

# **Appendix 4B-11: PSTA Field-Scale Test Facility Water Quality Summary Statistics**

**Table 1.** Arithmetic mean concentrations and standard errors for water quality parameters monitored at the inflow and outflow of each experimental cell in the Periphyton-Based Stormwater Treatment Area (PSTA) field-scale test facility. Data are presented by water year (WY) and for the period of record (POR).

	Limerock / Peat 5:1 aspect ratio Cell 1		Limerock / Peat 43:1 aspect ratio Cell 2		Caprock 5:1 aspect ratio Cell 3		Peat-Base 5:1 aspect ratio Cell 4	
	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow
	<b>Total Phosphorus (µg/L)</b>							
POR	24 ( $< 1$ )	19 ( $< 1$ )	22 ( $< 1$ )	15 ( $< 1$ )	22 ( $< 1$ )	15 ( $< 1$ )	20 (1)	27 ( $< 1$ )
WY2002	22 (1)	20 ( $< 1$ )	21 (1)	15 ( $< 1$ )	21 (1)	15 ( $< 1$ )	20 (2)	22 ( $< 1$ )
WY2003	25 (1)	18 ( $< 1$ )	22 ( $< 1$ )	14 ( $< 1$ )	23 (1)	16 ( $< 1$ )	20 ( $< 1$ )	31 (1)
<b>Total Dissolved Phosphorus (µg/L)</b>								
POR	12 ( $< 1$ )	9 ( $< 1$ )	11 ( $< 1$ )	10 ( $< 1$ )	9 ( $< 1$ )	9 ( $< 1$ )	12 ( $< 1$ )	13 ( $< 1$ )
WY2002	9 ( $< 1$ )	7 ( $< 1$ )	9 ( $< 1$ )	10 ( $< 1$ )	8 ( $< 1$ )	7 ( $< 1$ )	10 (1)	11 ( $< 1$ )
WY2003	14 ( $< 1$ )	10 ( $< 1$ )	13 ( $< 1$ )	10 ( $< 1$ )	10 ( $< 1$ )	10 ( $< 1$ )	13 (1)	14 ( $< 1$ )
<b>Total Particulate Phosphorus (µg/L)</b>								
POR	12 ( $< 1$ )	10 ( $< 1$ )	10 ( $< 1$ )	6 ( $< 1$ )	13 (1)	7 ( $< 1$ )	9 (1)	15 (1)
WY2002	13 ( $< 1$ )	13 ( $< 1$ )	12 ( $< 1$ )	8 ( $< 1$ )	13 (1)	9 ( $< 1$ )	10 (1)	11 (1)
WY2003	12 (1)	8 ( $< 1$ )	9 ( $< 1$ )	5 ( $< 1$ )	13 (1)	6 ( $< 1$ )	8 (1)	17 (1)
<b>Soluble Reactive Phosphorus (µg/L)</b>								
POR	3 ( $< 1$ )	3 ( $< 1$ )	3 ( $< 1$ )	3 ( $< 1$ )	3 ( $< 1$ )	3 ( $< 1$ )	3 ( $< 1$ )	4 ( $< 1$ )
WY2002	2 ( $< 1$ )	2 ( $< 1$ )	4 ( $< 1$ )	3 ( $< 1$ )	2 ( $< 1$ )	3 ( $< 1$ )	4 (1)	4 ( $< 1$ )
WY2003	3 ( $< 1$ )	4 ( $< 1$ )	3 ( $< 1$ )	4 ( $< 1$ )	4 ( $< 1$ )	3 ( $< 1$ )	2 ( $< 1$ )	4 ( $< 1$ )

**Table 1.** Continued.

	Limerock / Peat 5:1 aspect ratio Cell 1		Limerock / Peat 43:1 aspect ratio Cell 2		Caprock 5:1 aspect ratio Cell 3		Peat-Base 5:1 aspect ratio Cell 4	
	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow
	<b>Dissolved Organic Phosphorus (<math>\mu\text{g/L}</math>)</b>							
POR	11 ( $<1$ )	8 ( $<1$ )	10 ( $<1$ )	8 ( $<1$ )	8 ( $<1$ )	7 ( $<1$ )	9 (1)	10 ( $<1$ )
WY2002	7 ( $<1$ )	5 ( $<1$ )	5 ( $<1$ )	7 ( $<1$ )	6 ( $<1$ )	5 ( $<1$ )	6 ( $<1$ )	7 ( $<1$ )
WY2003	13 ( $<1$ )	11 ( $<1$ )	13 ( $<1$ )	10 ( $<1$ )	9 ( $<1$ )	11 ( $<1$ )	12 (1)	12 ( $<1$ )
<b>Total Nitrogen (mg/L)</b>								
POR	1.50 (0.04)	1.69 (0.04)	1.63 (0.04)	1.59 (0.03)	1.66 (0.03)	1.65 (0.03)	1.63 (0.08)	1.68 (0.06)
WY2002	1.57 (0.20)	2.25 (0.23)	1.79 (0.22)	1.77 (0.15)	1.78 (0.17)	1.70 (0.16)	1.43 (0.33)	1.34 (0.25)
WY2003	1.47 (0.04)	1.55 (0.04)	1.56 (0.04)	1.52 (0.04)	1.60 (0.04)	1.63 (0.03)	1.76 (0.06)	1.84 (0.07)
<b>Total Kjeldahl Nitrogen (mg/L)</b>								
POR	1.40 (0.03)	1.68 (0.04)	1.52 (0.04)	1.52 (0.03)	1.58 (0.03)	1.64 (0.03)	1.47 (0.06)	1.62 (0.06)
WY2002	1.54 (0.18)	2.21 (0.24)	1.67 (0.20)	1.64 (0.14)	1.75 (0.15)	1.67 (0.14)	1.17 (0.19)	1.23 (0.21)
WY2003	1.34 (0.03)	1.53 (0.04)	1.46 (0.04)	1.47 (0.05)	1.51 (0.03)	1.62 (0.03)	1.67 (0.06)	1.81 (0.06)
<b>Nitrate+Nitrite Nitrogen (mg/L)</b>								
POR	0.18 (0.01)	0.06 (0.00)	0.19 (0.01)	0.09 (0.01)	0.17 (0.01)	0.07 (0.01)	0.21 (0.03)	0.16 (0.03)
WY2002	0.23 (0.05)	0.13 (0.04)	0.25 (0.05)	0.18 (0.03)	0.21 (0.04)	0.14 (0.04)	0.38 (0.13)	0.43 (0.27)
WY2003	0.16 (0.02)	0.04 (0.00)	0.17 (0.02)	0.05 (0.00)	0.16 (0.02)	0.05 (0.00)	0.13 (0.02)	0.07 (0.01)

**Table 1.** Continued.

	Limerock / Peat 5:1 aspect ratio Cell 1		Limerock / Peat 43:1 aspect ratio Cell 2		Caprock 5:1 aspect ratio Cell 3		Peat-Base 5:1 aspect ratio Cell 4	
	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow
	<b>Ammonia Nitrogen (mg/L)</b>							
POR	0.07 (0.00)	0.05 (0.00)	0.07 (0.00)	0.05 (0.00)	0.07 (0.00)	0.09 (0.01)	0.10 (0.01)	0.08 (0.01)
WY2002	0.10 (0.01)	0.07 (0.01)	0.09 (0.01)	0.06 (0.00)	0.09 (0.01)	0.17 (0.04)	0.17 (0.06)	0.15 (0.08)
WY2003	0.06 (0.00)	0.05 (0.00)	0.06 (0.00)	0.05 (0.00)	0.07 (0.00)	0.06 (0.00)	0.07 (0.01)	0.06 (0.00)
<b>Dissolved Organic Nitrogen (mg/L)</b>								
POR	1.37 (0.03)	1.62 (0.04)	1.50 (0.04)	1.52 (0.04)	1.56 (0.03)	1.69 (0.03)	1.47 (0.06)	1.68 (0.06)
WY2002	1.65 (0.21)	2.14 (0.24)	1.81 (0.23)	1.81 (0.14)	1.87 (0.17)	2.07 (0.14)	1.22 (0.25)	1.44 (0.02)
WY2003	1.28 (0.03)	1.48 (0.04)	1.40 (0.04)	1.42 (0.04)	1.44 (0.03)	1.57 (0.03)	1.60 (0.06)	1.76 (0.06)
<b>Total Organic Carbon (mg/L)</b>								
POR	33.2 (0.3)	33.2 (0.3)	33.4 (0.3)	35.1 (0.3)	34.2 (0.3)	34.4 (0.3)	36.2 (0.5)	36.2 (0.6)
WY2002	38.2 (0.3)	37.8 (1.0)	38.8 (0.4)	41.0 (0.4)	39.6 (0.3)	38.9 (0.4)	39.5 (0.6)	40.2 (0.3)
WY2003	30.8 (0.4)	31.9 (0.3)	30.7 (0.4)	32.5 (0.4)	31.3 (0.4)	32.0 (0.4)	33.4 (1.0)	34.2 (0.9)
<b>Total Suspended Solids (mg/L)</b>								
POR	6.1 (0.4)	2.6 (0.1)	7.0 (0.7)	4.0 (0.3)	5.0 (0.1)	3.8 (0.1)	3.4 (0.2)	3.4 (0.3)
WY2002	7.9 (2.5)	1.5 (0.1)	4.2 (0.5)	1.8 (0.2)	4.2 (0.3)	3.5 (0.3)	4.4 (0.6)	3.4 (1.1)
WY2003	5.5 (0.4)	3.0 (0.1)	7.9 (1.2)	4.8 (0.4)	5.3 (0.2)	4.0 (0.1)	2.8 (0.3)	3.4 (0.4)

**Table 1.** Continued.

	Limerock / Peat 5:1 aspect ratio Cell 1		Limerock / Peat 43:1 aspect ratio Cell 2		Caprock 5:1 aspect ratio Cell 3		Peat-Base 5:1 aspect ratio Cell 4	
	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow
	<b>Calcium (mg/L)</b>							
POR	67.8 (0.8)	47.3 (0.8)	70.6 (0.8)	60.2 (0.9)	66.9 (0.6)	60.4 (0.6)	71.5 (1.2)	70.2 (2.0)
WY2002	67.6 (1.7)	59.7 (4.5)	79.3 (2.1)	72.3 (2.9)	72.2 (1.6)	64.5 (1.7)	81.1 (1.4)	86.4 (4.1)
WY2003	67.9 (1.3)	43.1 (0.7)	65.6 (1.2)	54.2 (1.0)	63.7 (1.0)	58.0 (0.9)	61.9 (2.3)	59.3 (2.3)
<b>Alkalinity (mg CaCO<sub>3</sub>/L)</b>								
POR	261.4 (3.0)	203.9 (2.0)	260.2 (2.9)	240.8 (2.7)	258.3 (2.6)	237.3 (2.1)	275.4 (3.9)	264.5 (4.9)
WY2002	270.6 (5.3)	233.1 (6.1)	280.4 (3.8)	267.3 (1.7)	262.4 (3.4)	247.1 (2.5)	292.0 (3.5)	288.6 (2.0)
WY2003	256.5 (5.3)	194.2 (2.5)	248.7 (5.3)	227.6 (4.6)	255.7 (5.0)	231.3 (4.1)	258.8 (10.1)	248.3 (9.8)
<b>Chloride (mg/L)</b>								
POR	179.1 (2.6)	170.8 (2.7)	161.4 (2.0)	164.3 (1.9)	107.7 (2.3)	167.9 (2.2)	203.1 (4.5)	192.7 (5.3)
WY2002	213.1 (6.3)	196.5 (7.9)	186.6 (7.4)	186.1 (7.0)	190.0 (6.9)	182.6 (7.4)	210.2 (8.1)	206.4 (11.9)
WY2003	165.5 (3.8)	163.9 (3.7)	148.9 (2.2)	153.4 (2.3)	161.7 (3.4)	161.7 (3.0)	197.2 (9.8)	183.5 (9.9)