Table 5-1
Summary of Calculated Vertical Hydraulic Gradients
1Q2014 (March 2014)
Hoffmann-La Roche Inc. - Nutley, New Jersey

Well ID	Depth to Center of Screen (feet amsl)	Measurement Date	Groundwater Elevation (feet amsl)	Vertical Hydraulic Gradient (-/+)	Flow Direction
Vertical Gradient Between Zone S1 and Zone S2					
53RI-MW4	115.7	3/17/14	119.80		
MW-16AW	90.8	3/17/14	119.44	-0.014	Downward ▼
MW-8W	125.7	3/17/14	126.34		
MW-7W	81.5	3/17/14	120.59	-0.130	Downward ▼
MW-10W	119.4	3/17/14	125.66		
MW-9W	85.1	3/17/14	125.45	-0.006	Downward ▼
MW-14A	103.3	3/17/14	106.04		
MW-252B	70.1	3/17/14	101.42	-0.139	Downward ▼
MW-38	115.1	3/17/14	113.05		
MW-41	70.0	3/17/14	108.42	-0.103	Downward ▼
MW-60	109.1	3/17/14	112.23		
MW-60-Z2	83.2	3/17/14	112.03	-0.008	Downward ▼
MW-60M	106.4	3/17/14	111.90		
MW-263B	83.7	3/17/14	111.83	-0.003	Downward ▼
MW-60O	106.1	3/17/14	111.84		
MW-234B	78.8	3/17/14	111.78	-0.002	Downward ▼
MW-80	109.2	3/17/14	111.70		
MW-80-Z2	83.1	3/17/14	111.63	-0.003	Downward ▼
MW-80C	105.3	3/17/14	111.27		
MW-24B	82.7	3/17/14	111.27	0.000	No Gradient
MW-91	101.5	3/17/14	100.21		
MW-82	74.7	3/17/14	100.04	-0.006	Downward ▼
MW-106A	87.2	3/17/14	91.33		
MW-106B	68.8	3/17/14	95.87	0.247	Upward ▲
MW-218	105.7	3/17/14	99.50		
MW-218B	83.2	3/17/14	98.44	-0.047	Downward ▼
MW-227A	90.3	3/17/14	97.22		
MW-227B	62.6	3/17/14	96.82	-0.014	Downward ▼
MW-257A	81.5	3/17/14	86.66		
MW-257B	56.5	3/17/14	85.76	-0.036	Downward ▼
MW-259A	111.3	3/17/14	116.10		
MW-259B	77.6	3/17/14	115.96	-0.004	Downward ▼
MW-266A	87.4	3/17/14	117.88		
MW-266B	55.2	3/17/14	116.32	-0.048	Downward ▼
MW-267A	103.3	3/17/14	128.33		
MW-267B	53.0	3/17/14	122.49	-0.116	Downward ▼
MW-229A	119.1	3/17/14	119.35		
MW-229B	82.3	3/17/14	118.95	-0.011	Downward ▼
MW-44	113.2	3/17/14	118.58		
MW-44B	86.5	3/17/14	114.68	-0.146	Downward ▼
MW-207A	104.3	3/17/14	108.95		
MW-207B	71.5	3/17/14	107.01	-0.059	Downward ▼
MW-213B	103.8	3/17/14	120.76		
MW-213C	79.2	3/17/14	118.81	-0.079	Downward ▼
MW-226A	109.9	3/17/14	112.03		
MW-226B	79.9	3/17/14	107.08	-0.165	Downward ▼
ART-MW-3	108.4	3/17/14	110.22		
ART-MW-6	86.2	3/17/14	107.25	-0.134	Downward ▼
ART-MW-2	109.3	3/17/14	110.05		
ART-MW-6	86.2	3/17/14	107.25	-0.121	Downward ▼
53RI-MW-2	112.2	3/17/14	115.59		
MW-223B	76.5	3/17/14	115.18	-0.011	Downward ▼
MW-186A	105.7	3/17/14	110.04		
MW-186-2	84.6	3/17/14	106.98	-0.145	Downward ▼
MW-90	91.3	3/17/14	100.24		
MW-78	75.9	3/17/14	100.06	-0.012	Downward ▼

Positive values indicate upward gradients and negative values indicate downward gradients

Table 5-1
Summary of Calculated Vertical Hydraulic Gradients
1Q2014 (March 2014)
Hoffmann-La Roche Inc. - Nutley, New Jersey

Well ID	Depth to Center of Screen (feet amsl)	Measurement Date	Groundwater Elevation (feet amsl)	Vertical Hydraulic Gradient (-/+)	Flow Direction
Vertical Gradient Between Zone S1 and Zone S2					
MW-93	101.2	3/17/14	100.24		
MW-87	75.6	3/17/14	100.41	0.007	Upward
MW-94	98.2	3/17/14	100.75		
MW-22A	74.8	3/17/14	99.91	-0.036	Downward
MW-92	95.1	3/17/14	100.83		
MW-84	73.4	3/17/14	99.73	-0.051	Downward
MW-208A	101.9	3/17/14	101.43		
MW-208B	70.5	3/17/14	100.70	-0.023	Downward
MW-214A	99.6	3/17/14	102.44		
MW-214B	76.8	3/17/14	102.5	0.003	Upward
MW-7B	99.7	3/17/14	99.07		
MW-7C	87.2	3/17/14	98.76	-0.025	Downward
MW-201A	105.6	3/17/14	112.38		
MW-201	91.1	3/17/14	112.79	0.028	Upward
MW-170A	104.9	3/17/14	108.17		
MW-170B	84.3	3/17/14	107.28	-0.043	Downward
MW-169A	105.2	3/17/14	105.56		
MW-169B	85.1	3/17/14	107.76	0.109	Upward
MW-168A	105.0	3/17/14	107.15		
MW-168B	85.1	3/17/14	103.39	-0.189	Downward
MW-167A	105.4	3/17/14	107.81		
MW-167B	85.4	3/17/14	105.75	-0.103	Downward
MW-209A	90.3	3/17/14	99.04		
MW-209B	68.2	3/17/14	98.32	-0.033	Downward
MW-103A	89.7	3/17/14	93.44		
MW-103B	67.2	3/17/14	97.00	0.158	Upward
MW-104A	90.4	3/17/14	91.11		
MW-104B	68.8	3/17/14	92.30	0.055	Upward
MW-105A	90.4	3/17/14	97.55		
MW-105B	65.0	3/17/14	97.33	-0.009	Downward
MW-62	83.5	3/17/14	95.34		
MW-63	65.5	3/17/14	94.80	-0.030	Downward
MW-68	88.4	3/17/14	91.8		
MW-71	71.3	3/17/14	93.15	0.079	Upward
MW-72	85.5	3/17/14	94.31		
MW-74	68.0	3/17/14	93.86	-0.026	Downward
MW-25	96.0	3/17/14	95.13		
MW-26A	63.9	3/17/14	95.39	0.008	Upward
MW-125	107.4	3/17/14	103.07		
MW-125A	89.6	3/17/14	100.78	-0.129	Downward
MW-15A	100.3	3/17/14	102.39		
MW-15B	85.1	3/17/14	101.72	-0.044	Downward
MW-128	105.7	3/17/14	102.33		
MW-128B	83.2	3/17/14	105.02	0.120	Upward
MW-60G	105.4	3/17/14	112.16		
MW-224B	89.3	3/17/14	112.08	-0.005	Downward
MW-39A	103.1	3/17/14	110.57		
MW-40A	89.8	3/17/14	109.53	-0.078	Downward
MW-108A	86.5	3/17/14	89.66		
MW-108B	68.4	3/17/14	92.19	0.140	Upward
MW-144A	87.0	3/17/14	91.72		
MW-144B	66.3	3/17/14	92.34	0.030	Upward
MW-171A	73.6	3/17/14	86.61		
MW-171B	58.5	3/17/14	86.70	0.006	Upward
MW-145A	79.2	3/17/14	79.90		
MW-145B	66.8	3/17/14	79.79	-0.009	Downward

Positive values indicate upward gradients and negative values indicate downward gradients

Table 5-1
Summary of Calculated Vertical Hydraulic Gradients
1Q2014 (March 2014)
Hoffmann-La Roche Inc. - Nutley, New Jersey

Well ID	Depth to Center of Screen (feet amsl)	Measurement Date	Groundwater Elevation (feet amsl)	Vertical Hydraulic Gradient (-/+)	Flow Direction
Vertical Gradient Between Zone S1 and Zone S2					
MW-124A	71.0	3/17/14	71.47		
MW-124B	63.1	3/17/14	68.72	-0.348	Downward ▼
Vertical Gradient Between Zone S2 and Zone S3					
MW-230B	75.5	3/17/14	117.59		
MW-230C	50.5	3/17/14	116.78	-0.032	Downward ▼
MW-206B	75.9	3/17/14	118.07		
MW-206C	50.5	3/17/14	118.17	0.004	Upward ▲
MW-229B	82.3	3/17/14	118.95		
MW-229C	56.7	3/17/14	118.57	-0.015	Downward ▼
MW-44B	86.5	3/17/14	114.68		
MW-44C	57.3	3/17/14	110.46	-0.145	Downward ▼
MW-207B	71.5	3/17/14	107.01		
MW-207C	44.5	3/17/14	105.45	-0.058	Downward ▼
Vertical Gradient Between Zone S2 and Zone S3					
MW-218B	63.0	3/17/14	98.44		
MW-218C	33.2	3/17/14	98.4	-0.001	Downward ▼
MW-223B	76.5	3/17/14	115.18		
MW-223C	46.2	3/17/14	115.89	0.023	Upward ▲
MW-225B	87.7	3/17/14	108.64		
MW-225C	52.0	3/17/14	106.65	-0.056	Downward ▼
MW-227B	62.6	3/17/14	96.82		
MW-227C	35.1	3/17/14	95.86	-0.035	Downward ▼
MW-228B	82.0	3/17/14	109.7		
MW-228C	51.9	3/17/14	101.86	-0.260	Downward ▼
MW-234B	78.8	3/17/14	111.78		
MW-233C	63.7	3/17/14	112.02	0.016	Upward ▲
MW-251B	71.5	3/17/14	106.51		
MW-251C	41.4	3/17/14	102.84	-0.122	Downward ▼
MW-252B	70.1	3/17/14	101.42		
MW-252C	45.2	3/17/14	102.33	0.037	Upward ▲
MW-253B	68.4	3/17/14	102.06		
MW-253C	43.3	3/17/14	101.25	-0.032	Downward ▼
MW-259B	111.3	3/17/14	115.96		
MW-259C	77.6	3/17/14	109.98	-0.177	Downward ▼
MW-264B	69.4	3/17/14	100.38		
MW-264C	24.9	3/17/14	101.52	0.026	Upward ▲
MW-266B	55.2	3/17/14	116.32		
MW-266C	30.3	3/17/14	114.65	-0.067	Downward ▼
MW-267B	53.0	3/17/14	122.49		
MW-267C	17.2	3/17/14	120.56	-0.054	Downward ▼
MW-268B	72.7	3/17/14	116.19		
MW-268C	38.5	3/17/14	116.17	-0.001	Downward ▼
MW-1N	63.9	3/17/14	64.28		
MW-4N	47.3	3/17/14	62.72	-0.094	Downward ▼
MW-9N	58.2	3/17/14	62.99		
MW-9IN	44.3	3/17/14	62.47	-0.037	Downward ▼
MW-226B	79.9	3/17/14	107.08		
MW-226C	49.7	3/17/14	106.28	-0.026	Downward ▼
MW-231B	81.0	3/17/14	107.56		
MW-231C	55.9	3/17/14	107.27	-0.012	Downward ▼
MW-186-2	84.6	3/17/14	106.98		
MW-186B	42.5	3/17/14	103.49	-0.083	Downward ▼
MW-53	78.4	3/17/14	101.08		
MW-54	53.4	3/17/14	100.21	-0.035	Downward ▼

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Summary of Calculated Vertical Hydraulic Gradients
1Q2014 (March 2014)
Hoffmann-La Roche Inc. - Nutley, New Jersey

Well ID	Depth to Center of Screen (feet amsl)	Measurement Date	Groundwater Elevation (feet amsl)	Vertical Hydraulic Gradient (-/+)	Flow Direction
Vertical Gradient Between Zone S2 and Zone S3					
MW-50	78.3	3/17/14	101.30		
MW-56	53.2	3/17/14	99.69	-0.064	Downward ▼
MW-76	77.0	3/17/14	100.42		
MW-77	52.0	3/17/14	100.28	-0.006	Downward ▼
MW-78	75.9	3/17/14	100.06		
MW-79	50.5	3/17/14	99.76	-0.012	Downward ▼
MW-87	75.6	3/17/14	100.41		
MW-88	49.6	3/17/14	100.01	-0.015	Downward ▼
MW-82	74.7	3/17/14	100.04		
MW-83	49.6	3/17/14	100.02	-0.001	Downward ▼
MW-22A	74.8	3/17/14	99.91		
MW-86	50.1	3/17/14	100.06	0.006	Upward ▲
MW-84	73.4	3/17/14	99.73		
MW-85	48.3	3/17/14	99.58	-0.006	Downward ▼
MW-208B	70.5	3/17/14	100.70		
MW-208C	41.2	3/17/14	100.52	-0.006	Downward ▼
MW-214B	76.8	3/17/14	102.50		
MW-214C	52.1	3/17/14	102.09	-0.017	Downward ▼
MW-209B	68.2	3/17/14	98.31		
MW-209C	33.2	3/17/14	98.28	-0.001	Downward ▼
MW-104B	68.8	3/17/14	92.30		
MW-104C	27.9	3/17/14	94.32	0.049	Upward ▲
MW-26A	63.9	3/17/14	95.39		
MW-25C	34.1	3/17/14	95.74	0.012	Upward ▲
MW-204B	74.6	3/17/14	100.46		
MW-204C	48.6	3/17/14	100.17	-0.011	Downward ▼
MW-128B	83.2	3/17/14	105.02		
MW-128C	63.3	3/17/14	106.97	0.098	Upward ▲
MW-171B	59.5	3/17/14	86.70		
MW-171C	33.7	3/17/14	88.33	0.063	Upward ▲
MW-124B	21.0	3/17/14	68.72		
MW-124C	59.1	3/17/14	67.53	0.031	Upward ▲
MW-148A	65.1	3/17/14	65.60		
MW-148B	45.1	3/17/14	65.05	-0.027	Downward ▼
MW-48	56.1	3/17/14	59.18		
MW-48B	28.8	3/17/14	60.52	0.049	Upward ▲
Vertical Gradient Between Zone S3 and Zone D1					
DW-13A	23.6	3/17/14	100.89		
DW-13B	-65.6	3/17/14	99.8	-0.012	Downward ▼
MW-258C	15.6	3/17/14	71.02		
DW-24	-29.6	3/17/14	61.26	-0.216	Downward ▼
MW-264C	24.9	3/17/14	101.52		
DW-26	-50.1	3/17/14	101.07	-0.006	Downward ▼
MW-266C	30.3	3/17/14	114.65		
DW-32A	-38.7	3/17/14	105.25	-0.136	Downward ▼
MW-215C	33.8	3/17/14	93.92		
DW-11B	8.5	3/17/14	91.92	-0.079	Downward ▼
DW-3B	28.1	3/17/14	96.85		
DW-3C	-75.9	3/17/14	97.07	0.002	Upward ▲
MW-48B	28.8	3/17/14	60.52		
MW-48C	-1.5	3/17/14	56.77	-0.124	Downward ▼

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1Q2014 (March 2014)
Hoffmann-La Roche Inc. - Nutley, New Jersey

Well ID	Depth to Center of Screen (feet amsl)	Measurement Date	Groundwater Elevation (feet amsl)	Vertical Hydraulic Gradient (-/+)	Flow Direction
Vertical Gradient Between Zone D1 and Zone D2					
DW-12A	-7.5	3/17/14	103.77		
DW-12B	-65.0	3/17/14	101.02	-0.048	Downward ▼
DW-27A	-31.7	3/17/14	105.93		
DW-27B	-163.0	3/17/14	103.41	-0.019	Downward ▼
DW-29A	-52.7	3/17/14	98.51		
DW-29B	-149.7	3/17/14	97.83	-0.007	Downward ▼
DW-30A	-54.4	3/17/14	101.26		
DW-30B	-134.4	3/17/14	99.98	-0.016	Downward ▼
DW-32A	-38.7	3/17/14	105.25		
DW-32B	-168.2	3/17/14	101.06	-0.032	Downward ▼
DW-34A	-46.4	3/17/14	118.67		
DW-34B	-133.6	3/17/14	110.13	-0.098	Downward ▼
DW-14A	-58.3	3/17/14	104.75		
DW-14B	-115.9	3/17/14	100.86	-0.068	Downward ▼
DW-7B	-48.8	3/17/14	103.13		
DW-7C	-216.2	3/17/14	99.21	-0.023	Downward ▼
DW-8B	-64.4	3/17/14	99.17		
DW-8C	-179.0	3/17/14	98.95	-0.002	Downward ▼
DW-10B	-17.1	3/17/14	95.32		
DW-10C	-180.9	3/17/14	95.30	0.000	Downward ▼
DW-5B	-2.4	3/17/14	101.32		
DW-5C	-171.5	3/17/14	97.72	-0.021	Downward ▼
DW-6B	8.8	3/17/14	97.88		
DW-6C	-167.4	3/17/14	97.07	-0.005	Downward ▼
Vertical Gradient Between Zone D2 and Zone D3					
DW-14B	-115.9	3/17/14	100.86		
DW-14C	-260.3	3/17/14	99.87	-0.007	Downward ▼
DW-7C	-216.2	3/17/14	99.21		
DW-7D	-314.2	3/17/14	100.36	0.012	Upward ▲
DW-8C	-179.0	3/17/14	98.95		
DW-8D	-318.7	3/17/14	101.24	0.016	Upward ▲
DW-6C	-167.4	3/17/14	97.07		
DW-6D	-366.7	3/17/14	96.95	-0.001	Downward ▼

Vertical hydraulic gradients were calculated for each well pair as follows:

$$\frac{\textit{Deep Well Ground Water Elev. (ft) - Shallow Well Ground Water Elev. (ft)}}{\textit{Deep Total Depth to Center of Screen (ft amsl) - Shallow Depth to Center of Screen (ft amsl)}} = \textit{Vertical Hydraulic Gradient (ft/ft)}\ ^{*}$$

* This formula is being used in lieu of Todd (1980) to betted address the site specific geologic/hydrogeologic conditions as they relate to ground water elevation and/or well screen length variation across the hydrostratigraphic zones.

Positive values indicate upward gradients and negative values indicate downward gradients