Electronic Supplementary Material (ESI) for Environmental Science: Water Research & Technology.

Supplementary Information

Table S.1. The typical maintenance cleaning procedure used in this study. For back-to-back cleans, this procedure is repeated once for each chemical

	Maintenance Clean Procedure	Time (s)	Action
	Membrane relaxation	300	Permeation is paused, biogas sparging continues
	Chemical backpulse	120	Biogas sparging and pump recirculation are paused, permeate pump is reversed and chemical is backpulsed at 20 LMH
	Membrane relaxation	300	Permeate pump is paused
5 Cycles	Chemical backpulse cycle	30	Permeate pump backpulses chemical at 20 LMH
	Membrane relaxation cycle	270	Permeate pump is paused
	Clean water Backpulse	120	Permeate pump backpulses water at 20 LMH
	Membrane relaxation	60	Permeate pump is paused
	Biogas Sparge	300	Biogas sparging is resumed

Table S.2. The recovery cleaning procedure used in this study. This procedure was repeated once for each chemical.

	Recovery Clean Procedure	Time	Action
	Membrane relaxation	5 min	Permeation is paused, biogas sparging at 50 SLPM, pump recirculation continues
	Drain membrane tank	N/A	Biogas sparging and pump recirculation are paused, drain the membrane tank's contents to the waste line
	Fill membrane tank with permeate	N/A	Backpulse membrane tank until filled with 110 L of permeate
	Biogas Sparge	5 min	Permeate backpulse is paused, biogas sparging is resumed
	Drain membrane tank	N/A	Biogas sparging is paused, drain the membrane tank to the waste line
Repeat until 90% of the membrane tank is filled	Chemical backpulse cycle	2 min	Permeate pump backpulses chemical at 33 LMH
	Membrane relaxation cycle	2 min	Permeate pump is paused
	Chemical soak: NaOCl	4 min	Permeate pump remains paused for 4 minutes after the final cycle
	Drain 30% of the membrane tank	N/A	Drain the 30% of the membrane tank's total volume to the waste line
Repeat until 90% of the membrane tank is filled	Chemical backpulse cycle	2 min	Permeate pump backpulses chemical at 33 LMH
	Membrane relaxation cycle	2 min	Permeate pump is paused
	Chemical soak	4 min	Permeate pump remains paused for 4 minutes after the final cycle
	Drain 30% of the membrane tank	N/A	Drain the 30% of the membrane tank's total volume to the waste line
	Fill membrane tank with permeate	N/A	Backpulse permeate at 33 LMH until membrane tank is full, diluting the dosed cleaning chemical
	Chemical soak	6 h	Allow membrane to soak in residual chemical
	Drain membrane tank	N/A	Drain the membrane tank's contents to the waste line

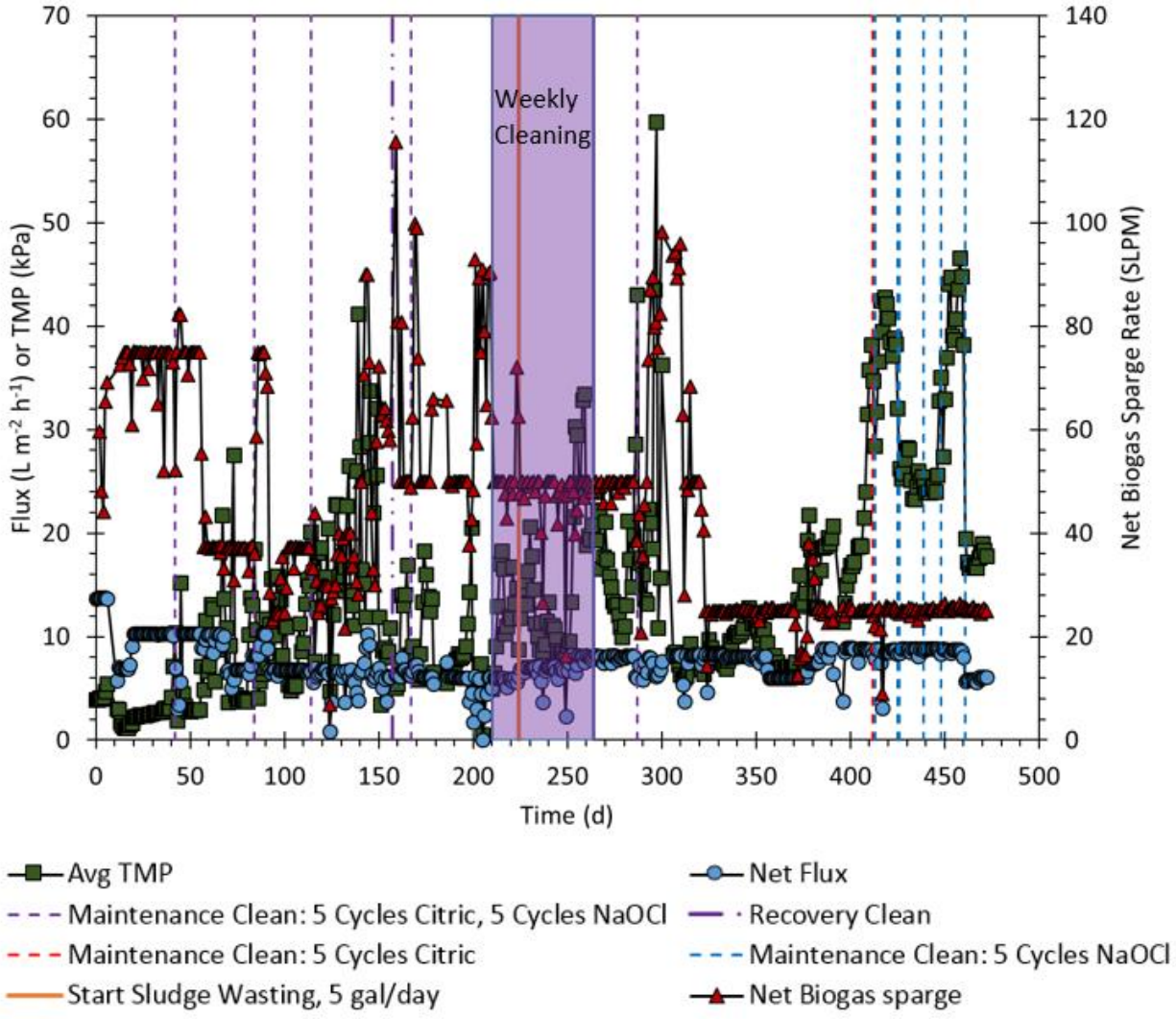

Figure S1. A plot of transmembrane pressure, flux, net biogas sparge flowrate, chemical cleaning events, and sludge wasting over the study's entire duration.

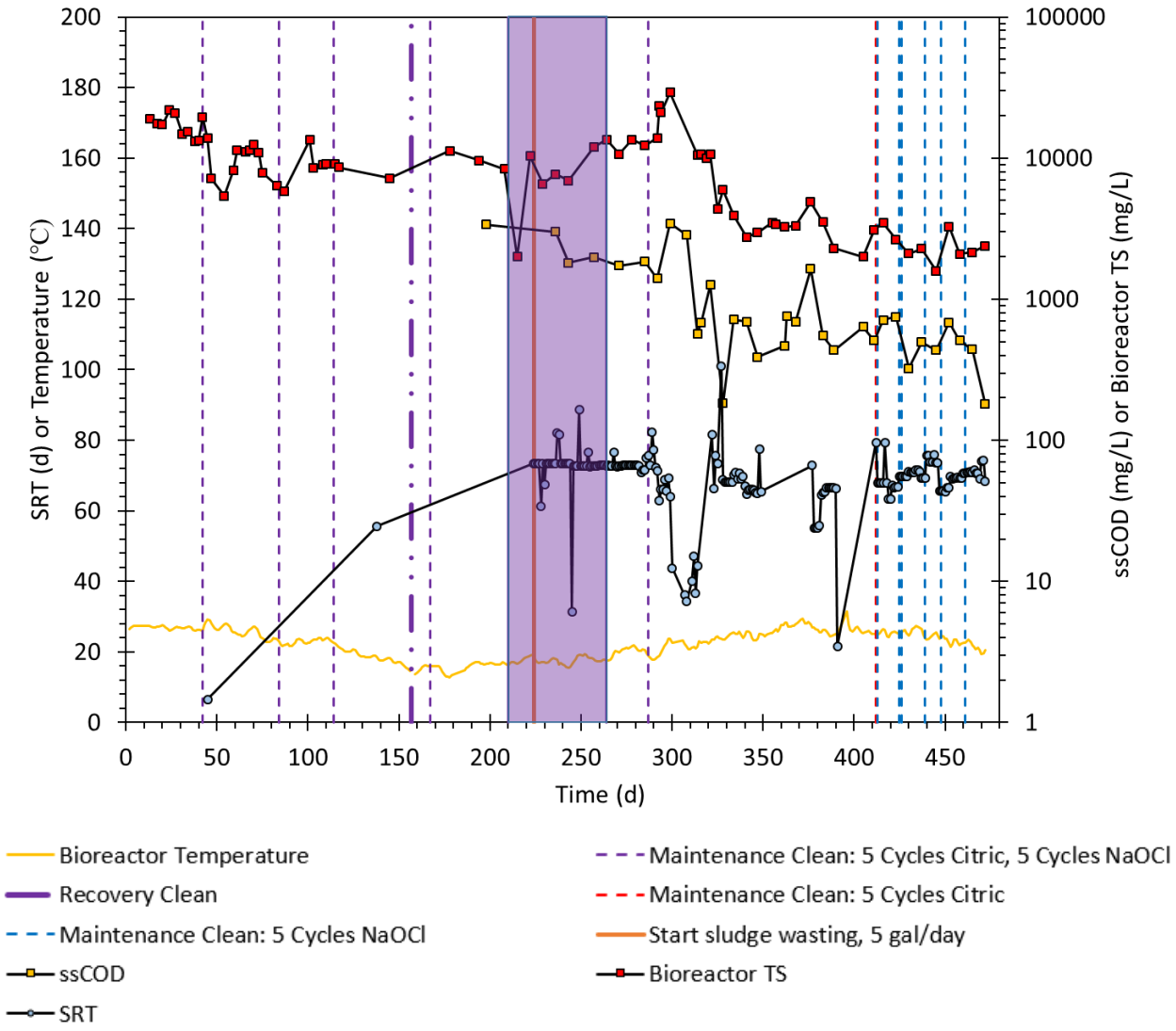

Figure S2. Plot of bioreactor total solids, semi-soluble chemical oxygen demand, temperature, solids retention time, with chemical cleaning events and sludge wasting over the study's entire duration.

Table S3. Table of LSI and pH values over the first 96 days of operation. The LSI values were consistently negative after the startup period, indicating that calcium carbonate scaling was not likely to occur.

Days	LSI	pH
17	-0.07	7.05
20	0.19	7.34
24	0.24	7.44
27	-0.39	6.76
31	-0.26	6.95
34	0.01	7.10
38	-0.22	7.01
40	-0.46	6.77
47	-0.24	6.92
54	-0.29	6.88
59	-0.30	6.97
61	-0.78	6.67
66	-0.56	6.63
68	-0.51	6.68
83	-0.19	7.06
87	-0.20	7.07
96	-0.05	7.10

A

B

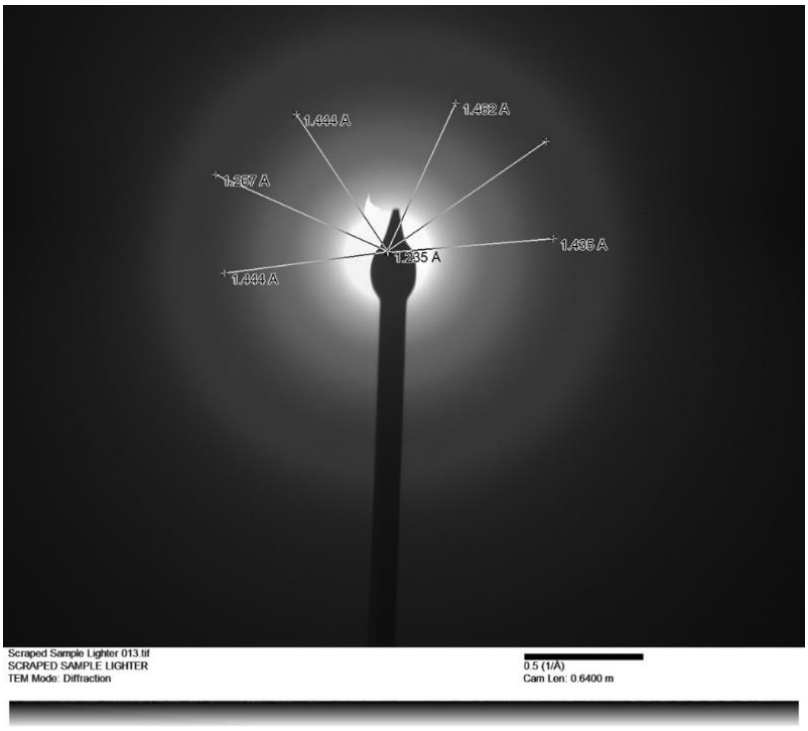

Figure S3. Transmission electron microscope crystal diffraction images taken of Figure 5B. The diffraction patterns are diffused due to the high organic content present throughout the wastewater matrix, but diffraction spots can be seen in (A). Measurements to determine d-spacing are shown in (B).

A

B

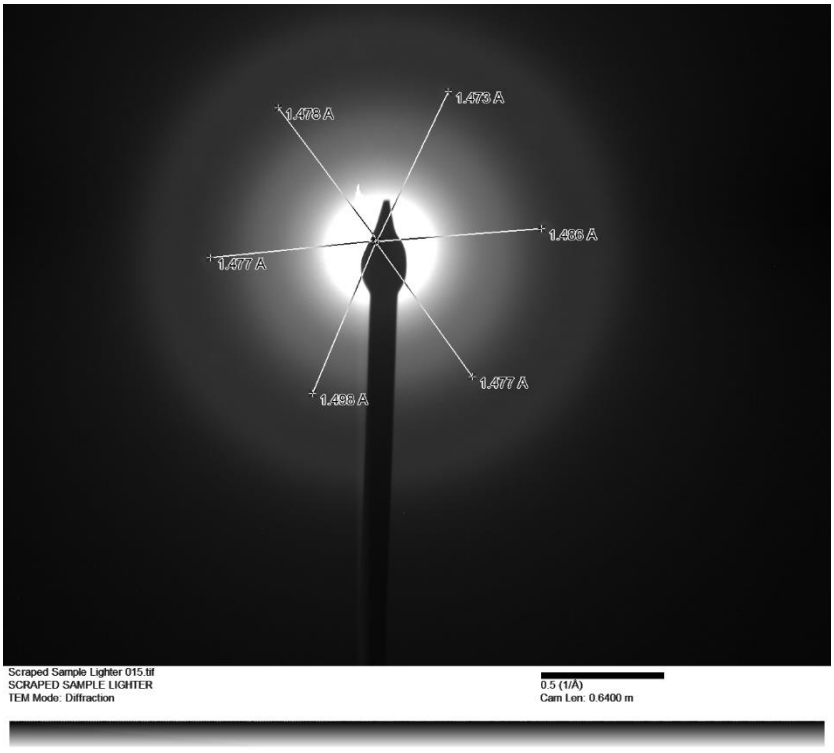

Figure S4. Transmission electron microscope crystal diffraction images taken of Figure 5C. The diffraction patterns are diffused due to the high organic content present throughout the wastewater matrix, but diffraction spots can be seen in (A). Measurements to determine d-spacing are shown in (B).