RO Feedwater Source Quality

Raw Water source		RO Perm	Brackish Well	Brackish Well	Brackish Surface	Brackish Surface	Sea Well	Sea Surface	Brackish Surface	Brackish Surface	Waste Tertiary	Waste Tertiary
Pretreatment type		RO	Softened	Not Soft	Conv.	MF/UF	MF/UF/Conv.	Conv.	Conv.	MF/UF	Conv.	MF/UF
TOC content		Low	Low	Low	Low	Low	Low	Low	High	High	High	High
Feedwater Parameters												
Recommended Maximum:												
SDI @15 minutes	**Maximum**	1	2	3	4	2	3	4	4	2	4	2
Turbidity NTU	**Typical**	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOC ppm as C	**Typical**	2	2	2	2	2	2	2	5	5	5	5
BOD ppm as O2 (est. as TOC x 2.0)	**Maximum**	4	4	4	4	4	4	4	10	10	10	10
COD ppm as O2 (est. as TOC x 3.0)	**Maximum**	6	6	6	6	6	6	6	15	15	15	15
Particle Count (2um particles / ml)	**Typical**	100	100	100	100	100	100	100	100	100	100	100
System Average Flux	**Conservative**	30.6	23.8	23.8	17	23.8	13.6	11.9	17	18.7	11.9	13.6
(LMH)	**Typical**	35.7	27.2	27.2	20.4	27.2	17	13.6	18.7	23.8	17	18.7
	Aggressive	40.8	34	30.6	23.8	30.6	20.4	17	23.8	28.9	20.4	22.1
Lead Element Flux *(LMH)*	**Conservative**	49.3	40.8	35.7	25.5	30.6	32.3	28.9	25.5	27.2	18.7	20.4
	Typical	51	45.9	40.8	30.6	35.7	40.8	34	30.6	32.3	25.5	27.2
	Aggressive	59.5	49.3	45.9	35.7	40.8	49.3	40.8	35.7	37.4	30.6	32.3
% Flux Decline	**Conservative**	7	10	10	10	10	10	10	15	13	18	15
(per year)	**Typical**	5	7	7	7	7	7	7	12	10	15	12
	Aggressive	3	5	7	7	5	7	7	7	7	7	7
% Salt Passage												
Increase	**Conservative**	7	15	15	15	15	15	15	15	15	15	15
(per year)	**Typical**	5	10	10	10	10	10	10	10	10	10	10
Beta												
Stand. Element	**Conservative**	1.30	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
	Typical	1.40	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
	Aggressive	1.70	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Full Fit Element	**Conservative**	2.00	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
	Typical	2.20	1.50	1.50	1.50	1.50	1.50	1.50	1.40	1.40	1.30	1.30
	Aggressive	2.20	1.50	1.50	1.50	1.50	1.50	1.50	1.40	1.40	1.30	1.30
Feed m3/h (maximum per vessel)												
2.5"	**Typical**	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
4"	**Typical**	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
8"	**Typical**	17	17	17	17	17	17	17	17	17	17	17
8"	**Conservative**	17	16	15	15	17	15	14	14	17	14	17
16"	**Typical**	68	68	68	68	68	68	68	68	68	68	68
16"	**Conservative**	68	64	59	59	68	59	55	55	68	55	68
Reject m3/h (min per vessel)												
2.5"	**Conservative**	0.27	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.45	0.45
2.5"	**Typical**	0.18	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
4"	**Conservative**	0.68	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	1.14	1.14
4"	**Typical**	0.45	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
8"	**Conservative**	2.7	3.2	3.6	3.6	3.2	3.2	3.6	3.6	3.6	4.1	4.1
8"	**Typical**	1.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
16"	**Conservative**	11	13	15	15	13	13	15	15	15	16	16
16"	**Typical**	7	11	11	11	11	11	11	11	11	11	11
Full Fit												
4"	**Conservative**	1.82	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27
4"	**Typical**	1.36	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
8"	**Conservative**	6.81	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
8"	**Typical**	4.54	6.81	6.81	6.81	6.81	6.81	6.81	6.81	6.81	6.81	6.81
Pressure Drop (bar)												
6 M Vessel	**Typical**	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	Maximum	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76
Element	**Maximum**	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Feedwater pH												
CPA and ESPA	**Limits**	2 to 11	2 to 11	2 to 11	2 to 11	2 to 11	2 to 11	2 to 11	2 to 11	2 to 11	2 to 11	2 to 11
LFC, SWC, ESNA	**Limits**	3 to 10	3 to 10	3 to 10	3 to 10	3 to 10	3 to 10	3 to 10	3 to 10	3 to 10	3 to 10	3 to 10
Feedwater Temp												
(in C)	**Limits**	.1 to 50	.1 to 50	.1 to 50	.1 to 50	.1 to 50	.1 to 50	.1 to 50	.1 to 50	.1 to 50	.1 to 50	.1 to 50
(in F)	**Limits**	33-122	33-122	33-122	33-122	33-122	33-122	33-122	33-122	33-122	33-122	33-122
Saturation Limits with antiscalant												
(LSI &SDSI)	**Typical**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
	Aggressive	< 2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
CaSO4 (%)	**Typical**	230	230	230	230	230	230	230	230	230	230	230
SrSO4 (%)	**Typical**	800	800	800	800	800	800	800	800	800	800	800
BaSO4 (%)	**Typical**	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
SiO2 (%)	**Typical**	100	100	100	100	100	100	100	100	100	100	100
	Aggressive	150	150	150	150	150	150	150	150	150	150	150