

**Appendix 5-14:
Summary Statistics for
Water Quality Variables
Monitored in the STA-3/4 PSTA
Implementation Project**

Michael Chimney

Table 1. Summary statistics for water quality variables monitored biweekly, monthly, or quarterly in grab samples and weekly by auto-samplers at water control structures in the STA-3/4 Periphyton Stormwater Treatment Area (PSTA) Implementation Project for all Water Year 2008 sampling dates. Note that only total phosphorus was measured in auto-sampler samples.

	Temp. Deg C	DO mg/L	Cond. µS/cm	pH s.u.	TSS mg/L	NO _x mg N/L	NH ₄ mg N/L	TKN mg N/L	SRP mg P/L	TP mg P/L	TDP mg P/L	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	Cl mg/L	SO ₄ mg/L	Hard. mg/L	Alk. mg CaCO ₃ /L
GRAB SAMPLES																			
G378E																			
Minimum	17.5	0.7	632	7.2	3.0	0.005	0.018	1.490	0.002	0.011	0.007	46.3	5.5	73.0	15.8	85.3	37.6	247	193
Maximum	31.2	7.5	1138	7.8	14.0	1.505	0.574	3.490	0.159	0.247	0.192	88.5	9.6	107.0	29.1	140.0	44.9	381	288
Mean	25.5	3.7	934	7.4	4.8	0.172	0.101	2.165	0.007	0.034	0.018	69.0	7.3	91.2	22.3	113.9	41.3	319	251
Median	25.6	3.6	928	7.4	3.0	0.034	0.031	2.025	0.002	0.024	0.012	69.1	7.4	91.3	22.1	116.0	41.3	316	273
CV	13%	50%	13%	2%	84%	258%	165%	26%	343%	101%	146%	19%	13%	10%	20%	14%	13%	11%	20%
N	51	50	51	51	12	11	12	12	49	51	50	14	14	14	14	12	2	14	3
G379E																			
Minimum	12.0	2.9	568	7.4	3.0	0.009	0.035	1.650	0.002	0.017	0.009	40.9	5.8	52.2	13.5	72.0	4.9	203	176
Maximum	36.8	10.6	1092	8.3	7.0	0.540	0.216	3.750	0.012	0.099	0.049	96.5	11.0	82.0	26.6	167.0	29.7	289	221
Mean	25.9	6.1	831	7.8	4.3	0.137	0.097	2.646	0.003	0.038	0.017	72.0	8.2	66.3	20.4	122.0	17.3	250	201
Median	25.5	5.9	818	7.8	3.0	0.064	0.069	2.590	0.002	0.035	0.015	71.2	7.8	67.9	19.8	117.0	17.3	251	207
CV	16%	31%	16%	2%	40%	125%	70%	23%	77%	42%	44%	22%	23%	13%	19%	25%	101%	11%	11%
N	51	50	51	51	12	12	12	11	50	50	50	14	14	14	14	12	2	14	3
G388																			
Maximum	14.2	2.4	578	7.3	3.0	0.012	0.042	1.510	0.002	0.008	0.004	41.2	4.9	47.1	13.4	73.1	6.0	184	157
Max	30.7	8.5	909	8.1	3.0	0.166	0.183	2.450	0.005	0.016	0.011	78.6	7.3	71.0	23.0	137.0	24.2	266	195
Mean	26.1	5.6	758	7.7	3.0	0.046	0.091	2.011	0.002	0.011	0.007	67.3	6.0	57.2	18.3	113.6	15.1	218	176
Median	26.6	5.9	771	7.7	3.0	0.022	0.087	2.060	0.002	0.011	0.007	68.8	6.1	56.5	18.4	117.0	15.1	217	176
CV	14%	28%	11%	3%	0%	118%	48%	15%	28%	22%	20%	16%	15%	12%	15%	17%	85%	13%	15%
N	36	35	36	36	9	8	9	9	36	36	34	11	11	11	11	9	2	11	2
G389A & G389B																			
Maximum	13.6	1.1	537	7.4	3.0	0.005	0.023	1.590	0.002	0.013	0.008	43.1	5.3	45.4	13.5	76.0	14.7	187	205
Max	32.2	10.9	1050	8.0	16.0	0.299	0.331	3.080	0.005	0.071	0.052	84.8	10.7	83.8	28.0	127.0	28.6	295	214
Mean	26.8	4.7	789	7.7	4.7	0.081	0.081	2.213	0.002	0.031	0.015	64.9	7.7	63.2	20.8	107.9	21.3	243	211
Median	27.8	4.5	801	7.7	3.0	0.025	0.048	2.180	0.002	0.027	0.013	68.2	7.6	63.0	19.5	112.5	21.0	244	212
CV	15%	40%	13%	2%	75%	137%	116%	19%	28%	46%	53%	19%	20%	15%	20%	14%	35%	12%	2%
N	72	70	72	72	18	16	18	18	72	72	70	22	22	22	22	18	4	22	4
G390A & G390B																			
Maximum	13.6	1.9	549	7.5	3.0	0.005	0.022	1.660	0.002	0.014	0.007	44.1	5.5	38.2	13.9	78.7	15.1	169	198
Max	32.5	9.5	1053	8.1	8.0	0.298	0.325	3.080	0.008	0.067	0.040	86.7	11.1	90.7	27.7	127.0	29.7	321	206
Mean	27.1	5.3	783	7.8	4.1	0.079	0.076	2.222	0.002	0.030	0.014	65.9	7.9	62.1	20.9	109.0	22.3	241	201
Median	28.0	4.8	797	7.7	3.0	0.019	0.038	2.145	0.002	0.027	0.012	67.4	7.8	63.1	19.7	112.5	22.2	240	201
CV	15%	33%	14%	2%	44%	146%	125%	19%	37%	46%	46%	19%	20%	20%	19%	13%	37%	13%	2%
N	72	70	72	72	18	16	18	18	72	72	70	22	22	22	22	18	4	22	4

Table 1. Continued.

	Temp.	DO	Cond.	pH	TSS	NO _x	NH ₄	TKN	SRP	TP	TDP	Na	K	Ca	Mg	Cl	SO ₄	Hard.	Alk.
	Deg C	mg/L	µS/cm	s.u.	mg/L	mg N/L	mg N/L	mg N/L	mg P/L	mg P/L	mg P/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg CaCO ₃ /L
AUTO-SAMPLER SAMPLES																			
G378E																			
Minimum	-	-	-	-	-	-	-	-	-	0.020	-	-	-	-	-	-	-	-	-
Maximum	-	-	-	-	-	-	-	-	-	0.128	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.035	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.028	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	70%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-
G379E																			
Minimum	-	-	-	-	-	-	-	-	-	0.015	-	-	-	-	-	-	-	-	-
Maximum	-	-	-	-	-	-	-	-	-	0.063	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.033	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.032	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	39%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-
G388																			
Maximum	-	-	-	-	-	-	-	-	-	0.008	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	0.034	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.012	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.011	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	46%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-
G389A & G389B																			
Maximum	-	-	-	-	-	-	-	-	-	0.015	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	0.479	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.066	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.040	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	173%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-
G390A & G390B																			
Maximum	-	-	-	-	-	-	-	-	-	0.011	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	0.082	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.030	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.026	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	55%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	34	-	-	-	-	-	-	-	-	-

Temp: temperature; DO: dissolved oxygen; Cond: specific conductance; TSS: total suspended solids; NO_x: nitrite+nitrate-nitrogen; NH₄: ammonium-nitrogen; TKN: total Kjeldahl-nitrogen; SRP: soluble reactive phosphorus; TP: total phosphorus; TDP: total dissolved phosphorus; Na: sodium; K: potassium; Ca: calcium; Mg: magnesium; Cl: chloride; SO₄: sulfate; Hard.: hardness; Alk.: alkalinity.

Table 2. Summary statistics for water quality variables monitored biweekly, monthly, or quarterly in grab samples and weekly by auto-samplers at water control structures in the STA-3/4 PSTA Implementation Project on dates only when G388 was in operation (July 5 to December 12, 2007). Note that only total phosphorus was measured by auto-sampler.

	Temp. Deg C	DO mg/L	Cond. µS/cm	pH s.u.	TSS mg/L	NO _x mg N/L	NH ₄ mg N/L	TKN mg N/L	SRP mg P/L	TP mg P/L	TDP mg P/L	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	Cl mg/L	SO ₄ mg/L	Hard. mg/L	Alk. mg CaCO ₃ /L
GRAB SAMPLES																			
G378E																			
Minimum	21.6	0.7	632	7.2	3.0	0.005	0.018	1.490	0.002	0.021	0.010	54.7	6.6	81.2	16.5	96.9	-	286.0	-
Maximum	31.2	6.9	1000	7.6	4.0	0.039	0.099	2.240	0.005	0.058	0.019	82.5	9.6	93.9	29.1	122.0	-	354.2	-
Mean	27.2	3.0	878	7.4	3.1	0.015	0.035	1.917	0.002	0.027	0.013	67.2	7.8	89.1	22.2	109.3	-	314.1	-
Median	27.2	3.0	904	7.4	3.0	0.009	0.020	1.940	0.002	0.024	0.012	65.5	7.5	87.8	22.2	110.0	-	310.7	-
CV	11%	57%	11%	2%	12%	88%	84%	13%	33%	29%	19%	14%	13%	5%	20%	9%	-	8%	-
N	23	23	23	23.0	7.0	6	7	7	23	23	22	7	7	7	7	7	-	7	-
G379E																			
Minimum	21.7	2.9	568	7.4	3.0	0.020	0.035	1.650	0.002	0.017	0.009	40.9	5.8	53.8	13.5	72.0	-	202.6	-
Maximum	36.8	9.4	887	7.9	6.0	0.103	0.198	2.750	0.004	0.071	0.049	73.3	7.9	73.0	24.0	120.0	-	262.3	-
Mean	28.0	5.4	752	7.7	3.4	0.051	0.091	2.270	0.003	0.032	0.014	61.7	6.8	64.1	18.7	99.7	-	237.2	-
Median	28.9	5.3	768	7.7	3	0.036	0.068	2.400	0.002	0.030	0.013	62.5	6.7	65.5	18.3	102.0	-	245.1	-
CV	13%	30%	11%	2%	33%	65%	74%	19%	29%	41%	56%	17%	12%	12%	20%	17%	-	11%	-
N	23	23	23	23	7	7	7	6	23	22	22	7	7	7	7	7	-	7	-
G388																			
Maximum	21.0	2.4	578	7.3	3.0	0.012	0.042	1.510	0.002	0.008	0.004	41.2	4.9	47.1	13.4	73.1	-	183.9	-
Max	30.7	8.5	852	7.9	3.0	0.033	0.183	2.160	0.005	0.016	0.011	73.5	6.2	71.0	21.4	121.0	-	265.5	-
Mean	26.7	5.0	734	7.6	3.0	0.020	0.093	1.900	0.002	0.010	0.007	63.7	5.6	57.1	18.0	107.0	-	216.8	-
Median	27.5	4.6	741	7.6	3.0	0.017	0.087	1.990	0.002	0.009	0.006	66.7	5.8	56.5	18.4	110.0	-	217.3	-
CV	12%	31%	11%	2%	0%	42%	51%	13%	30%	22%	22%	17%	10%	13%	16%	15%	-	13%	-
N	23	23	23	23	7	6	7	7	23	23	21	7	7	7	7	7	-	7	-
G389A & G389B																			
Maximum	20.9	2.0	537	7.4	3.0	0.005	0.023	1.590	0.002	0.013	0.008	43.1	5.3	45.4	13.5	76.0	-	186.8	-
Max	32.2	10.9	886	7.8	4.0	0.042	0.125	2.450	0.004	0.064	0.052	82.7	8.7	67.2	28.0	127.0	-	262.7	-
Mean	27.4	4.5	753	7.6	3.1	0.020	0.049	2.040	0.002	0.024	0.013	64.7	7.1	58.7	20.7	106.3	-	231.9	-
Median	28.3	4.1	789	7.6	3.0	0.019	0.043	2.145	0.002	0.022	0.011	68.4	7.1	60.0	19.5	112.5	-	234.8	-
CV	13%	39%	12%	1%	9%	71%	63%	13%	23%	42%	65%	18%	15%	11%	21%	15%	-	11%	-
N	46	46	46	46	14	12	14	14	46	46	44	14	14	14	14	14	-	14	-
G390A & G390B																			
Maximum	21.1	3.2	549	7.5	3.0	0.005	0.022	1.660	0.002	0.014	0.007	44.1	5.5	38.2	13.9	78.7	-	169.4	-
Max	32.5	9.5	885	8.0	4.0	0.033	0.125	2.450	0.003	0.055	0.040	82.3	8.6	73.6	27.7	127.0	-	268.0	-
Mean	27.7	5.3	746	7.7	3.2	0.015	0.044	2.044	0.002	0.023	0.012	65.4	7.2	57.8	20.8	106.9	-	229.9	-
Median	28.4	4.6	781	7.7	3.0	0.014	0.031	2.080	0.002	0.020	0.011	67.4	7.3	57.0	19.6	112.0	-	231.8	-
CV	13%	39%	12%	1%	9%	71%	63%	13%	23%	42%	65%	18%	15%	11%	21%	15%	-	11%	-
N	46	46	46	46	14	12	14	14	46	46	44	14	14	14	14	14	-	14	-

Table 2. Continued.

	Temp. Deg C	DO mg/L	Cond. µS/cm	pH s.u.	TSS mg/L	NO _x mg N/L	NH ₄ mg N/L	TKN mg N/L	SRP mg P/L	TP mg P/L	TDP mg P/L	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	Cl mg/L	SO ₄ mg/L	Hard. mg/L	Alk. mg CaCO ₃ /L
AUTO-SAMPLER SAMPLES																			
G378E																			
Minimum	-	-	-	-	-	-	-	-	-	0.020	-	-	-	-	-	-	-	-	-
Maximum	-	-	-	-	-	-	-	-	-	0.050	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.027	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.024	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	29%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-
G379E																			
Minimum	-	-	-	-	-	-	-	-	-	0.015	-	-	-	-	-	-	-	-	-
Maximum	-	-	-	-	-	-	-	-	-	0.063	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.033	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.026	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	47%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-
G388																			
Maximum	-	-	-	-	-	-	-	-	-	0.008	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	0.034	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.012	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.011	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	47%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-
G389A & G389B																			
Maximum	-	-	-	-	-	-	-	-	-	0.015	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	0.034	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.025	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.025	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	36%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-
G390A & G390B																			
Maximum	-	-	-	-	-	-	-	-	-	0.011	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	0.082	-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	-	-	0.030	-	-	-	-	-	-	-	-	-
Median	-	-	-	-	-	-	-	-	-	0.025	-	-	-	-	-	-	-	-	-
CV	-	-	-	-	-	-	-	-	-	56%	-	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-

Temp: temperature; DO: dissolved oxygen; Cond: specific conductance; TSS: total suspended solids; NO_x: nitrite+nitrate-nitrogen; NH₄: ammonium-nitrogen; TKN: total Kjeldahl-nitrogen; SRP: soluble reactive phosphorus; TP: total phosphorus; TDP: total dissolved phosphorus; Na: sodium; K: potassium; Ca: calcium; Mg: magnesium; Cl: chloride; SO₄: sulfate; Hard.: hardness; Alk.: alkalinity.