

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well/Wellbore Information

Well	RWF 422-4	Wellbore No.	00
Wellbore Legal Name	RWF 422-4	Common Wellbore Name	RWF 422-4
Project	RU 04-07S-094W	Site	RMV 108-4 Pad
Vertical Section Azimuth	221.96 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	12/16/2013	UWI	RWF 422-4
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	12/16/2013	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 (°)
12/16/2013	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/16/2013	NORMAL	102.0	0.53	263.58	102.00	-0.05	-0.47	0.35	0.52	0.52	0.00	263.58
	NORMAL	120.0	0.53	263.58	-610.92	-1,989.01	-1,638.60	2,574.64	0.00	0.01	0.64	204.22
	NORMAL	133.0	1.32	251.98	132.99	-0.18	-0.95	0.77	2.61	2.55	-37.42	340.82
	NORMAL	164.0	2.02	240.73	163.98	-0.56	-1.77	1.60	2.48	2.26	-36.29	329.21
	NORMAL	194.0	2.99	232.38	193.95	-1.29	-2.85	2.87	3.45	3.23	-27.83	335.18
	NORMAL	224.0	3.52	229.83	223.90	-2.36	-4.17	4.55	1.83	1.77	-8.50	343.44
	NORMAL	254.0	4.31	221.67	253.83	-3.80	-5.62	6.59	3.23	2.63	-27.53	320.31
	NORMAL	284.0	4.93	223.68	283.74	-5.58	-7.26	9.00	2.14	2.07	7.03	16.38
	NORMAL	314.0	6.07	220.17	313.60	-7.72	-9.18	11.88	3.96	3.80	-11.70	341.81
	NORMAL	344.0	6.77	219.29	343.41	-10.30	-11.32	15.23	2.36	2.33	-2.93	351.56
	NORMAL	375.0	8.01	218.06	374.15	-13.42	-13.81	19.21	4.03	4.00	-3.97	352.12
	NORMAL	404.0	9.33	215.95	402.82	-16.91	-16.43	23.56	4.68	4.55	-7.28	345.41
	NORMAL	435.0	10.21	213.84	433.37	-21.23	-19.44	28.78	3.06	2.84	-6.81	336.82
	NORMAL	465.0	11.17	216.74	462.85	-25.77	-22.66	34.31	3.67	3.20	9.67	30.69
	NORMAL	496.0	11.61	216.39	493.24	-30.68	-26.30	40.40	1.44	1.42	-1.13	350.90
	NORMAL	526.0	12.23	217.71	522.59	-35.63	-30.04	46.58	2.26	2.07	4.40	24.38
12/17/2013	NORMAL	544.0	12.88	219.77	540.16	-38.68	-32.49	50.48	4.38	3.61	11.45	35.57
	NORMAL	575.0	13.67	221.27	570.33	-44.09	-37.11	57.60	2.78	2.55	4.84	24.29
	NORMAL	605.0	14.86	221.27	599.41	-49.64	-41.99	64.99	3.97	3.97	0.00	0.00
	NORMAL	635.0	15.87	221.18	628.33	-55.62	-47.23	72.94	3.37	3.37	-0.30	358.60

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 (")
12/17/2013	NORMAL	665.0	17.01	221.27	657.11	-62.01	-52.82	81.43	3.80	3.80	0.30	1.32
	NORMAL	695.0	17.50	222.76	685.76	-68.62	-58.78	90.32	2.20	1.63	4.97	42.76
	NORMAL	725.0	17.93	222.41	714.33	-75.34	-64.96	99.45	1.48	1.43	-1.17	345.92
	NORMAL	755.0	18.77	222.67	742.81	-82.30	-71.34	108.90	2.81	2.80	0.87	5.69
	NORMAL	785.0	19.87	223.73	771.12	-89.53	-78.14	118.82	3.85	3.67	3.53	18.18
	NORMAL	815.0	21.27	223.29	799.21	-97.17	-85.39	129.36	4.70	4.67	-1.47	353.49
	NORMAL	845.0	22.55	223.38	827.04	-105.32	-93.08	140.55	4.27	4.27	0.30	1.54
	NORMAL	876.0	23.43	223.29	855.58	-114.12	-101.39	152.65	2.84	2.84	-0.29	357.67
	NORMAL	906.0	23.60	222.85	883.08	-122.87	-109.56	164.62	0.81	0.57	-1.47	313.88
	NORMAL	936.0	24.40	223.55	910.49	-131.76	-117.91	176.82	2.83	2.67	2.33	19.91
	NORMAL	966.0	25.10	223.20	937.74	-140.89	-126.54	189.37	2.38	2.33	-1.17	348.02
	NORMAL	998.0	26.11	222.24	966.59	-151.05	-135.92	203.20	3.41	3.16	-3.00	337.23
	NORMAL	1,030.0	27.12	221.80	995.20	-161.70	-145.51	217.54	3.22	3.16	-1.38	348.76
	NORMAL	1,062.0	28.13	220.83	1,023.55	-172.85	-155.31	232.37	3.45	3.16	-3.03	335.57
	NORMAL	1,094.0	29.32	221.27	1,051.62	-184.45	-165.41	247.75	3.78	3.72	1.38	10.27
	NORMAL	1,126.0	30.50	221.62	1,079.35	-196.41	-175.97	263.71	3.73	3.69	1.09	8.57
	NORMAL	1,157.0	31.87	221.88	1,105.87	-208.38	-186.66	279.78	4.44	4.42	0.84	5.72
	NORMAL	1,253.0	36.62	221.88	1,185.21	-248.59	-222.71	333.76	4.95	4.95	0.00	0.00
	NORMAL	1,348.0	39.12	222.94	1,260.20	-291.63	-262.05	392.07	2.72	2.63	1.12	15.01
	NORMAL	1,443.0	38.15	222.15	1,334.40	-335.33	-302.16	451.38	1.15	-1.02	-0.83	206.65
	NORMAL	1,539.0	37.89	221.01	1,410.03	-379.56	-341.40	510.51	0.78	-0.27	-1.19	249.23
	NORMAL	1,634.0	39.52	221.36	1,484.17	-424.26	-380.52	569.91	1.73	1.72	0.37	7.78
	NORMAL	1,729.0	38.73	222.32	1,557.87	-468.92	-420.50	629.85	1.05	-0.83	1.01	142.89
	NORMAL	1,825.0	37.67	221.27	1,633.31	-513.18	-460.07	689.21	1.29	-1.10	-1.09	211.08
	NORMAL	1,921.0	36.44	221.27	1,709.92	-556.66	-498.23	747.06	1.28	-1.28	0.00	180.00
	NORMAL	2,016.0	34.77	219.95	1,787.16	-598.63	-534.24	802.35	1.94	-1.76	-1.39	204.18
	NORMAL	2,112.0	36.18	220.30	1,865.34	-641.23	-570.14	858.03	1.48	1.47	0.36	8.34
	NORMAL	2,207.0	38.20	221.71	1,941.01	-684.55	-607.83	915.44	2.31	2.13	1.48	23.44
12/18/2013	NORMAL	2,302.0	37.06	221.97	2,016.25	-727.76	-646.52	973.44	1.21	-1.20	0.27	172.18
	NORMAL	2,397.0	34.81	222.76	2,093.17	-768.96	-684.08	1,029.19	2.42	-2.37	0.83	168.68
	NORMAL	2,492.0	35.60	223.73	2,170.79	-808.85	-721.60	1,083.94	1.02	0.83	1.02	35.69
	NORMAL	2,537.0	36.18	224.26	2,207.25	-827.83	-739.92	1,110.30	1.46	1.29	1.18	28.39
12/19/2013	NORMAL	2,648.0	36.66	223.73	2,296.57	-875.24	-785.70	1,176.16	0.52	0.43	-0.48	326.54
	NORMAL	2,680.0	36.75	223.55	2,322.22	-889.08	-798.90	1,195.28	0.44	0.28	-0.56	309.84
	NORMAL	2,776.0	37.45	222.67	2,398.79	-931.35	-838.47	1,253.18	0.92	0.73	-0.92	322.47
	NORMAL	2,871.0	37.63	223.30	2,474.12	-973.70	-877.93	1,311.05	0.45	0.19	0.66	65.13
	NORMAL	2,966.0	37.41	222.50	2,549.47	-1,016.08	-917.32	1,368.90	0.56	-0.23	-0.84	245.38
12/20/2013	NORMAL	3,061.0	37.23	222.24	2,625.02	-1,058.63	-956.13	1,426.49	0.25	-0.19	-0.27	221.11
	NORMAL	3,157.0	37.49	221.97	2,701.32	-1,101.85	-995.19	1,484.75	0.32	0.27	-0.28	327.68
	NORMAL	3,253.0	37.76	221.62	2,777.36	-1,145.55	-1,034.25	1,543.36	0.36	0.28	-0.36	321.50
	NORMAL	3,348.0	37.10	220.57	2,852.80	-1,189.06	-1,072.21	1,601.09	0.97	-0.69	-1.11	223.62
	NORMAL	3,443.0	37.14	219.77	2,928.55	-1,232.86	-1,109.19	1,658.39	0.51	0.04	-0.84	274.42
	NORMAL	3,538.0	37.45	220.65	3,004.12	-1,276.82	-1,146.35	1,715.92	0.65	0.33	0.93	60.18
	NORMAL	3,634.0	37.32	221.09	3,080.40	-1,320.90	-1,184.49	1,774.20	0.31	-0.14	0.46	116.12
	NORMAL	3,730.0	36.79	222.85	3,157.02	-1,363.91	-1,223.17	1,832.04	1.23	-0.55	1.83	117.25
	NORMAL	3,825.0	36.53	222.59	3,233.23	-1,405.58	-1,261.65	1,888.76	0.32	-0.27	-0.27	210.74
	NORMAL	3,921.0	34.46	221.44	3,311.38	-1,446.98	-1,298.96	1,944.49	2.27	-2.16	-1.20	197.41
	NORMAL	4,016.0	32.84	221.97	3,390.46	-1,486.28	-1,333.98	1,997.13	1.73	-1.71	0.56	169.94
	NORMAL	4,111.0	31.25	221.36	3,470.99	-1,523.93	-1,367.49	2,047.54	1.71	-1.67	-0.64	191.25
	NORMAL	4,207.0	29.63	222.76	3,553.75	-1,560.05	-1,400.06	2,096.17	1.84	-1.69	1.46	156.96
	NORMAL	4,302.0	27.91	222.67	3,637.02	-1,593.64	-1,431.08	2,141.89	1.81	-1.81	-0.09	181.40
	NORMAL	4,397.0	26.29	222.32	3,721.59	-1,625.55	-1,460.31	2,185.16	1.71	-1.71	-0.37	185.47
12/21/2013	NORMAL	4,492.0	24.70	223.64	3,807.34	-1,655.47	-1,488.18	2,226.04	1.78	-1.67	1.39	160.93
	NORMAL	4,588.0	22.86	222.85	3,895.18	-1,683.66	-1,514.70	2,264.74	1.95	-1.92	-0.82	189.46
	NORMAL	4,683.0	21.67	223.64	3,983.10	-1,709.88	-1,539.36	2,300.72	1.29	-1.25	0.83	166.25
	NORMAL	4,778.0	19.60	222.67	4,072.00	-1,734.29	-1,562.27	2,334.19	2.21	-2.18	-1.02	188.92

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 (')
12/21/2013	NORMAL	4,874.0	18.81	221.80	4,162.66	-1,757.67	-1,583.50	2,365.77	0.88	-0.82	-0.91	199.50
	NORMAL	4,969.0	17.89	222.50	4,252.82	-1,779.85	-1,603.56	2,395.68	1.00	-0.97	0.74	166.86
	NORMAL	5,065.0	17.54	224.08	4,344.27	-1,801.11	-1,623.59	2,424.88	0.62	-0.36	1.65	126.81
	NORMAL	5,160.0	15.60	221.97	4,435.32	-1,820.89	-1,642.09	2,451.96	2.14	-2.04	-2.22	196.22
	NORMAL	5,255.0	14.02	221.53	4,527.17	-1,839.01	-1,658.26	2,476.24	1.67	-1.66	-0.46	183.86
	NORMAL	5,351.0	12.75	222.41	4,620.56	-1,855.53	-1,673.12	2,498.46	1.34	-1.32	0.92	171.31
	NORMAL	5,446.0	11.74	220.48	4,713.39	-1,870.63	-1,686.46	2,518.61	1.15	-1.06	-2.03	201.12
	NORMAL	5,542.0	9.98	222.94	4,807.67	-1,884.15	-1,698.47	2,536.69	1.90	-1.83	2.56	166.45
	NORMAL	5,637.0	8.22	222.15	4,901.47	-1,895.21	-1,708.64	2,551.71	1.86	-1.85	-0.83	183.67
	NORMAL	5,732.0	6.42	218.37	4,995.70	-1,904.41	-1,716.49	2,563.81	1.96	-1.89	-3.98	193.11
	NORMAL	5,827.0	5.36	213.97	5,090.19	-1,912.25	-1,722.27	2,573.50	1.21	-1.12	-4.63	200.89
12/22/2013	NORMAL	5,923.0	4.18	207.65	5,185.86	-1,919.07	-1,726.40	2,581.33	1.34	-1.23	-6.58	200.88
	NORMAL	6,018.0	3.56	200.88	5,280.64	-1,924.89	-1,729.06	2,587.44	0.81	-0.65	-7.13	213.04
	NORMAL	6,114.0	1.71	195.69	5,376.54	-1,929.06	-1,730.51	2,591.51	1.94	-1.93	-5.41	184.76
	NORMAL	6,210.0	1.54	186.82	5,472.50	-1,931.72	-1,731.05	2,593.85	0.32	-0.18	-9.24	231.57
	NORMAL	6,305.0	1.32	193.23	5,567.47	-1,934.05	-1,731.45	2,595.85	0.29	-0.23	6.75	147.15
	NORMAL	6,401.0	1.41	187.08	5,663.44	-1,936.30	-1,731.85	2,597.79	0.18	0.09	-6.41	298.46
12/23/2013	NORMAL	6,497.0	0.53	182.33	5,759.43	-1,937.91	-1,732.01	2,599.10	0.92	-0.92	-4.95	182.85
	NORMAL	6,593.0	0.44	214.15	5,855.43	-1,938.66	-1,732.24	2,599.81	0.29	-0.09	33.15	123.94
	NORMAL	6,687.0	0.48	223.11	5,949.42	-1,939.25	-1,732.71	2,600.56	0.09	0.04	9.53	65.45
	NORMAL	6,782.0	0.48	272.86	6,044.42	-1,939.52	-1,733.38	2,601.21	0.43	0.00	52.37	114.87
	NORMAL	6,876.0	0.48	264.60	6,138.42	-1,939.54	-1,734.16	2,601.74	0.07	0.00	-8.79	265.87
	NORMAL	6,971.0	0.31	262.75	6,233.42	-1,939.61	-1,734.81	2,602.23	0.18	-0.18	-1.95	183.37
	NORMAL	7,066.0	0.44	225.58	6,328.41	-1,939.89	-1,735.33	2,602.79	0.28	0.14	-39.13	278.69
	NORMAL	7,161.0	0.40	235.95	6,423.41	-1,940.34	-1,735.86	2,603.48	0.09	-0.04	10.92	122.87
	NORMAL	7,257.0	0.57	228.13	6,519.41	-1,940.84	-1,736.50	2,604.28	0.19	0.18	-8.15	334.79
	NORMAL	7,352.0	0.48	260.03	6,614.40	-1,941.23	-1,737.24	2,605.06	0.32	-0.09	33.58	122.64
	NORMAL	7,447.0	0.57	239.73	6,709.40	-1,941.53	-1,738.04	2,605.82	0.22	0.09	-21.37	285.43
12/24/2013	NORMAL	7,543.0	0.75	256.60	6,805.39	-1,941.92	-1,739.07	2,606.79	0.27	0.19	17.57	55.83
	NORMAL	7,636.0	0.53	226.98	6,898.39	-1,942.35	-1,739.97	2,607.72	0.42	-0.24	-31.85	222.16
	NORMAL	7,732.0	0.57	275.94	6,994.39	-1,942.61	-1,740.77	2,608.45	0.48	0.04	51.00	109.91
	NORMAL	7,828.0	0.75	278.49	7,090.38	-1,942.47	-1,741.87	2,609.07	0.19	0.19	2.66	10.54
	NORMAL	7,923.0	0.97	258.01	7,185.37	-1,942.54	-1,743.27	2,610.07	0.39	0.23	-21.56	295.06
	NORMAL	8,019.0	1.19	262.58	7,281.35	-1,942.84	-1,745.05	2,611.48	0.25	0.23	4.76	23.68
	NORMAL	8,115.0	1.36	259.33	7,377.33	-1,943.18	-1,747.16	2,613.14	0.19	0.18	-3.39	335.33
	NORMAL	8,210.0	1.14	266.27	7,472.31	-1,943.45	-1,749.21	2,614.71	0.28	-0.23	7.31	148.90
	NORMAL	8,306.0	0.97	290.70	7,568.29	-1,943.22	-1,750.92	2,615.69	0.50	-0.18	25.45	122.63
	NORMAL	8,401.0	1.10	290.53	7,663.28	-1,942.62	-1,752.53	2,616.32	0.14	0.14	-0.18	358.56
12/25/2013	NORMAL	8,497.0	1.27	290.18	7,759.25	-1,941.93	-1,754.39	2,617.05	0.18	0.18	-0.36	357.39
	NORMAL	8,592.0	0.92	307.05	7,854.24	-1,941.11	-1,755.99	2,617.50	0.50	-0.37	17.76	145.58
	NORMAL	8,687.0	1.23	317.33	7,949.22	-1,939.90	-1,757.29	2,617.47	0.38	0.33	10.82	37.10
	NORMAL	8,721.0	1.27	318.74	7,983.21	-1,939.34	-1,757.78	2,617.40	0.15	0.12	4.15	38.27
	NORMAL	8,766.0	1.27	318.74	8,028.20	-1,938.60	-1,758.44	2,617.28	0.00	0.00	0.00	0.00