

	Unit	
Source:		Municipal Water
Feed Temperature:	°C	23.000
Raw Water Flow/ Train:	gal/min	25.643
Total Permeate Flow/ Train:	gal/min	17.950
Average Flux Rate:	gfd	16.160
Recycling Flow:	gal/min	10.000

	Unit	
Feed Pressure:	psi	150.296
Total Δ Pressure Elements:	psi	6.678
Brine Pressure:	psi	143.618
Permeate Pressure:	psi	0.000
Fouling Factor:		1.000
System Recovery:	%	70.000
Internal Recovery:	%	50.361

Cations	Raw water (mg/L)	Balanced Feed (mg/L)	Recycling + Feed (mg/L)	Reject (mg/L)	Permeate (mg/L)
Ca ²⁺	135.00	135.00	223.21	449.41	0.25
Mg ²⁺	36.00	36.00	59.52	119.84	0.07
Ba ²⁺	1.00	1.00	1.65	3.33	0.00
Sr ²⁺	0.00	0.00	0.00	0.00	0.00
Na ⁺	62.78	62.78	101.97	199.35	5.99
K ⁺	0.00	0.00	0.00	0.00	0.00
Fe ²⁺	0.00	0.00	0.00	0.00	0.00
Fe ³⁺	0.00	0.00	0.00	0.00	0.00
Al ³⁺	0.00	0.00	0.00	0.00	0.00
Mn ²⁺	0.00	0.00	0.00	0.00	0.00
NH ₃ /NH ₄ - N	0.00	0.00	0.00	0.00	0.00

Anions	Raw water (mg/L)	Balanced Feed (mg/L)	Recycling + Feed (mg/L)	Reject (mg/L)	Permeate (mg/L)
HCO ₃ ⁻ Alk(CaCO ₃)	245.00	242.61	397.92	799.34	2.49
CO ₃ ²⁻ Alk(CaCO ₃)	0.00	2.39	7.91	15.94	0.00
Total Alk (CaCO ₃)	245.00	245.00	405.83	815.27	2.49
Ortho-PO ₄ ³⁻	0.00	0.00	0.00	0.00	0.00
SO ₄ ²⁻	259.00	259.00	428.23	862.20	0.49
F ⁻	0.00	0.00	0.00	0.00	0.00
Cl ⁻	41.00	41.00	67.59	135.77	0.38
Br ⁻	0.00	0.00	0.00	0.00	0.00
SiO ₂	5.00	5.00	8.24	16.56	0.05
NO ₃ ⁻ -N	14.00	14.00	23.08	43.49	2.96
NO ₂ ⁻ -N	0.00	0.00	0.00	0.00	0.00
Sulfides (as S ²⁻)	0.00	0.00	0.00	0.00	0.00
B	0.00	0.00	0.00	0.00	0.00
AS (III)	0.00	0.00	0.00	0.00	0.00
AS (V)	0.00	0.00	0.00	0.00	0.00
TDS:	895.580	893.410	1473.390	2939.700	23.060
Cond (µs/cm):	0.000	1241.708	2049.637	4100.788	27.782
pH:	7.400	7.400	7.590	7.880	5.420
Flow:	gal/min	35.640	0.000	17.690	17.950

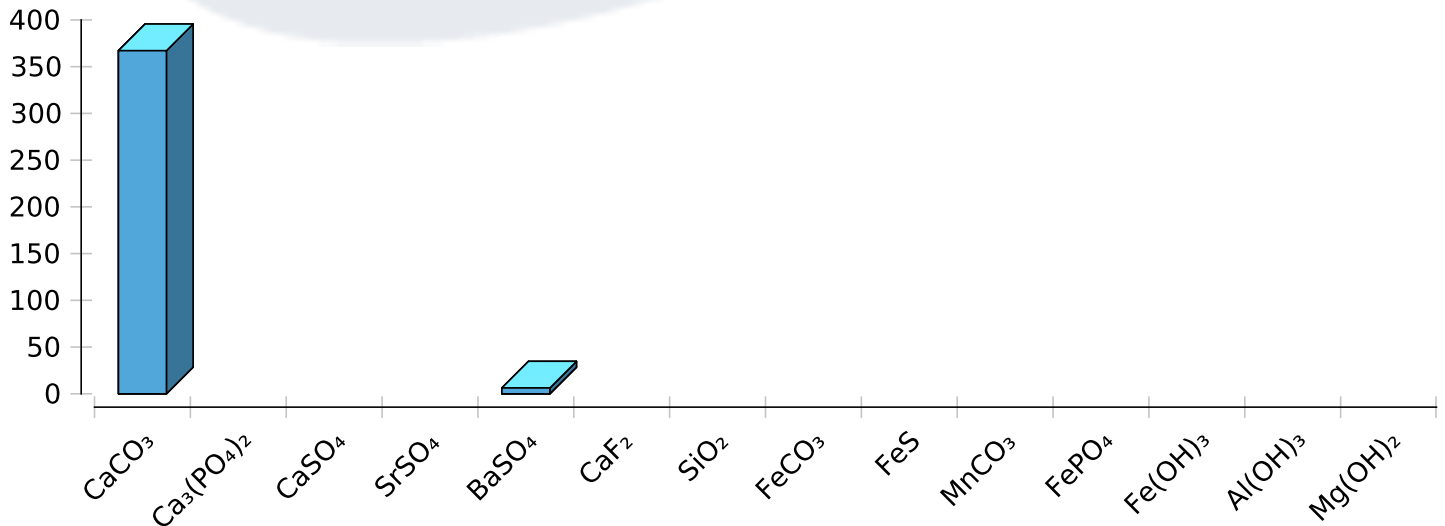
Summary	Product:	Dosage:
pH adjusted using:	H ₂ SO ₄	0.000 mg/L
Selected product:	AWC A-102 Ultra	1.115 mg/L

Unit	Stage 1
Total Elements:	4
Total Vessels:	1
Elements / Vessels:	4
Hydraulic/Interstage Pressure Losses: psi	0.000
Feed Pressure: psi	150.296
Permeate Throttle/Backpressure: psi	0.000
Interstage Boost Pressure: psi	0.000
Concentrate Pressure: psi	143.618
Feed Flow: gal/min	35.643
Concentrate Flow: gal/min	17.693

Hydraulics Details

Membrane Model:	Permeate Flow: gal/min	Average Flux: gfd	System Recovery: %	β	Feed Flow / PV: gal/min	Concentrate Flow / PV: gal/min	Δ Pressure: psi	Osmotic Pressure: psi	Net Driving Pressure: psi
Stage1	17.950	16.155	50.361	1.106	35.643	17.693	6.678	18.439	132.090
1 TM720-400	4.693	16.894	13.166	1.102	35.643	30.950	2.343	10.996	138.129
2 TM720-400	4.561	16.421	14.738	1.105	30.950	26.389	1.858	12.757	134.266
3 TM720-400	4.425	15.931	16.770	1.107	26.389	21.963	1.427	15.121	130.260
4 TM720-400	4.271	15.374	19.444	1.111	21.963	17.693	1.049	18.439	125.704

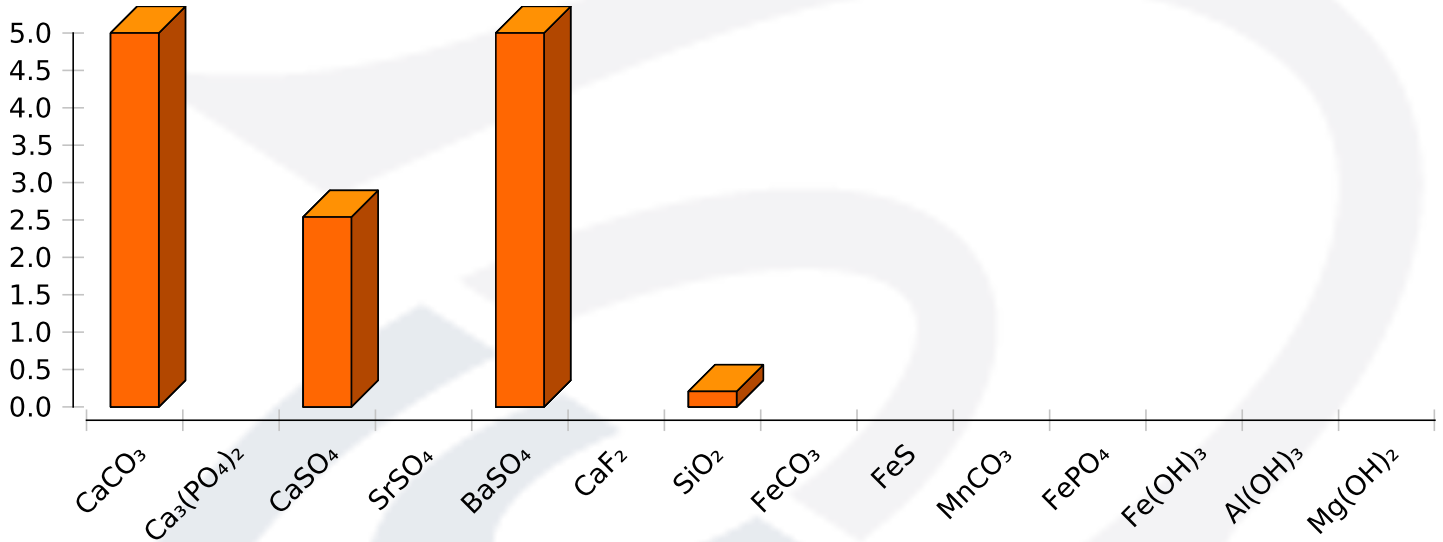
Summary Scale - Precipitation Potentials (mg/L)



Summary Scale - Precipitation Potentials (mg/L)

CaCO ₃	Ca ₃ (PO ₄) ₂	CaSO ₄	SrSO ₄	BaSO ₄	CaF ₂	SiO ₂	FeCO ₃	FeS	MnCO ₃	FePO ₄	Fe(OH) ₃	Al(OH) ₃	Mg(OH) ₂
367.089	0	0	0	6.241	0	0	0	0	0	0	0	0	0

Summary Scale - X Saturation



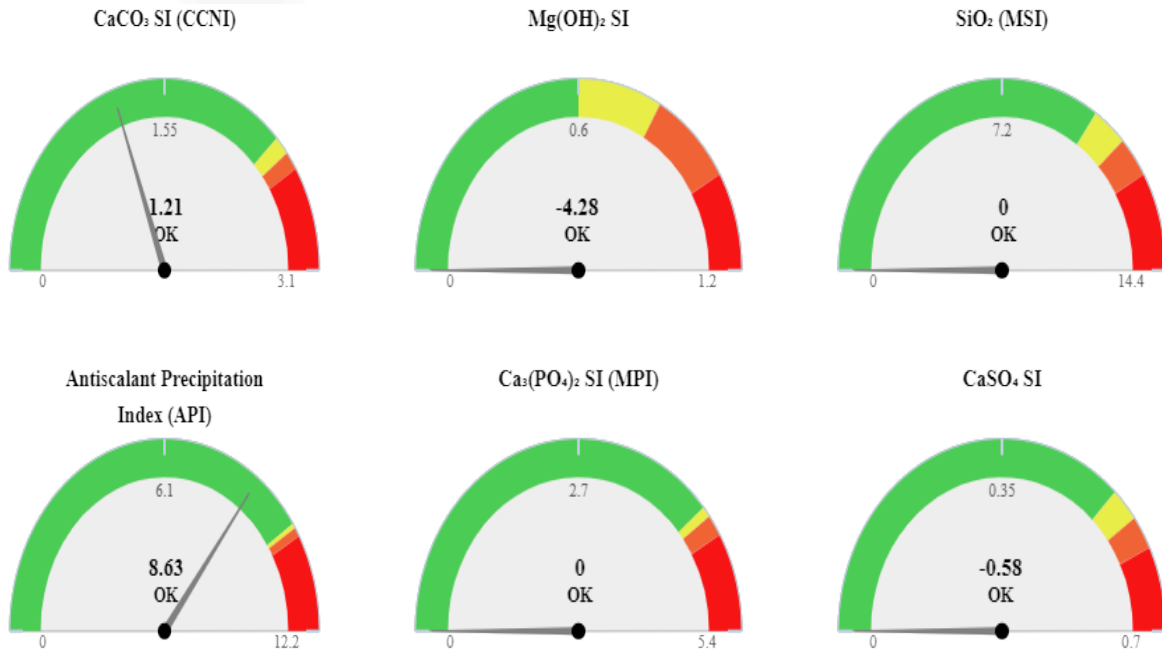
Summary Scale - X Saturation

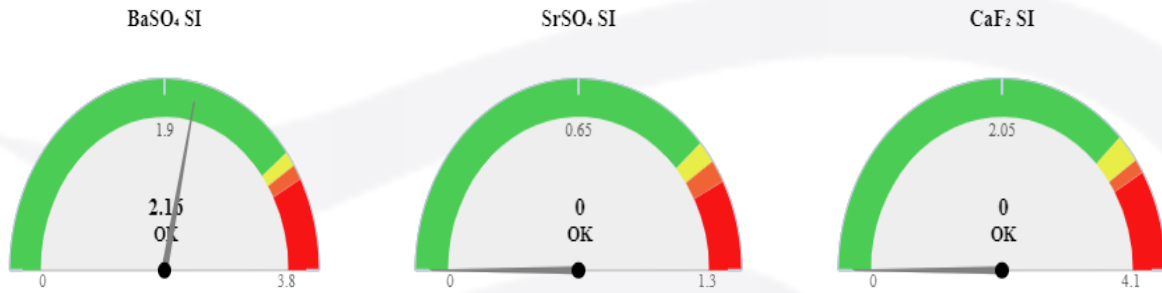
CaCO ₃	Ca ₃ (PO ₄) ₂	CaSO ₄	SrSO ₄	BaSO ₄	CaF ₂	SiO ₂	FeCO ₃	FeS	MnCO ₃	FePO ₄	Fe(OH) ₃	Al(OH) ₃	Mg(OH) ₂
16.051	0	2.539	0	145.863	0	0.207	0	0	0	0	0	0	0

Scales above 100% saturation

CaCO ₃	Saturation is 16.05 X; [Saturation Index is 1.21], Precipitation Potential: 367.09 mg/l
MgCO ₃	Saturation is 1.74 X; [Saturation Index is 0.24], Precipitation Potential: 74.79 mg/l
BaSO ₄	Saturation is 145.86 X; [Saturation Index is 2.16], Precipitation Potential: 6.24 mg/l

Critical Indices





Chemical dosing:	AWC A-102 Ultra	H2SO4
Calculated Dosage:	1.115 mg/L	0.000 mg/L
Total Dosage (modified by user):	1.115 mg/L	N/A
% Concentration:	N/A	93.000%
Density:	1.120 g/cm3	1.835 g/cm3
Dosing Pump:	0.134 ml/min	0.000 ml/min
Hours of Operation/Day:	24 hour(s)	24 hour(s)
Consumption per:		
Day	0.217 kg	0.000 kg
Week	1.517 kg	0.000 kg
4 Weeks	6.068 kg	0.000 kg
Year	79.104 kg	0.000 kg
5 Years	395.521 kg	0.000 kg

Insert your additional comments below:

DISCLAIMER: NO WARRANTY, EXPRESSED OR IMPLIED, AND NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS GIVEN. American Water Chemicals Inc does not assume any obligation or liability for results obtained or damages incurred from the application of this information. Because use conditions and applicable laws may differ from one location to another and may change with time, customer is responsible for determining whether products are appropriate for customer's use. American Water Chemicals assumes no liability, if, as a result of customer's use of the Proton membrane aqueous chemistry calculator, the customer should be sued for alleged infringement of any patent not owned or controlled by American Water Chemicals Inc.