

**Table 1**  
**Historical Well Construction Data**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Well Type	Well	Install Date	Riser Elevation (feet MSL)	Riser Stickup (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Diameter (inches)	Well Screen							Riser Material	Alaska State Plane NAD83, Zone 3	
										Depth to Top (feet bgs)	Top Elevation (feet MSL)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Slot Size (inches)	Material		Northing	Easting
										Monitoring	MW-101	4/1/1987	494.44	3.30	491.1	61.0		430.1	--
	MW-101A	4/1/1987	495.93	4.64	491.3	23.0	468.3	--	2.0	17.8	473.5	22.8	468.5	5.0	0.020	ss	ss?	3927590.29	1428209.63
	MW-102	4/1/1987	495.94	3.40	492.5	71.5	421.0	--	2.5	61.5	431.0	71.5	421.0	10.0	0.010	PVC	PVC?	3927955.12	1429113.91
	MW-104	4/1/1987	496.01	3.05	493.0	67.0	426.0	--	2.5	63.0	430.0	67.0	426.0	4.0	0.020	PVC	PVC?	3927958.82	1429747.75
	MW-105	4/1/1987	497.64	2.44	495.2	63.0	432.2	--	2.0	58.0	437.2	63.0	432.2	5.0	0.020	ss	ss?	3924918.95	1430402.38
	MW-105A	4/1/1987	499.19	3.41	495.8	23.0	472.8	--	2.0	18.0	477.8	23.0	472.8	5.0	0.020	ss	ss?	3924910.02	1430404.24
	MW-106	11/1/1987	499.21	1.41	497.8	23.0	474.8	--	2.0	18.5	479.3	23.0	474.8	4.5	0.020	PVC	PVC?	3926112.10	1428065.05
	MW-109	8/1/1988	495.17	0.34	494.8	14.0	480.8	--	2.0	9.5	485.3	14.0	480.8	4.5	0.020	PVC	PVC?	3925855.20	1428674.99
	MW-110	8/1/1988	496.64	3.34	493.3	18.0	475.3	--	2.0	13.5	479.8	18.0	475.3	4.5	0.020	PVC	PVC?	3925975.36	1428873.06
	MW-111	Sep 88/Jun 97	493.53	2.12	491.4	19.5	471.9	--	2.0	14.5	476.9	19.5	471.9	5.0	0.020	PVC	PVC?	3926568.20	1428698.07
	MW-113	9/1/1988	494.38	2.97	491.4	16.0	475.4	--	2.0	11.5	479.9	16.0	475.4	4.5	0.020	PVC	PVC?	3926957.71	1428777.98
	MW-115	9/1/1988	495.88	2.61	493.3	17.0	476.3	--	2.0	12.5	480.8	17.0	476.3	4.5	0.020	ss	ss?	3925758.76	1429540.81
	MW-116	9/1/1988	496.19	2.93	493.3	17.0	476.3	--	2.0	12.0	481.3	17.0	476.3	5.0	0.020	ss	ss?	3925670.10	1429332.64
	MW-118	3/1/1990	496.90	3.97	492.9	43.0	449.9	--	2.0	38.5	454.4	43.0	449.9	4.5	0.020	ss	PVC	3927467.01	1429638.43
	MW-124	6/1/1990	497.12	2.92	494.2	24.5	469.7	--	2.0	20.0	474.2	24.5	469.7	4.5	0.020	PVC	PVC?	3927015.09	1429816.83
	MW-125	6/1/1990	497.15	4.07	493.1	24.0	469.1	--	2.0	19.5	473.6	24.0	469.1	4.5	0.020	PVC	PVC	3927032.49	1429569.75
	MW-126	6/1/1991	495.55	3.75	491.8	24.5	467.3	--	2.0	20.0	471.8	24.5	467.3	4.5	0.020	PVC	PVC	3927426.37	1429419.17
	MW-127	6/1/1991	496.36	3.46	492.9	24.5	468.4	--	2.0	20.0	472.9	24.5	468.4	4.5	0.020	PVC	PVC	3927476.29	1429065.47
	MW-129	10/1/1996	496.06	3.26	492.8	41.5	451.3	--	2.0	37.0	455.8	41.5	451.3	4.5	0.020	PVC	PVC	3927205.45	1429720.22
	MW-130	4/1/1997	496.87	2.76	494.1	23.0	471.1	--	2.0	19.0	475.1	23.0	471.1	4.0	0.020	PVC	PVC	3926825.66	1429354.64
	MW-131	7/1/1998	495.69	1.79	493.9	24.5	469.4	--	2.0	20.0	473.9	24.5	469.4	4.5	0.020	PVC	PVC	3927936.24	1429024.82
	MW-132	9/1/1999	499.44	2.24	497.2	22.0	475.2	--	2.0	17.5	479.7	22.0	475.2	4.5	0.020	PVC	PVC	3926600.34	1429997.01
	MW-133	9/1/1999	498.36	2.06	496.3	22.0	474.3	--	2.0	17.5	478.8	22.0	474.3	4.5	0.020	PVC	PVC	3926597.42	1430160.18
	MW-134	9/1/1999	497.79	2.55	495.2	21.5	473.7	--	2.0	17.0	478.2	21.5	473.7	4.5	0.020	PVC	PVC	3926000.91	1430170.26
	MW-135	3/1/2001	496.93	3.45	493.5	19.5	474.0	--	2.0	10.6	482.9	19.5	474.0	8.9	0.020	PVC	PVC	3927024.53	1429730.91
	MW-136	3/1/2001	496.93	2.91	494.0	19.1	474.9	--	2.0	10.1	483.9	19.1	474.9	9.0	0.020	PVC	PVC	3927024.41	1429778.02
	MW-137	3/1/2001	497.45	3.65	493.8	19.3	474.5	--	2.0	10.4	483.4	19.3	474.5	8.9	0.020	PVC	PVC	3927083.81	1429737.46
	MW-138	4/1/2001	496.34	3.09	493.3	18.1	475.2	--	2.0	3.9	489.4	18.1	475.2	14.2	0.020	PVC	PVC	3925738.32	1429686.77
	MW-139	May 2001	497.18	1.89	495.3	25.0	470.3	--	2.0	5.7	489.6	25.0	470.3	19.3	0.020	PVC	PVC	3927427.97	1428848.56
	MW-140	5/1/2001	494.85	2.69	492.2	23.5	468.7	--	2.0	4.2	488.0	23.5	468.7	19.3	0.020	PVC	PVC	3927683.10	1429244.57
	MW-141	10/1/2001	492.39	2.12	490.3	22.4	467.9	--	2.0	7.9	482.4	22.4	467.9	14.5	0.020	PVC	PVC	3927598.03	1427540.67
	MW-142	8/1/2001	496.08	3.10	493.0	19.4	473.6	--	2.0	5.4	487.6	19.4	473.6	14.0	0.020	PVC	PVC	3927602.87	1428813.48
	MW-143	8/1/2005	495.23	3.35	491.9	19.5	472.4	--	2.0	4.7	487.2	19.5	472.4	14.8	0.020	PVC	PVC	3927688.65	1428487.50
	MW-144A	9/1/2005	495.25	1.69	493.6	24.7	468.9	--	2.0	5.7	487.9	24.7	468.9	19.0	0.020	PVC	PVC	3927485.68	1429623.04
	MW-144BR	9/21/2011	494.99	2.67	492.3	90.5	401.8	--	2.0	85.4	406.9	89.9	402.4	4.5	0.010	PVC	PVC	3927483.20	1429632.06
	MW-145	8/1/2005	495.61	2.91	492.7	19.0	473.7	--	2.0	4.7	488.0	19.0	473.7	14.3	0.020	PVC	PVC	3927212.61	1429712.57
	MW-146A	9/1/2008	495.07	2.74	492.3	16.0	476.3	--	2.0	6.0	486.3	16.0	476.3	10.0	0.020	PVC	PVC	3927201.05	1427049.42
	MW-146B	9/1/2008	494.95	2.40	492.6	28.0	464.6	--	2.0	22.0	470.6	27.0	465.6	5.0	0.020	PVC	PVC	3927193.28	1427048.17
	MW-147A	10/1/2008	491.90	2.32	489.6	13.0	476.6	--	2.0	3.0	486.6	13.0	476.6	10.0	0.020	PVC	PVC	3927723.21	1427288.46
	MW-147B	9/1/2008	492.57	2.82	489.8	26.0	463.8	--	2.0	20.5	469.3	25.5	464.3	5.0	0.020	PVC	PVC	3927729.22	1427290.37
	MW-148A	10/1/2008	492.99	2.08	490.9	15.0	475.9	--	2.0	5.0	485.9	15.0	475.9	10.0	0.020	PVC	PVC	3928675.03	1428153.49
	MW-148B	10/1/2008	493.25	2.96	490.3	29.0	461.3	--	2.0	22.0	468.3	27.0	463.3	5.0	0.020	PVC	PVC	3928677.21	1428158.65
	MW-148C	9/27/2011	493.05	2.64	490.4	55.7	434.7	--	2.0	50.7	439.7	55.2	435.3	4.4	0.010	PVC	PVC	3928670.73	1428140.18
	MW-148D	9/26/2011	493.32	2.98	490.3	151.0	339.4	151.5	2.0	145.9	344.4	150.4	340.0	4.4	0.010	PVC	PVC	3928673.10	1428146.93
	MW-149A	10/1/2008	493.65	3.10	490.6	14.0	476.6	--	2.0	4.0	486.6	14.0	476.6	10.0	0.020	PVC	PVC	3928676.81	1428953.13
	MW-149B	10/1/2008	493.34	2.64	490.7	21.0	469.7	--	2.0	14.0	476.7	19.0	471.7	5.0	0.020	PVC	PVC	3928677.69	1428959.56
	MW-150A	10/2/2009	487.03	-0.54	487.6	11.6	476.0	--	2.0	6.7	480.9	11.1	476.5	4.4	0.010	PVC	PVC	3930163.44	1426522.55
	MW-150B	10/2/2009	487.20	-0.32	487.5	24.6	462.9	--	2.0	20.6	466.9	24.5	463.0	3.9	0.010	PVC	PVC	3930162.06	1426527.97
	MW-151A	10/7/2009	487.09	-0.53	487.6	15.5	472.1	--	2.0	10.0	477.6	15.0	472.6	5.0	0.010	PVC	PVC	3930152.81	1427042.16
	MW-151B	10/2/2009	487.07	-0.64	487.7	23.6	464.1	--	2.0	18.5	469.2	23.1	464.6	4.6	0.010	PVC	PVC	3930154.30	1427034.87

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Well Type	Well	Install Date	Riser Elevation (feet MSL)	Riser Stickup (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Diameter (inches)	Well Screen							Riser Material	Alaska State Plane NAD83, Zone 3	
										Depth to Top (feet bgs)	Top Elevation (feet MSL)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Slot Size (inches)	Material		Northing	Easting
Monitoring	MW-151C	2/18/2010	491.02	3.21	487.8	57.7	430.1	65.0	2.0	52.6	435.3	57.2	430.7	4.6	0.010	PVC	PVC	3930151.93	1427038.65
	MW-152A	10/7/2009	488.40	-0.24	488.6	16.0	472.6	--	2.0	10.6	478.0	15.0	473.6	4.4	0.010	PVC	PVC	3930112.63	1427987.59
	MW-152B	10/7/2009	488.00	-0.51	488.5	25.4	463.1	--	2.0	19.9	468.6	24.4	464.1	4.5	0.010	PVC	PVC	3930112.89	1427983.05
	MW-152C	9/28/2011	488.10	-0.68	488.8	65.2	423.6	67.5	2.0	60.1	428.7	64.6	424.2	4.4	0.010	PVC	PVC	3930113.17	1427992.07
	MW-153A	10/7/2009	490.17	-0.35	490.5	16.0	474.5	--	2.0	10.6	479.9	14.5	476.0	3.9	0.010	PVC	PVC	3928749.86	1427720.55
	MW-153B	4/20/2010	489.73	-0.58	490.3	56.7	433.7	59.0	2.0	51.6	438.7	56.1	434.2	4.5	0.010	PVC	PVC	3928741.21	1427721.08
	MW-154A	10/5/2009	497.99	2.82	495.2	75.5	419.7	--	2.0	71.0	424.2	75.0	420.2	4.0	0.010	PVC	PVC	3927391.51	1428835.89
	MW-154B	2/20/2010	497.68	2.61	495.1	95.0	400.1	102.0	2.0	90.2	404.9	94.8	400.3	4.6	0.010	PVC	PVC	3927410.23	1428845.45
	MW-155A	11/11/2009	488.16	-0.52	488.7	15.5	473.2	--	2.0	5.4	483.3	15.1	473.6	9.7	0.010	PVC	PVC	3930320.08	1425509.58
	MW-155B	9/11/2010	488.21	-0.50	488.7	65.8	422.9	67.0	2.0	60.8	427.9	65.2	423.5	4.4	0.020	PVC	PVC	3930314.75	1425510.07
	MW-156A	11/12/2009	485.83	-0.33	486.2	15.5	470.7	--	2.0	5.4	480.8	15.1	471.1	9.7	0.010	PVC	PVC	3931955.04	1425536.52
	MW-156B	2/17/2010	489.29	2.99	486.3	50.4	435.9	51.5	2.0	45.2	441.1	50.0	436.3	4.8	0.010	PVC	PVC	3931949.92	1425537.02
	MW-157A	11/13/2009	485.00	-0.55	485.6	15.5	470.1	--	2.0	5.4	480.2	15.1	470.5	9.7	0.010	PVC	PVC	3932561.84	1426870.93
	MW-157B	9/30/2011	484.72	-0.68	485.4	30.7	454.7	40.0	2.0	25.7	459.7	30.1	455.3	4.4	0.010	PVC	PVC	3932567.15	1426874.11
	MW-158A	11/13/2009	487.83	-0.46	488.3	15.6	472.7	--	2.0	5.5	482.8	15.2	473.1	9.7	0.020	PVC	PVC	3931120.65	1426869.14
	MW-158B	9/23/2010	487.38	-0.65	488.0	60.6	427.4	65.0	2.0	55.6	432.4	60.1	427.9	4.5	0.020	PVC	PVC	3931119.26	1426874.85
	MW-159A	11/13/2009	488.42	-0.56	489.0	15.6	473.4	--	2.0	5.5	483.5	15.2	473.8	9.7	0.020	PVC	PVC	3931101.34	1427690.57
	MW-159B	10/12/2011	488.20	-0.87	489.1	46.2	442.9	--	2.0	41.2	447.9	45.6	443.5	4.4	0.010	PVC	PVC	3931101.12	1427679.28
	MW-159C	9/29/2011	488.63	-0.50	489.1	72.3	416.8	72.5	2.0	67.1	422.0	71.8	417.3	4.7	0.010	PVC	PVC	3931100.83	1427684.86
	MW-160A	11/13/2009	485.48	-0.34	485.8	15.5	470.3	--	2.0	5.4	480.5	15.1	470.7	9.7	0.010	PVC	PVC	3932566.91	1427463.18
	MW-160B	2/19/2010	485.53	-0.21	485.7	90.7	395.0	91.0	2.0	85.6	400.2	90.2	395.6	4.6	0.010	PVC	PVC	3932566.90	1427459.68
	MW-161A	12/9/2009	479.42	-0.40	479.8	15.6	464.2	--	2.0	5.5	474.3	15.2	464.6	9.7	0.020	PVC	PVC	3935554.06	1421680.78
	MW-161B	9/10/2010	479.58	-0.24	479.8	50.4	429.4	?	2.0	46.0	433.8	50.4	429.4	4.4	0.020	PVC	PVC	3935553.83	1421678.29
	B-161	8/18/2011	Boring installed					54.0											
	MW-162A	11/25/2009	483.94	-0.60	484.5	15.6	468.9	--	2.0	5.5	479.0	15.2	469.3	9.7	0.020	PVC	PVC	3934831.10	1425571.90
	MW-162B	2/21/2010	484.12	-0.29	484.4	65.4	419.0	67.5	2.0	60.2	424.2	64.7	419.7	4.6	0.010	PVC	PVC	3934825.07	1425574.08
	MW-163A	12/9/2009	485.05	-1.00	485.2	15.6	469.6	--	2.0	5.5	479.7	15.2	470.0	9.7	0.020	PVC	PVC	3935430.75	1426901.11
	MW-163B	9/13/2010	485.16	-0.45	485.4	39.6	445.8	40.0	2.0	34.5	450.9	39.0	446.4	4.4	0.020	PVC	PVC	3935430.72	1426906.78
	MW-164A	12/10/2009	480.01	-1.00	480.3	15.6	464.7	--	2.0	5.5	474.8	15.2	465.1	9.7	0.020	PVC	PVC	3938026.16	1425651.07
	MW-164B	9/9/2010	479.35	-0.45	480.3	50.7	429.6	?	2.0	45.6	434.7	50.1	430.2	4.4	0.020	PVC	PVC	3938027.01	1425654.08
	MW-164C	8/17/2011	479.50	-0.50	480.3	62.4	417.9	63.0	2.0	57.3	423.0	62.0	418.3	4.7	0.010	PVC	PVC	3938023.06	1425652.19
	MW-165A	1/18/2010	475.07	-0.40	475.5	15.4	460.1	--	2.0	5.2	470.3	14.9	460.6	9.7	0.010	PVC	PVC	3938692.18	1416849.70
	MW-165B	9/28/2010	474.78	-0.70	475.6	50.9	424.7	?	2.0	45.9	429.7	50.4	425.3	4.5	0.020	PVC	PVC	3938690.33	1416854.17
	MW-166A	1/8/2010	474.92	2.70	472.2	15.6	456.6	--	2.0	5.4	466.8	15.2	457.1	9.7	0.010	PVC	PVC	3940972.27	1419512.27
	MW-166B	3/15/2010	475.11	3.00	472.2	32.1	440.1	33.0	2.0	27.2	445.1	31.4	440.9	4.2	0.010	PVC	PVC	3940967.37	1419509.53
	MW-167A	1/7/2010	475.68	-0.36	476.0	15.8	460.2	--	2.0	5.7	470.4	15.4	460.7	9.7	0.010	PVC	PVC	3942809.92	1423092.52
	MW-167B	3/23/2010	475.82	-0.25	476.0	33.3	442.7	33.5	2.0	28.2	447.8	33.2	442.9	5.0	0.010	PVC	PVC	3942813.73	1423092.51
	MW-168A	1/8/2010	478.27	-0.15	478.7	15.5	463.2	--	2.0	5.4	473.4	15.1	463.7	9.7	0.010	PVC	PVC	3941284.64	1425723.88
	MW-168B	10/1/2011	478.34	-0.50	478.7	51.5	427.3	55.0	2.0	46.3	432.4	51.0	427.7	4.7	0.010	PVC	PVC	3941289.40	1425724.13
	MW-169A	2/25/2010	486.13	3.01	483.1	15.2	468.0	--	2.0	5.3	477.9	15.1	468.1	9.8	0.010	PVC	PVC	3931955.69	1423035.08
	MW-169B	10/21/2010	485.95	3.00	483.1	49.2	433.9	?	2.0	44.1	439.0	48.7	434.4	4.6	0.020	PVC	PVC	3931960.39	1423037.49
	MW-169C	9/1/2011	482.57	-0.70	483.2	59.9	423.2	69.0	2.0	54.8	428.4	59.5	423.7	4.7	0.020	PVC	PVC	3931966.50	1423042.84
	MW-170A	2/24/2010	490.82	-0.31	491.1	14.9	476.2	--	2.0	4.6	486.5	14.4	476.7	9.8	0.010	PVC	PVC	3930005.65	1429184.98
	MW-170B	3/6/2010	490.72	-0.25	491.0	74.8	416.3	--	4.0	69.7	421.3	74.1	417.0	4.4	0.010	PVC	PVC	3930000.43	1429187.53
	MW-170C	3/4/2010	490.85	-0.31	491.2	130.9	360.3	135.0	2.0	125.9	365.3	130.2	361.0	4.3	0.010	PVC	PVC	3929995.96	1429188.84
	MW-170D	10/13/2010	490.39	-0.40	490.9	50.6	440.3	?	2.0	45.5	445.4	50.1	440.8	4.6	0.020	PVC	PVC	3929991.96	1429189.27
	MW-171A	2/25/2010	484.68	-0.62	485.3	15.2	470.1	--	2.0	5.0	480.3	14.8	470.5	9.8	0.010	PVC	PVC	3935401.97	1428945.84
	MW-171B	3/16/2010	484.69	-0.25	485.3	40.3	445.1	42.0	2.0	35.3	450.1	39.7	445.6	4.4	0.010	PVC	PVC	3935402.47	1428941.37
	MW-172A	3/24/2010	475.72	-0.40	476.1	15.5	460.7	--	2.0	5.3	470.8	15.0	461.1	9.7	0.010	PVC	PVC	3942632.06	1427431.58
	MW-172B	3/27/2010	476.05	-0.22	476.3	150.4	325.9	150.5	2.0	145.4	330.9	149.8	326.5	4.4	0.010	PVC	PVC	3942631.33	1427425.63
	MW-173A	3/31/2010	496.16	3.16	493.0	14.6	478.4	--	2.0	4.5	488.5	14.2	478.8	9.7	0.010	PVC	PVC	3927534.58	1430223.98

**Table 1  
Historical Well Construction Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Well Type	Well	Install Date	Riser Elevation (feet MSL)	Riser Stickup (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Diameter (inches)	Well Screen							Riser Material	Alaska State Plane NAD83, Zone 3	
										Depth to Top (feet bgs)	Top Elevation (feet MSL)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Slot Size (inches)	Material		Northing	Easting
Monitoring	MW-173B	3/30/2010	496.40	3.17	493.2	150.8	342.4	--	2.0	145.8	347.4	150.2	343.0	4.4	0.010	PVC	PVC	3927527.38	1430222.41
	MW-174A	9/16/2010	494.16	2.77	491.4	50.2	441.2	?	2.0	45.0	446.4	49.7	441.7	4.7	0.020	PVC	PVC	3926454.50	1428665.44
	MW-174B	9/15/2010	493.28	1.97	491.3	90.4	400.9	?	2.0	85.2	406.2	89.9	401.4	4.7	0.020	PVC	PVC	3926461.30	1428664.22
	MW-175	9/30/2010	496.80	2.85	494.0	90.8	403.1	?	2.0	85.8	408.1	90.3	403.7	4.5	0.020	PVC	PVC	3926774.40	1429037.36
	MW-176A	10/4/2010	496.99	3.08	493.9	14.8	479.1	?	2.0	4.7	489.2	14.4	479.5	9.8	0.020	PVC	PVC	3926055.80	1429416.30
	MW-176B	10/4/2010	496.92	3.06	493.9	50.6	443.3	?	2.0	45.6	448.3	50.1	443.8	4.5	0.020	PVC	PVC	3926056.30	1429412.03
	MW-176C	10/1/2010	496.84	3.10	493.7	90.5	403.3	?	2.0	85.4	408.3	89.9	403.8	4.5	0.020	PVC	PVC	3926056.80	1429407.76
	MW-177	9/22/2010	497.90	2.92	495.0	89.7	405.3	?	2.0	84.7	410.3	89.2	405.8	4.5	0.020	PVC	PVC	3925072.46	1430037.88
	MW-178A	9/18/2010	496.48	2.32	494.2	16.1	478.1	?	2.0	5.9	488.3	15.6	478.5	9.7	0.020	PVC	PVC	3926117.29	1429586.63
	MW-178B	9/18/2010	496.09	1.96	494.1	51.2	443.0	?	2.0	46.0	448.1	50.7	443.4	4.7	0.020	PVC	PVC	3926117.08	1429579.97
	MW-178C	9/17/2010	497.26	3.10	494.2	90.2	404.0	?	2.0	85.2	409.0	89.9	404.2	4.8	0.020	PVC	PVC	3926117.30	1429573.58
	MW-179A	9/21/2010	496.94	2.96	494.0	15.6	478.4	?	2.0	5.6	488.4	15.2	478.8	9.6	0.020	PVC	PVC	3926050.54	1429676.64
	MW-179B	9/21/2010	496.74	2.72	494.0	50.8	443.2	?	2.0	45.8	448.2	50.3	443.7	4.5	0.020	PVC	PVC	3926047.16	1429680.75
	MW-179C	9/20/2010	497.25	3.22	494.0	90.4	403.6	?	2.0	85.4	408.6	89.9	404.1	4.5	0.020	PVC	PVC	3926045.58	1429674.43
	MW-179D	8/12/2011	497.05	3.52	494.0	134.1	360.0	140.5	2.0	129.0	365.1	133.7	360.4	4.7	0.020	PVC	PVC	3926048.88	1429668.63
	MW-180A	9/27/2010	497.40	3.06	494.3	15.4	479.0	?	2.0	5.3	489.1	15.0	479.4	9.7	0.020	PVC	PVC	3925874.85	1429928.62
	MW-180B	9/27/2010	496.86	2.68	494.2	50.7	443.5	?	2.0	45.7	448.5	50.2	444.0	4.5	0.020	PVC	PVC	3925879.52	1429922.58
	MW-180C	9/25/2010	497.05	2.82	494.2	90.4	403.8	?	2.0	85.3	408.9	89.9	404.4	4.5	0.020	PVC	PVC	3925873.80	1429924.19
	MW-181A	10/6/2010	475.91	-0.52	476.4	15.2	461.3	?	2.0	5.1	471.4	14.8	461.7	9.7	0.020	PVC	PVC	3944095.46	1425755.04
	MW-181B	10/6/2010	476.02	-0.41	476.4	50.8	425.7	?	2.0	45.8	430.7	50.3	426.1	4.5	0.020	PVC	PVC	3944099.95	1425752.10
	MW-181C	10/3/2011	475.96	-0.48	476.4	150.5	326.0	?	2.0	145.4	331.0	149.9	326.5	4.4	0.010	PVC	PVC	3944089.21	1425759.17
	MW-182A	10/8/2010	475.38	-0.45	475.9	15.8	460.0	?	2.0	5.7	470.2	15.4	460.5	9.7	0.020	PVC	PVC	3941132.12	1423038.13
	MW-182B	8/22/2011	475.32	-0.40	475.9	44.7	431.2	46.0	2.0	39.6	436.3	44.3	431.6	4.7	0.020	PVC	PVC	3941136.42	1423037.29
	MW-183A	10/8/2010	478.06	-0.55	478.6	15.9	462.7	?	2.0	5.8	472.8	15.5	463.1	9.7	0.020	PVC	PVC	3937529.71	1420159.70
	MW-183B	8/29/2011	478.05	-0.62	478.6	59.7	418.9	59.0	2.0	54.6	424.0	59.3	419.3	4.7	0.020	PVC	PVC	3937532.14	1420157.14
	MW-184	10/11/2010	486.44	-0.50	486.9	45.2	441.7	45.0	2.0	40.1	446.8	44.8	442.2	4.6	0.020	PVC	PVC	3932560.61	1428756.36
	MW-185A	10/12/2010	478.09	-0.60	478.7	15.6	463.1	?	2.0	5.5	473.2	15.1	463.6	9.6	0.020	PVC	PVC	3940802.50	1428251.19
	MW-185B	10/12/2010	478.09	-0.60	478.7	51.4	427.3	?	2.0	46.3	432.4	50.9	427.8	4.6	0.020	PVC	PVC	3940797.61	1428251.05
	MW-185C	10/4/2011	478.47	-0.50	478.8	121.0	357.8	121.0	2.0	116.0	362.9	120.4	358.4	4.4	0.010	PVC	PVC	3940806.68	1428250.19
	MW-186A	10/19/2010	495.95	3.24	492.7	15.2	477.5	?	2.0	5.1	487.6	14.8	477.9	9.7	0.020	PVC	PVC	3927025.87	1429092.83
	MW-186B	10/16/2010	495.77	3.09	492.7	60.8	431.9	?	2.0	50.7	442.0	60.4	432.3	9.7	0.020	PVC	PVC	3927021.15	1429092.67
	MW-186C	10/15/2010	495.72	3.00	492.7	100.8	391.9	?	2.0	90.7	402.0	100.3	392.4	9.6	0.020	PVC	PVC	3927017.05	1429092.45
	MW-186D	12/4/2011	495.13	2.29	492.8	135.0	357.8	?	2.0	129.8	363.0	134.6	358.2	4.8	0.010	PVC	PVC	3927010.35	1429093.23
	MW-187	10/21/2010	485.48	3.01	482.5	17.4	465.1	?	2.0	7.3	475.2	16.9	465.6	9.6	0.020	PVC	PVC	3934464.24	1420335.62
	MW-188B	11/24/2010	461.39	-0.62	462.0	40.9	421.1	45.5	2.0	35.4	426.6	40.4	421.6	5.0	0.020	PVC	PVC	3951521.76	1410365.52
	MW-189A	8/19/2011	470.20	-0.74	470.9	16.5	454.4	?	2.0	6.5	464.5	16.2	454.8	9.7	0.010	PVC	PVC	3945399.36	1424696.44
	MW-189B	8/19/2011	470.24	-0.70	470.9	60.5	410.4	?	2.0	55.4	415.5	60.1	410.9	4.7	0.010	PVC	PVC	3945396.24	1424692.19
	MW-190A	8/23/2011	481.49	-0.43	481.9	15.6	466.3	?	2.0	5.5	476.4	15.2	466.7	9.7	0.010	PVC	PVC	3938370.06	1429592.42
	MW-190B	8/23/2011	481.30	-0.62	481.9	60.7	421.2	?	2.0	55.6	426.3	60.3	421.6	4.7	0.010	PVC	PVC	3938370.16	1429596.16
	MW-191A	8/24/2011	475.61	-0.78	476.4	15.3	461.1	?	2.0	5.2	471.2	14.9	461.5	9.7	0.010	PVC	PVC	3937781.57	1417713.87
	MW-191B	8/24/2011	475.50	0.89	476.4	60.3	416.1	?	2.0	55.2	421.2	59.8	416.6	4.6	0.010	PVC	PVC	3937777.89	1417714.18
	MW-192A	8/25/2011	495.86	2.42	493.4	14.6	478.8	?	2.0	4.5	488.9	14.2	479.2	9.7	0.020	PVC	PVC	3924992.22	1428889.36
	MW-192B	8/25/2011	495.42	2.34	493.1	55.5	437.6	?	2.0	50.4	442.7	55.1	438.0	4.7	0.020	PVC	PVC	3924992.57	1428887.11
	MW-193A	8/30/2011	487.61	-0.36	488.0	15.7	472.3	?	2.0	5.0	483.0	15.5	472.5	10.5	0.020	PVC	PVC	3930483.21	1424590.71
	MW-193B	8/30/2011	487.31	-0.66	488.0	59.9	428.1	61	2.0	54.7	433.3	59.4	428.6	4.7	0.020	PVC	PVC	3930481.25	1424593.75
	MW-194A	8/31/2011	475.49	-0.74	476.2	15.8	460.5	?	2.0	6.0	470.2	15.4	460.9	9.4	0.020	PVC	PVC	3939634.55	1418923.90
	MW-194B	8/31/2011	475.72	0.51	476.2	39.5	436.8	39	2.0	34.4	441.9	39.0	437.3	4.6	0.020	PVC	PVC	3939630.80	1418924.87
	MW-195A	10/11/2011	495.98	2.57	493.4	15.4	478.1	?	2.0	5.2	488.3	15.0	478.5	9.8	0.010	PVC	PVC	3926110.91	1428572.63
	MW-195B	12/5/2011	496.09	2.63	493.5	149.9	343.6	?	2.0	144.8	348.7	149.5	344.0	4.7	0.01	PVC	PVC	3926110.92	1428566.32

**Table 1  
Historical Well Construction Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Well Type	Well	Install Date	Riser Elevation (feet MSL)	Riser Stickup (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Diameter (inches)	Well Screen							Riser Material	Alaska State Plane NAD83, Zone 3	
										Depth to Top (feet bgs)	Top Elevation (feet MSL)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Slot Size (inches)	Material		Northing	Easting
										<b>Monitoring</b>	MW-196	10/11/2011	497.20	3.01	494.2	15.2		479.0	?
	MW-197B	10/16/2011	495.27	2.91	492.8	149.7	343.2	?	2.0	144.6	348.2	149.1	343.8	4.5	0.01	PVC	PVC	3926950.83	1429491.74
	MW-198	12/10/2011	493.31	0.29	493.6	149.8	343.8	?	2.0	144.7	348.9	149.4	344.2	4.7	0.01	PVC	PVC	3925820.02	1429027.70
	MW-199	12/2/2011	495.89	2.54	493.3	149.8	343.5	?	2.0	144.7	348.7	149.4	343.9	4.8	0.01	PVC	PVC	3926959.18	1428830.82
	MW-300	12/6/2011	495.98	1.88	494.0	150.3	343.7	?	2.0	145.0	349.0	149.7	344.3	4.7	0.010	PVC	PVC	3926139.62	1429895.14
	MW-301-CMT-10	10/26/2011	492.83	3.37	489.5	10.0	479.5	?	2.0	9.9	479.6	10.1	479.3	0.3	CMT	PVC	PVC	3927444.46	1427850.40
	MW-301-CMT-20	10/26/2011	492.83	3.37	489.5	20.0	469.5	?	2.0	19.9	469.6	20.1	469.3	0.3	CMT	PVC	PVC	3927444.46	1427850.40
	MW-301-CMT-30	10/26/2011	492.83	3.37	489.5	30.0	459.5	?	2.0	29.9	459.6	30.1	459.3	0.3	CMT	PVC	PVC	3927444.46	1427850.40
	MW-301-CMT-40	10/26/2011	492.83	3.37	489.5	40.0	449.5	?	2.0	39.9	449.6	40.1	449.3	0.3	CMT	PVC	PVC	3927444.46	1427850.40
	MW-301-CMT-50	10/26/2011	492.83	3.37	489.5	50.0	439.5	?	2.0	49.9	439.6	50.1	439.3	0.3	CMT	PVC	PVC	3927444.46	1427850.40
	MW-301-60	10/26/2011	492.76	3.12	489.6	60.9	428.8	?	2.0	55.6	434.0	60.3	429.4	4.7	0.01	PVC	PVC	3927435.06	1427867.56
	MW-301-70	10/9/2011	492.37	2.72	489.7	70.8	418.9	71.5	2.0	65.7	424.0	70.1	419.5	4.4	0.010	PVC	PVC	3927422.66	1427894.40
	MW-302-CMT-10	10/25/2011	494.14	3.41	490.7	10.0	480.7	?	2.0	9.9	480.9	10.1	480.6	0.3	CMT	PVC	PVC	3927605.74	1428194.16
	MW-302-CMT-20	10/25/2011	494.14	3.41	490.7	20.0	470.7	?	2.0	19.9	470.9	20.1	470.6	0.3	CMT	PVC	PVC	3927605.74	1428194.16
	MW-302-CMT-30	10/25/2011	494.14	3.41	490.7	30.0	460.7	?	2.0	29.9	460.9	30.1	460.6	0.3	CMT	PVC	PVC	3927605.74	1428194.16
	MW-302-CMT-40	10/25/2011	494.14	3.41	490.7	40.0	450.7	?	2.0	39.9	450.9	40.1	450.6	0.3	CMT	PVC	PVC	3927605.74	1428194.16
	MW-302-CMT-50	10/25/2011	494.14	3.41	490.7	50.0	440.7	?	2.0	49.9	440.9	50.1	440.6	0.3	CMT	PVC	PVC	3927605.74	1428194.16
	MW-302-70	11/5/2011	493.13	2.63	490.5	70.9	419.6	?	2.0	65.8	424.8	70.4	420.1	4.7	0.01	PVC	PVC	3927612.39	1428219.37
	MW-302-80	11/3/2011	493.34	2.88	490.5	81.5	409.0	?	2.0	76.3	414.1	81.0	409.5	4.7	0.01	PVC	PVC	3927614.39	1428208.27
	MW-302-110	10/17/2011	493.48	2.90	490.6	110.2	380.4	110	2.0	105.1	385.5	109.6	381.0	4.5	0.01	PVC	PVC	3927616.89	1428196.81
	MW-303-CMT-9	10/20/2011	495.88	3.47	492.4	9.0	483.4	?	2.0	8.9	483.5	9.1	483.3	0.3	CMT	PVC	PVC	3927675.95	1428481.84
	MW-303-CMT-19	10/20/2011	495.88	3.47	492.4	19.0	473.4	?	2.0	18.9	473.5	19.1	473.3	0.3	CMT	PVC	PVC	3927675.95	1428481.84
	MW-303-CMT-29	10/20/2011	495.88	3.47	492.4	29.0	463.4	?	2.0	28.9	463.5	29.1	463.3	0.3	CMT	PVC	PVC	3927675.95	1428481.84
	MW-303-CMT-39	10/20/2011	495.88	3.47	492.4	39.0	453.4	?	2.0	38.9	453.5	39.1	453.3	0.3	CMT	PVC	PVC	3927675.95	1428481.84
	MW-303-CMT-49	10/20/2011	495.88	3.47	492.4	49.0	443.4	?	2.0	48.9	443.5	49.1	443.3	0.3	CMT	PVC	PVC	3927675.95	1428481.84
	MW-303-CMT-59	10/20/2011	495.88	3.47	492.4	59.0	433.4	?	2.0	58.9	433.5	59.1	433.3	0.3	CMT	PVC	PVC	3927675.95	1428481.84
	MW-303-70	11/1/2011	495.03	2.65	492.4	70.4	421.9	?	2.0	65.2	427.1	70.0	422.3	4.8	0.01	PVC	PVC	3927668.05	1428484.37
	MW-303-80	11/2/2011	495.09	2.72	492.4	80.7	411.6	?	2.0	75.5	416.8	80.3	412.0	4.8	0.01	PVC	PVC	3927660.37	1428485.11
	MW-303-130	10/18/2011	495.12	2.94	492.2	130.7	361.5	130	2.0	125.6	366.6	130.2	362.0	4.6	0.01	PVC	PVC	3927682.57	1428479.64
	MW-304-CMT-10	10/18/2011	497.59	3.42	494.2	10.0	484.2	?	2.0	9.9	484.3	10.1	484.0	0.3	CMT	PVC	PVC	3927758.31	1428860.58
	MW-304-CMT-20	10/18/2011	497.59	3.42	494.2	20.0	474.2	?	2.0	19.9	474.3	20.1	474.0	0.3	CMT	PVC	PVC	3927758.31	1428860.58
	MW-304-CMT-30	10/18/2011	497.59	3.42	494.2	30.0	464.2	?	2.0	29.9	464.3	30.1	464.0	0.3	CMT	PVC	PVC	3927758.31	1428860.58
	MW-304-CMT-40	10/18/2011	497.59	3.42	494.2	40.0	454.2	?	2.0	39.9	454.3	40.1	454.0	0.3	CMT	PVC	PVC	3927758.31	1428860.58
	MW-304-CMT-50	10/18/2011	497.59	3.42	494.2	50.0	444.2	?	2.0	49.9	444.3	50.1	444.0	0.3	CMT	PVC	PVC	3927758.31	1428860.58
	MW-304-CMT-60	10/18/2011	497.59	3.42	494.2	60.0	434.2	?	2.0	59.9	434.3	60.1	434.0	0.3	CMT	PVC	PVC	3927758.31	1428860.58
	MW-304-70	10/20/2011	496.94	2.72	494.2	70.7	423.6	?	2.0	65.5	428.7	70.2	424.0	4.7	0.01	PVC	PVC	3927751.83	1428854.08
	MW-304-80	10/31/2011	496.69	2.67	494.0	81.1	412.9	?	2.0	76.0	418.0	80.7	413.4	4.7	0.01	PVC	PVC	3927740.60	1428843.75
	MW-304-125	10/14/2011	497.09	3.30	493.8	125.9	367.9	?	2.0	120.9	372.9	125.3	368.5	4.4	0.01	PVC	PVC	3927730.33	1428833.79
	MW-304-150	12/12/2011	NS	2.86	NS	150.7	--	?	2.0	145.5	--	150.2	--	4.7	0.010	PVC	PVC	NS	NS
	MW-305-CMT-8	10/24/2011	496.33	3.20	493.1	7.5	485.6	?	2.0	7.4	485.8	7.6	485.5	0.3	CMT	PVC	PVC	3927940.69	1429048.97
	MW-305-CMT-18	10/24/2011	496.33	3.20	493.1	17.5	475.6	?	2.0	17.4	475.8	17.6	475.5	0.3	CMT	PVC	PVC	3927940.69	1429048.97
	MW-305-CMT-28	10/24/2011	496.33	3.20	493.1	27.5	465.6	?	2.0	27.4	465.8	27.6	465.5	0.3	CMT	PVC	PVC	3927940.69	1429048.97
	MW-305-CMT-38	10/24/2011	496.33	3.20	493.1	37.5	455.6	?	2.0	37.4	455.8	37.6	455.5	0.3	CMT	PVC	PVC	3927940.69	1429048.97
	MW-305-CMT-48	10/24/2011	496.33	3.20	493.1	47.5	445.6	?	2.0	47.4	445.8	47.6	445.5	0.3	CMT	PVC	PVC	3927940.69	1429048.97
	MW-305-CMT-58	10/24/2011	496.33	3.20	493.1	57.5	435.6	?	2.0	57.4	435.8	57.6	435.5	0.3	CMT	PVC	PVC	3927940.69	1429048.97
	MW-305-70	10/22/2011	495.58	2.76	492.8	70.4	422.5	?	2.0	65.0	427.8	69.9	422.9	4.9	0.01	PVC	PVC	3927953.08	1429040.73

**Table 1  
Historical Well Construction Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Well Type	Well	Install Date	Riser Elevation (feet MSL)	Riser Stickup (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Diameter (inches)	Well Screen							Riser Material	Alaska State Plane NAD83, Zone 3	
										Depth to Top (feet bgs)	Top Elevation (feet MSL)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Slot Size (inches)	Material		Northing	Easting
Monitoring	MW-305-80	10/30/2011	495.35	2.66	492.7	81.2	411.5	?	2.0	76.1	416.6	80.8	411.9	4.7	0.01	PVC	PVC	3927959.70	1429046.56
	MW-305-100	10/8/2011	495.67	2.68	493.0	99.9	393.1	110	2.0	94.9	398.1	99.3	393.7	4.4	0.010	PVC	PVC	3927946.36	1429034.54
	MW-306-CMT-10	10/27/2011	496.92	3.36	493.6	10.0	483.6	?	2.0	9.9	483.7	10.1	483.4	0.3	CMT	PVC	PVC	3928108.33	1429306.73
	MW-306-CMT-20	10/27/2011	496.92	3.36	493.6	20.0	473.6	?	2.0	19.9	473.7	20.1	473.4	0.3	CMT	PVC	PVC	3928108.33	1429306.73
	MW-306-CMT-30	10/27/2011	496.92	3.36	493.6	30.0	463.6	?	2.0	29.9	463.7	30.1	463.4	0.3	CMT	PVC	PVC	3928108.33	1429306.73
	MW-306-CMT-40	10/27/2011	496.92	3.36	493.6	40.0	453.6	?	2.0	39.9	453.7	40.1	453.4	0.3	CMT	PVC	PVC	3928108.33	1429306.73
	MW-306-CMT-50	10/27/2011	496.92	3.36	493.6	50.0	443.6	?	2.0	49.9	443.7	50.1	443.4	0.3	CMT	PVC	PVC	3928108.33	1429306.73
	MW-306-CMT-60	10/27/2011	496.92	3.36	493.6	60.0	433.6	?	2.0	59.9	433.7	60.1	433.4	0.3	CMT	PVC	PVC	3928108.33	1429306.73
	MW-306-70	11/6/2011	496.68	3.32	493.4	70.7	422.7	?	2.0	65.5	427.9	70.3	423.1	4.8	0.010	PVC	PVC	3928115.77	1429309.12
	MW-306-80	11/7/2011	496.50	3.02	493.5	80.5	413.0	?	2.0	75.3	418.2	80.1	413.4	4.8	0.010	PVC	PVC	3928108.87	1429292.74
MW-306-100	10/13/2011	495.51	2.32	493.2	100.6	392.6	?	2.0	95.4	397.8	100.2	393.0	4.8	0.010	PVC	PVC	3928121.97	1429302.41	
MW-306-150	10/7/2011	496.00	2.79	493.2	150.1	343.2	?	2.0	144.9	348.4	149.6	343.6	4.8	0.010	PVC	PVC	3928118.47	1429303.75	
MW-307	12/3/2011	495.48	2.52	492.9	149.9	343.0	?	2.0	144.8	348.2	149.6	343.4	4.8	0.010	PVC	PVC	3926951.83	1429734.66	
Observation	O-1	9/23/2010	497.15	2.54	494.6	15.1	479.5	?	2.0	4.9	489.7	14.7	479.9	9.7	0.020	PVC	PVC	3925973.83	1429619.47
	O-2	9/23/2010	496.84	2.99	493.9	15.0	478.8	?	2.0	4.9	489.0	14.6	479.2	9.7	0.020	PVC	PVC	3927114.04	1429130.05
	O-3	9/23/2010	497.67	3.23	494.4	14.6	479.9	?	2.0	4.4	490.0	14.2	480.3	9.7	0.020	PVC	PVC	3927090.75	1429551.50
	O-4	9/16/2010	496.47	2.63	493.8	15.1	478.7	?	2.0	5.0	488.9	14.6	479.2	9.7	0.020	PVC	PVC	3927159.11	1428795.47
	O-5	9/13/2011	496.05	2.55	493.5	15.1	478.4	?	2.0	5.0	488.5	14.7	478.8	9.7	0.010	PVC	PVC	3926951.41	1428829.08
	O-6	9/14/2011	494.52	2.22	492.3	15.6	476.7	?	2.0	5.5	486.8	15.2	477.1	9.7	0.010	PVC	PVC	3926744.06	1428769.81
	O-7	9/14/2011	495.95	2.28	493.7	15.3	478.3	?	2.0	5.2	488.5	14.9	478.8	9.7	0.010	PVC	PVC	3926757.84	1429941.88
	O-8	9/15/2011	496.71	2.66	494.1	15.9	478.2	?	2.0	5.8	488.3	15.5	478.6	9.7	0.010	PVC	PVC	3926131	1429895.9
	O-9	9/15/2011	496.89	3.09	493.8	15.1	478.7	?	2.0	5.0	488.8	14.7	479.1	9.7	0.010	PVC	PVC	3926505.32	1429912.51
	O-10	9/16/2011	496.21	2.59	493.6	16.4	477.3	?	4.0	6.4	487.2	16.0	477.6	9.7	0.010	PVC	PVC	3926386.30	1429760.78
	O-11	9/20/2011	497.86	2.83	495.0	16.4	478.6	?	2.0	6.4	488.6	15.9	479.1	9.5	0.010	PVC	PVC	3927247.94	1429025.71
	O-12	9/21/2011	496.12	2.99	493.1	17.0	476.1	?	2.0	6.8	486.3	16.6	476.5	9.8	0.010	PVC	PVC	3927268.21	1429161.41
	O-13	9/21/2011	495.35	2.88	492.5	15.9	476.6	?	2.0	5.7	486.8	15.5	477.0	9.8	0.010	PVC	PVC	3927268.35	1429254.10
	O-14	10/1/2011	494.89	0.37	495.3	15.3	480.0	?	2.0	5.1	490.1	14.9	480.4	9.8	0.010	PVC	PVC	3925995.33	1430224.22
	O-15	10/6/2011	498.62	2.98	495.6	15.4	480.3	?	2.0	5.2	490.5	15.0	480.7	9.8	0.010	PVC	PVC	3925553.75	1430177.50
	O-16	10/7/2011	NS	0.50	NS	14.6	NS	?	2.0	4.4	NS	14.2	NS	9.8	0.010	PVC	PVC	NS	NS
	O-17	10/13/2011	493.23	0.44	493.7	15.0	478.6	?	2.0	4.9	488.8	14.6	479.1	9.7	0.010	PVC	PVC	3926546.15	1429036.74
	O-18	10/12/2011	492.66	0.46	493.1	15.3	477.8	?	2.0	5.2	488.0	14.9	478.3	9.7	0.010	PVC	PVC	3926309.43	1429007.34
	O-19	10/15/2011	496.44	3.06	493.4	15.3	478.0	?	2.0	5.2	488.2	14.9	478.5	9.7	0.010	PVC	PVC	3926814.98	1429229.93
	O-20	10/13/2011	497.42	3.12	494.3	15.8	478.5	?	2.0	5.6	488.7	15.4	478.9	9.8	0.010	PVC	PVC	3925863.81	1429729.04
	O-21	10/14/2011	493.12	0.46	493.6	15.7	477.9	?	2.0	5.5	488.1	15.3	478.3	9.8	0.010	PVC	PVC	3925656.97	1429631.77
O-22	11/14/2011	496.73	1.90	494.8	18.6	476.2	?	2.0	8.3	486.5	18.1	476.8	9.8	0.010	PVC	PVC	3926789.25	1430139.00	
O-23	12/5/2011	495.83	2.23	493.6	16.3	477.3	?	2.0	6.0	487.6	15.8	477.8	9.8	0.010	PVC	PVC	3927110.81	1429926.5	
O-24	11/10/2011	496.86	2.39	494.5	15.2	479.2	?	2.0	5.0	489.5	14.7	479.8	9.8	0.010	PVC	PVC	3927281.16	1429428.42	
O-25	11/10/2011	497.74	2.44	495.3	16.4	478.9	?	2.0	6.1	489.2	15.9	479.4	9.8	0.010	PVC	PVC	3927402.44	1429242.45	
O-26	11/9/2011	496.79	2.79	494.0	15.0	479.0	?	2.0	4.7	489.3	14.4	479.6	9.8	0.010	PVC	PVC	3927363.19	1429037.48	
O-27	11/10/2011	496.84	1.91	494.9	17.4	477.6	?	2.0	7.1	487.9	16.8	478.1	9.8	0.010	PVC	PVC	3927278.05	1428804.68	
O-28	11/14/2011	494.62	2.06	492.6	14.8	477.7	?	2	4.6	488	14.3	478.3	9.8	0.01	PVC	PVC	3925637.58	1428886.2	
O-29	11/12/2011	498.59	2.35	496.2	18.2	478.1	?	2	7.9	488.4	17.6	478.6	9.8	0.01	PVC	PVC	3926600.52	1430083.48	
S-9	8/1/2001	495.11	2.80	492.3	19.8	?	?	?	2	4.9	487.4	18.9	473.4	14.0	0.01	PVC	PVC	3927494.32	1429112.46
S-20†	5/1/1987	498.00	1.80	496.2	12.1	?	?	?	2	2.7	493.5	12.5	483.8	9.8	0.02	PVC	PVC	?	?
S-21	5/1/1987	497.16	2.40	494.8	13.4	?	?	?	2	2.9	491.8	12.7	482.1	9.8	0.02	PVC	PVC	3926670.65	1429597.64

**Table 1  
Historical Well Construction Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Well Type	Well	Install Date	Riser Elevation (feet MSL)	Riser Stickup (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Diameter (inches)	Well Screen							Riser Material	Alaska State Plane NAD83, Zone 3		
										Depth to Top (feet bgs)	Top Elevation (feet MSL)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Slot Size (inches)	Material		Northing	Easting	
Observation	S-22	5/1/1987	496.70	1.90	494.8	14.7	?	?	2	4.5	490.3	14.2	480.6	9.7	0.02	PVC	PVC	3926430.46	1429717.9	
	S-23†	9/1/1986	498.25	4.02	494.2	13.6	?	?	2	3.5	490.7	12.9	481.4	9.3	0.02	PVC	PVC	?	?	
	S-32	11/1/1987	495.69	2.60	493.1	11.3	?	?	4	1.3	491.8	11.3	481.8	10.0	0.02	ABS	ABS	3926946.66	1429732.57	
	S-34	12/1/1989	?	?	?	13.0	?	?	?	7.9	?	12.9	?	5.0	?	?	?	?	?	
	S-37†	12/1/1989	500.59	7.30	493.3	12.0	?	?	?	6.8	486.5	11.8	481.5	5.0	?	?	?	3926645.38	1429730.56	
	S-38†	12/1/1989	499.30	5.80	493.5	13.0	?	?	?	7.9	485.6	12.9	480.6	5.0	?	?	?	3926817.13	1429386.00	
	S-39	12/1/1989	497.11	4.01	493.1	13.0	?	?	?	7.5	485.6	12.5	480.6	5.0	?	?	?	3927009.82	1429395.60	
	S-40†	12/1/1989	493.62	0.01	493.6	13.0	?	?	?	7.8	485.9	12.8	480.9	5.0	?	?	?	3927031.64	1429617.37	
	S-41†	5/1/1990	497.83	1.93	495.9	17.0	?	?	?	12.1	483.8	16.5	479.4	4.5	?	?	?	?	?	
	S-43	6/1/1991	496.13	1.98	494.2	13.0	?	?	?	3.4	490.8	12.7	481.5	9.3	?	?	?	3926779.68	1429530.33	
	S-44	6/1/1991	495.69	2.61	493.1	13.0	?	?	?	3.2	489.9	12.6	480.4	9.5	?	?	?	3926922.12	1429493.51	
	S-50	7/1/1997	496.67	3.24	493.4	15.0	?	?	4.0	3.9	489.6	13.6	479.9	9.7	0.02	PVC	PVC	3926779.29	1429065.48	
	S-51	6/1/1997	495.90	2.64	493.3	15.0	?	?	2.0	4.8	488.5	14.4	478.8	9.7	0.02	PVC	PVC	3926824.07	1429045.61	
	S-52†	7/1/1997	?	?	?	15.0	?	?	4.0	4.5	?	14.1	?	9.7	0.02	PVC	PVC			
	S-54	7/1/1998	496.98	3.07	493.9	15.0	?	?	2.0	10.0	483.9	15.0	478.9	5.0	0.020	PVC	PVC	3928055.37	1429680.65	
Recovery	R-1	6/1/1986	497.64	?	496.8	9.3	?	?	50.0	?	?	?	?	?	NA	culvert	?	3926818.91	1429340.13	
	R-3	11/1/1987	493.98	0.40	493.6	6.9	?	?	38	?	?	?	?	?	NA	culvert	?	3925550.08	1429397.48	
	R-4	11/1/1987	494.93	0.77	494.2	8.6	?	?	50	?	?	?	?	?	NA	culvert	?	3925501.58	1429377.63	
	R-5	6/1/1986	495.29	1.86	493.4	7.2	?	?	38	?	?	?	?	?	NA	culvert	?	3925824.93	1429309.40	
	R-14	6/1/1986	493.99	1.36	492.6	6.1	?	?	20	?	?	?	?	?	NA	culvert	?	3927108.36	1429010.00	
	R-14A	6/9/1905	494.12	1.40	492.7	10.7	?	?	4	4.0	488.7	10.7	482.0	6.7	?	ABS	ABS	3927100.21	1429016.07	
	R-18	6/1/1987	499.67	3.71	496.0	32.8	?	?	10	7.7	488.3	32.8	463.2	25.1	?	steel	steel	3926667.15	1429608.07	
	R-20R	2/1/2011	498.77	3.86	494.9		?	?	6	3.8	491.1	19.7	475.2	15.9	0.025	ss	ss	3926382.77	1429577.80	
	R-21	10/1/1987	495.53	2.82	492.7	24.2	?	?	12	4.2	488.5	24.2	468.5	20.0	?	steel	steel	3926960.05	1429035.68	
	R-22	10/1/1987	495.57	?	493.1	24.7	?	?	12	4.7	?	24.7	?	20.0	?	steel	steel	3927061.93	1429008.20	
	R-31	11/1/1987	?	?	?	11.0	?	?	24	?	?	?	?	?	?	NA	culvert	?	?	?
	R-32	11/1/1987	494.28	0.37	493.9	11.0	?	?	24	?	?	?	?	?	?	NA	culvert	?	3926473.43	1429438.03
	R-33	8/1/1988	495.77	2.53	493.2	24.6	?	?	12	7.4	485.8	24.6	468.6	17.2	?	steel	steel	3925827.95	1429332.73	
	R-34	8/1/1988	495.15	1.82	493.3	20.8	?	?	12.0	0.5	492.8	20.8	472.5	20.3	?	ss	steel	3926500.01	1429393.41	
	R-35R	2/1/2011	494.74	2.01	492.7	?	?	?	8.0	4.0	488.7	39.0	453.7	35.0	0.008	ss	steel	3926840.14	1429455.05	
	R-38	8/1/1988	498.65	2.74	495.9	9.8	?	?	24.0	?	?	?	?	?	?	NA	culvert	?	3925496.45	1429474.75
	R-39	8/1/1988	495.27	1.89	493.4	25.5	?	?	10.0	6.3	487.1	25.5	467.9	19.3	?	steel	steel	3927030.22	1429648.72	
	R-40	6/11/1905	494.53	1.81	492.7	25.2	?	?	10.0	6.0	486.7	25.2	467.6	19.2	?	steel	steel	3927004.81	1429396.89	
	R-41	7/1/1997	?	?	?	24.5	?	?	5.0	19.5	?	24.5	?	5.0	?	ss	steel	?	?	
	R-42	?	?	493.3	1.4	491.9	?	?	?	8.0	15.0	476.9	35.0	456.9	20.0	0.04	ss	steel	3926974.24	1428686.38

**Notes:**  
 -- = not established or not applicable  
 † = Well to be decommissioned in 2012.  
 ABS = acrylonitrile butadiene styrene  
 bgs = below ground surface  
 CMT = continuous multi-channel tubing  
 MSL = mean sea level  
 NA = not available  
 NAD83 = North American Datum of 1983  
 NS = not surveyed  
 PVC = polyvinyl chloride  
 ss = stainless steel

**Table 2**  
**Phase 7 Well Construction Data - Onsite**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Proposed Well Name	Existing Well Name	Install Date	Riser Elevation (feet MSL)	Riser Stickup* (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Diameter (inches)	Well Screen						Riser Material	Filter Pack		Water Table			Alaska State Plane		
										Depth to Top (feet bgs)	Top Elevation (feet MSL)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Screen Slot Size (inches)		Material	Depth to Top (feet bgs)	Depth to Bottom (feet bgs)	Approx Depth (ft bgs)	In Screen	Feet above top of Screen	NAD83, Zone 3	
																							Northing	Eastings
MW-149C	MW-149C	6/12/12	Boring installed to permafrost at a depth of 23 feet NO WELL																					
MW-186E	MW-186E	4/25/12	495.73	2.99	492.74	75.90	416.84	--	2.00	70.76	421.98	75.42	417.32	4.66	0.01	PVC	PVC	Natural pack		7.0	N	63.76	3927030.39	1429093.30
MW-197A	MW-197A	6/6/12	495.15	0.54	494.61	66.06	428.55	--	2.00	61.09	433.52	65.74	428.87	4.65	0.01	PVC	PVC	Natural pack		7.0	N	54.1	3926959.84	1429490.28
MW-302-95	MW-302-95	5/31/12	492.93	2.94	489.99	95.20	479.99	--	2.00	90.15	399.84	94.81	395.18	4.66	0.01	PVC	PVC	Natural pack		9.0	N	81.2	3927608.27	1428231.29
MW-303-95	MW-303-95	4/17/12	495.11	3.19	491.92	95.18	472.92	--	2.00	90.13	402.24	94.78	397.59	4.65	0.01	PVC	PVC	Natural pack		9.0	N	81.1	3927651.67	1428487.31
MW-304-15	MW-304-15	4/18/12	496.95	3.37	493.58	18.17	342.93	--	2.00	8.02	485.77	17.83	475.96	9.81	0.01	PVC	PVC	3.4	18.7	10.5	Y	NA	3927723.82	1428828.03
MW-304-96	MW-304-96	4/18/12	496.91	2.90	494.01	95.71	484.01	--	2.00	90.57	403.45	95.22	398.80	4.65	0.01	PVC	PVC	Natural pack		10.5	N	80.1	3927746.17	1428848.56
MW-306-15	MW-306-15	4/16/12	496.74	3.20	493.54	15.40	478.14	--	2.00	5.20	487.99	15.01	478.18	9.81	0.01	PVC	PVC	3.2	15.4	11.0	Y	NA	3928103.64	1429299.52
7-la	MW-309-15	4/24/12	495.10	3.08	492.02	15.06	476.96	--	2.00	4.92	487.10	14.72	477.30	9.80	0.01	PVC	PVC	3.2	15.0	7.0	Y	NA	3927042.65	1428539.04
7-lb	MW-309-66	4/23/12	495.08	3.12	491.96	65.85	426.11	--	2.00	59.43	432.53	64.10	427.86	4.67	0.01	PVC	PVC	Natural pack		7.0	N	52.4	3927043.22	1428532.39
7-lc	MW-309-150	4/19/12	494.76	2.72	492.04	149.75	342.29	--	2.00	144.61	347.43	149.27	342.77	4.66	0.01	PVC	PVC	Natural pack		7.0	N	137.6	3927043.93	1428525.49
7-Va	MW-310-15	4/20/12	494.32	3.15	491.17	14.72	476.45	--	2.00	4.58	486.59	14.38	476.79	9.80	0.01	PVC	PVC	3.2	14.7	6.0	Y	NA	3926810.88	1428028.92
7-Vb	MW-310-65	4/20/12	494.47	3.12	491.35	65.53	425.82	--	2.00	60.47	430.88	65.13	426.22	4.66	0.01	PVC	PVC	Natural pack		6.0	N	54.5	3926805.71	1428036.73
7-Vc	MW-310-110	5/29/12	494.27	3.15	491.12	110.42	380.70	--	2.00	105.28	385.84	109.94	381.18	4.66	0.01	PVC	PVC	Natural pack		6.0	N	99.3	3926802.76	1428044.57
7-ASa	MW-321-15	5/5/12	495.62	2.71	492.91	15.77	477.14	--	2.00	5.62	487.29	15.41	477.50	9.79	0.01	PVC	PVC	3.9	15.8	7.0	Y	NA	3926256.76	1428855.78
7-ASb	MW-321-65	5/5/12	495.28	2.59	492.69	66.04	426.65	--	2.00	60.89	431.80	65.55	427.14	4.66	0.01	PVC	PVC	Natural pack		7.0	N	53.9	3926265.14	1428856.30
7-ASc	MW-321-151	5/26/12	495.15	2.33	492.82	150.54	342.28	--	2.00	145.41	347.41	150.06	342.76	4.65	0.01	PVC	PVC	Natural pack		7.0	N	138.41	3926273.73	1428856.06
7-Ua	MW-330-20	6/4/12	500.02	2.90	497.12	19.62	477.50	--	2.00	9.46	487.66	19.21	477.91	9.75	0.01	PVC	PVC	7.7	9.5	12.0	Y	NA	3926218.84	1428281.49
7-Ub	MW-330-65	6/4/12	499.82	2.58	497.24	65.39	431.85	--	2.00	60.26	436.98	64.91	432.33	4.65	0.01	PVC	PVC	Natural pack		12.0	N	48.26	3926212.39	1428284.78
7-Uc	MW-330-150	6/1/12	499.62	2.50	497.12	150.42	346.70	--	2.00	145.36	351.76	150.02	347.10	4.66	0.01	PVC	PVC	Natural pack		12.0	N	133.36	3926206.19	1428288.44
7-AP	MW-331-150	6/5/12	495.63	2.60	493.03	150.24	342.79	--	2.00	145.10	347.93	149.75	343.28	4.65	0.01	PVC	PVC	Natural pack		8.6	N	136.50	3927767.73	1429695.15
7-Ja	MW-334-15	8/21/12	490.82	2.66	488.16	15.53	472.63	--	2.00	5.43	482.73	14.92	473.24	9.49	0.01	PVC	PVC	3.1	15.5	7.2	Y	NA	3927035.89	1429327.86
7-Jb	MW-334-65	8/20/12	490.76	2.66	488.10	65.41	422.69	--	2.00	60.57	427.53	65.23	422.87	4.66	0.01	PVC	PVC	Natural pack		7.2	N	53.4	3927036.11	1429323.29
O-30	O-30	8/14/12	469.33	-0.87	470.20	15.82	454.38	--	2.00	6.71	463.49	15.36	454.84	9.75	0.01	PVC	PVC	4.0	15.8	9.0	Y	NA	3946145.20	1419928.02

**Notes:**

Elevation referenced to National Geodetic Vertical Datum of 1929 datum, 1966 adjustment.

\* = Based on difference between surveyed ground surface and top of casing.

-- = not established or not applicable

bgs = below ground surface

MSL = mean sea level

N = no

NA = not applicable

NAD83 = North American Datum of 1983

PVC = polyvinyl chloride

Y = yes

**Table 3  
Phase 7 Well Construction Data - Offsite**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Proposed Well Name	Existing Well Name	Install Date	Riser Elevation (feet MSL)	Riser Stickup* (feet)	Ground Surface Elevation (feet MSL)	Well Depth (feet bgs)	Well Bottom Elevation (feet MSL)	Depth to Top of Permafrost (feet bgs)	Well Screen						Riser Material	Filter Pack		Water Table			Alaska State Plane	
									Depth to Top (feet bgs)	Depth to Bottom (feet bgs)	Bottom Elevation (feet MSL)	Length (feet)	Screen Slot Size (inches)	Material		Depth to Top (feet bgs)	Depth to Bottom (feet bgs)	Approx Depth (ft bgs)	In Screen	Feet above top of Screen	NAD83, Zone 3	
																					Northing	Easting
MW-150C	MW-150C	5/12/12	486.71	-0.21	486.92	60.51	426.41	63.5	55.43	60.08	426.84	4.65	0.01	PVC	PVC	Natural pack	8.0	N	47.4	3930159.85	1426535.91	
MW-188A	MW-188A	4/28/12	461.19	-0.02	461.21	15.33	445.88	--	5.20	14.98	446.23	9.78	0.01	PVC	PVC	3.0 15.3	10.0	Y	NA	3951510.80	1410365.41	
7-Ca	MW-308-15	4/13/12	476.87	4.20	472.67	14.95	457.72	--	4.91	14.36	458.31	9.45	0.01	PVC	PVC	3.5 15.0	9.0	Y	NA	3943105.50	1420578.30	
7-Cb	MW-308-30	4/12/12	475.33	3.37	471.96	30.42	441.54	41.0	25.21	30.02	441.94	4.81	0.01	PVC	PVC	Natural pack	10.0	N	15.2	3943026.01	1420453.62	
7-Fa	MW-311-15	4/26/12	467.01	-0.20	467.21	15.43	451.78	--	5.24	15.04	452.17	9.80	0.01	PVC	PVC	3.2 15.4	4.5	N	0.7	3946536.13	1415602.20	
7-Fb	MW-311-46	4/28/12	467.06	-0.11	467.17	45.74	421.43	48.0	40.60	45.26	421.91	4.66	0.01	PVC	PVC	Natural pack	4.5	N	36.1	3946534.99	1415612.86	
7-AAa	MW-312-15	4/26/12	464.18	-0.21	464.39	15.52	448.87	--	5.34	15.13	449.26	9.79	0.01	PVC	PVC	2.7 15.5	5.7	Y	NA	3951394.25	1415642.38	
7-AAb	MW-312-50	5/2/12	464.25	-0.14	464.39	50.36	414.03	50.0	44.90	49.56	414.83	4.66	0.01	PVC	PVC	Natural pack	7.0	N	37.9	3951399.72	1415642.19	
7-AHa	MW-313-15	4/30/12	465.77	-0.42	466.19	15.18	451.01	--	4.99	14.79	451.40	9.80	0.01	PVC	PVC	3.0 15.2	9.5	Y	NA	3951374.78	1423235.06	
7-AHb	MW-313-150	5/8/12	465.87	-0.32	466.19	149.94	316.25	--	144.69	149.34	316.85	4.65	0.01	PVC	PVC	Natural pack	9.5	N	135.2	3951370.40	1423237.65	
7-Ra	MW-314-15	4/30/12	476.17	-0.21	476.38	15.56	460.82	--	5.38	15.16	461.22	9.78	0.01	PVC	PVC	3.0 15.6	7.0	Y	NA	3943866.90	1427115.02	
7-Rb	MW-314-150	5/11/12	476.00	-0.38	476.38	150.51	325.87	--	145.31	150.13	326.25	4.82	0.01	PVC	PVC	Natural pack	7.0	N	138.3	3943874.84	1427119.27	
7-AZa	MW-315-15	5/1/12	458.45	-0.57	459.02	15.83	443.19	--	5.70	15.49	443.53	9.79	0.01	PVC	PVC	3.0 15.8	7.0	Y	NA	3949804.15	1403467.06	
7-AZb	MW-315-150	5/2/12	458.95	-0.29	459.24	150.63	308.61	--	145.58	150.23	309.01	4.65	0.01	PVC	PVC	Natural pack	7.0	N	138.6	3949809.75	1403467.06	
7-ALa	MW-316-15	5/1/12	486.30	-0.38	486.68	15.67	471.01	--	5.46	15.26	471.42	9.80	0.01	PVC	PVC	3.0 15.0	7.0	Y	NA	3932950.20	142872.65	
7-ALb	MW-316-56	5/16/12	486.16	-0.52	486.68	56.00	430.68	57.0	50.95	55.59	431.09	4.64	0.01	PVC	PVC	Natural pack	7.0	N	44.0	3932950.03	1428377.41	
7-Xa	MW-317-15	5/3/12	488.84	-0.50	489.34	15.66	473.68	--	5.46	15.25	474.09	9.79	0.01	PVC	PVC	3.0 15.7	9.0	Y	NA	3930184.86	1428701.63	
7-Xb	MW-317-71	5/21/12	488.79	-0.50	489.29	71.23	418.06	--	66.10	70.73	418.56	4.63	0.01	PVC	PVC	Natural pack	9.0	N	57.1	3930184.86	1428701.63	
7-WL-1a	MW-318-20	5/3/12	493.15	3.03	490.12	20.48	469.64	--	10.29	20.08	470.04	9.79	0.01	PVC	PVC	8.0 20.5	10.0	Y	0.3	3928866.23	1424726.43	
7-WL-1b	MW-318-135	5/10/12	493.08	3.23	489.85	135.29	354.56	--	130.15	134.80	355.05	4.65	0.01	PVC	PVC	Natural pack	7.0	N	123.2	3928883.99	1424703.15	
7-ADa	MW-319-15	5/4/12	456.11	-0.40	456.51	15.28	441.23	--	5.08	14.89	441.62	9.81	0.01	PVC	PVC	3.0 15.3	7.0	Y	NA	3953109.18	1404197.93	
7-ADb	MW-319-45	5/7/12	455.95	-0.50	456.45	45.52	410.93	45.5	40.44	45.10	411.35	4.66	0.01	PVC	PVC	Natural pack	7.0	N	33.4	3953109.18	1404192.73	
7-ARa	MW-320-20	5/4/12	450.89	-0.53	451.42	20.15	431.27	--	9.96	19.76	431.66	9.80	0.01	PVC	PVC	7.9 20.2	10.2	Y	NA	3963542.54	1402682.33	
7-ARb	MW-320-130	5/9/12	450.98	-0.44	451.42	131.38	320.04	--	126.32	130.97	320.45	4.65	0.01	PVC	PVC	Natural pack	10.0	N	116.3	3963539.90	1402678.14	
7-Ea	MW-322-15	5/7/12	472.01	2.63	469.38	15.73	453.65	--	5.55	15.34	454.04	9.79	0.01	PVC	PVC	3.0 15.7	7.0	Y	NA	3940670.73	1410082.02	
7-Eb	MW-322-150	5/18/12	471.99	-0.38	472.37	151.07	321.30	--	145.94	150.59	321.78	4.65	0.01	PVC	PVC	Natural pack	7.0	N	138.9	3940646.94	1410074.03	
7-Qa	MW-323-15	5/7/12	485.17	3.02	482.15	15.55	466.60	--	5.42	15.21	466.94	9.79	0.01	PVC	PVC	3.0 15.6	7.0	Y	NA	3931840.58	1422094.72	
7-Qb	MW-323-61	5/17/12	484.26	-0.47	484.73	60.80	423.93	64.0	55.70	60.35	424.38	4.65	0.01	PVC	PVC	Natural pack	7.0	N	48.7	3931823.38	1422078.80	
7-AFa	MW-324-15	5/8/12	463.40	-0.23	463.63	15.35	448.28	--	5.17	14.96	448.67	9.79	0.01	PVC	PVC	3.0 15.4	7.0	Y	NA	3945444.19	1404965.19	
7-AFb	MW-324-151	5/23/12	462.91	-0.44	463.35	150.92	312.43	--	145.78	150.44	312.91	4.66	0.01	PVC	PVC	Natural pack	7.0	N	138.8	3945445.95	1404958.62	
7-Sa	MW-325-18	5/8/12	486.12	-0.79	486.91	18.68	468.23	--	8.53	18.33	468.58	9.80	0.01	PVC	PVC	6.5 18.7	12.0	Y	NA	3937079.28	1430639.29	
7-Sb	MW-325-150	5/14/12	486.84	-0.59	487.43	150.54	336.89	--	145.48	150.13	337.30	4.65	0.01	PVC	PVC	Natural pack	12.0	N	133.5	3937085.15	1430633.64	
7-WL-2a	MW-326-20	6/8/12	500.53	3.22	497.31	20.75	476.56	--	10.61	20.40	476.91	9.79	0.01	PVC	PVC	7.0 20.8	7.0	N	NA	3921150.73	1430277.63	
7-WL-2b	MW-326-150	5/15/12	500.44	3.13	497.31	150.51	346.80	--	145.45	150.10	347.21	4.65	0.01	PVC	PVC	Natural pack	7.0	N	138.5	3921145.09	1430276.63	
7-ACa	MW-327-15	5/21/12	467.82	-0.28	468.10	15.40	452.70	--	5.21	15.01	453.09	9.80	0.01	PVC	PVC	2.8 15.4	7.0	Y	NA	3951301.83	1420336.90	
7-ACb	MW-327-150	5/19/12	467.60	-0.50	468.10	150.92	317.18	--	145.79	150.44	317.66	4.65	0.01	PVC	PVC	Natural pack	7.0	N	138.8	3951297.90	1420342.92	
7-Ka	MW-328-15	5/21/12	472.35	-0.80	473.15	15.77	457.38	--	5.83	15.33	457.82	9.50	0.01	PVC	PVC	2.8 15.8	8.5	Y	NA	3945516.60	1422877.24	
7-Kb	MW-328-151	5/24/12	472.68	-0.47	473.15	150.66	322.49	--	145.58	150.25	322.90	4.67	0.01	PVC	PVC	Natural pack	8.5	N	137.1	3945525.83	1422876.28	
7-Ga	MW-329-15	4/10/01	482.94	3.05	479.89	14.82	465.07	--	5.40	14.34	465.55	8.94	0.01	PVC	PVC	3.5 14.8	7.0	Y	NA	3937284.38	1421278.22	
7-Gb	MW-329-66	5/22/12	479.26	-0.34	479.60	65.67	413.93	67.0	60.53	65.19	414.41	4.66	0.01	PVC	PVC	Natural pack	7.0	N	53.5	3937283.58	1421283.36	
7-Da	MW-332-15	6/8/12	481.79	-0.25	482.04	15.67	466.37	--	5.53	15.32	466.72	9.79	0.01	PVC	PVC	3.0 15.7	7.0	y	NA	3937270.16	1428736.01	
7-Db	MW-332-150	6/7/12	481.32	-0.75	482.07	150.87	331.20	--	145.74	150.39	331.68	4.65	0.01	PVC	PVC	Natural pack	7.0	N	138.7	3937270.37	1428731.02	
7-WL-3a	MW-333-16	6/12/12	497.68	2.78	494.90	16.22	478.68	--	6.09	15.83	479.07	9.74	0.01	PVC	PVC	2.8 16.2	6.0	N	NA	3922961.12	1430188.05	
7-WL-3b	MW-333-150	6/11/12	497.84	2.94	494.90	150.47	344.43	--	145.32	149.98	344.92	4.66	0.01	PVC	PVC	Natural pack	6.0	N	139.3	3922968.19	1430186.58	
--	MW-335-41	8/23/12	469.33	-0.89	470.22	41.11	429.11	43.0	36.01	40.56	429.66	4.55	0.01	PVC	PVC	Natural pack	5.5	N	30.5	3946145.20	1419928.02	
PF-3	PF-3	4/14/12	Permafrost encountered at ground surface to 28.5 feet; NO WELL																			
PF-4	PF-4	4/30/12	Permafrost encountered at 1.50 to 20.0 feet; NO WELL																			

**Notes:**  
Elevation referenced to National Geodetic Vertical Datum of 1929, 1966 adjustment.  
\* = Based on difference between surveyed ground surface and top of casing.  
-- = not established or not applicable  
bgs = below ground surface  
MSL = mean sea level  
N = no  
NA = not applicable  
NAD83 = North American Datum of 1983  
PVC = polyvinyl chloride  
Y = yes

**Table 4  
Phase 7 Well Boring Soil Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Sample Name	Sample Date	Depth (feet)	Location Name	Sulfolane µg/kg	Gasoline Range Organics mg/kg	Diesel Range Organics mg/kg	Benzene µg/kg	Toluene µg/kg	Ethylbenzene µg/kg	P & M - Xylene µg/kg	o-Xylene µg/kg
S-197A-10	6/6/12	10	MW-197A	<7.38	129JH*	--	900	11800	4810	13700	3620
S-334-15-8	8/21/12	8	MW-334-15	<7.00J*	4380JH*	14,400	140,000	688,000	162,000	588,000	277,000
S-334-15-1	8/21/12	1	MW-334-15	<6.98	<1.22	7.60J	<6.50	<12.7	<12.7	<24.4	<12.7
S-O-30-15	8/14/12	15	O-30	<7.66	<1.58	<15.2	<8.46	<16.5	<16.5	<31.6	<16.5

**Notes:**

< = Not detected; limit of detection listed.

< ... J\* = Limit of detection is considered in question due to potential low bias from sample handling or holding time issues (flag applied by SWI).

J = Estimated concentration, detected above the detection limit and below the limit of quantitation.

JH\* = Result is considered estimated, biased high, due to quality control failures (flag applied by SWI).

J\* = Result is considered estimated (no direction of bias), due to quality control failures (flag applied by SWI).

-- = not analyzed

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

**Table 5  
Current Pressure Transducer Network**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

<b>Well</b>	<b>Location</b>	<b>Installed</b>	<b>Comments</b>
Barrotroll	NPR guardshack	yes	
MW-109	onsite	yes	
MW-111	onsite	destroyed	Well was destroyed with datalogger inside. Data was downloaded on 8/17/12, but it's usefulness is questionable because the well casing has been broken and no manual depth to water measurement is possible.
MW-113	onsite	yes	
MW-151A	offsite	yes	
MW-151B	offsite	yes	
MW-151C	offsite	yes	
MW-156A	offsite	yes	
MW-157A	offsite	yes	
MW-158A	offsite	yes	
MW-161A	offsite	yes	
MW-162A	offsite	yes	
MW-162B	offsite	yes	
MW-164A	offsite	yes	
MW-164C	offsite	yes	
MW-169A	offsite	yes	
MW-169C	offsite	yes	
MW-170A	offsite	yes	
MW-170C	offsite	yes	
MW-172A	offsite	yes	
MW-172B	offsite	yes	
MW-175	onsite	yes	
MW-179A	onsite	yes	
MW-179B	onsite	yes	
MW-179C	onsite	yes	
MW-179D	onsite	yes	
MW-181A	offsite	yes	
MW-181B	offsite	yes	
MW-181C	offsite	yes	
MW-186A	onsite	yes	
MW-186B	onsite	yes	
MW-186C	onsite	yes	
MW-186E	onsite	yes	
MW-304-125	onsite	yes	Originally deployed on 4/24/2012 11:00:00 AM.
MW-304-15	onsite	yes	
MW-304-150	onsite	yes	Originally deployed on 4/24/2012 11:00:00 AM.
MW-306-15	onsite	yes	
MW-306-150	onsite	yes	
MW-309-15	onsite	yes	
MW-309-65	onsite	yes	
MW-310-110	onsite	yes	
MW-310-15	onsite	yes	
MW-318-135	offsite	yes	
MW-318-20	offsite	yes	
MW-320-130	offsite	yes	

**Table 5  
Current Pressure Transducer Network**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

<b>Well</b>	<b>Location</b>	<b>Installed</b>	<b>Comments</b>
MW-320-20	offsite	yes	
MW-322-15	offsite	yes	
MW-322-150	offsite	yes	
MW-325-150	offsite	yes	
MW-325-18	offsite	yes	
MW-326-150	offsite	yes	
MW-326-20	offsite	yes	
MW-328-15	offsite	yes	
MW-328-151	offsite	yes	
MW-333-150	offsite	yes	
MW-333-16	offsite	yes	
MW-334-15	onsite	yes	
MW-334-65	onsite	yes	
O-12	onsite	yes	
S-43	onsite	yes	
MW-167A	offsite/UAF	yes	
MW-168A	offsite/UAF	Frozen	
MW-171A	offsite/UAF	yes	
MW-182A	offsite/UAF	yes	
MW-185A	offsite/UAF	Frozen	
MW-187	offsite/UAF	yes	
MW-189A	offsite/UAF	Frozen	
MW-190A	offsite/UAF	yes	
MW-191A	offsite/UAF	yes	
MW-194A	offsite/UAF	yes	

**Notes:**

NPR = North Pole Refinery

UAF = University of Alaska, Fairbanks

**Table 6  
Hydropunch Sample Field Parameter Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Date	Location	Soil Boring	Analysis	Depth to Water from Ground Surface (Feet)	Temperature (°C)	DO (mg/L) ‡	Conductivity (µS/cm)	pH	ORP (mV)	Water Clarity	Notes
6/18/2012	North Pole, AK	HP-01 14	S	7.84	6.66	0.99	335	5.12	47.7	clear	
6/18/2012	North Pole, AK	HP-01 24	S	13.90	6.79	0.50	338	6.93	-101.5	clear	
6/18/2012	North Pole, AK	HP-01 34	S	8.54	7.13	0.55	323	6.49	-95.1	cloudy	
6/18/2012	North Pole, AK	HP-01 44	S	9.57	8.30	0.68	303	6.40	-72.3	cloudy	
6/18/2012	North Pole, AK	HD-01 44	†	†	†	†	†	†	†	†	Equipment Blank
6/18/2012	North Pole, AK	HP-01 54	S	13.26	9.16	0.57	307	7.43	-181.6	cloudy	
6/4/2012	North Pole, AK	HP-2-15	S	--	7.99	1.57	418	6.29	-33.9	clear	
6/4/2012	North Pole, AK	HP-2-25	S	--	10.44	1.00	405	6.72	-250.0	clear	
6/4/2012	North Pole, AK	HP-2-35	S	--	9.82	1.18	401	6.36	-153.4	clear	
6/6/2012	North Pole, AK	HP-3-20	S	15.45	7.43	1.35	463	5.27	-69.2	cloudy	
6/6/2012	North Pole, AK	HP-3-30	S	14.20	8.15	1.01	406	7.20	-166.7	cloudy	
6/6/2012	North Pole, AK	HP-3-40	S	15.08	7.50	0.76	386	7.76	-111.3	sprinkling	
6/6/2012	North Pole, AK	HP-3-50	S	18.61	4.08	0.90	350	6.82	-169.9	--	
6/6/2012	North Pole, AK	HP-3-60	S	19.40	9.64	0.85	347	7.78	-322.8	sunny	
6/5/2012	North Pole, AK	HP-4-20	S	12.90	7.38	1.78	432	6.33	-94.7	clear-warm	
6/5/2012	North Pole, AK	HP-4-30	S	13.70	10.91	3.15	373	7.62	-372.0	clear	
6/5/2012	North Pole, AK	HP-4-40	S	--	9.90	1.41	357	6.86	-336.0	clear	
6/7/2012	North Pole, AK	HP-5-15	S	12.00	9.21	2.02	444	5.97	-45.0	sunny/hot	
6/7/2012	North Pole, AK	HP-5-25	S	12.77	8.68	1.19	400	7.28	-187.4	sunny	
6/7/2012	North Pole, AK	HP-5-35	S	13.74	11.48	1.24	359	7.30	-199.2	cloudy/warm	
6/7/2012	North Pole, AK	HP-5-45	S	14.08	12.41	0.99	357	7.69	-353.9	warm/overcast	
6/6/2012	North Pole, AK	HP-6-20	S	12.94	6.58	2.84	459	6.86	-108.2	cloudy	
6/6/2012	North Pole, AK	HP-6-30	S	14.65	7.12	1.05	364	7.02	-138.0	cloudy/sprinkling	
6/6/2012	North Pole, AK	HP-6-40	S	--	8.63	0.96	344	6.40	-105.2	raining	
6/6/2012	North Pole, AK	HP-6-48	S	15.65	7.80	1.67	343	7.35	-159.1	raining	
6/7/2012	North Pole, AK	HP-7-20	S	15.66	8.70	1.61	413	10.20	-151.8	--	
6/7/2012	North Pole, AK	HP-7-30	S	13.39	9.37	0.67	369	7.02	-367.4	warm/sunny	
6/7/2012	North Pole, AK	HP-7-40	S	13.71	10.22	1.31	350	7.66	-327.7	cloudy	
6/11/2012	North Pole, AK	HP-8-15	S	--	7.59	1.17	680	5.22	46.8	sunny	
6/11/2012	North Pole, AK	HP-8-25	S	11.99	10.19	0.85	412	7.25	-175.6	sunny	
6/11/2012	North Pole, AK	HP-8-35	S	12.15	10.53	2.64	355	6.69	-117.0	sunny/hot	
6/11/2012	North Pole, AK	HP-8-45	S	16.05	12.60	0.54	350	7.33	-186.6	sunny/hot	
6/11/2012	North Pole, AK	HP-8-54	S	17.20	11.88	0.44	348	7.33	-20.8	hot	

**Table 6  
Hydropunch Sample Field Parameter Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Date	Location	Soil Boring	Analysis	Depth to Water from Ground Surface (Feet)	Temperature (°C)	DO (mg/L) ‡	Conductivity (µS/cm)	pH	ORP (mV)	Water Clarity	Notes
6/11/2012	North Pole, AK	HP-9-15	S	12.79	6.46	2.20	372	5.98	58.2	sunny	
6/11/2012	North Pole, AK	HP-9-25	S	12.89	7.93	1.90	363	6.28	-68.2	sunny/hot	
6/11/2012	North Pole, AK	HP-9-36	S	13.60	9.25	0.90	383	7.43	-214.8	sunny	
6/11/2012	North Pole, AK	HP-9-44	S	14.95	12.28	1.24	349	7.24	-184.6	hot	
6/11/2012	North Pole, AK	HP-9-56	S	--	9.10	2.53	353	7.42	-293.5	--	
6/15/2012	North Pole, AK	HP-10-13	S, BTEX	6.81	5.31	3.04	501	4.65	65.4	cool	
6/15/2012	North Pole, AK	HP-10-23	S, BTEX	6.94	6.29	2.36	390	6.65	-72.2	hot	
6/15/2012	North Pole, AK	HP-10-33	S, BTEX	6.66	6.59	4.98	321	6.70	-71.3	cloudy	
6/15/2012	North Pole, AK	HP-10-44	S, BTEX	7.50	7.88	2.75	323	7.55	-182.7	cloudy/hot	
6/15/2012	North Pole, AK	HP-10-54	S, BTEX	9.74	8.40	2.06	323	7.19	-179.7	sunny	
6/15/2012	North Pole, AK	HP-11-13	S, BTEX	8.11	6.14	2.34	439	5.99	-16.7	sunny/hot	
6/15/2012	North Pole, AK	HP-11-23	S, BTEX	9.07	6.85	1.55	391	7.08	-109.9	hot	
6/15/2012	North Pole, AK	HP-11-34	S, BTEX	9.66	7.35	2.33	363	6.49	-98.7	cloudy	
6/15/2012	North Pole, AK	HP-11-44	S, BTEX	9.50	8.56	2.78	315	7.16	-115.8	cloudy	
6/19/2012	North Pole, AK	HP-12 14	S	9.85	9.41	12.04	255	4.88	66.8	clear	
6/19/2012	North Pole, AK	HP-12 24	S	15.99	7.71	1.40	262	6.93	-59.5	cloudy	
6/19/2012	North Pole, AK	HP-12 34	S	16.27	9.14	0.34	272	7.14	-122.2	cloudy	
6/19/2012	North Pole, AK	HP-12 44	S	12.89	8.74	0.34	258	7.33	-115.7	cloudy	
6/19/2012	North Pole, AK	HP-12 54	S	13.54	9.11	0.39	252	7.14	-115.1	cloudy	
6/16/2012	North Pole, Ak	HP-13 14	S, BTEX	~8.34	5.34	1.70	242	6.64	-77.6	slightly cloudy	
6/16/2012	North Pole, Ak	HP-13 24	S, BTEX	~8.50	7.13	0.87	248	7.13	-138.4	slightly cloudy	
6/16/2012	North Pole, Ak	HP-13 39	S, BTEX	~9.12	7.06	0.90	212	6.87	-111.7	cloudy	
6/16/2012	North Pole, Ak	HP-13 44	S, BTEX	~9.24	8.98	0.96	223	7.35	-141.7	cloudy	
6/16/2012	North Pole, Ak	HP-13 54	--	--	--	--	--	--	--	--	No sample taken due to screen breaking off
6/22/2012	North Pole, AK	HP-14 14	S, BTEX	8.39	6.04	0.96	292	5.82	-34.4	clear	
6/22/2012	North Pole, AK	HD-14 14	†	†	†	†	†	†	†	†	Duplicate of HP-14 14
6/22/2012	North Pole, AK	HP-14 24	S, BTEX	8.53	7.35	0.62	266	6.67	-106.3	cloudy	
6/22/2012	North Pole, AK	HP-14 34	S, BTEX	9.25	7.52	0.41	260	6.55	-68.0	cloudy	
6/22/2012	North Pole, AK	HP-14 44	S, BTEX	10.35	9.37	0.47	274	6.75	-79.8	cloudy	
6/22/2012	North Pole, AK	HP-14 54	S, BTEX	9.87	9.18	0.52	267	6.84	-73.8	cloudy	
6/8/2012	North Pole, AK	HP-15-15	S, BTEX	9.34	8.98	1.76	437	6.92	-163.0		
6/8/2012	North Pole, AK	HP-15-25	S, BTEX	8.92	9.70	1.12	369	7.35	-224.1		
6/8/2012	North Pole, AK	HP-15-34	S, BTEX	10.10	9.07	0.81	340	7.47	-226.6		
6/8/2012	North Pole, AK	HP-15-45	S, BTEX	12.14	--	0.66	323	7.32	-172.00	cloudy/hot	
6/8/2012	North Pole, AK	HP-15-54	S, BTEX	12.50	10.77	0.83	322	7.46	-214.6	hot/sunny	

**Table 6  
Hydropunch Sample Field Parameter Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Date	Location	Soil Boring	Analysis	Depth to Water from Ground Surface (Feet)	Temperature (°C)	DO (mg/L) ‡	Conductivity (µS/cm)	pH	ORP (mV)	Water Clarity	Notes
6/8/2012	North Pole, AK	HP-16-15	S, BTEX	9.80	7.76	1.40	366	5.17	-85.5	cloudy/warm	
6/8/2012	North Pole, AK	HP-16-25	S, BTEX	10.40	8.77	0.95	334	7.56	-224.4	cloudy/sprinkle	
6/8/2012	North Pole, AK	HP-16-35	S, BTEX	11.03	8.50	1.89	366	7.70	-210.0	cloudy/hot	
6/8/2012	North Pole, AK	HP-16-45	S, BTEX	14.25	9.33	1.04	323	7.86	-243.4	hot	
6/8/2012	North Pole, AK	HP-16-53	S, BTEX	15.70	9.34	1.15	317	8.03	-245.6	hot	
6/8/2012	North Pole, AK	HP-16-62	S, BTEX	--	12.78	0.04	311	7.96	-303.2	hot/sunny	
6/21/2012	North Pole, AK	HP-17 14	S, BTEX	9.81	7.47	0.96	388	5.57	-26.6	slightly cloudy	
6/21/2012	North Pole, AK	HP-17 24	S, BTEX	9.03	7.70	0.85	300	6.35	-59.8	slightly cloudy	
6/21/2012	North Pole, AK	HP-17 34	S, BTEX	9.44	11.83	0.38	301	7.10	-142.4	cloudy	
6/21/2012	North Pole, AK	HP-17 44	S	10.01	8.24	0.48	275	6.77	-121.4	cloudy	
6/21/2012	North Pole, AK	HP-17 54	S	10.13	8.31	0.67	265	6.62	-109.1	cloudy	
6/9/2012	North Pole, AK	HP-19-15	S	8.65	4.92	1.57	515	5.23	-31.4	cloudy	
6/9/2012	North Pole, AK	HP-19-25	S	8.65	5.58	0.95	491	6.26	-105.4	cloudy	
6/9/2012	North Pole, AK	HP-19-34	S	9.38	6.07	1.03	381	6.80		cloudy	
6/9/2012	North Pole, AK	HP-19-45	S	14.00	9.47	0.58	363	7.74	-223.4	sunny/hot	
6/9/2012	North Pole, AK	HP-19-54	S	14.60	7.85	0.30	342	6.98	-146.3	warm	
6/9/2012	North Pole, AK	HP-20-15	S	7.15	5.89	1.15	486	6.25	-104.4	cloudy	
6/9/2012	North Pole, AK	HP-20-25	S	7.20	6.44	1.69	415	6.48	-126.5	cloudy/cool	
6/9/2012	North Pole, AK	HP-20-35	S	8.60	6.00	0.89	382	7.07	-136.6	overcast	
6/9/2012	North Pole, AK	HP-20-40	S	10.54	6.88	0.78	334	7.24	-141.7	warm	
6/9/2012	North Pole, AK	HP-20-54	S	13.45	7.35	0.60	336	7.14	-177.9	cloudy	
6/13/2012	North Pole, AK	HP-21-16	S, BTEX	10.85	7.34	3.09	365	5.43	-27.2	rain	
6/13/2012	North Pole, AK	HP-21-25	S, BTEX	9.08	7.64	3.80	354	6.50	-139.0	rain	
6/15/2012	North Pole, AK	HP-21-31	S, BTEX	25.10	10.52	0.63	332	8.00	-297.7	cloudy	
6/14/2012	North Pole, AK	HP-22-13	S, BTEX	6.00	5.66	1.94	409	6.89	-74.8	clear/warm	
6/14/2012	North Pole, AK	HP-22-24	S, BTEX	6.55	5.36	1.06	442	6.85	-107.2	clear/warm	
6/14/2012	North Pole, AK	HP-22-34	S, BTEX	6.71	6.24	1.63	333	7.21	-134.0	cloudy	
6/14/2012	North Pole, AK	HP-22-43	S, BTEX	7.81	8.14	1.01	319	7.68	-208.6	sunny	
6/14/2012	North Pole, AK	HP-23-14	S, BTEX	10.50	6.00	1.66	514	4.69	7.2	clear	
6/14/2012	North Pole, AK	HP-23-32	S, BTEX	8.65	6.62	3.88	336	6.63	-147.6	warm/cloudy	
6/14/2012	North Pole, AK	HP-23-24	S, BTEX	7.80	5.92	2.43	411	7.14	-119.7	clear/warm	
6/14/2012	North Pole, AK	HP-23-42	S, BTEX	10.08	7.55	0.85	331	7.15	-139.0	cloudy	
6/14/2012	North Pole, AK	HP-23-53	S, BTEX	12.09	8.62	3.44	317	7.51	-125.8	--	
6/20/2012	North Pole, AK	HP-24 14	S	7.66	7.66	0.66	358	5.91	9.7	clear	
6/20/2012	North Pole, AK	HP-24 24	S, BTEX	8.18	8.48	0.58	283	6.29	-108.5	cloudy	
6/20/2012	North Pole, AK	HP-24 34	S, BTEX	8.72	8.95	0.70	276	7.26	-121.8	cloudy	
6/20/2012	North Pole, AK	HP-24 44	S, BTEX	11.54	10.22	0.58	285	7.25	-113.2	cloudy	
6/20/2012	North Pole, AK	HD-24 44	†	†	†	†	†	†	†	†	Equipment Blank

**Table 6  
Hydropunch Sample Field Parameter Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Date	Location	Soil Boring	Analysis	Depth to Water from Ground Surface (Feet)	Temperature (°C)	DO (mg/L) ‡	Conductivity (µS/cm)	pH	ORP (mV)	Water Clarity	Notes
6/20/2012	North Pole, AK	HD-24 44	†	†	†	†	†	†	†	†	Equipment Blank
6/20/2012	North Pole, AK	HP-24 54	S, BTEX	11.47	10.86	0.48	279	7.21	-105.7	cloudy	
6/25/2012	North Pole, AK	HP-25 14	S, BTEX	8.61	4.99	0.63	400	5.12	46.8	slightly cloudy	
6/25/2012	North Pole, AK	HD-25 14	†	†	†	†	†	†	†	†	Duplicate of HP-25 14
6/25/2012	North Pole, AK	HP-25 24	S, BTEX	14.76	5.33	0.75	286	6.77	-112.5	slightly cloudy	
6/25/2012	North Pole, AK	HP-25 34	S, BTEX	17.19	6.9	0.42	245	6.69	-88.0	slightly cloudy	
6/25/2012	North Pole, AK	HP-25 44	S, BTEX	12.92	6.87	0.27	234	6.89	-119.0	slightly cloudy	
6/25/2012	North Pole, AK	HP-25 54	S, BTEX	15.36	7.27	0.36	230	7.50	-143.3	slightly cloudy	
6/24/2012	North Pole, AK	HP-26 14	S, BTEX	7.29	5.39	0.55	296	5.58	-38.1	slightly cloudy	
6/24/2012	North Pole, AK	HP-26 24	S, BTEX	7.64	6.91	0.63	265	7.41	-135.0	slightly cloudy	
6/24/2012	North Pole, AK	HP-26 34	S, BTEX	14.45	7.36	0.35	276	7.30	-146.5	slightly cloudy	
6/24/2012	North Pole, AK	HP-26 45	S, BTEX	13.73	7.71	0.59	235	7.01	-99.2	cloudy	
6/24/2012	North Pole, AK	HP-26 54	S, BTEX	16.94	7.59	0.24	231	7.24	-132.9	cloudy	
6/12/2012	North Pole, AK	HP-27-25	S, BTEX	8.05	5.30	1.50	340	6.21	-92.1	raining	
6/12/2012	North Pole, AK	HP-27-34	S, BTEX	10.10	6.64	0.73	335	7.60	-194.7	cloudy	
6/12/2012	North Pole, AK	HP-27-44	S, BTEX	11.18	6.53	0.88	323	7.66	-192.7	cloudy	
6/12/2012	North Pole, AK	HP-27-51	S, BTEX	11.80	6.91	0.86	323	7.79	-232.7	cloudy	
6/12/2012	North Pole, AK	HP-28-15	S, BTEX	10.58	5.28	3.43	626	5.63	-66.8	raining	
6/12/2012	North Pole, AK	HP-28-26	S, BTEX	10.68	6.81	1.12	359	7.25	-165.4	cloudy	
6/12/2012	North Pole, AK	HP-28-35	S, BTEX	12.00	6.22	0.66	369	7.40	-198.8	raining	
6/12/2012	North Pole, AK	HP-28-45	S, BTEX	12.13	7.24	0.76	358	7.76	-227.6	cloudy	
6/12/2012	North Pole, AK	HP-28-55	S, BTEX	13.71	7.42	0.87	334	7.42	-203.9	cloudy	
6/23/2012	North Pole, AK	HP-29 14	S	7.83	6.52	0.86	328	5.33	-6.9	clear	
6/23/2012	North Pole, AK	HP-29 24	S	8.53	7.99	0.39	294	6.92	-109.7	slightly cloudy	
6/23/2012	North Pole, AK	HP-29 34	S	11.55	8.88	0.32	288	6.98	-109.1	cloudy	
6/23/2012	North Pole, AK	HP-29 44	S	11.43	9.90	0.63	293	6.88	-94.0	cloudy	
6/23/2012	North Pole, AK	HP-29 54	S	13.22	9.68	0.35	292	7.15	-106.9	cloudy	
6/26/2012	North Pole, AK	HP-30 14	--	--	--	--	--	--	--	--	No sample taken due to refusal at 7.0'
8/10/2012	North Pole, AK	HP-30 14	S	6.62	5.9	0.11	262.7	7.62	-115.9	slightly cloudy	
8/10/2012	North Pole, AK	HP-30 24	S	10.91	6.0	0.09	256.6	7.68	-146.0	cloudy	
8/10/2012	North Pole, AK	HP-30 34	S	8.59	7.5	0.10	294.0	7.63	-126.7	cloudy	
8/10/2012	North Pole, AK	HP-30 44	S	8.77	7.8	0.13	282.4	7.70	-173.8	cloudy	
8/10/2012	North Pole, AK	HP-30 54	S	9.79	9.0	0.12	282.7	7.65	-203.5	cloudy	
6/26/2012	North Pole, AK	HP-31 14	S	7.08	5.32	0.97	268	4.73	31.4	slightly cloudy	
6/26/2012	North Pole, AK	HP-31 24	S	7.68	5.67	0.57	302	6.59	-99.5	cloudy	
6/26/2012	North Pole, AK	HD-31 24	†	†	†	†	†	†	†	†	Duplicate of HP-31 24
6/26/2012	North Pole, AK	HP-31 34	S	9.04	6.31	0.89	298	7.13	-125.4	cloudy	
6/26/2012	North Pole, AK	HP-31 44	S	12.99	6.56	0.33	226	7.93	-246.7	cloudy	

**Table 6  
Hydropunch Sample Field Parameter Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Date	Location	Soil Boring	Analysis	Depth to Water from Ground Surface (Feet)	Temperature (°C)	DO (mg/L) ‡	Conductivity (µS/cm)	pH	ORP (mV)	Water Clarity	Notes
6/26/2012	North Pole, AK	HP-31 54	--	27.77	--	--	--	--	--	--	No sample taken due to water level depth and recharge rate
7/5/2012	North Pole, AK	HP-32 14	S	7.46	7.9	2.30	335.5	6.95	-114.9	clear	
7/5/2012	North Pole, AK	HP-32 19	S	7.58	7.5	3.34	357.6	7.13	-130.6	cloudy	
7/5/2012	North Pole, AK	HP-32 24	S	6.40	7.1	1.60	271.4	7.37	-141.6	slightly cloudy	
7/5/2012	North Pole, AK	HD-32 24	†	†	†	†	†	†	†	†	Duplicate of HP-32-24
7/5/2012	North Pole, AK	HP-33 14	S, BTEX	8.20	8.2	13.09	334.9	6.81	-109.2	clear	
7/5/2012	North Pole, AK	HP-33 19	S	8.14	6.4	2.21	306.3	7.20	-125.1	cloudy	
7/5/2012	North Pole, AK	HP-33 24	S	8.08	6.5	1.91	273.4	7.25	-130.9	clear	
7/7/2012	North Pole, AK	HP-34 15	S	8.60	5.0	0.35	324.2	7.33	-123.9	product, cloudy	
7/7/2012	North Pole, AK	HP-34 20	S	7.89	5.5	0.63	313.5	7.59	-135.2	product, cloudy	
7/7/2012	North Pole, AK	HP-34 25	S	8.20	5.6	0.20	283.9	7.94	-142.8	Not noted	
7/7/2012	North Pole, AK	HP-35 15	S	7.66	5.4	0.51	308.0	7.46	-130.7	cloudy	
7/7/2012	North Pole, AK	HP-35 20	S	7.60	5.3	0.20	282.9	7.62	-130.1	product, cloudy	
7/7/2012	North Pole, AK	HP-35 25	S	7.58	5.7	0.24	270.2	7.84	-131.5	product, cloudy	
7/7/2012	North Pole, AK	HD-35 25	†	†	†	†	†	†	†	†	Duplicare of HP-35 25
7/6/2012	North Pole, AK	HP-36 15	S	7.19	7.1	7.00	343.2	6.80	-79.6	product, cloudy	
7/6/2012	North Pole, AK	HP-36 20	S	7.54	6.6	1.89	279.8	7.23	-92.1	product, cloudy	
7/6/2012	North Pole, AK	HP-36 25	S	7.57	6.8	§	273.5	7.37	-114.8	Not noted	
7/8/2012	North Pole, AK	HP-37 15	S	7.69	7.4	0.54	318.8	7.30	-129.9	product, cloudy	
7/8/2012	North Pole, AK	HP-37 20	S	7.54	5.8	10.80	295.2	7.45	-130.9	product, cloudy	
7/8/2012	North Pole, AK	HP-37-25	S	7.66	6.6	0.32	267.0	7.63	-158.4	product, cloudy	
7/6/2012	North Pole, AK	HP-38 15	S	6.74	4.5	§	287.0	7.24	-106.7	slightly cloudy	
7/6/2012	North Pole, AK	HP-38 20	S	6.84	5.0	§	279.0	7.35	-105.9	cloudy	
7/6/2012	North Pole, AK	HP-38 25	S	6.74	5.5	§	262.1	7.32	-104.2	Not noted	
7/8/2012	North Pole, AK	HP-39 15	S	7.61	7.1	0.32	259.9	7.28	-121.2	product, cloudy	
7/8/2012	North Pole, AK	HP-39 20	S	7.47	5.8	0.13	270.9	7.54	-164.1	product, cloudy	
7/8/2012	North Pole, AK	HP-39 25	S	7.66	6.4	13.99	261.6	7.77	-144.0	product, cloudy	
7/24/2012	North Pole, AK	HP-40 15	S, BTEX	6.55	9.6	0.14	398.7	6.73	-63.0	clear	
7/24/2012	North Pole, AK	HP-40 24	S, BTEX	6.66	8.5	0.12	363.9	7.51	-169.8	cloudy	
7/24/2012	North Pole, AK	HP-40 34	S, BTEX	6.64	9.1	0.14	314.4	7.46	-139.5	slightly cloudy	
7/24/2012	North Pole, AK	HP-40 44	S, BTEX	9.12	9.1	0.05	290.0	7.71	-168.1	cloudy	
7/24/2012	North Pole, AK	HP-40 54	S, BTEX	10.31	8.7	0.03	276.6	7.82	-120.7	cloudy	
7/25/2012	North Pole, AK	HP-41 14	S, BTEX	6.62	6.9	0.09	356.3	7.51	-175.4	cloudy	
7/25/2012	North Pole, AK	HP-41 24	S, BTEX	6.80	7.4	0.06	282.8	7.71	172.4	cloudy	
7/25/2012	North Pole, AK	HP-41 34	S, BTEX	9.88	8.2	0.04	233.9	7.65	-166.6	cloudy	
7/25/2012	North Pole, AK	HP-41 44	S, BTEX	10.05	8.6	0.08	227.1	7.63	-161.7	cloudy	
7/25/2012	North Pole, AK	HP-41 54	S, BTEX	10.34	9.4	0.06	189.8	7.61	-127.2	very cloudy	
7/31/2012	North Pole, AK	HP-42 14	S, BTEX	6.44	10.6	0.20	358.7	7.39	-148.2	product	
7/31/2012	North Pole, AK	HP-42 24	S, BTEX	8.88	9.2	0.11	348.0	7.49	-143.1	slightly cloudy	
7/31/2012	North Pole, AK	HP-42 34	S, BTEX	9.62	9.9	0.10	293.5	7.57	-141.8	slightly cloudy	
7/31/2012	North Pole, AK	HP-42 44	S, BTEX	10.31	10.5	0.11	294.7	7.59	-140.1	slightly cloudy	
7/31/2012	North Pole, AK	HP-42 54	S, BTEX	11.10	10.7	0.09	255.8	7.63	-116.5	slightly cloudy	
7/30/2012	North Pole, AK	HP-43 15	S, BTEX	6.61	10.9	0.26	509	6.61	-90.4	clear	

**Table 6  
Hydropunch Sample Field Parameter Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Date	Location	Soil Boring	Analysis	Depth to Water from Ground Surface (Feet)	Temperature (°C)	DO (mg/L) ‡	Conductivity (µS/cm)	pH	ORP (mV)	Water Clarity	Notes
7/30/2012	North Pole, AK	HP-43 25	S, BTEX	7.41	10.7	0.12	380.0	7.34	-142.1	sediment	
7/30/2012	North Pole, AK	HP-43 35	S, BTEX	8.53	9.4	0.11	277.4	7.39	-110.1	product	
7/30/2012	North Pole, AK	HP-43 45	S, BTEX	9.66	9.4	0.12	255.0	7.45	-104.2	product	
7/30/2012	North Pole, AK	HP-43 55	S, BTEX	12.06	9.6	0.07	256.6	7.76	-164.1	product	
7/28/2012	North Pole, AK	HP-44 14	S	6.63	11.9	0.13	750	7.14	-158.3	cloudy	
7/28/2012	North Pole, AK	HP-44 24	S	8.91	9.8	0.08	344.0	7.53	-136.2	cloudy	
7/28/2012	North Pole, AK	HP-44 34	S	9.41	9.2	0.06	263.5	7.55	-124.2	cloudy	
7/28/2012	North Pole, AK	HP-44 44	S	9.06	9.8	0.08	253.3	7.46	-90.9	cloudy	
7/28/2012	North Pole, AK	HP-44 54	S	12.09	10.5	0.07	253.2	7.65	-129.2	cloudy	
7/27/2012	North Pole, AK	HP-45 14	S	5.75	10.9	0.15	652	6.91	-111.7	clear	
7/27/2012	North Pole, AK	HP-45 24	S	8.53	9.2	0.03	563	7.23	-242.3	cloudy	
7/27/2012	North Pole, AK	HP-45 29	S	6.59	9.2	0.06	388.9	7.48	-94.3	cloudy	
7/27/2012	North Pole, AK	HD-45 29	†	†	†	†	†	†	†	†	Duplicate of HP-45 29
7/27/2012	North Pole, AK	HP-45 44	S	8.76	9.6	0.12	274.9	7.54	-84.5	cloudy	
7/27/2012	North Pole, AK	HP-45 54	S	9.16	10.2	0.09	259.4	7.59	-122.4	cloudy	
7/26/2012	North Pole, AK	HP-46 14	S, BTEX	5.94	11.8	0.11	331.8	7.23	-133.8	clear	
7/26/2012	North Pole, AK	HP-46 24	S, BTEX	6.48	9.4	0.10	286.1	7.34	-91.6	cloudy	
7/26/2012	North Pole, AK	HP-46 34	S, BTEX	6.63	10.3	0.11	286.0	7.39	-91.9	cloudy	
7/26/2012	North Pole, AK	HP-46 44	S, BTEX	8.50	11.2	0.08	291.7	7.51	-113.6	cloudy	
7/26/2012	North Pole, AK	HP-46 54	S, BTEX	6.87	12.1	0.06	281.3	7.75	-154.4	cloudy	
8/9/2012	North Pole, AK	HP-47 14	S	7.43	8.0	0.29	348.6	6.90	-60.3	clear	
8/9/2012	North Pole, AK	HP-47 24	S	7.63	8.4	0.18	283.9	7.23	-112.9	slightly cloudy	
8/9/2012	North Pole, AK	HD-47 24	†	†	†	†	†	†	†	†	Duplicate of HP-47 24
8/9/2012	North Pole, AK	HP-47 34	S	8.12	9.0	0.17	281.8	7.33	-100.1	slightly cloudy	
8/9/2012	North Pole, AK	HP-47 44	S	12.25	8.9	0.17	276.0	7.36	-131.1	slightly cloudy	
8/9/2012	North Pole, AK	HP-47 54	S	16.97	8.3	0.15	268.1	7.50	-143.2	cloudy	
8/8/2012	North Pole, AK	HP-48 14	S	7.87	6.2	0.23	351.5	7.11	-108.6	cloudy	
8/8/2012	North Pole, AK	HP-48 24	S	7.98	6.7	0.21	305.0	7.27	-134.5	cloudy	
8/8/2012	North Pole, AK	HP-48 34	S	14.72	7.6	0.16	298.5	7.42	-128.3	cloudy	
8/8/2012	North Pole, AK	HP-48 44	S	14.95	8.0	0.18	291.9	7.36	-115.4	cloudy	
8/8/2012	North Pole, AK	HP-48 54	S	30.45	10.7	0.07	304.4	7.84	-253.0	very cloudy	
8/7/2012	North Pole, AK	HP-49 15	S	9.00	7.4	0.21	278.2	6.69	-61.3	sediment	
8/7/2012	North Pole, AK	HD-49 15	†	†	†	†	†	†	†	†	Duplicate of HP-49 15
8/7/2012	North Pole, AK	HP-49 25	S	9.01	7.2	0.17	280.1	7.08	-90.3	sediment	
8/7/2012	North Pole, AK	HP-49 35	S	10.07	7.5	0.14	275.1	7.34	-106.1	heavy sediment	
8/7/2012	North Pole, AK	HP-49 45	S	12.08	7.9	0.13	261.9	7.39	-113.2	heavy sediment	
8/7/2012	North Pole, AK	HP-49 55	S	11.90	8.1	0.16	248.0	7.42	-87.8	heavy sediment	
8/6/2012	North Pole, AK	HP-50 14	S	10.87	6.3	0.26	312.0	6.80	50.2	clear	
8/6/2012	North Pole, AK	HP-50 24	S	10.76	7.9	0.21	287.5	7.20	-97.0	cloudy	
8/6/2012	North Pole, AK	HP-50 34	S	11.03	8.8	0.17	288.1	7.40	-112.0	cloudy	
8/6/2012	North Pole, AK	HP-50 44	S	13.55	8.8	0.16	279.3	7.51	-152.3	cloudy	
8/6/2012	North Pole, AK	HP-50 54	S	13.77	9.3	0.15	264.8	7.52	-141.8	cloudy	

**Table 6  
Hydropunch Sample Field Parameter Data**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Date	Location	Soil Boring	Analysis	Depth to Water from Ground Surface (Feet)	Temperature (°C)	DO (mg/L) ‡	Conductivity (µS/cm)	pH	ORP (mV)	Water Clarity	Notes
8/4/2012	North Pole, AK	HP-51 15	S	10.62	5.2	10.22	301.0	6.74	55.0	clear	
8/4/2012	North Pole, AK	HP-51 24	S	12.31	5.7	0.29	257.6	7.15	-54.9	cloudy	
8/4/2012	North Pole, AK	HP-51 34	S	11.66	6.3	0.17	260.2	7.33	-94.1	cloudy	
8/4/2012	North Pole, AK	HD-51 34	†	†	†	†	†	†	†	†	Duplicate of HP-51 34
8/4/2012	North Pole, AK	HP-51 44	S	12.10	7.0	0.16	259.0	7.36	-134.9	cloudy	
8/4/2012	North Pole, AK	HP-51 54	S	14.86	7.3	0.19	299.9	7.32	-120.7	cloudy	
8/3/2012	North Pole, AK	HP-52 14	S	11.16	5.4	0.30	263.4	7.09	-27.1	clear	
8/3/2012	North Pole, AK	HP-52 24	S	13.50	5.6	0.20	244.7	7.24	-65.8	cloudy	
8/3/2012	North Pole, AK	HP-52 34	S	11.43	6.2	0.15	230.3	7.53	-121.2	slightly cloudy	
8/3/2012	North Pole, AK	HP-52 44	S	13.86	7.4	0.19	236.0	7.50	-112.6	cloudy	
8/3/2012	North Pole, AK	HP-52 54	S	21.75	7.3	0.17	229.2	7.51	-116.9	slightly cloudy	
8/2/2012	North Pole, AK	HP-53 15	S	10.46	6.3	0.16	482.7	6.45	64.4	sediment	
8/2/2012	North Pole, AK	HD-53 15	†	†	†	†	†	†	†	†	Duplicate of HP-53 15
8/2/2012	North Pole, AK	HP-53 25	S	12.59	8.0	0.13	299.8	7.22	-93.7	sediment	
8/2/2012	North Pole, AK	HP-53 35	S	11.10	8.4	0.13	281.3	7.26	-80.5	sediment	
8/2/2012	North Pole, AK	HP-53 45	S	11.87	8.9	0.12	284.3	7.29	-79.7	sediment	
8/2/2012	North Pole, AK	HP-53 55	S	13.83	9.0	0.13	280.0	7.32	-84.3	sediment	
8/1/2012	North Pole, AK	HP-54 15	S, BTEX	13.68	7.7	1.19	663	6.69	22.7	clear	
8/1/2012	North Pole, AK	HP-54 24	S	14.62	6.7	0.13	337.5	7.34	-120.2	slightly cloudy	
8/1/2012	North Pole, AK	HP-54 34	S	14.35	7.2	0.08	345.6	7.65	-143.0	cloudy	
8/1/2012	North Pole, AK	HP-54 44	S	14.73	7.9	0.09	332.2	7.61	-118.2	cloudy	
8/1/2012	North Pole, AK	HP-54 54	S	14.71	9.0	0.08	335.6	7.61	-126.5	cloudy	

Notes:

- S sulfolane
- BTEX benzene, toluene, ethylbenzene, and xylenes
- (ft.) Measurement in feet
- (°C) Temperature measured in degrees Celcius
- mg/L milligrams per liter
- µS/cm microsiemens per centimeter
- mV millivolts
- † Indicates that a duplicate or equipment blank was taken. See original sample sheet.
- § Instrument malfunction
- ‡ Due to the equipment used for hydropunch sampling, DO results may be biased
- ~ Approximated value
- Not applicable or no data

**Table 7  
Hydropunch Sampling Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Sample Name	Location Name	Sample Date	Dup	Depth	Sulfolane (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	P & M -Xylene (µg/L)	o-Xylene (µg/L)
<b>Alaska Department of Environmental Conservation (ADEC) Alternative Cleanup Level (ACL) and Groundwater Cleanup Levels (GCLs)</b>					<b>14</b>	<b>5</b>	<b>1,000</b>	<b>700</b>	<b>10,000</b>	
HP-1 14	HP-1	6/18/12		14	104	--	--	--	--	--
HP-1 24	HP-1	6/18/12		24	171	--	--	--	--	--
HP-1 34	HP-1	6/18/12		34	123	--	--	--	--	--
HP-1 44	HP-1	6/18/12		44	63.1	--	--	--	--	--
HD-1 44	HP-1	6/18/12	DUP	44	67.7J*	--	--	--	--	--
HP-1 54	HP-1	6/18/12		54	49.1	--	--	--	--	--
HP-2 15	HP-2	6/4/12		15	146	--	--	--	--	--
HP-2 25	HP-2	6/4/12		25	106	--	--	--	--	--
HP-2 35	HP-2	6/4/12		35	121	--	--	--	--	--
HP-3 20	HP-3	6/6/12		20	146	--	--	--	--	--
HP-3 30	HP-3	6/6/12		30	160	--	--	--	--	--
HP-3 40	HP-3	6/6/12		40	157	--	--	--	--	--
HP-3 50	HP-3	6/6/12		50	8.89J	--	--	--	--	--
HP-3 60	HP-3	6/6/12		60	<6.52	--	--	--	--	--
HP-4 20	HP-4	6/5/12		20	196JL*	--	--	--	--	--
HP-4 30	HP-4	6/5/12		30	56.4JL*	--	--	--	--	--
HP-4 40	HP-4	6/5/12		40	27.2JL*	--	--	--	--	--
HP-5 15	HP-5	6/7/12		15	252	--	--	--	--	--
HP-5 25	HP-5	6/7/12		25	225	--	--	--	--	--
HP-5 35	HP-5	6/7/12		35	8.88J	--	--	--	--	--
HP-5 45	HP-5	6/7/12		45	6.36J	--	--	--	--	--
HP-6 20	HP-6	6/6/12		20	83.2	--	--	--	--	--
HP-6 30	HP-6	6/6/12		30	42.1	--	--	--	--	--
HP-6 40	HP-6	6/6/12		40	7.69J	--	--	--	--	--
HP-6 48	HP-6	6/6/12		48	<6.46	--	--	--	--	--
HP-7 20	HP-7	6/7/12		20	<6.20	--	--	--	--	--
HP-7 30	HP-7	6/7/12		30	<6.20J*	--	--	--	--	--
HP-7 40	HP-7	6/7/12		40	<6.20	--	--	--	--	--
HP-8 15	HP-8	6/11/12		15	1110	--	--	--	--	--
HP-8 25	HP-8	6/11/12		25	83.2	--	--	--	--	--
HP-8 35	HP-8	6/11/12		35	10.9	--	--	--	--	--
HP-8 45	HP-8	6/11/12		45	<6.32	--	--	--	--	--
HP-8 54	HP-8	6/11/12		54	<6.20	--	--	--	--	--
HP-9 15	HP-9	6/11/12		15	98.3	--	--	--	--	--
HP-9 25	HP-9	6/11/12		25	95.6	--	--	--	--	--
HP-9 36	HP-9	6/11/12		36	130	--	--	--	--	--
HP-9 44	HP-9	6/11/12		44	10.8	--	--	--	--	--
HP-9 56	HP-9	6/11/12		56	3.63J	--	--	--	--	--
HP-10 13	HP-10	6/15/12		13	55.3JL*	5.65JL*	<0.620J*	<0.620J*	0.660JL*	3.01JL*
HP-10 23	HP-10	6/15/12		23	41.2JL*	10.8JL*	<0.620J*	<0.620J*	4.43JL*	0.750JL*
HP-10 33	HP-10	6/15/12		33	4.03JL*	0.350JL*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-10 44	HP-10	6/15/12		44	<6.20J*	0.210JL*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-10 54	HP-10	6/15/12		54	<6.60J*	0.740JL*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-11 13	HP-11	6/15/12		13	10.8JL*	<0.300J*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-11 23	HP-11	6/15/12		23	19.8JL*	0.170JL*	<0.620J*	<0.620J*	1.50JL*	<0.620J*
HP-11 34	HP-11	6/15/12		34	9.49JL*	<0.300J*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-11 44	HP-11	6/15/12		44	<6.20J*	0.180JL*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-12 14	HP-12	6/19/12		14	19.3	--	--	--	--	--
HP-12 24	HP-12	6/19/12		24	37.3	--	--	--	--	--

**Table 7  
Hydropunch Sampling Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Sample Name	Location Name	Sample Date	Dup	Depth	Sulfolane (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	P & M -Xylene (µg/L)	o-Xylene (µg/L)
<b>Alaska Department of Environmental Conservation (ADEC) Alternative Cleanup Level (ACL) and Groundwater Cleanup Levels (GCLs)</b>					<b>14</b>	<b>5</b>	<b>1,000</b>	<b>700</b>	<b>10,000</b>	
HP-12 34	HP-12	6/19/12		34	73.3	--	--	--	--	--
HP-12 44	HP-12	6/19/12		44	61.9	--	--	--	--	--
HP-12 54	HP-12	6/19/12		54	21.9	--	--	--	--	--
HP-13 14	HP-13	6/16/12		14	177	<0.300	<0.620	<0.620	<1.24	<0.620
HP-13 24	HP-13	6/16/12		24	238	<0.300	<0.620	<0.620	<1.24	<0.620
HP-13 39	HP-13	6/16/12		39	17	<0.300	<0.620	<0.620	<1.24	<0.620
HP-13 44	HP-13	6/16/12		44	10.5	<0.300	<0.620	<0.620	<1.24	<0.620
HP-14 14	HP-14	6/22/12		14	253	215	161	54.5	177	75.9
HD-14 14	HP-14	6/22/12	DUP	14	301	213	145	50.3	164	70.1
HP-14 24	HP-14	6/22/12		24	44.7	22.8	110	63.1	214	93.5
HP-14 34	HP-14	6/22/12		34	13.6	199	906	478	1,690	715
HP-14 44	HP-14	6/22/12		44	9.56J	111	318	131	387	183
HP-14 54	HP-14	6/22/12		54	<6.20	87.8	187	63	146	77.7
HP-15 15	HP-15	6/8/12		15	1,160	0.180J	<0.620	<0.620	<1.24	<0.620
HP-15 25	HP-15	6/8/12		25	515J*	<0.300	0.380J	<0.620	<1.24	<0.620
HP-15 34	HP-15	6/8/12		34	135	0.86	6.36	4.05	14.1	6.72
HP-15 45	HP-15	6/8/12		45	22.7	0.200J	1.14	0.400J	1.21J	0.640J
HP-15 54	HP-15	6/8/12		54	26.8	0.300J	1.58	0.480J	1.46J	0.720J
HP-16 15	HP-16	6/8/12		15	300	3.42	36.1	16.6	61.4	27.2
HP-16 25	HP-16	6/8/12		25	64.7	232	1,870	686	2,410	1,090
HP-16 35	HP-16	6/8/12		35	R	1,870	9,150	1,840	6,290	3,020
HP-16 45	HP-16	6/8/12		45	R	2,380	11,200	2,290	7,950	3,770
HP-16 53	HP-16	6/8/12		53	R	2,710	12,000	2,340	8,090	3,900
HP-16 62	HP-16	6/8/12		62	R	1,780	9,000	1,960	6,770	3,230
HP-17 14	HP-17	6/21/12		14	1,380	33.5	1.41	35.1	69	24.7
HP-17 24	HP-17	6/21/12		24	641	0.81	1.48	3.86	11	4.64
HP-17 34	HP-17	6/21/12		34	129	2.15	4.55	12.3	26.6	11.6
HP-17 44	HP-17	6/21/12		44	96.3	2.05	4.01	10.4	24.3	10.2
HP-17 54	HP-17	6/21/12		54	62.9	1.97	3.31	8.03	18.5	7.72
HP-19 15	HP-19	6/9/12		15	329	--	--	--	--	--
HP-19 25	HP-19	6/9/12		25	461	--	--	--	--	--
HP-19 34	HP-19	6/9/12		34	76.3	--	--	--	--	--
HP-19 45	HP-19	6/9/12		45	60.2	--	--	--	--	--
HP-19 54	HP-19	6/9/12		54	21.8J*	--	--	--	--	--
HP-20 15	HP-20	6/9/12		15	281	--	--	--	--	--
HP-20 25	HP-20	6/9/12		25	164J*	--	--	--	--	--
HP-20 35	HP-20	6/9/12		35	62.4	--	--	--	--	--
HP-20 44	HP-20	6/9/12		44	7.50J	--	--	--	--	--
HP-20 54	HP-20	6/9/12		54	8.52J	--	--	--	--	--
HP-21 16	HP-21	6/13/12		16	427	1	0.810J	4.16	16.3	6.29
HP-21 25	HP-21	6/13/12		25	291	1.87	1.41	6.16	19.8	8.36
HP-21 31	HP-21	6/13/12		31	152	4.00JL*	2.93JL*	11.1JL*	44.9JL*	17.0JL*
HP-22 13	HP-22	6/14/12		13	49.8JL*	31.0JL*	<0.620J*	<0.620J*	2.63JL*	2.08JL*
HP-22 24	HP-22	6/14/12		24	74.8JL*	157JL*	<0.620J*	<0.620J*	6.43JL*	9.76JL*
HP-22 34	HP-22	6/14/12		34	12.0JL*	3.63JL*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-22 43	HP-22	6/14/12		43	<6.74J*	0.650JL*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-23 14	HP-23	6/14/12		14	189JL*	5.07JL*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-23 24	HP-23	6/14/12		24	61.4JL*	0.380JL*	<0.620J*	<0.620J*	0.830JL*	<0.620J*
HP-23 32	HP-23	6/14/12		32	38.9JL*	<0.300J*	<0.620J*	<0.620J*	<1.24J*	<0.620J*

**Table 7  
Hydropunch Sampling Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Sample Name	Location Name	Sample Date	Dup	Depth	Sulfolane (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	P & M -Xylene (µg/L)	o-Xylene (µg/L)
<b>Alaska Department of Environmental Conservation (ADEC) Alternative Cleanup Level (ACL) and Groundwater Cleanup Levels (GCLs)</b>					<b>14</b>	<b>5</b>	<b>1,000</b>	<b>700</b>	<b>10,000</b>	
HP-23 42	HP-23	6/14/12		42	44.5JL*	<0.300J*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-23 53	HP-23	6/14/12		53	<6.52J*	<0.300J*	<0.620J*	<0.620J*	<1.24J*	<0.620J*
HP-24 14	HP-24	6/20/12		14	274	<0.300	<0.620	<0.620	<1.24	<0.620
HP-24 24	HP-24	6/20/12		24	59.3	<0.300	<0.620	<0.620	<1.24	<0.620
HP-24 34	HP-24	6/20/12		34	36.6	<0.300	<0.620	<0.620	<1.24	<0.620
HP-24 44	HP-24	6/20/12		44	59.5	<0.300	<0.620	<0.620	<1.24	<0.620
HD-24 44	HP-24	6/20/12	DUP	44	61.3	<0.300	<0.620	<0.620	<1.24	<0.620
HP-24 54	HP-24	6/20/12		54	5.98J	<0.300	<0.620	<0.620	<1.24	<0.620
HP-25 14	HP-25	6/25/12		14	515J*	<0.300	<0.620	<0.620	<1.24	<0.620
HD-25 14	HP-25	6/25/12	DUP	14	464	<0.300	<0.620	<0.620	<1.24	<0.620
HP-25 24	HP-25	6/25/12		24	331	<0.300	<0.620	<0.620	<1.24	<0.620
HP-25 34	HP-25	6/25/12		34	82	<0.300	<0.620	<0.620	<1.24	<0.620
HP-25 44	HP-25	6/25/12		44	30.9	<0.300	<0.620	<0.620	<1.24	<0.620
HP-25 54	HP-25	6/25/12		54	9.35J	<0.300	<0.620	<0.620	<1.24	<0.620
HP-26 14	HP-26	6/24/12		14	327J*	0.420J	<0.620	<0.620	0.940J	0.420J
HP-26 24	HP-26	6/24/12		24	219	0.160J	<0.620	<0.620	<1.24	0.360J
HP-26 34	HP-26	6/24/12		34	243	0.240J	<0.620	<0.620	<1.24	0.310J
HP-26 44	HP-26	6/24/12		44	18.7	<0.300	<0.620	<0.620	<1.24	<0.620
HP-26 54	HP-26	6/24/12		54	9.55J	<0.300	<0.620	<0.620	<1.24	<0.620
HP-27 15	HP-27	6/12/12		15	292	17.2	<0.620	11.2	50.2	0.430J
HP-27 25	HP-27	6/12/12		25	97.6	0.360J	<0.620	<0.620	1.84J	<0.620
HP-27 34	HP-27	6/12/12		34	81.8	0.220J	<0.620	<0.620	0.740J	<0.620
HP-27 44	HP-27	6/12/12		44	23	0.210J	<0.620	<0.620	<1.24	<0.620
HP-27 51	HP-27	6/12/12		51	19	0.420J	0.580J	0.330J	1.76J	<0.620
HP-28 15	HP-28	6/12/12		15	188	150	0.810J	52.7	976	3.14
HP-28 26	HP-28	6/12/12		26	160	1.56	<0.620	0.580J	9.91	0.400J
HP-28 35	HP-28	6/12/12		35	49.9	9.26	<0.620	3.39	62.2	0.560J
HP-28 45	HP-28	6/12/12		45	38.1	0.94	<0.620	0.360J	5.02	<0.620
HP-28 55	HP-28	6/12/12		55	25.1	0.64	<0.620	<0.620	4.03	<0.620
HP-29 14	HP-29	6/23/12		14	67.5	--	--	--	--	--
HP-29 24	HP-29	6/23/12		24	41.2	--	--	--	--	--
HP-29 34	HP-29	6/23/12		34	26.9	--	--	--	--	--
HP-29 44	HP-29	6/23/12		44	20.6	--	--	--	--	--
HP-29 54	HP-29	6/23/12		54	20.3	--	--	--	--	--
HP-30 14	HP-30	8/10/12		14	43.1	--	--	--	--	--
HP-30 24	HP-30	8/10/12		24	69.8	--	--	--	--	--
HP-30 34	HP-30	8/10/12		34	68	--	--	--	--	--
HP-30 44	HP-30	8/10/12		44	53.1	--	--	--	--	--
HP-30 54	HP-30	8/10/12		54	52.3	--	--	--	--	--
HP-31 14	HP-31	6/26/12		14	48.6	--	--	--	--	--
HP-31 24	HP-31	6/26/12		24	91.9	--	--	--	--	--
HD-31 24	HP-31	6/26/12	DUP	24	93.8	--	--	--	--	--
HP-31 34	HP-31	6/26/12		34	82.8	--	--	--	--	--
HP-31 44	HP-31	6/26/12		44	94.8	--	--	--	--	--
HP-32 14	HP-32	7/5/12		14	1,420	28.7	<0.620	20.8	164	2.29
HP-32 19	HP-32	7/5/12		19	1,420	10.7	0.440J	33.5	195	27.3
HP-32 24	HP-32	7/5/12		24	1,310	1.12	0.320J	24.3	161	25.6
HD-32 24	HP-32	7/5/12	DUP	24	1,110	1.15	0.350J	23.9	158	25.4
HP-33 14	HP-33	7/5/12		14	213	29	0.990J	174	631	164

**Table 7  
Hydropunch Sampling Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Sample Name	Location Name	Sample Date	Dup	Depth	Sulfolane (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	P & M -Xylene (µg/L)	o-Xylene (µg/L)
<b>Alaska Department of Environmental Conservation (ADEC) Alternative Cleanup Level (ACL) and Groundwater Cleanup Levels (GCLs)</b>					<b>14</b>	<b>5</b>	<b>1,000</b>	<b>700</b>	<b>10,000</b>	
HP-33 19	HP-33	7/5/12		19	374	28	1.22	235	843	376
HP-33 24	HP-33	7/5/12		24	937	5.4	<0.620	58.4	246	106
HP-34 15	HP-34	7/7/12		15	25.3	118	1.4	221	1,250	40.3
HP-34 20	HP-34	7/7/12		20	79	55.4	<0.620	86.7	195	22.8
HP-34 25	HP-34	7/7/12		25	850	3.13	0.370J	45.3	116	32.3
HP-35 15	HP-35	7/7/12		15	18.2	50	0.630J	78.1	575	265
HP-35 20	HP-35	7/7/12		20	49.1J	13.3	<0.620	27.2	132	44.4
HP-35 25	HP-35	7/7/12		25	104	9.99	<0.620	33.3	128	59.6
HD-35 25	HP-35	7/7/12	DUP	25	90.4	10.3	<0.620	32.9	125	58
HP-36 15	HP-36	7/6/12		15	1490	16.3	0.330J	63.1	291	103
HP-36 20	HP-36	7/6/12		20	1680	7.45	0.400J	94.7	375	168
HP-36 25	HP-36	7/6/12		25	2,040JN^*	34.3	2	459	1,890	801
HP-37 15	HP-37	7/8/12		15	<12.6^*	4.64	<0.620	68	274	89.9
HP-37 20	HP-37	7/8/12		20	54.8JN^*	3.82	0.630J	83.6	323	132
HP-37 25	HP-37	7/8/12		25	261	2.74	0.520J	132	443	223
HP-38 15	HP-38	7/6/12		15	1,100	0.280J	<0.620	3.45	6.36	1.59
HP-38 20	HP-38	7/6/12		20	1,710	0.54	<0.620	25.7	107	50.2
HP-38 25	HP-38	7/6/12		25	1,460	0.480J	<0.620	15.7	66.9	30.6
HP-39 15	HP-39	7/8/12		15	62.8JN^*	6.69	0.740J	98.2	382	82.9
HP-39 20	HP-39	7/8/12		20	104JN^*	4.61	2.06	276	1,080	412
HP-39 25	HP-39	7/8/12		25	512	4.29	0.490J	87.4	317	119
HP-40 15	HP-40	7/24/12		15	44.2	--	--	--	--	--
HP-40 24	HP-40	7/24/12		24	51.7	0.59	<0.620	<0.620	<1.24	<0.620
HP-40 34	HP-40	7/24/12		34	25.3	0.280J	<0.620	<0.620	<1.24	<0.620
HP-40 44	HP-40	7/24/12		44	6.66J	<0.300	<0.620	<0.620	<1.24	<0.620
HP-40 54	HP-40	7/24/12		54	4.37J	<0.300	<0.620	<0.620	<1.24	<0.620
HP-41 14	HP-41	7/25/12		14	52.6	148	<0.620	<0.620	<1.24	<0.620
HD-41 14	HP-41	7/25/12	DUP	14	53.7	149	<0.620	<0.620	<1.24	<0.620
HP-41 24	HP-41	7/25/12		24	16.1	0.6	<0.620	<0.620	<1.24	<0.620
HP-41 34	HP-41	7/25/12		34	27.3	3.69	<0.620	<0.620	<1.24	<0.620
HP-41 44	HP-41	7/25/12		44	5.69J	0.260J	<0.620	<0.620	<1.24	<0.620
HP-41 54	HP-41	7/25/12		54	<6.20	0.170J	<0.620	<0.620	<1.24	<0.620
HP-42 14	HP-42	7/31/12		14	<6.20	27	<0.620	0.410J	3.14	0.430J
HD-42 24	HP-42	7/31/12	DUP	24	<6.26	21.7	<0.620	0.460J	1.82J	<0.620
HP-42 24	HP-42	7/31/12		24	<6.20	21.6	<0.620	0.440J	1.69J	<0.620
HP-42 34	HP-42	7/31/12		34	<6.20	0.72	<0.620	<0.620	<1.24	<0.620
HP-42 44	HP-42	7/31/12		44	<6.26	<0.300	<0.620	<0.620	<1.24	<0.620
HP-42 54	HP-42	7/31/12		54	<6.20	<0.300	<0.620	<0.620	<1.24	<0.620
HP-43 15	HP-43	7/30/12		15	34.1	336	0.440J	15.4	991	16.2
HP-43 25	HP-43	7/30/12		25	11.5JN^*	8.43	7.14	3.79	229	226
HP-43 35	HP-43	7/30/12		35	<6.20	11.8	7.09	3.96	211	217
HP-43 45	HP-43	7/30/12		45	<6.20	3.89	3.96	2.18	104	109
HP-43 55	HP-43	7/30/12		55	<6.20	8.64	14.8	6.18	377	344
HP-44 14	HP-44	7/28/12		14	301JL*	223	0.320J	3.07	49.1	1.13
HP-44 24	HP-44	7/28/12		24	21.9J*	20.7	0.460J	<0.620	1.15J	0.380J
HP-44 34	HP-44	7/28/12		34	<6.20	0.420J	<0.620	<0.620	<1.24	<0.620
HP-44 44	HP-44	7/28/12		44	<6.20	0.310J	<0.620	<0.620	<1.24	<0.620
HP-44 54	HP-44	7/28/12		54	<6.20	0.64	<0.620	<0.620	0.620J	<0.620
HP-45 14	HP-45	7/27/12		14	15,900JL*	11,300	1,460	350	2,760	1,230

**Table 7  
Hydropunch Sampling Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Sample Name	Location Name	Sample Date	Dup	Depth	Sulfolane (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	P & M -Xylene (µg/L)	o-Xylene (µg/L)
<b>Alaska Department of Environmental Conservation (ADEC) Alternative Cleanup Level (ACL) and Groundwater Cleanup Levels (GCLs)</b>					<b>14</b>	<b>5</b>	<b>1,000</b>	<b>700</b>	<b>10,000</b>	
HP-45 24	HP-45	7/27/12		24	706	372	592	99.3	948	443
HP-45 29	HP-45	7/27/12		29	269	82.3	353	73.7	584	285
HD-45 29	HP-45	7/27/12	DUP	29	278	78.5	347	68.1	563	281
HP-45 44	HP-45	7/27/12		44	R	376	2,210	261	2,820	1,320
HP-45 54	HP-45	7/27/12		54	R	270	1,530	200	2,190	1,040
HP-46 14	HP-46	7/26/12		14	138	38.4	3.63	2.33	13.5	6.69
HP-46 24	HP-46	7/26/12		24	R	68.7	296	111	636	259
HP-46 34	HP-46	7/26/12		34	4.27JL*	109	311	82.2	414	187
HP-46 44	HP-46	7/26/12		44	3.39J*	102	255	52	242	118
HP-46 54	HP-46	7/26/12		54	11.7	310	698	133	701	320
HP-47 14	HP-47	8/9/12		14	39.7	--	--	--	--	--
HP-47 24	HP-47	8/9/12		24	10.9	--	--	--	--	--
HD-47 24	HP-47	8/9/12	DUP	24	11.2	--	--	--	--	--
HP-47 34	HP-47	8/9/12		34	<6.20	--	--	--	--	--
HP-47 44	HP-47	8/9/12		44	<6.20	--	--	--	--	--
HP-47 54	HP-47	8/9/12		54	<6.20	--	--	--	--	--
HP-48 14	HP-48	8/8/12		14	190	--	--	--	--	--
HP-48 24	HP-48	8/8/12		24	30	--	--	--	--	--
HP-48 34	HP-48	8/8/12		34	16.9	--	--	--	--	--
HP-48 44	HP-48	8/8/12		44	<6.20	--	--	--	--	--
HP-48 54	HP-48	8/8/12		54	<6.88	--	--	--	--	--
HP-49 15	HP-49	8/7/12		15	720	--	--	--	--	--
HD-49 15	HP-49	8/7/12		15	687	--	--	--	--	--
HP-49 25	HP-49	8/7/12		25	509	--	--	--	--	--
HP-49 35	HP-49	8/7/12		35	237	--	--	--	--	--
HP-49 45	HP-49	8/7/12		45	26.3	--	--	--	--	--
HP-49 55	HP-49	8/7/12		55	5.00J	--	--	--	--	--
HP-50 14	HP-50	8/6/12		14	914	--	--	--	--	--
HP-50 24	HP-50	8/6/12		24	218	--	--	--	--	--
HP-50 34	HP-50	8/6/12		34	23.6	--	--	--	--	--
HP-50 44	HP-50	8/6/12		44	21.4	--	--	--	--	--
HP-50 54	HP-50	8/6/12		54	<6.20	--	--	--	--	--
HP-51 15	HP-51	8/4/12		15	127	--	--	--	--	--
HP-51 24	HP-51	8/4/12		24	98.7	--	--	--	--	--
HP-51 34	HP-51	8/4/12		34	14.5	--	--	--	--	--
HD-51 34	HP-51	8/4/12	DUP	34	16.7	--	--	--	--	--
HP-51 44	HP-51	8/4/12		44	7.10J	--	--	--	--	--
HP-51 54	HP-51	8/4/12		54	5.94J	--	--	--	--	--
HP-52 14	HP-52	8/3/12		14	44.4	--	--	--	--	--
HP-52 24	HP-52	8/3/12		24	31.4	--	--	--	--	--
HP-52 34	HP-52	8/3/12		34	16.3	--	--	--	--	--
HP-52 44	HP-52	8/3/12		44	6.57J	--	--	--	--	--
HP-52 54	HP-52	8/3/12		54	<6.20	--	--	--	--	--
HP-53 15	HP-53	8/2/12		15	395	--	--	--	--	--
HD-53 15	HP-53	8/2/12	DUP	15	370	--	--	--	--	--
HP-53 25	HP-53	8/2/12		25	94.4	--	--	--	--	--
HP-53 35	HP-53	8/2/12		35	10.0J	--	--	--	--	--
HP-53 45	HP-53	8/2/12		45	11.5	--	--	--	--	--
HP-53 55	HP-53	8/2/12		55	<6.46	--	--	--	--	--

**Table 7  
Hydropunch Sampling Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Sample Name	Location Name	Sample Date	Dup	Depth	Sulfolane (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	P & M -Xylene (µg/L)	o-Xylene (µg/L)
<b>Alaska Department of Environmental Conservation (ADEC) Alternative Cleanup Level (ACL) and Groundwater Cleanup Levels (GCLs)</b>					<b>14</b>	<b>5</b>	<b>1,000</b>	<b>700</b>	<b>10,000</b>	
HP-54 15	HP-54	8/1/12		15	318	--	--	--	--	--
HP-54 24	HP-54	8/1/12		24	111	--	--	--	--	--
HP-54 34	HP-54	8/1/12		34	207	--	--	--	--	--
HP-54 44	HP-54	8/1/12		44	183	--	--	--	--	--
HP-54 54	HP-54	8/1/12		54	190	--	--	--	--	--

**Notes:**  
 \* = Data flag applied based on S&W's Level II data assurance review.  
 < ... J\* = Limit of detection is considered in question due to potential low bias from sample handling or holding time issues (flag applied by SWI).  
 ^\* = Data flag applied based on ESI's Level IV data assurance review.  
 J = Estimated concentration, detected above the detection limit and below the limit of quantitation.  
 R = Laboratory could not quantify sulfolane due to hydrocarbon interference; datum is rejected.  
 N = Analysis indicates there is presumptive evidence to make a tentative identification of this compound.  
 J\* = Result is considered estimated (no direction of bias), due to quality control failures (flag applied by SWI).  
 JL\* = Result is considered estimated, biased low, due to quality control failures (flag applied by SWI).  
 < = not detected; limit of detection listed  
 -- = not analyzed  
 DUP = field duplicate sample  
 µg/L = micrograms per liter

**Table 8  
Soil Boring Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Location Name	Sample Date	Sample Name	Dup	Depth (feet)	Depth to Water (feet)	Sulfolane (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	P & M -Xylene (mg/kg)	o-Xylene (mg/kg)	Comments
<b>Alaska Department of Environmental Conservation (ADEC) Interim Estimated Screening Level and Soil Cleanup Levels (SCLs)</b>						<b>0.043</b>	<b>0.025</b>	<b>6.5</b>	<b>6.9</b>	<b>63</b>		
SB-184	05/23/12	SB-184 (0.0-2.0)		0.0-2.0	10.7	<0.00960	<0.0128	<0.0250	<0.0250	<0.0480	<0.0250	
SB-184	05/23/12	SB-184 (8.5-10.5)		8.5-10.5	10.7	<0.00848	<0.00920	<0.0179	<0.0179	<0.0346	<0.0179	
SB-185	05/22/12	SB-185 (0.0-2.0)		0.0-2.0	10.4	<0.00920	<0.0112	<0.0218	<0.0218	<0.0420	<0.0218	
SB-185	05/22/12	SB-185 (8.5-10.5)		8.5-10.5	10.4	<0.00960	<0.0120	<0.0234	<0.0234	<0.0452	<0.0234	
SB-186	05/29/12	SB-186 (0.0-2.0)		0.0-2.0	12	<0.00948	<0.0115	<0.0224	<0.0224	<0.0432	<0.0224	
SB-186	05/29/12	SB-186 (10.0-12.0)		10.0-12.0	12	0.0331	<0.00586	<0.0114	<0.0114	<0.0220	<0.0114	
SB-187	05/23/12	SB-187 (0.0-2.0)		0.0-2.0	11	<0.00890	<0.00710	<0.0138	<0.0138	<0.0266	<0.0138	
SB-187	05/23/12	SB-187 (9.0-11.0)		9.0-11.0	11	0.514	<0.0103	<0.0200	<0.0200	<0.0386	<0.0200	
SB-188	05/23/12	SB-188 (0.0-2.0)		0.0-2.0	8.5	<0.00854	<0.00810	<0.0158	<0.0158	<0.0304	<0.0158	
SB-188	05/23/12	SB-188 (6.5-8.5)		6.5-8.5	8.5	<0.00842	<0.00900	<0.0176	<0.0176	<0.0338	<0.0176	
SB-188	05/23/12	SD-188 (6.5-8.5)	DUP	6.5-8.5	8.5	<0.00842	<0.00750	<0.0146	<0.0146	<0.0282	<0.0146	
SB-189	05/23/12	SB-189 (0.0-2.0)		0.0-2.0	8.6	<0.00900	<0.00976	<0.0190	<0.0190	<0.0366	<0.0190	
SB-189	05/23/12	SB-189 (6.6-8.6)		6.6-8.6	8.6	<0.00850	<0.00782	<0.0153	<0.0153	<0.0294	<0.0153	
SB-190	05/24/12	SB-190 (0.0-2.0)		0.0-2.0	9.3	7.07	0.0233	0.0938	0.845	1.04	0.574	
SB-190	05/24/12	SB-190 (7.3-9.3)		7.3-9.3	9.3	1.12	<0.00930	<0.0181	<0.0181	<0.0348	<0.0181	
SB-191	05/23/12	SB-191 (0.0-2.0)		0.0-2.0	7.8	72.0J*	<0.0123	0.0284J	<0.0240	<0.0460	<0.0240	
SB-191	05/23/12	SB-191 (5.8-7.8)		5.8-7.8	7.8	36.8J*	<0.0139	<0.0270	<0.0270	<0.0520	<0.0270	
SB-192	05/24/12	SB-192 (0.0-2.0)		0.0-2.0	9	<0.00946	<0.0119	<0.0232	<0.0232	<0.0448	<0.0232	
SB-192	05/24/12	SD-192 (7.0-9.0)	DUP	7.0-9.0	9	0.0187	<0.00946	<0.0184	<0.0184	<0.0354	<0.0184	
SB-192	05/24/12	SB-192 (7.0-9.0)		7.0-9.0	9	0.0235	<0.00996	<0.0194	<0.0194	<0.0374	<0.0194	
SB-193	05/24/12	SB-193 (0.0-2.0)		0.0-2.0	6.9	27.4	<0.0119J	<0.0232J	<0.0232J	<0.0448J	<0.0232J	
SB-193	05/24/12	SB-193 (5.0-6.9)		5.0-6.9	6.9	21.3	<0.0150	<0.0292	<0.0292	<0.0564	<0.0292	
SB-194	05/24/12	SB-194 (0.0-2.0)		0.0-2.0	5.6	0.209	<0.0110	<0.0214	<0.0214	<0.0412	<0.0214	
SB-194	05/24/12	SB-194 (3.6-5.6)		3.6-5.6	5.6	97.0J	<0.0193	<0.0376	<0.0376	<0.0724	<0.0376	
SB-195	05/24/12	SB-195 (0.0-2.0)		0.0-2.0	8.6	1.27	<0.00898	<0.0175	<0.0175	<0.0336	<0.0175	
SB-195	05/24/12	SB-195 (6.6-8.6)		6.6-8.6	8.6	0.0123J	<0.00668	<0.0130	<0.0130	<0.0250	<0.0130	
SB-196	05/25/12	SB-196 (0.0-2.0)		0.0-2.0	7.1	0.00975J	<0.00850	<0.0166	<0.0166	<0.0318	<0.0166	
SB-196	05/25/12	SB-196 (5.1-7.1)		5.1-7.1	7.1	0.0535	<0.00932	0.0451	<0.0182	<0.0350	<0.0182	
SB-197	05/25/12	SB-197 (0.0-2.0)		0.0-2.0	6.6	0.00543J	<0.0101	<0.0197	<0.0197	<0.0378	<0.0197	
SB-197	05/25/12	SD-197 (5.0-6.6)	DUP	5.0-6.6	6.6	0.00819J	<0.00688	<0.0134	<0.0134	<0.0258	<0.0134	
SB-197	05/25/12	SB-197 (5.0-6.6)		5.0-6.6	6.6	<0.00834	<0.00778	<0.0152	<0.0152	<0.0292	<0.0152	
SB-198	05/30/12	SB-198 (0.0-2.0)		0.0-2.0	5.4	<0.0104	<0.0133	<0.0260	<0.0260	<0.0500	<0.0260	
SB-198	05/30/12	SB-198 (5.0-5.4)		5.0-5.4	5.4	<0.00902	<0.0119	<0.0232	<0.0232	<0.0446	<0.0232	
SB-199	05/30/12	SB-199 (0.0-1.0)		0.0-1.0	7.2	<0.00660	<0.00906	<0.0177	<0.0177	<0.0340	<0.0177	
SB-199	05/30/12	SB-199 (1.5-2.5)		1.5-2.5	7.2	R	<0.0130	0.0660	2.22	5.11	4.14	
SB-199	05/30/12	SB-199 (5.2-7.2)		5.2-7.2	7.2	<0.0100	<0.0119	<0.0232	<0.0232	<0.0446	<0.0232	
SB-200	05/30/12	SD-200 (0.0-2.0)	DUP	0.0-2.0	6.9	0.0495JL	<0.0122	0.183J	0.212	0.191	0.889J	
SB-200	05/30/12	SB-200 (0.0-2.0)		0.0-2.0	6.9	0.0179JL	<0.00932	<0.0182J	0.157	0.154	0.121J	
SB-200	05/30/12	SB-200 (5.0-6.9)		5.0-6.9	6.9	0.182	<0.0109	<0.0212	<0.0212	<0.0408	<0.0212	
SB-201	05/30/12	SB-201 (0.0-2.0)		0.0-2.0	5.1	0.0334	<0.0101	<0.0197	<0.0197	<0.0378	<0.0197	

**Table 8  
Soil Boring Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Location Name	Sample Date	Sample Name	Dup	Depth (feet)	Depth to Water (feet)	Sulfolane (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	P & M -Xylene (mg/kg)	o-Xylene (mg/kg)	Comments
<b>Alaska Department of Environmental Conservation (ADEC) Interim Estimated Screening Level and Soil Cleanup Levels (SCLs)</b>						<b>0.043</b>	<b>0.025</b>	<b>6.5</b>	<b>6.9</b>	<b>63</b>		
SB-201	05/30/12	SB-201 (5.0-5.5)		5.0-5.5	5.1	<0.00954	<0.0106	<0.0208	<0.0208	<0.0398	<0.0208	
SB-202	05/30/12	SB-202 (0.0-2.0)		0.0-2.0	5	<0.0102	<0.0134	<0.0262	<0.0262	<0.0504	<0.0262	
SB-202	05/30/12	SB-202 (5.0-5.5)		5.0-5.5	5	<0.0104	<0.0109	<0.0212	<0.0212	<0.0410	<0.0212	
SB-203	05/31/12	SB-203 (0.0-1.3)		0.0-1.3	5.4	<0.00758J	<0.0129	<0.0250	<0.0250	<0.0482	<0.0250	
SB-203	05/31/12	SB-203 (5.0-5.4)		5.0-5.4	5.4	<0.00636J	<0.00792	<0.0154	<0.0154	<0.0298	<0.0154	
SB-204	05/31/12	SB-204 (0.0-2.0)		0.0-2.0	5	<0.00612J	<0.00712	<0.0139	<0.0139	0.0174J	0.0140J	
SB-204	05/31/12	SB-204 (2.0-4.0)		2.0-4.0	5	<0.00688J	<0.00994	<0.0194	<0.0194	0.0336J	0.0267J	
SB-205	05/31/12	SD-205 (0.0-2.0)	DUP	0.0-2.0	5	<0.00732J	<0.00946	<0.0184	<0.0184	<0.0354	<0.0184	
SB-205	05/31/12	SB-205 (0.0-2.0)		0.0-2.0	5	<0.00706J	<0.0106	<0.0208	<0.0208	<0.0398	<0.0208	
SB-205	05/31/12	SB-205 (2.0-4.0)		2.0-4.0	5	0.0107JL	<0.0138	<0.0268	<0.0268	<0.0516	<0.0268	
SB-206	06/04/12	SB-206 (2.8-3.0)		2.8-3.0	3	<0.00704J*	<0.00736J*	<0.0143J*	<0.0143J*	<0.0276J*	<0.0143J*	Sample collected in Lagoon B
SB-207	06/06/12	SB-207 (3.2-3.4)		3.2-3.4	3.4	<0.00708J*	<0.00694J*	<0.0135J*	<0.0135J*	<0.0260J*	<0.0135J*	Sample collected in Lagoon B
SB-208	06/06/12	SB-208 (3.0-3.2)		3.0-3.2	3.2	<0.00686J*	<0.00500J*	<0.00976J*	<0.00976J*	<0.0188J*	<0.00976J*	Sample collected in Lagoon B
SB-209	06/06/12	SB-209 (3.0-3.2)		3.0-3.2	3.2	0.0237JL*	<0.00442J*	<0.00862J*	<0.00862J*	<0.0166J*	<0.00862J*	Sample collected in Lagoon B
SB-210	06/07/12	SB-210 (3.0-3.2)		3.0-3.2	3.2	<0.00782	<0.00888	<0.0173	<0.0173	<0.0332	<0.0173	Sample collected in Lagoon B
SB-211	06/26/12	SB-211 (2.5-3.0)		2.5-3.0	3	0.104	<0.0120	0.0124J	<0.0234	0.0334J	0.0345J	Sample collected in Lagoon B
SB-212	06/26/12	SB-212 (2.5-3.0)		2.5-3.0	3	0.405	<0.00964	<0.0188	<0.0188	<0.0362	0.0139J	Sample collected in Lagoon B
SB-213	06/06/12	SB-213 (3.0-3.2)		3.0-3.2	3.2	<0.00656J*	0.484J*	1.32J*	1.30J*	8.57J*	1.00J*	Sample collected in Lagoon B
SB-214	06/07/12	SB-214 (3.0-3.2)		3.0-3.2	3.2	<0.00670	<0.00472	<0.00920	<0.00920	<0.0177	<0.00920	Sample collected in Lagoon B
SB-215	06/26/12	SB-215 (2.5-3.0)		2.5-3.0	3	0.803	<0.0119	<0.0232	<0.0232	0.0420J	0.0457	Sample collected in Lagoon B
SB-216	06/26/12	SB-216 (2.5-3.0)		2.5-3.0	3	5.95	<0.0140	<0.0274	<0.0274	<0.0526	<0.0274	Sample collected in Lagoon B
SB-217	06/06/12	SB-217 (3.2-3.4)		3.2-3.4	3.4	0.120JL*	<0.00882J*	<0.0172J*	<0.0172J*	<0.0332J*	<0.0172J*	Sample collected in Lagoon B
SB-218	06/07/12	SB-218 (3.0-3.2)		3.0-3.2	3.2	<0.00764	<0.00782	<0.0153	<0.0153	<0.0294	<0.0153	Sample collected in Lagoon B
SB-219	06/26/12	SD-219 (2.5-3.0)	DUP	2.5-3.0	3	0.126	<0.00984	<0.0192	<0.0192	<0.0370	<0.0192	Sample collected in Lagoon B
SB-219	06/26/12	SB-219 (2.5-3.0)		2.5-3.0	3	0.125	<0.0103	<0.0202	<0.0202	<0.0388	<0.0202	Sample collected in Lagoon B
SB-220	06/26/12	SB-220 (2.5-3.0)		2.5-3.0	3	0.294	<0.0125	<0.0244	<0.0244	<0.0470	<0.0244	Sample collected in Lagoon B
SB-221	06/07/12	SB-221 (3.3-3.5)		3.3-3.5	3.5	<0.00698	<0.00592	<0.0115	<0.0115	<0.0222	<0.0115	Sample collected in Lagoon B
SB-222	06/05/12	SB-222 (3.0-3.2)		3.0-3.2	3.2	0.0288JL*	<0.0104J*	<0.0202J*	<0.0202J*	<0.0390J*	<0.0202J*	Sample collected in Lagoon B
SB-223	06/05/12	SB-223 (3.0-3.2)		3.0-3.2	3.2	0.0159JL*	<0.00748J*	<0.0146J*	<0.0146J*	<0.0280J*	<0.0146J*	Sample collected in Lagoon B
SB-224	06/05/12	SB-224 (3.6-3.8)		3.6-3.8	3.8	0.0151JL*	<0.00926J*	<0.0180J*	<0.0180J*	<0.0348J*	<0.0180J*	Sample collected in Lagoon B
SB-225	06/05/12	SB-225 (3.6-3.8)		3.6-3.8	3.8	<0.00672J*	<0.00500J*	<0.00976J*	<0.00976J*	<0.0188J*	<0.00976J*	Sample collected in Lagoon B
SB-226	05/31/12	SB-226 (0.0-2.0)		0.0-2.0	9.5	<0.00686J	<0.0106	<0.0206	<0.0206	<0.0396	<0.0206	
SB-226	05/31/12	SD-226 (7.0-9.0)	DUP	7.0-9.0	9.5	R	<0.0392	0.411	4.90	20.8	7.05	
SB-226	05/31/12	SB-226 (7.0-9.0)		7.0-9.0	9.5	R	0.306JL	0.683JL	9.22JL	37.0JL	16.0JL	
SB-226	05/31/12	SB-226 (16.0-17.7)		16.0-17.7	9.5	0.0158JL	<0.00674	<0.0131	0.0242	0.140	0.0128J	
SB-227	05/31/12	SB-227 (0.0-2.0)		0.0-2.0	9.5	<0.00676J	<0.0104	<0.0202	<0.0202	<0.0390	<0.0202	
SB-227	05/31/12	SB-227 (7.0-8.9)		7.0-8.9	9.5	R	0.486	1.19	12.3	47.4	20.8	
SB-227	05/31/12	SB-227 (16.0-17.3)		16.0-17.3	9.5	0.00506JL	<0.00700	<0.0136	<0.0136	<0.0262	<0.0136	
SB-228	05/31/12	SB-228 (0.0-2.0)		0.0-2.0	9.5	<0.0106J	<0.0308J	<0.0602J	<0.0602J	<0.116J	<0.0602J	
SB-228	05/31/12	SB-228 (6.0-7.5)		6.0-7.5	9.5	R	0.403JL	3.97JL	22.8JL	95.3JL	43.7JL	

**Table 8  
Soil Boring Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Location Name	Sample Date	Sample Name	Dup	Depth (feet)	Depth to Water (feet)	Sulfolane (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	P & M -Xylene (mg/kg)	o-Xylene (mg/kg)	Comments
<b>Alaska Department of Environmental Conservation (ADEC) Interim Estimated Screening Level and Soil Cleanup Levels (SCLs)</b>						<b>0.043</b>	<b>0.025</b>	<b>6.5</b>	<b>6.9</b>	<b>63</b>		
SB-228	05/31/12	SB-228 (11.5-13.0)		11.5-13.0	9.5	0.0158JL	<0.00900	<0.0176	<0.0176	0.0676	<0.0176	
SB-229	06/27/12	SB-229 (0.0-2.0)		0.0-2.0	5.5	<0.00652	<0.00866	<0.0169	<0.0169	<0.0324	<0.0169	
SB-229	06/27/12	SB-229 (5.0-6.0)		5.0-6.0	5.5	0.0143	<0.0120	<0.0234	<0.0234	<0.0450	<0.0234	
SB-230	06/27/12	SB-230 (0.0-2.0)		0.0-2.0	8.6	<0.00638	<0.00546	<0.0106	<0.0106	<0.0204	<0.0106	
SB-230	06/27/12	SB-230 (10.0-11.0)		10.0-11.0	8.6	1.80	0.0153J	<0.0258	<0.0258	<0.0496	<0.0258	
SB-231	06/27/12	SB-231 (0.5-1.0)		0.5-1.0	5.1	<0.00648	<0.00758	<0.0148	<0.0148	<0.0284	<0.0148	
SB-231	06/27/12	SB-231 (5.0-6.6)		5.0-6.6	5.1	0.0590	<0.0113	<0.0220	<0.0220	<0.0424	<0.0220	
SB-232	06/27/12	SB-232 (0.0-2.0)		0.0-2.0	5	<0.00646	<0.00564	<0.0110	<0.0110	<0.0212	<0.0110	
SB-232	06/27/12	SB-232 (3.0-3.8)		3.0-3.8	5	0.134	<0.00864	<0.0169	<0.0169	<0.0324	<0.0169	
SB-233	07/17/12	SB-233 (0.0-2.0)		0.0-2.0	2.5	<0.00844	<0.0136	<0.0266	<0.0266	<0.0510	<0.0266	
SB-233	07/17/12	SD-233 (0.0-2.0)	DUP	0.0-2.0	2.5	<0.00834	<0.0142	<0.0278	<0.0278	<0.0534	<0.0278	
SB-233	07/17/12	SB-233 (2.0-2.5)		2.0-2.5	2.5	<0.00818	<0.0128	<0.0248	<0.0248	<0.0478	<0.0248	
SB-234	07/17/12	SB-234 (0.0-2.0)		0.0-2.0	5.7	<0.00742	<0.0105	<0.0206	<0.0206	<0.0396	<0.0206	
SB-234	07/17/12	SB-234 (3.7-5.7)		3.7-5.7	5.7	<0.00688	<0.0106	<0.0206	<0.0206	<0.0398	<0.0206	
SB-235	06/29/12	SB-235 (0.0-2.0)		0.0-2.0	7.9	<0.00646	<0.00464	<0.00906	<0.00906	<0.0174	<0.00906	
SB-235	06/29/12	SB-235 (5.9-7.0)		5.9-7.0	7.9	<0.00744	<0.00764	<0.0149	<0.0149	<0.0286	<0.0149	
SB-236	06/29/12	SB-236 (0.0-2.0)		0.0-2.0	8.1	0.0729	<0.00688	<0.0134	<0.0134	<0.0258	<0.0134	
SB-236	06/29/12	SB-236 (6.1-8.1)		6.1-8.1	8.1	0.0371J*	<0.00752	<0.0147	<0.0147	<0.0282	<0.0147	
SB-237	06/28/12	SB-237 (0.0-2.0)		0.0-2.0	5.8	<0.00686	<0.0119	<0.0232	<0.0232	<0.0446	<0.0232	
SB-237	06/28/12	SB-237 (5.0-5.8)		5.0-5.8	5.8	0.122	<0.0102	<0.0199	<0.0199	<0.0384	<0.0199	
SB-238	06/28/12	SB-238 (0.0-2.0)		0.0-2.0	6.8	35.8	<0.00744	<0.0145	<0.0145	<0.0280	<0.0145	
SB-238	06/28/12	SB-238 (5.8-6.8)		5.8-6.8	6.8	724	<0.00954	<0.0186	<0.0186	<0.0358	<0.0186	
SB-239	06/28/12	SB-239 (0.0-2.0)		0.0-2.0	9.4	0.0376	<0.00704	<0.0137	<0.0137	<0.0264	<0.0137	
SB-239	06/28/12	SB-239 (7.4-8.8)		7.4-8.8	9.4	52.3	<0.0114	<0.0222	<0.0222	<0.0426	<0.0222	
SB-240	06/28/12	SB-240 (0.0-2.0)		0.0-2.0	9.4	1.44	<0.0110	<0.0214	<0.0214	<0.0412	<0.0214	
SB-240	06/28/12	SB-240 (7.4-8.8)		7.4-8.8	9.4	8.18	<0.0116	<0.0226	<0.0226	<0.0434	<0.0226	
SB-241	07/19/12	SB-241 (0.0-2.0)		0.0-2.0	9	0.375	<0.00906	<0.0177	<0.0177	<0.0340	0.0122J	
SB-241	07/19/12	SB-241 (7.0-8.1)		7.0-8.1	9	0.0730	<0.00702	<0.0137	<0.0137	<0.0264	<0.0137	
SB-242	07/19/12	SB-242 (0.0-2.0)		0.0-2.0	9.2	0.00730J	<0.00612	<0.0119	<0.0119	<0.0230	<0.0119	
SB-242	07/19/12	SD-242 (0.0-2.0)	DUP	0.0-2.0	9.2	0.00752J	<0.00620	<0.0121	<0.0121	<0.0232	<0.0121	
SB-242	07/19/12	SB-242 (7.2-8.4)		7.2-8.4	9.2	0.574	<0.0125	<0.0242	<0.0242	<0.0468	<0.0242	
SB-243	07/18/12	SB-243 (0.0-2.0)		0.0-2.0	8.2	0.153	<0.00942	<0.0184	<0.0184	<0.0354	<0.0184	
SB-243	07/18/12	SB-243 (6.2-8.2)		6.2-8.2	8.2	0.0395	<0.00978	<0.0191	<0.0191	<0.0366	<0.0191	
SB-244	07/19/12	SB-244 (0.0-2.0)		0.0-2.0	10.2	0.0169	<0.0102	<0.0199	<0.0199	<0.0382	<0.0199	
SB-244	07/19/12	SB-244 (6.0-7.3)		6.0-7.3	10.2	21.6	<0.0128	<0.0250	<0.0250	<0.0482	<0.0250	
SB-244	07/19/12	SB-244 (8.2-9.0)		8.2-9.0	10.2	23.3	<0.0128	<0.0248	<0.0248	<0.0478	<0.0248	
SB-245	07/18/12	SB-245 (0.0-2.0)		0.0-2.0	6.7	0.0213	<0.00852	<0.0166	<0.0166	<0.0320	<0.0166	
SB-245	07/18/12	SB-245 (5.0-6.7)		5.0-6.7	6.7	<0.00784	<0.0111	<0.0216	<0.0216	<0.0416	<0.0216	
SB-245	07/18/12	SD-245 (5.0-6.7)	DUP	5.0-6.7	6.7	0.0316	<0.0110	<0.0214	<0.0214	<0.0412	<0.0214	
SB-246	07/19/12	SB-246 (0.0-2.0)		0.0-2.0	9	0.0384	<0.00718	<0.0140	<0.0140	<0.0270	<0.0140	

**Table 8  
Soil Boring Analytical Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

Location Name	Sample Date	Sample Name	Dup	Depth (feet)	Depth to Water (feet)	Sulfolane (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	P & M -Xylene (mg/kg)	o-Xylene (mg/kg)	Comments
<b>Alaska Department of Environmental Conservation (ADEC) Interim Estimated Screening Level and Soil Cleanup Levels (SCLs)</b>						<b>0.043</b>	<b>0.025</b>	<b>6.5</b>	<b>6.9</b>	<b>63</b>		
SB-246	07/19/12	SB-246 (7.0-9.0)		7.0-9.0	9	76.0	<0.0116	<0.0226	<0.0226	<0.0436	<0.0226	
SB-246	07/19/12	SD-246 (7.0-9.0)	DUP	7.0-9.0	9	49.3	<0.0107	<0.0208	<0.0208	<0.0400	<0.0208	
SB-247	07/18/12	SB-247 (0.0-2.0)		0.0-2.0	8.9	0.0226	<0.00800	<0.0156	<0.0156	<0.0300	<0.0156	
SB-247	07/18/12	SB-247 (6.9-8.9)		6.9-8.9	8.9	0.0960	<0.00962	<0.0188	<0.0188	<0.0360	<0.0188	
SB-248	07/18/12	SB-248 (0.0-2.0)		0.0-2.0	6.5	0.0843	<0.00930	<0.0181	<0.0181	<0.0348	<0.0181	
SB-248	07/18/12	SD-248 (5.0-6.5)	DUP	5.0-6.5	6.5	194	<0.0163	<0.0318	<0.0318	<0.0612	<0.0318	
SB-248	07/18/12	SB-248 (5.0-6.5)		5.0-6.5	6.5	163	<0.0181	<0.0352	<0.0352	<0.0678	<0.0352	
SB-249	07/18/12	SB-249 (0.0-2.0)		0.0-2.0	6.4	0.0282	<0.00820	<0.0160	<0.0160	<0.0308	<0.0160	
SB-249	07/18/12	SB-249 (5.0-6.4)		5.0-6.4	6.4	121	<0.0160	<0.0312	<0.0312	<0.0600	<0.0312	
SB-250	07/18/12	SB-250 (0.0-2.0)		0.0-2.0	6	<0.00668	<0.00584	<0.0114	<0.0114	<0.0220	<0.0114	
SB-250	07/18/12	SB-250 (5.0-6.0)		5.0-6.0	6	1.63	<0.0176	0.162	<0.0344	<0.0660	<0.0344	
SB-251	07/18/12	SB-251 (0.0-2.0)		0.0-2.0	6.3	0.736	<0.00776	<0.0151	<0.0151	<0.0290	<0.0151	
SB-251	07/18/12	SB-251 (5.0-6.3)		5.0-6.3	6.3	0.0596	<0.00816	0.0102J	<0.0159	<0.0306	<0.0159	
SB-252	08/15/12	SB-252 (3.0-3.5)		3.0-3.5	3.5	0.0973	<0.00702	0.00877J	0.0195J	<0.0264	0.0202J	Sample collected in Lagoon B
SB-253	08/15/12	SB-253 (2.5-3.5)		2.5-3.5	3.5	1.23	<0.00654	<0.0128	0.0155J	<0.0246	0.0129J	Sample collected in Lagoon B
SB-254	08/15/12	SB-254 (2.5-3.3)		2.5-3.3	3.3	0.343	<0.00844	<0.0164	<0.0164	<0.0316	<0.0164	Sample collected in Lagoon B
SB-255	08/16/12	SB-255 (3.0-3.5)		3.0-3.5	3.5	0.618	<0.00726	<0.0141	0.0118J	<0.0272	<0.0141	Sample collected in Lagoon B
SB-256	08/16/12	SB-256 (3.0-3.5)		3.0-3.5	3.5	1.86	<0.00686	<0.0134	0.0221	<0.0258	0.0189J	Sample collected in Lagoon B
SB-257	08/16/12	SB-257 (3.0-3.5)		3.0-3.5	3.5	0.417	0.00376J	0.00835J	0.0230	0.0317J	0.0198J	Sample collected in Lagoon B
SB-258	08/16/12	SB-258 (2.5-3.0)		2.5-3.0	3	0.571	<0.00978	<0.0191	<0.0191	<0.0366	<0.0191	Sample collected in Lagoon B
SB-258	08/16/12	SD-258 (2.5-3.0)	DUP	2.5-3.0	3	0.563	<0.0100	<0.0195	<0.0195	<0.0374	<0.0195	Sample collected in Lagoon B
SB-259	08/16/12	SB-259 (2.5-3.5)		2.5-3.5	3.5	3.56	<0.00872	<0.0170	<0.0170	<0.0326	<0.0170	Sample collected in Lagoon B
SB-260	08/16/12	SB-260 (2.5-3.0)		2.5-3.0	3	0.458	<0.00780	<0.0152	0.0102J	<0.0292	<0.0152	Sample collected in Lagoon B
SB-261	08/16/12	SB-261 (2.5-3.5)		2.5-3.5	3.5	3.36	<0.00914	<0.0178	<0.0178	<0.0344	<0.0178	Sample collected in Lagoon B
SB-262	08/16/12	SB-262 (2.5-3.5)		2.5-3.5	3.5	5.33	<0.00874	<0.0170	0.0158J	<0.0328	<0.0170	Sample collected in Lagoon B
SB-263	08/16/12	SB-263 (2.5-3.5)		2.5-3.5	3.5	2.33	<0.00666	<0.0130	<0.0130	<0.0250	<0.0130	Sample collected in Lagoon B

Notes:

- < Not detected; limit of detection (LOD) listed
- J Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ)
- R Laboratory could not quantify sulfolane due to fuel interference; datum is rejected
- JH\* Result is considered estimated, biased high, due to QC failures (flag applied by SWI)
- JL\* Result is considered estimated, biased low, due to QC failures (flag applied by SWI)
- J\* Result is considered estimated (no direction of bias), due to QC failures (flag applied by SWI) or because the result was above the laboratory's calibration range
- < ... J\* Limit of detection is considered in question due to potential low bias from sample handling or holding time issues (flag applied by SWI)
- N Analysis indicates there is presumptive evidence to make a tentative identification of this compound

**Table 9  
LIF/UVOST Survey Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

<b>Location ID</b>	<b>Max Fluorescence (%)</b>	<b>Maximum Fluorescence Depth (feet bgs)</b>	<b>Total Depth (feet bgs)</b>	<b>Depth Detected (feet bgs)</b>
1	118.5	8.43	16.11	6.5 to 13.5
2	0.9	9.7	16.45	--
3	1.0	4.57	16.28	--
4	1.1	0.74	16.07	--
5	49.6	9.28	16.39	7 to 12
6	171.2	9.07	16.18	8 to 11
7	26.9	8.47	17.12	4 to 9
8	74.3	9.15	16.09	6 to 12
9	58.6	11.28	16.3	6.5 to 12
10	77.6	7.22	16.18	5 to 10.5
11	68.54	9.1	16.08	6 to 11
12	115	11.05	16.15	9 to 13
13	35.1	7.51	16.1	4.25 to 9.5
14	0.4	2.47	16.05	--
15	21.9	10.53	16.27	10.25 to 12.5
16	67.4	6.74	16.1	5.75 to 9
17	0.6	0.33	16.13	--
18	0.4	15.53	16.29	--
19	0.4	10.55	16.1	--
20	0.4	1.45	16.02	--
21	0.4	11.87	16.09	--
22	0.4	0	16.1	--
23	0.4	9.79	16.07	--
24	0.6	6.31	16.09	--
25	1.2	1.9	16.04	--
26	1	0	16	--
27	1	9.96	16.1	--
28	0.4	9.89	16	--
29	0.6	12.39	16.02	--
30	0.7	14.79	16.04	--
31	0.6	1.61	16.01	--
32	0.4	2.22	16.21	--
33	0.6	0.05	16.05	--
34	1	3.77	16.16	--
35	2.6	1.25	16.08	--
36	109.4	11.24	16.17	7 to 12

**Table 9  
LIF/UVOST Survey Results**

**Flint Hills North Pole Refinery  
North Pole, Alaska**

<b>Location ID</b>	<b>Max Fluorescence (%)</b>	<b>Maximum Fluorescence Depth (feet bgs)</b>	<b>Total Depth (feet bgs)</b>	<b>Depth Detected (feet bgs)</b>
37	190	9.69	16.1	7.75 to 10.25
38	1.8	0	16.2	--
39	1.6	7.32	16.04	--
40	247.6	9.03	16.11	7 to 12.5
41	61.2	10.49	16.1	6.5 to 11.75
42	66.6	8.88	16.1	8 to 11
43	0.6	2.53	16.04	--
44	44.6	8.14	16.06	6.5 to 11
45	87.7	9.26	16.31	7.5 to 11.75
46	178.2	6.9	16.1	6 to 9.75
47	87.3	9.16	16.05	8.5 to 11
48	COULD NOT COMPLETE DUE TO UTILITIES			
49	94.1	8.83	16.06	5.75 to 11
50	COULD NOT COMPLETE DUE TO UTILITIES			
51	0.8	11.55	16.12	--
52	22.9	6.68	16.06	6.25 to 9
53	1	12.36	16.11	--
54	0.4	11.62	16.12	--
55	0.5	15.29	16.28	--

**Notes:**

-- = not applicable

% = percent

bgs = below ground surface

LIF = Laser Induced Fluorescence

UVOST = ultraviolet optical screening tool

**Table 10**  
**2012 Site Characterization Report Qualified Data**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Work Order	Sample Name	CAS	Analyte	Method	Display Result	Numerical Result	Result Flag	LOD	Final Value	QC Flag	Bias	QC Note
1128023	SB-213 (3.0-3.2)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	<0.00656J*	0.00656	U	0.00656	0.00656	UJ	Low	High temp and holding time
1128023	SB-217 (3.2-3.4)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	0.120JL*	0.12	=	0.00788	0.12	JL	Low	High temp and holding time
1128023	SB-222 (3.0-3.2)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	0.0288JL*	0.0288	=	0.00768	0.0288	JL	Low	High temp and holding time
1128023	SB-223 (3.0-3.2)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	0.0159JL*	0.0159	=	0.0076	0.0159	JL	Low	High temp and holding time
1128023	SB-224 (3.6-3.8)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	0.0151JL*	0.0151	=	0.00804	0.0151	JL	Low	High temp and holding time
1128023	SB-225 (3.6-3.8)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	<0.00672J*	0.00672	U	0.00672	0.00672	UJ	Low	High temp and holding time
1128023	SB-213 (3.0-3.2)	100-41-4	Ethylbenzene	SW8021B	1.30J*	1.3	=	0.00886	1.3	J	None	High temp and surrogate recovery failure
1128023	SB-213 (3.0-3.2)	P & M -Xylene	P & M -Xylene	SW8021B	8.57J*	8.57	=	0.0852	8.57	J	None	High temp and surrogate recovery failure
1128023	SB-213 (3.0-3.2)	95-47-6	o-Xylene	SW8021B	1.00J*	1	=	0.00886	1	J	None	High temp and surrogate recovery failure
1128023	SB-213 (3.0-3.2)	71-43-2	Benzene	SW8021B	0.484J*	0.484	=	0.00454	0.484	J	None	High temp and surrogate recovery failure
1128023	SB-213 (3.0-3.2)	108-88-3	Toluene	SW8021B	1.32J*	1.32	=	0.00886	1.32	J	None	High temp and surrogate recovery failure
1128038	HP-7 30	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00620J*	0.0062	U	0.0062	0.0062	UJ	None	Sulfolane-d8 recovery
1128052	HP-16 35	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0.00632	U	0.00632	0.00632	R	None	Fuel interference
1128052	HP-16 45	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0.00646	U	0.00646	0.00646	R	None	Fuel interference
1128052	HP-16 53	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0.00646	U	0.00646	0.00646	R	None	Fuel interference
1128052	HP-16 62	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0.00688	U	0.00688	0.00688	R	None	Fuel interference
1128052	HP-15 25	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.515J*	0.515	=	0.031	0.515	J	None	Sulfolane-d8 recovery
1128054	HP-19 54	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0218J*	0.0218	=	0.0064	0.0218	J	None	Sulfolane-d8 recovery
1128054	HP-20 25	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.164J*	0.164	=	0.0062	0.164	J	None	Sulfolane-d8 recovery
1128071	S-197A-10	GRO	oline Range Orga	AK101	129JH*	129	=	6.76	129	JH	High	Surrogate recovery failure
1128082	HP-21 31	95-47-6	o-Xylene	SW8021B	0.0170JL*	0.017	=	0.00062	0.017	JL	Low	Bubbles in VOA
1128082	HP-21 31	P & M -Xylene	P & M -Xylene	SW8021B	0.0449JL*	0.0449	=	0.00124	0.0449	JL	Low	Bubbles in VOA
1128082	HP-21 31	108-88-3	Toluene	SW8021B	0.00293JL*	0.00293	=	0.00062	0.00293	JL	Low	Bubbles in VOA
1128082	HP-21 31	100-41-4	Ethylbenzene	SW8021B	0.0111JL*	0.0111	=	0.00062	0.0111	JL	Low	Bubbles in VOA
1128082	HP-21 31	71-43-2	Benzene	SW8021B	0.00400JL*	0.004	=	0.0003	0.004	JL	Low	Bubbles in VOA
1128093	HP-22 13	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 13	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 13	71-43-2	Benzene	SW8021B	0.0310JL*	0.031	=	0.0003	0.031	JL	Low	High temp
1128093	HP-22 13	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0498JL*	0.0498	=	0.0062	0.0498	JL	Low	High temp
1128093	HP-22 13	95-47-6	o-Xylene	SW8021B	0.00208JL*	0.00208	=	0.00062	0.00208	JL	Low	High temp
1128093	HP-22 13	P & M -Xylene	P & M -Xylene	SW8021B	0.00263JL*	0.00263	=	0.00124	0.00263	JL	Low	High temp
1128093	HP-22 24	P & M -Xylene	P & M -Xylene	SW8021B	0.00643JL*	0.00643	=	0.00124	0.00643	JL	Low	High temp
1128093	HP-22 24	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 24	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0748JL*	0.0748	=	0.0062	0.0748	JL	Low	High temp
1128093	HP-22 24	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 24	71-43-2	Benzene	SW8021B	0.157JL*	0.157	=	0.0003	0.157	JL	Low	High temp
1128093	HP-22 24	95-47-6	o-Xylene	SW8021B	0.00976JL*	0.00976	=	0.00062	0.00976	JL	Low	High temp
1128093	HP-22 34	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-22 34	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 34	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0120JL*	0.012	=	0.0062	0.012	JL	Low	High temp
1128093	HP-22 34	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 34	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 34	71-43-2	Benzene	SW8021B	0.00363JL*	0.00363	=	0.0003	0.00363	JL	Low	High temp
1128093	HP-22 43	71-43-2	Benzene	SW8021B	0.000650JL*	0.00065	=	0.0003	0.00065	JL	Low	High temp
1128093	HP-22 43	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 43	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp

**Table 10**  
**2012 Site Characterization Report Qualified Data**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Work Order	Sample Name	CAS	Analyte	Method	Display Result	Numerical Result	Result Flag	LOD	Final Value	QC Flag	Bias	QC Note
1128093	HP-22 43	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00674J*	0.00674	U	0.00674	0.00674	UJ	Low	High temp
1128093	HP-22 43	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 43	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.189JL*	0.189	=	0.0064	0.189	JL	Low	High temp
1128093	HP-23 14	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 14	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	71-43-2	Benzene	SW8021B	0.00507JL*	0.00507	=	0.0003	0.00507	JL	Low	High temp
1128093	HP-23 24	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0614JL*	0.0614	=	0.0062	0.0614	JL	Low	High temp
1128093	HP-23 24	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 24	P & M -Xylene	P & M -Xylene	SW8021B	0.000830JL*	0.00083	J	0.00124	0.00083	JL	Low	High temp
1128093	HP-23 24	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 24	71-43-2	Benzene	SW8021B	0.000380JL*	0.00038	J	0.0003	0.00038	JL	Low	High temp
1128093	HP-23 24	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 32	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 32	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0389JL*	0.0389	=	0.0062	0.0389	JL	Low	High temp
1128093	HP-23 32	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 32	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128093	HP-23 32	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 32	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 42	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 42	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 42	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 42	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0445JL*	0.0445	=	0.00652	0.0445	JL	Low	High temp
1128093	HP-23 42	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128093	HP-23 42	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 53	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 53	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 53	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 53	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00652J*	0.00652	U	0.00652	0.00652	UJ	Low	High temp
1128093	HP-23 53	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128093	HP-23 53	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 23	95-47-6	o-Xylene	SW8021B	0.000750JL*	0.00075	J	0.00062	0.00075	JL	Low	High temp
1128099	HP-10 23	P & M -Xylene	P & M -Xylene	SW8021B	0.00443JL*	0.00443	=	0.00124	0.00443	JL	Low	High temp
1128099	HP-10 33	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 33	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00403JL*	0.00403	J	0.00666	0.00403	JL	Low	High temp
1128099	HP-10 33	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 33	71-43-2	Benzene	SW8021B	0.000350JL*	0.00035	J	0.0003	0.00035	JL	Low	High temp
1128099	HP-10 33	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 33	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-10 44	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 44	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00620J*	0.0062	U	0.0062	0.0062	UJ	Low	High temp
1128099	HP-10 44	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-10 44	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp

**Table 10**  
**2012 Site Characterization Report Qualified Data**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Work Order	Sample Name	CAS	Analyte	Method	Display Result	Numerical Result	Result Flag	LOD	Final Value	QC Flag	Bias	QC Note
1128099	HP-10 44	71-43-2	Benzene	SW8021B	0.000210JL*	0.00021	J	0.0003	0.00021	JL	Low	High temp
1128099	HP-10 54	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-10 54	71-43-2	Benzene	SW8021B	0.000740JL*	0.00074	=	0.0003	0.00074	JL	Low	High temp
1128099	HP-10 54	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 54	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 54	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 54	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00660J*	0.0066	U	0.0066	0.0066	UJ	Low	High temp
1128099	HP-11 13	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 13	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 13	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-11 13	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 13	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128099	HP-11 13	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0108JL*	0.0108	=	0.0062	0.0108	JL	Low	High temp
1128099	HP-11 23	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 23	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 23	71-43-2	Benzene	SW8021B	0.000170JL*	0.00017	J	0.0003	0.00017	JL	Low	High temp
1128099	HP-11 23	P & M -Xylene	P & M -Xylene	SW8021B	0.00150JL*	0.0015	J	0.00124	0.0015	JL	Low	High temp
1128099	HP-11 23	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 23	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0198JL*	0.0198	=	0.0062	0.0198	JL	Low	High temp
1128099	HP-11 34	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 34	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 34	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00949JL*	0.00949	J	0.0062	0.00949	JL	Low	High temp
1128099	HP-11 34	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-11 34	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128099	HP-11 34	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 44	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-11 44	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00620J*	0.0062	U	0.0062	0.0062	UJ	Low	High temp
1128099	HP-11 44	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 44	71-43-2	Benzene	SW8021B	0.000180JL*	0.00018	J	0.0003	0.00018	JL	Low	High temp
1128099	HP-11 44	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128108	HD-01 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0677J*	0.0677	=	0.0062	0.0677	J	None	Sulfolane-d8 recovery
1128141	HP-26 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.327J*	0.327	=	0.031	0.327	J	None	Sulfolane-d8 recovery
1128149	HP-25 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.515J*	0.515	=	0.0124	0.515	J	None	Sulfolane-d8 recovery
1128169	SB-236 (6.1-8.1)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	0.0371J*	0.0371	=	0.00726	0.0371	J	None	MS/MSD issue
1128191	HP-36 25	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	2.04JN^*	2.04	=	0.062	2.04	JN^	None	Estimated tentative identification
1128191	HP-37 20	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0548JN^*	0.0548	=	0.00688	0.0548	JN^	None	Estimated tentative identification
1128191	HP-39 15	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0628JN^*	0.0628	=	0.00688	0.0628	JN^	None	Estimated tentative identification
1128191	HP-39 20	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.104JN^*	0.104	=	0.00688	0.104	JN^	None	Estimated tentative identification
1128191	HP-37 15	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.0126^*	0.0126	U	0.00688	0.0126	U^	None	Hydrocarbon interference
1128272	HP-46 34	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00427JL*	0.00427	J	0.0062	0.00427	JL	Low	Extracted past holding time
1128272	HP-46 24	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0	J	0.0062	0	R	None	Hydrocarbon interference
1128272	HP-46 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00339J*	0.00339	J	0.0062	0.00339	J	None	Sulfolane-d8 recovery
1128280	HP-44 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.301JL*	0.301	=	0.0124	0.301	JL	Low	Extracted past holding time
1128280	HP-45 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0	J	0.0062	0	R	None	Hydrocarbon interference
1128280	HP-45 54	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0	J	0.0062	0	R	None	Hydrocarbon interference

**Table 10**  
**2012 Site Characterization Report Qualified Data**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Work Order	Sample Name	CAS	Analyte	Method	Display Result	Numerical Result	Result Flag	LOD	Final Value	QC Flag	Bias	QC Note
1128280	HP-44 24	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0219J*	0.0219	=	0.0062	0.0219	J	None	Sulfolane-d8 recovery
1128286	HP-43 25	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0115JN^*	0.0115	=	0.0062	0.0115	JN^	None	Estimated tentative identification
1128399	S-334-15-8	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	<0.00700J*	0.007	U	0.007	0.007	UJ	Low	Extracted past holding time
1128399	S-334-15-8	GRO	coline Range Orga	AK101	4380JH*	4380	=	238	4380	JH	High	Surrogate recovery failure
1128093	HP-22 34	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 34	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 34	71-43-2	Benzene	SW8021B	0.00363JL*	0.00363	=	0.0003	0.00363	JL	Low	High temp
1128093	HP-22 43	71-43-2	Benzene	SW8021B	0.000650JL*	0.00065	=	0.0003	0.00065	JL	Low	High temp
1128093	HP-22 43	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 43	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-22 43	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00674J*	0.00674	U	0.00674	0.00674	UJ	Low	High temp
1128093	HP-22 43	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-22 43	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.189JL*	0.189	=	0.0064	0.189	JL	Low	High temp
1128093	HP-23 14	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 14	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 14	71-43-2	Benzene	SW8021B	0.00507JL*	0.00507	=	0.0003	0.00507	JL	Low	High temp
1128093	HP-23 24	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0614JL*	0.0614	=	0.0062	0.0614	JL	Low	High temp
1128093	HP-23 24	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 24	P & M -Xylene	P & M -Xylene	SW8021B	0.000830JL*	0.00083	J	0.00124	0.00083	JL	Low	High temp
1128093	HP-23 24	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 24	71-43-2	Benzene	SW8021B	0.000380JL*	0.00038	J	0.0003	0.00038	JL	Low	High temp
1128093	HP-23 24	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 32	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 32	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0389JL*	0.0389	=	0.0062	0.0389	JL	Low	High temp
1128093	HP-23 32	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 32	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128093	HP-23 32	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 32	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 42	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 42	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 42	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 42	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0445JL*	0.0445	=	0.0062	0.0445	JL	Low	High temp
1128093	HP-23 42	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128093	HP-23 42	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 53	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 53	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128093	HP-23 53	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128093	HP-23 53	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00652J*	0.00652	U	0.00652	0.00652	UJ	Low	High temp
1128093	HP-23 53	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128093	HP-23 53	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 23	95-47-6	o-Xylene	SW8021B	0.000750JL*	0.00075	J	0.00062	0.00075	JL	Low	High temp
1128099	HP-10 23	P & M -Xylene	P & M -Xylene	SW8021B	0.00443JL*	0.00443	=	0.00124	0.00443	JL	Low	High temp
1128099	HP-10 33	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp

**Table 10**  
**2012 Site Characterization Report Qualified Data**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Work Order	Sample Name	CAS	Analyte	Method	Display Result	Numerical Result	Result Flag	LOD	Final Value	QC Flag	Bias	QC Note
1128099	HP-10 33	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00403JL*	0.00403	J	0.00666	0.00403	JL	Low	High temp
1128099	HP-10 33	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 33	71-43-2	Benzene	SW8021B	0.000350JL*	0.00035	J	0.0003	0.00035	JL	Low	High temp
1128099	HP-10 33	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 33	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-10 44	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 44	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00620J*	0.0062	U	0.0062	0.0062	UJ	Low	High temp
1128099	HP-10 44	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-10 44	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 44	71-43-2	Benzene	SW8021B	0.000210JL*	0.00021	J	0.0003	0.00021	JL	Low	High temp
1128099	HP-10 54	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-10 54	71-43-2	Benzene	SW8021B	0.000740JL*	0.00074	=	0.0003	0.00074	JL	Low	High temp
1128099	HP-10 54	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 54	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 54	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-10 54	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00660J*	0.0066	U	0.0066	0.0066	UJ	Low	High temp
1128099	HP-11 13	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 13	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 13	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-11 13	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 13	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128099	HP-11 13	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0108JL*	0.0108	=	0.0062	0.0108	JL	Low	High temp
1128099	HP-11 23	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 23	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 23	71-43-2	Benzene	SW8021B	0.000170JL*	0.00017	J	0.0003	0.00017	JL	Low	High temp
1128099	HP-11 23	P & M -Xylene	P & M -Xylene	SW8021B	0.00150JL*	0.0015	J	0.00124	0.0015	JL	Low	High temp
1128099	HP-11 23	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 23	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0198JL*	0.0198	=	0.0062	0.0198	JL	Low	High temp
1128099	HP-11 34	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 34	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 34	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00949JL*	0.00949	J	0.0062	0.00949	JL	Low	High temp
1128099	HP-11 34	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-11 34	71-43-2	Benzene	SW8021B	<0.000300J*	0.0003	U	0.0003	0.0003	UJ	Low	High temp
1128099	HP-11 34	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 44	P & M -Xylene	P & M -Xylene	SW8021B	<0.00124J*	0.00124	U	0.00124	0.00124	UJ	Low	High temp
1128099	HP-11 44	95-47-6	o-Xylene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.00620J*	0.0062	U	0.0062	0.0062	UJ	Low	High temp
1128099	HP-11 44	100-41-4	Ethylbenzene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128099	HP-11 44	71-43-2	Benzene	SW8021B	0.000180JL*	0.00018	J	0.0003	0.00018	JL	Low	High temp
1128099	HP-11 44	108-88-3	Toluene	SW8021B	<0.000620J*	0.00062	U	0.00062	0.00062	UJ	Low	High temp
1128108	HD-01 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0677J*	0.0677	=	0.0062	0.0677	J	None	Sulfolane-d8 recovery
1128141	HP-26 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.327J*	0.327	=	0.031	0.327	J	None	Sulfolane-d8 recovery
1128149	HP-25 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.515J*	0.515	=	0.0124	0.515	J	None	Sulfolane-d8 recovery
1128169	SB-236 (6.1-8.1)	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	0.0371J*	0.0371	=	0.00726	0.0371	J	None	MS/MSD issue
1128191	HP-36 25	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	2.04JN^*	2.04	=	0.062	2.04	JN^	None	Estimated tentative identification

**Table 10**  
**2012 Site Characterization Report Qualified Data**

**Flint Hills North Pole Refinery**  
**North Pole, Alaska**

Work Order	Sample Name	CAS	Analyte	Method	Display Result	Numerical Result	Result Flag	LOD	Final Value	QC Flag	Bias	QC Note
1128191	HP-37 20	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0548JN^*	0.0548	=	0.00688	0.0548	JN^	None	Estimated tentative identification
1128191	HP-39 15	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0628JN^*	0.0628	=	0.00688	0.0628	JN^	None	Estimated tentative identification
1128191	HP-39 20	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.104JN^*	0.104	=	0.00688	0.104	JN^	None	Estimated tentative identification
1128191	HP-37 15	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	<0.0126^*	0.0126	U	0.00688	0.0126	U^	None	Hydrocarbon interference
1128272	HP-46 34	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00427JL*	0.00427	J	0.0062	0.00427	JL	Low	Extracted past holding time
1128272	HP-46 24	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0	J	0.0062	0	R	None	Hydrocarbon interference
1128272	HP-46 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.00339J*	0.00339	J	0.0062	0.00339	J	None	Sulfolane-d8 recovery
1128280	HP-44 14	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.301JL*	0.301	=	0.0124	0.301	JL	Low	Extracted past holding time
1128280	HP-45 44	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0	J	0.0062	0	R	None	Hydrocarbon interference
1128280	HP-45 54	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	R	0	J	0.0062	0	R	None	Hydrocarbon interference
1128280	HP-44 24	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0219J*	0.0219	=	0.0062	0.0219	J	None	Sulfolane-d8 recovery
1128286	HP-43 25	126-33-0	Sulfolane	Sulfolane-EPA1625B w/Iso Dil-W	0.0115JN^*	0.0115	=	0.0062	0.0115	JN^	None	Estimated tentative identification
1128399	S-334-15-8	126-33-0	Sulfolane	Sulfolane-SW8270D M w/IsoDI SI	<0.00700J*	0.007	U	0.007	0.007	UJ	Low	Extracted past holding time
1128399	S-334-15-8	GRO	GRO	AK101	4380JH*	4380	=	238	4380	JH	High	Surrogate recovery failure

**Notes:**

< = not detected; LOD listed

J = Estimated concentration, detected above the detection limit and below the limit of quantitation.

R = Laboratory could not quantify sulfolane due to fuel interference; datum is rejected.

JH\* = Result is considered estimated, biased high, due to QC failures (flag applied by SWI).

JL\* = Result is considered estimated, biased low, due to QC failures (flag applied by SWI).

J\* = Result is considered estimated (no direction of bias), due to QC failures (flag applied by SWI) or because the result was above the laboratory's calibration range.

< ... J\* = LOD is considered in question due to potential low bias from sample handling or holding time issues (flag applied by SWI).

N = Analysis indicates there is presumptive evidence to make a tentative identification of this compound.

CAS = Chemical Abstract Services

GRO = gasoline range organics

LOD = limit of detection

MS/MSD = matrix spike matrix spike duplicate

QC = quality control

RPD = relative percent difference

VOA = volatile organic analyte