

Deviation Summary

PICEANCE VLY

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well/Wellbore Information

Well	PA 31-21	Wellbore No.	OH
Wellbore Legal Name	PA 31-21	Common Wellbore Name	PA 31-21
Project	PA 21-06S-095W	Site	PA 22-21 Pad
Vertical Section Azimuth	42.06 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	2/5/2014	UWI	PA 31-21
Active datum	KB @6,056.0ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #2

Survey Name	Survey #2	Company	
Date Started	2/5/2014	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 (°)
2/5/2014	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/5/2014	NORMAL	101.0	1.58	35.33	100.99	1.14	0.81	1.38	1.56	1.56	0.00	35.33
	NORMAL	131.0	2.20	51.94	130.97	1.83	1.50	2.36	2.74	2.07	55.37	49.96
	NORMAL	161.0	2.82	55.28	160.94	2.60	2.56	3.65	2.12	2.07	11.13	14.95
	NORMAL	192.0	3.08	55.81	191.90	3.51	3.87	5.20	0.84	0.84	1.71	6.25
	NORMAL	222.0	3.78	57.48	221.85	4.49	5.37	6.93	2.36	2.33	5.57	8.96
	NORMAL	253.0	4.66	52.65	252.76	5.80	7.24	9.16	3.06	2.84	-15.58	335.59
	NORMAL	283.0	5.54	53.44	282.64	7.41	9.37	11.77	2.94	2.93	2.63	4.96
	NORMAL	313.0	6.77	52.47	312.47	9.35	11.93	14.93	4.11	4.10	-3.23	354.68
	NORMAL	343.0	8.27	53.09	342.21	11.72	15.06	18.79	5.01	5.00	2.07	3.40
	NORMAL	374.0	10.21	51.77	372.81	14.76	19.00	23.69	6.29	6.26	-4.26	353.11
	NORMAL	404.0	12.32	51.06	402.23	18.42	23.58	29.47	7.05	7.03	-2.37	355.89
	NORMAL	435.0	14.34	51.06	432.39	22.91	29.14	36.53	6.52	6.52	0.00	0.00
	NORMAL	465.0	15.57	51.86	461.37	27.73	35.20	44.17	4.16	4.10	2.67	9.91
	NORMAL	495.0	16.10	48.69	490.24	32.96	41.49	52.27	3.38	1.77	-10.57	299.97
	NORMAL	525.0	16.54	45.35	519.03	38.71	47.65	60.66	3.45	1.47	-11.13	293.51
	NORMAL	556.0	17.16	45.09	548.70	45.04	54.03	69.63	2.01	2.00	-0.84	352.94
	NORMAL	586.0	17.95	44.91	577.30	51.44	60.43	78.67	2.64	2.63	-0.60	355.98
	NORMAL	616.0	19.53	44.82	605.71	58.27	67.23	88.30	5.27	5.27	-0.30	358.91
	NORMAL	687.0	21.97	45.02	672.10	76.08	84.99	113.42	3.44	3.44	0.28	1.76
	NORMAL	778.0	24.62	44.43	755.67	101.65	110.30	149.36	2.92	2.91	-0.65	354.70

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 (°)
2/5/2014	NORMAL	869.0	28.12	41.19	837.20	131.34	137.71	189.76	4.16	3.85	-3.56	336.19
	NORMAL	960.0	31.99	40.80	915.94	165.73	167.59	235.32	4.26	4.25	-0.43	356.94
2/7/2014	NORMAL	1,124.0	31.60	43.77	1,055.34	229.65	225.70	321.70	0.98	-0.24	1.81	105.25
	NORMAL	1,169.0	31.47	43.16	1,093.70	246.73	241.89	345.23	0.77	-0.29	-1.36	247.57
	NORMAL	1,265.0	31.65	41.48	1,175.50	283.88	275.72	395.47	0.93	0.19	-1.76	280.85
	NORMAL	1,360.0	31.30	41.05	1,256.52	321.16	308.43	445.07	0.44	-0.37	-0.45	212.50
	NORMAL	1,455.0	30.86	40.52	1,337.89	358.30	340.47	494.10	0.55	-0.46	-0.56	211.65
	NORMAL	1,551.0	30.15	39.64	1,420.60	395.58	371.85	542.80	0.87	-0.74	-0.92	211.80
	NORMAL	1,645.0	31.16	39.99	1,501.46	432.39	402.54	590.69	1.09	1.07	0.37	10.17
	NORMAL	1,740.0	31.16	40.43	1,582.75	469.93	434.27	639.82	0.24	0.00	0.46	90.19
	NORMAL	1,835.0	32.48	43.59	1,663.48	507.12	467.80	689.89	2.24	1.39	3.33	52.96
	NORMAL	1,931.0	31.87	43.59	1,744.74	544.14	503.05	740.99	0.64	-0.84	0.00	180.00
	NORMAL	2,026.0	30.90	42.89	1,825.84	580.18	536.94	790.46	1.09	-1.02	-0.74	200.30
	NORMAL	2,122.0	31.60	44.91	1,907.91	616.06	571.48	840.23	1.31	0.73	2.10	57.12
	NORMAL	2,217.0	30.77	44.30	1,989.18	651.08	606.02	889.37	0.93	-0.87	-0.64	200.57
	NORMAL	2,312.0	31.65	42.89	2,070.43	686.73	639.96	938.57	1.20	0.93	-1.48	319.69
	NORMAL	2,407.0	30.90	41.05	2,151.63	723.39	672.94	987.89	1.28	-0.79	-1.94	231.08
	NORMAL	2,503.0	32.53	41.48	2,233.29	761.32	706.23	1,038.35	1.71	1.70	0.45	8.08
	NORMAL	2,598.0	32.09	40.34	2,313.58	799.69	739.48	1,089.11	0.79	-0.46	-1.20	233.69
	NORMAL	2,693.0	33.06	43.07	2,393.64	837.86	773.52	1,140.25	1.85	1.02	2.87	57.73
	NORMAL	2,789.0	32.97	42.01	2,474.14	876.39	808.88	1,192.55	0.61	-0.09	-1.10	260.70
	NORMAL	2,884.0	32.09	45.09	2,554.24	913.42	844.05	1,243.60	1.97	-0.93	3.24	119.28
	NORMAL	2,979.0	31.39	44.39	2,635.03	948.91	879.23	1,293.52	0.83	-0.74	-0.74	207.45
	NORMAL	3,074.0	31.21	44.30	2,716.21	984.21	913.73	1,342.84	0.20	-0.19	-0.09	194.52
2/8/2014	NORMAL	3,170.0	29.36	42.54	2,799.10	1,019.36	947.02	1,391.23	2.14	-1.93	-1.83	204.87
	NORMAL	3,265.0	30.64	43.07	2,881.37	1,054.20	979.30	1,438.72	1.38	1.35	0.56	11.93
	NORMAL	3,360.0	30.46	43.16	2,963.19	1,089.45	1,012.30	1,487.00	0.20	-0.19	0.09	165.78
	NORMAL	3,455.0	29.67	42.89	3,045.40	1,124.24	1,044.77	1,534.59	0.84	-0.83	-0.28	189.60
	NORMAL	3,551.0	28.92	42.19	3,129.13	1,158.85	1,076.53	1,581.56	0.86	-0.78	-0.73	204.24
	NORMAL	3,646.0	28.84	38.76	3,212.32	1,193.74	1,106.31	1,627.41	1.75	-0.08	-3.61	265.73
	NORMAL	3,741.0	29.50	37.88	3,295.27	1,230.07	1,135.01	1,673.61	0.83	0.69	-0.93	326.60
	NORMAL	3,836.0	30.64	38.58	3,377.48	1,267.45	1,164.47	1,721.10	1.26	1.20	0.74	17.40
	NORMAL	3,932.0	31.47	41.22	3,459.73	1,305.43	1,196.24	1,770.58	1.66	0.86	2.75	59.78
	NORMAL	4,027.0	30.59	41.57	3,541.13	1,342.17	1,228.62	1,819.55	0.95	-0.93	0.37	168.56
	NORMAL	4,123.0	29.54	41.13	3,624.21	1,378.27	1,260.40	1,867.64	1.12	-1.09	-0.46	191.67
	NORMAL	4,218.0	30.29	44.12	3,706.56	1,413.11	1,292.48	1,915.00	1.76	0.79	3.15	64.60
	NORMAL	4,313.0	31.47	43.42	3,788.09	1,448.32	1,326.21	1,963.73	1.30	1.24	-0.74	342.77
	NORMAL	4,409.0	30.95	43.68	3,870.20	1,484.37	1,360.48	2,013.46	0.56	-0.54	0.27	165.59
	NORMAL	4,504.0	30.33	43.68	3,951.94	1,519.39	1,393.92	2,061.86	0.65	-0.65	0.00	180.00
	NORMAL	4,599.0	30.95	41.13	4,033.68	1,555.14	1,426.55	2,110.26	1.52	0.65	-2.68	294.40
	NORMAL	4,694.0	32.44	40.17	4,114.51	1,593.01	1,459.06	2,160.16	1.66	1.57	-1.01	340.89
	NORMAL	4,790.0	32.22	39.46	4,195.62	1,632.44	1,491.93	2,211.46	0.46	-0.23	-0.74	239.61
	NORMAL	4,885.0	32.62	43.95	4,275.83	1,670.44	1,525.81	2,262.36	2.57	0.42	4.73	82.47
	NORMAL	4,980.0	32.09	43.68	4,356.08	1,707.12	1,561.01	2,313.17	0.58	-0.56	-0.28	195.14
2/9/2014	NORMAL	5,075.0	31.52	42.98	4,436.81	1,743.54	1,595.36	2,363.23	0.71	-0.60	-0.74	212.62
	NORMAL	5,170.0	30.81	43.16	4,518.10	1,779.45	1,628.94	2,412.38	0.75	-0.75	0.19	172.60
	NORMAL	5,266.0	29.98	43.42	4,600.91	1,814.81	1,662.24	2,460.94	0.88	-0.86	0.27	171.11
	NORMAL	5,361.0	29.67	43.16	4,683.33	1,849.20	1,694.64	2,508.18	0.35	-0.33	-0.27	202.53
	NORMAL	5,457.0	29.63	43.07	4,766.76	1,883.87	1,727.10	2,555.66	0.06	-0.04	-0.09	228.02
	NORMAL	5,552.0	28.66	39.99	4,849.73	1,918.48	1,757.78	2,601.91	1.88	-1.02	-3.24	235.77
	NORMAL	5,648.0	27.47	42.10	4,934.44	1,952.55	1,787.42	2,647.06	1.61	-1.24	2.20	141.09
	NORMAL	5,743.0	26.68	41.48	5,019.03	1,984.79	1,816.23	2,690.30	0.88	-0.83	-0.65	199.38
	NORMAL	5,838.0	24.57	43.63	5,104.69	2,015.07	1,843.99	2,731.38	2.43	-2.22	2.26	157.18
	NORMAL	5,933.0	21.98	43.68	5,191.95	2,042.22	1,869.90	2,768.90	2.73	-2.73	0.05	179.59
	NORMAL	6,029.0	20.04	40.96	5,281.56	2,067.64	1,893.10	2,803.31	2.26	-2.02	-2.83	205.42
	NORMAL	6,124.0	20.53	37.79	5,370.67	2,093.10	1,913.97	2,836.20	1.27	0.52	-3.34	292.54

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 (°)
2/9/2014	NORMAL	6,220.0	19.82	37.62	5,460.78	2,119.29	1,934.22	2,869.21	0.74	-0.74	-0.18	184.64
	NORMAL	6,315.0	18.59	37.27	5,550.49	2,144.10	1,953.23	2,900.36	1.30	-1.29	-0.37	185.18
	NORMAL	6,411.0	17.10	35.95	5,641.87	2,167.70	1,970.78	2,929.64	1.61	-1.55	-1.38	184.56
	NORMAL	6,506.0	16.40	37.27	5,732.84	2,189.68	1,987.10	2,956.89	0.84	-0.74	1.39	152.11
	NORMAL	6,602.0	16.09	37.00	5,825.01	2,211.09	2,003.31	2,983.65	0.33	-0.32	-0.28	193.56
2/10/2014	NORMAL	6,698.0	16.48	39.64	5,917.16	2,232.20	2,020.01	3,010.51	0.87	0.41	2.75	63.49
	NORMAL	6,793.0	15.16	38.14	6,008.56	2,252.35	2,036.28	3,036.36	1.45	-1.39	-1.58	196.49
	NORMAL	6,889.0	14.37	42.54	6,101.39	2,271.00	2,052.08	3,060.80	1.43	-0.82	4.58	127.28
	NORMAL	6,984.0	12.79	43.33	6,193.73	2,287.34	2,067.27	3,083.10	1.67	-1.66	0.83	173.69
	NORMAL	7,080.0	10.90	41.84	6,287.68	2,301.83	2,080.62	3,102.80	1.99	-1.97	-1.55	188.46
2/11/2014	NORMAL	7,174.0	9.36	40.08	6,380.22	2,314.30	2,091.47	3,119.33	1.67	-1.64	-1.87	190.50
	NORMAL	7,269.0	6.33	42.19	6,474.32	2,324.10	2,099.96	3,132.29	3.20	-3.19	2.22	175.61
	NORMAL	7,365.0	5.54	40.69	6,569.80	2,331.53	2,106.54	3,142.22	0.84	-0.82	-1.56	190.36
	NORMAL	7,460.0	4.75	40.96	6,664.42	2,337.98	2,112.11	3,150.74	0.83	-0.83	0.28	178.38
	NORMAL	7,556.0	4.13	45.79	6,760.13	2,343.39	2,117.19	3,158.16	0.75	-0.65	5.03	151.30
	NORMAL	7,651.0	3.60	45.88	6,854.91	2,347.85	2,121.78	3,164.55	0.56	-0.56	0.09	179.39
	NORMAL	7,746.0	3.12	35.51	6,949.75	2,352.03	2,125.43	3,170.09	0.81	-0.51	-10.92	226.60
	NORMAL	7,842.0	2.46	27.25	7,045.64	2,355.99	2,127.89	3,174.68	0.80	-0.69	-8.60	207.27
	NORMAL	7,938.0	2.64	34.89	7,141.54	2,359.64	2,130.09	3,178.87	0.40	0.19	7.96	65.95
2/12/2014	NORMAL	8,033.0	2.90	60.56	7,236.43	2,362.61	2,133.44	3,183.32	1.32	0.27	27.02	91.18
	NORMAL	8,129.0	2.20	99.84	7,332.35	2,363.49	2,137.37	3,186.60	1.91	-0.73	40.92	130.67
	NORMAL	8,225.0	1.89	102.66	7,428.28	2,362.83	2,140.73	3,188.36	0.34	-0.32	2.94	163.42
	NORMAL	8,320.0	1.58	119.53	7,523.24	2,361.84	2,143.40	3,189.41	0.63	-0.33	17.76	129.50
	NORMAL	8,416.0	1.23	151.88	7,619.21	2,360.28	2,145.04	3,189.35	0.89	-0.36	33.70	129.41
	NORMAL	8,511.0	1.54	155.13	7,714.19	2,358.22	2,146.05	3,188.51	0.34	0.33	3.42	15.85
	NORMAL	8,607.0	1.76	174.11	7,810.15	2,355.59	2,146.75	3,187.01	0.61	0.23	19.77	77.74
	NORMAL	8,702.0	1.93	191.25	7,905.10	2,352.57	2,146.58	3,184.66	0.61	0.18	18.04	81.56
	NORMAL	8,798.0	2.11	201.09	8,001.04	2,349.33	2,145.63	3,181.62	0.41	0.19	10.25	67.55
	NORMAL	8,893.0	2.90	209.36	8,095.95	2,345.60	2,143.83	3,177.65	0.91	0.83	8.71	28.75
	NORMAL	8,989.0	3.69	215.07	8,191.79	2,340.96	2,140.86	3,172.21	0.89	0.82	5.95	25.43
2/13/2014	NORMAL	9,084.0	2.37	235.72	8,286.66	2,337.35	2,137.48	3,167.27	1.78	-1.39	21.74	150.42
	NORMAL	9,180.0	1.85	241.35	8,382.59	2,335.49	2,134.48	3,163.88	0.58	-0.54	5.86	161.06
	NORMAL	9,276.0	2.29	234.23	8,478.53	2,333.63	2,131.56	3,160.54	0.53	0.46	-7.42	326.10
	NORMAL	9,371.0	2.33	241.00	8,573.45	2,331.58	2,128.33	3,156.86	0.29	0.04	7.13	85.05
	NORMAL	9,466.0	2.81	241.26	8,668.36	2,329.52	2,124.60	3,152.83	0.51	0.51	0.27	1.52
	NORMAL	9,562.0	2.94	241.08	8,764.23	2,327.20	2,120.39	3,148.28	0.14	0.14	-0.19	355.94
	NORMAL	9,658.0	2.77	235.20	8,860.12	2,324.69	2,116.33	3,143.69	0.35	-0.18	-6.13	236.95
	NORMAL	9,733.0	2.77	235.20	8,935.03	2,322.62	2,113.35	3,140.16	0.00	0.00	0.00	0.00