

## 1 General

### 1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

### 1.2 Well/Wellbore Information

Well	PA 542-21	Wellbore No.	OH
Wellbore Legal Name	PA 542-21	Common Wellbore Name	PA 542-21
Project	PA 21-06S-095W	Site	PA 22-21 Pad
Vertical Section Azimuth	89.92 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	1/1/2014	UWI	PA 542-21
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	1/1/2014	Ended	
Tool Name	MWD	Engineer	

#### 2.1.1 Tie On Point

MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)
		135.62			

#### 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 (°)
1/1/2014	NORMAL	133.0	2.29	135.62	132.96	-1.90	1.86	1.86	1.72	1.72	0.00	135.62
	NORMAL	163.0	3.61	123.40	162.92	-2.85	3.07	3.06	4.85	4.40	-40.73	328.34
	NORMAL	194.0	4.84	121.38	193.84	-4.07	5.00	4.99	4.00	3.97	-6.52	352.09
	NORMAL	224.0	5.19	116.54	223.72	-5.33	7.29	7.28	1.83	1.17	-16.13	307.17
	NORMAL	255.0	5.37	110.39	254.59	-6.46	9.91	9.90	1.91	0.58	-19.84	284.57
	NORMAL	285.0	6.33	110.92	284.44	-7.54	12.77	12.76	3.21	3.20	1.77	3.48
	NORMAL	315.0	7.39	110.21	314.22	-8.80	16.12	16.11	3.54	3.53	-2.37	355.07
	NORMAL	345.0	8.62	115.22	343.93	-10.42	19.97	19.95	4.71	4.10	16.70	32.06
	NORMAL	376.0	9.94	114.61	374.52	-12.53	24.50	24.48	4.27	4.26	-1.97	355.44
	NORMAL	406.0	11.35	115.58	404.01	-14.88	29.52	29.50	4.74	4.70	3.23	7.72
1/1/2014	NORMAL	437.0	12.32	111.80	434.35	-17.43	35.34	35.32	4.00	3.13	-12.19	319.51
	NORMAL	467.0	13.46	106.26	463.59	-19.59	41.66	41.64	5.60	3.80	-18.47	309.97
	NORMAL	497.0	14.60	102.74	492.70	-21.40	48.71	48.68	4.75	3.80	-11.73	321.47
	NORMAL	527.0	15.66	100.37	521.66	-22.97	56.38	56.34	4.09	3.53	-7.90	328.59
	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/2/2014	NORMAL	596.0	17.98	100.29	587.70	-26.55	76.02	75.98	3.36	3.36	-0.12	359.39
	NORMAL	687.0	20.88	98.36	673.51	-31.41	105.89	105.84	3.26	3.19	-2.12	346.60
	NORMAL	777.0	23.87	93.26	756.73	-34.78	139.95	139.90	3.96	3.32	-5.67	324.63
	NORMAL	869.0	27.56	91.06	839.61	-36.24	179.83	179.78	4.14	4.01	-2.39	344.50
	NORMAL	959.0	30.95	91.24	918.12	-37.12	223.79	223.74	3.77	3.77	0.20	1.57
	NORMAL	1,054.0	35.47	88.87	997.58	-37.11	275.80	275.75	4.95	4.76	-2.49	342.98

## 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 (°)
1/2/2014	NORMAL	1,080.0	36.75	89.04	1,018.59	-36.83	291.12	291.07	4.94	4.92	0.65	4.54
1/3/2014	NORMAL	1,168.0	37.45	87.64	1,088.78	-35.29	344.18	344.13	1.25	0.80	-1.59	309.10
	NORMAL	1,264.0	37.98	87.11	1,164.72	-32.59	402.84	402.80	0.65	0.55	-0.55	328.33
	NORMAL	1,359.0	35.87	88.43	1,240.66	-30.36	459.87	459.82	2.37	-2.22	1.39	159.93
	NORMAL	1,454.0	34.64	89.57	1,318.24	-29.39	514.69	514.65	1.47	-1.29	1.20	152.32
	NORMAL	1,550.0	34.42	88.52	1,397.32	-28.49	569.10	569.06	0.66	-0.23	-1.09	249.28
	NORMAL	1,644.0	34.07	88.17	1,475.03	-26.96	621.97	621.93	0.43	-0.37	-0.37	209.22
	NORMAL	1,739.0	34.37	89.66	1,553.58	-25.95	675.38	675.35	0.94	0.32	1.57	70.92
	NORMAL	1,835.0	35.74	89.57	1,632.17	-25.58	730.52	730.48	1.43	1.43	-0.09	357.80
	NORMAL	1,930.0	34.77	90.10	1,709.74	-25.42	785.36	785.32	1.07	-1.02	0.56	162.71
	NORMAL	2,025.0	34.33	89.66	1,787.99	-25.31	839.23	839.20	0.53	-0.46	-0.46	209.38
	NORMAL	2,121.0	33.01	89.04	1,867.88	-24.71	892.45	892.41	1.42	-1.38	-0.65	194.34
	NORMAL	2,216.0	33.32	90.89	1,947.41	-24.68	944.41	944.38	1.11	0.33	1.95	73.75
1/4/2014	NORMAL	2,311.0	34.46	91.77	2,026.27	-25.92	997.37	997.33	1.31	1.20	0.93	23.65
	NORMAL	2,407.0	35.96	91.42	2,104.70	-27.45	1,052.70	1,052.66	1.58	1.56	-0.36	352.19
	NORMAL	2,502.0	35.43	90.19	2,181.86	-28.24	1,108.12	1,108.08	0.94	-0.56	-1.29	233.06
	NORMAL	2,597.0	35.34	88.60	2,259.31	-27.66	1,163.12	1,163.08	0.97	-0.09	-1.67	263.77
	NORMAL	2,693.0	34.77	88.08	2,337.89	-26.06	1,218.24	1,218.20	0.67	-0.59	-0.54	207.44
	NORMAL	2,788.0	34.37	86.58	2,416.12	-23.55	1,272.08	1,272.05	0.99	-0.42	-1.58	244.21
	NORMAL	2,883.0	35.16	85.44	2,494.16	-19.78	1,326.12	1,326.09	1.08	0.83	-1.20	320.08
	NORMAL	2,978.0	35.96	86.14	2,571.45	-15.73	1,381.21	1,381.19	0.94	0.84	0.74	27.25
	NORMAL	3,074.0	35.82	87.64	2,649.22	-12.67	1,437.41	1,437.39	0.93	-0.15	1.56	99.65
	NORMAL	3,169.0	35.08	90.10	2,726.62	-11.57	1,492.48	1,492.47	1.69	-0.78	2.59	118.41
	NORMAL	3,264.0	34.46	90.36	2,804.65	-11.79	1,546.66	1,546.64	0.67	-0.65	0.27	166.66
	NORMAL	3,359.0	33.89	89.84	2,883.25	-11.89	1,600.02	1,600.00	0.67	-0.60	-0.55	206.92
	NORMAL	3,455.0	33.76	89.66	2,963.00	-11.65	1,653.46	1,653.44	0.17	-0.14	-0.19	217.55
	NORMAL	3,550.0	33.93	91.50	3,041.90	-12.19	1,706.36	1,706.34	1.09	0.18	1.94	81.35
	NORMAL	3,645.0	34.99	91.59	3,120.23	-13.64	1,760.10	1,760.08	1.12	1.12	0.09	2.79
	NORMAL	3,740.0	34.20	90.63	3,198.43	-14.69	1,814.02	1,814.00	1.01	-0.83	-1.01	214.21
	NORMAL	3,836.0	34.77	90.71	3,277.56	-15.33	1,868.37	1,868.35	0.60	0.59	0.08	4.58
	NORMAL	3,931.0	34.90	89.92	3,355.54	-15.62	1,922.64	1,922.61	0.49	0.14	-0.83	285.75
	NORMAL	4,026.0	35.87	89.57	3,432.99	-15.38	1,977.65	1,977.62	1.04	1.02	-0.37	348.06
	NORMAL	4,122.0	35.03	88.78	3,511.20	-14.58	2,033.32	2,033.30	1.00	-0.88	-0.82	208.29
	NORMAL	4,217.0	33.98	87.46	3,589.48	-12.82	2,087.10	2,087.08	1.36	-1.11	-1.39	214.91
	NORMAL	4,312.0	34.68	89.57	3,667.94	-11.44	2,140.65	2,140.63	1.45	0.74	2.22	60.41
	NORMAL	4,408.0	35.52	89.39	3,746.48	-10.94	2,195.85	2,195.83	0.88	0.88	-0.19	352.90
	NORMAL	4,503.0	34.55	89.22	3,824.26	-10.28	2,250.38	2,250.37	1.03	-1.02	-0.18	185.68
	NORMAL	4,598.0	35.43	88.78	3,902.09	-9.33	2,304.85	2,304.84	0.96	0.93	-0.46	343.82
	NORMAL	4,693.0	34.73	87.99	3,979.83	-7.79	2,359.43	2,359.41	0.88	-0.74	-0.83	212.65
	NORMAL	4,789.0	35.43	88.34	4,058.40	-6.03	2,414.57	2,414.56	0.76	0.73	0.36	16.18
	NORMAL	4,884.0	34.37	88.52	4,136.31	-4.54	2,468.90	2,468.89	1.12	-1.12	0.19	174.52
1/5/2014	NORMAL	4,979.0	34.77	88.60	4,214.54	-3.18	2,522.79	2,522.78	0.42	0.42	0.08	6.51
	NORMAL	5,074.0	34.02	88.43	4,292.93	-1.79	2,576.44	2,576.43	0.80	-0.79	-0.18	187.23
	NORMAL	5,169.0	35.21	89.57	4,371.11	-0.86	2,630.39	2,630.39	1.43	1.25	1.20	29.03
	NORMAL	5,265.0	34.42	89.31	4,449.92	-0.32	2,685.20	2,685.19	0.84	-0.82	-0.27	190.54
	NORMAL	5,360.0	34.42	90.45	4,528.29	-0.21	2,738.89	2,738.89	0.68	0.00	1.20	90.47
	NORMAL	5,456.0	34.59	90.27	4,607.40	-0.55	2,793.27	2,793.27	0.21	0.18	-0.19	328.97
	NORMAL	5,551.0	32.75	90.89	4,686.46	-1.08	2,845.94	2,845.93	1.97	-1.94	0.65	169.68
	NORMAL	5,647.0	30.15	90.36	4,768.35	-1.63	2,896.02	2,896.01	2.72	-2.71	-0.55	185.85
	NORMAL	5,742.0	29.58	88.17	4,850.74	-1.03	2,943.31	2,943.31	1.30	-0.60	-2.31	241.46
	NORMAL	5,837.0	27.82	92.73	4,934.08	-1.34	2,988.90	2,988.90	2.96	-1.85	4.80	130.77
	NORMAL	5,932.0	25.63	91.84	5,018.92	-3.09	3,031.58	3,031.58	2.34	-2.31	-0.83	188.86
	NORMAL	6,028.0	24.04	90.89	5,106.04	-4.10	3,071.89	3,071.88	1.72	-1.66	-1.09	195.03
	NORMAL	6,123.0	23.25	91.33	5,193.07	-4.84	3,109.98	3,109.97	0.85	-0.83	0.46	167.61
1/6/2014	NORMAL	6,219.0	23.56	90.63	5,281.17	-5.49	3,148.11	3,148.10	0.43	0.32	-0.73	317.79
	NORMAL	6,315.0	22.07	89.57	5,369.65	-5.56	3,185.33	3,185.32	1.61	-1.55	-1.10	194.93

## 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 (°)
1/6/2014	NORMAL	6,410.0	22.02	90.45	5,457.71	-5.57	3,220.99	3,220.98	0.35	-0.05	0.93	99.02
1/8/2014	NORMAL	6,506.0	21.06	88.08	5,547.00	-5.13	3,256.23	3,256.21	1.35	-1.00	-2.47	221.09
	NORMAL	6,602.0	19.08	88.17	5,637.17	-4.05	3,289.15	3,289.14	2.06	-2.06	0.09	179.15
	NORMAL	6,698.0	17.19	84.47	5,728.40	-2.18	3,318.96	3,318.95	2.30	-1.97	-3.85	209.61
	NORMAL	6,793.0	17.32	85.88	5,819.13	0.19	3,347.03	3,347.03	0.46	0.14	1.48	73.41
	NORMAL	6,889.0	15.56	83.51	5,911.20	2.67	3,374.08	3,374.08	1.96	-1.83	-2.47	199.73
1/9/2014	NORMAL	6,985.0	14.37	85.35	6,003.94	5.09	3,398.75	3,398.75	1.33	-1.24	1.92	159.12
	NORMAL	7,080.0	13.71	86.32	6,096.10	6.77	3,421.74	3,421.74	0.74	-0.69	1.02	160.85
	NORMAL	7,174.0	12.04	86.32	6,187.74	8.11	3,442.64	3,442.65	1.78	-1.78	0.00	180.00
	NORMAL	7,269.0	10.90	88.08	6,280.84	9.05	3,461.50	3,461.51	1.26	-1.20	1.85	163.79
	NORMAL	7,365.0	9.76	88.96	6,375.28	9.50	3,478.71	3,478.72	1.20	-1.19	0.92	172.55
	NORMAL	7,461.0	9.54	84.12	6,469.92	10.46	3,494.76	3,494.77	0.88	-0.23	-5.04	252.45
1/10/2014	NORMAL	7,556.0	7.38	84.12	6,563.88	11.89	3,508.66	3,508.68	2.27	-2.27	0.00	180.00
	NORMAL	7,652.0	7.12	85.35	6,659.12	13.01	3,520.72	3,520.74	0.32	-0.27	1.28	149.77
	NORMAL	7,747.0	6.37	87.20	6,753.46	13.74	3,531.86	3,531.87	0.82	-0.79	1.95	164.76
	NORMAL	7,842.0	4.97	87.37	6,847.99	14.19	3,541.23	3,541.25	1.47	-1.47	0.18	179.40
	NORMAL	7,938.0	4.66	92.03	6,943.65	14.24	3,549.28	3,549.30	0.52	-0.32	4.85	130.70
	NORMAL	8,033.0	4.09	86.85	7,038.38	14.29	3,556.52	3,556.54	0.73	-0.60	-5.45	212.17
	NORMAL	8,129.0	3.65	88.69	7,134.16	14.55	3,563.00	3,563.01	0.48	-0.46	1.92	165.16
	NORMAL	8,225.0	2.94	96.51	7,230.00	14.34	3,568.50	3,568.51	0.87	-0.74	8.15	151.53
	NORMAL	8,320.0	2.73	97.39	7,324.88	13.77	3,573.16	3,573.18	0.23	-0.22	0.93	168.73
1/11/2014	NORMAL	8,416.0	2.33	93.44	7,420.79	13.36	3,577.38	3,577.39	0.45	-0.42	-4.11	201.59
	NORMAL	8,512.0	1.71	80.52	7,516.73	13.48	3,580.74	3,580.75	0.80	-0.65	-13.46	209.96
	NORMAL	8,607.0	1.58	91.42	7,611.69	13.68	3,583.44	3,583.46	0.36	-0.14	11.47	117.95
	NORMAL	8,703.0	1.19	108.47	7,707.66	13.33	3,585.71	3,585.73	0.59	-0.41	17.76	141.73
	NORMAL	8,798.0	0.88	172.01	7,802.65	12.30	3,586.75	3,586.76	1.18	-0.33	66.88	135.36
1/12/2014	NORMAL	8,894.0	1.19	184.49	7,898.63	10.57	3,586.77	3,586.79	0.40	0.32	13.00	42.37
	NORMAL	8,989.0	1.45	191.17	7,993.61	8.41	3,586.46	3,586.47	0.32	0.27	7.03	33.99
	NORMAL	9,085.0	1.50	199.61	8,089.58	6.04	3,585.81	3,585.81	0.23	0.05	8.79	81.28
	NORMAL	9,180.0	1.89	203.21	8,184.53	3.43	3,584.77	3,584.77	0.43	0.41	3.79	17.08
	NORMAL	9,276.0	2.37	211.21	8,280.47	0.27	3,583.12	3,583.12	0.59	0.50	8.33	35.82
	NORMAL	9,371.0	2.99	218.59	8,375.36	-3.34	3,580.56	3,580.55	0.75	0.65	7.77	32.82
	NORMAL	9,467.0	2.90	227.03	8,471.24	-6.96	3,577.22	3,577.21	0.46	-0.09	8.79	105.92
	NORMAL	9,563.0	4.40	231.25	8,567.04	-10.92	3,572.57	3,572.55	1.59	1.56	4.40	12.26
	NORMAL	9,658.0	3.25	235.56	8,661.83	-14.72	3,567.51	3,567.48	1.25	-1.21	4.54	168.11
	NORMAL	9,731.0	3.56	238.28	8,734.70	-17.08	3,563.87	3,563.84	0.48	0.42	3.73	28.89
	NORMAL	9,781.0	3.56	238.28	8,784.60	-18.71	3,561.23	3,561.20	0.00	0.00	0.00	0.00