

Deviation Summary

PICEANCE VLY

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well/Wellbore Information

Well	PA 331-21	Wellbore No.	00
Wellbore Legal Name	PA 331-21	Common Wellbore Name	PA 331-21
Project	PA 21-06S-095W	Site	PA 22-21 Pad
Vertical Section Azimuth	47.39 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	3/16/2014	UWI	PA 331-21
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	3/16/2014	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 (°)
3/16/2014	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/16/2014	NORMAL	132.0	0.88	100.11	131.99	-0.18	1.00	0.61	0.67	0.67	0.00	100.11
	NORMAL	162.0	2.64	79.72	161.98	-0.10	1.90	1.34	6.14	5.87	-67.97	330.03
	NORMAL	193.0	3.61	65.04	192.93	0.44	3.49	2.87	4.03	3.13	-47.35	312.99
	NORMAL	254.0	3.70	62.75	253.81	2.16	6.98	6.60	0.28	0.15	-3.75	300.51
	NORMAL	284.0	4.49	62.93	283.73	3.13	8.89	8.66	2.63	2.63	0.60	1.02
	NORMAL	314.0	6.07	64.78	313.60	4.34	11.37	11.31	5.30	5.27	6.17	7.07
	NORMAL	344.0	8.36	64.78	343.37	5.95	14.78	14.90	7.63	7.63	0.00	0.00
	NORMAL	375.0	9.50	65.74	373.99	7.96	19.15	19.48	3.71	3.68	3.10	7.92
	NORMAL	405.0	10.03	61.35	403.55	10.23	23.70	24.37	3.05	1.77	-14.63	303.27
	NORMAL	436.0	11.52	60.03	434.01	13.07	28.75	30.01	4.87	4.81	-4.26	349.95
	NORMAL	466.0	12.67	57.57	463.34	16.33	34.12	36.17	4.20	3.83	-8.20	334.65
	NORMAL	496.0	13.46	60.38	492.56	19.82	39.93	42.81	3.38	2.63	9.37	40.18
3/17/2014	NORMAL	526.0	14.43	62.40	521.68	23.28	46.28	49.82	3.62	3.23	6.73	27.63
	NORMAL	557.0	15.84	62.14	551.60	27.05	53.45	57.65	4.55	4.55	-0.84	357.12
	NORMAL	587.0	17.68	58.10	580.33	31.37	60.93	66.08	7.26	6.13	-13.47	325.71
	NORMAL	617.0	19.00	59.15	608.81	36.28	69.00	75.34	4.54	4.40	3.50	14.55
	NORMAL	647.0	19.88	58.01	637.09	41.49	77.51	85.13	3.19	2.93	-3.80	336.14
	NORMAL	678.0	21.03	55.37	666.14	47.44	86.56	95.82	4.76	3.71	-8.52	320.02
	NORMAL	708.0	21.82	54.05	694.07	53.77	95.50	106.69	3.08	2.63	-4.40	327.99
	NORMAL	718.0	22.42	54.13	703.33	55.98	98.55	110.43	6.01	6.00	0.80	2.91

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 (°)
3/17/2014	NORMAL	749.0	23.78	50.83	731.85	63.39	108.19	122.54	6.06	4.39	-10.65	314.88
	NORMAL	779.0	24.92	48.20	759.18	71.43	117.59	134.90	5.24	3.80	-8.77	315.23
	NORMAL	809.0	26.26	47.88	786.23	80.09	127.23	147.86	4.49	4.47	-1.07	353.97
	NORMAL	839.0	27.44	49.56	813.00	89.03	137.41	161.40	4.68	3.93	5.60	33.49
	NORMAL	870.0	27.96	49.56	840.45	98.37	148.38	175.80	1.68	1.68	0.00	0.00
	NORMAL	900.0	28.73	47.58	866.85	107.80	159.05	190.04	4.05	2.57	-6.60	308.45
	NORMAL	960.0	29.57	46.51	919.25	127.72	180.44	219.26	1.65	1.40	-1.78	327.71
3/17/2014	NORMAL	1,042.0	30.82	48.52	990.13	155.56	210.86	260.50	1.96	1.52	2.45	39.84
3/18/2014	NORMAL	1,105.0	31.82	47.01	1,043.95	177.57	235.10	293.24	2.02	1.59	-2.40	321.22
	NORMAL	1,169.0	30.42	46.57	1,098.73	200.22	259.21	326.32	2.22	-2.19	-0.69	189.04
	NORMAL	1,265.0	30.33	47.28	1,181.56	233.37	294.67	374.86	0.39	-0.09	0.74	104.38
	NORMAL	1,360.0	30.64	47.45	1,263.42	266.01	330.12	423.05	0.34	0.33	0.18	15.62
	NORMAL	1,455.0	30.95	47.28	1,345.03	298.95	365.90	471.69	0.34	0.33	-0.18	344.24
	NORMAL	1,550.0	29.80	47.10	1,426.99	331.60	401.15	519.73	1.21	-1.21	-0.19	184.45
	NORMAL	1,646.0	29.54	47.01	1,510.40	363.97	435.93	567.25	0.27	-0.27	-0.09	189.68
	NORMAL	1,741.0	28.66	46.66	1,593.41	395.58	469.63	613.45	0.94	-0.93	-0.37	190.79
	NORMAL	1,836.0	30.37	46.75	1,676.08	427.67	503.69	660.24	1.80	1.80	0.09	1.52
	NORMAL	1,932.0	31.08	46.84	1,758.60	461.25	539.45	709.29	0.74	0.74	0.09	3.74
	NORMAL	2,027.0	31.25	45.87	1,839.89	495.18	575.02	758.44	0.56	0.18	-1.02	288.29
3/19/2014	NORMAL	2,123.0	30.15	47.28	1,922.44	528.88	610.61	807.45	1.37	-1.15	1.47	147.40
	NORMAL	2,218.0	29.54	45.78	2,004.84	561.39	644.92	854.71	1.01	-0.64	-1.58	230.10
	NORMAL	2,313.0	29.27	48.86	2,087.60	593.01	679.19	901.34	1.62	-0.28	3.24	101.46
	NORMAL	2,409.0	29.67	47.36	2,171.18	624.54	714.35	948.56	0.87	0.42	-1.56	297.81
	NORMAL	2,505.0	29.85	48.68	2,254.52	656.41	749.77	996.21	0.71	0.19	1.38	75.21
	NORMAL	2,599.0	29.36	48.24	2,336.25	687.21	784.53	1,042.64	0.57	-0.52	-0.47	203.73
	NORMAL	2,695.0	28.75	47.36	2,420.17	718.52	819.07	1,089.26	0.78	-0.64	-0.92	214.63
	NORMAL	2,790.0	29.58	50.09	2,503.13	749.04	853.86	1,135.53	1.65	0.87	2.87	59.24
	NORMAL	2,885.0	29.63	50.53	2,585.73	779.01	889.98	1,182.40	0.23	0.05	0.46	77.24
	NORMAL	2,981.0	29.14	49.65	2,669.38	809.23	926.11	1,229.45	0.68	-0.51	-0.92	221.00
	NORMAL	3,076.0	28.40	49.21	2,752.65	838.97	960.84	1,275.15	0.81	-0.78	-0.46	195.78
	NORMAL	3,171.0	29.80	47.36	2,835.66	869.72	995.31	1,321.34	1.75	1.47	-1.95	326.46
	NORMAL	3,267.0	29.93	47.45	2,918.91	902.07	1,030.51	1,369.14	0.14	0.14	0.09	19.06
	NORMAL	3,362.0	29.76	47.89	3,001.31	933.91	1,065.46	1,416.42	0.29	-0.18	0.46	128.02
	NORMAL	3,457.0	30.42	45.43	3,083.51	966.60	1,100.08	1,464.03	1.47	0.69	-2.59	297.08
	NORMAL	3,552.0	30.42	44.90	3,165.43	1,000.52	1,134.19	1,512.10	0.28	0.00	-0.56	269.77
	NORMAL	3,648.0	30.20	44.29	3,248.31	1,035.02	1,168.21	1,560.49	0.39	-0.23	-0.64	234.19
	NORMAL	3,743.0	29.98	44.02	3,330.51	1,069.19	1,201.39	1,608.04	0.27	-0.23	-0.28	211.49
	NORMAL	3,838.0	29.01	46.48	3,413.20	1,102.12	1,234.59	1,654.77	1.63	-1.02	2.59	129.76
	NORMAL	3,933.0	28.48	45.96	3,496.49	1,133.73	1,267.58	1,700.45	0.62	-0.56	-0.55	205.03
	NORMAL	4,029.0	27.82	49.21	3,581.14	1,164.28	1,300.99	1,745.72	1.74	-0.69	3.39	114.72
	NORMAL	4,124.0	28.97	49.91	3,664.71	1,193.58	1,335.38	1,790.87	1.26	1.21	0.74	16.45
3/20/2014	NORMAL	4,219.0	28.53	49.12	3,748.00	1,223.24	1,370.13	1,836.53	0.61	-0.46	-0.83	220.47
	NORMAL	4,314.0	29.32	48.68	3,831.15	1,253.45	1,404.75	1,882.46	0.86	0.83	-0.46	344.73
	NORMAL	4,410.0	28.84	49.21	3,915.04	1,284.09	1,439.94	1,929.10	0.57	-0.50	0.55	152.01
	NORMAL	4,505.0	30.29	48.42	3,997.67	1,314.96	1,475.21	1,975.96	1.58	1.53	-0.83	344.61
	NORMAL	4,601.0	30.64	45.96	4,080.42	1,348.04	1,510.90	2,024.62	1.35	0.36	-2.56	284.61
	NORMAL	4,696.0	30.42	45.34	4,162.25	1,381.77	1,545.41	2,072.86	0.40	-0.23	-0.65	234.80
	NORMAL	4,792.0	29.27	46.40	4,245.52	1,415.04	1,579.70	2,120.61	1.32	-1.20	1.10	155.82
	NORMAL	4,887.0	29.14	46.04	4,328.44	1,447.11	1,613.17	2,166.96	0.23	-0.14	-0.38	233.34
	NORMAL	4,983.0	27.96	48.16	4,412.77	1,478.35	1,646.76	2,212.83	1.62	-1.23	2.21	140.28
	NORMAL	5,078.0	28.75	48.59	4,496.37	1,508.32	1,680.49	2,257.94	0.86	0.83	0.45	14.68
	NORMAL	5,173.0	28.31	48.77	4,579.84	1,538.28	1,714.56	2,303.30	0.47	-0.46	0.19	169.02
	NORMAL	5,268.0	29.23	48.95	4,663.11	1,568.36	1,749.00	2,349.01	0.97	0.97	0.19	5.46
	NORMAL	5,364.0	28.40	48.77	4,747.22	1,598.80	1,783.84	2,395.26	0.87	-0.86	-0.19	185.89
	NORMAL	5,459.0	27.60	48.16	4,831.10	1,628.37	1,817.23	2,439.86	0.89	-0.84	-0.64	199.43
3/21/2014	NORMAL	5,554.0	27.03	47.54	4,915.51	1,657.62	1,849.55	2,483.45	0.67	-0.60	-0.65	206.25

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 (°)
3/21/2014	NORMAL	5,649.0	26.29	46.84	5,000.41	1,686.58	1,880.82	2,526.07	0.85	-0.78	-0.74	202.69
	NORMAL	5,744.0	25.36	46.40	5,085.92	1,715.01	1,910.90	2,567.45	1.00	-0.98	-0.46	191.45
	NORMAL	5,839.0	23.65	46.92	5,172.36	1,742.05	1,939.56	2,606.85	1.81	-1.80	0.55	173.05
	NORMAL	5,935.0	23.03	45.87	5,260.50	1,768.28	1,967.10	2,644.88	0.78	-0.65	-1.09	213.38
	NORMAL	6,030.0	20.97	48.33	5,348.58	1,792.52	1,993.14	2,680.45	2.38	-2.17	2.59	157.04
	NORMAL	6,126.0	20.22	47.63	5,438.45	1,815.12	2,018.23	2,714.22	0.82	-0.78	-0.73	197.85
	NORMAL	6,221.0	16.92	48.24	5,528.49	1,835.40	2,040.68	2,744.47	3.48	-3.47	0.64	176.92
	NORMAL	6,316.0	15.39	47.45	5,619.73	1,853.13	2,060.28	2,770.90	1.63	-1.61	-0.83	187.80
	NORMAL	6,411.0	14.11	48.86	5,711.60	1,869.28	2,078.28	2,795.08	1.40	-1.35	1.48	165.01
	NORMAL	6,507.0	12.75	48.33	5,804.97	1,884.02	2,095.01	2,817.37	1.42	-1.42	-0.55	184.91
	3/22/2014 NORMAL	6,601.0	12.18	48.24	5,896.76	1,897.52	2,110.16	2,837.66	0.61	-0.61	-0.10	181.91
	NORMAL	6,696.0	12.04	47.19	5,989.64	1,910.93	2,124.90	2,857.59	0.27	-0.15	-1.11	237.05
	NORMAL	6,792.0	11.87	46.75	6,083.56	1,924.50	2,139.44	2,877.47	0.20	-0.18	-0.46	207.98
	NORMAL	6,887.0	11.65	47.36	6,176.57	1,937.69	2,153.61	2,896.84	0.27	-0.23	0.64	150.83
	NORMAL	6,983.0	11.65	48.42	6,270.59	1,950.69	2,167.99	2,916.22	0.22	0.00	1.10	90.52
	NORMAL	7,078.0	10.55	47.19	6,363.81	1,962.96	2,181.55	2,934.51	1.18	-1.16	-1.29	191.55
	NORMAL	7,173.0	10.02	48.16	6,457.28	1,974.39	2,194.08	2,951.47	0.59	-0.56	1.02	162.38
	3/23/2014 NORMAL	7,269.0	9.19	45.43	6,551.94	1,985.34	2,205.77	2,967.48	0.99	-0.86	-2.84	207.42
	NORMAL	7,364.0	9.10	47.19	6,645.73	1,995.77	2,216.68	2,982.57	0.31	-0.09	1.85	108.70
	NORMAL	7,459.0	8.22	45.87	6,739.65	2,005.60	2,227.07	2,996.88	0.95	-0.93	-1.39	192.08
	NORMAL	7,553.0	6.46	42.00	6,832.87	2,014.21	2,235.43	3,008.86	1.94	-1.87	-4.12	193.78
	NORMAL	7,649.0	5.05	41.48	6,928.39	2,021.39	2,241.84	3,018.44	1.47	-1.47	-0.54	181.86
	NORMAL	7,744.0	3.25	34.80	7,023.14	2,026.73	2,246.15	3,025.23	1.96	-1.89	-7.03	191.72
	NORMAL	7,839.0	2.86	32.51	7,118.00	2,030.94	2,248.96	3,030.15	0.43	-0.41	-2.41	196.24
	NORMAL	7,935.0	1.89	21.70	7,213.92	2,034.44	2,250.83	3,033.89	1.11	-1.01	-11.26	199.45
	NORMAL	8,030.0	1.27	11.33	7,308.88	2,036.92	2,251.62	3,036.15	0.72	-0.65	-10.92	199.63
	NORMAL	8,125.0	0.83	7.81	7,403.86	2,038.64	2,251.92	3,037.53	0.47	-0.46	-3.71	186.58
	NORMAL	8,220.0	0.61	333.36	7,498.86	2,039.77	2,251.79	3,038.20	0.50	-0.23	-36.26	226.54
	3/24/2014 NORMAL	8,315.0	0.57	279.57	7,593.85	2,040.30	2,251.09	3,038.05	0.56	-0.04	-56.62	239.28
	NORMAL	8,411.0	0.97	246.35	7,689.84	2,040.05	2,249.88	3,036.99	0.61	0.42	-34.60	294.44
	NORMAL	8,506.0	1.71	237.12	7,784.82	2,038.96	2,247.95	3,034.83	0.81	0.78	-9.72	339.09
	NORMAL	8,601.0	2.50	237.12	7,879.75	2,037.07	2,245.02	3,031.39	0.83	0.83	0.00	0.00
	NORMAL	8,696.0	1.98	241.16	7,974.68	2,035.15	2,241.84	3,027.76	0.57	-0.55	4.25	165.12
	NORMAL	8,792.0	1.45	238.70	8,070.64	2,033.72	2,239.35	3,024.95	0.56	-0.55	-2.56	186.68
	NORMAL	8,887.0	1.98	224.90	8,165.59	2,031.93	2,237.17	3,022.14	0.70	0.56	-14.53	315.04
	NORMAL	8,982.0	2.46	228.24	8,260.52	2,029.41	2,234.49	3,018.46	0.52	0.51	3.52	16.76
	NORMAL	9,077.0	2.55	229.56	8,355.43	2,026.68	2,231.36	3,014.31	0.11	0.09	1.39	33.32
	NORMAL	9,173.0	3.12	226.84	8,451.31	2,023.51	2,227.83	3,009.56	0.61	0.59	-2.83	345.36
	3/25/2014 NORMAL	9,268.0	3.60	226.57	8,546.15	2,019.69	2,223.78	3,003.99	0.51	0.51	-0.28	357.98
	NORMAL	9,362.0	3.74	228.95	8,639.96	2,015.65	2,219.32	2,997.98	0.22	0.15	2.53	48.61
	NORMAL	9,457.0	4.00	230.53	8,734.74	2,011.51	2,214.43	2,991.57	0.30	0.27	1.66	23.09
	NORMAL	9,552.0	4.44	232.20	8,829.48	2,007.15	2,208.96	2,984.60	0.48	0.46	1.76	16.44
	NORMAL	9,570.0	4.53	232.02	8,847.43	2,006.29	2,207.85	2,983.20	0.51	0.50	-1.00	351.02
	NORMAL	9,620.0	4.53	232.02	8,897.27	2,003.86	2,204.74	2,979.26	0.00	0.00	0.00	0.00