

## 1 General

### 1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

### 1.2 Well/Wellbore Information

Well	PA 342-21	Wellbore No.	OH
Wellbore Legal Name	PA 342-21	Common Wellbore Name	PA 342-21
Project	PA 21-06S-095W	Site	PA 22-21 Pad
Vertical Section Azimuth	79.29 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	11/9/2013	UWI	PA 342-21
Active datum	KB @6,056.0ft (above Mean Sea Level)		

## 2 Survey Name

### 2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	MOSTAR
Date Started	11/9/2013	Ended	
Tool Name	MWD	Engineer	

#### 2.1.1 Tie On Point

MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)
0.0	0.00	0.00	0.00	0.00	0.00

#### 2.1.2 Survey Stations

Date	Type	MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS (°/100usft)	Build Rate (°/100usft)	Turn (°/100usft)	Tface (°)
11/9/2013	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/9/2013	NORMAL	104.0	0.26	184.33	104.00	-0.24	-0.02	-0.06	0.25	0.25	0.00	184.33
	NORMAL	133.0	1.50	115.93	133.00	-0.47	0.32	0.23	4.91	4.28	-235.86	281.83
	NORMAL	163.0	2.20	106.70	162.98	-0.80	1.22	1.05	2.53	2.33	-30.77	332.28
	NORMAL	184.0	3.26	102.74	193.95	-1.17	2.65	2.39	3.47	3.42	-12.77	347.93
	NORMAL	224.0	3.17	98.61	223.90	-1.48	4.31	3.95	0.83	-0.30	-13.77	246.71
	NORMAL	255.0	4.13	92.72	254.83	-1.66	6.27	5.85	3.32	3.10	-19.00	335.71
	NORMAL	285.0	4.40	89.91	284.75	-1.71	8.50	8.03	1.14	0.90	-9.37	320.85
	NORMAL	315.0	5.45	86.48	314.64	-1.62	11.07	10.58	3.63	3.50	-11.43	342.62
	NORMAL	345.0	6.07	81.74	344.49	-1.31	14.06	13.57	2.60	2.07	-15.80	320.13
	NORMAL	376.0	7.30	86.66	375.28	-0.96	17.65	17.17	4.37	3.97	15.87	27.43
	NORMAL	406.0	8.01	82.35	405.01	-0.57	21.62	21.14	3.04	2.37	-14.37	318.89
	NORMAL	437.0	9.06	83.67	435.67	-0.01	26.19	25.73	3.45	3.39	4.26	11.22
	NORMAL	506.0	12.31	82.03	503.46	1.61	38.88	38.50	4.73	4.71	-2.38	353.85
	NORMAL	597.0	14.81	79.92	591.92	4.99	59.94	59.82	2.80	2.75	-2.32	347.78
	NORMAL	688.0	17.45	77.37	679.33	10.01	84.71	85.09	3.00	2.90	-2.80	343.75
	NORMAL	779.0	21.50	77.90	765.11	16.49	114.34	115.41	4.45	4.45	0.58	2.75
	NORMAL	870.0	23.12	78.52	849.29	23.54	148.16	149.95	1.80	1.78	0.68	8.55
	NORMAL	961.0	24.88	76.85	932.42	31.45	184.31	186.95	2.07	1.93	-1.84	338.13
	NORMAL	1,056.0	26.81	77.20	1,017.92	40.75	224.67	228.33	2.04	2.03	0.37	4.68
11/10/2013	NORMAL	1,151.0	30.99	79.48	1,101.07	49.96	269.63	274.21	4.55	4.40	2.40	15.77

## 2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS (°/100usft)	Build Rate (°/100usft)	Turn (°/100usft)	Tface (°)
11/10/2013	NORMAL	1,247.0	35.03	78.96	1,181.56	59.76	320.99	326.50	4.22	4.21	-0.54	355.77
	NORMAL	1,342.0	36.57	79.13	1,258.61	70.32	375.55	382.07	1.62	1.62	0.18	3.76
	NORMAL	1,437.0	38.42	80.45	1,333.98	80.55	432.45	439.89	2.12	1.95	1.39	24.00
	NORMAL	1,520.0	40.44	79.92	1,398.08	89.54	484.39	492.60	2.47	2.43	-0.64	350.33
11/11/2013	NORMAL	1,626.0	41.19	80.54	1,478.31	101.30	552.67	561.87	0.80	0.71	0.58	28.62
	NORMAL	1,721.0	40.44	78.08	1,550.21	112.80	613.68	623.95	1.87	-0.79	-2.59	244.07
	NORMAL	1,817.0	40.48	77.37	1,623.25	126.05	674.55	686.22	0.48	0.04	-0.74	274.69
	NORMAL	1,912.0	40.48	76.67	1,695.51	139.90	734.65	747.85	0.48	0.00	-0.74	269.73
	NORMAL	2,007.0	39.93	77.99	1,768.07	153.35	794.47	809.13	1.07	-0.58	1.39	123.34
	NORMAL	2,103.0	39.96	78.87	1,841.67	165.71	854.86	870.76	0.59	0.03	0.92	87.30
	NORMAL	2,198.0	39.60	77.37	1,914.68	178.22	914.34	931.53	1.08	-0.38	-1.58	248.86
	NORMAL	2,294.0	41.14	78.78	1,987.82	191.06	975.17	993.69	1.86	1.60	1.47	31.21
	NORMAL	2,389.0	40.35	80.89	2,059.80	202.01	1,036.20	1,055.69	1.67	-0.83	2.22	120.64
	NORMAL	2,484.0	38.64	79.83	2,133.10	212.12	1,095.76	1,116.09	1.93	-1.80	-1.12	201.11
	NORMAL	2,579.0	38.64	80.71	2,207.31	222.14	1,154.23	1,175.41	0.58	0.00	0.93	90.34
	NORMAL	2,675.0	40.26	80.89	2,281.44	231.89	1,214.44	1,236.38	1.69	1.69	0.19	4.11
	NORMAL	2,770.0	39.12	80.63	2,354.54	241.63	1,274.32	1,297.03	1.21	-1.20	-0.27	188.19
	NORMAL	2,865.0	40.35	79.92	2,427.59	251.90	1,334.18	1,357.75	1.38	1.29	-0.75	339.47
	NORMAL	2,961.0	39.82	79.48	2,501.04	262.95	1,395.00	1,419.56	0.63	-0.55	-0.46	207.96
	NORMAL	3,056.0	40.09	78.52	2,573.86	274.59	1,454.88	1,480.57	0.71	0.28	-1.01	293.28
11/12/2013	NORMAL	3,150.0	39.25	77.67	2,646.22	286.96	1,513.60	1,540.56	1.06	-0.89	-0.90	212.53
	NORMAL	3,246.0	39.25	80.01	2,720.57	298.72	1,573.18	1,601.29	1.54	0.00	2.44	90.91
	NORMAL	3,341.0	41.19	80.36	2,793.10	309.17	1,633.62	1,662.62	2.06	2.04	0.37	6.78
	NORMAL	3,436.0	40.44	80.19	2,865.00	319.66	1,694.82	1,724.70	0.80	-0.79	-0.18	188.36
	NORMAL	3,532.0	40.48	80.89	2,938.04	329.90	1,756.27	1,786.99	0.47	0.04	0.73	85.23
	NORMAL	3,627.0	40.04	79.57	3,010.54	340.31	1,816.77	1,848.37	1.01	-0.46	-1.39	242.21
	NORMAL	3,722.0	39.69	79.40	3,083.46	351.42	1,876.64	1,909.26	0.39	-0.37	-0.18	197.23
	NORMAL	3,817.0	39.34	79.22	3,156.75	362.64	1,936.04	1,969.71	0.39	-0.37	-0.19	198.05
	NORMAL	3,913.0	40.04	79.22	3,230.62	374.10	1,996.27	2,031.02	0.73	0.73	0.00	0.00
	NORMAL	4,008.0	39.87	79.31	3,303.44	385.47	2,056.21	2,092.02	0.19	-0.18	0.09	161.26
	NORMAL	4,104.0	39.91	78.34	3,377.10	397.40	2,116.61	2,153.59	0.65	0.04	-1.01	273.31
	NORMAL	4,199.0	40.48	78.25	3,449.67	409.84	2,176.64	2,214.89	0.60	0.60	-0.09	354.15
	NORMAL	4,294.0	39.56	77.90	3,522.42	422.46	2,236.41	2,275.97	1.00	-0.97	-0.37	193.61
	NORMAL	4,390.0	38.81	77.64	3,596.83	435.31	2,295.69	2,336.60	0.80	-0.78	-0.27	192.25
	NORMAL	4,485.0	38.81	79.48	3,670.86	447.12	2,354.04	2,396.13	1.21	0.00	1.94	90.72
	NORMAL	4,580.0	38.51	79.13	3,745.04	458.13	2,412.36	2,455.48	0.39	-0.32	-0.37	215.95
	NORMAL	4,676.0	37.27	77.64	3,820.80	469.99	2,470.11	2,514.42	1.61	-1.29	-1.55	215.84
	NORMAL	4,770.0	36.26	79.40	3,896.11	481.19	2,525.24	2,570.67	1.55	-1.07	1.87	134.50
	NORMAL	4,864.0	35.52	78.96	3,972.28	491.54	2,579.36	2,625.78	0.83	-0.79	-0.47	199.04
	NORMAL	4,960.0	34.20	79.83	4,051.03	501.64	2,633.29	2,680.65	1.47	-1.38	0.91	159.71
	NORMAL	5,054.0	34.02	80.71	4,128.86	510.55	2,685.25	2,733.35	0.56	-0.19	0.94	110.40
	NORMAL	5,150.0	31.87	80.01	4,209.42	519.28	2,736.72	2,785.55	2.27	-2.24	-0.73	189.75
	NORMAL	5,245.0	31.00	79.00	4,290.48	528.30	2,785.43	2,835.09	1.07	-0.92	-1.06	210.76
	NORMAL	5,340.0	29.45	77.55	4,372.56	538.01	2,832.25	2,882.90	1.80	-1.63	-1.53	204.59
11/13/2013	NORMAL	5,435.0	28.92	77.81	4,455.50	547.89	2,877.51	2,929.21	0.57	-0.56	0.27	166.66
	NORMAL	5,531.0	27.82	79.48	4,539.97	556.88	2,922.23	2,974.81	1.41	-1.15	1.74	144.93
	NORMAL	5,626.0	26.29	78.96	4,624.57	564.96	2,964.68	3,018.02	1.63	-1.61	-0.55	188.56
	NORMAL	5,721.0	26.02	79.66	4,709.85	572.73	3,005.82	3,059.90	0.43	-0.28	0.74	131.50
	NORMAL	5,816.0	24.48	79.40	4,795.77	580.09	3,045.67	3,100.42	1.63	-1.62	-0.27	184.00
	NORMAL	5,912.0	22.55	79.57	4,883.79	587.08	3,083.33	3,138.72	2.01	-2.01	0.18	178.07
	NORMAL	6,007.0	21.98	78.96	4,971.71	593.78	3,118.70	3,174.72	0.65	-0.60	-0.64	201.79
	NORMAL	6,103.0	21.80	79.66	5,060.79	600.42	3,153.86	3,210.51	0.33	-0.19	0.73	124.92
	NORMAL	6,198.0	21.41	81.24	5,149.11	606.23	3,188.36	3,245.48	0.74	-0.41	1.66	124.57
	NORMAL	6,293.0	19.91	77.20	5,238.01	612.46	3,221.27	3,278.97	2.18	-1.58	-4.25	221.66
	NORMAL	6,389.0	19.00	78.00	5,328.52	619.33	3,252.50	3,310.93	0.99	-0.95	0.83	164.06
	NORMAL	6,484.0	19.03	78.96	5,418.34	625.51	3,282.82	3,341.88	0.33	0.03	1.01	84.98

## 2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS (°/100usft)	Build Rate (°/100usft)	Turn (°/100usft)	Tface (°)
11/15/2013	NORMAL	6,580.0	18.77	79.48	5,509.17	631.33	3,313.37	3,372.98	0.32	-0.27	0.54	147.31
	NORMAL	6,675.0	16.84	77.02	5,599.61	637.21	3,341.81	3,402.02	2.18	-2.03	-2.59	200.13
	NORMAL	6,770.0	15.96	77.64	5,690.75	643.09	3,367.98	3,428.82	0.94	-0.93	0.65	169.05
	NORMAL	6,866.0	14.95	78.52	5,783.27	648.38	3,393.01	3,454.40	1.08	-1.05	0.92	167.35
	NORMAL	6,961.0	14.33	78.25	5,875.19	653.22	3,416.53	3,478.40	0.66	-0.65	-0.28	186.15
	NORMAL	7,056.0	13.63	79.22	5,967.38	657.70	3,439.03	3,501.35	0.78	-0.74	1.02	161.96
	NORMAL	7,151.0	13.01	79.40	6,059.82	661.77	3,460.54	3,523.24	0.65	-0.65	0.19	176.26
	NORMAL	7,246.0	12.35	81.24	6,152.50	665.28	3,481.09	3,544.09	0.81	-0.69	1.94	149.43
	NORMAL	7,342.0	10.86	76.76	6,246.54	668.91	3,500.04	3,563.38	1.81	-1.55	-4.67	208.99
11/16/2013	NORMAL	7,437.0	9.93	77.02	6,339.98	672.80	3,516.74	3,580.51	0.98	-0.98	0.27	177.24
	NORMAL	7,532.0	9.01	79.13	6,433.68	676.05	3,532.02	3,596.13	1.03	-0.97	2.22	160.36
	NORMAL	7,628.0	8.48	80.45	6,528.57	678.64	3,546.39	3,610.73	0.59	-0.55	1.38	159.91
	NORMAL	7,723.0	7.25	73.42	6,622.68	681.51	3,559.04	3,623.69	1.64	-1.29	-7.40	214.58
	NORMAL	7,818.0	6.95	72.98	6,716.95	684.90	3,570.28	3,635.37	0.32	-0.32	-0.46	190.06
	NORMAL	7,914.0	8.36	76.41	6,812.09	688.24	3,582.62	3,648.11	1.54	1.47	3.57	19.66
	NORMAL	8,009.0	4.57	79.22	6,906.47	690.58	3,593.05	3,658.80	4.00	-3.99	2.96	176.62
	NORMAL	8,105.0	3.21	74.12	7,002.25	692.03	3,599.40	3,665.30	1.46	-1.42	-5.31	191.74
	NORMAL	8,200.0	2.81	73.51	7,097.11	693.42	3,604.19	3,670.27	0.42	-0.42	-0.64	184.27
	NORMAL	8,296.0	1.14	82.03	7,193.05	694.22	3,607.39	3,673.56	1.76	-1.74	8.87	174.27
	NORMAL	8,391.0	0.70	92.32	7,288.04	694.32	3,608.91	3,675.07	0.49	-0.46	10.83	164.51
11/17/2013	NORMAL	8,486.0	1.36	46.44	7,383.03	695.08	3,610.30	3,676.58	1.06	0.69	-48.29	284.19
	NORMAL	8,582.0	1.63	42.75	7,479.00	696.86	3,612.06	3,678.64	0.30	0.28	-3.84	338.53
	NORMAL	8,677.0	0.18	16.91	7,573.98	698.00	3,613.02	3,679.79	1.55	-1.53	-27.20	183.06
11/18/2013	NORMAL	8,772.0	0.31	286.91	7,668.98	698.22	3,612.81	3,679.64	0.38	0.14	-94.74	239.86
	NORMAL	8,867.0	0.44	231.27	7,763.98	698.06	3,612.28	3,679.09	0.39	0.14	-58.57	260.36
	NORMAL	8,963.0	0.88	228.72	7,859.96	697.35	3,611.44	3,678.13	0.46	0.46	-2.66	354.91
	NORMAL	9,058.0	1.27	229.07	7,954.94	696.18	3,610.10	3,676.59	0.41	0.41	0.37	1.14
	NORMAL	9,154.0	1.58	227.23	8,050.91	694.58	3,608.32	3,674.55	0.33	0.32	-1.92	350.68
	NORMAL	9,249.0	1.85	220.46	8,145.87	692.52	3,606.37	3,672.24	0.35	0.28	-7.13	319.70
	NORMAL	9,344.0	2.81	223.10	8,240.79	689.66	3,603.78	3,669.17	1.02	1.01	2.78	7.70
	NORMAL	9,440.0	3.30	224.68	8,336.65	685.97	3,600.23	3,664.99	0.52	0.51	1.65	10.54
	NORMAL	9,535.0	3.25	228.02	8,431.49	682.23	3,596.30	3,660.44	0.21	-0.05	3.52	106.35
	NORMAL	9,630.0	3.34	227.76	8,526.34	678.57	3,592.25	3,655.78	0.10	0.09	-0.27	350.44
	NORMAL	9,725.0	3.43	229.95	8,621.17	674.88	3,588.03	3,650.95	0.17	0.09	2.31	56.26
	NORMAL	9,821.0	3.34	232.24	8,717.00	671.32	3,583.62	3,645.95	0.17	-0.09	2.39	124.79
11/19/2013	NORMAL	9,882.0	3.25	231.62	8,777.90	669.16	3,580.86	3,642.84	0.16	-0.15	-1.02	201.29