



Jay-Bee Oil & Gas

Tyler County

Happy Pad

Happy #3

Wellbore #1

Survey: MWD Surveys

QES Survey Report

01 May, 2017

Quintana Energy Services

11390 FM 830
 Willis, TX 77318
 Phone: (936) 856-4332
 Fax: (936) 856-8678

**Survey Certification Sheet**

Company	Job Number	Date
Jay-Bee Oil & Gas, Inc.	AM-170405	5/1/2017

Lease	Well Name	County & State
N/A	Happy #3	Tyler County, WV

API No.	Survey Depth Range	Survey Type
47-095-02227	5620.6 feet to 13215 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
N/A	Steve Spicer

Certification Statement

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Quintana Energy Services (QES). This report represents a true and correct directional survey of this well based on the original data obtained at the well site. Wellbore coordinates are calculated using minimum curvature.

Christopher Hughes

Digitally signed by Christopher Hughes
 DN: cn=Christopher Hughes, o=QES,
 ou=compliance, email=chrish@qeslp.com, c=US
 Date: 2017.05.03 07:34:11 -05'00'

Christopher Hughes
 MWD Compliance Manager
 Quintana Energy Services



Survey Report

05/03/2019
QES
QUALITY ENGINEERING SERVICES

Company:	Jay-Bee Oil & Gas	Local Co-ordinate Reference:	Well Happy #3
Project:	Tyler County	TVD Reference:	well @ 1274.1usft (Nomac #81)
Site:	Happy Pad	MD Reference:	well @ 1274.1usft (Nomac #81)
Well:	Happy #3	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Project	Tyler County		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	Happy Pad				
Site Position:		Northing:	355,679.62 usft	Latitude:	39° 28' 11.215 N
From:	Map	Easting:	1,615,403.34 usft	Longitude:	80° 45' 2.938 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.80 °

Well	Happy #3					
Well Position	+N/-S	0.0 usft	Northing:	355,705.26 usft	Latitude:	39° 28' 11.471 N
	+E/-W	0.0 usft	Easting:	1,615,418.38 usft	Longitude:	80° 45' 2.750 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft	Ground Level:	1,253.5 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/12/2017	-8.59	66.73	52,038

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	159.95	

Survey Program	Date	4/19/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
20.6	5,620.6	Gyros (Wellbore #1)	Good_gyro	Good Gyro	
5,726.0	13,215.0	MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,620.6	1.28	289.29	5,617.3	-72.3	31.6	78.8	0.00	0.00	0.00	
Gyro Tie In @ 5620.7 'MD / 5617.4 'TVD										
5,620.7	1.28	289.29	5,617.4	-72.3	31.6	78.8	0.00	0.00	0.00	
5,726.0	1.00	271.40	5,722.7	-71.9	29.5	77.7	0.43	-0.27	-16.99	
5,821.0	0.90	273.00	5,817.6	-71.8	28.0	77.1	0.11	-0.11	1.68	
5,916.0	0.40	284.40	5,912.6	-71.7	26.9	76.6	0.54	-0.53	12.00	
6,011.0	1.60	306.40	6,007.6	-70.9	25.5	75.3	1.30	1.26	23.16	
6,106.0	1.10	267.00	6,102.6	-70.1	23.5	73.9	1.08	-0.53	-41.47	
6,200.0	1.00	272.20	6,196.6	-70.1	21.8	73.4	0.15	-0.11	5.53	
6,295.0	1.80	138.10	6,291.6	-71.2	22.0	74.4	2.73	0.84	-141.16	



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05/03/2019



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Site:	Happy Pad	MD Reference:	well @ 1274.1usft (Nomac #81)
Well:	Happy #3	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
6,342.0	9.50	101.20	6,338.3	-72.5	26.3	77.1	17.30	16.38	-78.51	
6,389.0	17.10	91.70	6,384.0	-73.5	37.0	81.7	16.77	16.17	-20.21	
6,436.0	21.00	91.80	6,428.4	-73.9	52.3	87.4	8.30	8.30	0.21	
6,484.0	22.90	94.50	6,473.0	-74.9	70.2	94.5	4.48	3.96	5.63	
6,531.0	26.20	91.40	6,515.7	-75.9	89.7	102.1	7.53	7.02	-6.60	
6,579.0	31.00	90.90	6,557.8	-76.4	112.7	110.4	10.01	10.00	-1.04	
6,626.0	33.50	88.90	6,597.6	-76.3	137.8	118.9	5.78	5.32	-4.26	
6,674.0	35.70	90.40	6,637.1	-76.2	165.0	128.1	4.91	4.58	3.13	
6,721.0	37.10	96.90	6,674.9	-78.0	192.8	139.3	8.73	2.98	13.83	
6,769.0	39.90	106.50	6,712.5	-84.1	222.0	155.1	13.73	5.83	20.00	
6,816.0	42.50	113.50	6,747.9	-94.7	251.0	175.0	11.26	5.53	14.89	
6,864.0	44.90	117.30	6,782.6	-108.9	281.0	198.7	7.41	5.00	7.92	
6,911.0	47.60	118.60	6,815.1	-124.9	310.9	223.9	6.08	5.74	2.77	
6,959.0	49.80	122.30	6,846.8	-143.1	342.0	251.7	7.38	4.58	7.71	
7,006.0	53.10	126.20	6,876.1	-163.8	372.4	281.6	9.56	7.02	8.30	
7,054.0	56.80	130.70	6,903.7	-188.3	403.1	315.1	10.87	7.71	9.38	
7,101.0	60.00	134.80	6,928.3	-215.5	432.5	350.7	10.08	6.81	8.72	
7,148.0	62.60	136.80	6,950.9	-245.0	461.2	388.3	6.67	5.53	4.26	
7,195.0	65.00	139.40	6,971.6	-276.4	489.3	427.4	7.12	5.11	5.53	
7,244.0	67.40	144.80	6,991.4	-311.8	516.9	470.1	11.21	4.90	11.02	
7,291.0	71.90	147.50	7,007.7	-348.4	541.4	512.9	10.98	9.57	5.74	
7,339.0	74.60	151.50	7,021.6	-388.0	564.7	558.1	9.76	5.63	8.33	
7,386.0	77.80	155.80	7,032.8	-428.9	584.9	603.4	11.19	6.81	9.15	
7,433.0	80.20	159.50	7,041.8	-471.5	602.5	649.5	9.26	5.11	7.87	
7,480.0	82.60	163.80	7,048.8	-515.6	617.1	695.9	10.39	5.11	9.15	
7,528.0	84.70	163.60	7,054.1	-561.4	630.5	743.5	4.39	4.38	-0.42	
7,575.0	88.10	166.80	7,057.1	-606.7	642.5	790.2	9.92	7.23	6.81	
7,623.0	90.10	166.60	7,057.8	-653.4	653.5	837.9	4.19	4.17	-0.42	
7,718.0	91.50	163.90	7,056.5	-745.3	677.7	932.5	3.20	1.47	-2.84	
7,813.0	91.80	164.80	7,053.8	-836.7	703.3	1,027.1	1.00	0.32	0.95	
7,907.0	90.30	164.70	7,052.0	-927.4	728.0	1,120.8	1.60	-1.60	-0.11	
8,001.0	90.50	163.30	7,051.4	-1,017.8	753.9	1,214.6	1.50	0.21	-1.49	
8,096.0	90.80	162.60	7,050.3	-1,108.6	781.8	1,309.4	0.80	0.32	-0.74	
8,190.0	89.10	161.00	7,050.4	-1,197.9	811.1	1,403.4	2.48	-1.81	-1.70	
8,285.0	89.80	164.00	7,051.3	-1,288.5	839.7	1,498.2	3.24	0.74	3.16	
8,380.0	91.30	164.00	7,050.4	-1,379.8	865.9	1,593.0	1.58	1.58	0.00	
8,474.0	89.60	160.70	7,049.6	-1,469.3	894.4	1,686.9	3.95	-1.81	-3.51	
8,568.0	91.10	164.00	7,049.1	-1,558.9	922.9	1,780.8	3.86	1.60	3.51	
8,663.0	91.30	164.90	7,047.1	-1,650.4	948.3	1,875.5	0.97	0.21	0.95	
8,758.0	92.00	166.40	7,044.3	-1,742.4	971.9	1,970.0	1.74	0.74	1.58	
8,853.0	90.90	166.80	7,041.9	-1,834.8	993.9	2,064.3	1.23	-1.16	0.42	
8,947.0	89.50	166.40	7,041.6	-1,926.2	1,015.7	2,157.7	1.55	-1.49	-0.43	
9,042.0	89.40	167.60	7,042.5	-2,018.8	1,037.0	2,251.9	1.27	-0.11	1.26	



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05/03/2019



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Site:	Happy Pad	MD Reference:	well @ 1274.1usft (Nomac #81)
Well:	Happy #3	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,137.0	89.10	164.40	7,043.8	-2,110.9	1,060.0	2,346.4	3.38	-0.32	-3.37
9,232.0	91.60	167.50	7,043.2	-2,203.1	1,083.1	2,440.9	4.19	2.63	3.26
9,326.0	92.40	164.70	7,039.9	-2,294.2	1,105.6	2,534.2	3.10	0.85	-2.98
9,421.0	91.40	164.40	7,036.8	-2,385.8	1,130.9	2,628.9	1.10	-1.05	-0.32
9,516.0	89.80	165.50	7,035.8	-2,477.5	1,155.6	2,723.5	2.04	-1.68	1.16
9,610.0	90.00	164.50	7,035.9	-2,568.3	1,179.9	2,817.1	1.08	0.21	-1.06
9,705.0	88.50	166.80	7,037.2	-2,660.3	1,203.5	2,911.7	2.89	-1.58	2.42
9,800.0	88.40	163.50	7,039.7	-2,752.1	1,227.8	3,006.2	3.47	-0.11	-3.47
9,894.0	89.20	163.00	7,041.7	-2,842.1	1,254.9	3,100.0	1.00	0.85	-0.53
9,989.0	91.00	163.60	7,041.5	-2,933.1	1,282.2	3,194.9	2.00	1.89	0.63
10,084.0	90.30	161.00	7,040.5	-3,023.6	1,311.0	3,289.8	2.83	-0.74	-2.74
10,179.0	89.00	160.80	7,041.0	-3,113.3	1,342.1	3,384.8	1.38	-1.37	-0.21
10,274.0	89.50	163.20	7,042.3	-3,203.7	1,371.5	3,479.7	2.58	0.53	2.53
10,369.0	90.70	162.60	7,042.1	-3,294.5	1,399.4	3,574.6	1.41	1.26	-0.63
10,463.0	89.60	163.20	7,041.9	-3,384.3	1,427.1	3,668.4	1.33	-1.17	0.64
10,558.0	88.70	162.10	7,043.3	-3,475.0	1,455.4	3,763.3	1.50	-0.95	-1.16
10,653.0	88.90	161.40	7,045.3	-3,565.2	1,485.1	3,858.2	0.77	0.21	-0.74
10,747.0	88.90	162.10	7,047.1	-3,654.4	1,514.6	3,952.2	0.74	0.00	0.74
10,843.0	88.60	161.20	7,049.2	-3,745.5	1,544.8	4,048.1	0.99	-0.31	-0.94
10,938.0	88.60	163.30	7,051.5	-3,836.0	1,573.7	4,143.0	2.21	0.00	2.21
11,033.0	89.20	161.90	7,053.3	-3,926.6	1,602.1	4,237.9	1.60	0.63	-1.47
11,128.0	88.80	163.50	7,055.0	-4,017.3	1,630.4	4,332.8	1.74	-0.42	1.68
11,222.0	89.00	161.60	7,056.8	-4,106.9	1,658.6	4,426.6	2.03	0.21	-2.02
11,317.0	87.10	162.90	7,060.0	-4,197.3	1,687.5	4,521.5	2.42	-2.00	1.37
11,412.0	86.90	166.30	7,065.0	-4,288.8	1,712.7	4,616.0	3.58	-0.21	3.58
11,507.0	88.70	166.80	7,068.6	-4,381.1	1,734.8	4,710.3	1.97	1.89	0.53
11,602.0	90.30	168.20	7,069.5	-4,473.9	1,755.3	4,804.5	2.24	1.68	1.47
11,697.0	90.40	166.90	7,068.9	-4,566.6	1,775.8	4,898.7	1.37	0.11	-1.37
11,792.0	89.40	167.70	7,069.0	-4,659.3	1,796.7	4,992.9	1.35	-1.05	0.84
11,886.0	89.10	164.50	7,070.3	-4,750.5	1,819.3	5,086.3	3.42	-0.32	-3.40
11,981.0	89.80	163.10	7,071.2	-4,841.7	1,845.8	5,181.1	1.85	0.74	-1.47
12,075.0	91.70	164.30	7,070.0	-4,932.0	1,872.1	5,274.9	2.39	2.02	1.28
12,170.0	90.20	160.80	7,068.4	-5,022.5	1,900.6	5,369.8	4.01	-1.58	-3.68
12,265.0	89.70	163.20	7,068.5	-5,112.9	1,930.0	5,464.7	2.58	-0.53	2.53
12,360.0	88.70	162.20	7,069.8	-5,203.6	1,958.2	5,559.6	1.49	-1.05	-1.05
12,455.0	89.40	163.60	7,071.4	-5,294.4	1,986.2	5,654.4	1.65	0.74	1.47
12,550.0	87.60	163.90	7,073.9	-5,385.5	2,012.7	5,749.2	1.92	-1.89	0.32
12,645.0	91.30	165.30	7,074.8	-5,477.1	2,038.0	5,843.9	4.16	3.89	1.47
12,740.0	91.10	165.50	7,072.8	-5,569.0	2,061.9	5,938.4	0.30	-0.21	0.21
12,835.0	90.70	164.70	7,071.3	-5,660.8	2,086.3	6,033.0	0.94	-0.42	-0.84
12,930.0	92.20	166.10	7,068.9	-5,752.7	2,110.3	6,127.5	2.16	1.58	1.47
13,025.0	92.80	166.60	7,064.7	-5,844.9	2,132.7	6,221.9	0.82	0.63	0.53
13,119.0	92.30	166.10	7,060.6	-5,936.2	2,154.8	6,315.2	0.75	-0.53	-0.53



Survey Report

05/03/2019



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Well:	Happy #3	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,157.0	92.40	165.70	7,059.0	-5,973.0	2,164.1	6,352.9	1.08	0.26	-1.05	
TD @ 13215.0' MD / 7056.6' TVD										
13,215.0	92.40	165.70	7,056.6	-6,029.2	2,178.4	6,410.6	0.00	0.00	0.00	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
5,620.7	5,617.4	-72.3	31.6	Gyro Tie In @ 5620.7 'MD / 5617.4 'TVD	
13,215.0	7,056.6	-6,029.2	2,178.4	TD @ 13215.0' MD / 7056.6' TVD	

Checked By: _____ Approved By: _____ Date: _____

Company Name: Jay-Bee Oil & Gas
 Happy #3
 Tyler County
 Rig: Nomac #51
 Created By: Will Jircik
 Date: 04/19/2017

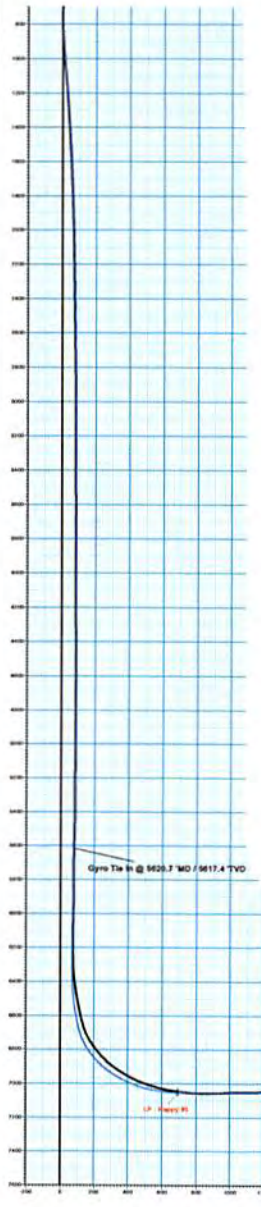
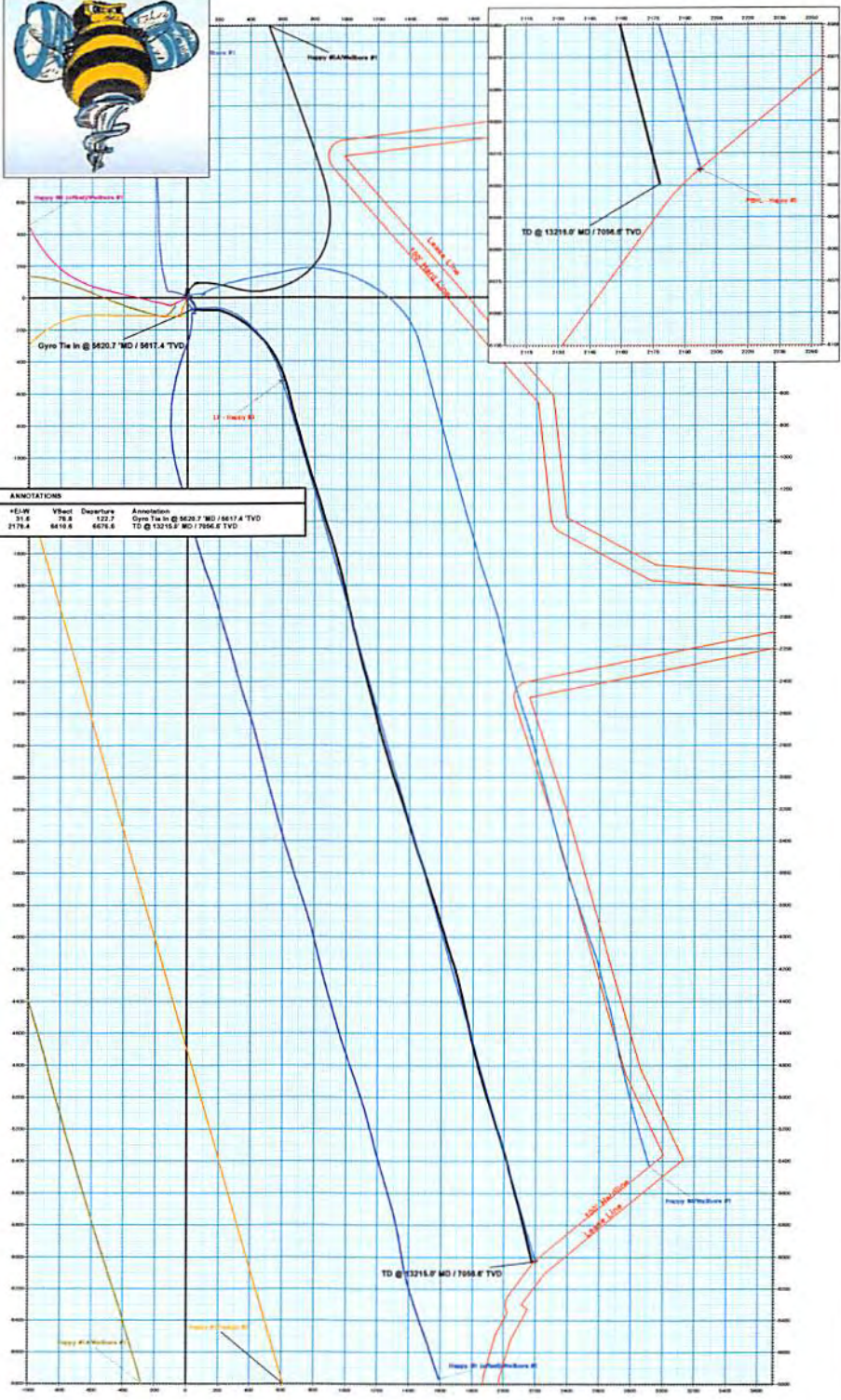
Happy #3
 Tyler County
 Q170490 & AM-170405
 Design #2

PROJECT DETAILS: Tyler County
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: West Virginia Northern Zone
 System Datum: Mean Sea Level

WELL DETAIL: Happy #3
 +N.B. +E.W. Northing Easting
 4.0 0.0 308795.26
 Ground Level: 1253.5
 Easting: 1616418.30
 Latitude: 39° 26' 11.471" N
 Longitude: 80° 45' 2.750" W



Azimuths to Grid North
 Magnetic North: -7.79°
 Magnetic Field Strength: 52038.4snT
 Dip Angle: 66.73°
 Date: 4/12/2017
 Model: IGRF2015



DESIGN TARGET DETAILS

Name	TVD	+N.B.	+E.W.	Northing	Easting	Latitude	Longitude
LP - Happy #3	7952.0	-478.2	537.8	308185.87	1616155.89	39° 26' 4.421" N	80° 44' 55.536" W
FDHL - Happy #3	7952.0	-4822.4	2167.4	346982.82	1617619.81	39° 27' 12.203" N	80° 44' 33.888" W