

## Supplementary Materials



**Fig. S1.** (a) Algal growth in CT basin and (b) suspended algae captured in sand filter.

**Table S1.** Characterization of Red Sea Water

Parameter	Raw Red Sea water	Parameter	Raw Red Sea water
pH (SU)	8.13	UVA254 (1/cm)	0.016
Temperature (C°)	26.4	SUVA (L/mg-m)	1.4
TDS (mg/L)	38,000	Bromide (mg/L)	71.0
Conductivity (mS/cm)	60.0	Chloride (mg/L)	23,624
Turbidity (NTU)	5.34	Fluoride (mg/L)	1.3
ORP (mV)	147	Nitrite as NO <sub>2</sub> <sup>-</sup> (mg/L)	0.0047
Total Alkalinity (mg/L as CaCO <sub>3</sub> )	120	Ortho-P as PO <sub>4</sub> <sup>-3</sup> (mg/L)	0.1
Total Hardness (mg/L as CaCO <sub>3</sub> )	7,500	Sulfate (mg/L)	2,650
Mg Hardness (mg/L as CaCO <sub>3</sub> )	6,300	silica (mg/L)	0.13
Ca Hardness (mg/L as CaCO <sub>3</sub> )	1,200	Sodium (mg/L)	12,000
DOC (mg/L)	1.101	Potassium (mg/L)	560
Total Iron (mg/L)	0.02	Chromium (mg/L)	0.1749E-2
Boron (mg/L)	4.6	Copper (mg/L)	0.5235E-4
Aluminum (mg/L)	0.1214E-1	Lead (mg/L)	0.1902E-4

Antimony (mg/L)	0.2232E-4	Lithium (mg/L)	0.03207
Arsenic (mg/L)	0.6108E-3	Manganese (mg/L)	0.1541E-2
Barium (mg/L)	0.522E-2	Molybdenum (mg/L)	0.0001625
Cadmium (mg/L)	0.1295E04	Nickel (mg/L)	0.01628
Chromium (mg/L)	0.1749E-2	Selenium (mg/L)	0.03042
Copper (mg/L)	0.5235E-4	Silver (mg/L)	ND
Lead (mg/L)	0.1902E-4		
Total Iron (mg/L)	0.02		

**Table S2.** ICP-MS and IC Data for All CTs

Parameters	unit	No oxidation			Oxidation		
		CT1	CT2	CT3	CT1	CT2	CT3
Fluoride (F <sup>-</sup> )	ppm	0.8	0.8	0.8	1.4	1.2	1.3
Chloride (Cl <sup>-</sup> )	ppm	26476	25427	25612	25773	24522	24967
Nitrite (NO <sub>2</sub> <sup>-</sup> )	ppb	21	17	21	82	37	80
Bromide (Br <sup>-</sup> )	ppm	107	90	101	21	14	7
Sulfate (SO <sub>4</sub> <sup>-2</sup> )	ppm	3824	3688	3695	3815	3555	3629
Sodium (Na <sup>+</sup> )	ppm	14690	13970	14310	1768	1606	1709
Potassium (K <sup>+</sup> )	ppm	697	638	647	517	465	508
Magnesium (Mg <sup>+2</sup> )	ppm	1944	1743	1802	629	573	604
Calcium (Ca <sup>+2</sup> )	ppm	548	519	543	14040	12820	13540
Iron (Fe)	ppb	301	283	297	275	272	279
Nickel (Ni)	ppb	6	5	8	1	1	1
Copper (Cu)	ppb	6	4	3	3	2	1
Zinc (Zn)	ppb	52	35	38	45	25	32
Titanium (Ti)	ppb	BDL	BDL	BDL	BDL	BDL	BDL
Manganese (Mn)	ppb	1	1	1	0.7	BDL	BDL

\*BLD: Below detection limit.