Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

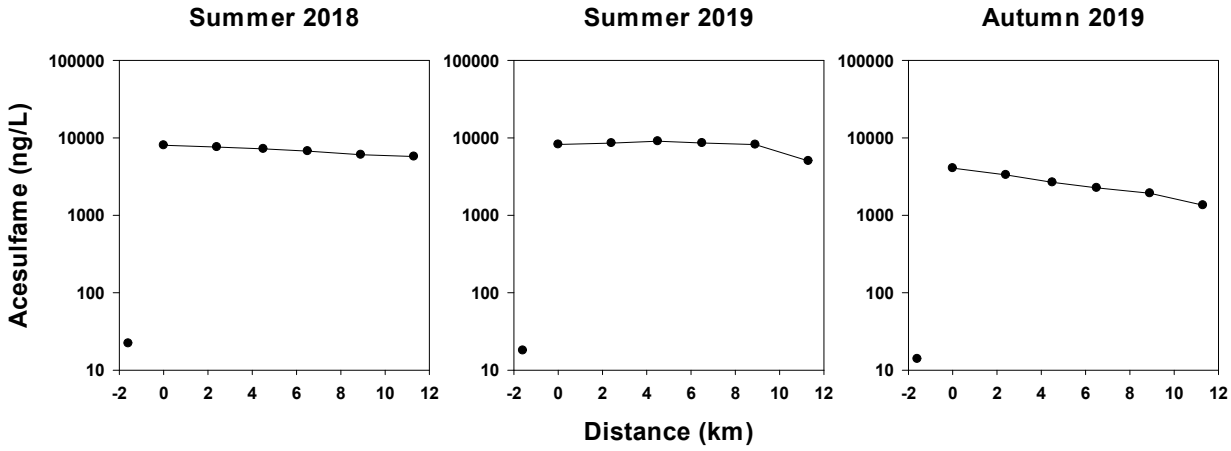
Supplemental Information for "Fate of bioavailable nutrients released to a stream during episodic effluent releases from a municipal wastewater treatment lagoon"

Supplemental Table 1) Instantaneous stream water temperature and pH measurements taken upstream, at the lagoon outflow pipe, and five progressively farther downstream sites along Deadhorse Creek, Manitoba, Canada during three lagoon effluent release events in summer 2018, summer 2019, and autumn 2019

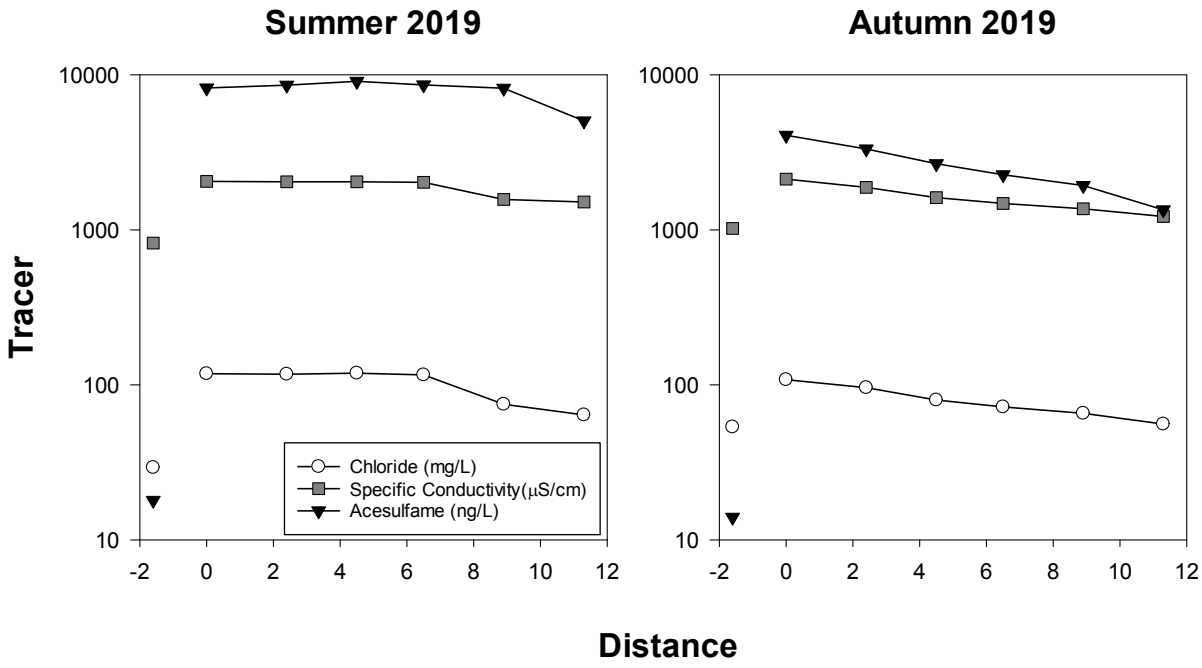
Date	Site	Distance (km)	Temperature (°C)	pH
Summer 2018	US	-1.6	19.2	7.27
	Pipe	0.0	21.5	7.73
	DS1	2.4	21.6	7.41
	DS2	4.5	20.3	7.20
	DS3	6.5	20.3	7.20
	DS4	8.9	21.4	7.45
	DS5	11.3	21.5	7.30
Summer 2019	US	-1.6	19.7	7.25
	Pipe	0.0	20.9	8.22
	DS1	2.4	21.9	7.94
	DS2	4.5	21.4	7.62
	DS3	6.5	21.8	7.82
	DS4	8.9	20.6	7.70
	DS5	11.3	21	8.15
Autumn 2019	US	-1.6	4.8	7.87
	Pipe	0.0	5.4	8.31
	DS1	2.4	5.3	8.02
	DS2	4.5	5.2	8.09
	DS3	6.5	5.2	8.05
	DS4	8.9	5.2	8.06
	DS5	11.3	5.3	7.98

Supplemental Table 2) The estimated dilution (%) of wastewater effluent calculated using acesulfame (ACE), chloride, and specific conductivity (Spec. Cond.) during summer 2019 and autumn 2019.

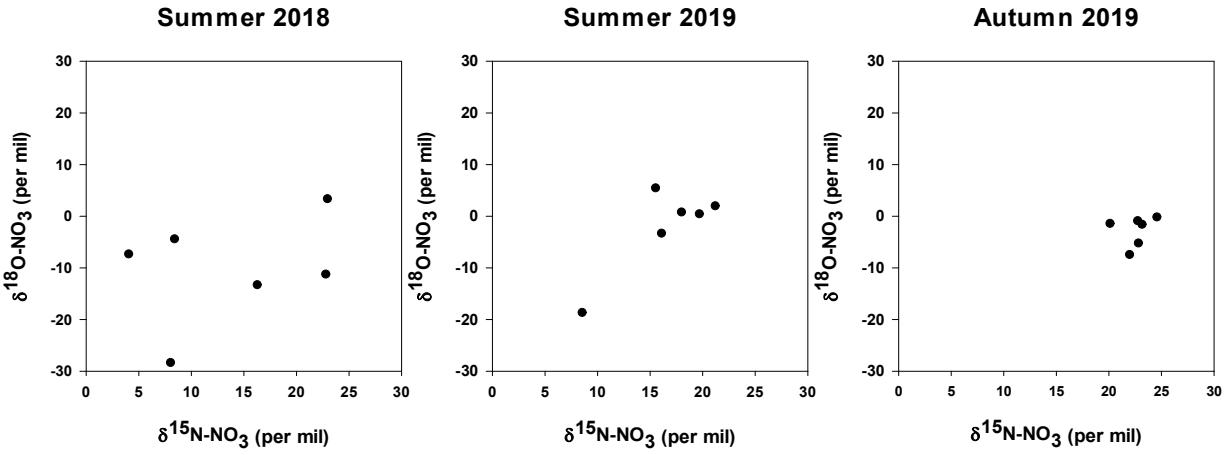
Date	Site	Distance (km)	% Dilution ACE	% Dilution Chloride	% Dilution Spec. Cond.
Summer 2019	US	-1.6	n/a	n/a	n/a
	Pipe	0.0	0	0	0
	DS1	2.4	0	0.85	0.54
	DS2	4.5	0	0	0.58
	DS3	6.5	0	1.7	1.4
	DS4	8.9	0.36	36.4	23.5
	DS5	11.3	38.7	45.8	26.4
Autumn 2019	US	-1.6	n/a	n/a	n/a
	Pipe	0.0	0	0	0
	DS1	2.4	18.4	11.2	11.5
	DS2	4.5	34.5	26.0	23.9
	DS3	6.5	44.4	33.3	30.3
	DS4	8.9	52.6	39.4	35.6
	DS5	11.3	67.0	48.3	42.6



Supplemental Figure 1) Acesulfame concentrations (ng/L) measured upstream (-1.6 km) and at increasing distance downstream from the lagoon outflow (0 to 11.3 km) during three lagoon effluent releases in summer 2018, summer 2019, and autumn 2019 in Deadhorse Creek, Manitoba, Canada. The sampling site at 0 km is the lagoon effluent prior to mixing with Deadhorse Creek.



Supplemental Figure 2) Graph showing longitudinal pattern of the tracers chloride (mg/L), specific conductivity (µS/Cm), and acesulfame (ng/L) during effluent releases in summer 2019 and autumn 2019 in Deadhorse Creek, Manitoba, Canada.



Supplemental Figure 3) Spearman rank correlations indicate no relationship ($r \leq 0.3$, $p \geq 0.5$) between $\delta^{15}N\text{-}NO_3^-$ and $\delta^{18}O\text{-}NO_3^-$ downstream from the lagoon outflow during three wastewater lagoon effluent releases in Deadhorse Creek, Manitoba, Canada during summer 2018, summer 2019, and autumn 2019.