SLUG TEST CALCULATIONS

SLUG TEST DATA
HYDRAULIC CONDUCTIVITY CALCULATIONS

Task: Determine the hydraulic conductivity for a singular well at three (3) well locations, which wells are used to monitor groundwater at the Wellsboro, Pennsylvania facility.

Method: Record field data using the Campbell Scientific, Inc. PST8 Pump and Slug Test data logging system and calculate the hydraulic conductivity using the Hvorslev slug-test method.

Hvorslev Equation:

$$K = \frac{r^2 \ln (L/R)}{2 L T_o}$$

where: K = hydraulic conductivity (ft./day)
r = radius of the well (ft.)
R = radius of the well screen and gravel pack (ft.)
L = length of the well screen (ft.)
T_o = time for water level to reach 37% of the initial change (min.)

Well Data:

Parameter/Well ID#	MW-8	MW-9	MW-10
r (ft.)	.084	.084	.167
R (ft.)	.250	.250	.417
L (ft.)	30	30	5
T_o (min.)	.18	.067	4.68

Calculations:

Monitoring Well MW-8:

$$K = \frac{(.084)^2 \times \ln (30/.250)}{2 \times 30 \times .18}$$

$$= \frac{.034}{10.8}$$

= .003 ft./min. X 60 min./hr. X 24 hr./day

= **4.5 ft./day**

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Monitoring Well MW-9:

$$K = \frac{(.084)^2 \times \ln(30/.250)}{2 \times 30 \times .067}$$

$$= \frac{.034}{4.02}$$

$$= .008 \text{ ft./min. X 60 min./hr. X 24 hr./day}$$

$$= \mathbf{12.1\ ft./day}$$

Monitoring Well MW-12:

$$K = \frac{(.167)^2 \times \ln(5/.417)}{2 \times 5 \times 4.68}$$

$$= \frac{.069}{46.8}$$

$$= 1.5 \times 10^{-3} \text{ ft./min. X 60 min./hr. X 24 hr./day}$$

$$= \mathbf{2.13\ ft./day}$$

Graphical Representation of Slug Test Data
Osram Sylvania - RFI Monitoring Well MW-8
December 3, 1998

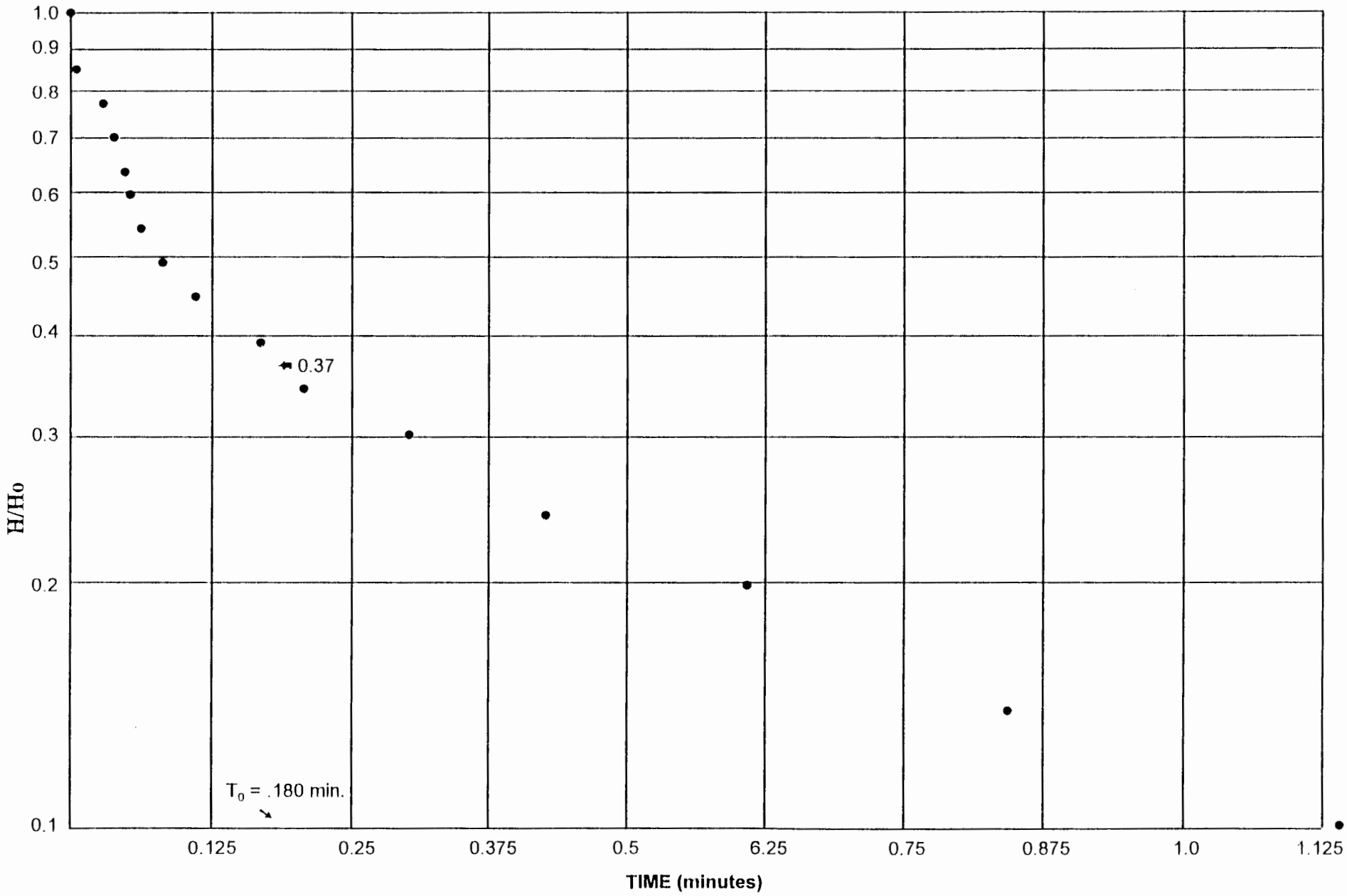

TABLE 1
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-8
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
0	-0.406	0	8.760	0.00
0.273	-0.133	0.009	8.751	0.02
0.277	-0.129	-0.002	8.762	-0.00
0.298	-0.108	0.005	8.755	0.01
0.31	-0.096	-0.002	8.762	-0.00
0.323	-0.083	0.005	8.755	0.01
0.34	-0.066	-0.002	8.762	-0.00
0.352	-0.054	0.005	8.755	0.01
0.39	-0.016	0.318	8.442	0.55
0.394	-0.012	0.468	8.292	0.81
0.398	-0.008	0.569	8.191	0.99
0.402	-0.004	0.519	8.241	0.90
0.406	0.000	0.575	8.185	1.00
0.41	0.004	0.489	8.271	0.85
0.415	0.009	0.482	8.278	0.84
0.419	0.013	0.435	8.325	0.76
0.423	0.017	0.276	8.484	0.48
0.427	0.021	0.503	8.257	0.87
0.431	0.025	0.357	8.403	0.62
0.435	0.029	0.445	8.315	0.77
0.44	0.034	0.373	8.387	0.65
0.444	0.038	0.361	8.399	0.63
0.448	0.042	0.404	8.356	0.70
0.452	0.046	0.419	8.341	0.73
0.456	0.050	0.363	8.397	0.63
0.46	0.054	0.285	8.475	0.50
0.465	0.059	0.342	8.418	0.59
0.469	0.063	0.322	8.438	0.56
0.477	0.071	0.313	8.447	0.54
0.485	0.079	0.303	8.457	0.53
0.494	0.088	0.287	8.473	0.50
0.498	0.092	0.281	8.479	0.49
0.502	0.096	0.274	8.486	0.48
0.515	0.109	0.266	8.494	0.46
0.519	0.113	0.258	8.502	0.45
0.531	0.125	0.252	8.508	0.44
0.54	0.134	0.246	8.514	0.43
0.544	0.138	0.239	8.521	0.42
0.552	0.146	0.233	8.527	0.41
0.569	0.163	0.225	8.535	0.39
0.577	0.171	0.217	8.543	0.38
0.594	0.188	0.208	8.552	0.36
0.61	0.204	0.202	8.558	0.35
0.615	0.209	0.209	8.551	0.36
0.619	0.213	0.2	8.560	0.35
0.644	0.238	0.194	8.566	0.34
0.656	0.250	0.188	8.572	0.33
0.681	0.275	0.178	8.582	0.31
0.71	0.304	0.172	8.588	0.30
0.735	0.329	0.166	8.594	0.29
0.74	0.334	0.159	8.601	0.28
0.769	0.363	0.153	8.607	0.27

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December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
0.777	0.371	0.16	8.600	0.28
0.785	0.379	0.15	8.610	0.26
0.835	0.429	0.143	8.617	0.25
0.873	0.467	0.135	8.625	0.23
0.894	0.488	0.129	8.631	0.22
0.923	0.517	0.123	8.637	0.21
0.998	0.592	0.117	8.643	0.20
1.006	0.600	0.111	8.649	0.19
1.01	0.604	0.119	8.641	0.21
1.019	0.613	0.113	8.647	0.20
1.027	0.621	0.106	8.654	0.18
1.09	0.684	0.098	8.662	0.17
1.181	0.775	0.092	8.668	0.16
1.215	0.809	0.086	8.674	0.15
1.248	0.842	0.078	8.682	0.14
1.256	0.850	0.084	8.676	0.15
1.265	0.859	0.077	8.683	0.13
1.348	0.942	0.071	8.689	0.12
1.356	0.950	0.078	8.682	0.14
1.377	0.971	0.071	8.689	0.12
1.435	1.029	0.065	8.695	0.11
1.444	1.038	0.072	8.688	0.13
1.452	1.046	0.065	8.695	0.11
1.552	1.146	0.059	8.701	0.10
1.752	1.346	0.053	8.707	0.09
1.89	1.484	0.047	8.713	0.08
1.902	1.496	0.055	8.705	0.10
1.906	1.500	0.047	8.713	0.08
1.99	1.584	0.041	8.719	0.07
1.994	1.588	0.049	8.711	0.09
2.015	1.609	0.043	8.717	0.07
2.027	1.621	0.049	8.711	0.09
2.04	1.634	0.041	8.719	0.07
2.123	1.717	0.033	8.727	0.06
2.135	1.729	0.045	8.715	0.08
2.152	1.746	0.037	8.723	0.06
2.19	1.784	0.043	8.717	0.07
2.206	1.800	0.035	8.725	0.06
2.21	1.804	0.041	8.719	0.07
2.26	1.854	0.035	8.725	0.06
2.277	1.871	0.041	8.719	0.07
2.281	1.875	0.03	8.730	0.05
2.302	1.896	0.037	8.723	0.06
2.31	1.904	0.028	8.732	0.05
2.323	1.917	0.036	8.724	0.06
2.331	1.925	0.028	8.732	0.05
2.34	1.934	0.035	8.725	0.06
2.423	2.017	0.028	8.732	0.05
2.485	2.079	0.035	8.725	0.06
2.494	2.088	0.028	8.732	0.05
2.51	2.104	0.035	8.725	0.06
2.523	2.117	0.028	8.732	0.05

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December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
2.535	2.129	0.036	8.724	0.06
2.552	2.146	0.024	8.736	0.04
2.556	2.150	0.03	8.730	0.05
2.577	2.171	0.024	8.736	0.04
2.623	2.217	0.03	8.730	0.05
2.627	2.221	0.022	8.738	0.04
2.648	2.242	0.03	8.730	0.05
2.652	2.246	0.024	8.736	0.04
2.694	2.288	0.03	8.730	0.05
2.702	2.296	0.036	8.724	0.06
2.706	2.300	0.028	8.732	0.05
2.719	2.313	0.022	8.738	0.04
2.727	2.321	0.03	8.730	0.05
2.731	2.325	0.024	8.736	0.04
2.981	2.575	0.018	8.742	0.03
3.015	2.609	0.024	8.736	0.04
3.115	2.709	0.016	8.744	0.03
3.127	2.721	0.024	8.736	0.04
3.135	2.729	0.018	8.742	0.03
3.173	2.767	0.024	8.736	0.04
3.269	2.863	0.018	8.742	0.03
3.323	2.917	0.012	8.748	0.02
3.335	2.929	0.02	8.740	0.03
3.435	3.029	0.014	8.746	0.02
3.444	3.038	0.024	8.736	0.04
3.452	3.046	0.016	8.744	0.03
3.523	3.117	0.022	8.738	0.04
3.535	3.129	0.016	8.744	0.03
3.552	3.146	0.022	8.738	0.04
3.565	3.159	0.014	8.746	0.02
3.573	3.167	0.02	8.740	0.03
3.594	3.188	0.014	8.746	0.02
3.602	3.196	0.02	8.740	0.03
3.619	3.213	0.012	8.748	0.02
3.631	3.225	0.018	8.742	0.03
3.644	3.238	0.012	8.748	0.02
3.706	3.300	0.018	8.742	0.03
3.777	3.371	0.012	8.748	0.02
3.898	3.492	0.018	8.742	0.03
3.915	3.509	0.012	8.748	0.02
3.923	3.517	0.018	8.742	0.03
3.935	3.529	0.01	8.750	0.02
3.948	3.542	0.016	8.744	0.03
3.965	3.559	0.01	8.750	0.02
4.027	3.621	0.016	8.744	0.03
4.123	3.717	0.01	8.750	0.02
4.215	3.809	0.016	8.744	0.03
4.256	3.850	0.01	8.750	0.02
4.265	3.859	0.016	8.744	0.03
4.285	3.879	0.008	8.752	0.01
4.298	3.892	0.014	8.746	0.02
4.306	3.900	0.007	8.753	0.01

TABLE 1
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Osram Sylvania - RFI Monitoring Well MW-8
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
4.377	3.971	0.016	8.744	0.03
4.385	3.979	0.008	8.752	0.01
4.39	3.984	0.014	8.746	0.02
4.452	4.046	0.008	8.752	0.01
4.456	4.050	0.014	8.746	0.02
4.469	4.063	0.008	8.752	0.01
4.59	4.184	0.016	8.744	0.03
4.602	4.196	0.01	8.750	0.02
4.752	4.346	0.016	8.744	0.03
4.756	4.350	0.01	8.750	0.02
4.777	4.371	0.016	8.744	0.03
4.785	4.379	0.008	8.752	0.01
4.91	4.504	0.016	8.744	0.03
4.919	4.513	0.007	8.753	0.01
4.935	4.529	0.014	8.746	0.02
4.948	4.542	0.008	8.752	0.01
5.123	4.717	0.014	8.746	0.02
5.135	4.729	0.008	8.752	0.01
5.26	4.854	0.014	8.746	0.02
5.269	4.863	0.006	8.754	0.01
5.281	4.875	0.014	8.746	0.02
5.294	4.888	0.007	8.753	0.01
5.473	5.067	0.014	8.746	0.02
5.477	5.071	0.007	8.753	0.01
6.427	6.021	0.002	8.758	0.00
6.44	6.034	0.008	8.752	0.01
6.61	6.204	0.002	8.758	0.00
6.623	6.217	0.008	8.752	0.01
6.773	6.367	0.002	8.758	0.00
6.785	6.379	0.008	8.752	0.01
6.798	6.392	0	8.760	0.00
6.81	6.404	0.008	8.752	0.01
6.823	6.417	0.002	8.758	0.00
6.835	6.429	0.008	8.752	0.01
6.956	6.550	0.002	8.758	0.00
6.973	6.567	0.008	8.752	0.01
6.981	6.575	0.002	8.758	0.00
6.998	6.592	0.008	8.752	0.01
7.12	6.714	0	8.760	0.00
7.13	6.724	0.006	8.754	0.01
7.14	6.734	0	8.760	0.00
7.16	6.754	0.006	8.754	0.01
7.28	6.874	0	8.760	0.00
7.29	6.884	0.006	8.754	0.01
7.3	6.894	0	8.760	0.00
7.31	6.904	0.006	8.754	0.01
7.34	6.934	0	8.760	0.00
7.34	6.934	0.008	8.752	0.01
7.47	7.064	0.002	8.758	0.00
7.53	7.124	0.008	8.752	0.01
7.63	7.224	0.002	8.758	0.00
7.64	7.234	0.008	8.752	0.01

TABLE 1
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-8
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
7.65	7.244	0.002	8.758	0.00
7.72	7.314	0.008	8.752	0.01
7.81	7.404	0.002	8.758	0.00
7.89	7.484	0.008	8.752	0.01
7.98	7.574	0.002	8.758	0.00
8.1	7.694	0.007	8.753	0.01
8.16	7.754	0	8.760	0.00
8.23	7.824	0.006	8.754	0.01
8.35	7.944	0	8.760	0.00
8.42	8.014	0.006	8.754	0.01
8.54	8.134	0	8.760	0.00
8.6	8.194	0.005	8.755	0.01
8.69	8.284	-0.001	8.761	-0.00
8.74	8.334	0.006	8.754	0.01
8.75	8.344	0	8.760	0.00
8.76	8.354	0.006	8.754	0.01
8.86	8.454	-0.001	8.761	-0.00
8.87	8.464	0.005	8.755	0.01
8.89	8.484	0	8.760	0.00
8.93	8.524	0.005	8.755	0.01
9.04	8.634	-0.001	8.761	-0.00
9.11	8.704	0.007	8.753	0.01
9.13	8.724	0.002	8.758	0.00
9.13	8.724	0.008	8.752	0.01
9.2	8.794	0.002	8.758	0.00
9.3	8.894	0.007	8.753	0.01
9.37	8.964	-0.001	8.761	-0.00
9.37	8.964	0.005	8.755	0.01
9.39	8.984	0	8.760	0.00
9.46	9.054	0.005	8.755	0.01
9.58	9.174	-0.001	8.761	-0.00
9.68	9.274	0.005	8.755	0.01
9.74	9.334	-0.001	8.761	-0.00
9.84	9.434	0.005	8.755	0.01
9.9	9.494	-0.001	8.761	-0.00
9.91	9.504	0.005	8.755	0.01
9.93	9.524	-0.001	8.761	-0.00
10	9.594	0.005	8.755	0.01
10.25	9.844	-0.001	8.749	-0.00
11.5	11.094	-0.518	8.232	-0.90
11.75	11.344	-0.294	8.456	-0.51
12	11.594	-0.174	8.576	-0.30
12.25	11.844	-0.11	8.640	-0.19
12.5	12.094	-0.66	8.090	-1.15
12.75	12.344	-0.041	8.709	-0.07
13	12.594	-0.025	8.725	-0.04
13.25	12.844	-0.01	8.740	-0.02
13.75	13.344	-0.004	8.746	-0.01
14.5	14.094	0.002	8.752	0.00
18.5	18.094	-0.004	8.746	-0.01
18.75	18.344	0.004	8.754	0.01
19	18.594	-0.002	8.748	-0.00

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SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-8
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
20	19.594	0.005	8.755	0.01
21.25	20.844	-0.002	8.748	-0.00
21.45	21.044	0	8.750	0.00

Graphical Representation of Slug Test Data
Osram Sylvania - RFI Monitoring Well MW-9
December 3, 1998

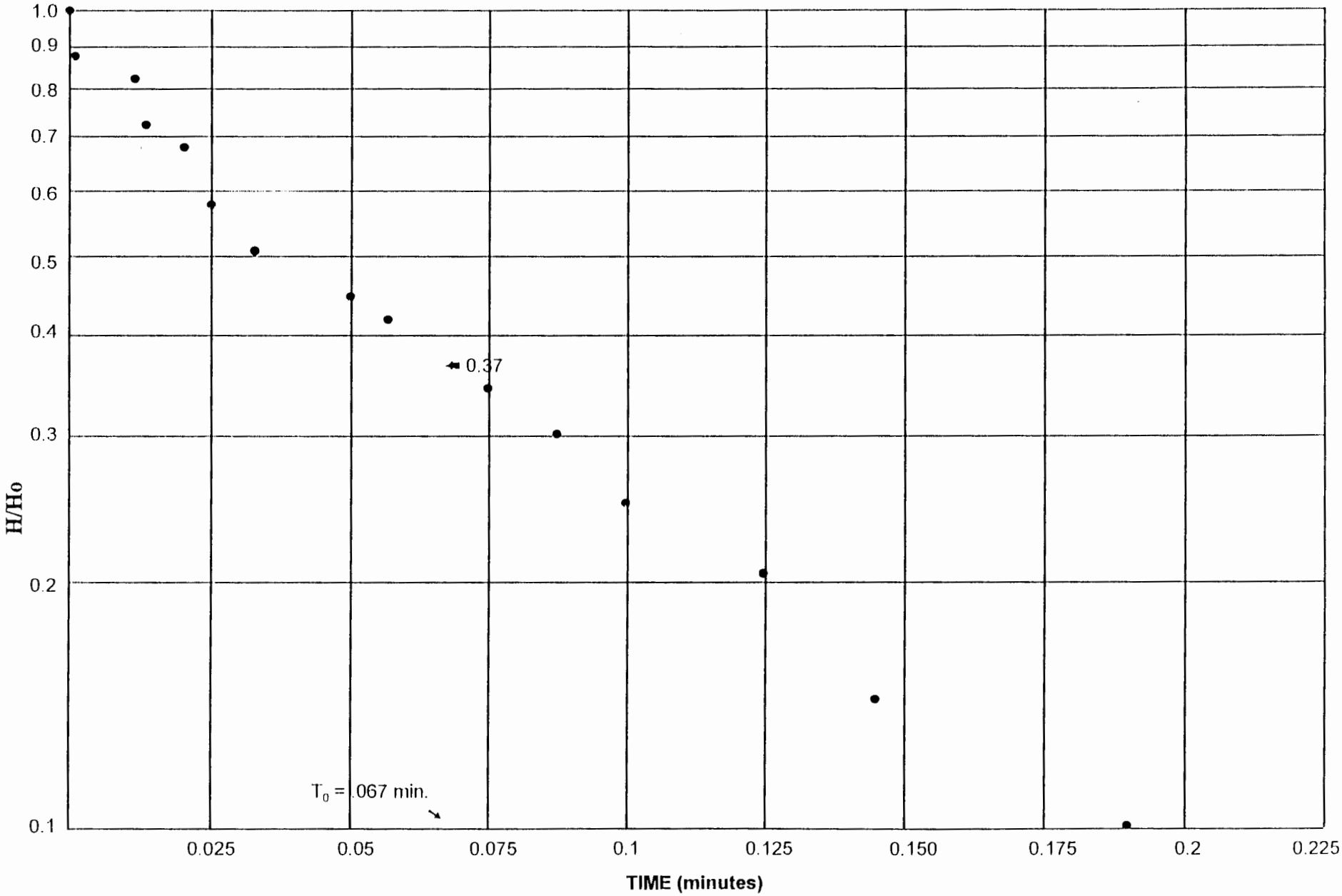

TABLE 2
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-9
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
0	-0.219	0	9.120	--
0.006	-0.213	0.008	9.112	--
0.035	-0.184	0.002	9.118	--
0.202	-0.017	0.144	8.976	--
0.206	-0.013	0.321	8.799	--
0.210	-0.009	0.428	8.692	--
0.215	-0.004	0.477	8.643	--
0.219	0.000	0.645	8.475	1.000
0.223	0.004	0.567	8.501	0.879
0.227	0.008	0.541	8.520	0.839
0.231	0.012	0.522	8.579	0.809
0.235	0.016	0.463	8.600	0.718
0.240	0.021	0.442	8.666	0.685
0.244	0.025	0.376	8.602	0.583
0.248	0.029	0.440	8.715	0.682
0.252	0.033	0.327	8.606	0.507
0.256	0.037	0.436	8.637	0.676
0.260	0.041	0.405	8.768	0.628
0.265	0.046	0.274	8.746	0.425
0.269	0.050	0.296	8.707	0.459
0.273	0.054	0.335	8.777	0.519
0.277	0.058	0.265	8.801	0.411
0.281	0.062	0.241	8.793	0.374
0.285	0.066	0.249	8.805	0.386
0.290	0.071	0.237	8.816	0.367
0.294	0.075	0.226	8.822	0.350
0.298	0.079	0.220	8.834	0.341
0.302	0.083	0.208	8.846	0.322
0.306	0.087	0.196	8.859	0.304
0.310	0.091	0.183	8.869	0.284
0.315	0.096	0.173	8.875	0.268
0.319	0.100	0.167	8.888	0.259
0.327	0.108	0.154	8.894	0.239
0.331	0.112	0.148	8.902	0.229
0.335	0.116	0.140	8.908	0.217
0.344	0.125	0.134	8.918	0.208
0.348	0.129	0.124	8.929	0.192
0.356	0.137	0.113	8.939	0.175
0.360	0.141	0.103	8.945	0.160
0.365	0.146	0.097	8.953	0.150
0.373	0.154	0.089	8.962	0.138
0.385	0.166	0.080	8.970	0.124
0.394	0.175	0.072	8.976	0.112
0.410	0.191	0.066	8.982	0.102
0.415	0.196	0.060	8.988	0.093
0.435	0.216	0.054	8.996	0.084
0.440	0.221	0.046	9.004	0.071
0.473	0.254	0.038	9.011	0.059
0.523	0.304	0.031	9.017	0.048
0.552	0.333	0.025	9.011	0.039
0.565	0.346	0.031	9.017	0.048
0.581	0.362	0.025	9.023	0.039

TABLE 2
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-9
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
0.627	0.408	0.019	9.029	0.029
0.798	0.579	0.013	9.022	0.020
0.806	0.587	0.020	9.030	0.031
0.848	0.629	0.012	9.022	0.019
0.860	0.641	0.020	9.028	0.031
0.952	0.733	0.014	9.034	0.022
0.985	0.766	0.008	9.026	0.012
0.990	0.771	0.016	9.032	0.025
1.115	0.896	0.010	9.022	0.016
1.127	0.908	0.020	9.028	0.031
1.135	0.916	0.014	9.035	0.022
1.169	0.950	0.007	9.028	0.011
1.181	0.962	0.014	9.022	0.022
1.235	1.016	0.020	9.030	0.031
1.248	1.029	0.012	9.022	0.019
1.260	1.041	0.020	9.028	0.031
1.273	1.054	0.014	9.022	0.022
1.290	1.071	0.020	9.030	0.031
1.298	1.079	0.012	9.024	0.019
1.319	1.100	0.018	9.030	0.028
1.323	1.104	0.012	9.024	0.019
1.402	1.183	0.018	9.032	0.028
1.410	1.191	0.010	9.022	0.016
1.423	1.204	0.020	9.032	0.031
1.435	1.216	0.010	9.024	0.016
1.448	1.229	0.018	9.030	0.028
1.456	1.237	0.012	9.024	0.019
1.560	1.341	0.018	9.032	0.028
1.565	1.346	0.010	9.026	0.016
1.581	1.362	0.016	9.032	0.025
1.598	1.379	0.010	9.024	0.016
1.615	1.396	0.018	9.036	0.028
1.623	1.404	0.006	9.030	0.009
1.631	1.412	0.012	9.036	0.019
1.673	1.454	0.006	9.030	0.009
1.690	1.471	0.012	9.037	0.019
1.806	1.587	0.005	9.030	0.008
1.819	1.600	0.012	9.038	0.019
1.835	1.616	0.004	9.032	0.006
1.844	1.625	0.010	9.024	0.016
2.119	1.900	0.018	9.032	0.028
2.127	1.908	0.010	9.026	0.016
2.152	1.933	0.016	9.038	0.025
2.156	1.937	0.004	9.032	0.006
2.160	1.941	0.010	9.024	0.016
2.277	2.058	0.018	9.032	0.028
2.290	2.071	0.010	9.038	0.016
2.340	2.121	0.004	9.030	0.006
2.356	2.137	0.012	9.036	0.019
2.477	2.258	0.006	9.030	0.009
2.490	2.271	0.012	9.038	0.019
2.502	2.283	0.004	9.032	0.006

TABLE 2
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-9
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
2.515	2.296	0.010	9.038	0.016
2.527	2.308	0.004	9.032	0.006
2.540	2.321	0.010	9.038	0.016
2.719	2.500	0.004	9.032	0.006
2.735	2.516	0.010	9.038	0.016
2.823	2.604	0.004	9.032	0.006
2.840	2.621	0.010	9.038	0.016
2.848	2.629	0.004	9.032	0.006
2.873	2.654	0.010	9.038	0.016
2.877	2.658	0.004	9.032	0.006
2.894	2.675	0.010	9.038	0.016
3.010	2.791	0.004	9.032	0.006
3.031	2.812	0.010	9.038	0.016
3.035	2.816	0.004	9.032	0.006
3.048	2.829	0.010	9.038	0.016
3.065	2.846	0.004	9.032	0.006
3.073	2.854	0.010	9.038	0.016
3.177	2.958	0.004	9.032	0.006
3.185	2.966	0.010	9.038	0.016
3.194	2.975	0.004	9.032	0.006
3.244	3.025	0.010	9.038	0.016
3.360	3.141	0.004	9.030	0.006
3.423	3.204	0.012	9.036	0.019
3.465	3.246	0.006	9.030	0.009
3.481	3.262	0.012	9.038	0.019
3.519	3.300	0.004	9.032	0.006
3.531	3.312	0.010	9.038	0.016
3.544	3.325	0.004	9.032	0.006
3.615	3.396	0.010	9.038	0.016
3.681	3.462	0.004	9.032	0.006
3.694	3.475	0.010	9.038	0.016
3.710	3.491	0.004	9.032	0.006
3.723	3.504	0.010	9.038	0.016
3.894	3.675	0.004	9.032	0.006
3.935	3.716	0.010	9.038	0.016
4.031	3.812	0.004	9.032	0.006
4.044	3.825	0.010	9.038	0.016
4.056	3.837	0.004	9.032	0.006
4.073	3.854	0.010	9.038	0.016
4.077	3.858	0.004	9.030	0.006
4.123	3.904	0.012	9.036	0.019
4.185	3.966	0.006	9.030	0.009
4.202	3.983	0.012	9.038	0.019
4.215	3.996	0.004	9.032	0.006
4.231	4.012	0.010	9.038	0.016
4.240	4.021	0.004	9.032	0.006
4.256	4.037	0.010	9.038	0.016
4.265	4.046	0.004	9.030	0.006
4.310	4.091	0.012	9.036	0.019
4.352	4.133	0.006	9.030	0.009
4.494	4.275	0.012	9.036	0.019
4.535	4.316	0.006	9.030	0.009

TABLE 2
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-9
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
4.656	4.437	0.012	9.038	0.019
4.723	4.504	0.004	9.032	0.006
4.740	4.521	0.010	9.038	0.016
4.752	4.533	0.004	9.032	0.006
4.819	4.600	0.010	9.038	0.016
4.906	4.687	0.004	9.032	0.006
5.006	4.787	0.010	9.038	0.016
5.044	4.825	0.004	9.030	0.006
5.056	4.837	0.012	9.038	0.019
5.069	4.850	0.004	9.032	0.006
5.081	4.862	0.010	9.038	0.016
5.094	4.875	0.004	9.032	0.006
5.110	4.891	0.010	9.038	0.016
5.123	4.904	0.004	9.032	0.006
5.144	4.925	0.010	9.038	0.016
5.152	4.933	0.004	9.030	0.006
5.165	4.946	0.012	9.036	0.019
5.177	4.958	0.006	9.030	0.009
5.190	4.971	0.012	9.036	0.019
5.206	4.987	0.006	9.030	0.009
5.215	4.996	0.012	9.038	0.019
5.231	5.012	0.004	9.032	0.006
5.244	5.025	0.010	9.038	0.016
5.256	5.037	0.004	9.032	0.006
5.331	5.112	0.010	9.038	0.016
5.340	5.121	0.004	9.032	0.006
5.348	5.129	0.010	9.038	0.016
5.419	5.200	0.004	9.032	0.006
5.515	5.296	0.010	9.038	0.016
5.602	5.383	0.004	9.032	0.006
5.623	5.404	0.010	9.038	0.016
5.631	5.412	0.004	9.032	0.006
5.702	5.483	0.010	9.038	0.016
5.740	5.521	0.004	9.032	0.006
5.752	5.533	0.010	9.038	0.016
5.769	5.550	0.004	9.032	0.006
5.777	5.558	0.010	9.038	0.016
5.785	5.566	0.004	9.032	0.006
5.831	5.612	0.010	9.038	0.016
5.848	5.629	0.004	9.032	0.006
5.856	5.637	0.010	9.038	0.016
5.931	5.712	0.004	9.032	0.006
5.944	5.725	0.010	9.038	0.016
5.948	5.729	0.004	9.032	0.006
6.023	5.804	0.010	9.038	0.016
6.035	5.816	0.004	9.030	0.006
6.048	5.829	0.012	9.036	0.019
6.056	5.837	0.006	9.030	0.009
6.077	5.858	0.012	9.036	0.019
6.090	5.871	0.006	9.030	0.009
6.394	6.175	0.012	9.036	0.019
6.440	6.221	0.006	9.030	0.009

TABLE 2
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-9
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
6.452	6.233	0.012	9.036	0.019
6.460	6.241	0.006	9.030	0.009
6.590	6.371	0.012	9.036	0.019
6.623	6.404	0.006	9.031	0.009
7.470	7.251	0.011	9.039	0.017
7.480	7.261	0.003	9.033	0.005
7.490	7.271	0.009	9.038	0.014
7.510	7.291	0.004	9.033	0.006
7.580	7.361	0.009	9.039	0.014
7.580	7.361	0.003	9.033	0.005
7.610	7.391	0.009	9.039	0.014
7.610	7.391	0.003	9.033	0.005
7.630	7.411	0.009	9.039	0.014
7.640	7.421	0.003	9.031	0.005
7.660	7.441	0.011	9.036	0.017
7.660	7.441	0.006	9.030	0.009
7.690	7.471	0.012	9.039	0.019
7.690	7.471	0.003	9.032	0.005
7.790	7.571	0.010	9.038	0.016
7.830	7.611	0.004	9.032	0.006
7.840	7.621	0.010	9.038	0.016
7.860	7.641	0.004	9.032	0.006
7.980	7.761	0.010	9.038	0.016
8.070	7.851	0.004	9.030	0.006
8.200	7.981	0.012	9.036	0.019
8.240	8.021	0.006	9.030	0.009
9.210	8.991	0.012	9.036	0.019
9.220	9.001	0.006	9.030	0.009
9.910	9.691	0.012	9.037	0.019
9.910	9.691	0.005	9.030	0.008
9.930	9.711	0.012	9.037	0.019
9.940	9.721	0.005	9.031	0.008
10.250	10.031	0.011	9.037	0.017
10.500	10.281	0.005	9.031	0.008
11.000	10.781	0.011	9.158	0.017
11.250	11.031	-0.116	9.267	-0.180
11.500	11.281	-0.007	9.277	-0.011
11.750	11.531	0.003	9.283	0.005
14.750	14.531	0.009	9.277	0.014
15.250	15.031	0.003	9.285	0.005
15.500	15.281	0.011	9.279	0.017
15.750	15.531	0.005	9.287	0.008
17.250	17.031	0.013	9.277	0.020
17.500	17.281	0.003	9.285	0.005
17.750	17.531	0.011	9.276	0.017
18.000	17.781	0.002	9.283	0.003
19.500	19.281	0.009	9.277	0.014
19.750	19.531	0.003	9.285	0.005
20.000	19.781	0.011	9.277	0.017
20.250	20.031	0.003	4.671	0.005
21.190	20.971	-4.603	9.274	-7.136

Graphical Representation of Slug Test Data
Osram Sylvania - RFI Monitoring Well MW-12
December 3, 1998

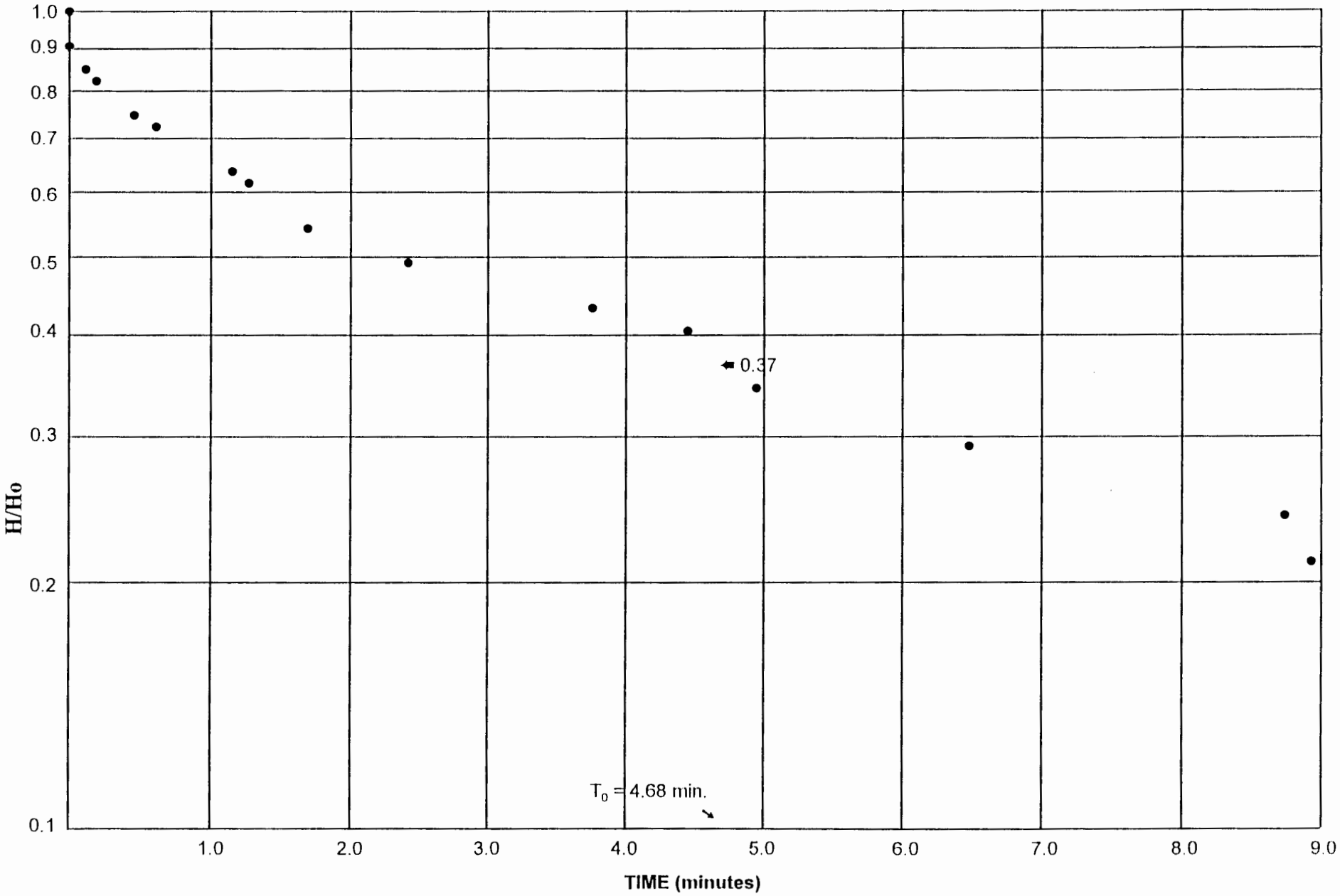

TABLE 3
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-12
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
0	-0.127	0	9.580	—
0.094	-0.033	0.094	9.486	—
0.098	-0.029	0.1	9.480	—
0.102	-0.025	0.137	9.443	—
0.016	-0.111	0.055	9.525	—
0.11	-0.017	0.078	9.502	—
0.115	-0.012	0.107	9.473	—
0.119	-0.008	0.148	9.432	—
0.123	-0.004	0.186	9.394	—
0.127	0	0.203	9.377	1.000
0.135	0.008	0.156	9.424	0.768
0.14	0.013	0.172	9.408	0.847
0.144	0.017	0.184	9.396	0.906
0.252	0.125	0.176	9.404	0.867
0.34	0.213	0.17	9.410	0.837
0.419	0.292	0.164	9.416	0.808
0.448	0.321	0.156	9.424	0.768
0.619	0.492	0.15	9.430	0.739
0.831	0.704	0.144	9.436	0.709
0.973	0.846	0.138	9.442	0.680
1.256	1.129	0.132	9.448	0.650
1.394	1.267	0.123	9.457	0.606
1.869	1.742	0.118	9.462	0.581
1.923	1.796	0.111	9.469	0.547
1.927	1.80	0.119	9.461	0.586
1.935	1.808	0.113	9.467	0.557
2.294	2.167	0.107	9.473	0.527
2.581	2.454	0.101	9.479	0.498
2.898	2.771	0.095	9.485	0.468
3.702	3.575	0.089	9.491	0.438
3.915	3.788	0.082	9.498	0.404
3.919	3.792	0.089	9.491	0.438
3.948	3.821	0.083	9.497	0.409
4.531	4.404	0.077	9.503	0.379
4.569	4.442	0.082	9.498	0.404
4.573	4.446	0.076	9.504	0.374
5.094	4.967	0.07	9.510	0.345
6.419	6.292	0.064	9.516	0.315
6.606	6.479	0.058	9.522	0.286
6.66	6.533	0.066	9.514	0.325
6.673	6.546	0.06	9.520	0.296
7.71	7.583	0.054	9.526	0.266
8.36	8.233	0.048	9.532	0.236
8.96	8.833	0.041	9.539	0.202
8.97	8.843	0.05	9.530	0.246
9.01	8.883	0.043	9.537	0.212
9.06	8.933	0.05	9.530	0.246
9.06	8.933	0.043	9.537	0.212
9.85	9.723	0.037	9.543	0.182
11.5	11.373	0.029	9.551	0.143
12	11.873	0.021	9.559	0.103
14.25	14.123	0.014	9.566	0.069

TABLE 3
SLUG TEST DATA
Osram Sylvania - RFI Monitoring Well MW-12
December 3, 1998

Elapsed Test Time (minutes)	Test Time Adjusted to zero (minutes)	Change in Water Level - H (delta feet)	Static Water Level (ft. below TOC)	H/Ho (dimensionless)
15.25	15.123	0.009	9.571	0.044
16.25	16.123	-0.156	9.406	-0.768
16.5	16.373	-0.143	9.419	-0.704
16.75	16.623	-0.131	9.431	-0.645
17.25	17.123	-0.121	9.441	-0.596
17.5	17.373	-0.114	9.448	-0.562
18	17.873	-0.107	9.455	-0.527
18.5	18.373	-0.096	9.466	-0.473
19	18.873	-0.086	9.476	-0.424
20.25	20.123	-0.08	9.482	-0.394
23	22.873	-0.072	9.490	-0.355
31.75	31.623	-0.065	9.497	-0.320
32.1	31.973	-4.178	5.384	-20.581

PUMP TEST CALCULATIONS

Table 1
Observation Well MW-1 Data
48-Hour Constant-Rate Pumping Test Data

Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:45	- -	9.01	- -	- -	*static*
10/12/99	10:05	- -	9.04	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:56	2532	9.41	0.37	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	15:08	2980	9.02	- -	-0.02	*Recovery*

Table 2
Observation Well MW-2 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	17:10	- -	5.69	- -	- -	*static*
10/12/99	10:00	- -	5.68	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	12:51	86	5.72	0.04	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	14:38	193	5.71	0.03	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	16:30	305	5.72	0.04	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	18:48	443	5.72	0.04	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	21:35	610	5.72	0.04	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	2:37	912	5.72	0.04	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	7:54	1229	5.73	0.05	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	9:33	1328	5.74	0.06	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	13:45	1580	5.74	0.06	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	17:32	1807	5.75	0.07	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	5:25	2520	5.57	-0.11	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	10:00	2795	5.58	-0.10	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	12:55	2970	5.58	- -	-0.10	*Recovery*
10/14/99	13:47	3022	5.60	- -	-0.08	*Recovery*
10/14/99	15:06	3101	5.59	- -	-0.09	*Recovery*

Table 3
Observation Well MW-3 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	14:30	- -	6.66	- -	- -	*static*
10/12/99	9:15	- -	6.76	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:32	2532	6.51	-0.25	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	14:47	2980	6.56	- -	-0.20	*Recovery*

Table 4
Observation Well MW-4 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	14:28	- -	9.19	- -	- -	*static*
10/12/99	9:10	- -	9.24	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:34	2532	9.62	0.38	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	14:45	3105	9.38	- -	0.14	*Recovery*

Table 5
Observation Well MW-5 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:46	- -	11.07	- -	- -	*static*
10/12/99	10:07	- -	11.12	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:58	2532	11.43	0.31	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	15:09	3105	11.28	- -	0.16	*Recovery*

Table 6.1
Observation Well MW-6 Data
Pumping Phase

48-Hour Constant-Rate Pumping Test Data

Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Comments
10/11/99	14:25	- -	7.43	- -	*static water level*
10/12/99	9:05	- -	7.47	- -	*static water level*
10/12/99	11:25	0	7.54	0.00	*pretest static water level*
10/12/99	14:40	15	7.55	0.01	*pumping MW-8 at 6.3 gpm*
10/12/99	14:55	30	7.60	0.06	*pumping MW-8 at 6.3 gpm*
10/12/99	15:10	45	7.64	0.10	*pumping MW-8 at 6.3 gpm*
10/12/99	15:25	60	7.66	0.12	*pumping MW-8 at 6.3 gpm*
10/12/99	15:55	90	7.68	0.14	*pumping MW-8 at 6.3 gpm*
10/12/99	16:25	120	7.69	0.15	*pumping MW-8 at 6.3 gpm*
10/12/99	16:55	150	7.70	0.16	*pumping MW-8 at 6.3 gpm*
10/12/99	17:25	180	7.72	0.18	*pumping MW-8 at 6.3 gpm*
10/12/99	18:01	216	7.72	0.18	*pumping MW-8 at 6.3 gpm*
10/12/99	18:25	240	7.73	0.19	*pumping MW-8 at 6.3 gpm*
10/12/99	18:55	270	7.74	0.20	*pumping MW-8 at 6.3 gpm*
10/12/99	19:25	300	7.74	0.20	*pumping MW-8 at 6.3 gpm*
10/12/99	20:00	335	7.75	0.21	*pumping MW-8 at 6.3 gpm*
10/12/99	20:25	360	7.76	0.22	*pumping MW-8 at 6.3 gpm*
10/12/99	20:55	390	7.75	0.21	*pumping MW-8 at 6.3 gpm*
10/12/99	21:25	420	7.75	0.21	*pumping MW-8 at 6.3 gpm*
10/12/99	21:56	451	7.77	0.23	*pumping MW-8 at 6.3 gpm*
10/12/99	22:25	480	7.77	0.23	*pumping MW-8 at 6.3 gpm*
10/12/99	23:45	560	7.78	0.24	*pumping MW-8 at 6.3 gpm*
10/12/99	0:25	600	7.79	0.25	*pumping MW-8 at 6.3 gpm*
10/12/99	1:25	660	7.80	0.26	*pumping MW-8 at 6.3 gpm*
10/12/99	2:25	720	7.80	0.26	*pumping MW-8 at 6.3 gpm*
10/13/99	3:27	782	7.80	0.26	*pumping MW-8 at 6.3 gpm*
10/13/99	4:32	847	7.80	0.26	*pumping MW-8 at 6.3 gpm*
10/13/99	5:28	903	7.80	0.26	*pumping MW-8 at 6.3 gpm*
10/13/99	6:28	963	7.80	0.26	*pumping MW-8 at 6.3 gpm*
10/13/99	7:25	1020	7.80	0.26	*pumping MW-8 at 6.3 gpm*
10/13/99	8:25	1080	7.85	0.31	*pumping MW-8 at 6.3 gpm*
10/13/99	9:25	1140	7.85	0.31	*pumping MW-8 at 6.3 gpm*
10/13/99	10:25	1200	7.86	0.32	*pumping MW-8 at 6.3 gpm*
10/13/99	11:25	1260	7.87	0.33	*pumping MW-8 at 6.3 gpm*
10/13/99	12:25	1320	7.87	0.33	*pumping MW-8 at 6.3 gpm*
10/13/99	13:25	1380	7.88	0.34	*pumping MW-8 at 6.3 gpm*
10/13/99	14:25	1440	7.88	0.34	*pumping MW-8 at 6.3 gpm*
10/13/99	16:37	1572	7.86	0.32	*pumping MW-8 at 6.3 gpm*
10/13/99	18:26	1681	7.89	0.35	*pumping MW-8 at 6.3 gpm*
10/13/99	20:26	1801	7.89	0.35	*pumping MW-8 at 6.3 gpm*
10/13/99	22:25	1920	7.90	0.36	*pumping MW-8 at 6.3 gpm*
10/13/99	0:25	2040	7.89	0.35	*pumping MW-8 at 6.3 gpm*
10/13/99	2:30	2165	7.89	0.35	*pumping MW-8 at 6.3 gpm*
10/14/99	4:30	2285	7.89	0.35	*pumping MW-8 at 6.3 gpm*
10/14/99	6:30	2405	7.89	0.35	*pumping MW-8 at 6.3 gpm*
10/14/99	8:33	2528	7.92	0.38	*pumping MW-8 at 6.3 gpm*
10/14/99	10:27	2642	7.92	0.38	*pumping MW-8 at 6.3 gpm*
10/14/99	12:30	2765	7.93	0.39	*pumping MW-8 at 6.3 gpm*
10/14/99	14:13	2868	7.94	0.40	*pumping MW-8 at 6.3 gpm*
10/14/99	14:25	2880	- -	- -	*Stop pumping MW-8*

Note: DTW = Depth to Water

Table 6.2
Observation Well MW-6 Data
Recovery Phase
48-Hour Constant-Rate Pumping Test Data
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (t) (min)	Elapsed Time (t') since Pumping Stopped (min)	t/t'	DTW (ft)	Residual Drawdown (ft)
10/14/99	11:25:00	2880.0	0.0	- -		
10/14/99	11:35:00	2890.0	10.0	289	7.88	0.45
10/14/99	11:36:00	2891.0	11.0	263	7.85	0.42
10/14/99	11:42:00	2897.0	17.0	170	7.83	0.40
10/14/99	11:45:30	2900.5	20.5	141	7.81	0.38
10/14/99	11:50:30	2905.5	25.5	114	7.80	0.37
10/14/99	11:55:30	2910.5	30.5	95.4	7.79	0.36
10/14/99	12:00:30	2915.5	35.5	82.1	7.78	0.35
10/14/99	12:05:30	2920.5	40.5	72.1	7.77	0.34
10/14/99	12:10:30	2925.5	45.5	64.3	7.76	0.33
10/14/99	12:15:30	2930.5	50.5	58.0	7.75	0.32
10/14/99	12:20:30	2935.5	55.5	52.9	7.74	0.31
10/14/99	12:25:30	2940.5	60.5	48.6	7.74	0.31
10/14/99	12:35:30	2950.5	70.5	41.9	7.73	0.30
10/14/99	12:46:00	2961.0	81.0	36.6	7.72	0.29
10/14/99	12:56:30	2971.5	91.5	32.5	7.71	0.28
10/14/99	13:06:00	2981.0	101.0	29.5	7.70	0.27
10/14/99	13:16:00	2991.0	111.0	26.9	7.70	0.27
10/14/99	13:26:00	3001.0	121.0	24.8	7.69	0.26
10/14/99	13:56:00	3031.0	151.0	20.1	7.69	0.26
10/14/99	14:26:00	3061.0	181.0	16.9	7.67	0.24
10/14/99	14:37:00	3072.0	192.0	16.0	7.65	0.22
10/14/99	16:20:00	3175.0	295.0	10.8	7.64	0.21

Note: DTW = Depth to Water

Table 7
Observation Well MW-7 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:35	- -	10.09	- -	- -	*static*
10/12/99	10:15	- -	10.12	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	12:48	83	10.22	0.10	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	14:35	190	10.25	0.13	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	16:28	303	10.28	0.16	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	21:43	618	10.31	0.19	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	2:40	915	10.34	0.22	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	7:29	1204	10.37	0.25	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	9:28	1323	10.38	0.26	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	13:48	1583	10.39	0.27	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	17:28	1803	10.40	0.28	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	5:42	2537	10.40	0.28	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:50	2785	10.42	0.30	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	12:51	2966	10.31	- -	0.19	*Recovery*
10/14/99	13:44	3019	10.29	- -	0.17	*Recovery*
10/14/99	15:00	3095	10.28	- -	0.16	*Recovery*

Table 8.1
Pumping Well MW-8 Data
Pumping Phase

48-Hour Constant-Rate Pumping Test

Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Volume Pumped (gallons)	Calculated Flow Rate (gpm)
10/11/99	14:20:00	- -	7.47	- -	- -	- -
10/12/99	9:00:00	- -	7.55	- -	- -	- -
10/12/99	11:25:00	0.0	7.53	0.00	- -	- -
10/12/99	14:20:30	0.5	11.10	3.57	- -	- -
10/12/99	14:21:00	1.0	13.50	5.97	- -	- -
10/12/99	14:21:30	1.5	13.70	6.17	- -	- -
10/12/99	14:22:00	2.0	13.75	6.22	- -	- -
10/12/99	14:22:30	2.5	13.90	6.37	- -	- -
10/12/99	14:23:00	3.0	14.20	6.67	- -	- -
10/12/99	14:23:30	3.5	14.50	6.97	- -	- -
10/12/99	14:24:00	4.0	14.70	7.17	- -	- -
10/12/99	14:24:30	4.5	17.60	10.07	- -	- -
10/12/99	14:25:00	5.0	17.80	10.27	- -	- -
10/12/99	14:26:00	6.0	19.40	11.87	38	6.3
10/12/99	14:27:00	7.0	21.80	14.27	44	6.0
10/12/99	14:28:00	8.0	21.80	14.27	51	7.0
10/12/99	14:29:00	9.0	21.80	14.27	57	6.0
10/12/99	14:30:00	10	21.80	14.27	63	6.0
10/12/99	14:31:00	11	21.85	14.32	70	7.0
10/12/99	14:32:00	12	21.88	14.35	76	6.0
10/12/99	14:33:00	13	21.90	14.37	82	6.0
10/12/99	14:34:00	14	21.90	14.37	88	6.0
10/12/99	14:35:00	15	21.90	14.37	95	7.0
10/12/99	14:40:00	20	21.90	14.37	127	6.4
10/12/99	14:45:00	25	21.92	14.39	159	6.4
10/12/99	14:50:00	30	21.96	14.43	191	6.4
10/12/99	14:55:00	35	21.98	14.45	233	8.4
10/12/99	15:00:00	40	21.92	14.39	255	4.4
10/12/99	15:05:00	45	21.91	14.38	287	6.4
10/12/99	15:10:00	50	21.94	14.41	319	6.4
10/12/99	15:15:00	55	21.90	14.37	351	6.4
10/12/99	15:20:00	60	22.05	14.52	383	6.4
10/12/99	15:30:00	70	21.99	14.46	446	6.3
10/12/99	15:40:00	80	22.11	14.58	509	6.3
10/12/99	15:50:00	90	22.05	14.52	572	6.3
10/12/99	16:00:00	100	22.08	14.55	635	6.3
10/12/99	16:10:00	110	22.14	14.61	698	6.3
10/12/99	16:20:00	120	22.15	14.62	761	6.3
10/12/99	16:50:00	150	22.20	14.67	950	6.3
10/12/99	17:20:00	180	22.26	14.73	1,139	6.3
10/12/99	17:50:00	210	22.19	14.66	1,328	6.3
10/12/99	18:20:00	240	22.23	14.70	1,517	6.3

Table 8.1
Pumping Well MW-8 Data
Pumping Phase

48-Hour Constant-Rate Pumping Test

Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Volume Pumped (gallons)	Calculated Flow Rate (gpm)
10/12/99	18:50:00	270	22.35	14.82	1,706	6.3
10/12/99	19:20:00	300	22.41	14.88	1,895	6.3
10/12/99	19:50:00	330	22.55	15.02	2,084	6.3
10/12/99	20:20:00	360	22.65	15.12	2,273	6.3
10/12/99	20:50:00	390	22.70	15.17	2,462	6.3
10/12/99	21:20:00	420	22.85	15.32	2,651	6.3
10/12/99	21:50:00	450	22.97	15.44	2,840	6.3
10/12/99	22:20:00	480	23.03	15.50	3,029	6.3
10/12/99	23:20:00	540	23.18	15.65	3,407	6.3
10/12/99	0:20:00	600	23.21	15.68	3,785	6.3
10/12/99	1:20:00	660	23.51	15.98	4,163	6.3
10/12/99	2:20:00	720	23.70	16.17	4,541	6.3
10/13/99	3:20:00	780	23.86	16.33	4,919	6.3
10/13/99	4:20:00	840	24.09	16.56	5,297	6.3
10/13/99	5:20:00	900	24.04	16.51	5,675	6.3
10/13/99	6:20:00	960	24.92	17.39	6,053	6.3
10/13/99	7:20:00	1,020	25.62	18.09	6,431	6.3
10/13/99	8:20:00	1,080	25.67	18.14	6,809	6.3
10/13/99	9:20:00	1,140	25.94	18.41	7,187	6.3
10/13/99	10:20:00	1,200	26.24	18.71	7,565	6.3
10/13/99	11:20:00	1,260	26.60	19.07	7,943	6.3
10/13/99	12:20:00	1,320	26.89	19.36	8,320	6.3
10/13/99	13:20:00	1,380	27.13	19.60	8,700	6.3
10/13/99	14:20:00	1,440	27.36	19.83	9,080	6.3
10/13/99	16:20:00	1,560	27.68	20.15	9,840	6.3
10/13/99	18:20:00	1,680	28.38	20.85	10,516	5.6
10/13/99	20:20:00	1,800	28.84	21.31	11,259	6.2
10/13/99	22:20:00	1,920	28.98	21.45	12,070	6.8
10/13/99	0:20:00	2,040	29.00	21.47	12,840	6.4
10/13/99	2:20:00	2,160	29.08	21.55	13,473	5.3
10/14/99	4:20:00	2,280	28.90	21.37	14,125	5.4
10/14/99	6:20:00	2,400	29.58	22.05	14,868	6.2
10/14/99	8:20:00	2,520	29.70	22.17	15,663	6.6
10/14/99	10:20:00	2,640	29.95	22.42	16,357	5.8
10/14/99	12:20:00	2,760	30.80	23.27	17,075	6.0
10/14/99	14:20:00	2,880	32.50	24.97	17,780	5.9
					average pumping rate = 6.3 gpm	

Note: DTW = Depth to Water

Table 8.2
Pumping Well MW-8 Data
Recovery Phase
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (t) (min)	Elapsed Time (t') since Pumping Stopped (min)	t/t'	DTW (ft)	Residual Drawdown (ft)
10/14/99	11:25:00	2,880.0	0.0	- -	32.50	24.97
10/14/99	11:25:30	2,880.5	0.5	5761	21.00	13.47
10/14/99	11:26:00	2,881.0	1.0	2881	12.05	4.52
10/14/99	11:26:30	2,881.5	1.5	1921	10.02	2.49
10/14/99	11:27:00	2,882.0	2.0	1441	9.11	1.58
10/14/99	11:27:30	2,882.5	2.5	1153	8.65	1.12
10/14/99	11:28:00	2,883.0	3.0	961	8.54	1.01
10/14/99	11:28:30	2,883.5	3.5	824	8.46	0.93
10/14/99	11:29:00	2,884.0	4.0	721	8.39	0.86
10/14/99	11:29:30	2,884.5	4.5	641	8.34	0.81
10/14/99	11:30:00	2,885.0	5.0	577	8.29	0.76
10/14/99	11:31:00	2,886.0	6.0	481	8.19	0.66
10/14/99	11:32:00	2,887.0	7.0	412	8.15	0.62
10/14/99	11:33:00	2,888.0	8.0	361	8.10	0.57
10/14/99	11:34:00	2,889.0	9.0	321	8.07	0.54
10/14/99	11:35:00	2,890.0	10.0	289	8.06	0.53
10/14/99	11:36:00	2,891.0	11.0	263	8.04	0.51
10/14/99	11:37:00	2,892.0	12.0	241	8.02	0.49
10/14/99	11:38:00	2,893.0	13.0	223	8.01	0.48
10/14/99	11:39:00	2,894.0	14.0	207	7.99	0.46
10/14/99	11:40:00	2,895.0	15.0	193	7.98	0.45
10/14/99	11:45:00	2,900.0	20.0	145	7.95	0.42
10/14/99	11:50:00	2,905.0	25.0	116	7.93	0.40
10/14/99	11:55:00	2,910.0	30.0	97.0	7.90	0.37
10/14/99	12:00:00	2,915.0	35.0	83.3	7.89	0.36
10/14/99	12:05:00	2,920.0	40.0	73.0	7.87	0.34
10/14/99	12:10:00	2,925.0	45.0	65.0	7.86	0.33
10/14/99	12:15:00	2,930.0	50.0	58.6	7.86	0.33
10/14/99	12:20:00	2,935.0	55.0	53.4	7.85	0.32
10/14/99	12:25:00	2,940.0	60.0	49.0	7.84	0.31
10/14/99	12:35:00	2,950.0	70.0	42.1	7.83	0.30
10/14/99	12:45:00	2,960.0	80.0	37.0	7.82	0.29
10/14/99	12:55:00	2,970.0	90.0	33.0	7.82	0.29
10/14/99	13:05:00	2,980.0	100.0	29.8	7.81	0.28
10/14/99	13:15:00	2,990.0	110.0	27.2	7.80	0.27
10/14/99	13:25:00	3,000.0	120.0	25.0	7.79	0.26
10/14/99	13:55:00	3,030.0	150.0	20.2	7.78	0.25
10/14/99	14:25:00	3,060.0	180.0	17.0	7.77	0.24
10/14/99	16:18:00	3,173.0	293.0	10.8	7.75	0.22

Note: DTW = Depth to Water

Table 9
Observation Well MW-9 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	14:34	- -	7.69	- -	- -	*static*
10/12/99	9:20	- -	7.74	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	12:32	67	7.74	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	14:29	184	7.74	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	16:38	313	7.75	0.01	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	18:42	437	7.76	0.02	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	21:40	615	7.79	0.05	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	2:44	919	7.81	0.07	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	7:32	1207	7.84	0.10	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	9:36	1331	7.85	0.11	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	13:41	1576	7.87	0.13	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	17:35	1810	7.89	0.15	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	5:35	2530	7.91	0.17	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:37	2772	7.92	0.18	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	13:03	2978	7.94	- -	0.20	*Recovery*
10/14/99	13:52	3027	7.93	- -	0.19	*Recovery*
10/14/99	14:49	3084	7.94	- -	0.20	*Recovery*

Table 10
Observation Well MW-10 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:36	- -	8.68	- -	- -	*static*
10/12/99	10:16	- -	8.71	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:52	2532	9.00	0.29	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	15:04	3105	8.86	- -	0.15	*Recovery*

Table 11
Observation Well MW-11 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	17:16	- -	9.14	- -	- -	*static*
10/12/99	9:50	- -	9.13	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	10:23	2532	9.06	-0.07	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	15:36	3105	9.07	- -	-0.06	*Recovery*

Table 12
Observation Well MW-12 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:21	- -	9.28	- -	- -	*static*
10/12/99	10:14	- -	9.30	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	10:08	2532	8.84	-0.46	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	15:18	3105	9.00	- -	-0.30	*Recovery*

Table 13
Observation Well MW-13 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	14:45	- -	5.43	- -	- -	*static*
10/12/99	9:30	- -	5.45	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	12:35	70	5.44	-0.01	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	14:32	187	5.44	-0.01	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	16:36	311	5.46	0.01	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	18:36	431	5.46	0.01	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	21:31	606	5.47	0.02	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	2:32	907	5.47	0.02	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	7:35	1210	5.48	0.03	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	9:38	1333	5.48	0.03	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	13:40	1575	5.48	0.03	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	17:39	1814	5.49	0.04	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	5:38	2533	5.32	-0.13	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:39	2774	5.35	-0.10	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	13:06	2981	5.37	- -	-0.08	*Recovery*
10/14/99	14:36	3071	5.37	- -	-0.08	*Recovery*
10/14/99	14:52	3087	5.37	- -	-0.08	*Recovery*

Table 14
Observation Well MW-14 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:21	- -	6.23	- -	- -	*static*
10/12/99	10:09	- -	6.07	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	10:03	2532	6.14	0.07	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -		*Stop pumping MW-8*
10/14/99	15:13	3105	6.13	- -	0.06	*Recovery*

Table 15
Observation Well P-1 Data
48-Hour Constant-Rate Pumping Test

Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:40	- -	8.98	- -	- -	*static*
10/12/99	9:55	- -	9.00	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	12:52	87	9.23	0.23	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	14:39	194	9.24	0.24	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	16:31	306	9.27	0.27	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	18:50	445	9.29	0.29	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	21:36	611	9.31	0.31	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	2:38	913	9.34	0.34	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	7:53	1228	9.37	0.37	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	9:31	1326	9.40	0.40	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	13:44	1579	9.43	0.43	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	17:31	1806	9.41	0.41	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	5:44	2539	9.45	0.45	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	9:54	2789	9.45	0.45	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	12:54	2969	9.24	- -	0.24	*Recovery*
10/14/99	13:46	3021	9.26	- -	0.26	*Recovery*
10/14/99	15:06	3101	9.17	- -	0.17	*Recovery*
10/14/99	16:44	3199	9.17	- -	0.17	*Recovery*

Table 16
Observation Well P-3 Data
48-Hour Constant-Rate Pumping Test
Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	14:50	- -	5.45	- -	- -	*static*
10/12/99	9:25	- -	5.48	- -	- -	*pretest staticwater level*
10/12/99	11:25	0	- -	0.00	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	12:33	68	5.49	0.01	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	14:31	186	5.49	0.01	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	16:34	309	5.50	0.02	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	18:35	430	5.50	0.02	- -	*pumping MW-8 at 6.3 gpm*
10/12/99	21:30	605	5.51	0.03	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	2:33	908	5.52	0.04	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	7:34	1209	5.53	0.05	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	9:39	1334	5.53	0.05	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	13:39	1574	5.53	0.05	- -	*pumping MW-8 at 6.3 gpm*
10/13/99	17:38	1813	5.54	0.06	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	5:37	2532	5.37	-0.11	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	13:05	2980	5.42	- -	-0.06	*Recovery*
10/14/99	14:34	3069	5.41	- -	-0.07	*Recovery*
10/14/99	14:51	3086	5.43	- -	-0.05	*Recovery*

Table 17
Observation Well P-4 Data
48-Hour Constant-Rate Pumping Test

Osram Sylvania - Wellsboro, Pennsylvania

Date	Time	Elapsed Time (min)	DTW (ft)	Drawdown (ft)	Residual Drawdown (ft)	Comments
10/11/99	15:27	- -	5.17	- -	- -	*static*
10/12/99	10:11	- -	5.40	- -	- -	*pretest static water level*
10/12/99	11:25	0	- -	- -	- -	*pumping MW-8 at 6.3 gpm*
10/14/99	11:25	2880	- -	- -	- -	*Stop pumping MW-8*
10/14/99	15:14	3105	5.52	- -	0.35	*Recovery*

Summary of Aquifer Parameters

Osram Sylvania - Wellsboro, Pennsylvania

Summary of Time-Drawdown Calculations

Pumping Well	Pump Rate (gpm)	Specific Capacity at End of Test (gpm/ft)	Well	Jacob Method		Distance-Drawdown (1)		Recovery Data	
				Transmissivity (gpd/ft)	Storativity (- -)	Transmissivity (gpd/ft)	Storativity (- -)	Transmissivity (gpd/ft)	Storativity (- -)
MW-8	6.3	0.25	MW-6	8,710	5.90E-03	7,020	9.0E-03	10,390	(2)
			MW-8	- -	- -			8,270	(2)
			MW-9	8,190	1.20E-02			- -	- -

Average Transmissivity (gpd/ft) = 8,516
Average Transmissivity (ft^2/d) = 1,139
If b = 50 feet, **K** (ft/d) = 23
Average Storativity = 8.97E-03

Notes:
(1) Calculateed using data from wells MW-6, MW-7 and MW-9.
(2) Cannot be calculated using residual drawdown.

MISCELLANEOUS INFORMATION

Glass Technologies

OSRAM SYLVANIA

August 31, 1998

Dept. of Environmental Protection
208 West Third Street, Suite 101
Williamsport, PA. 17701-6510
Attention: Mr. Rich Adams - Permitting

NPDES Permit No. PA0008915

Dear Rich:

This is a request for a temporary discharge through NPDES Outfall No. 001 or to Charleston Creek. The temporary discharge is associated with a pump test which will result in the generation of about ten to twenty gallons per minute of groundwater for a period of approximately 48 hours. This one time pump test will be performed on a monitoring well that will be installed onsite as part of the current RCRA Facility Investigation. We presently discharge approximately 130 gallons per minute of cooling water during an average day. It is anticipated that the groundwater to be discharged will be uncontaminated. Prior to conducting the pump test, laboratory analysis will be performed on the groundwater with the results forwarded to you.

We are asking the Department to conditionally approve this temporary discharge pending your satisfactory review of the analytical data. If you have any further questions, please contact me at (717) 724-8236.

Sincerely,

Thomas Lang

Thomas Lang
Senior Engineer

tl

Cc: Dave Engle – DEP Water Quality
file

Killam
Associates ▫ Consulting Engineers

Thorn Hill Industrial Park
100 Allegheny Drive
Warrendale, PA 15086-7565
Telephone: 724-772-0200
Fax: 724-772-1955
killam@nauticom.net
www.randerskillam.com

December 18, 1998

Mr. Rich Adams
Pennsylvania Department of Environmental Protection
208 West Third Street, Suite 101
Williamsport, PA 17701-6510

REQUEST FOR TEMPORARY DISCHARGE APPROVAL
OSRAM SYLVANIA PRODUCTS, INC.
NPDES PERMIT NO. PA0008915

Dear Mr. Adams:

On August 31, 1998, OSRAM SYLVANIA PRODUCTS, Inc. sent you a letter informing you of a planned temporary discharge through Outfall 001 at their Wellsboro facility. This discharge will be associated with a pump test that will be performed in the near future by Killam Associates as part of a RCRA Facility Investigation (RFI) now underway at the site (RCRA number 3-072-CA). The pump test will result in the need to discharge site groundwater to Charleston Creek for a period of approximately 48 hours.

As we discussed over the telephone on November 30, 1998, initial testing of site groundwater has revealed detectable concentrations of hexavalent chromium and dissolved arsenic in certain site groundwater monitoring wells. In order to perform the pump test, Killam needs to select one of the existing on-site monitoring wells to serve as the pumping well. The selected well must satisfy two requirements: 1) the well must be situated in a hydrogeologically appropriate location in order to produce the required aquifer characteristics, and 2) the water that will be pumped from the well must be of sufficient quality to allow direct discharge without treatment to Charleston Creek. In order to determine if the second criteria can be met, Killam needs to know the maximum allowable discharge concentration for hexavalent chromium and dissolved arsenic. The maximum allowable discharge concentration will likely dictate which well can be used to satisfy the first criteria as well.

During our recent telephone conversation, you indicated that PaDEP could establish temporary maximum allowable discharge concentrations if we could provide the maximum expected pumping rate. Based on slug tests that were recently performed at the site, we expect to pump at a target rate of 3 to 4 gpm, with maximum rate of 8 gpm. Please note that this flow will be blended with the approximately 130 gpm of cooling water that is currently discharged through Outfall 001. As stated earlier, the pump test is scheduled to be performed in the near future, presumably within next few weeks. This information should be considered when establishing estimated flow rates for Charleston Creek in the course of establishing the temporary discharge criteria.

Killam

OSRAM SYLVANIA PRODUCTS, Inc. and Killam Associates appreciates your prompt assistance with this matter. If there are any questions, please call me at (724) 772-0200, extension 268.

Sincerely,

Dale A. Krysinski, P.E.
Senior Project Manager

H:\PROJ\212172\WPDOCS\0003CCG.DAK

cc: Gerd-Otto Eckstein - OSRAM

Pennsylvania Department of Environmental Protection

208 West Third Street, Suite 101
Williamsport, PA 17701-6448

January 11, 1999

Northcentral Regional Office

Fax 570-327-3565

RECEIVED
JAN 14 1999
KILLAM ASSOCIATES
A DIVISION

Mr. Thomas Lang
OSRAM SYLVANIA Products, Inc.
One Jackson Street
Wellsboro, PA 16901

Re: Temporary Discharge Approval
OSRAM SYLVANIA Products, Inc.
Wellsboro Borough, Tioga County

Dear Mr. Lang:

The Department has reviewed your August 31, 1998, letter and your consultant's December 18, 1998, correspondence concerning a planned temporary discharge through Outfall 001 from a 24 hour pump test. Your consultant requests that the Department establish water quality based effluent limitations for hexavalent chromium and arsenic. The Department has evaluated this 8 gallon per minute discharge with the Department's PENTOXSD single discharge waste allocation model. It has been determined that the hexavalent chromium water quality based effluent limit is 0.35 mg/l and the arsenic water quality based effluent limit is 1.0 mg/l. These levels will protect the water quality of the receiving stream.

Your consultant must compare the above water quality based effluent limits with the concentration of these metals in the pumped well water to determine if the test water could be directly discharged without treatment. Should this not be possible, treatment of the discharge shall be provided to assure removal of the metals as a technology based requirement.

It should also be noted that the above noted limits are short-term water-quality based safe levels. Any long-term discharge would require technology-based limits based on treatability levels, which would be more stringent than the water-quality based levels. Even in the short-term, the Department recommends that some treatment be provided (carbon absorption, for instance) to ensure against any miscalculation of receiving stream flow, or pump surge rate. Please notify the Department when the pump test is scheduled and provide us the details for the testing frequency to be preformed during the discharge period.

Should you have any questions, feel free to call me at 570-327-3681.

Sincerely,

Lynn Kyle

Lynn Kyle
Sanitary Engineer
Water Management

cc: Dale A. Krysinski, P.E.

Analytical Services, Inc.

R.D. #2, Box 282
Brockway, PA 15824

Laboratory (814) 265-8749
FAX (814) 265-8749

CHEMICAL ANALYSIS REPORT

PAGE : 1

CUSTOMER: Osram Sylvania
1 Jackson Street
Wellsboro, PA 16901
Attn: Larry Warriner

ID# : 025141
SAMPLE DATE: 10/13/99
RECEIVED : 10/14/99
REPORTED : 10/14/99
P.O. NUMBER:

DESCRIPTION OF SAMPLE: Outfall 001

ANALYTICAL RESULTS:

PARAMETER	RESULT	METHOD	BY/DATE
Tot. Arsenic	.005 mg/L	206.2	RLD 10/14/99
Chromium +6	<.005 mg/L	SM 3500CR-D	RLD 10/14/99

BY: William J. Sabatore

Date: 10/14/99

Title: Chief Chemical Analyst

Analytical Services, Inc.

R.D #2, Box 282
Brockway, PA 15824

Laboratory (814) 265-8749
FAX (814) 265-8749

LAB I.D. NO. 25141

CHAIN OF CUSTODY / CHEMICAL ANALYSIS WORKSHEET

SAMPLE DATE 10-13-99 SAMPLING TIME 13 17 hrs

SAMPLE COLLECTED BY Ed Davis
SAMPLE RECEIVED _____ TIME _____ BY _____
SAMPLE RECEIVED _____ TIME _____ BY _____
LABORATORY RECEIPT 10-14-99 TIME 9:20 am BY [illegible]

SAMPLE MATRIX Water
NUMBER/TYPE OF CONTAINERS 2l
PRESERVATIVE(S) ADDED None 1 HNO3
CONDITION OF SAMPLES AS RECEIVED good

SAMPLE LOCATION/IDENTIFICATION outfall 001

REPORTED TO WHOM L. B. Wagner Needed By _____

CUSTOMER Osram Sylvania P.O.# _____

PARAMETER	RESULT	METHOD	PERFORMED BY/DATE/TIME	COMMENTS/NOTE
Total As	.005 mg/L	206.2	[illegible] 10-14-99	
Cr+6	<.005 mg/L	SM3500(R-D)	WJF 10-14-99	