

Electronic supplementary information:

The role of alkalinity in setting water quality metrics: Phosphorus standards in United Kingdom rivers

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ESI 1. Example calculation of Source Apportionment Model

Tamar Polson Bridge

Alkalinity loads

STW (DWF)			GW			Diffuse			Total flow	Total load	% load	% load	% load
Flow (m3/s)	Alk (g/m3)	Load (g/s)	Flow (m3/s)	Alk (g/m3)	Load (g/s)	Flow (m3/s)	Alk (g/m3)	Load (g/s)	(m3/s)	(g/s)	STW	GW	Diffuse
0.035	47	1.65	0.178	7	1.26	0.00	34.40	0.00	0.21	2.91	56.6	43.4	0.0
0.035	47	1.65	0.178	7	1.26	0.13	34.40	4.30	0.34	7.21	22.8	17.5	59.6
0.035	47	1.65	0.178	7	1.26	0.25	34.40	8.60	0.46	11.51	14.3	11.0	74.7
0.035	47	1.65	0.178	7	1.26	0.50	34.40	17.20	0.71	20.11	8.2	6.3	85.5
0.035	47	1.65	0.178	7	1.26	0.75	34.40	25.80	0.96	28.71	5.7	4.4	89.9
0.035	47	1.65	0.178	7	1.26	1.00	34.40	34.40	1.21	37.31	4.4	3.4	92.2
0.035	47	1.65	0.178	7	1.26	1.50	34.40	51.60	1.71	54.51	3.0	2.3	94.7
0.035	47	1.65	0.178	7	1.26	2.00	34.40	68.80	2.21	71.71	2.3	1.8	95.9
0.035	47	1.65	0.178	7	1.26	2.50	34.40	86.00	2.71	88.91	1.9	1.4	96.7
0.035	47	1.65	0.178	7	1.26	3.00	34.40	103.20	3.21	106.11	1.6	1.2	97.3
0.035	47	1.65	0.178	7	1.26	3.50	34.40	120.40	3.71	123.31	1.3	1.0	97.6
0.035	47	1.65	0.178	7	1.26	4.00	34.40	137.60	4.21	140.51	1.2	0.9	97.9
0.035	47	1.65	0.178	7	1.26	4.50	34.40	154.80	4.71	157.71	1.0	0.8	98.2
0.035	47	1.65	0.178	7	1.26	5.00	34.40	172.00	5.21	174.91	0.9	0.7	98.3
0.035	47	1.65	0.178	7	1.26	5.50	34.40	189.20	5.71	192.11	0.9	0.7	98.5
0.035	47	1.65	0.178	7	1.26	6.00	34.40	206.40	6.21	209.31	0.8	0.6	98.6
0.035	47	1.65	0.178	7	1.26	6.50	34.40	223.60	6.71	226.51	0.7	0.6	98.7
0.035	47	1.65	0.178	7	1.26	7.00	34.40	240.80	7.21	243.71	0.7	0.5	98.8
0.035	47	1.65	0.178	7	1.26	7.50	34.40	258.00	7.71	260.91	0.6	0.5	98.9
0.035	47	1.65	0.178	7	1.26	8.00	34.40	275.20	8.21	278.11	0.6	0.5	99.0
0.035	47	1.65	0.178	7	1.26	8.50	34.40	292.40	8.71	295.31	0.6	0.4	99.0
0.035	47	1.65	0.178	7	1.26	9.00	34.40	309.60	9.21	312.51	0.5	0.4	99.1
0.035	47	1.65	0.178	7	1.26	9.50	34.40	326.80	9.71	329.71	0.5	0.4	99.1
0.035	47	1.65	0.178	7	1.26	10.00	34.40	344.00	10.21	346.91	0.5	0.4	99.2
0.035	47	1.65	0.178	7	1.26	11.00	34.40	378.40	11.21	381.31	0.4	0.3	99.2
0.035	47	1.65	0.178	7	1.26	12.00	34.40	412.80	12.21	415.71	0.4	0.3	99.3
0.035	47	1.65	0.178	7	1.26	13.00	34.40	447.20	13.21	450.11	0.4	0.3	99.4
0.035	47	1.65	0.178	7	1.26	14.00	34.40	481.60	14.21	484.51	0.3	0.3	99.4
0.035	47	1.65	0.178	7	1.26	15.00	34.40	516.00	15.21	518.91	0.3	0.2	99.4
0.035	47	1.65	0.178	7	1.26	16.00	34.40	550.40	16.21	553.31	0.3	0.2	99.5
0.035	47	1.65	0.178	7	1.26	17.00	34.40	584.80	17.21	587.71	0.3	0.2	99.5
0.035	47	1.65	0.178	7	1.26	18.00	34.40	619.20	18.21	622.11	0.3	0.2	99.5
0.035	47	1.65	0.178	7	1.26	19.00	34.40	653.60	19.21	656.51	0.3	0.2	99.6
0.035	47	1.65	0.178	7	1.26	20.00	34.40	688.00	20.21	690.91	0.2	0.2	99.6

STW, sewage treatment works; DWF, dry weather flow; Alk, alkalinity; GW, groundwater