



NOVEMBER 2022

SpectraGuard 311

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SpectraGuard™ 311
LIQUID REVERSE OSMOSIS ANTISCALANT

SpectraGuard™ 300
LIQUID REVERSE OSMOSIS ANTISCALANT



Piedmont



DISTRIBUTOR SUMMIT
NOVEMBER 13-17, 2022

Developing a Sustainable, complete and efficient PWT Portfolio for your Business



Climate Crisis – Environmental Crisis – Water Crisis



**Sustainable
Solutions**



SpectraGuard 111 – *Always in your PWT Portfolio*



- **Superconcentrated (x11).**
 - Reduce CO₂ emissions
 - Reduce Transport Cost
 - Reduce stock area
- **Phosphate-free** formulation beneficial for environmental considerations.
- Classified as **non-hazardous** (and Low Toxicity)
- Membrane **compatibility.**
- **NSF** Approval.



SpectraGuard 111 – *Always in your PWT Portfolio*



**DON'T
MISS OUT!**



**Everything you need to know
about our SpectraGuard 111**

Today: 15:30 to 16:00 hs

by our Dendrimer Queen!



SpectraGuard™ 311
LIQUID REVERSE OSMOSIS ANTISCALANT

SpectraGuard™ 300
LIQUID REVERSE OSMOSIS ANTISCALANT



DID YOU KNOW SG300 / SG311??



Antiscalant Selection

SpectraGuard™ 311

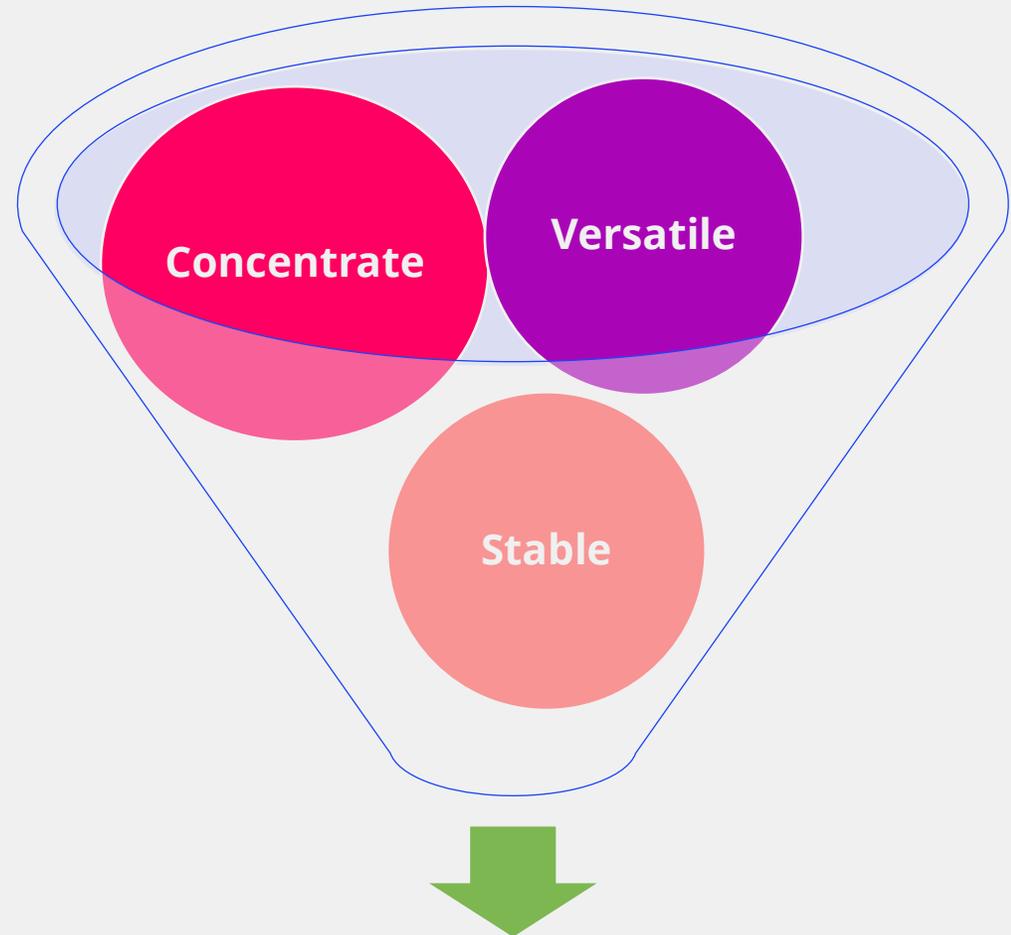
LIQUID REVERSE OSMOSIS ANTISCALANT

Product	SpectraGuard 100	SpectraGuard 250	SpectraGuard 300	SpectraGuard 360
CaCO3	***	***	***	***
CaSO4	***	***	***	***
BaSO4	***	***	***	***
Fe/Mn	*	***	***	***
CaHPO4	*	*	***	***
SiO2	***	*	***	***
Phosphate Free	✓			
NSF 60	✓	✓	✓	✓



Inspired in successful experiences

- **Concentrated as SG111** 
- **Versatile as SG360**
- **Low phosphonate** 
- **Chemical stable**



SpectraGuard 311



SpectraGuard 311



Certified to
NSF/ANSI 60

SpectraGuard™ 311 is an 8x Super Concentrated antiscalant/dispersant that has been proven as a superior pretreatment in RO feed water. SpectraGuard™ 311 is a high performance blended antiscalant/dispersant with broad spectrum scale inhibition. Capable of controlling carbonates, sulfates, phosphates, metal hydroxides, silica and particulates, SpectraGuard™ 311 provides full protection of the membrane system from a multitude of feed waters. SpectraGuard™ 311 can be used in municipal reuse, heavy industrial, drinking water and other high loading applications.

Features / Benefits

- High performance formula provides best available inorganic scale inhibitor
- 8x concentrate significantly reduces freight and inventory requirements
- Using a proprietary blend of polymers and phosphonates this formula provides added control of membrane fouling in waters with high salts, high silica and colloidal foulants
- Higher performance allows for lower dose rates than existing formulations
- Stable molecular structure maintains integrity in high pH, high temperature and high salinity applications

Uses

- Control of calcium carbonate, calcium sulfate, barium sulfate, calcium fluoride, silica, and hydroxides of iron and manganese

Specifications

Appearance	Amber / pale yellow liquid
pH (1% solution)	1.60 – 2.20
Density (kg/liter)	1.20 – 1.40

Packaging

Pail: 5 gallon/18.9 liter
Drum: 55 gallon/208 liter

Tote: 275 gallon/1,040 liter
Bulk: available upon request

For special packaging options, please contact PWT or your local distributor.

SpectraGuard™ 311
LIQUID REVERSE OSMOSIS ANTISCALANT

- **8x 'SC'** version to reduce CO₂ emission & freight and inventory costs and
- Blend of polymer and phosphonate
- For Municipal, heavy Industrial, and other high loading applications (*Wastewater Reuse*)
- Capable of controlling
 - Ca, Mg, Ba, Sr
 - Carbonates
 - Sulfates
 - Phosphates
 - Fe
 - Silica



NSF 60 Certified



Antiscalants

- SpectraGuard 100
- SpectraGuard 101
- SpectraGuard 105
- SpectraGuard 150 SC
- SpectraGuard 205 SC
- SpectraGuard 211 SC
- SpectraGuard 250
- SpectraGuard 281
- SpectraGuard 360
- SpectraGuard 311
- Titan ASD 200 SC
- Titan ASD 200
- BioGuard 100
- BioGuard 111
- OrganoGuard 100
- OrganoGuard 111

Membrane Cleaners

Powder Cleaners:

- OptiClean A
- OptiClean B
- OptiClean D
- OptiClean N
- OptiClean S
- OptiClean X Eco
- OptiClean Y Eco

Liquid Cleaners:

- Lavasol 1
- Lavasol 2
- Lavasol 5
- Lavasol 6
- Lavasol 7
- Lavasol 9

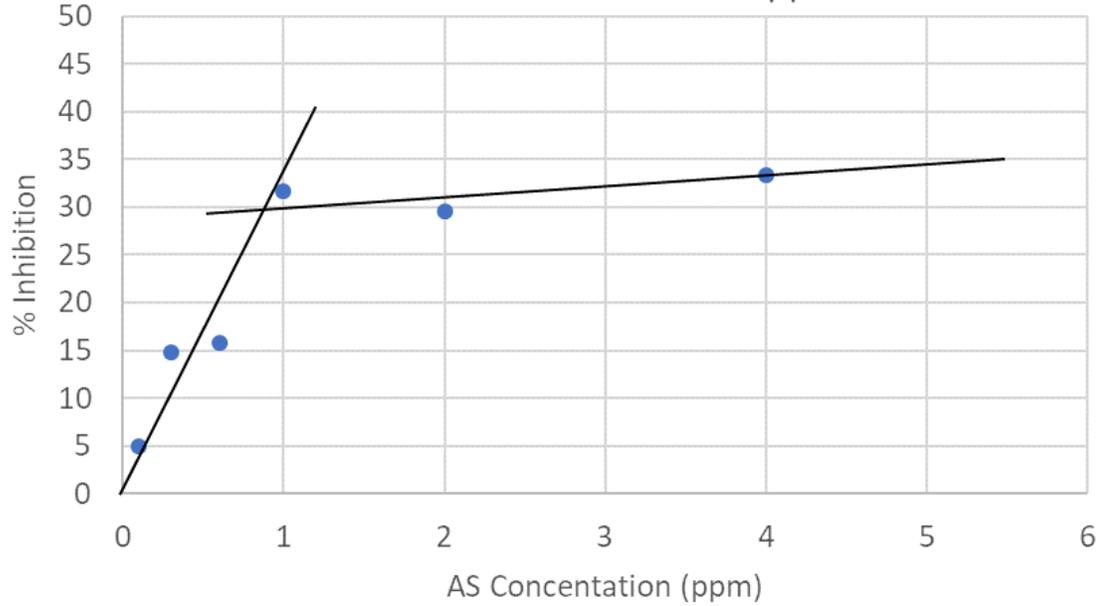
Follow link for latest listings

<http://info.nsf.org/Certified/PwsChemicals/Listings.asp?Company=53700&Standard=060>

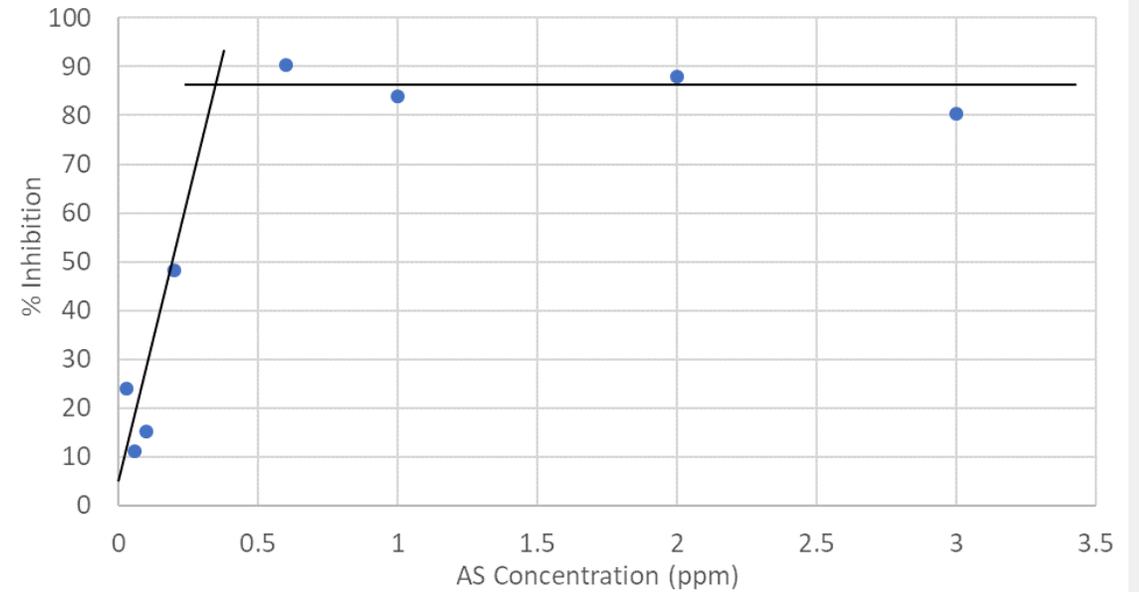


SpectraGuard 311 - Inhibition

SiO₂ Inhibition test at 400ppm



CaCO₃ Inhibition Test (LSI = 3.6)



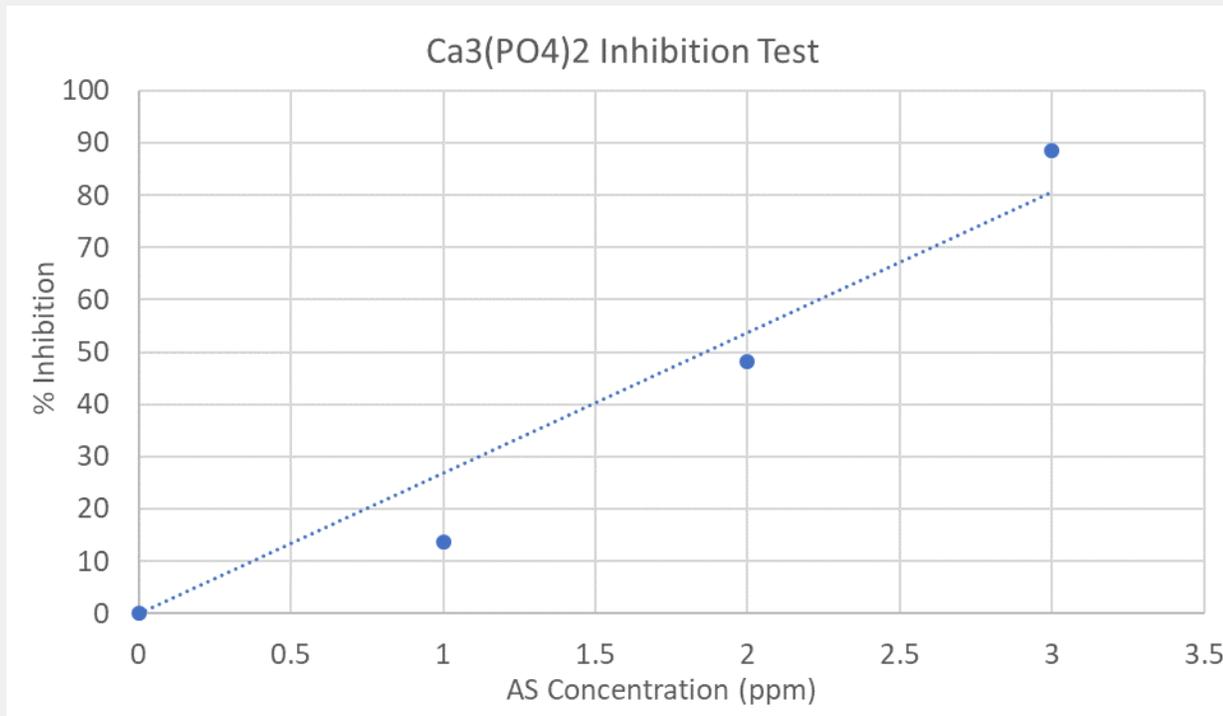
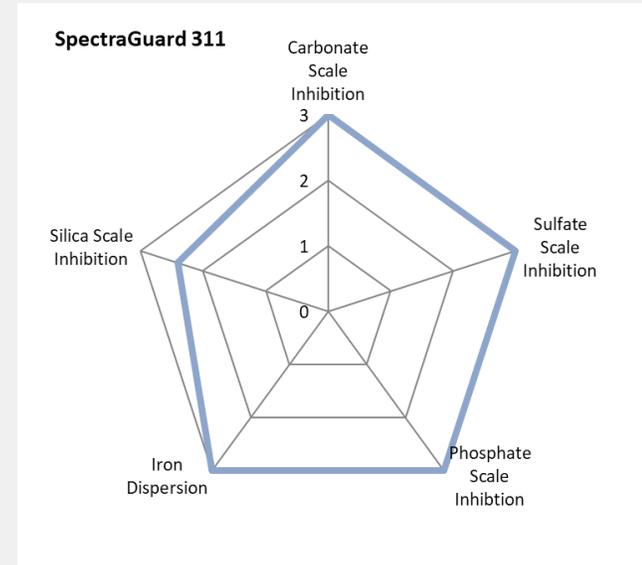
Advantages

- At least 8x concentrated product
- Highly effective against Si, Fe and heavy metals
- Best used for waste-water applications



SpectraGuard 311 - Inhibition

- Phosphate inhibition
 - Calcium Phosphate scaling with out ferrous additives
 - Utilized new “USEPA Ascorbic Acid” Method
 - 100% inhibition at 3ppm of SG 311 (vs ~40ppm for SG 360)



Row Labels	3ppm
Ca ₃ (PO ₄) ₂	88.51
CaCO ₃	80.4
SiO ₂	63.38



SG 311 v/s SG 360

Vander Lans Example

System Information

Feed Water Type:	Well Water	Flow Units:	Gal/min
Feed Water Flow:	2,641.0	Concentrate Flow:	396.2
Permeate Flow:	2,244.9	Recycle Flow:	0.0
System Recovery (%):	85.00%	RO Recovery:	85.00%
Feed Temperature:	77.0 Deg F	Membrane Rejection:	99.3%

Product Selection: SpectraGuard 360

Recommended Dose Rate:	3.08 mg/l Feed	20.55 mg/l in Concentrate
Estimated Usage (100%):	95.15 lbs/day	17.36 US ton/yr, 15,753 kg/yr

Saturation %	Raw Feed	Treated Feed	Concentrate	% of Max w Antiscalant
LSI	0.1	0.1	2.3	76.8
CCPP (mg/L)	3.7	3.7	511.7	-
CaCO3	72.3	72.3	12,433.9	69.8
CaSO4	0.8	0.8	15.2	2.3
BaSO4	64.9	64.9	1,187.2	5.3
SrSO4	0.6	0.6	10.4	0.5
CaF2	0.0	0.0	0.0	0.0
SiO2	15.9	15.9	102.0	42.51
Fe/Iron	0.0	0.0	0.0	0.00
Ca5(PO4)3(OH) - SI	-0.4	-0.4	7.7	91.29
Mg(OH)2	0.0	0.0	0.0	0.00
Al	0.0	0.0	0.0	0.00

Product Selection: SpectraGuard 311

Recommended Dose Rate:	0.42 mg/l Feed	2.78 mg/l in Concentrate
Estimated Usage (100%):	12.85 lbs/day	2.35 US ton/yr, 2,128 kg/yr

Saturation %	Raw Feed	Treated Feed	Concentrate	% of Max w Antiscalant
LSI	0.1	0.1	2.3	76.8
CCPP (mg/L)	3.7	3.7	511.7	-
CaCO3	72.3	72.3	12,433.9	69.8
CaSO4	0.8	0.8	15.2	2.3
BaSO4	64.9	64.9	1,187.2	4.2
SrSO4	0.6	0.6	10.4	0.5
CaF2	0.0	0.0	0.0	0.0
SiO2	15.9	15.9	102.0	42.51
Fe/Iron	0.0	0.0	0.0	0.00
Ca5(PO4)3(OH) - SI	-0.4	-0.4	7.7	91.29
Mg(OH)2	0.0	0.0	0.0	0.00
Al	0.0	0.0	0.0	0.00



SpectraGuard 311 - Dilution



SpectraGuard 311 SpectraGuard 300

Appearance	Amber/Pale Yellow	Clear/Pale Yellow
pH (1% Solution)	~1.9	~2.5
Density (kg/L)	~1.28	~1.01

Breathing protection



Hand protection



Eye protection



Skin protection



Anti-static safety footwear
against chemicals



SpectraGuard 311 - Dilution

SpectraGuard 300

Mix:

- 0.125 gals. (0.473 L) **SpectraGuard 311**
- 0.875 gals. (3.312 L) D.I. water
- To create 1 gallon (3.785 L) finished product

SpectraGuard 300

Mix:

- 1.25 lb. (0.57 kg) **SpectraGuard 311**
- 7.30 lbs. (3.31 kg) D.I. water
- To create 1 gallon (3.785 L) finished product



Breathing protection



Hand protection



Eye protection



Skin protection



Anti-static safety footwear
against chemicals



Weights/Dims and Shipping

<i>Container Sizes</i>	5 Gal. / 18.9 L	55 Gal. / 208.2 L	275 Gal. / 1,041 L	330 Gal. / 1,249 L
<i>SpectraGuard 300</i>	42 lbs. / 19 kg	470 lbs. / 213,2 kg	2.330 lbs. / 1.056,9 kg	2.800 lbs. / 1.270 kg
<i>SpectraGuard 311</i>	50 lbs. / 22,7 kg	540 lbs. / 245 kg	2.700 lbs. / 1.224,7 kg.	3.250 lbs. / 1.474,2 kg



SpectraGuard™ 311
LIQUID REVERSE OSMOSIS ANTISCALANT

has been

recategorized as Non Hazardous

Antiscalant Selection



- Phosphonates can't handle silica, polymers can
- The preference is to use SpectraGuard 100, unless:
 - ❖ Transition metals present (>0,5 ppm): SG250 / SG300 / SG360
 - ❖ Transition metals with silica: SG300 / SG360
 - ❖ Calcium phosphate potential: SG300 / SG360
 - ❖ Complex feeds (variable / unknown): SG300 / SG360
 - ❖ Customer doesn't want something different or bid specs
- Application Specific
 - ❖ Brackish: Any
 - ❖ Seawater: Typically SpectraGuard 100, unless Fe & Mn
 - ❖ Wastewater: SpectraGuard 300 (CaHPO_4 and Si)
 - ❖ Industrial Wastewater: SpectraGuard 300 (multiple scale formers)



Tips for Projections

- The projection is only as good as the water quality provided
- Membrane projections do not typically include iron and manganese
- Ensure the water quality is RO feed
- Oversaturated in the feed?
- Ask for process details (i.e. iron removal, UF, etc)
- Converting from ion to molecule (i.e. P to PO_4 , Si to SiO_2 , etc)
- How many scale formers are present?
- Safety factor!
 - 80% to 85% of max based on antiscalant capacity
- Other factors that affect scaling
 - System design
 - Operation
 - Water quality changes

Wt. of P=30.97; of O=15.99
[PO₄] = [P] (94.93/30.97)



Case Study – Waste Water Reuse



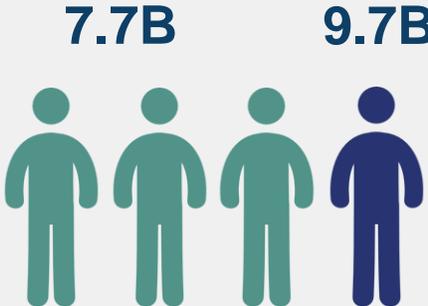
Water Stress: Global and Growing

2.2B People with lack access to safe drinking water

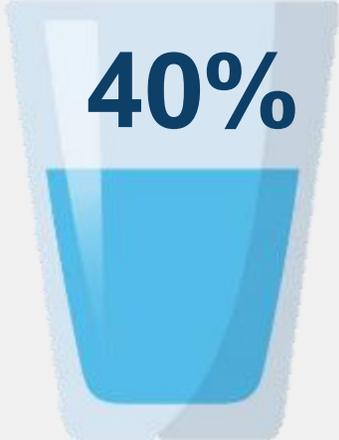
4.2B People with lack access to safe wastewater services

NOW

Population growth
2019 → 2050



World Water
Consumption By 2050



Water
Deficit By
2030

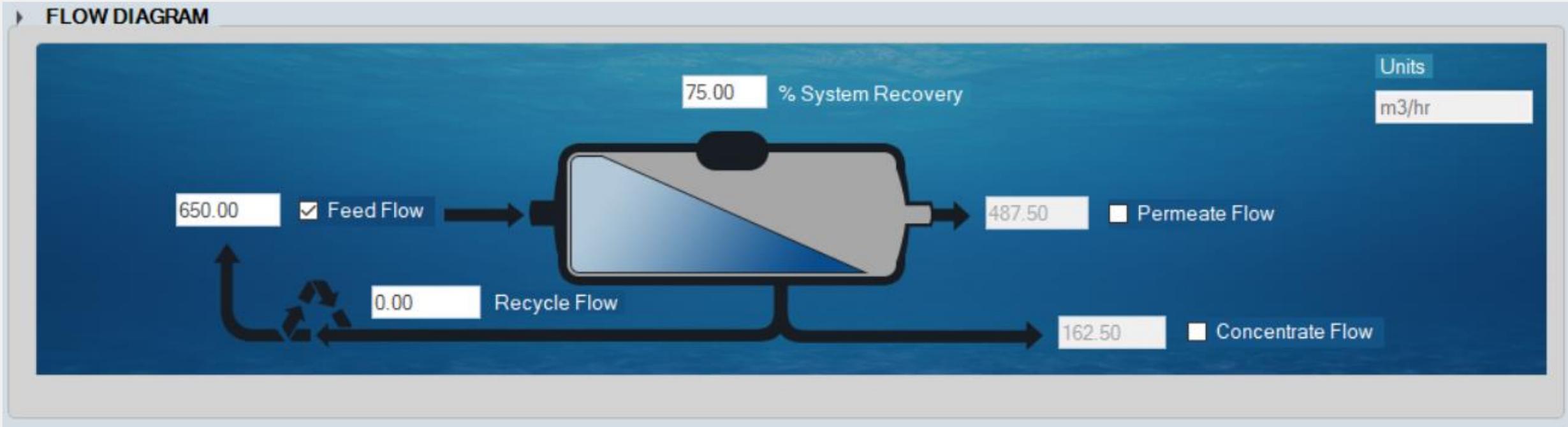


Case Study – Waste Water Reuse

PARAMETERS		IONS							
TEMPERATURE:	25.0	FEED CATIONS				FEED ANIONS			
pH:	7.50	IONS	mg/L	meq/L	ppm CaCO3	IONS	mg/L	meq/L	ppm CaCO3
TDS:	723	Ca	40.00	1.9960	99.89	HCO3	100.00	1.6391	82.03
		Mg	15.00	1.2343	61.77	Cl	194.75	5.4937	274.93
		Na	166.00	7.2205	361.35	SO4	143.00	2.9773	149.00
		K	10.00	0.2558	12.80	F	1.00	0.0526	2.63
		NH4	5.00	0.2772	13.87	NO3	30.00	0.4838	24.21
		Ba	0.0100	0.0001	0.01	PO4	3.06	0.0967	4.84
		Sr	0.0100	0.0002	0.01	SiO2	15.0000	0.2497	12.49
		Fe	0.40	0.0143	0.72	CO3	0.22	0.0073	0.37
		Mn	0.01	0.0005	0.03	CO2	4.62	0.1049	5.25
		Al	0.01	0.0011	0.06	Total	487.03	11.0002	550.50
		Total	236.44	11.0001	550.50				



Case Study – Waste Water Reuse

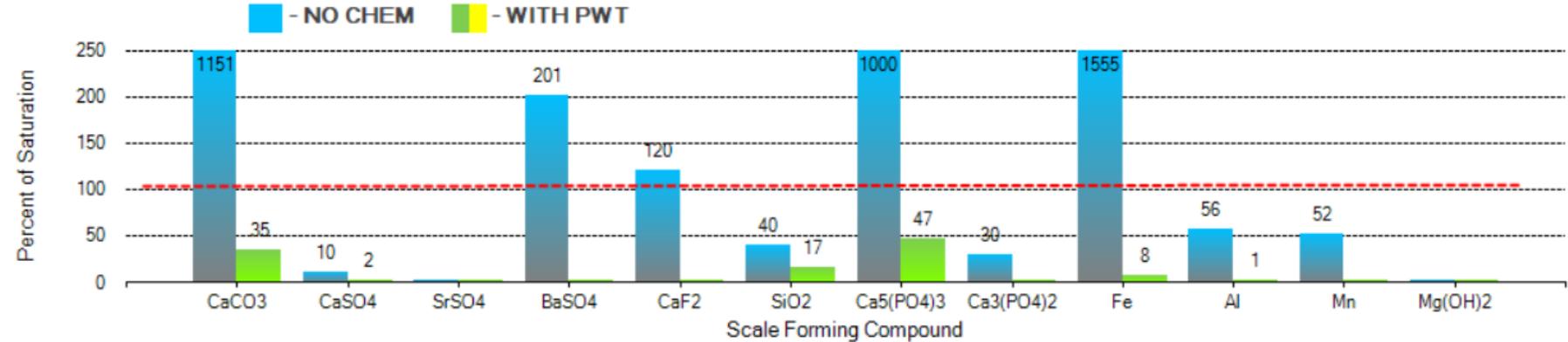


Case Study – Waste Water Reuse

PRE-TREATMENT OPTIONS

ANTISCALANT SELECTION: SpectraGuard 360
 PPM: 2.462

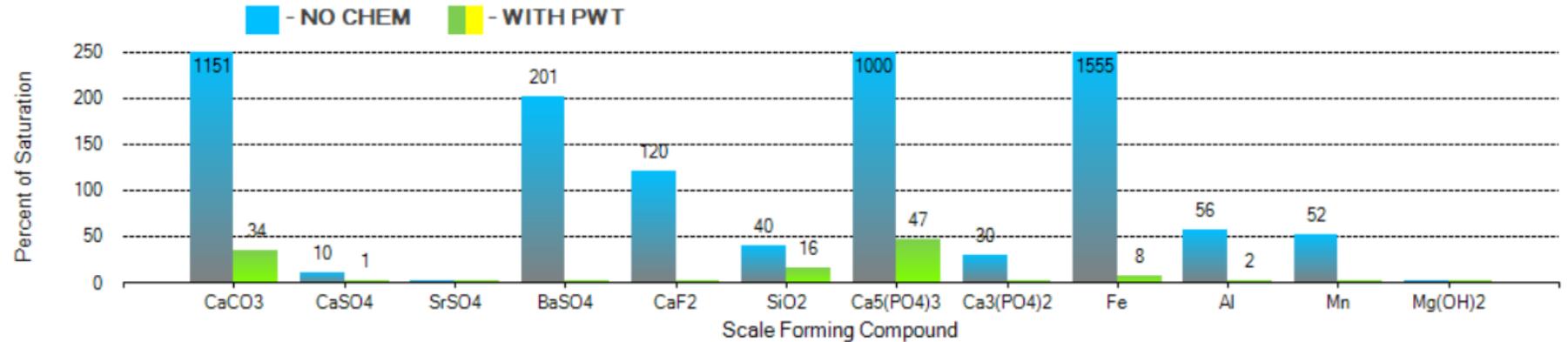
CONCENTRATE SOLUBILITY



PRE-TREATMENT OPTIONS

ANTISCALANT SELECTION: SpectraGuard 311
 PPM: 0.339

CONCENTRATE SOLUBILITY



Case Study – Waste Water Reuse

System Information

Feed Water Type:	Municipal Waste Water	Flow Units:	m3/hr
Feed Water Flow:	650.0	Concentrate Flow:	162.5
Permeate Flow:	487.5	Recycle Flow:	0.0
System Recovery (%):	75.00%	RO Recovery:	75.00%
Feed Temperature:	25.0 Deg C	Membrane Rejection:	99.3%

Product Name	Dose Rate (mg/l)	Estimated Usage (kg/day) 100%	Estimated Usage (kg/yr) 100%
SpectraGuard 311	0,34	5,27	1.925,00
SpectraGuard 300	2,71	42,19	15.399,00
SpectraGuard 360	2,46	38,35	13.999,00



Transportation and Packaging CO₂ Footprint

kgCO₂- 14.000 kg SG360
Pre-Carriage - 9.52% of total emissions
CO₂e - 251.1 Kilogramme Transport Mode: ROAD Origin: 92081 - United States Distance: 166.125 KM Port of Loading: USWQJ - West Los Angeles
Main Carriage - 63.05% of total emissions
CO₂e - 1.7 Tonne Transport Mode: OCEAN Port of Loading: USWQJ - West Los Angeles Distance: 13436.185 KM Port of Destination: BRRIO - Rio de Janeiro
On-Carriage - 27.43% of total emissions
CO₂e - 723.3 Kilogramme Transport Mode: ROAD Port of Destination: BRRIO - Rio de Janeiro Distance: 432.151 KM Destination: 04230000 - Brazil
Packaging (kgCO₂) - 12 IBC
CO₂e - 1.435 kg
TOTAL CO₂ FOOTPRINT (kgCO₂)
CO₂e - 4.109 kg

kgCO₂ - 1.925 kg SG311
Pre-Carriage - 9.51% of total emissions
CO₂e - 34.5 Kilogramme Transport Mode: ROAD Origin: 92081 - United States Distance: 166.125 KM Port of Loading: USWQJ - West Los Angeles
Main Carriage - 63.04% of total emissions
CO₂e - 228.6 Kilogramme Transport Mode: OCEAN Port of Loading: USWQJ - West Los Angeles Distance: 13436.185 KM Port of Destination: BRRIO - Rio de Janeiro
On-Carriage - 27.44% of total emissions
CO₂e - 99.5 Kilogramme Transport Mode: ROAD Port of Destination: BRRIO - Rio de Janeiro Distance: 432.151 KM Destination: 04230000 - Brazil
Packaging (kgCO₂) - 2 IBC
CO₂e - 239 kg
TOTAL CO₂ FOOTPRINT (kgCO₂)
CO₂e - 603 kg



CO₂e Saving kgCO₂/year
3.506



Sustainable, complete and efficient PWT Portfolio for your Business

SpectraGuard™ 111
CONCENTRATED, LIQUID REVERSE OSMOSIS ANTISCALANT

SpectraGuard™ 311
LIQUID REVERSE OSMOSIS ANTISCALANT



EventMobi

- **SG300** and **SG360** has comparable performances?
- **SG311** and/or **SG300** is part of your company current Portfolio?
- **SG311** could also be presented as a **sustainable product** because is concentrated an reduce CO₂ emissions and is Low Phosphonate?
- Are **SG300** and **SG311** excellent alternatives for challenging waters with High Fe&Mn, Phosphates and Silica?
- Are **SG300** and **SG311** excellent alternatives for mining applications?



Successful History



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AR Africa



ECSA



h₂O innovation[®]

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WATER COMPANY
OF THE YEAR 2020

