

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well Information

Well	PA 21-11	Wellbore No.	
Well Name	PA 21-11	Common Name	PA 21-11
Project	PA 11-07S-095W	Site	PA 22-11 Pad
Vertical Section Azimuth	358.65 (°)	North Reference	True
Origin N/S		Origin E/W	
Spud Date	6/19/2013	UWI	PA 21-11
Active Datum	KB @6,295.0ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	SCIENTIFIC DRILLING
Date Started	6/19/2013	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 (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
6/19/2013	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/19/2013	NORMAL	76.0	0.35	20.83	76.00	0.22	0.08	0.21	0.46	0.46	0.00	20.83
	NORMAL	166.0	2.46	3.25	165.97	2.40	0.29	2.40	2.37	2.34	-19.53	339.58
	NORMAL	257.0	5.37	356.75	256.75	8.61	0.16	8.60	3.23	3.20	-7.14	348.08
	NORMAL	347.0	9.33	1.23	345.99	20.11	0.08	20.10	4.44	4.40	4.98	10.46
	NORMAL	438.0	13.81	359.03	435.12	38.35	0.05	38.34	4.95	4.92	-2.42	353.29
	NORMAL	528.0	16.80	358.15	521.92	62.10	-0.55	62.09	3.33	3.32	-0.98	355.13
	NORMAL	619.0	19.44	358.68	608.40	90.39	-1.32	90.39	2.91	2.90	0.58	3.83
	NORMAL	709.0	23.58	357.28	692.11	123.35	-2.52	123.38	4.63	4.60	-1.56	352.28
	NORMAL	800.0	25.07	358.33	775.03	160.81	-3.95	160.86	1.70	1.64	1.15	16.67
	NORMAL	892.0	25.78	359.91	858.12	200.30	-4.55	200.35	1.07	0.77	1.72	44.41
6/20/2013	NORMAL	961.0	26.76	0.60	919.99	230.84	-4.41	230.88	1.49	1.42	1.00	17.62
	NORMAL	1,054.0	28.04	0.51	1,002.56	273.63	-4.00	273.65	1.38	1.38	-0.10	358.11
	NORMAL	1,148.0	25.80	357.38	1,086.37	316.17	-4.73	316.19	2.82	-2.38	-3.33	210.93
	NORMAL	1,241.0	24.49	356.28	1,170.56	355.62	-6.91	355.69	1.50	-1.41	-1.18	199.14
	NORMAL	1,336.0	25.09	359.27	1,256.80	395.41	-8.51	395.50	1.38	0.63	2.94	64.12
	NORMAL	1,430.0	25.14	0.02	1,341.92	435.31	-8.83	435.39	0.43	0.05	1.01	83.36
	NORMAL	1,525.0	26.10	0.15	1,427.58	476.38	-8.77	476.46	1.01	1.01	0.14	3.41
6/21/2013	NORMAL	1,618.0	25.43	359.92	1,511.33	516.81	-8.74	516.87	0.73	-0.72	-0.25	188.38
	NORMAL	1,712.0	26.82	359.83	1,595.72	558.20	-8.84	558.25	1.48	1.48	-0.10	358.33
	NORMAL	1,806.0	26.96	356.83	1,679.57	600.68	-10.08	600.75	1.45	0.15	-3.19	274.55

2.1.2 Survey Stations (Continued)

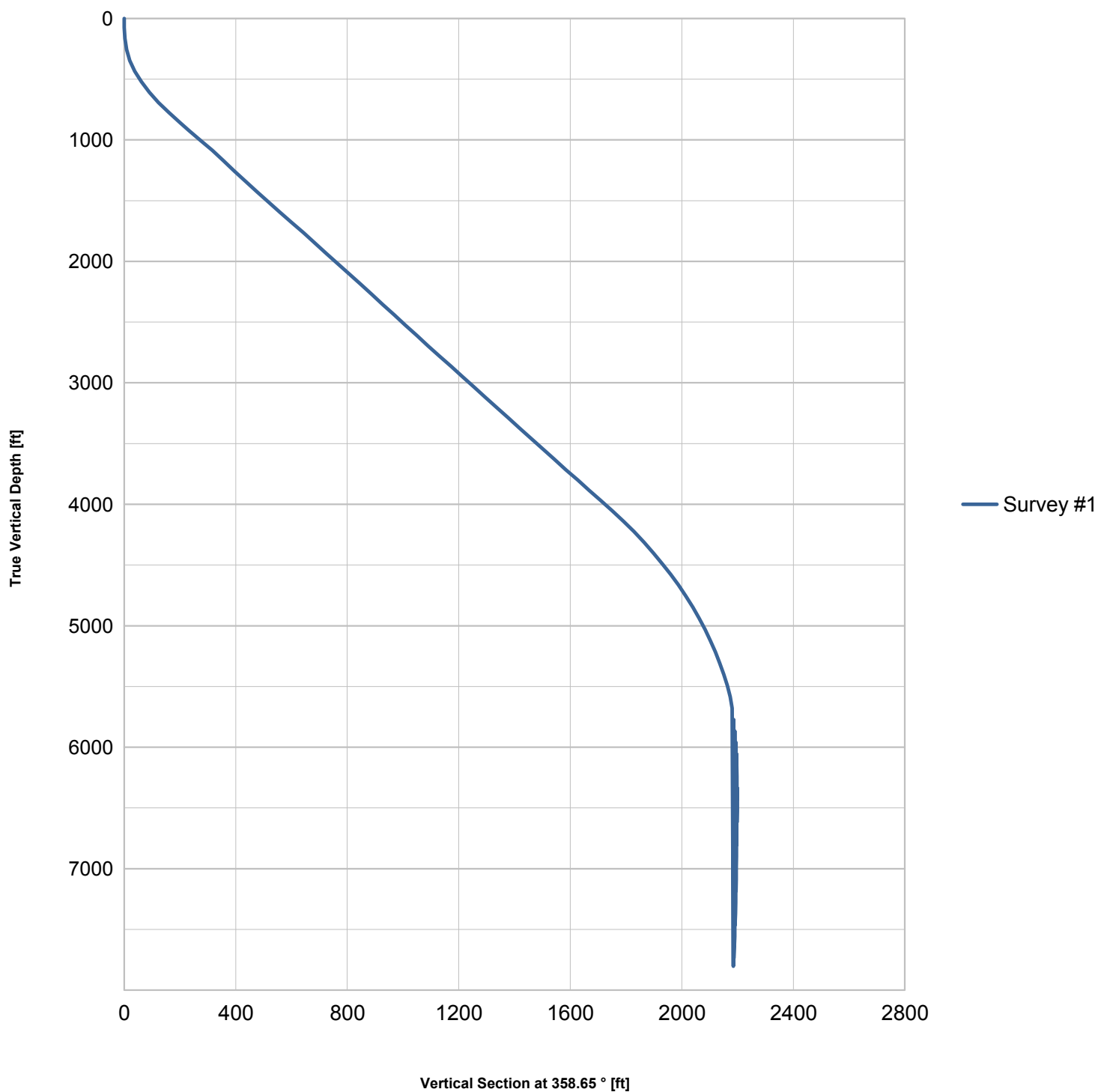
Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLS (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
6/21/2013	NORMAL	1,901.0	26.11	356.68	1,764.56	643.05	-12.48	643.17	0.90	-0.89	-0.16	184.44
	NORMAL	1,994.0	25.87	355.92	1,848.15	683.72	-15.11	683.89	0.44	-0.26	-0.82	233.88
	NORMAL	2,088.0	25.23	359.04	1,932.96	724.21	-16.90	724.41	1.58	-0.68	3.32	116.84
	NORMAL	2,183.0	26.22	359.33	2,018.55	765.44	-17.49	765.64	1.05	1.04	0.31	7.38
	NORMAL	2,276.0	26.24	359.61	2,101.97	806.54	-17.87	806.74	0.13	0.02	0.30	80.95
	NORMAL	2,370.0	25.49	359.51	2,186.55	847.55	-18.18	847.74	0.80	-0.80	-0.11	183.28
	NORMAL	2,464.0	25.12	358.58	2,271.53	887.72	-18.85	887.92	0.58	-0.39	-0.99	226.63
	NORMAL	2,557.0	25.90	357.75	2,355.47	927.75	-20.13	927.97	0.92	0.84	-0.89	335.00
	NORMAL	2,651.0	25.12	357.58	2,440.30	968.20	-21.78	968.45	0.83	-0.83	-0.18	185.29
	NORMAL	2,745.0	25.69	359.98	2,525.21	1,008.51	-22.63	1,008.77	1.25	0.61	2.55	62.12
	NORMAL	2,840.0	25.58	1.00	2,610.86	1,049.61	-22.28	1,049.84	0.48	-0.12	1.07	104.46
	NORMAL	2,934.0	25.08	0.35	2,695.83	1,089.82	-21.81	1,090.03	0.61	-0.53	-0.69	208.79
	NORMAL	3,028.0	26.72	358.65	2,780.38	1,130.87	-22.18	1,131.08	1.92	1.74	-1.81	334.87
	NORMAL	3,122.0	26.29	357.69	2,864.50	1,172.80	-23.52	1,173.03	0.65	-0.46	-1.02	224.47
	NORMAL	3,217.0	24.94	357.22	2,950.16	1,213.83	-25.34	1,214.09	1.44	-1.42	-0.49	188.35
	NORMAL	3,311.0	26.12	357.78	3,034.99	1,254.30	-27.10	1,254.59	1.28	1.26	0.60	11.81
	NORMAL	3,404.0	25.83	358.19	3,118.59	1,295.01	-28.53	1,295.32	0.37	-0.31	0.44	148.42
	NORMAL	3,500.0	25.72	358.54	3,205.04	1,336.74	-29.73	1,337.07	0.20	-0.11	0.36	126.02
	NORMAL	3,593.0	25.55	358.03	3,288.89	1,376.95	-30.93	1,377.30	0.30	-0.18	-0.55	232.16
	NORMAL	3,688.0	26.19	358.94	3,374.37	1,418.39	-32.02	1,418.75	0.79	0.67	0.96	32.23
	NORMAL	3,782.0	25.57	357.94	3,458.94	1,459.40	-33.13	1,459.78	0.81	-0.66	-1.06	214.70
	NORMAL	3,877.0	26.20	358.83	3,544.41	1,500.86	-34.30	1,501.25	0.78	0.66	0.94	32.06
	NORMAL	3,971.0	25.38	359.38	3,629.04	1,541.75	-34.94	1,542.15	0.91	-0.87	0.59	163.98
	NORMAL	4,068.0	26.89	0.30	3,716.12	1,584.48	-35.05	1,584.86	1.61	1.56	0.95	15.44
	NORMAL	4,161.0	26.27	359.75	3,799.29	1,626.09	-35.03	1,626.46	0.72	-0.67	-0.59	201.40
	NORMAL	4,255.0	25.36	358.76	3,883.91	1,667.02	-35.56	1,667.39	1.07	-0.97	-1.05	204.90
6/22/2013	NORMAL	4,350.0	26.57	359.97	3,969.32	1,708.60	-36.01	1,708.98	1.39	1.27	1.27	24.19
	NORMAL	4,444.0	25.86	358.97	4,053.65	1,750.12	-36.39	1,750.50	0.89	-0.76	-1.06	211.44
	NORMAL	4,539.0	24.72	0.75	4,139.55	1,790.70	-36.50	1,791.07	1.44	-1.20	1.87	147.10
	NORMAL	4,632.0	22.46	359.71	4,224.77	1,827.92	-36.34	1,828.27	2.47	-2.43	-1.12	189.96
	NORMAL	4,727.0	22.28	358.93	4,312.62	1,864.07	-36.76	1,864.42	0.37	-0.19	-0.82	238.41
	NORMAL	4,821.0	19.89	358.60	4,400.32	1,897.88	-37.49	1,898.23	2.55	-2.54	-0.35	182.69
	NORMAL	4,915.0	19.53	357.91	4,488.82	1,929.56	-38.45	1,929.93	0.46	-0.38	-0.73	212.55
	NORMAL	5,008.0	17.98	358.65	4,576.88	1,959.45	-39.36	1,959.83	1.69	-1.67	0.80	171.62
	NORMAL	5,101.0	17.02	359.02	4,665.57	1,987.41	-39.93	1,987.80	1.04	-1.03	0.40	173.57
	NORMAL	5,196.0	15.58	356.21	4,756.75	2,014.04	-41.01	2,014.45	1.73	-1.52	-2.96	207.37
	NORMAL	5,290.0	15.13	359.87	4,847.40	2,038.91	-41.87	2,039.33	1.14	-0.48	3.89	116.66
	NORMAL	5,383.0	13.41	0.05	4,937.52	2,061.83	-41.89	2,062.24	1.85	-1.85	0.19	178.61
	NORMAL	5,478.0	12.29	1.74	5,030.14	2,082.95	-41.57	2,083.35	1.24	-1.18	1.78	162.27
6/23/2013	NORMAL	5,572.0	11.60	0.99	5,122.11	2,102.40	-41.11	2,102.79	0.75	-0.73	-0.80	192.31
	NORMAL	5,667.0	9.46	3.32	5,215.50	2,119.75	-40.49	2,120.11	2.30	-2.25	2.45	169.89
	NORMAL	5,761.0	9.90	2.50	5,308.16	2,135.53	-39.69	2,135.87	0.49	0.47	-0.87	342.20
	NORMAL	5,855.0	8.46	4.95	5,400.96	2,150.49	-38.74	2,150.81	1.59	-1.53	2.61	166.02
	NORMAL	5,948.0	6.95	4.37	5,493.12	2,162.92	-37.72	2,163.21	1.63	-1.62	-0.62	182.66
	NORMAL	6,041.0	5.71	10.88	5,585.55	2,173.07	-36.42	2,173.33	1.54	-1.33	7.00	153.14
	NORMAL	6,135.0	3.78	16.60	5,679.22	2,180.64	-34.65	2,180.85	2.11	-2.05	6.09	169.06
	NORMAL	6,228.0	2.82	15.17	5,772.07	2,185.78	-33.18	2,185.96	1.04	-1.03	-1.54	184.19
	NORMAL	6,322.0	2.81	16.89	5,865.95	2,190.22	-31.90	2,190.36	0.09	-0.01	1.83	97.61
	NORMAL	6,416.0	1.92	8.43	5,959.87	2,193.98	-31.00	2,194.10	1.01	-0.95	-9.00	197.23
	NORMAL	6,510.0	0.83	12.53	6,053.84	2,196.20	-30.62	2,196.32	1.16	-1.16	4.36	176.89
	NORMAL	6,603.0	0.55	286.89	6,146.84	2,196.99	-30.90	2,197.11	1.03	-0.30	-92.09	214.83
6/24/2013	NORMAL	6,698.0	0.58	300.44	6,241.83	2,197.37	-31.75	2,197.51	0.14	0.03	14.26	84.18
	NORMAL	6,792.0	1.23	304.29	6,335.82	2,198.18	-33.00	2,198.34	0.69	0.69	4.10	7.27
	NORMAL	6,886.0	0.74	235.41	6,429.81	2,198.40	-34.33	2,198.60	1.26	-0.52	-73.28	215.63
	NORMAL	6,981.0	0.58	266.65	6,524.81	2,198.02	-35.32	2,198.25	0.41	-0.17	32.88	129.06
	NORMAL	7,075.0	0.88	230.14	6,618.80	2,197.53	-36.35	2,197.78	0.57	0.32	-38.84	283.67
	NORMAL	7,169.0	1.71	250.67	6,712.77	2,196.61	-38.22	2,196.90	1.00	0.88	21.84	39.73

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLS (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
6/24/2013	NORMAL	7,263.0	0.93	264.57	6,806.75	2,196.07	-40.31	2,196.41	0.89	-0.83	14.79	164.53
	NORMAL	7,357.0	0.55	244.21	6,900.74	2,195.80	-41.47	2,196.17	0.49	-0.40	-21.66	204.79
	NORMAL	7,452.0	1.44	247.37	6,995.73	2,195.14	-42.98	2,195.55	0.94	0.94	3.33	5.11
	NORMAL	7,545.0	1.65	264.75	7,088.69	2,194.57	-45.40	2,195.03	0.55	0.23	18.69	74.71
	NORMAL	7,640.0	2.02	258.92	7,183.64	2,194.13	-48.40	2,194.66	0.44	0.39	-6.14	330.29
	NORMAL	7,734.0	3.01	254.88	7,277.55	2,193.16	-52.41	2,193.79	1.07	1.05	-4.30	347.83
6/25/2013	NORMAL	7,828.0	3.24	255.28	7,371.41	2,191.84	-57.36	2,192.59	0.25	0.24	0.43	5.62
	NORMAL	7,922.0	3.33	254.40	7,465.26	2,190.44	-62.56	2,191.30	0.11	0.10	-0.94	330.30
	NORMAL	8,015.0	3.52	251.08	7,558.09	2,188.78	-67.86	2,189.77	0.30	0.20	-3.57	312.10
	NORMAL	8,108.0	4.13	253.52	7,650.88	2,186.91	-73.77	2,188.04	0.68	0.66	2.62	16.16
	NORMAL	8,195.0	3.96	246.77	7,737.67	2,184.83	-79.54	2,186.10	0.58	-0.20	-7.76	247.01
	NORMAL	8,260.0	3.96	246.77	7,802.51	2,183.06	-83.66	2,184.43	0.00	0.00	0.00	0.00

3 Charts

3.1 Vertical Section View



3.2 Plan View

