



Site: Wethington 21-7 Pad
Well: Wethington 41-7
Wellbore: Wellbore #1
Design: Plan #1

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
Northing: 1268645.68
Easting: 3190190.23
Latitude: 40° 4' 7.734 N
Longitude: 104° 49' 13.627 W
Grid Convergence: 0.44° West
Ground Elevation: 4902.00
KB Elevation: WELL @ 4917.00ft (Original Well Elev)



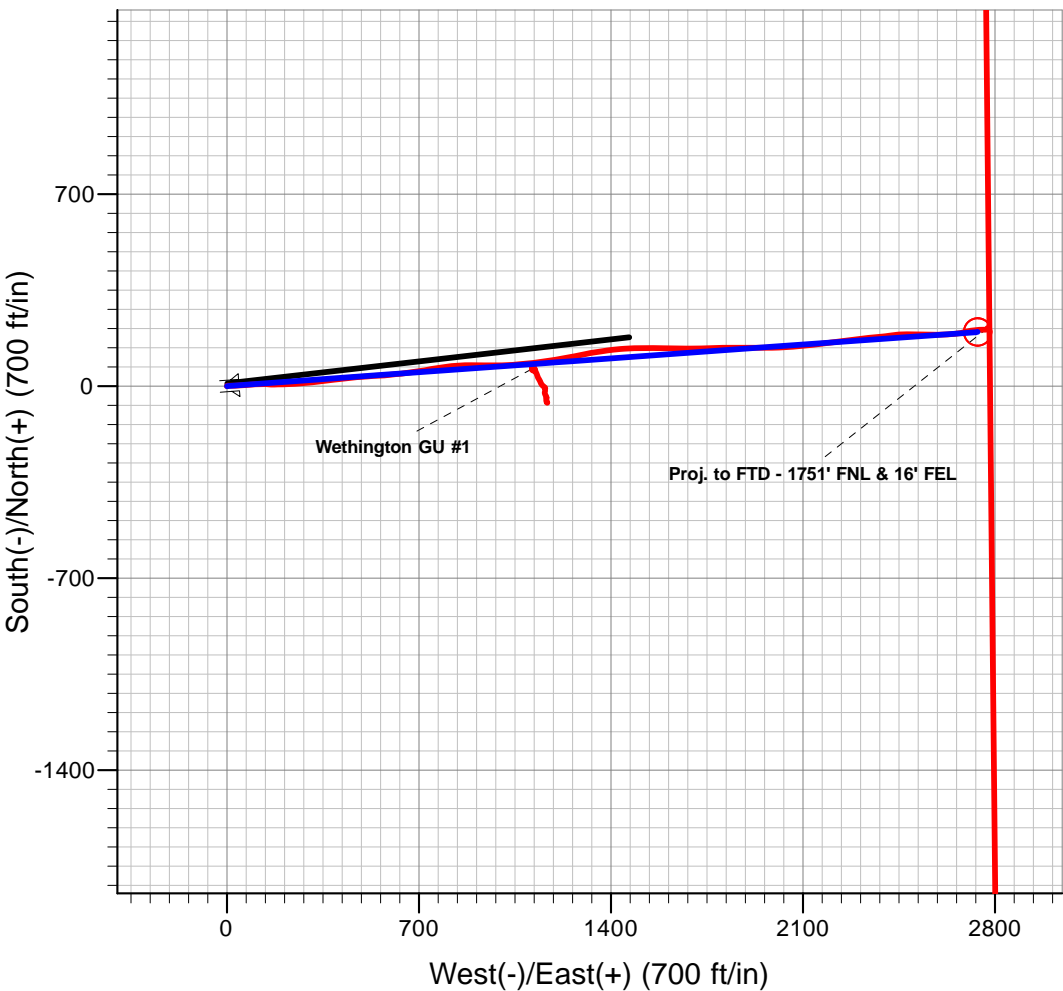
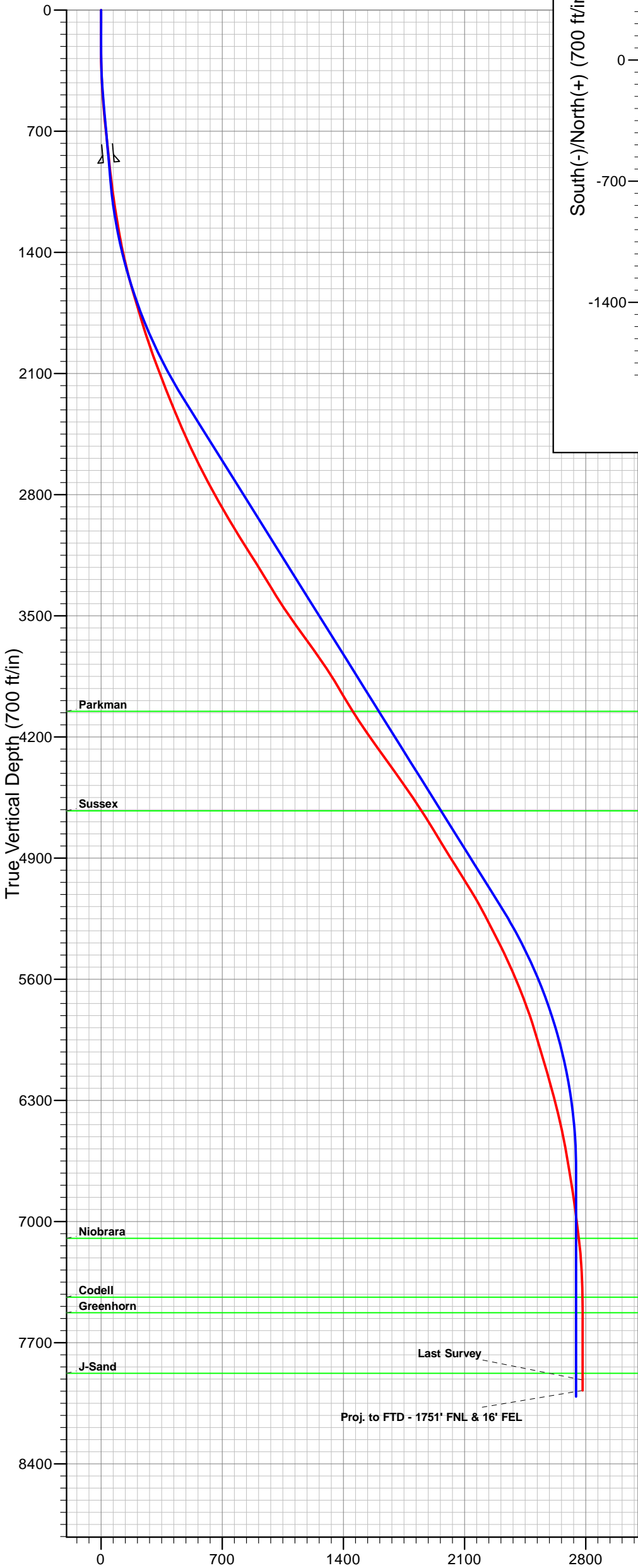
Departure
Energy Services (US) L.P

Denver, Colorado
Phone: 303.542.2000

Casper, Wyoming
Phone: 307.265.2231
Fax: 307.472.5064
www.departureus.com

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Closure	Annotation
250.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP - Build at 2°/100'
499.68	500.00	5.00	85.88	0.78	10.87	10.90	10.90	End of Build - Hold at 5° Inc.
979.62	981.77	5.00	85.88	3.80	52.75	52.89	52.89	Build at 2°/100'
2247.97	2331.68	32.00	85.88	34.31	476.02	477.25	477.25	End of Build - Hold at 32° Inc.
5178.62	5787.37	32.00	85.88	165.94	2302.43	2308.40	2308.40	Drop at 2°/100'
6696.65	7387.28	0.00	0.00	197.23	2736.56	2743.66	2743.66	End of Drop
8012.00	8702.63	0.00	0.00	197.23	2736.56	2743.66	2743.66	PBHL - 1320' FNL & 50' FEL



FORMATION TOP DETAILS

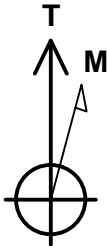
TVDPATH	MDPATH	FORMATION
4052.00	4458.91	Parkman
4627.00	5136.93	Sussex
7097.00	7787.63	Niobrara
7437.00	8127.63	Codell
7527.00	8217.63	Greenhorn
7877.00	8567.63	J-Sand

CASING DETAILS

TVD	MD	NAME	SIZE
880.00	881.77	8 5/8"	8.625

DESIGN TARGET DETAILS

NAME	TVD	+N/-S	+E/-W	NORTHING	EASTING
Wethington 41-7 PBHL	8012.00	197.23	2736.56	1268863.88	3192925.20



Azimuths to True North
Magnetic North: 8.83°

Magnetic Field
Strength: 52926.3snT
Dip Angle: 66.77°
Date: 09/06/2011
Model: IGRF2010



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Anadarko Petroleum Corporation

Weld County, Colorado

Section 7 - Township 1 North - Range 66 West

Wethington 41-7

S-Well

Final Surveys

Job Number: 311032

Surface location

NAD 83

Lat: 40.068815°N

Long: 104.820452°W

Final Survey Report

September 22, 2011

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Wethington 41-7
Project:	Weld County, Colorado (Northern Zone)	TVD Reference:	WELL @ 4917.00ft (Original Well Elev)
Site:	Wethington 21-7 Pad	MD Reference:	WELL @ 4917.00ft (Original Well Elev)
Well:	Wethington 41-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM Depart

Project	Weld County, Colorado (Northern Zone)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Wethington 21-7 Pad, Sec 7-T1N-R66W		
Site Position:		Northing:	1,268,685.79 ft
From:	Lat/Long	Easting:	3,190,193.28 ft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	40° 4' 8.130 N
		Longitude:	104° 49' 13.584 W
		Grid Convergence:	0.44 °

Well	Wethington 41-7		
Well Position	+N/-S	0.00 ft	Northing: 1,268,645.68 ft
	+E/-W	0.00 ft	Easting: 3,190,190.23 ft
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	40° 4' 7.734 N
		Longitude:	104° 49' 13.627 W
		Ground Level:	4,902.00 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	09/06/11	8.83
			Dip Angle (°)
			66.77
			Field Strength (nT)
			52,926

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			Direction (°)
			85.88

Survey Program	Date	09/22/11		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
71.00	8,639.00	Survey #1 (Wellbore #1)	MWD	MWD - Standard

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71.00	0.40	270.00	71.00	0.00	-0.25	-0.25	0.56	0.56	0.00
161.00	0.20	304.80	161.00	0.09	-0.69	-0.68	0.29	-0.22	38.67
251.00	0.50	47.50	251.00	0.44	-0.53	-0.50	0.64	0.33	114.11
341.00	1.60	79.80	340.98	0.93	1.00	1.06	1.34	1.22	35.89
418.00	3.00	87.20	417.92	1.22	4.07	4.14	1.85	1.82	9.61
509.00	4.40	91.10	508.73	1.27	9.94	10.00	1.56	1.54	4.29
599.00	5.30	90.40	598.40	1.18	17.54	17.58	1.00	1.00	-0.78
690.00	6.00	88.30	688.96	1.29	26.50	26.52	0.80	0.77	-2.31
781.00	6.20	86.10	779.44	1.76	36.16	36.19	0.34	0.22	-2.42

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Well:	Wethington 41-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM Depart

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
848.00	6.20	86.80	846.05	2.21	43.38	43.43	0.11	0.00	1.04	
920.00	5.60	89.70	917.67	2.45	50.77	50.82	0.93	-0.83	4.03	
1,011.00	7.40	86.80	1,008.08	2.80	61.07	61.11	2.01	1.98	-3.19	
1,101.00	8.60	84.00	1,097.21	3.82	73.55	73.63	1.40	1.33	-3.11	
1,192.00	9.00	81.90	1,187.13	5.54	87.36	87.53	0.56	0.44	-2.31	
1,283.00	9.70	83.30	1,276.92	7.43	102.02	102.29	0.81	0.77	1.54	
1,374.00	11.60	93.50	1,366.36	7.77	118.77	119.02	2.93	2.09	11.21	
1,464.00	13.50	94.60	1,454.21	6.38	138.27	138.37	2.13	2.11	1.22	
1,555.00	14.60	90.00	1,542.49	5.52	160.33	160.31	1.72	1.21	-5.05	
1,646.00	16.40	88.30	1,630.17	5.90	184.64	184.59	2.04	1.98	-1.87	
1,737.00	16.70	87.60	1,717.40	6.83	210.55	210.49	0.40	0.33	-0.77	
1,828.00	16.70	87.20	1,804.57	8.02	236.67	236.64	0.13	0.00	-0.44	
1,918.00	18.10	86.50	1,890.44	9.50	263.54	263.54	1.57	1.56	-0.78	
2,009.00	19.70	85.40	1,976.54	11.60	292.94	293.02	1.80	1.76	-1.21	
2,100.00	21.10	83.00	2,061.83	14.82	324.49	324.72	1.79	1.54	-2.64	
2,190.00	20.60	82.30	2,145.93	18.92	356.26	356.70	0.62	-0.56	-0.78	
2,281.00	22.00	83.00	2,230.72	23.14	389.04	389.70	1.56	1.54	0.77	
2,372.00	22.50	83.00	2,314.94	27.34	423.24	424.11	0.55	0.55	0.00	
2,463.00	23.60	85.10	2,398.68	31.02	458.68	459.72	1.51	1.21	2.31	
2,553.00	24.05	85.40	2,481.01	34.03	494.91	496.07	0.52	0.50	0.33	
2,644.00	25.50	86.80	2,563.63	36.61	532.95	534.20	1.72	1.59	1.54	
2,735.00	27.30	86.10	2,645.14	39.12	573.33	574.66	2.01	1.98	-0.77	
2,826.00	27.30	83.70	2,726.00	42.83	614.90	616.38	1.21	0.00	-2.64	
2,916.00	28.90	82.60	2,805.39	47.90	656.98	658.72	1.87	1.78	-1.22	
3,007.00	30.60	80.20	2,884.40	54.67	701.61	703.73	2.28	1.87	-2.64	
3,098.00	31.30	80.50	2,962.44	62.52	747.75	750.31	0.79	0.77	0.33	
3,189.00	32.00	81.90	3,039.91	69.82	794.94	797.90	1.12	0.77	1.54	
3,280.00	32.20	86.50	3,117.01	74.70	843.02	846.20	2.69	0.22	5.05	
3,370.00	31.70	91.10	3,193.38	75.71	890.60	893.74	2.76	-0.56	5.11	
3,461.00	31.80	90.40	3,270.77	75.08	938.48	941.45	0.42	0.11	-0.77	
3,552.00	31.30	89.70	3,348.31	75.04	986.10	988.94	0.68	-0.55	-0.77	
3,642.00	33.10	86.10	3,424.48	76.83	1,034.00	1,036.85	2.92	2.00	-4.00	
3,733.00	34.00	84.40	3,500.32	81.00	1,084.11	1,087.13	1.43	0.99	-1.87	
3,824.00	36.20	82.60	3,574.77	86.95	1,136.09	1,139.40	2.67	2.42	-1.98	
3,915.00	35.70	80.50	3,648.43	94.79	1,188.93	1,192.67	1.46	-0.55	-2.31	
4,005.00	36.10	80.20	3,721.34	103.64	1,240.96	1,245.20	0.49	0.44	-0.33	
4,096.00	33.60	78.10	3,796.01	113.39	1,292.02	1,296.83	3.05	-2.75	-2.31	
4,187.00	31.50	80.20	3,872.72	122.63	1,340.09	1,345.44	2.62	-2.31	2.31	
4,278.00	30.30	82.30	3,950.80	129.76	1,386.27	1,392.01	1.77	-1.32	2.31	
4,369.00	31.80	84.70	4,028.77	135.05	1,432.90	1,438.90	2.14	1.65	2.64	
4,459.00	33.60	88.60	4,104.51	137.85	1,481.42	1,487.49	3.08	2.00	4.33	
4,550.00	34.50	90.40	4,179.91	138.28	1,532.36	1,538.34	1.48	0.99	1.98	
4,651.00	35.90	91.10	4,262.44	137.52	1,590.57	1,596.34	1.44	1.39	0.69	
4,793.00	35.70	89.70	4,377.61	136.93	1,673.63	1,679.14	0.59	-0.14	-0.99	

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Well:	Wethington 41-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM Depart

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,822.00	36.10	89.70	4,401.10	137.02	1,690.64	1,696.11	1.38	1.38	0.00	
4,913.00	34.70	88.60	4,475.28	137.80	1,743.34	1,748.74	1.69	-1.54	-1.21	
5,004.00	34.00	88.30	4,550.41	139.18	1,794.67	1,800.03	0.79	-0.77	-0.33	
5,095.00	33.10	90.00	4,626.25	139.94	1,844.95	1,850.24	1.43	-0.99	1.87	
5,186.00	32.00	90.40	4,702.95	139.77	1,893.91	1,899.06	1.23	-1.21	0.44	
5,276.00	31.00	90.00	4,779.69	139.60	1,940.93	1,945.95	1.14	-1.11	-0.44	
5,367.00	31.30	89.30	4,857.57	139.89	1,988.00	1,992.92	0.52	0.33	-0.77	
5,458.00	32.20	86.80	4,934.95	141.53	2,035.85	2,040.76	1.75	0.99	-2.75	
5,549.00	32.20	85.40	5,011.96	144.83	2,084.23	2,089.25	0.82	0.00	-1.54	
5,640.00	31.00	82.60	5,089.47	149.80	2,131.64	2,136.89	2.08	-1.32	-3.08	
5,730.00	29.70	81.90	5,167.13	155.92	2,176.70	2,182.28	1.50	-1.44	-0.78	
5,821.00	27.40	83.00	5,247.06	161.65	2,219.81	2,225.68	2.59	-2.53	1.21	
5,912.00	27.10	84.00	5,327.96	166.37	2,261.20	2,267.31	0.60	-0.33	1.10	
6,003.00	26.20	84.00	5,409.29	170.64	2,301.80	2,308.11	0.99	-0.99	0.00	
6,093.00	24.80	83.30	5,490.52	174.92	2,340.30	2,346.82	1.59	-1.56	-0.78	
6,184.00	23.90	83.70	5,573.43	179.16	2,377.58	2,384.31	1.01	-0.99	0.44	
6,275.00	21.80	82.60	5,657.28	183.36	2,412.67	2,419.60	2.35	-2.31	-1.21	
6,366.00	20.10	83.30	5,742.26	187.37	2,444.95	2,452.10	1.89	-1.87	0.77	
6,456.00	18.80	91.80	5,827.14	188.71	2,474.82	2,481.98	3.46	-1.44	9.44	
6,547.00	16.70	90.40	5,913.81	188.16	2,502.55	2,509.60	2.35	-2.31	-1.54	
6,638.00	16.90	89.70	6,000.92	188.14	2,528.85	2,535.83	0.31	0.22	-0.77	
6,729.00	16.50	91.40	6,088.09	187.89	2,555.00	2,561.89	0.69	-0.44	1.87	
6,820.00	15.00	92.50	6,175.67	187.06	2,579.68	2,586.45	1.68	-1.65	1.21	
6,911.00	15.50	87.60	6,263.47	187.06	2,603.60	2,610.31	1.52	0.55	-5.38	
7,001.00	14.30	86.50	6,350.44	188.24	2,626.71	2,633.44	1.37	-1.33	-1.22	
7,092.00	12.30	84.70	6,438.99	189.82	2,647.58	2,654.37	2.24	-2.20	-1.98	
7,183.00	11.40	82.30	6,528.05	191.92	2,666.14	2,673.04	1.13	-0.99	-2.64	
7,274.00	9.50	75.60	6,617.54	195.00	2,682.33	2,689.41	2.48	-2.09	-7.36	
7,364.00	10.00	75.90	6,706.24	198.75	2,697.10	2,704.41	0.56	0.56	0.33	
7,455.00	9.10	80.20	6,795.98	201.90	2,711.86	2,719.36	1.26	-0.99	4.73	
7,546.00	7.90	84.00	6,885.98	203.78	2,725.17	2,732.77	1.46	-1.32	4.18	
7,637.00	6.90	87.90	6,976.22	204.63	2,736.85	2,744.48	1.23	-1.10	4.29	
7,728.00	7.00	90.70	7,066.55	204.76	2,747.86	2,755.47	0.39	0.11	3.08	
7,818.00	6.20	84.00	7,155.96	205.20	2,758.18	2,765.79	1.23	-0.89	-7.44	
7,909.00	3.50	86.80	7,246.62	205.87	2,765.84	2,773.48	2.98	-2.97	3.08	
8,000.00	2.50	73.00	7,337.50	206.61	2,770.51	2,778.19	1.35	-1.10	-15.16	
8,091.00	1.20	53.00	7,428.45	207.76	2,773.17	2,780.93	1.57	-1.43	-21.98	
8,182.00	0.40	338.00	7,519.44	208.63	2,773.81	2,781.63	1.28	-0.88	-82.42	
8,272.00	0.40	337.90	7,609.44	209.21	2,773.57	2,781.44	0.00	0.00	-0.11	
8,363.00	0.40	1.80	7,700.44	209.82	2,773.47	2,781.37	0.18	0.00	26.26	
8,454.00	0.40	349.50	7,791.44	210.45	2,773.42	2,781.37	0.09	0.00	-13.52	
8,545.00	0.50	13.40	7,882.43	211.15	2,773.45	2,781.45	0.23	0.11	26.26	
8,578.00	0.50	343.10	7,915.43	211.43	2,773.44	2,781.47	0.79	0.00	-91.82	

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Last Survey									
8,639.00	0.50	343.10	7,976.43	211.94	2,773.29	2,781.35	0.00	0.00	0.00
Proj. to FTD - 1751' FNL & 16' FEL									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,578.00	7,915.43	211.43	2,773.44	Last Survey
8,639.00	7,976.43	211.94	2,773.29	Proj. to FTD - 1751' FNL & 16' FEL

Checked By: _____	Approved By: _____	Date: _____
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