Supporting Information

S1. SSB-driven FO water flux for black water enrichment

Considering the high fluctuation of domestic black water composition, the LSBW tests and HSBW tests were replicated for five and four times, respectively, in order to confirm the repeatable experimental results. The water flux showed in Fig. S1 demonstrated the stable performance of SSB-driven FO on concentrating black water.

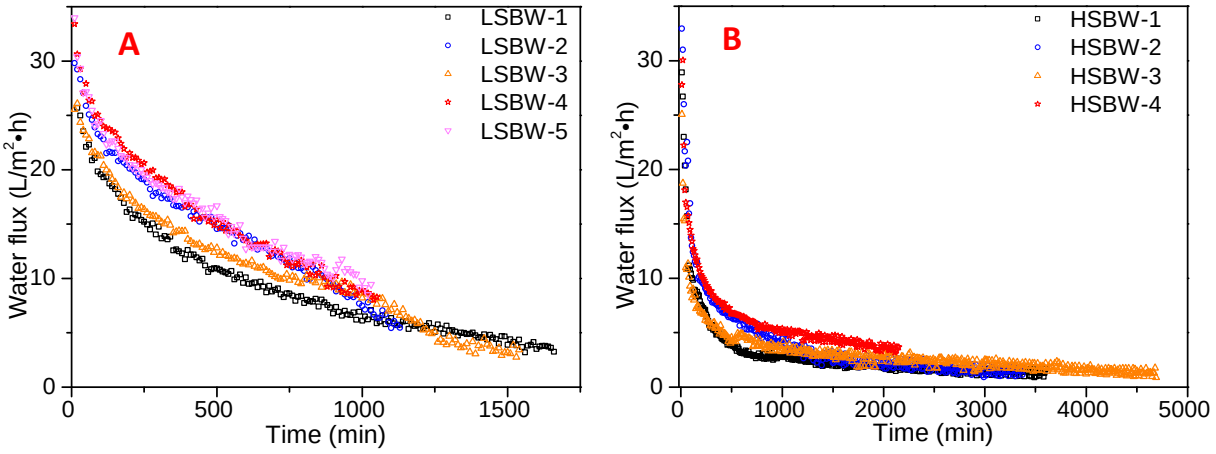

Fig. S1 Water flux of FO for black water enrichment (A) low strength black water tests, (B) high strength black water tests.

S2. SEM-EDS observation of used FO membrane surface

SEM-EDS was adopted to observe the surface of used FO membranes in comparison with the virgin membrane (**Fig.S2 and Table S1**). Scaling particularly caused by precipitated struvite was identified as the major reason of membrane fouling.

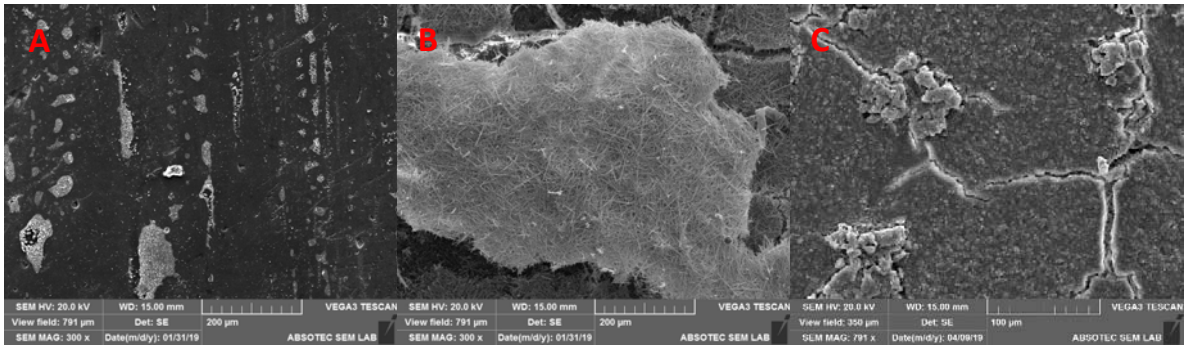

Fig. S2 Membrane surface observation using SEM (A) virgin membrane, (B) low strength black water fouled membrane, and (C) high strength black water fouled membrane.

Table S1 Major elements observed on virgin and used FO membranes

	wt%								
	O	S	Na	Cl	P	Mg	N	Ca	K
Virgin membrane	27.7	25.7	10.5	1.0	n.d.	n.d.	n.d.	n.d.	n.d.
LSBW fouled membrane	36.5	n.d.	1.1	6.6	18.2	14.3	n.d.	3.0	2.3
HSBW fouled membrane	18.3	4.5	6.2	22.3	1.5	5.6	5.7	n.d.	2.6

n.d.: not detected