746.95	7.52	2.90	-7.53	8.06	21.09	0.21	-0.21	-1.92	80.00	-173.85	
841.00	0.68	17.24	840.94	8.60	3.18	-8.60	9.17	20.31	0.07	0.00	5.49	80.00	92.58	
935.00	0.68	23.22	934.94	9.64	3.57	-9.65	10.28	20.30	0.08	0.00	6.36	80.00	92.99	
1030.00	0.64	21.64	1029.93	10.65	3.99	-10.66	11.38	20.51	0.05	-0.04	-1.66	80.00	-156.32	
1124.00	0.68	18.65	1123.92	11.67	4.36	-11.68	12.46	20.48	0.06	0.04	-3.18	80.00	-42.23	
1219.00	0.66	28.23	1218.92	12.69	4.80	-12.70	13.56	20.71	0.12	-0.02	10.08	80.00	104.89	
1314.00	0.59	29.19	1313.91	13.60	5.29	-13.61	14.59	21.28	0.07	-0.07	1.01	80.00	171.97	
1408.00	0.62	29.46	1407.91	14.46	5.78	-14.47	15.57	21.79	0.03	0.03	0.29	80.00	5.56	
1503.00	0.70	40.71	1502.90	15.35	6.41	-15.36	16.63	22.67	0.16	0.08	11.84	80.00	64.02	
1598.00	0.81	37.37	1597.89	16.32	7.20	-16.34	17.84	23.80	0.12	0.12	-3.52	80.00	-23.48	
1693.00	0.90	43.52	1692.88	17.40	8.12	-17.41	19.20	25.02	0.14	0.09	6.47	80.00	48.66	
1789.00	1.01	47.83	1788.87	18.51	9.27	-18.53	20.70	26.59	0.14	0.11	4.49	80.00	35.31	
1872.00	1.05	42.90	1871.85	19.56	10.33	-19.58	22.12	27.83	0.12	0.05	-5.94	80.00	-68.19	
2011.00	1.08	40.71	2010.83	21.49	12.05	-21.51	24.63	29.28	0.04	0.02	-1.58	80.00	-54.71	
2075.00	1.63	40.97	2074.81	22.63	13.04	-22.66	26.12	29.95	0.86	0.86	0.41	80.00	0.77	
2170.00	2.99	42.03	2169.73	25.49	15.58	-25.52	29.88	31.44	1.43	1.43	1.12	80.00	2.33	
2264.00	2.92	38.07	2263.61	29.20	18.70	-29.23	34.67	32.64	0.23	-0.07	-4.21	80.00	-110.90	
2359.00	2.88	40.80	2358.49	32.91	21.75	-32.95	39.45	33.46	0.15	-0.04	2.87	80.00	107.51	
2455.00	3.30	38.51	2454.35	36.90	25.05	-36.94	44.60	34.17	0.46	0.44	-2.39	80.00	-17.52	
2550.00	3.45	37.02	2549.18	41.32	28.47	-41.37	50.18	34.57	0.18	0.16	-1.57	80.00	-31.06	
2645.00	3.10	37.02	2644.03	45.65	31.74	-45.71	55.60	34.81	0.37	-0.37	0.00	80.00	180.00	
2740.00	3.03	35.43	2738.89	49.75	34.74	-49.82	60.68	34.93	0.12	-0.07	-1.67	80.00	-130.26	
2835.00	3.41	43.96	2833.74	53.83	38.16	-53.90	65.98	35.33	0.64	0.40	8.98	80.00	55.89	
2930.00	3.52	46.77	2928.57	57.86	42.24	-57.94	71.64	36.13	0.21	0.12	2.96	80.00	58.48	
3024.00	3.45	51.25	3022.39	61.61	46.55	-61.70	77.22	37.08	0.30	-0.07	4.77	80.00	106.64	

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3119.00	3.27	48.71	3117.23	65.18	50.82	-65.28	82.65	37.94	0.25	-0.19	-2.67	80.00	-141.67
3213.00	3.36	45.19	3211.07	68.89	54.79	-69.00	88.02	38.49	0.24	0.10	-3.74	80.00	-67.91
3308.00	3.34	44.93	3305.91	72.82	58.72	-72.93	93.54	38.88	0.03	-0.02	-0.27	80.00	-142.91
3403.00	3.19	43.08	3400.76	76.70	62.48	-76.82	98.93	39.16	0.19	-0.16	-1.95	80.00	-145.84
3498.00	3.63	36.14	3495.59	81.06	66.05	-81.19	104.57	39.17	0.63	0.46	-7.31	80.00	-46.67
3593.00	3.82	34.73	3590.39	86.09	69.63	-86.23	110.73	38.97	0.22	0.20	-1.48	80.00	-26.44
3688.00	3.49	32.53	3685.20	91.13	72.99	-91.27	116.76	38.69	0.38	-0.35	-2.32	80.00	-158.07
3784.00	3.78	29.90	3781.00	96.34	76.14	-96.49	122.79	38.32	0.35	0.30	-2.74	80.00	-31.21
3879.00	4.15	38.16	3875.78	101.76	79.82	-101.91	129.33	38.11	0.72	0.39	8.69	80.00	61.23
3974.00	3.93	35.52	3970.54	107.11	83.84	-107.27	136.02	38.05	0.30	-0.23	-2.78	80.00	-141.10
4068.00	4.26	41.59	4064.30	112.34	88.03	-112.51	142.72	38.08	0.58	0.35	6.46	80.00	55.77
4163.00	4.07	49.58	4159.05	117.17	92.94	-117.35	149.55	38.42	0.64	-0.20	8.41	80.00	112.09
4255.00	4.02	46.68	4250.82	121.50	97.77	-121.68	155.95	38.82	0.23	-0.05	-3.15	80.00	-105.18
4381.00	3.58	51.78	4376.54	126.96	104.07	-127.16	164.16	39.34	0.44	-0.35	4.05	61.00	145.00
4476.00	3.65	51.96	4471.35	130.66	108.78	-130.87	170.02	39.78	0.07	0.07	0.19	61.00	9.30
4571.00	3.43	54.07	4566.17	134.19	113.47	-134.41	175.73	40.22	0.27	-0.23	2.22	61.00	150.42
4667.00	3.47	50.64	4662.00	137.72	118.04	-137.94	181.38	40.60	0.22	0.04	-3.57	61.00	-80.75
4762.00	2.53	41.23	4756.87	141.12	121.64	-141.35	186.31	40.76	1.11	-0.99	-9.91	61.00	-156.99
4857.00	2.51	35.52	4851.78	144.39	124.23	-144.63	190.48	40.71	0.26	-0.02	-6.01	61.00	-97.40
4952.00	1.27	23.22	4946.72	147.05	125.86	-147.29	193.55	40.56	1.37	-1.31	-12.95	61.00	-167.97
5047.00	0.64	1.51	5041.71	148.55	126.29	-148.79	194.97	40.37	0.75	-0.66	-22.85	61.00	-160.68
5142.00	0.79	354.48	5136.70	149.73	126.24	-149.97	195.84	40.13	0.18	0.16	-7.40	61.00	-33.87
5238.00	0.31	184.58	5232.70	150.13	126.15	-150.37	196.09	40.04	1.14	-0.50	-176.98	61.00	-177.16
5333.00	0.26	191.35	5327.70	149.66	126.09	-149.90	195.70	40.11	0.06	-0.05	7.13	61.00	149.39
5428.00	0.37	235.56	5422.70	149.28	125.79	-149.52	195.21	40.12	0.27	0.12	46.54	61.00	88.84
5522.00	0.42	206.73	5516.70	148.80	125.39	-149.04	194.58	40.12	0.22	0.05	-30.67	61.00	-90.58
5618.00	0.13	317.39	5612.69	148.56	125.16	-148.80	194.26	40.11	0.50	-0.30	115.27	61.00	165.37
5714.00	0.44	291.37	5708.69	148.78	124.74	-149.02	194.15	39.98	0.34	0.32	-27.10	61.00	-36.03
5809.00	0.51	267.29	5803.69	148.89	123.98	-149.13	193.75	39.78	0.22	0.07	-25.35	61.00	-82.98
5903.00	0.46	287.07	5897.69	148.98	123.20	-149.22	193.32	39.59	0.18	-0.05	21.04	61.00	116.36
5998.00	0.26	246.28	5992.69	149.01	122.64	-149.24	192.98	39.46	0.33	-0.21	-42.94	61.00	-147.16
6094.00	0.24	257.01	6088.68	148.87	122.24	-149.11	192.63	39.39	0.05	-0.02	11.18	61.00	118.44
6189.00	0.22	266.85	6183.68	148.82	121.87	-149.05	192.35	39.31	0.05	-0.02	10.36	61.00	121.72
6284.00	0.37	281.62	6278.68	148.87	121.38	-149.10	192.08	39.19	0.18	0.16	15.55	61.00	34.40
6379.00	0.53	305.52	6373.68	149.19	120.72	-149.42	191.92	38.98	0.26	0.17	25.16	61.00	61.92
6474.00	0.55	324.95	6468.68	149.82	120.11	-150.05	192.02	38.72	0.19	0.02	20.45	61.00	93.54
6569.00	0.99	318.18	6563.67	150.80	119.30	-151.03	192.28	38.35	0.47	0.46	-7.13	61.00	-15.08
6665.00	0.24	246.90	6659.66	151.34	118.56	-151.57	192.25	38.07	0.98	-0.78	-74.25	61.00	-166.02
6760.00	0.53	241.36	6754.66	151.05	117.99	-151.28	191.67	37.99	0.31	0.31	-5.83	61.00	-10.09
6856.00	0.70	242.33	6850.65	150.57	117.08	-150.79	190.73	37.87	0.18	0.18	1.01	61.00	3.99
6951.00	0.26	120.51	6945.65	150.19	116.75	-150.41	190.23	37.86	0.91	-0.46	-128.23	61.00	-165.22

7045.00	0.13	126.66	7039.65	150.02	117.02	-150.24	190.26	37.96	0.14	-0.14	6.54	61.00	173.92
7141.00	0.18	133.52	7135.65	149.85	117.22	-150.07	190.25	38.03	0.06	0.05	7.15	61.00	23.82
7236.00	0.02	314.14	7230.65	149.76	117.31	-149.98	190.24	38.07	0.21	-0.17	-188.82	61.00	-179.94
7331.00	0.07	66.46	7325.65	149.79	117.36	-150.02	190.29	38.08	0.08	0.05	118.23	61.00	125.73
7426.00	0.24	323.19	7420.65	149.97	117.29	-150.20	190.39	38.03	0.28	0.18	-108.71	61.00	-118.17
7520.00	0.40	270.45	7514.65	150.13	116.84	-150.36	190.24	37.89	0.34	0.17	-56.11	61.00	-89.61
7616.00	0.35	267.20	7610.65	150.12	116.22	-150.34	189.85	37.75	0.06	-0.05	-3.39	61.00	-158.57
7710.00	0.29	288.82	7704.65	150.18	115.70	-150.41	189.59	37.61	0.14	-0.06	23.00	61.00	126.96
7806.00	0.59	273.18	7800.64	150.29	114.98	-150.51	189.23	37.42	0.33	0.31	-16.29	61.00	-29.76
7902.00	0.84	279.77	7896.63	150.44	113.79	-150.65	188.63	37.10	0.27	0.26	6.86	61.00	21.52
7996.00	0.57	247.07	7990.63	150.37	112.68	-150.59	187.91	36.85	0.50	-0.29	-34.79	61.00	-139.48
8092.00	0.81	134.05	8086.62	149.71	112.73	-149.93	187.41	36.98	1.21	0.25	-117.73	61.00	-139.94
8187.00	0.99	89.84	8181.61	149.25	114.04	-149.47	187.83	37.38	0.73	0.19	-46.54	61.00	-98.27
8282.00	1.36	65.40	8276.59	149.72	115.88	-149.94	189.33	37.74	0.65	0.39	-25.73	61.00	-66.20
8377.00	1.52	51.43	8371.56	150.98	117.89	-151.20	191.55	37.98	0.40	0.17	-14.71	61.00	-72.59
8473.00	1.01	93.53	8467.54	151.72	119.73	-151.95	193.27	38.28	1.07	-0.53	43.85	65.00	138.69
8568.00	1.38	119.02	8562.52	151.11	121.57	-151.34	193.94	38.82	0.67	0.39	26.83	65.00	68.35
8664.00	0.79	79.38	8658.51	150.67	123.23	-150.91	194.65	39.28	0.96	-0.61	-41.29	65.00	-146.85
8758.00	0.88	46.68	8752.50	151.29	124.39	-151.53	195.86	39.43	0.51	0.10	-34.79	65.00	-95.94
8854.00	1.05	37.63	8848.48	152.49	125.46	-152.73	197.47	39.45	0.24	0.18	-9.43	65.00	-46.46
8950.00	1.14	44.66	8944.46	153.86	126.67	-154.11	199.30	39.46	0.17	0.09	7.32	65.00	59.73
9045.00	0.70	172.81	9039.46	153.96	127.41	-154.21	199.84	39.61	1.75	-0.46	134.89	65.00	160.70
9141.00	0.94	155.49	9135.45	152.66	127.81	-152.91	199.10	39.94	0.36	0.25	-18.04	65.00	-54.80
9236.00	1.05	139.94	9230.43	151.29	128.69	-151.53	198.62	40.39	0.31	0.12	-16.37	65.00	-75.73
9332.00	0.55	118.58	9326.43	150.39	129.66	-150.64	198.57	40.77	0.60	-0.52	-22.25	65.00	-159.57
9427.00	1.03	88.26	9421.42	150.20	130.92	-150.45	199.25	41.08	0.65	0.51	-31.92	65.00	-56.89
9522.00	0.64	65.49	9516.41	150.45	132.25	-150.70	200.31	41.32	0.53	-0.41	-23.97	65.00	-150.62
9617.00	0.64	35.08	9611.40	151.10	133.04	-151.36	201.33	41.36	0.35	0.00	-32.01	65.00	-105.20
9713.00	0.73	36.84	9707.39	152.03	133.72	-152.29	202.47	41.33	0.10	0.09	1.83	65.00	14.04
9808.00	1.03	47.21	9802.38	153.09	134.71	-153.35	203.92	41.34	0.36	0.32	10.92	65.00	33.21
9904.00	0.53	102.14	9898.37	153.59	135.77	-153.85	205.00	41.48	0.88	-0.52	57.22	65.00	149.12
9999.00	1.08	115.85	9993.36	153.10	137.01	-153.37	205.46	41.82	0.61	0.58	14.43	65.00	26.24
10094.00	1.10	183.53	10088.35	151.80	137.76	-152.07	204.99	42.22	1.28	0.02	71.24	62.00	123.05
10189.00	0.46	249.18	10183.34	150.76	137.35	-151.02	203.94	42.33	1.05	-0.67	69.11	62.00	155.28
10283.00	0.48	178.08	10277.34	150.23	137.01	-150.49	203.32	42.36	0.58	0.02	-75.64	62.00	-123.84
10378.00	0.46	136.68	10372.34	149.56	137.28	-149.82	203.01	42.55	0.35	-0.02	-43.58	62.00	-113.92
10438.00	0.22	72.35	10432.34	149.42	137.56	-149.68	203.09	42.63	0.69	-0.40	-107.22	62.00	-151.47
10500.00	0.26	228.27	10494.34	149.36	137.56	-149.62	203.06	42.65	0.76	0.06	251.48	55.00	166.94
10532.00	2.20	188.71	10526.33	148.70	137.42	-148.97	202.47	42.74	6.27	6.06	-123.63	55.00	-44.29
10564.00	4.70	184.23	10558.27	146.79	137.23	-147.05	200.94	43.07	7.85	7.81	-14.00	55.00	-8.39
10595.00	7.23	183.71	10589.10	143.57	137.01	-143.84	198.45	43.66	8.16	8.16	-1.68	55.00	-1.48

10627.00	9.65	183.79	10620.75	138.89	136.70	-139.15	194.88	44.55	7.56	7.56	0.25	55.00	0.32
10658.00	12.17	183.88	10651.19	133.03	136.31	-133.30	190.47	45.70	8.13	8.13	0.29	55.00	0.43
10690.00	14.37	183.88	10682.33	125.71	135.81	-125.97	185.06	47.21	6.87	6.87	0.00	55.00	0.00
10722.00	16.66	183.97	10713.16	117.17	135.22	-117.43	178.92	49.09	7.16	7.16	0.28	55.00	0.65
10767.00	20.42	183.18	10755.82	102.89	134.34	-103.15	169.21	52.55	8.37	8.36	-1.76	55.00	-4.20
10785.00	22.00	183.62	10772.60	96.39	133.95	-96.65	165.03	54.26	8.82	8.78	2.44	55.00	5.96
10832.00	26.41	184.41	10815.46	77.17	132.59	-77.43	153.42	59.80	9.41	9.38	1.68	55.00	4.56
10881.00	30.22	183.88	10858.59	53.99	130.92	-54.25	141.62	67.59	7.79	7.78	-1.08	55.00	-4.01
10928.00	34.28	183.09	10898.33	28.97	129.41	-29.21	132.61	77.38	8.68	8.64	-1.68	55.00	-6.26
10976.00	38.87	182.48	10936.86	0.41	128.02	-0.65	128.03	89.82	9.59	9.56	-1.27	55.00	-4.77
11022.00	44.54	181.68	10971.19	-30.17	126.93	29.92	130.46	103.37	12.38	12.33	-1.74	55.00	-5.66
11071.00	50.32	180.98	11004.33	-66.23	126.10	65.98	142.43	117.71	11.84	11.80	-1.43	55.00	-5.34
11098.00	53.44	181.60	11020.99	-87.46	125.62	87.22	153.07	124.85	11.70	11.56	2.30	55.00	9.08
11145.00	59.40	181.42	11046.98	-126.58	124.59	126.35	177.61	135.46	12.68	12.68	-0.38	55.00	-1.49
11192.00	66.37	180.54	11068.39	-168.39	123.88	168.15	209.05	143.66	14.92	14.83	-1.87	55.00	-6.62
11240.00	70.72	179.40	11085.94	-213.05	123.91	212.81	246.46	149.82	9.33	9.06	-2.38	55.00	-13.92
11256.00	71.84	178.96	11091.07	-228.20	124.13	227.96	259.78	151.46	7.47	7.00	-2.75	55.00	-20.48
11281.00	75.60	178.26	11098.08	-252.19	124.72	251.95	281.34	153.69	15.28	15.04	-2.80	55.00	-10.23
11327.00	78.96	177.64	11108.21	-297.02	126.32	296.78	322.77	156.96	7.42	7.30	-1.35	80.00	-10.27
11391.00	81.22	177.82	11119.22	-360.01	128.82	359.77	382.37	160.31	3.54	3.53	0.28	80.00	4.50
11422.00	81.81	177.90	11123.80	-390.65	129.96	390.40	411.70	161.60	1.92	1.90	0.26	80.00	7.64
11486.00	82.36	178.17	11132.61	-454.01	132.14	453.75	472.84	163.77	0.96	0.86	0.42	80.00	25.95
11517.00	84.10	179.31	11136.26	-484.78	132.81	484.52	502.64	164.68	6.70	5.61	3.68	80.00	33.12
11549.00	84.65	179.31	11139.40	-516.62	133.20	516.37	533.52	165.54	1.72	1.72	0.00	80.00	0.00
11581.00	84.58	179.40	11142.40	-548.48	133.56	548.22	564.51	166.31	0.36	-0.22	0.28	80.00	128.00
11613.00	84.91	179.84	11145.33	-580.35	133.77	580.09	595.56	167.02	1.71	1.03	1.38	80.00	53.03
11676.00	86.71	181.33	11149.94	-643.17	133.12	642.91	656.80	168.31	3.70	2.86	2.37	80.00	39.60
11771.00	86.14	181.95	11155.86	-737.94	130.41	737.69	749.38	169.98	0.89	-0.60	0.65	80.00	132.67
11866.00	85.73	182.21	11162.59	-832.64	126.97	832.40	842.27	171.33	0.51	-0.43	0.27	80.00	147.69
11961.00	85.62	182.30	11169.76	-927.30	123.24	927.06	935.45	172.43	0.15	-0.12	0.09	80.00	140.79
12056.00	86.67	181.42	11176.15	-1022.03	120.17	1021.80	1029.07	173.29	1.44	1.11	-0.93	80.00	-39.93
12152.00	88.32	180.89	11180.34	-1117.92	118.24	1117.69	1124.15	173.96	1.81	1.72	-0.55	80.00	-17.80
12247.00	88.80	180.54	11182.73	-1212.88	117.05	1212.65	1218.51	174.49	0.63	0.51	-0.37	80.00	-36.09
12343.00	89.04	180.89	11184.54	-1308.85	115.85	1308.63	1313.97	174.94	0.44	0.25	0.36	80.00	55.56
12438.00	89.24	181.07	11185.96	-1403.83	114.23	1403.61	1408.47	175.35	0.28	0.21	0.19	80.00	41.99
12533.00	89.33	181.33	11187.15	-1498.80	112.24	1498.58	1503.00	175.72	0.29	0.09	0.27	80.00	70.91
12629.00	88.43	182.12	11189.03	-1594.74	109.35	1594.53	1598.48	176.08	1.25	-0.94	0.82	80.00	138.74
12724.00	87.99	181.77	11191.99	-1689.64	106.13	1689.43	1692.97	176.41	0.59	-0.46	-0.37	80.00	-141.52
12820.00	85.99	181.24	11197.03	-1785.47	103.61	1785.26	1788.47	176.68	2.16	-2.08	-0.55	80.00	-165.19
12916.00	86.23	179.49	11203.55	-1881.24	103.00	1881.04	1884.06	176.87	1.84	0.25	-1.82	80.00	-82.23
13010.00	87.40	179.40	11208.77	-1975.09	103.91	1974.88	1977.82	176.99	1.25	1.24	-0.10	80.00	-4.39

13105.00	88.56	179.84	11212.12	-2070.02	104.54	2069.82	2072.66	177.11	1.31	1.22	0.46	80.00	20.77
13201.00	88.67	180.01	11214.44	-2166.00	104.66	2165.79	2168.52	177.23	0.21	0.11	0.18	80.00	57.09
13297.00	89.13	179.75	11216.28	-2261.98	104.86	2261.77	2264.41	177.35	0.55	0.48	-0.27	80.00	-29.47
13392.00	89.62	178.61	11217.32	-2356.96	106.22	2356.75	2359.35	177.42	1.31	0.52	-1.20	80.00	-66.75
13488.00	89.20	178.70	11218.31	-2452.93	108.48	2452.72	2455.33	177.47	0.45	-0.44	0.09	80.00	167.91
13583.00	87.95	179.05	11220.67	-2547.88	110.34	2547.66	2550.27	177.52	1.37	-1.32	0.37	80.00	164.37
13678.00	88.60	179.31	11223.53	-2642.83	111.70	2642.61	2645.19	177.58	0.74	0.68	0.27	80.00	21.80
13774.00	89.44	179.22	11225.17	-2738.80	112.93	2738.58	2741.13	177.64	0.88	0.87	-0.09	80.00	-6.12
13869.00	88.30	179.31	11227.04	-2833.78	114.15	2833.55	2836.07	177.69	1.20	-1.20	0.09	80.00	175.49
13964.00	89.15	179.40	11229.16	-2928.75	115.22	2928.52	2931.01	177.75	0.90	0.89	0.09	80.00	6.04
14060.00	88.47	179.93	11231.15	-3024.72	115.78	3024.49	3026.94	177.81	0.90	-0.71	0.55	80.00	142.08
14155.00	89.59	180.19	11232.76	-3119.71	115.68	3119.48	3121.85	177.88	1.21	1.18	0.27	80.00	13.07
14250.00	90.96	180.54	11232.30	-3214.70	115.08	3214.47	3216.76	177.95	1.49	1.44	0.37	80.00	14.33
14346.00	90.52	180.89	11231.06	-3310.69	113.88	3310.46	3312.64	178.03	0.59	-0.46	0.36	80.00	141.50
14441.00	89.68	180.98	11230.90	-3405.67	112.33	3405.45	3407.52	178.11	0.89	-0.88	0.09	80.00	173.88
14536.00	90.52	180.80	11230.73	-3500.66	110.85	3500.44	3502.41	178.19	0.90	0.88	-0.19	80.00	-12.09
14631.00	90.34	180.80	11230.02	-3595.65	109.53	3595.43	3597.31	178.26	0.19	-0.19	0.00	80.00	180.00
14726.00	88.36	180.28	11231.10	-3690.63	108.63	3690.42	3692.23	178.31	2.15	-2.08	-0.55	80.00	-165.29
14820.00	89.04	180.54	11233.23	-3784.60	107.96	3784.39	3786.14	178.37	0.77	0.72	0.28	80.00	20.92
14915.00	88.30	179.93	11235.44	-3879.58	107.57	3879.36	3881.07	178.41	1.01	-0.78	-0.64	80.00	-140.51
15010.00	89.29	180.10	11237.43	-3974.55	107.54	3974.34	3976.01	178.45	1.06	1.04	0.18	80.00	9.74
15105.00	89.75	179.05	11238.23	-4069.55	108.25	4069.33	4070.99	178.48	1.21	0.48	-1.11	80.00	-66.35
15200.00	88.93	178.87	11239.32	-4164.52	109.97	4164.31	4165.98	178.49	0.88	-0.86	-0.19	80.00	-167.62
15295.00	89.57	178.87	11240.57	-4259.50	111.85	4259.27	4260.97	178.50	0.67	0.67	0.00	80.00	0.00
15390.00	88.67	179.22	11242.03	-4354.47	113.43	4354.25	4355.95	178.51	1.02	-0.95	0.37	80.00	158.75
15485.00	89.29	179.31	11243.72	-4449.45	114.65	4449.22	4450.93	178.52	0.66	0.65	0.09	80.00	8.26
15580.00	88.67	179.75	11245.41	-4544.43	115.43	4544.20	4545.90	178.55	0.80	-0.65	0.46	80.00	144.65
15676.00	89.84	180.10	11246.66	-4640.42	115.55	4640.19	4641.86	178.57	1.27	1.22	0.36	80.00	16.66
15769.00	88.85	180.19	11247.72	-4733.41	115.32	4733.18	4734.82	178.60	1.07	-1.06	0.10	80.00	174.81
15863.00	89.70	180.54	11248.91	-4827.40	114.72	4827.17	4828.76	178.64	0.98	0.90	0.37	80.00	22.38
15957.00	88.76	180.28	11250.17	-4921.39	114.04	4921.16	4922.71	178.67	1.04	-1.00	-0.28	80.00	-164.54
16053.00	88.08	180.45	11252.82	-5017.35	113.43	5017.12	5018.63	178.70	0.73	-0.71	0.18	80.00	165.97
16148.00	89.07	180.45	11255.18	-5112.32	112.69	5112.09	5113.56	178.74	1.04	1.04	0.00	80.00	0.00
16243.00	88.45	180.37	11257.24	-5207.29	112.01	5207.07	5208.50	178.77	0.66	-0.65	-0.08	80.00	-172.65
16338.00	89.37	180.37	11259.04	-5302.27	111.39	5302.05	5303.44	178.80	0.97	0.97	0.00	80.00	0.00
16433.00	89.35	179.93	11260.11	-5397.27	111.15	5397.04	5398.41	178.82	0.46	-0.02	-0.46	80.00	-92.61
16528.00	89.24	179.93	11261.27	-5492.26	111.26	5492.03	5493.38	178.84	0.12	-0.12	0.00	80.00	180.00
16623.00	87.99	179.57	11263.57	-5587.23	111.68	5587.00	5588.34	178.85	1.37	-1.32	-0.38	80.00	-163.94
16717.00	89.59	179.58	11265.56	-5681.20	112.37	5680.97	5682.31	178.87	1.70	1.70	0.01	80.00	0.36
16812.00	88.91	179.84	11266.80	-5776.19	112.85	5775.96	5777.29	178.88	0.77	-0.72	0.27	80.00	159.08
16907.00	89.22	179.75	11268.35	-5871.18	113.19	5870.95	5872.27	178.90	0.34	0.33	-0.09	80.00	-16.19

17003.00	89.24	179.93	11269.64	-5967.17	113.46	5966.94	5968.25	178.91	0.19	0.02	0.19	80.00	83.66
17098.00	89.79	179.84	11270.44	-6062.16	113.65	6061.93	6063.23	178.93	0.59	0.58	-0.09	80.00	-9.29
17193.00	88.60	179.84	11271.78	-6157.15	113.92	6156.92	6158.21	178.94	1.25	-1.25	0.00	80.00	180.00
17288.00	90.10	179.93	11272.86	-6252.14	114.11	6251.91	6253.18	178.95	1.58	1.58	0.09	80.00	3.43
17382.00	90.58	180.72	11272.30	-6346.14	113.58	6345.91	6347.16	178.97	0.98	0.51	0.84	80.00	58.72
17477.00	89.09	181.07	11272.57	-6441.12	112.09	6440.90	6442.10	179.00	1.61	-1.57	0.37	80.00	166.78
17572.00	87.81	179.66	11275.14	-6536.08	111.49	6535.86	6537.03	179.02	2.00	-1.35	-1.48	80.00	-132.26
17666.00	88.93	180.01	11277.82	-6630.04	111.76	6629.82	6630.99	179.03	1.25	1.19	0.37	80.00	17.35
17759.00	88.67	179.66	11279.76	-6723.02	112.02	6722.80	6723.96	179.05	0.47	-0.28	-0.38	80.00	-126.62
17854.00	87.22	179.22	11283.17	-6817.95	112.95	6817.72	6818.89	179.05	1.59	-1.53	-0.46	80.00	-163.14
17949.00	88.49	179.66	11286.73	-6912.88	113.88	6912.65	6913.82	179.06	1.41	1.34	0.46	80.00	19.11
18043.00	88.65	179.75	11289.07	-7006.85	114.36	7006.62	7007.78	179.06	0.20	0.17	0.10	80.00	29.35
18139.00	89.40	179.93	11290.70	-7102.84	114.63	7102.60	7103.76	179.08	0.80	0.78	0.19	80.00	13.50
18234.00	90.03	180.10	11291.18	-7197.83	114.61	7197.60	7198.75	179.09	0.69	0.66	0.18	80.00	15.10
18330.00	90.19	180.10	11290.99	-7293.83	114.44	7293.60	7294.73	179.10	0.17	0.17	0.00	80.00	0.00
18404.00	89.57	180.54	11291.15	-7367.83	114.03	7367.60	7368.71	179.11	1.03	-0.84	0.59	80.00	144.64

This survey is correct to the best of my knowledge and is supported by actual field data.

Steve Morris

