

# Deviation Summary

PICEANCE VLY

## 1 General

### 1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

### 1.2 Well/Wellbore Information

Well	RU 43-5	Wellbore No.	00
Wellbore Legal Name	RU 43-5	Common Wellbore Name	RU 43-5
Project	RU 05-07S-093W	Site	RU 23-5 Pad
Vertical Section Azimuth	124.21 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	9/15/2013	UWI	RU 43-5
Active datum	KB @7,627.0ft (above Mean Sea Level)		

## 2 Survey Name

### 2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	SCIENTIFIC
Date Started	9/15/2013	Ended	
Tool Name	MWD	Engineer	

#### 2.1.1 Tie On Point

MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)
		138.52			

#### 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 (°)
9/4/2013	NORMAL	88.0	0.44	138.52	88.00	-0.25	0.22	0.33	0.00	0.00	0.00	0.00
	NORMAL	178.0	3.34	105.03	177.94	-1.19	2.99	3.14	0.00	0.00	0.00	0.00
	NORMAL	270.0	5.89	125.60	269.64	-4.64	9.41	10.39	0.00	0.00	0.00	0.00
	NORMAL	360.0	10.21	125.07	358.73	-11.91	19.70	22.99	0.00	0.00	0.00	0.00
9/15/2013	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/15/2013	NORMAL	88.0	0.44	138.52	88.00	-0.25	0.22	0.33	0.50	0.50	0.00	138.52
	NORMAL	178.0	3.34	105.03	177.94	-1.19	2.99	3.14	3.31	3.22	-37.21	321.85
	NORMAL	270.0	5.89	125.60	269.64	-4.64	9.41	10.39	3.26	2.77	22.36	43.53
	NORMAL	360.0	10.21	125.07	358.73	-11.91	19.70	22.99	4.80	4.80	-0.59	358.75
	NORMAL	452.0	14.52	126.65	448.58	-23.49	35.64	42.67	4.70	4.68	1.72	5.26
	NORMAL	544.0	17.86	120.59	536.93	-37.55	57.04	68.29	4.06	3.63	-6.59	330.23
	NORMAL	615.0	20.39	124.47	604.00	-50.10	76.61	91.52	3.99	3.56	5.46	28.52
	NORMAL	707.0	21.23	122.93	690.00	-68.22	103.81	124.21	1.09	0.91	-1.67	326.20
	NORMAL	800.0	21.98	126.67	776.47	-87.77	131.90	158.43	1.69	0.81	4.02	63.17
	NORMAL	892.0	23.15	126.37	861.43	-108.78	160.27	193.70	1.28	1.27	-0.33	354.24
	NORMAL	984.0	23.85	126.09	945.80	-130.46	189.87	230.37	0.77	0.76	-0.30	350.81
	NORMAL	1,075.0	22.02	124.64	1,029.60	-151.00	218.77	265.82	2.10	-2.01	-1.59	196.49
	NORMAL	1,118.0	21.63	122.73	1,069.52	-159.86	232.07	281.80	0.00	0.00	0.00	0.00
9/17/2013	NORMAL	1,118.0	21.63	122.73	1,069.52	-159.86	232.07	281.80	1.88	-0.91	-4.44	240.34
	NORMAL	1,203.0	22.49	120.65	1,148.30	-176.62	259.24	313.69	1.37	1.01	-2.45	316.78
	NORMAL	1,267.0	22.63	122.61	1,207.40	-189.50	280.14	338.21	1.20	0.22	3.06	80.36

## 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 (°)
9/17/2013	NORMAL	1,362.0	22.37	123.29	1,295.17	-209.27	310.65	374.56	0.39	-0.27	0.72	135.29
	NORMAL	1,457.0	21.95	122.59	1,383.15	-228.76	340.72	410.38	0.52	-0.44	-0.74	211.83
	NORMAL	1,552.0	23.70	124.39	1,470.71	-249.11	371.44	447.23	1.98	1.84	1.89	22.58
	NORMAL	1,647.0	23.54	125.94	1,557.75	-271.02	402.55	485.28	0.68	-0.17	1.63	105.16
	NORMAL	1,742.0	24.15	125.25	1,644.64	-293.38	433.78	523.67	0.71	0.64	-0.73	335.11
	NORMAL	1,837.0	24.25	124.64	1,731.30	-315.68	465.70	562.61	0.28	0.11	-0.64	291.52
	NORMAL	1,932.0	23.62	124.30	1,818.13	-337.50	497.48	601.15	0.68	-0.66	-0.36	192.19
	NORMAL	2,028.0	22.79	123.05	1,906.36	-358.47	528.95	638.98	1.01	-0.86	-1.30	210.11
	NORMAL	2,124.0	22.21	123.34	1,995.05	-378.59	559.69	675.71	0.62	-0.60	0.30	169.30
	NORMAL	2,219.0	21.72	121.77	2,083.16	-397.71	589.64	711.22	0.81	-0.52	-1.65	229.43
	NORMAL	2,313.0	22.47	125.50	2,170.26	-417.30	619.05	746.56	1.69	0.80	3.97	63.61
	NORMAL	2,409.0	22.71	127.00	2,258.89	-439.11	648.79	783.41	0.65	0.25	1.56	68.08
	NORMAL	2,505.0	22.10	127.35	2,347.65	-461.22	677.94	819.95	0.65	-0.64	0.36	167.83
	NORMAL	2,599.0	23.52	123.50	2,434.30	-482.30	707.64	856.37	2.19	1.51	-4.10	311.79
	NORMAL	2,695.0	23.05	124.63	2,522.48	-503.55	739.08	894.32	0.68	-0.49	1.18	136.97
	NORMAL	2,791.0	22.33	124.73	2,611.05	-524.62	769.53	931.35	0.75	-0.75	0.10	176.98
	NORMAL	2,886.0	21.81	125.37	2,699.09	-545.12	798.76	967.04	0.60	-0.55	0.67	155.48
	NORMAL	2,981.0	23.25	121.97	2,786.84	-565.26	829.06	1,003.42	2.04	1.52	-3.58	316.28
	NORMAL	3,077.0	23.04	122.65	2,875.11	-585.43	860.95	1,041.13	0.35	-0.22	0.71	128.47
	NORMAL	3,173.0	22.77	123.00	2,963.54	-605.68	892.35	1,078.49	0.32	-0.28	0.36	153.39
	NORMAL	3,268.0	24.12	122.46	3,050.70	-626.12	924.14	1,116.27	1.44	1.42	-0.57	350.71
	NORMAL	3,363.0	24.04	123.86	3,137.43	-647.32	956.59	1,155.02	0.61	-0.08	1.47	98.61
	NORMAL	3,458.0	23.94	124.06	3,224.23	-668.89	988.63	1,193.65	0.14	-0.11	0.21	140.97
	NORMAL	3,554.0	23.46	123.95	3,312.13	-690.47	1,020.62	1,232.23	0.50	-0.50	-0.11	185.21
	NORMAL	3,649.0	23.08	123.61	3,399.40	-711.34	1,051.81	1,269.76	0.42	-0.40	-0.36	199.31
	NORMAL	3,742.0	22.99	124.26	3,484.99	-731.65	1,082.00	1,306.15	0.29	-0.10	0.70	109.79
	NORMAL	3,838.0	22.96	123.81	3,573.37	-752.63	1,113.05	1,343.62	0.19	-0.03	-0.47	260.10
	NORMAL	3,932.0	22.14	123.90	3,660.18	-772.71	1,142.99	1,379.67	0.87	-0.87	0.10	177.63
	NORMAL	4,027.0	21.87	123.76	3,748.26	-792.53	1,172.56	1,415.27	0.29	-0.28	-0.15	190.93
9/18/2013	NORMAL	4,122.0	21.63	124.32	3,836.50	-812.23	1,201.73	1,450.47	0.33	-0.25	0.59	139.41
	NORMAL	4,217.0	21.37	123.22	3,924.89	-831.59	1,230.67	1,485.28	0.50	-0.27	-1.16	236.67
	NORMAL	4,312.0	22.37	124.61	4,013.05	-851.34	1,260.03	1,520.67	1.19	1.05	1.46	28.02
	NORMAL	4,407.0	22.68	123.94	4,100.81	-871.83	1,290.10	1,557.06	0.42	0.33	-0.71	320.07
	NORMAL	4,502.0	21.90	124.87	4,188.71	-892.19	1,319.84	1,593.09	0.90	-0.82	0.98	156.10
	NORMAL	4,597.0	21.54	124.67	4,276.96	-912.24	1,348.71	1,628.25	0.39	-0.38	-0.21	191.52
	NORMAL	4,692.0	23.30	126.69	4,364.78	-933.38	1,378.13	1,664.46	2.02	1.85	2.13	24.58
	NORMAL	4,787.0	22.95	126.78	4,452.15	-955.70	1,408.03	1,701.73	0.37	-0.37	0.09	174.27
	NORMAL	4,883.0	22.54	126.69	4,540.68	-977.90	1,437.77	1,738.82	0.43	-0.43	-0.09	184.81
	NORMAL	4,978.0	21.78	126.85	4,628.66	-999.35	1,466.48	1,774.61	0.80	-0.80	0.17	175.53
	NORMAL	5,074.0	23.04	126.60	4,717.41	-1,021.23	1,495.81	1,811.17	1.32	1.31	-0.26	355.56
	NORMAL	5,169.0	23.92	122.91	4,804.55	-1,042.78	1,526.91	1,849.01	1.80	0.93	-3.88	299.20
	NORMAL	5,265.0	23.39	122.76	4,892.48	-1,063.67	1,559.27	1,887.51	0.56	-0.55	-0.16	186.41
	NORMAL	5,361.0	22.86	123.70	4,980.77	-1,084.32	1,590.81	1,925.21	0.67	-0.55	0.98	145.57
	NORMAL	5,456.0	23.92	122.56	5,067.96	-1,104.93	1,622.40	1,962.91	1.21	1.12	-1.20	336.36
	NORMAL	5,552.0	23.48	121.77	5,155.87	-1,125.47	1,655.06	2,001.48	0.57	-0.46	-0.82	215.46
	NORMAL	5,646.0	21.76	119.22	5,242.63	-1,143.84	1,686.19	2,037.55	2.11	-1.83	-2.71	208.52
	NORMAL	5,742.0	21.54	119.83	5,331.86	-1,161.29	1,717.01	2,072.85	0.33	-0.23	0.64	134.63
9/19/2013	NORMAL	5,838.0	20.15	118.67	5,421.58	-1,177.99	1,746.80	2,106.88	1.51	-1.45	-1.21	196.00
9/20/2013	NORMAL	5,933.0	20.00	119.07	5,510.81	-1,193.74	1,775.36	2,139.34	0.21	-0.16	0.42	137.72
	NORMAL	6,029.0	18.51	118.96	5,601.43	-1,209.09	1,803.04	2,170.87	1.55	-1.55	-0.11	181.34
	NORMAL	6,124.0	18.31	119.03	5,691.57	-1,223.64	1,829.29	2,200.75	0.21	-0.21	0.07	173.73
	NORMAL	6,219.0	17.06	119.30	5,782.08	-1,237.70	1,854.49	2,229.50	1.32	-1.32	0.28	176.37
	NORMAL	6,315.0	16.71	119.39	5,873.94	-1,251.36	1,878.79	2,257.28	0.37	-0.36	0.09	175.77
	NORMAL	6,411.0	13.87	115.63	5,966.54	-1,263.11	1,901.20	2,282.42	3.13	-2.96	-3.92	197.44
	NORMAL	6,507.0	13.10	115.53	6,059.89	-1,272.78	1,921.39	2,304.55	0.80	-0.80	-0.10	181.69
	NORMAL	6,602.0	13.08	114.63	6,152.42	-1,281.90	1,940.88	2,325.79	0.22	-0.02	-0.95	263.96



## 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 (°)
9/21/2013	NORMAL	6,698.0	12.51	117.95	6,246.04	-1,291.30	1,959.94	2,346.84	0.97	-0.59	3.46	129.40
	NORMAL	6,794.0	11.37	120.79	6,339.96	-1,301.02	1,977.25	2,366.62	1.34	-1.19	2.96	154.12
	NORMAL	6,889.0	9.67	125.30	6,433.36	-1,310.42	1,991.81	2,383.95	1.99	-1.79	4.75	156.36
	NORMAL	6,984.0	7.74	120.89	6,527.27	-1,318.32	2,003.81	2,398.31	2.15	-2.03	-4.64	196.91
	NORMAL	7,080.0	7.60	119.35	6,622.41	-1,324.75	2,014.89	2,411.09	0.26	-0.15	-1.60	234.98
	NORMAL	7,175.0	5.80	123.79	6,716.75	-1,330.50	2,024.36	2,422.15	1.97	-1.89	4.67	166.14
	NORMAL	7,270.0	5.15	120.87	6,811.32	-1,335.36	2,032.01	2,431.21	0.74	-0.68	-3.07	201.75
	NORMAL	7,366.0	4.57	123.11	6,906.98	-1,339.66	2,038.91	2,439.33	0.64	-0.60	2.33	163.00
	NORMAL	7,461.0	3.67	134.74	7,001.73	-1,343.86	2,044.24	2,446.11	1.29	-0.95	12.24	142.83
9/22/2013	NORMAL	7,556.0	2.21	121.33	7,096.60	-1,346.96	2,047.96	2,450.93	1.69	-1.54	-14.12	198.63
	NORMAL	7,652.0	2.00	121.07	7,192.54	-1,348.78	2,050.98	2,454.45	0.22	-0.22	-0.27	182.47
	NORMAL	7,747.0	1.93	128.83	7,287.48	-1,350.64	2,053.64	2,457.70	0.29	-0.07	8.17	108.60
	NORMAL	7,842.0	1.55	127.94	7,382.44	-1,352.44	2,055.90	2,460.57	0.40	-0.40	-0.94	183.62
	NORMAL	7,937.0	1.06	114.38	7,477.42	-1,353.59	2,057.72	2,462.72	0.61	-0.52	-14.27	205.56
	NORMAL	8,032.0	0.88	111.57	7,572.40	-1,354.22	2,059.20	2,464.30	0.20	-0.19	-2.96	193.40
	NORMAL	8,128.0	0.88	111.48	7,668.39	-1,354.76	2,060.57	2,465.74	0.00	0.00	-0.09	269.96
	NORMAL	8,223.0	1.58	36.51	7,763.37	-1,353.98	2,062.03	2,466.50	1.68	0.74	-78.92	252.88
	NORMAL	8,319.0	1.68	50.25	7,859.34	-1,352.01	2,063.90	2,466.94	0.42	0.10	14.31	82.58
	NORMAL	8,415.0	0.72	25.19	7,955.31	-1,350.57	2,065.23	2,467.24	1.12	-1.00	-26.10	196.53
	NORMAL	8,510.0	0.45	23.04	8,050.31	-1,349.68	2,065.63	2,467.07	0.29	-0.28	-2.26	183.57
9/23/2013	NORMAL	8,605.0	0.42	4.81	8,145.31	-1,348.99	2,065.81	2,466.83	0.15	-0.03	-19.19	248.76
	NORMAL	8,700.0	0.20	139.27	8,240.31	-1,348.77	2,065.95	2,466.82	0.61	-0.23	141.54	165.70
	NORMAL	8,796.0	0.50	209.69	8,336.31	-1,349.26	2,065.85	2,467.01	0.49	0.31	73.35	93.94
9/24/2013	NORMAL	8,890.0	0.53	214.58	8,430.30	-1,349.98	2,065.40	2,467.04	0.06	0.03	5.20	58.15
9/25/2013	NORMAL	8,985.0	0.79	224.55	8,525.30	-1,350.80	2,064.69	2,466.92	0.30	0.27	10.49	28.87
	NORMAL	9,080.0	1.06	219.06	8,620.28	-1,351.95	2,063.68	2,466.73	0.30	0.28	-5.78	339.07
	NORMAL	9,175.0	1.39	218.60	8,715.26	-1,353.54	2,062.40	2,466.57	0.35	0.35	-0.48	358.06
	NORMAL	9,270.0	1.68	227.41	8,810.23	-1,355.38	2,060.66	2,466.16	0.39	0.31	9.27	43.60
	NORMAL	9,365.0	1.93	226.44	8,905.18	-1,357.42	2,058.48	2,465.51	0.27	0.26	-1.02	352.55
	NORMAL	9,460.0	2.11	221.43	9,000.12	-1,359.84	2,056.16	2,464.95	0.27	0.19	-5.27	313.03
	NORMAL	9,555.0	2.12	221.64	9,095.06	-1,362.46	2,053.83	2,464.50	0.01	0.01	0.22	37.88
	NORMAL	9,650.0	2.24	232.39	9,189.99	-1,364.91	2,051.20	2,463.69	0.45	0.13	11.32	79.06
	NORMAL	9,745.0	1.78	241.01	9,284.93	-1,366.76	2,048.44	2,462.45	0.58	-0.48	9.07	150.94
	NORMAL	9,839.0	1.93	214.74	9,378.88	-1,368.76	2,046.26	2,461.78	0.91	0.16	-27.95	266.70
9/26/2013	NORMAL	9,934.0	2.26	225.61	9,473.82	-1,371.39	2,044.01	2,461.39	0.54	0.35	11.44	55.81
	NORMAL	10,029.0	2.73	216.84	9,568.73	-1,374.51	2,041.31	2,460.92	0.64	0.49	-9.23	316.48
	NORMAL	10,124.0	2.66	212.98	9,663.63	-1,378.17	2,038.75	2,460.86	0.20	-0.07	-4.06	246.99
	NORMAL	10,219.0	2.82	215.19	9,758.52	-1,381.93	2,036.21	2,460.87	0.20	0.17	2.33	34.54
	NORMAL	10,315.0	2.56	210.77	9,854.41	-1,385.70	2,033.75	2,460.96	0.35	-0.27	-4.60	216.39
	NORMAL	10,347.0	2.64	208.60	9,886.38	-1,386.96	2,033.03	2,461.07	0.40	0.25	-6.78	308.01
	NORMAL	10,404.0	2.64	208.60	9,943.32	-1,389.27	2,031.77	2,461.33	0.00	0.00	0.00	0.00