NAPL Effective Hydraulic Conductivity Calculations and Mobility Interpretations Based on Multiple Lines of Evidence

Draft

Quanta Resources Superfund Site

Sample ID		A-13A-120125	A-23A-048053	A-23A-084089	PR2-8-105113	TTA-06-D-006008	A-13A-166168
Zone	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	EA-SMA	Outside EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)							
Porosity, n	0.70	0.71	0.68	0.66	0.68	0.66	0.73
NAPL sat, S init (%)	4.1	1.8	3.0	3.0	5.7	3.6	2.8
NAPL sat, S after Step 1 (%)	4.1	1.8	3.0	3.0	5.7	3.6	2.8
NAPL sat, S after Step 2 (%)	4.1	1.8	3.0	3.0	5.7	3.6	2.8
NAPL sat, S after Step 3 (%)	4.1	1.8	3.0	3.0	5.7	3.6	2.8
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
	Immobile	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**
Lines of Evidence for Immobile (IM) or Potentially Mobile (PM)							
NAPL produced in first flow step? No = IM, Yes = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Total change in NAPL saturation, <10% of value = IM, >10% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Maximum Kn < 10^{-7} cm/sec = IM, >10^{-7} cm/sec = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Initial saturation, <10% = IM, >30% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Initial Vn = Vt n S (cm^3)	2.10	0.86	1.29	1.34	2.62	1.58	1.45
Post Step 1 Vn = Vt n S (cm^3)	2.10	0.86	1.29	1.34	2.62	1.58	1.45
Post Step 2 Vn = Vt n S (cm^3)	2.10	0.86	1.29	1.34	2.62	1.58	1.45
Post Step 3 Vn = Vt n S (cm^3)	2.10	0.86	1.29	1.34	2.62	1.58	1.45
Step 1 Displaced NAPL, lab description	None	None	None	None	None	None	None
Step 2 Displaced NAPL, lab description	None	None	None	None	None	None	None
Step 3 Displaced NAPL, lab description	None	None	None	None	None	None	None
Step 1 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Step 2 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Step 3 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Step 1 Test Duration, t (s)	59,940	59,940	59,940	59,940	59,940	59,940	59,940
Step 2 Test Duration, t (s)	12,960	12,960	12,960	12,960	12,960	12,960	12,960
Step 3 Test Duration, t (s)	6,480	6,480	6,480	6,480	6,480	6,480	6,480
Step 1 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Step 2 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Step 3 NAPL Flow Rate, (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Step 1 Water Pressure, est., pounds per square inch (psi)	4	0.574	5	0.369	0.779	0.585	1.03
Step 2 Water Pressure, est., pounds per square inch (psi)	3	1.25	7.5	0.63	0.685	1.25	1.47
Step 3 Water Pressure, est., pounds per square inch (psi)	1.5	1.74	6.5	0.933	0.987	3.06	2.83
Step 1 Hydraulic Gradient, I	52	8	75	5	11	8	14
Step 2 Hydraulic Gradient, I	39	18	112	9	9	18	20
Step 3 Hydraulic Gradient, I	20	25	97	13	14	43	38
Plug diameter, d (mm)	41.49	41.51	41.32	41.49	41.07	41.29	41.47
Plug diameter, d (cm)	4.149	4.151	4.132	4.149	4.107	4.129	4.147
Plug radius, r (cm)	2.0745	2.0755	2.066	2.0745	2.0535	2.0645	2.0735
Plug length, L (mm)	53.77	49.89	47.22	50.74	50.8	50.11	52.65
Plug length, L (cm)	5.377	4.989	4.722	5.074	5.08	5.011	5.265
Plug area, A (cm^2)	13.5	13.5	13.4	13.5	13.2	13.4	13.5
Plug total volume, Vt (cm^3)	72.7	67.5	63.3	68.6	67.3	67.1	71.1

NAPL Effective Hydraulic Conductivity Calculations and Mobility Interpretations Based on Multiple Lines of Evidence
Quanta Resources Superfund Site

Sample ID	A23-A-111113	A23-A-134136	A23-A-201203	PR2-8-150152	PR2-8-170172	TTA-04-D-032034	A-13A-170172
Zone	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	EA-SMA	Outside EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)							
Porosity, n	0.73	0.71	0.67	0.66	0.75	0.75	0.72
NAPL sat, S init (%)	3.6	3.5	6.2	4.4	7.2	5.9	5.5
NAPL sat, S after Step 1 (%)	3.6	3.5	6.2	4.4	7.2	5.9	5.5
NAPL sat, S after Step 2 (%)	3.6	3.5	6.2	4.4	7.2	5.9	5.5
NAPL sat, S after Step 3 (%)	3.6	3.5	6.2	4.4	7.2	5.9	5.5
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
	Immobile	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**
Lines of Evidence for Immobile (IM) or Potentially Mobile (PM)							
NAPL produced in first flow step? No = IM, Yes = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Total change in NAPL saturation, <10% of value = IM, >10% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Maximum Kn < 10^{-7} cm/sec = IM, >10^{-7} cm/sec = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Initial saturation, <10% = IM, >30% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Initial Vn = Vt n S (cm^3)	1.80	1.64	2.92	2.00	3.67	3.11	2.80
Post Step 1 Vn = Vt n S (cm^3)	1.80	1.64	2.92	2.00	3.67	3.11	2.80
Post Step 2 Vn = Vt n S (cm^3)	1.80	1.64	2.92	2.00	3.67	3.11	2.80
Post Step 3 Vn = Vt n S (cm^3)	1.80	1.64	2.92	2.00	3.67	3.11	2.80
Step 1 Displaced NAPL, lab description	None	None	None	None	None	None	None
Step 2 Displaced NAPL, lab description	None	None	None	None	None	None	None
Step 3 Displaced NAPL, lab description	None	None	None	None	None	None	None
Step 1 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Step 2 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Step 3 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Step 1 Test Duration, t (s)	59,940	59,940	59,940	59,940	59,940	59,940	59,940
Step 2 Test Duration, t (s)	12,960	12,960	12,960	12,960	12,960	12,960	12,960
Step 3 Test Duration, t (s)	6,480	6,480	6,480	6,480	6,480	6,480	6,480
Step 1 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Step 2 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Step 3 NAPL Flow Rate, (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Step 1 Water Pressure, est., pounds per square inch (psi)	0.256	0.247	5.85	2.07	0.581	0.243	0.591
Step 2 Water Pressure, est., pounds per square inch (psi)	0.532	0.192	10.41	4.25	0.973	0.342	1.77
Step 3 Water Pressure, est., pounds per square inch (psi)	0.911	0.274	20.46	6.07	1.64	0.449	7.468
Step 1 Hydraulic Gradient, I	4	4	79	29	8	3	8
Step 2 Hydraulic Gradient, I	7	3	140	59	14	5	24
Step 3 Hydraulic Gradient, I	13	4	275	85	23	6	99
Plug diameter, d (mm)	41.51	41.25	41.51	41.49	41.52	41.48	41.00
Plug diameter, d (cm)	4.151	4.125	4.151	4.149	4.152	4.148	4.1
Plug radius, r (cm)	2.0755	2.0625	2.0755	2.0745	2.076	2.074	2.05
Plug length, L (mm)	50.29	49.02	52.41	50.54	49.93	52.07	53.03
Plug length, L (cm)	5.029	4.902	5.241	5.054	4.993	5.207	5.303
Plug area, A (cm^2)	13.5	13.4	13.5	13.5	13.5	13.5	13.2
Plug total volume, Vt (cm^3)	68.0	65.5	70.9	68.3	67.6	70.3	70.0

NAPL Effective Hydraulic Conductivity Calculations and Mobility Interpretations Based on Multiple Lines of Evidence
Quanta Resources Superfund Site

Sample ID	TTA-05-D-004006	PR1-4-058060	A-03b-046048	A-08b-033035	AA1-4-074076	PR1-7-080082	NN6-10a-030032
Zone	EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	EA-SMA	Outside EA-SMA	Outside EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)							
Porosity, n	0.74	0.74	0.64	0.70	0.73	0.70	0.61
NAPL sat, S init (%)	3.1	5.6	2.4	4.5	5.6	2.5	4.9
NAPL sat, S after Step 1 (%)	3.1	5.6	2.4	4.5	5.5	2.5	4.9
NAPL sat, S after Step 2 (%)	3.1	5.6	2.4	4.5	5.5	2.5	4.9
NAPL sat, S after Step 3 (%)	3.1	5.6	2.4	4.5	5.5	2.5	4.9
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**1.0E-09**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**2E-11**	**4.7E-11**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**3.3E-11**	**0.0E+00**	**0.0E+00**
	Immobile	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**
Lines of Evidence for Immobile (IM) or Potentially Mobile (PM)							
NAPL produced in first flow step? No = IM, Yes = PM	**IM**	**IM**	**IM**	**IM**	**PM**	**IM**	**IM**
Total change in NAPL saturation, <10% of value = IM, >10% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Maximum Kn < 10^{-7} cm/sec = IM, >10^{-7} cm/sec = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Initial saturation, <10% = IM, >30% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Initial Vn = Vt n S (cm^3)	1.58	2.89	1.04	2.15	2.71	1.20	2.02
Post Step 1 Vn = Vt n S (cm^3)	1.58	2.89	1.04	2.15	2.64	1.20	2.02
Post Step 2 Vn = Vt n S (cm^3)	1.58	2.88	1.04	2.15	2.64	1.20	2.02
Post Step 3 Vn = Vt n S (cm^3)	1.58	2.88	1.04	2.15	2.64	1.20	2.02
Step 1 Displaced NAPL, lab description	None	None	None	None	"tiny bleb"	None	None
Step 2 Displaced NAPL, lab description	"spec of a pin head"	"less than 10ul"	None	None	None	None	None
Step 3 Displaced NAPL, lab description	None	None	None	None	"pin head bleb"	None	None
Step 1 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.1	0.00	0.00
Step 2 Displaced NAPL volume, est'd. (cm^3)	0.0004	0.009	0.00	0.00	0.00	0.00	0.00
Step 3 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.0004	0.00	0.00
Step 1 Test Duration, t (s)	59,940	59,940	59,940	59,940	59,940	59,940	59,940
Step 2 Test Duration, t (s)	12,960	51,660	12,960	12,960	12,960	12,960	12,960
Step 3 Test Duration, t (s)	6,480	119,880	59,940	6,480	6,480	6,480	6,480
Step 1 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-06	0.0E+00	0.0E+00
Step 2 NAPL Flow Rate, Qn (cm^3/s)	2.9E-08	1.7E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Step 3 NAPL Flow Rate, (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.9E-08	0.0E+00	0.0E+00
Step 1 Water Pressure, est., pounds per square inch (psi)	2.36	8.58	7	8.82	5.51	1.15	0.93
Step 2 Water Pressure, est., pounds per square inch (psi)	6.85	20.5	10	9.98	4.51	1.79	1.79
Step 3 Water Pressure, est., pounds per square inch (psi)	9.73	9.98	9	10.3	9.31	3.77	2.31
Step 1 Hydraulic Gradient, I	32	116	100	124	79	15	13
Step 2 Hydraulic Gradient, I	93	277	142	140	65	24	25
Step 3 Hydraulic Gradient, I	132	135	128	144	133	51	33
Plug diameter, d (mm)	41.10	41.31	41.51	41.37	41.57	41.24	41.39
Plug diameter, d (cm)	4.11	4.131	4.151	4.137	4.157	4.124	4.139
Plug radius, r (cm)	2.055	2.0655	2.0755	2.0685	2.0785	2.062	2.0695
Plug length, L (mm)	51.87	52.18	49.44	50.27	49.14	52.34	50.01
Plug length, L (cm)	5.187	5.218	4.944	5.027	4.914	5.234	5.001
Plug area, A (cm^2)	13.3	13.4	13.5	13.4	13.6	13.4	13.4
Plug total volume, Vt (cm^3)	68.8	69.9	66.9	67.5	66.7	69.9	67.3

NAPL Effective Hydraulic Conductivity Calculations and Mobility Interpretations Based on Multiple Lines of Evidence
Quanta Resources Superfund Site

Sample ID	NN6-10a-084086	VC-05b-037039	VC-05b-093095	A-03C-093095	A-14a-1-080082	PR1-9-1-032034	AA1-3-057059
Zone	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)							
Porosity, n	0.68	0.69	0.76	0.75	0.67	0.78	0.67
NAPL sat, S init (%)	5.3	5.2	2.3	3.3	7.1	3.5	16.3
NAPL sat, S after Step 1 (%)	5.3	5.2	2.3	3.3	7.1	3.5	16.2
NAPL sat, S after Step 2 (%)	5.3	5.2	2.3	3.3	7.1	3.5	16.2
NAPL sat, S after Step 3 (%)	5.3	5.2	2.3	3.3	7.1	3.5	16.2
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**5.9E-11**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**1.6E-11**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**3.9E-12**
	Immobile	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**	**Immobile**
Lines of Evidence for Immobile (IM) or Potentially Mobile (PM)							
NAPL produced in first flow step? No = IM, Yes = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**PM**
Total change in NAPL saturation, <10% of value = IM, >10% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Maximum Kn < 10^{-7} cm/sec = IM, >10^{-7} cm/sec = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**
Initial saturation, <10% = IM, >30% = PM	**IM**	**IM**	**IM**	**IM**	**IM**	**IM**	Indeterminate
Initial Vn = Vt n S (cm^3)	2.36	2.43	1.18	1.62	3.22	1.83	7.5980
Post Step 1 Vn = Vt n S (cm^3)	2.36	2.43	1.18	1.62	3.22	1.83	7.5942
Post Step 2 Vn = Vt n S (cm^3)	2.36	2.43	1.18	1.62	3.22	1.83	7.5938
Post Step 3 Vn = Vt n S (cm^3)	2.36	2.43	1.18	1.62	3.22	1.83	7.5934
Step 1 Displaced NAPL, lab description	None	None	None	None	None	None	"pin heads"
Step 2 Displaced NAPL, lab description	None	None	None	None	None	None	"pin head"
Step 3 Displaced NAPL, lab description	None	None	None	None	None	None	"very small pin head"
Step 1 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.004
Step 2 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.0004
Step 3 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.00	0.00	0.00	0.0004
Step 1 Test Duration, t (s)	59,940	59,940	59,940	59,940	59,940	59,940	59,940
Step 2 Test Duration, t (s)	12,960	12,960	12,960	12,960	12,960	12,960	12,960
Step 3 Test Duration, t (s)	6,480	6,480	6,480	6,480	6,480	6,480	59,940
Step 1 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.4E-08
Step 2 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-08
Step 3 NAPL Flow Rate, (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.4E-09
Step 1 Water Pressure, est., pounds per square inch (psi)	1.19	1.17	3.06	1.18	2.34	0.67	6
Step 2 Water Pressure, est., pounds per square inch (psi)	2.90	2.44	5.58	1.43	9.39	1.42	10
Step 3 Water Pressure, est., pounds per square inch (psi)	5.55	5.94	7.68	1.82	9.72	2.96	9
Step 1 Hydraulic Gradient, I	17	16	42	17	33	10	81
Step 2 Hydraulic Gradient, I	43	33	76	21	131	20	135
Step 3 Hydraulic Gradient, I	81	81	105	27	135	42	122
Plug diameter, d (mm)	41.44	40.97	41.02	41.42	41.4	41.33	41.23
Plug diameter, d (cm)	4.144	4.097	4.102	4.142	4.14	4.133	4.123
Plug radius, r (cm)	2.072	2.0485	2.051	2.071	2.07	2.0665	2.0615
Plug length, L (mm)	48.01	51.90	51.60	48.09	50.62	49.53	52.12
Plug length, L (cm)	4.801	5.19	5.16	4.809	5.062	4.953	5.212
Plug area, A (cm^2)	13.5	13.2	13.2	13.5	13.5	13.4	13.3
Plug total volume, Vt (cm^3)	64.7	68.4	68.2	64.8	68.1	66.4	69.6

NAPL Effective Hydraulic Conductivity Calculations and Mobility Interpretations Based on Multiple Lines of Evidence
Quanta Resources Superfund Site

Sample ID	AA1-1-062064	VC-05b-2-084086	TTA-05-D-032034	TTA-04-E-063065	TTA-04-E-098100		PR2-1 (0.6 ft)
Zone	Outside EA-SMA	Outside EA-SMA	EA-SMA	EA-SMA	EA-SMA		EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive		1000G centrifuge
Test Plug Depth (feet)							(no compression)
Porosity, n	0.65	0.66	0.66	0.70	0.62		0.78
NAPL sat, S init (%)	4.3	5.5	3.1	11.6	25.0		34.3
NAPL sat, S after Step 1 (%)	4.3	5.5	3.1	11.6	24.9		33.1
NAPL sat, S after Step 2 (%)	4.3	5.5	3.1	11.6	17.4		Not Applicable
NAPL sat, S after Step 3 (%)	4.3	5.5	3.1	5.4	10.0		Not Applicable
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**1.0E-10**	**5.4E-10**		**1.3E-08**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**1.9E-10**	**1.4E-06**		Not Applicable
Step 3 Kn (cm/s)	**0.0E+00**	**7.1E-11**	**1.7E-11**	**1.7E-06**	**2.6E-07**		Not Applicable
	Immobile	**Immobile**	**Immobile**	**Potentially Mobile**	**Potentially Mobile**		**Potentially Mobile**
Lines of Evidence for Immobile (IM) or Potentially Mobile (PM)							
NAPL produced in first flow step? No = IM, Yes = PM	**IM**	**IM**	**IM**	**PM**	**PM**		**PM**
Total change in NAPL saturation, <10% of value = IM, >10% = PM	**IM**	**IM**	**IM**	**PM**	**PM**		**IM**
Maximum Kn < 10^{-7} cm/sec = IM, >10^{-7} cm/sec = PM	**IM**	**IM**	**IM**	**PM**	**PM**		**IM**
Initial saturation, <10% = IM, >30% = PM	**IM**	**IM**	**IM**	Indeterminate	Indeterminate		**PM**
Initial Vn = Vt n S (cm^3)	1.73	2.45	1.56	5.60	10.07		15.47
Post Step 1 Vn = Vt n S (cm^3)	1.73	2.45	1.56	5.60	10.03		14.93
Post Step 2 Vn = Vt n S (cm^3)	1.73	2.45	1.56	5.59	7.03		Not Applicable
Post Step 3 Vn = Vt n S (cm^3)	1.73	2.45	1.56	2.59	4.03		Not Applicable
Step 1 Displaced NAPL, lab description	None	None	None	"pin heads"	"small less than 50ul"		"dark brown DNAPL"
Step 2 Displaced NAPL, lab description	None	None	None	"pin heads"	"glob on bottom"		Not Applicable
Step 3 Displaced NAPL, lab description	None	"pin head"	"small pin head"	"globs at bottom"	"glob"		Not Applicable
Step 1 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.004	0.040		0.54
Step 2 Displaced NAPL volume, est'd. (cm^3)	0.00	0.00	0.00	0.004	3		Not Applicable
Step 3 Displaced NAPL volume, est'd. (cm^3)	0.00	0.0004	0.0004	3	3		Not Applicable
Step 1 Test Duration, t (s)	59,940	59,940	59,940	59,940	59,940		3,600
Step 2 Test Duration, t (s)	12,960	12,960	12,960	12,960	12,960		Not Applicable
Step 3 Test Duration, t (s)	59,940	6,480	6,480	6,480	6,480		Not Applicable
Step 1 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	6.4E-08	6.7E-07		1.5E-04
Step 2 NAPL Flow Rate, Qn (cm^3/s)	0.0E+00	0.0E+00	0.0E+00	2.9E-07	2.3E-04		Not Applicable
Step 3 NAPL Flow Rate, (cm^3/s)	0.0E+00	5.9E-08	5.9E-08	4.6E-04	4.6E-04		Not Applicable
Step 1 Water Pressure, est., pounds per square inch (psi)	5	2.29	2.82	3.5	6.25		Not Applicable
Step 2 Water Pressure, est., pounds per square inch (psi)	20	3.54	6.88	8.5	0.86		Not Applicable
Step 3 Water Pressure, est., pounds per square inch (psi)	19	4.33	20	1.5	9.14		Not Applicable
Step 1 Hydraulic Gradient, I	75	32	36	48	91		1000
Step 2 Hydraulic Gradient, I	301	50	87	116	13		Not Applicable
Step 3 Hydraulic Gradient, I	286	61	253	20	133		Not Applicable
Plug diameter, d (mm)	41.34	41.45	41.47	41.29	41.37		38.1
Plug diameter, d (cm)	4.134	4.145	4.147	4.129	4.137		3.81
Plug radius, r (cm)	2.067	2.0725	2.0735	2.0645	2.0685		1.905
Plug length, L (mm)	46.73	49.81	55.68	51.72	48.23		50.8
Plug length, L (cm)	4.673	4.981	5.568	5.172	4.823		5.08
Plug area, A (cm^2)	13.4	13.5	13.5	13.4	13.4		11.4
Plug total volume, Vt (cm^3)	62.7	67.2	75.2	69.2	64.8		57.9

Notes:

1) Pink-shaded cells indicates inlet water pressure did not stabilize - listed value is approximate midpoint of range for the specified flow rate step.

2) Blue-shaded cells indicate that the NAPL volume displaced during the specified flow rate step was estimated based on qualitative description reported by the laboratory, and photographs when available.

3) Shading on sample names indicates USEPA sample selection category. Red = high, tan = medium, blue = low.

4) Historical centrifuge test result for PR2-1 (0.6 ft) included for comparison purposes only (PTS File No. 43527, Report Date February 11, 2014).

Equations:

NAPL Effective Hydraulic Conductivity	Kn = Qn / (A I)
NAPL Flow Rate	Qn = dVn / t
Volume of NAPL in Test Plug	Vn = Vt n S
Change in NAPL Volume	dVn = Vn,start - Vn,end
Vn,start is Vn at start of test; Vn,end is Vn at end of test.	
NAPL Effective Hydraulic Conductivity	Kn = dVn /(A I t)

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)
Quanta Resources Superfund Site

Sample ID Zone Test Type Test Plug Depth (feet)		A-13A-120125 Outside EA-SMA water drive	A-23A-048053 Outside EA-SMA water drive	A-23A-084089 Outside EA-SMA water drive	PR2-8-105113 Outside EA-SMA water drive
Porosity, n	0.70	0.71	0.68	0.66	0.68
NAPL sat, S init (%)	4.1	1.8	3.0	3.0	5.7
NAPL sat, S after Step 1 (%)	4.1	1.8	3.0	3.0	5.7
NAPL sat, S after Step 2 (%)	4.1	1.8	3.0	3.0	5.7
NAPL sat, S after Step 3 (%)	4.1	1.8	3.0	3.0	5.7
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Max Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Estimated Field Hydraulic Gradient	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Maximum Field NAPL Velocity, If Mobile and Migrating (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Maximum Field NAPL Velocity, If Mobile and Migrating (ft/yr)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Minimum Field NAPL Travel Time Per Foot, If Mobile and Migrating (yr)	**NA**	**NA**	**NA**	**NA**	**NA**

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)
Quanta Resources Superfund Site

Sample ID	TTA-06-D-006008	A-13A-166168	A23-A-111113	A23-A-134136	A23-A-201203
Zone	EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)					
Porosity, n	0.66	0.73	0.73	0.71	0.67
NAPL sat, S init (%)	3.6	2.8	3.6	3.5	6.2
NAPL sat, S after Step 1 (%)	3.6	2.8	3.6	3.5	6.2
NAPL sat, S after Step 2 (%)	3.6	2.8	3.6	3.5	6.2
NAPL sat, S after Step 3 (%)	3.6	2.8	3.6	3.5	6.2
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Max Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Estimated Field Hydraulic Gradient	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Maximum Field NAPL Velocity, If Mobile and Migrating (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Maximum Field NAPL Velocity, If Mobile and Migrating (ft/yr)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Minimum Field NAPL Travel Time Per Foot, If Mobile and Migrating (yr)	**NA**	**NA**	**NA**	**NA**	**NA**

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)
Quanta Resources Superfund Site

Sample ID	PR2-8-150152	PR2-8-170172	TTA-04-D-032034	A-13A-170172	TTA-05-D-004006
Zone	Outside EA-SMA	Outside EA-SMA	EA-SMA	Outside EA-SMA	EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)					
Porosity, n	0.66	0.75	0.75	0.72	0.74
NAPL sat, S init (%)	4.4	7.2	5.9	5.5	3.1
NAPL sat, S after Step 1 (%)	4.4	7.2	5.9	5.5	3.1
NAPL sat, S after Step 2 (%)	4.4	7.2	5.9	5.5	3.1
NAPL sat, S after Step 3 (%)	4.4	7.2	5.9	5.5	3.1
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**2.4E-11**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Max Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**2.4E-11**
Estimated Field Hydraulic Gradient	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Maximum Field NAPL Velocity, If Mobile and Migrating (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**2.1E-10**
Maximum Field NAPL Velocity, If Mobile and Migrating (ft/yr)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**2.1E-04**
Minimum Field NAPL Travel Time Per Foot, If Mobile and Migrating (yr)	**NA**	**NA**	**NA**	**NA**	**4657**

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)
Quanta Resources Superfund Site

Sample ID	PR1-4-058060	A-03b-046048	A-08b-033035	AA1-4-074076	PR1-7-080082
Zone	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	EA-SMA	Outside EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)					
Porosity, n	0.74	0.64	0.70	0.73	0.70
NAPL sat, S init (%)	5.6	2.4	4.5	5.6	2.5
NAPL sat, S after Step 1 (%)	5.6	2.4	4.5	5.5	2.5
NAPL sat, S after Step 2 (%)	5.6	2.4	4.5	5.5	2.5
NAPL sat, S after Step 3 (%)	5.6	2.4	4.5	5.5	2.5
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**1.0E-09**	**0.0E+00**
Step 2 Kn (cm/s)	**4.7E-11**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**3.3E-11**	**0.0E+00**
Max Kn (cm/s)	**4.7E-11**	**0.0E+00**	**0.0E+00**	**1.0E-09**	**0.0E+00**
Estimated Field Hydraulic Gradient	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Maximum Field NAPL Velocity, If Mobile and Migrating (cm/s)	**2.3E-10**	**0.0E+00**	**0.0E+00**	**5.0E-09**	**0.0E+00**
Maximum Field NAPL Velocity, If Mobile and Migrating (ft/yr)	**2.4E-04**	**0.0E+00**	**0.0E+00**	**5.2E-03**	**0.0E+00**
Minimum Field NAPL Travel Time Per Foot, If Mobile and Migrating (yr)	**4244**	**NA**	**NA**	**193**	**NA**

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)
Quanta Resources Superfund Site

Sample ID	NN6-10a-030032	NN6-10a-084086	VC-05b-037039	VC-05b-093095	A-03C-093095
Zone	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA	Outside EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)					
Porosity, n	0.61	0.68	0.69	0.76	0.75
NAPL sat, S init (%)	4.9	5.3	5.2	2.3	3.3
NAPL sat, S after Step 1 (%)	4.9	5.3	5.2	2.3	3.3
NAPL sat, S after Step 2 (%)	4.9	5.3	5.2	2.3	3.3
NAPL sat, S after Step 3 (%)	4.9	5.3	5.2	2.3	3.3
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Max Kn (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Estimated Field Hydraulic Gradient	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Maximum Field NAPL Velocity, If Mobile and Migrating (cm/s)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Maximum Field NAPL Velocity, If Mobile and Migrating (ft/yr)	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**
Minimum Field NAPL Travel Time Per Foot, If Mobile and Migrating (yr)	**NA**	**NA**	**NA**	**NA**	**NA**

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)

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Quanta Resources Superfund Site

Sample ID	A-14a-1-080082	PR1-9-1-032034	AA1-3-057059	AA1-1-062064	VC-05b-2-084086
Zone	Outside EA-SMA	Outside EA-SMA	EA-SMA	Outside EA-SMA	Outside EA-SMA
Test Type	water drive	water drive	water drive	water drive	water drive
Test Plug Depth (feet)					
Porosity, n	0.67	0.78	0.67	0.65	0.66
NAPL sat, S init (%)	7.1	3.5	16.3	4.3	5.5
NAPL sat, S after Step 1 (%)	7.1	3.5	16.2	4.3	5.5
NAPL sat, S after Step 2 (%)	7.1	3.5	16.2	4.3	5.5
NAPL sat, S after Step 3 (%)	7.1	3.5	16.2	4.3	5.5
Step 1 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**5.9E-11**	**0.0E+00**	**0.0E+00**
Step 2 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**1.6E-11**	**0.0E+00**	**0.0E+00**
Step 3 Kn (cm/s)	**0.0E+00**	**0.0E+00**	**3.9E-12**	**0.0E+00**	**7.1E-11**
Max Kn (cm/s)	**0.0E+00**	**0.0E+00**	**5.9E-11**	**0.0E+00**	**7.1E-11**
Estimated Field Hydraulic Gradient	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Maximum Field NAPL Velocity, If Mobile and Migrating (cm/s)	**0.0E+00**	**0.0E+00**	**1.1E-10**	**0.0E+00**	**3.9E-10**
Maximum Field NAPL Velocity, If Mobile and Migrating (ft/yr)	**0.0E+00**	**0.0E+00**	**1.1E-04**	**0.0E+00**	**4.0E-04**
Minimum Field NAPL Travel Time Per Foot, If Mobile and Migrating (yr)	**NA**	**NA**	**8971**	**NA**	**2470**

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)
Quanta Resources Superfund Site

Sample ID	TTA-05-D-032034	TTA-04-E-063065	TTA-04-E-098100		PR2-1 (0.6 ft)
Zone	EA-SMA	EA-SMA	EA-SMA		A
Test Type	water drive	water drive	water drive		1000G centrifuge
Test Plug Depth (feet)					(no compression)
Porosity, n	0.66	0.70	0.62		0.78
NAPL sat, S init (%)	3.1	11.6	25.0		34.30
NAPL sat, S after Step 1 (%)	3.1	11.6	24.9		33.10
NAPL sat, S after Step 2 (%)	3.1	11.6	17.4		Not Applicable
NAPL sat, S after Step 3 (%)	3.1	5.4	10.0		Not Applicable
Step 1 Kn (cm/s)	**0.0E+00**	**1.0E-10**	**5.4E-10**		**1.3E-08**
Step 2 Kn (cm/s)	**0.0E+00**	**1.9E-10**	**1.4E-06**		Not Applicable
Step 3 Kn (cm/s)	**1.7E-11**	**1.7E-06**	**2.6E-07**		Not Applicable
Max Kn (cm/s)	**1.7E-11**	**1.7E-06**	**1.4E-06**		**1.3E-08**
Estimated Field Hydraulic Gradient	**0.20**	**0.20**	**0.20**		**0.20**
Maximum Field NAPL Velocity, If Mobile and Migrating (cm/s)	**1.7E-10**	**4.2E-06**	**1.8E-06**		**9.9E-09**
Maximum Field NAPL Velocity, If Mobile and Migrating (ft/yr)	**1.7E-04**	**4.3E+00**	**1.8E+00**		**1.0E-02**
Minimum Field NAPL Travel Time Per Foot, If Mobile and Migrating (yr)	**5833**	**0.2**	**0.5**		**97.9**

NAPL Velocity and Travel Time Calculations (If Mobile and Migrating)
Quanta Resources Superfund Site

Notes:

1) To be conservative, maximum calculated NAPL effective hydraulic conductivity value for each sample used in velocity and travel time calculations.

2) To be conservative, estimated field hydraulic gradient is 2x the average vertical hydraulic gradient measured in the top 15 feet of sediment during the RI, prior to OU-1 remediation activities.

3) NA = not applicable, calcualted NAPL velocity is zero so calculated travel time is infinite.

4) Shading on sample names indicates USEPA sample selection category. Red = high, tan = medium, blue = low.

Equations:

NAPL Velocity in Field, If Mobile and Migrating (vn) $vn = Kn\ I / nS$ (converted to feet per year to facillitate interpretation of results)

I = estimated field hydraulic gradient, n = porosity, S = initial NAPL saturation

NAPL Travel Time, If Mobile and Migrating (years per foot) $t = 1\ ft / vn$

				Media Mass							
Sample ID	**Sample Midpoint Depth** (ft)	**SDG**	**Location**	**Solids** (g)	**Water** (g)	**NAPL** (g)	**Grain Density** (g/mL)	**Estimated NAPL Density (mg/L)**	**Calculated NAPL Volume (mL)**	**Calculated NAPL Saturation**	**Calculated Porosity**
A-13A-088090	7.42	T1060-02	OA	46.39	49.70	3.42	2.14	1.13	3.0	5.7%	0.71
		T1060-02_B	PWD	26.53	29.92	1.46	2.00	1.13	1.3	4.1%	0.70
A-13A-120125[a]	10.25	T1060-03	OA	50.43	39.80	11.46	2.07	1.13	10.1	20.3%	0.67
		T1060-03 RE	OA	26.59	26.20	0.36	2.07	1.13	0.3	1.2%	0.67
		T1060-03_B	PWD	28.23	28.55	0.59	2.37	1.13	0.5	1.8%	0.71
A-23A-048053	4.25	T1060-04	OA	44.65	55.60	2.40	1.91	1.13	2.1	3.7%	0.71
		T1060-04_B	PWD	20.94	24.27	0.85	1.76	1.13	0.8	3.0%	0.68
A-23A-084089	7.25	T1060-05	OA	46.14	51.50	4.04	1.76	1.13	3.6	6.5%	0.68
		T1060-05_B	PWD	27.05	30.83	1.06	1.67	1.13	0.9	3.0%	0.66
PR2-8-105113	9.08	T1060-07	OA	47.00	52.00	2.96	1.84	1.13	2.6	4.8%	0.68
		T1060-07_B	PWD	27.11	30.60	2.09	1.80	1.13	1.8	5.7%	0.68
TTA-06-D-006008	0.58	T1060-08	OA	47.55	50.70	2.74	1.81	1.13	2.4	4.6%	0.67
		T1060-08_A	PWD	26.76	26.43	1.11	1.90	1.13	1.0	3.6%	0.66
A-13A-166168	13.92	T1065-01	OA	26.68	27.74	1.80	2.30	1.13	1.6	5.4%	0.72
		T1065-01C	PWD	30.90	34.91	1.13	2.38	1.13	1.0	2.8%	0.73
A23-A-111113	9.33	T1065-02	OA	25.45	31.48	0.92	2.05	1.13	0.8	2.5%	0.72
		T1065-02B	PWD	24.71	31.39	1.34	2.01	1.13	1.2	3.6%	0.73
A23-A-134136	11.25	T1065-03	OA	26.61	32.61	1.61	1.75	1.13	1.4	4.2%	0.69
		T1065-03B	PWD	23.05	29.77	1.22	1.87	1.13	1.1	3.5%	0.71
A23-A-201203	16.83	T1065-04	OA	31.65	26.87	2.66	2.01	1.13	2.4	8.1%	0.65
		T1065-04B	PWD	34.61	31.37	2.33	2.10	1.13	2.1	6.2%	0.67
PR2-8-150152	12.58	T1065-05	OA	25.33	27.89	1.02	1.74	1.13	0.9	3.1%	0.66
		T1065-05B	PWD	30.61	33.23	1.74	1.70	1.13	1.5	4.4%	0.66
PR2-8-170172	14.25	T1065-06	OA	27.52	26.74	0.98	2.83	1.13	0.9	3.1%	0.74
		T1065-06B	PWD	30.91	31.37	2.75	2.82	1.13	2.4	7.2%	0.75
TTA-04-D-032034	2.75	T1065-07	OA	22.19	34.65	-0.46	1.89	1.13	NA[b]	NA[b]	NA[b]
		T1065-07B	PWD	21.80	33.29	2.35	1.87	1.13	2.1	5.9%	0.75
A-13A-170172	14.25	T1065-08	OA	26.90	28.18	1.71	2.34	1.13	1.5	5.1%	0.72
		T1065-08B	PWD	33.47	36.06	2.39	2.28	1.13	2.1	5.5%	0.72

Water Drive Test Results Summary
Quanta Resources Superfund Site, Operable Unit 2

				Media Mass							
Sample ID	**Sample Midpoint Depth** (ft)	**SDG**	**Location**	**Solids** (g)	**Water** (g)	**NAPL** (g)	**Grain Density** (g/mL)	**Estimated NAPL Density (mg/L)**	**Calculated NAPL Volume (mL)**	**Calculated NAPL Saturation**	**Calculated Porosity**
TTA-05-D-004006	0.42	T1065-09	OA	28.66	28.55	1.52	2.93	1.13	1.3	4.5%	0.75
		T1065-09B	PWD	26.37	24.70	0.90	2.89	1.13	0.8	3.1%	0.74
PR1-4-058060	4.92	T1065-11	OA	29.85	26.77	2.20	2.77	1.13	1.9	6.8%	0.73
		T1065-11C	PWD	26.37	26.13	1.74	2.72	1.13	1.5	5.6%	0.74
A-03b-046048	3.92	T1067-01	OA	26.74	23.11	0.24	2.46	1.13	0.2	0.9%	0.68
		T1067-01C	PWD	39.72	30.55	0.86	2.28	1.13	0.8	2.4%	0.64
A-08b-033035	2.83	T1067-02	OA	18.42	28.66	2.84	1.32	1.13	2.5	8.1%	0.69
		T1067-02B	PWD	22.30	31.44	1.69	1.60	1.13	1.5	4.5%	0.70
AA1-4-074076	6.25	T1067-03	OA	22.00	27.79	2.42	1.99	1.13	2.1	7.2%	0.73
		T1067-03B	PWD	25.93	30.78	2.01	2.10	1.13	1.8	5.5%	0.73
PR1-7-080082	6.75	T1067-04	OA	19.97	29.05	0.88	1.64	1.13	0.8	2.6%	0.71
		T1067-04B	PWD	34.53	37.08	1.06	2.08	1.13	0.9	2.5%	0.70
NN6-10a-030032	2.58	T1067-05	OA	23.12	26.91	0.74	1.90	1.13	0.7	2.4%	0.69
		T1067-05B	PWD	29.45	33.93	1.98	1.29	1.13	1.8	4.9%	0.61
NN6-10a-084086	7.08	T1067-07	OA	24.04	33.06	8.02	1.51	1.13	7.1	17.7%	0.72
		T1067-07B	PWD	14.52	22.00	1.40	1.35	1.13	1.2	5.3%	0.68
VC-05b-037039	3.17	T1067-08	OA	17.65	19.39	1.88	1.71	1.13	1.7	7.9%	0.67
		T1067-08B	PWD	23.67	26.10	1.61	1.89	1.13	1.4	5.2%	0.69
VC-05b-093095	7.83	T1067-09	OA	19.26	23.82	1.34	2.20	1.13	1.2	4.7%	0.74
		T1067-09B	PWD	24.71	28.50	0.75	2.67	1.13	0.7	2.3%	0.76
A-03C-093095	7.83	T1072-01B	OA	35.48	39.06	1.63	2.53	1.13	1.4	3.6%	0.74
			PWD	23.98	27.88	1.09	2.49	1.13	1.0	3.3%	0.75
A-14a-1-080082	6.67	T1072-02C	OA	25.81	24.70	2.13	1.95	1.13	1.9	7.1%	0.67
			PWD	30.54	30.47	ND[c]	2.78	1.13	ND[c]	NA[c]	NA[c]
PR1-9-1-032034	2.67	T1072-03B	OA	22.78	27.44	1.48	1.55	1.13	1.3	4.6%	0.66
			PWD	24.77	31.17	1.28	2.79	1.13	1.1	3.5%	0.78
AA1-3-057059	4.75	T1072-04C	OA	23.28	28.59	1.31	1.47	1.13	1.2	3.9%	0.65
			PWD	18.56	17.88	3.92	1.78	1.13	3.5	16.2%	0.67
AA1-1-062064	5.17	T1072-05A	OA	22.93	26.67	2.27	1.50	1.13	2.0	7.0%	0.65
			PWD	18.88	20.13	1.01	1.66	1.13	0.9	4.3%	0.65
VC-05b-2-084086	7.00	T1072-06A	OA	23.94	22.67	5.35	2.35	1.13	4.7	17.3%	0.73
			PWD	26.06	28.81	1.89	1.68	1.13	1.7	5.5%	0.66
TTA-05-D-032034	2.67	T1072-07C	OA	24.52	24.61	2.33	2.23	1.13	2.1	7.7%	0.71
			PWD	29.84	28.50	1.05	1.98	1.13	0.9	3.1%	0.66

Water Drive Test Results Summary
Quanta Resources Superfund Site, Operable Unit 2

				Media Mass							
Sample ID	**Sample Midpoint Depth** (ft)	**SDG**	**Location**	**Solids** (g)	**Water** (g)	**NAPL** (g)	**Grain Density** (g/mL)	**Estimated NAPL Density (mg/L)**	**Calculated NAPL Volume (mL)**	**Calculated NAPL Saturation**	**Calculated Porosity**
TTA-04-E-063065	5.25	T1072-09A	OA	22.49	30.71	2.80	1.96	1.13	2.5	7.5%	0.74
			PWD	22.76	32.91	2.11	1.52	1.13	1.9	5.4%	0.70
TTA-04-E-098100	8.17	T1072-12B	OA	24.39	27.26	3.07	1.89	1.13	2.7	9.1%	0.70
			PWD	20.54	24.93	3.13	1.22	1.13	2.8	10.0%	0.62

Notes:

1) NAPL saturation values for PWD samples indicate NAPL content in laboratory NAPL mobility test sample after completion of water-drive test.

2) NAPL density estimated based on measured NAPL specific gravity at well MW-116B, reported in OU-1 RI Report.

[a]Dean Stark analysis repeated on additional aliquot due to suspected heterogeneity.

[b]Negative NAPL mass reported. Result not applicable (NA) for calculation of NAPL volume, NAPL saturation or sample porosity.

[c]ND = No data due to laboratory error. PWD result not applicable (NA) for calculation of NAPL volume, NAPL saturation or sample porosity. NAPL saturation and porosity values from OA sample entered in NAPL mobility interpretation worksheet

OA: Outer annulus
PWD: Post-water drive
SDG: Sample delivery group