

# Deviation Summary

PICEANCE VLY

## 1 General

### 1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

### 1.2 Well/Wellbore Information

Well	PA 432-21	Wellbore No.	00
Wellbore Legal Name	PA 432-21	Common Wellbore Name	PA 432-21
Project	PA 21-06S-095W	Site	PA 22-21 Pad
Vertical Section Azimuth	72.58 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	3/7/2014	UWI	PA 432-21
Active datum	KB @6,056.0ft (above Mean Sea Level)		

## 2 Survey Name

### 2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	
Date Started	3/7/2014	Ended	
Tool Name	MWD	Engineer	

#### 2.1.1 Tie On Point

MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)
		353.58			

#### 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 (°)
3/7/2014	NORMAL	105.0	0.53	353.58	105.00	0.48	-0.05	0.09	0.50	0.50	0.00	353.58
	NORMAL	134.0	0.35	125.95	134.00	0.56	0.00	0.17	2.79	-0.62	456.45	161.34
	NORMAL	165.0	0.35	93.16	165.00	0.50	0.17	0.32	0.64	0.00	-105.77	253.61
	NORMAL	195.0	0.18	336.92	195.00	0.54	0.25	0.40	1.53	-0.57	-387.47	200.60
	NORMAL	225.0	0.18	359.91	225.00	0.63	0.23	0.41	0.24	0.00	76.63	101.49
	NORMAL	256.0	0.35	162.95	256.00	0.59	0.26	0.42	1.69	0.55	525.94	168.78
	NORMAL	286.0	0.26	102.74	286.00	0.49	0.35	0.48	1.05	-0.30	-200.70	225.62
	NORMAL	316.0	0.53	183.78	316.00	0.33	0.41	0.49	1.84	0.90	270.13	108.72
	NORMAL	346.0	0.18	257.17	346.00	0.19	0.35	0.39	1.70	-1.17	244.63	160.18
	NORMAL	377.0	0.70	98.79	376.99	0.15	0.49	0.51	2.81	1.68	-510.90	197.25
	NORMAL	407.0	1.06	62.84	406.99	0.24	0.92	0.95	2.14	1.20	-119.83	284.26
	NORMAL	438.0	1.67	58.27	437.98	0.61	1.56	1.67	2.00	1.97	-14.74	347.59
	NORMAL	468.0	2.46	74.27	467.96	1.02	2.55	2.74	3.24	2.63	53.33	44.30
	NORMAL	498.0	3.08	67.50	497.93	1.50	3.91	4.18	2.33	2.07	-22.57	328.77
	NORMAL	529.0	4.13	76.82	528.87	2.07	5.77	6.13	3.87	3.39	30.06	33.87
	NORMAL	559.0	5.19	71.81	558.77	2.74	8.11	8.56	3.78	3.53	-16.70	336.48
	NORMAL	589.0	5.63	78.22	588.63	3.47	10.84	11.38	2.49	1.47	21.37	57.16
	NORMAL	620.0	6.51	81.21	619.46	4.05	14.07	14.63	3.02	2.84	9.65	21.25
	NORMAL	650.0	6.25	80.60	649.27	4.57	17.36	17.93	0.90	-0.87	-2.03	194.31
	NORMAL	680.0	6.69	72.42	679.08	5.37	20.64	21.30	3.40	1.47	-27.27	291.42
	NORMAL	710.0	6.69	72.77	708.88	6.41	23.97	24.79	0.14	0.00	1.17	90.17

## 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 (")
3/7/2014	NORMAL	721.0	7.43	72.32	719.80	6.82	25.26	26.14	6.75	6.73	-4.09	355.50
	NORMAL	751.0	8.40	70.48	749.51	8.14	29.17	30.27	3.34	3.23	-8.13	344.45
	NORMAL	782.0	8.97	76.45	780.15	9.46	33.66	34.95	3.44	1.84	19.26	60.67
	NORMAL	873.0	10.99	77.33	869.77	13.03	49.02	50.67	2.23	2.22	0.97	4.75
	NORMAL	963.0	12.13	77.60	957.95	16.94	66.62	68.64	1.27	1.27	0.30	2.85
	NORMAL	1,059.0	14.24	76.10	1,051.41	21.94	87.94	90.47	2.23	2.20	-1.56	350.06
3/7/2014	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/8/2014	NORMAL	1,154.0	15.91	76.37	1,143.14	27.82	111.94	115.13	1.76	1.76	0.28	2.54
	NORMAL	1,249.0	17.93	76.72	1,234.02	34.25	138.83	142.71	2.13	2.13	0.37	3.05
	NORMAL	1,345.0	20.18	76.90	1,324.75	41.39	169.34	173.97	2.34	2.34	0.19	1.58
	NORMAL	1,440.0	21.36	75.66	1,413.58	49.39	202.06	207.58	1.33	1.24	-1.31	338.98
	NORMAL	1,509.0	22.29	74.87	1,477.63	55.92	226.87	233.21	1.41	1.35	-1.14	342.11
3/9/2014	NORMAL	1,552.0	23.16	74.26	1,517.29	60.34	242.88	249.81	2.10	2.02	-1.42	344.56
	NORMAL	1,647.0	24.57	74.43	1,604.17	70.71	279.89	288.22	1.49	1.48	0.18	2.87
	NORMAL	1,742.0	25.58	69.42	1,690.23	83.23	318.12	328.45	2.47	1.06	-5.27	293.16
	NORMAL	1,838.0	26.99	69.07	1,776.30	98.29	357.87	370.89	1.48	1.47	-0.36	353.57
	NORMAL	1,933.0	26.77	71.18	1,861.04	112.90	398.26	413.79	1.03	-0.23	2.22	103.93
	NORMAL	2,028.0	26.37	68.98	1,946.00	127.37	438.20	456.24	1.12	-0.42	-2.32	246.90
	NORMAL	2,124.0	27.39	73.55	2,031.64	141.27	479.29	499.60	2.40	1.06	4.77	65.83
	NORMAL	2,219.0	26.37	72.41	2,116.37	153.83	520.36	542.55	1.21	-1.07	-1.21	206.50
	NORMAL	2,314.0	26.99	74.70	2,201.26	165.89	561.27	585.19	1.26	0.65	2.41	59.94
	NORMAL	2,410.0	26.24	73.03	2,287.09	177.83	602.58	628.18	1.10	-0.78	-1.74	224.18
	NORMAL	2,505.0	27.16	74.35	2,371.98	189.81	643.55	670.86	1.15	0.97	1.39	33.40
	NORMAL	2,600.0	26.86	73.99	2,456.60	201.58	685.05	713.98	0.36	-0.32	-0.38	208.43
	NORMAL	2,695.0	25.71	73.29	2,541.77	213.43	725.42	756.04	1.25	-1.21	-0.74	194.77
	NORMAL	2,791.0	26.55	72.59	2,627.96	225.83	765.84	798.32	0.93	0.88	-0.73	339.53
	NORMAL	2,886.0	27.78	72.85	2,712.48	238.71	807.25	841.69	1.30	1.29	0.27	5.63
	NORMAL	2,981.0	28.31	70.48	2,796.33	252.77	849.64	886.34	1.30	0.56	-2.49	294.39
	NORMAL	3,077.0	28.13	70.66	2,880.92	267.87	892.45	931.71	0.21	-0.19	0.19	154.77
	NORMAL	3,172.0	28.09	70.57	2,964.71	282.73	934.67	976.45	0.06	-0.04	-0.09	226.63
3/10/2014	NORMAL	3,267.0	28.66	69.51	3,048.30	298.14	977.10	1,021.55	0.80	0.60	-1.12	318.06
	NORMAL	3,362.0	28.18	72.15	3,131.85	312.99	1,019.80	1,066.73	1.42	-0.51	2.78	112.07
	NORMAL	3,458.0	27.21	70.92	3,216.85	327.12	1,062.12	1,111.34	1.17	-1.01	-1.28	209.97
	NORMAL	3,553.0	27.43	73.03	3,301.26	340.60	1,103.58	1,154.93	1.05	0.23	2.22	78.14
	NORMAL	3,648.0	28.09	74.08	3,385.33	353.12	1,146.01	1,199.17	0.86	0.69	1.11	37.00
	NORMAL	3,744.0	26.81	73.73	3,470.52	365.39	1,188.53	1,243.41	1.34	-1.33	-0.36	187.03
	NORMAL	3,839.0	26.81	72.68	3,555.30	377.77	1,229.55	1,286.25	0.50	0.00	-1.11	269.53
	NORMAL	3,934.0	27.82	71.97	3,639.71	391.01	1,271.08	1,329.84	1.12	1.06	-0.75	341.81
	NORMAL	4,030.0	27.52	70.66	3,724.73	405.29	1,313.31	1,374.41	0.71	-0.31	-1.36	243.17
	NORMAL	4,125.0	27.65	73.73	3,808.94	418.73	1,355.18	1,418.39	1.50	0.14	3.23	86.14
	NORMAL	4,220.0	27.34	73.29	3,893.21	431.18	1,397.24	1,462.24	0.39	-0.33	-0.46	213.04
	NORMAL	4,315.0	26.81	72.94	3,977.80	443.74	1,438.62	1,505.48	0.58	-0.56	-0.37	196.57
	NORMAL	4,411.0	26.20	72.68	4,063.71	456.40	1,479.54	1,548.32	0.65	-0.64	-0.27	190.65
	NORMAL	4,506.0	27.08	72.68	4,148.62	469.08	1,520.21	1,590.92	0.93	0.93	0.00	0.00
	NORMAL	4,601.0	26.55	72.76	4,233.40	481.81	1,561.13	1,633.77	0.56	-0.56	0.08	176.14
	NORMAL	4,697.0	27.43	72.41	4,318.95	494.85	1,602.70	1,677.34	0.93	0.92	-0.36	349.61
	NORMAL	4,792.0	26.68	72.68	4,403.55	507.82	1,643.92	1,720.55	0.80	-0.79	0.28	170.82
	NORMAL	4,888.0	25.93	72.06	4,489.61	520.70	1,684.46	1,763.09	0.83	-0.78	-0.65	199.84
	NORMAL	4,983.0	25.67	71.80	4,575.14	533.52	1,723.77	1,804.43	0.30	-0.27	-0.27	203.40
	NORMAL	5,079.0	24.88	70.66	4,661.95	546.70	1,762.58	1,845.41	0.97	-0.82	-1.19	211.12
	NORMAL	5,174.0	23.43	71.97	4,748.63	559.17	1,799.40	1,884.27	1.63	-1.53	1.38	160.31
	NORMAL	5,269.0	21.14	71.89	4,836.53	570.34	1,833.64	1,920.29	2.41	-2.41	-0.08	180.72
	NORMAL	5,365.0	20.31	71.09	4,926.32	581.12	1,865.86	1,954.26	0.91	-0.86	-0.83	198.46
	NORMAL	5,460.0	19.39	70.66	5,015.67	591.69	1,896.34	1,986.50	0.98	-0.97	-0.45	188.82
	NORMAL	5,555.0	20.18	71.01	5,105.06	602.24	1,926.71	2,018.64	0.84	0.83	0.37	8.69
3/11/2014	NORMAL	5,650.0	19.16	70.74	5,194.52	612.72	1,956.93	2,050.60	1.08	-1.07	-0.28	184.96

## 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 (°)
3/11/2014	NORMAL	5,745.0	18.81	69.95	5,284.35	623.11	1,986.03	2,081.49	0.46	-0.37	-0.83	215.92
	NORMAL	5,840.0	17.93	70.39	5,374.51	633.27	2,014.19	2,111.40	0.94	-0.93	0.46	171.25
	NORMAL	5,936.0	17.27	71.01	5,466.01	642.87	2,041.59	2,140.41	0.71	-0.69	0.65	164.44
	NORMAL	6,031.0	16.53	71.62	5,556.91	651.72	2,067.75	2,168.02	0.80	-0.78	0.64	166.82
	NORMAL	6,126.0	15.12	71.97	5,648.31	659.81	2,092.36	2,193.92	1.49	-1.48	0.37	176.30
	NORMAL	6,222.0	13.85	73.38	5,741.25	666.98	2,115.27	2,217.93	1.37	-1.32	1.47	165.16
	NORMAL	6,317.0	13.41	72.68	5,833.58	673.51	2,136.68	2,240.32	0.49	-0.46	-0.74	200.21
	NORMAL	6,412.0	12.35	72.32	5,926.19	679.87	2,156.88	2,261.49	1.12	-1.12	-0.38	184.15
	NORMAL	6,508.0	10.90	74.26	6,020.22	685.45	2,175.40	2,280.83	1.56	-1.51	2.02	165.86
	NORMAL	6,603.0	9.89	73.29	6,113.66	690.24	2,191.86	2,297.97	1.08	-1.06	-1.02	189.35
3/12/2014	NORMAL	6,698.0	10.95	65.47	6,207.09	696.33	2,207.88	2,315.08	1.86	1.12	-8.23	302.96
	NORMAL	6,794.0	9.98	66.26	6,301.49	703.46	2,223.79	2,332.40	1.02	-1.01	0.82	171.97
	NORMAL	6,889.0	10.37	66.88	6,395.00	710.13	2,239.19	2,349.09	0.43	0.41	0.65	15.99
	NORMAL	6,984.0	9.85	66.96	6,488.52	716.67	2,254.53	2,365.68	0.55	-0.55	0.08	178.49
	NORMAL	7,080.0	8.79	67.84	6,583.26	722.65	2,268.88	2,381.17	1.11	-1.10	0.92	172.78
	NORMAL	7,175.0	8.18	69.60	6,677.22	727.75	2,281.94	2,395.15	0.70	-0.64	1.85	157.81
	NORMAL	7,270.0	6.99	71.18	6,771.38	731.97	2,293.75	2,407.68	1.27	-1.25	1.66	170.84
	NORMAL	7,366.0	6.55	71.09	6,866.71	735.63	2,304.46	2,418.99	0.46	-0.46	-0.09	181.34
	NORMAL	7,461.0	5.93	75.31	6,961.15	738.63	2,314.33	2,429.31	0.81	-0.65	4.44	145.59
	NORMAL	7,556.0	4.97	72.50	7,055.72	741.11	2,323.00	2,438.33	1.05	-1.01	-2.96	194.14
3/13/2014	NORMAL	7,651.0	3.34	59.93	7,150.47	743.73	2,329.32	2,445.14	1.96	-1.72	-13.23	203.02
	NORMAL	7,747.0	1.85	65.73	7,246.37	745.77	2,333.15	2,449.41	1.57	-1.55	6.04	172.89
	NORMAL	7,842.0	1.36	65.38	7,341.33	746.87	2,335.58	2,452.05	0.52	-0.52	-0.37	180.97
	NORMAL	7,937.0	0.88	87.44	7,436.31	747.37	2,337.33	2,453.87	0.67	-0.51	23.22	148.74
	NORMAL	8,032.0	0.70	99.40	7,531.30	747.31	2,338.63	2,455.10	0.26	-0.19	12.59	143.38
	NORMAL	8,128.0	1.01	136.66	7,627.29	746.60	2,339.79	2,455.99	0.65	0.32	38.81	80.36
	NORMAL	8,223.0	1.32	178.06	7,722.28	744.90	2,340.40	2,456.06	0.92	0.33	43.58	91.30
	NORMAL	8,318.0	1.67	186.49	7,817.24	742.43	2,340.28	2,455.21	0.43	0.37	8.87	36.41
	NORMAL	8,414.0	2.02	199.50	7,913.19	739.44	2,339.56	2,453.63	0.57	0.36	13.55	56.74
	NORMAL	8,509.0	2.29	212.07	8,008.13	736.26	2,337.99	2,451.18	0.57	0.28	13.23	66.64
3/14/2014	NORMAL	8,604.0	2.68	216.38	8,103.04	732.86	2,335.67	2,447.94	0.45	0.41	4.54	27.77
	NORMAL	8,700.0	2.86	217.52	8,198.93	729.15	2,332.88	2,444.17	0.20	0.19	1.19	17.59
	NORMAL	8,795.0	3.03	218.93	8,293.80	725.32	2,329.86	2,440.14	0.19	0.18	1.48	23.79
	NORMAL	8,890.0	3.43	220.51	8,388.65	721.21	2,326.43	2,435.64	0.43	0.42	1.66	13.34
	NORMAL	8,985.0	3.69	224.38	8,483.47	716.86	2,322.45	2,430.54	0.37	0.27	4.07	44.69
	NORMAL	9,081.0	3.95	222.62	8,579.25	712.21	2,318.04	2,424.95	0.31	0.28	-1.83	335.62
	NORMAL	9,176.0	4.35	225.96	8,674.00	707.29	2,313.23	2,418.88	0.48	0.41	3.52	33.49
	NORMAL	9,252.0	4.40	225.96	8,749.78	703.26	2,309.07	2,413.70	0.07	0.07	0.00	0.00
	NORMAL	9,302.0	4.40	255.96	8,799.64	701.47	2,305.83	2,410.07	4.55	0.00	60.00	104.96