



## Directional Survey Data

Well Name Union Pacific 154Y29	Lease Union Pacific	Field Name Rangely	Business Unit Mid-Continent/Alaska	Surface UWI 0510311720	Surface ChevNo MH9749
Wellbore Name Original Hole	Directional Type Shallow Kick Off 'S'	Wellbore UWI 051031172000	Wellbore ChevNo MH9749-00	Kick Off Depth (ftKB) 0	Total Depth (ftKB) 6,610.00
UTM Northing (Y) (ft)	UTM Easting (X) (ft)	UTM Grid Zone	Latitude (DMS)	Longitude (DMS)	Date TD Reached (wellbore) 9/19/2010 18:30
					Closure Direction (°) 74.64

### Directional Surveys

Description

Surveys

Planned?

No

Definitive?

No

Note Correction

### Survey Data

Survey Company	Date	MD (ftKB)	TVD (ftKB)	Incl (°)	Azm (°)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)
Scientific Drilling	8/29/2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scientific Drilling	8/29/2010	161.00	161.00	0.26	300.97	-0.25	0.19	-0.31	0.16	0.16	186.94
Scientific Drilling	8/29/2010	222.00	222.00	0.18	358.45	-0.32	0.35	-0.43	0.37	-0.13	94.23
Scientific Drilling	8/29/2010	313.00	313.00	0.53	354.93	-0.22	0.92	-0.48	0.39	0.38	-3.87
Scientific Drilling	8/29/2010	404.00	403.99	0.53	340.87	-0.17	1.73	-0.65	0.14	0.00	-15.45
Scientific Drilling	8/29/2010	495.00	494.99	0.62	318.81	-0.41	2.50	-1.11	0.26	0.10	-24.24
Scientific Drilling	8/29/2010	586.00	585.98	1.23	300.27	-1.31	3.36	-2.28	0.74	0.67	-20.37
Scientific Drilling	8/29/2010	677.00	676.95	1.32	305.36	-2.65	4.46	-3.98	0.16	0.10	5.59
Scientific Drilling	8/29/2010	769.00	768.95	0.10	77.00	-3.25	5.10	-4.76	1.51	-1.33	-248.22
Scientific Drilling	8/30/2010	867.00	866.94	0.62	289.72	-3.59	5.29	-5.18	0.72	0.53	217.06
Scientific Drilling	8/30/2010	964.00	963.94	1.14	103.92	-3.18	5.24	-4.74	1.81	0.54	-191.55
Scientific Drilling	8/30/2010	1,061.00	1,060.91	1.67	93.72	-1.00	4.91	-2.39	0.60	0.55	-10.52
Scientific Drilling	8/30/2010	1,158.00	1,158.86	1.93	93.20	1.91	4.73	0.68	0.27	0.27	-0.53
Scientific Drilling	8/30/2010	1,256.00	1,255.79	2.37	91.44	5.38	4.59	4.32	0.46	0.45	-1.81
Scientific Drilling	8/30/2010	1,352.00	1,351.70	2.81	91.88	9.53	4.46	8.65	0.46	0.46	0.46
Scientific Drilling	8/30/2010	1,450.00	1,449.56	3.25	94.87	14.43	4.15	13.82	0.48	0.45	3.05
Scientific Drilling	8/30/2010	1,547.00	1,546.41	3.08	77.73	19.61	4.47	19.11	0.99	-0.18	-17.67
Scientific Drilling	8/30/2010	1,644.00	1,643.25	3.52	71.93	25.19	5.94	24.49	0.57	0.45	-5.98
Scientific Drilling	8/30/2010	1,741.00	1,740.08	3.25	86.87	30.85	7.02	30.06	0.95	-0.28	15.40
Scientific Drilling	8/30/2010	1,838.00	1,836.95	2.73	88.27	35.78	7.24	35.12	0.54	-0.54	1.44
Scientific Drilling	8/30/2010	1,935.00	1,933.86	2.30	73.85	39.97	7.85	39.30	0.79	-0.44	-14.87
Scientific Drilling	8/30/2010	2,003.00	2,001.81	2.02	72.01	42.53	8.60	41.75	0.42	-0.41	-2.71
Scientific Drilling	9/13/2010	2,106.00	2,104.77	1.14	69.99	45.37	9.51	44.44	0.86	-0.85	-1.96
Scientific Drilling	9/13/2010	2,203.00	2,201.76	0.88	155.24	46.45	9.16	45.65	1.42	-0.27	87.89
Scientific Drilling	9/13/2010	2,300.00	2,298.75	0.88	110.16	47.18	8.23	46.67	0.70	0.00	-46.47
Scientific Drilling	9/13/2010	2,398.00	2,396.72	1.93	80.54	49.43	8.24	49.00	1.27	1.07	-30.22
Scientific Drilling	9/13/2010	2,494.00	2,492.64	2.81	76.41	53.39	9.06	52.88	0.93	0.92	-4.30
Scientific Drilling	9/13/2010	2,592.00	2,590.43	4.66	76.76	59.77	10.54	59.09	1.89	1.89	0.36
Scientific Drilling	9/14/2010	2,689.00	2,686.99	6.16	85.72	68.82	11.83	68.12	1.77	1.55	9.24
Scientific Drilling	9/14/2010	2,786.00	2,783.36	6.95	90.65	79.57	12.15	79.18	1.00	0.81	5.08
Scientific Drilling	9/14/2010	2,883.00	2,879.51	8.18	89.68	91.87	12.12	91.95	1.27	1.27	-1.00
Scientific Drilling	9/14/2010	2,980.00	2,975.54	8.09	90.12	105.11	12.15	105.67	0.11	-0.09	0.45
Scientific Drilling	9/14/2010	3,077.00	3,071.48	8.79	90.38	118.83	12.08	119.91	0.72	0.72	0.27
Scientific Drilling	9/14/2010	3,174.00	3,167.01	11.17	84.06	135.23	13.01	136.67	2.70	2.45	-6.52
Scientific Drilling	9/14/2010	3,272.00	3,262.72	13.63	80.54	156.08	15.89	157.50	2.62	2.51	-3.59
Scientific Drilling	9/14/2010	3,368.00	3,355.91	14.16	79.66	179.03	19.85	180.21	0.59	0.55	-0.92
Scientific Drilling	9/15/2010	3,464.00	3,448.76	15.30	73.68	203.40	25.52	203.92	1.98	1.19	-6.23
Scientific Drilling	9/15/2010	3,563.00	3,544.13	15.83	69.90	229.91	33.83	229.14	1.16	0.54	-3.82
Scientific Drilling	9/15/2010	3,660.00	3,637.65	14.95	70.08	255.57	42.64	253.33	0.91	-0.91	0.19



## Directional Survey Data

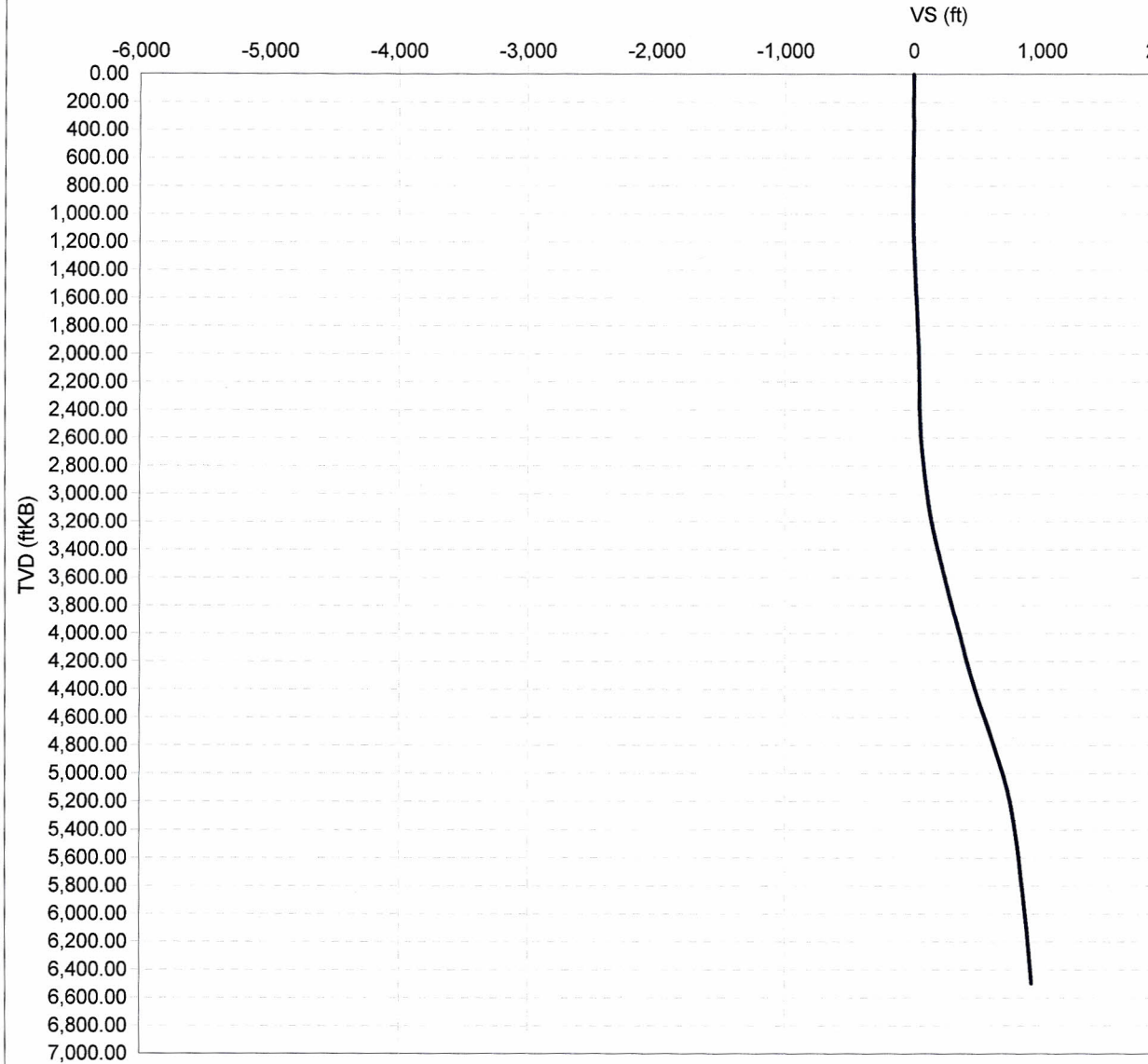
Well Name Union Pacific 154Y29		Lease Union Pacific		Field Name Rangely		Business Unit Mid-Continent/Alaska		Surface UWI 0510311720		Surface ChevNo MH9749	
Survey Data											
Survey Company	Date	MD (ftKB)	TVD (ftKB)	Incl (°)	Azm (°)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)
Scientific Drilling	9/15/2010	3,757.00	3,731.11	16.09	72.37	281.48	50.98	277.90	1.33	1.18	2.36
Scientific Drilling	9/15/2010	3,854.00	3,824.32	16.09	74.43	308.35	58.66	303.66	0.59	0.00	2.12
Scientific Drilling	9/15/2010	3,951.00	3,917.49	16.18	73.68	335.30	66.06	329.58	0.23	0.09	-0.77
Scientific Drilling	9/15/2010	4,048.00	4,010.59	16.44	74.12	362.54	73.61	355.75	0.30	0.27	0.45
Scientific Drilling	9/15/2010	4,145.00	4,104.00	14.86	69.11	388.65	81.81	380.58	2.14	-1.63	-5.16
Scientific Drilling	9/15/2010	4,242.00	4,197.38	16.53	72.19	414.82	90.46	405.34	1.92	1.72	3.18
Scientific Drilling	9/15/2010	4,340.00	4,291.05	17.67	76.23	443.62	98.27	433.06	1.68	1.16	4.12
Scientific Drilling	9/15/2010	4,437.00	4,383.10	19.08	74.91	474.19	105.90	462.66	1.52	1.45	-1.36
Scientific Drilling	9/15/2010	4,534.00	4,474.40	20.40	74.65	506.95	114.50	494.28	1.36	1.36	-0.27
Scientific Drilling	9/15/2010	4,631.00	4,565.03	21.37	71.05	541.50	124.72	527.30	1.66	1.00	-3.71
Scientific Drilling	9/15/2010	4,729.00	4,656.59	20.40	71.05	576.36	136.06	560.34	0.99	-0.99	0.00
Scientific Drilling	9/15/2010	4,826.00	4,747.96	18.82	73.95	608.88	145.88	591.37	1.91	-1.63	2.99
Scientific Drilling	9/15/2010	4,923.00	4,839.33	20.40	70.78	641.40	155.77	622.37	1.96	1.63	-3.27
Scientific Drilling	9/15/2010	5,020.00	4,930.54	19.43	74.39	674.40	165.68	653.87	1.61	-1.00	3.72
Scientific Drilling	9/15/2010	5,117.00	5,022.23	18.64	77.29	706.02	173.43	684.53	1.27	-0.81	2.99
Scientific Drilling	9/15/2010	5,215.00	5,116.12	14.60	78.78	734.00	179.28	711.94	4.14	-4.12	1.52
Scientific Drilling	9/15/2010	5,312.00	5,210.65	11.26	81.77	755.59	183.02	733.31	3.51	-3.44	3.08
Scientific Drilling	9/16/2010	5,409.00	5,305.85	10.82	80.80	774.04	185.83	751.67	0.49	-0.45	-1.00
Scientific Drilling	9/16/2010	5,506.00	5,401.23	10.20	79.05	791.66	188.92	769.09	0.72	-0.64	-1.80
Scientific Drilling	9/16/2010	5,603.00	5,496.94	8.44	80.45	807.31	191.73	784.54	1.83	-1.81	1.44
Scientific Drilling	9/16/2010	5,700.00	5,593.06	7.03	83.79	820.25	193.55	797.47	1.53	-1.45	3.44
Scientific Drilling	9/16/2010	5,797.00	5,689.31	7.21	75.44	832.20	195.72	809.26	1.08	0.19	-8.61
Scientific Drilling	9/16/2010	5,844.00	5,735.91	7.74	70.43	838.30	197.53	815.09	1.79	1.13	-10.66
Scientific Drilling	9/19/2010	5,949.00	5,840.01	7.30	66.83	851.96	202.52	827.89	0.61	-0.42	-3.43
Scientific Drilling	9/19/2010	6,046.00	5,936.25	7.03	61.99	863.86	207.73	838.80	0.68	-0.28	-4.99
Scientific Drilling	9/19/2010	6,143.00	6,032.53	6.95	61.91	875.38	213.28	849.21	0.08	-0.08	-0.08
Scientific Drilling	9/19/2010	6,240.00	6,128.91	6.07	54.70	885.92	219.01	858.58	1.24	-0.91	-7.43
Scientific Drilling	9/19/2010	6,337.00	6,225.35	6.24	50.83	895.57	225.30	866.85	0.46	0.18	-3.99
Scientific Drilling	9/19/2010	6,435.00	6,322.81	5.80	50.39	904.95	231.82	874.79	0.45	-0.45	-0.45
Scientific Drilling	9/19/2010	6,552.00	6,439.23	5.63	44.42	915.30	239.69	883.37	0.53	-0.15	-5.10
Scientific Drilling	9/19/2010	6,610.00	6,496.95	5.63	44.42	920.22	243.76	887.35	0.00	0.00	0.00



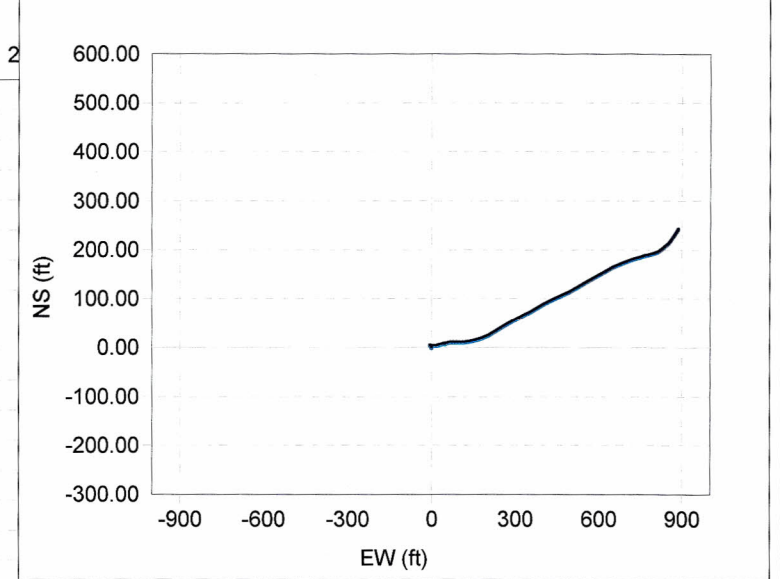
# Directional Plot

Well Name Union Pacific 154Y29	Lease Union Pacific	Field Name Rangely	Business Unit Mid-Continent/Alaska	Surface UWI 0510311720	Surface ChevNo MH9749
Wellbore Name Original Hole	Directional Type Shallow Kick Off 'S'	Kick Off Depth (ftKB) 0	Total Depth of Wellbore (ftKB) 6,610.00	Wellbore UWI 051031172000	Wellbore ChevNo MH9749-00

Vertical Section



Plan



— VS vs TVD

— VS vs TVD