Removal Characteristics of *N*-Nitrosamines and Their Precursors by Pilot-Scale Integrated Membrane Systems for Water Reuse

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SUPPLEMENTARY INFORMATION

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Table S1. Limit of detection (LOD) and limit of quantification (LOQ) for eight *N*-nitrosamines.

	NDMA	NMEA	NPYR	NDEA	NPIP	NMOR	NDPA	NDBA
LOD (ng/L)	0.1	0.4	0.4	1.0	0.5	1.0	0.9	0.9
LOQ (ng/L)	0.4	1.3	1.3	3.2	1.5	3.3	2.9	2.9

Table S2. Concentration of disinfectant across the water reclamation trains of plant A and plant B.

Plant A					
Sampling campaign	Disinfectant	Concentration (mg/L)			
		NF perm.	NF conc.	RO perm.	RO conc.
1st	Chlorine	<0.02	0.07	0.13	0.03
	Chloramine	0.33	0.29	0.20	0.31
2nd	Chlorine	0.04	0.07	0.07	0.07
	Chloramine	1.18	1.15	1.18	1.20
3rd	Chlorine	<0.02	0.02	0.02	<0.02
	Chloramine	0.03	0.09	<0.02	0.02

Plant B								
Sampling campaign	Disinfectant	Concentration (mg/L)						
		Sand filter effluent	1st RO perm.	1st RO conc.	2nd RO perm.	2nd RO conc.	3rd RO perm.	3rd RO conc.
1st	Chlorine	1.17	<0.02	<0.02	0.12	<0.02	0.03	0.08
	Chloramine	1.03	0.41	0.65	0.30	0.81	0.38	0.81
2nd	Chlorine	0.04	0.01	0.03	0.03	0.03	<0.02	0.04
	Chloramine	0.98	0.19	0.35	<0.02	0.40	<0.02	0.46
3rd	Chlorine	0.16	0.25	0.05	<0.02	0.03	<0.02	0.03
	Chloramine	3.24	0.42	0.67	0.21	0.39	0.13	0.33

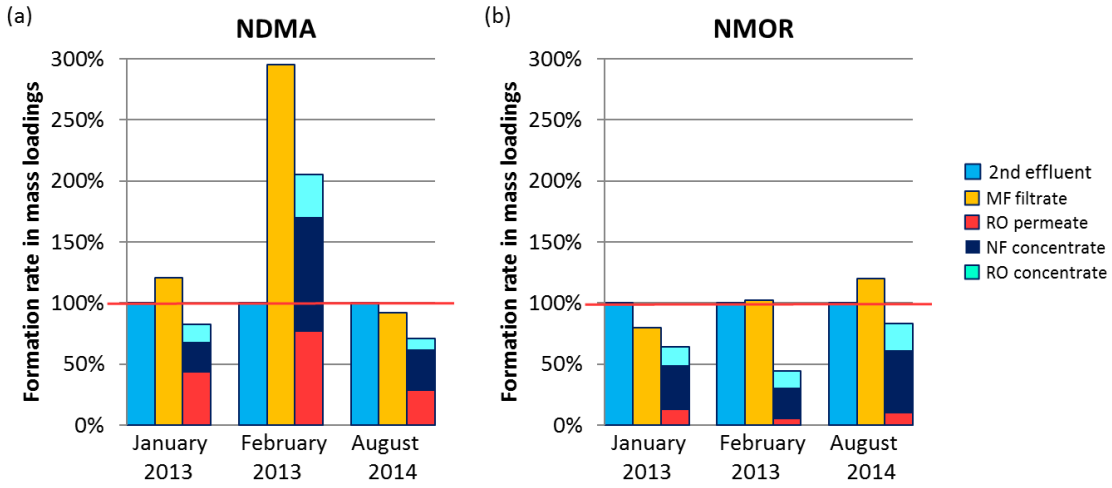

Figure S1. Formation rates of (a) NDMA and (b) NMOR across the membrane treatment at plant A.

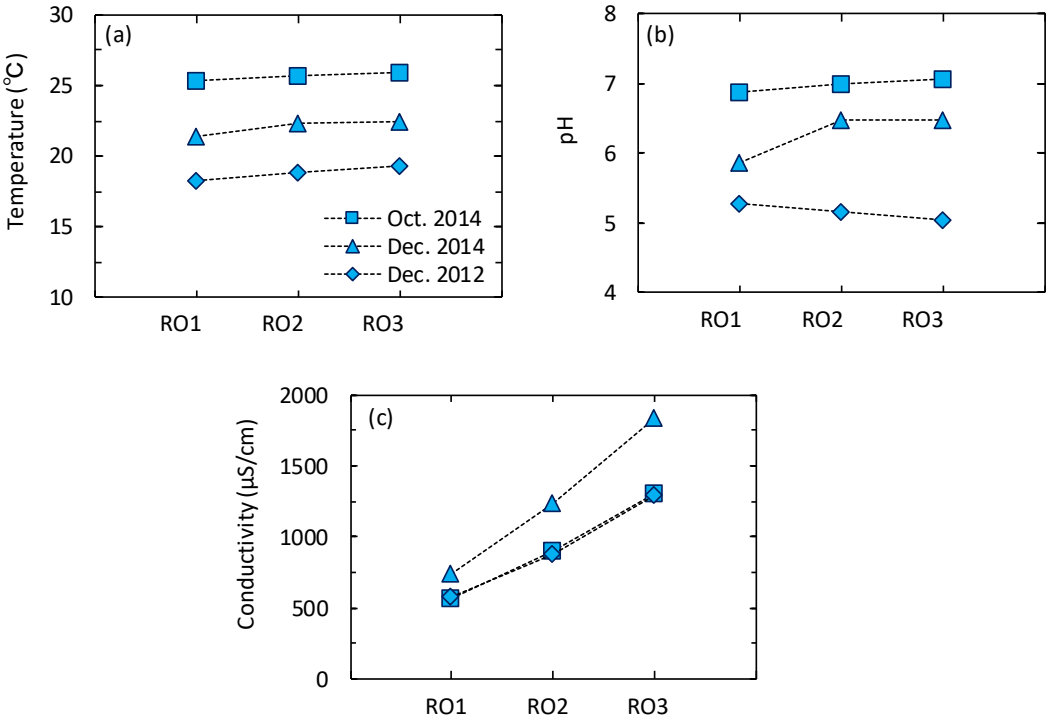

Figure S2. Feed water characteristics of each RO process stage at plant B.

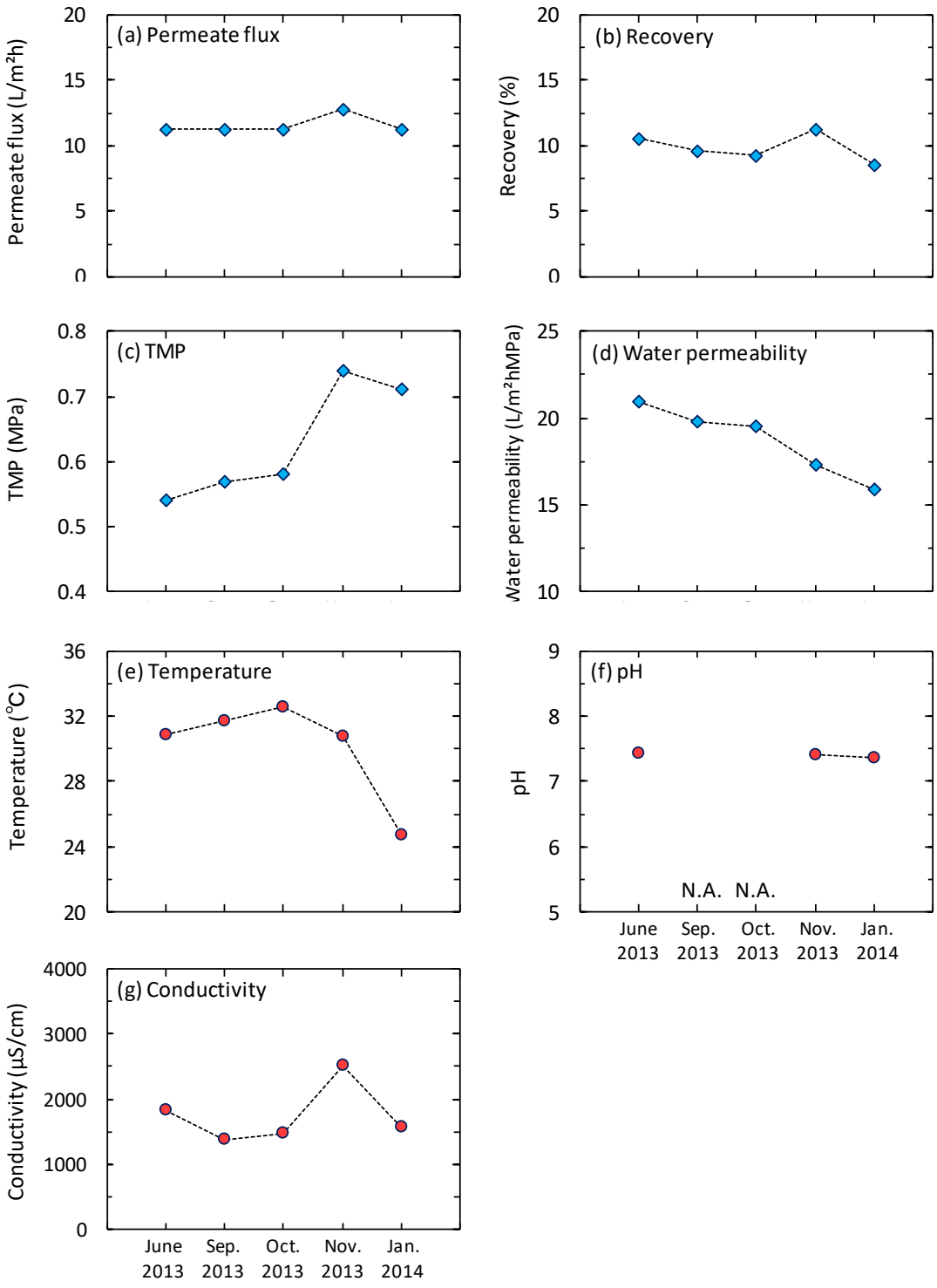

Figure S3. Operating conditions and feed water characteristics at each sampling campaign at plant C. N.A.: not available.