

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well/Wellbore Information

Well	RMV 163-4	Wellbore No.	00
Wellbore Legal Name	RMV 163-4	Common Wellbore Name	RMV 163-4
Project	RU 04-07S-094W	Site	RMV 108-4 Pad
Vertical Section Azimuth	193.25 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	11/12/2013	UWI	RMV 163-4
Active datum	KB @5,820.0ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	
Date Started	11/12/2013	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 (°)
11/12/2013	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/12/2013	NORMAL	73.0	0.35	234.84	73.00	-0.13	-0.18	0.17	0.48	0.48	0.00	234.84
	NORMAL	103.0	1.06	179.65	103.00	-0.46	-0.26	0.51	3.02	2.37	-183.97	286.34
	NORMAL	133.0	1.06	200.21	132.99	-1.00	-0.35	1.05	1.26	0.00	68.53	100.28
	NORMAL	164.0	2.11	196.17	163.98	-1.81	-0.61	1.90	3.40	3.39	-13.03	351.90
	NORMAL	195.0	2.38	196.44	194.96	-2.98	-0.95	3.12	0.87	0.87	0.87	2.38
	NORMAL	225.0	3.17	188.96	224.92	-4.40	-1.25	4.57	2.89	2.63	-24.93	331.61
	NORMAL	255.0	3.96	187.65	254.86	-6.24	-1.52	6.42	2.65	2.63	-4.37	353.46
	NORMAL	286.0	5.01	189.23	285.77	-8.64	-1.88	8.84	3.41	3.39	5.10	7.50
	NORMAL	316.0	6.16	190.28	315.62	-11.52	-2.38	11.75	3.85	3.83	3.50	5.60
	NORMAL	346.0	7.39	192.13	345.42	-14.99	-3.07	15.29	4.16	4.10	6.17	10.98
	NORMAL	376.0	8.97	193.01	375.11	-19.15	-4.00	19.56	5.28	5.27	2.93	4.97
	NORMAL	407.0	10.56	195.21	405.66	-24.25	-5.29	24.82	5.27	5.13	7.10	14.29
	NORMAL	437.0	11.70	195.91	435.09	-29.83	-6.85	30.60	3.83	3.80	2.33	7.10
	NORMAL	481.0	13.76	195.97	478.01	-39.15	-9.51	40.29	4.68	4.68	0.14	0.40
	NORMAL	512.0	15.12	195.26	508.03	-46.59	-11.59	48.01	4.42	4.39	-2.29	352.24
	NORMAL	542.0	16.97	195.18	536.86	-54.59	-13.77	56.30	6.17	6.17	-0.27	359.28
	NORMAL	572.0	18.55	194.91	565.43	-63.43	-16.14	65.44	5.27	5.27	-0.90	356.89
	NORMAL	602.0	19.96	193.95	593.75	-73.01	-18.60	75.33	4.82	4.70	-3.20	346.89
	NORMAL	633.0	21.50	193.24	622.74	-83.68	-21.18	86.30	5.03	4.97	-2.29	350.40
	NORMAL	693.0	23.43	192.63	678.19	-106.02	-26.31	109.23	3.24	3.22	-1.02	352.83

2.1.2 Survey Stations (Continued)

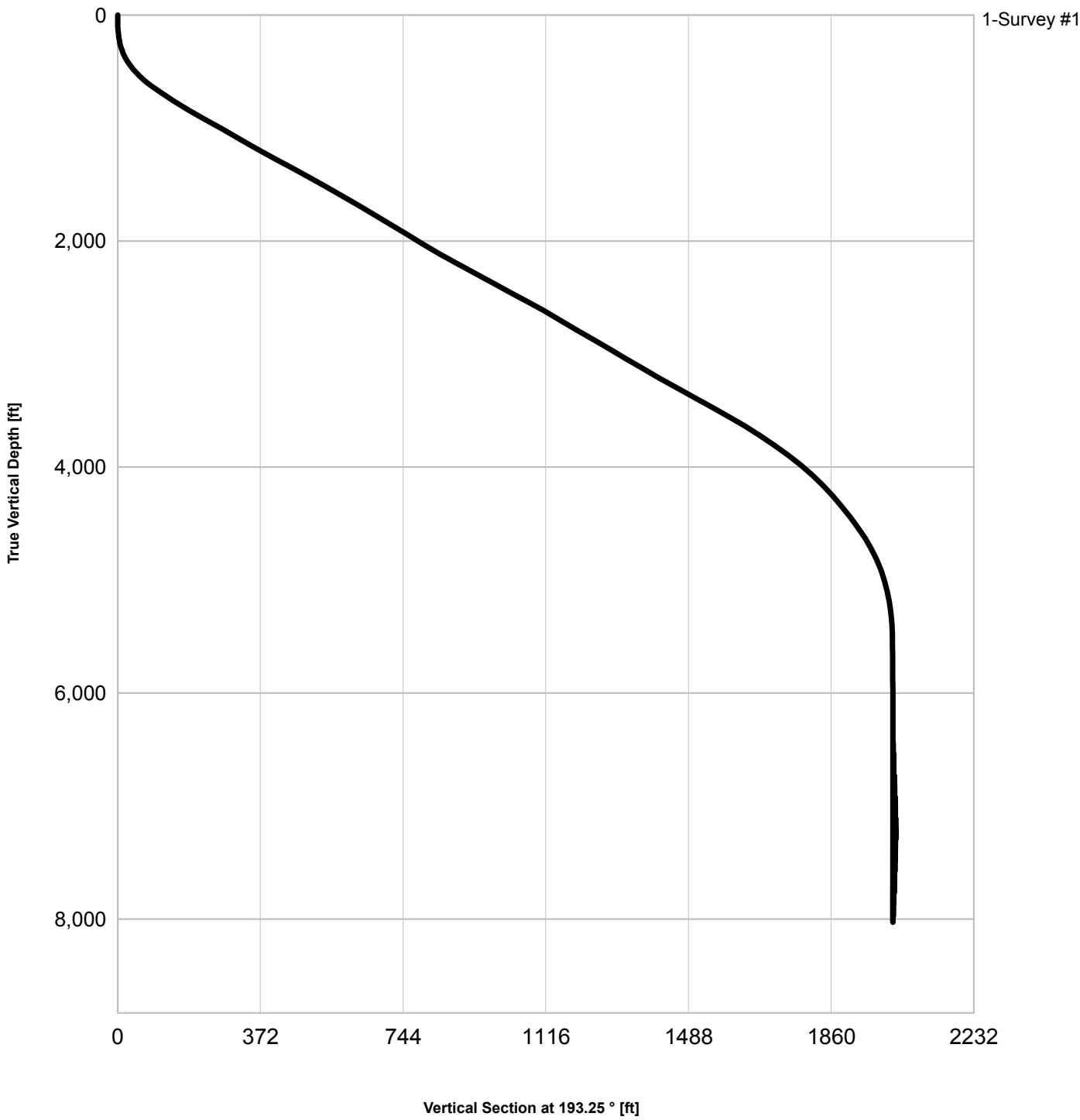
Date	Type	MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS (°/100usft)	Build Rate (°/100usft)	Turn (°/100usft)	Tface (°)
11/13/2013	NORMAL	784.0	24.92	192.80	761.21	-142.37	-34.51	146.49	1.64	1.64	0.19	2.75
	NORMAL	875.0	26.95	192.28	843.04	-181.22	-43.14	186.29	2.24	2.23	-0.57	353.37
	NORMAL	966.0	27.96	191.31	923.79	-222.29	-51.71	228.23	1.21	1.11	-1.07	335.69
	NORMAL	1,061.0	27.47	191.66	1,007.89	-265.59	-60.51	272.39	0.54	-0.52	0.37	161.78
	NORMAL	1,156.0	26.77	193.51	1,092.44	-307.85	-69.94	315.69	1.15	-0.74	1.95	130.51
11/14/2013	NORMAL	1,253.0	27.60	193.47	1,178.73	-350.95	-80.27	360.00	0.86	0.86	-0.04	358.72
	NORMAL	1,359.0	28.70	192.28	1,272.19	-399.70	-91.41	410.01	1.17	1.04	-1.12	332.44
	NORMAL	1,444.0	29.10	194.30	1,346.61	-439.67	-100.85	451.08	1.24	0.47	2.38	68.61
	NORMAL	1,540.0	28.35	194.56	1,430.79	-484.35	-112.35	497.21	0.79	-0.78	0.27	170.65
	NORMAL	1,635.0	26.86	193.59	1,514.98	-527.05	-123.06	541.22	1.64	-1.57	-1.02	196.36
	NORMAL	1,730.0	27.60	191.92	1,599.45	-569.44	-132.65	584.68	1.12	0.78	-1.76	313.34
	NORMAL	1,825.0	26.15	192.54	1,684.19	-611.41	-141.74	627.62	1.55	-1.53	0.65	169.34
	NORMAL	1,921.0	27.21	191.48	1,769.96	-653.57	-150.71	670.71	1.21	1.10	-1.10	335.35
	NORMAL	2,016.0	25.45	192.10	1,855.10	-694.82	-159.31	712.83	1.88	-1.85	0.65	171.40
	NORMAL	2,112.0	25.98	191.05	1,941.60	-735.62	-167.66	754.47	0.73	0.55	-1.09	318.84
	NORMAL	2,208.0	26.02	194.30	2,027.89	-776.67	-176.89	796.53	1.48	0.04	3.39	89.85
	NORMAL	2,303.0	27.30	193.51	2,112.79	-818.04	-187.13	839.16	1.40	1.35	-0.83	344.17
	NORMAL	2,398.0	28.48	192.28	2,196.75	-861.36	-197.04	883.59	1.38	1.24	-1.29	333.46
	NORMAL	2,493.0	28.00	193.86	2,280.44	-905.14	-207.20	928.54	0.94	-0.51	1.66	123.40
11/15/2013	NORMAL	2,588.0	29.01	192.98	2,363.93	-949.24	-217.71	973.87	1.15	1.06	-0.93	337.03
	NORMAL	2,684.0	28.18	193.51	2,448.22	-993.97	-228.24	1,019.82	0.90	-0.86	0.55	163.24
	NORMAL	2,779.0	29.14	191.66	2,531.58	-1,038.43	-238.15	1,065.37	1.38	1.01	-1.95	316.44
	NORMAL	2,874.0	27.56	193.59	2,615.18	-1,082.45	-247.99	1,110.48	1.92	-1.66	2.03	150.73
	NORMAL	2,970.0	25.98	195.26	2,700.89	-1,124.33	-258.75	1,153.70	1.82	-1.65	1.74	155.29
	NORMAL	3,066.0	26.99	194.12	2,786.82	-1,165.74	-269.60	1,196.50	1.18	1.05	-1.19	332.77
	NORMAL	3,161.0	27.82	193.33	2,871.16	-1,208.22	-279.97	1,240.22	0.95	0.87	-0.83	335.99
	NORMAL	3,257.0	25.93	194.39	2,956.78	-1,250.35	-290.35	1,283.61	2.03	-1.97	1.10	166.25
	NORMAL	3,352.0	26.42	193.86	3,042.04	-1,290.99	-300.57	1,325.51	0.57	0.52	-0.56	334.26
	NORMAL	3,447.0	27.03	193.07	3,126.89	-1,332.54	-310.52	1,368.23	0.74	0.64	-0.83	329.43
	NORMAL	3,543.0	27.52	192.98	3,212.22	-1,375.40	-320.43	1,412.23	0.51	0.51	-0.09	355.15
	NORMAL	3,638.0	28.44	192.36	3,296.12	-1,418.88	-330.20	1,456.79	1.02	0.97	-0.65	342.18
	NORMAL	3,734.0	27.56	192.45	3,380.88	-1,462.90	-339.89	1,501.86	0.92	-0.92	0.09	177.29
	NORMAL	3,829.0	28.44	192.10	3,464.76	-1,506.48	-349.37	1,546.45	0.94	0.93	-0.37	349.27
	NORMAL	3,924.0	26.99	193.51	3,548.86	-1,549.56	-359.14	1,590.63	1.68	-1.53	1.48	156.29
11/16/2013	NORMAL	4,019.0	26.15	193.86	3,633.82	-1,590.85	-369.19	1,633.12	0.90	-0.88	0.37	169.60
	NORMAL	4,115.0	24.48	194.21	3,720.60	-1,630.67	-379.15	1,674.16	1.75	-1.74	0.36	175.04
	NORMAL	4,210.0	22.90	196.23	3,807.60	-1,667.50	-389.14	1,712.30	1.87	-1.66	2.13	153.73
	NORMAL	4,305.0	21.32	193.33	3,895.61	-1,702.06	-398.29	1,748.04	2.02	-1.66	-3.05	213.30
	NORMAL	4,401.0	19.69	192.19	3,985.52	-1,734.85	-405.73	1,781.66	1.75	-1.70	-1.19	193.23
	NORMAL	4,496.0	17.71	191.66	4,075.50	-1,764.65	-412.03	1,812.11	2.09	-2.08	-0.56	184.65
	NORMAL	4,591.0	16.18	194.56	4,166.38	-1,791.61	-418.28	1,839.79	1.84	-1.61	3.05	152.46
	NORMAL	4,687.0	14.46	194.39	4,258.97	-1,816.17	-424.62	1,865.14	1.79	-1.79	-0.18	181.41
	NORMAL	4,782.0	13.76	191.66	4,351.10	-1,838.72	-429.85	1,888.30	1.02	-0.74	-2.87	222.24
	NORMAL	4,878.0	12.57	192.45	4,444.58	-1,860.11	-434.41	1,910.16	1.25	-1.24	0.82	171.79
	NORMAL	4,973.0	12.13	190.96	4,537.38	-1,880.00	-438.54	1,930.47	0.57	-0.46	-1.57	215.19
	NORMAL	5,068.0	10.64	191.13	4,630.51	-1,898.40	-442.13	1,949.20	1.57	-1.57	0.18	178.79
	NORMAL	5,164.0	8.79	185.07	4,725.13	-1,914.41	-444.49	1,965.32	2.20	-1.93	-6.31	205.97
11/17/2013	NORMAL	5,258.0	7.78	185.77	4,818.14	-1,927.89	-445.76	1,978.74	1.08	-1.07	0.74	174.64
	NORMAL	5,353.0	6.02	192.80	4,912.46	-1,939.15	-447.51	1,990.10	2.05	-1.85	7.40	157.83
	NORMAL	5,448.0	5.10	207.57	5,007.01	-1,947.75	-450.57	1,999.17	1.78	-0.97	15.55	129.94
	NORMAL	5,544.0	3.82	208.89	5,102.72	-1,954.33	-454.09	2,006.39	1.34	-1.33	1.38	176.07
	NORMAL	5,639.0	3.25	214.16	5,197.54	-1,959.33	-457.13	2,011.95	0.69	-0.60	5.55	152.93
	NORMAL	5,734.0	1.98	196.41	5,292.44	-1,963.14	-459.11	2,016.10	1.57	-1.34	-18.68	203.87
	NORMAL	5,830.0	0.97	182.96	5,388.41	-1,965.54	-459.62	2,018.56	1.11	-1.05	-14.01	192.28
	NORMAL	5,926.0	0.75	127.85	5,484.40	-1,966.74	-459.17	2,019.62	0.85	-0.23	-57.41	228.67
	NORMAL	6,021.0	0.97	116.34	5,579.39	-1,967.47	-457.95	2,020.06	0.29	0.23	-12.12	316.01

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 (°)
11/18/2013	NORMAL	6,117.0	1.19	115.90	5,675.37	-1,968.27	-456.33	2,020.46	0.23	0.23	-0.46	357.62
	NORMAL	6,212.0	0.66	99.73	5,770.36	-1,968.79	-454.90	2,020.65	0.62	-0.56	-17.02	198.29
	NORMAL	6,308.0	0.88	116.51	5,866.35	-1,969.22	-453.70	2,020.78	0.33	0.23	17.48	54.30
	NORMAL	6,404.0	0.92	102.71	5,962.34	-1,969.71	-452.29	2,020.94	0.23	0.04	-14.38	273.51
	NORMAL	6,499.0	0.79	105.70	6,057.33	-1,970.06	-450.91	2,020.96	0.14	-0.14	3.15	162.55
	NORMAL	6,594.0	0.48	99.99	6,152.32	-1,970.31	-449.89	2,020.97	0.33	-0.33	-6.01	188.69
11/19/2013	NORMAL	6,688.0	0.35	123.90	6,246.32	-1,970.53	-449.26	2,021.05	0.23	-0.14	25.44	138.45
	NORMAL	6,783.0	0.18	145.34	6,341.32	-1,970.82	-448.94	2,021.25	0.20	-0.18	22.57	160.17
	NORMAL	6,878.0	0.26	185.95	6,436.32	-1,971.16	-448.88	2,021.56	0.18	0.08	42.75	84.14
	NORMAL	6,973.0	0.53	192.19	6,531.32	-1,971.80	-448.99	2,022.22	0.29	0.28	6.57	12.18
	NORMAL	7,069.0	0.70	181.99	6,627.31	-1,972.82	-449.10	2,023.24	0.21	0.18	-10.63	322.05
	NORMAL	7,164.0	0.66	183.66	6,722.30	-1,973.95	-449.16	2,024.35	0.05	-0.04	1.76	154.48
	NORMAL	7,259.0	0.66	195.20	6,817.30	-1,975.02	-449.34	2,025.43	0.14	0.00	12.15	95.77
	NORMAL	7,355.0	0.75	203.35	6,913.29	-1,976.13	-449.73	2,026.60	0.14	0.09	8.49	52.22
	NORMAL	7,450.0	0.61	195.35	7,008.28	-1,977.19	-450.11	2,027.72	0.18	-0.15	-8.42	210.19
	NORMAL	7,545.0	0.40	161.60	7,103.28	-1,977.99	-450.14	2,028.51	0.37	-0.22	-35.53	218.70
	NORMAL	7,639.0	0.53	112.30	7,197.28	-1,978.47	-449.64	2,028.86	0.43	0.14	-52.45	262.29
	NORMAL	7,735.0	0.88	85.49	7,293.27	-1,978.58	-448.49	2,028.70	0.49	0.36	-27.93	302.76
	NORMAL	7,831.0	1.10	67.30	7,389.26	-1,978.16	-446.90	2,027.93	0.40	0.23	-18.95	295.67
	NORMAL	7,926.0	0.88	75.03	7,484.24	-1,977.62	-445.36	2,027.05	0.27	-0.23	8.14	152.56
11/20/2013	NORMAL	8,022.0	0.97	63.16	7,580.23	-1,977.07	-443.92	2,026.18	0.22	0.09	-12.36	289.14
	NORMAL	8,117.0	1.05	61.93	7,675.22	-1,976.29	-442.44	2,025.09	0.09	0.08	-1.29	344.22
	NORMAL	8,213.0	0.88	66.59	7,771.20	-1,975.59	-440.98	2,024.07	0.19	-0.18	4.85	157.54
	NORMAL	8,309.0	0.97	69.84	7,867.19	-1,975.01	-439.54	2,023.18	0.11	0.09	3.39	31.87
	NORMAL	8,404.0	1.01	62.37	7,962.18	-1,974.35	-438.05	2,022.19	0.14	0.04	-7.86	283.46
	NORMAL	8,425.0	1.05	63.60	7,983.17	-1,974.18	-437.71	2,021.95	0.22	0.19	5.86	29.55
	NORMAL	8,470.0	1.05	63.60	8,028.17	-1,973.81	-436.97	2,021.42	0.00	0.00	0.00	0.00

3 Charts

3.1 Vertical Section View



3.2 Plan View

