

SUPPLEMENTARY INFORMATION

Optimising Operational Reliability and Performance in Aerobic Passive Mine Water Treatment: The Multistage Westfield Pilot Plant

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SUPPLEMENTARY FIGURES

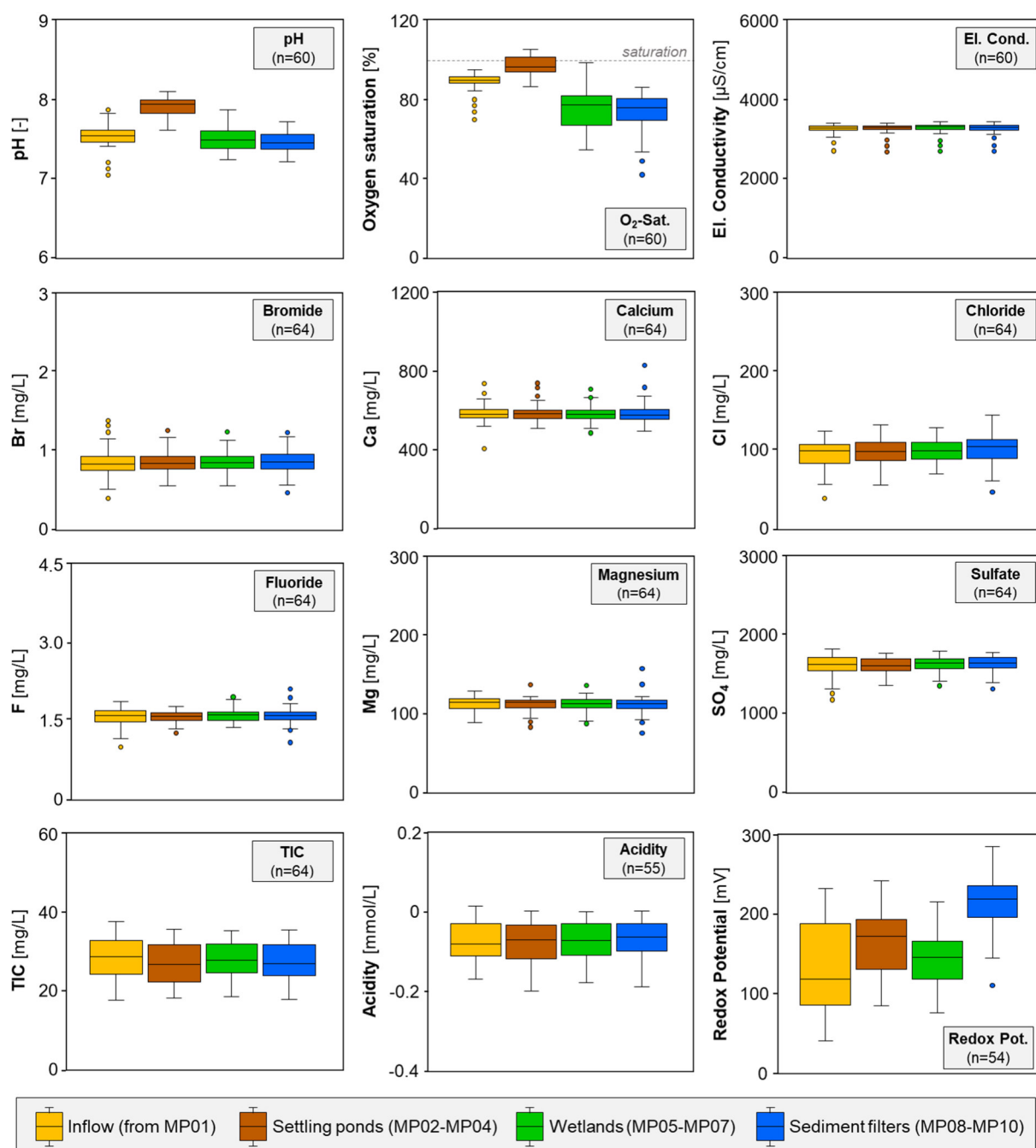


Figure S1 Development of chemical parameters in the Westfield pilot plant through the study period as median concentrations (C_m) with number of samples per boxplot in brackets

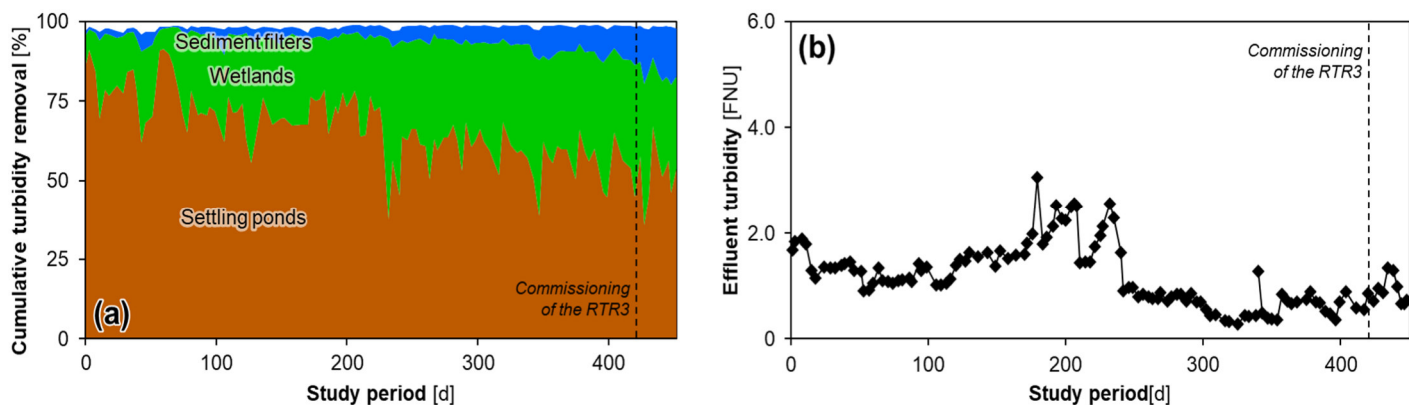


Figure S2 Turbidity monitoring through the study period with (a) cumulative removal and (b) effluent turbidity



Figure S3. Photo of fresh, unused granite filter gravel (on the right) and used filter gravel from the pilot plant after approx. two years of operation (on the left) with black coating of Mn-(oxyhydr)oxides

SUPPLEMENTARY TABLES

Table S1 Juxtaposition of inflow concentrations for conventional treatment plant (n=128) and Westfield pilot plant (n=64) as lower and upper quartiles with deviating number of samples in brackets

Parameter		Conventional treatment plant (2011-2021)	Westfield pilot plant (MP01) (2018-2019)
pH	[-]	7.2 – 7.5	7.4 – 7.6 (n=60)
As	[µg/L]	0 – 10 (n=61)	4.7 – 8.9 (n=18)
B	[µg/L]	860 – 1022 (n=88)	n/a
Br	[mg/L]	n/a	0.7 – 0.9
Ca	[mg/L]	554 – 603	556 – 600
Cl	[mg/L]	140 – 245 (n=101)	82 – 105
F	[mg/L]	1.4 – 1.8 (n=61)	1.5 – 1.7
Fe	[mg/L]	5.0 – 12.0	6.9 – 9.6 (n=120)
K	[mg/L]	62 – 72	n/a
Mg	[mg/L]	88 – 113	106 – 119
Mn	[mg/L]	1.2 – 1.4	1.4 – 1.7
Na	[mg/L]	127 – 157	n/a
NH ₄	[mg/L]	1.0 – 1.4	0.7 – 0.9
NO ₃	[mg/L]	0.9 – 3.7	0.8 – 1.4
SO ₄	[mg/L]	1639 – 1960	1540 – 1702
TOC	[mg/L]	1.0 – 1.9	0.6 – 1.1
TIC	[mg/L]	26 – 33	24 – 33

Table S2 Pearson correlation coefficients between treatment efficiency (Mn, NH₄, NO₃) and in-situ monitored water temperature, both aggregated to monthly averages (n=17)

Treatment stage	Mn removal	NH ₄ removal	NO ₃ removal
Settling ponds	0.76*	0.75*	-0.22
Wetlands	0.13	0.45	0.83*
Sediment filters	0.73*	0.38	-0.40

* p < 0.05