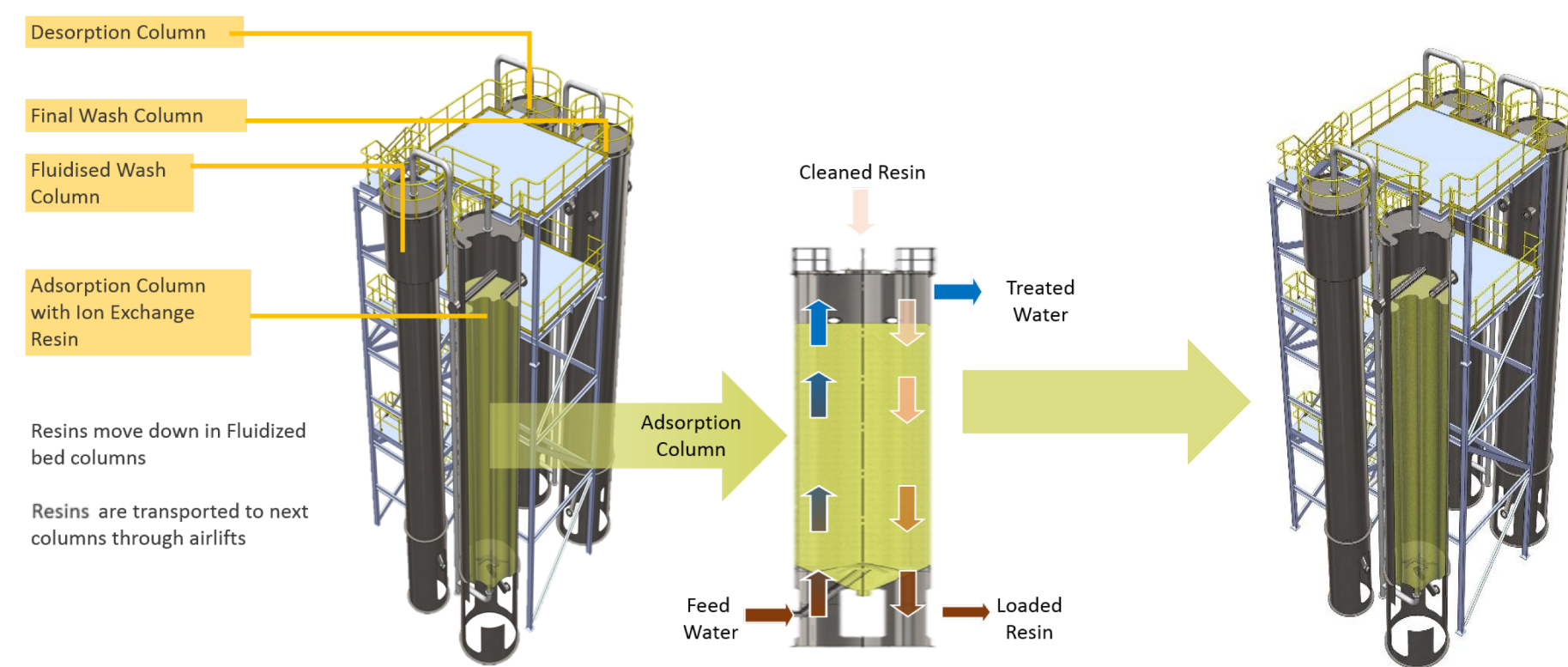


Minimum or Zero Liquid Discharge Without Saline Brines

Robust Contaminant Removal

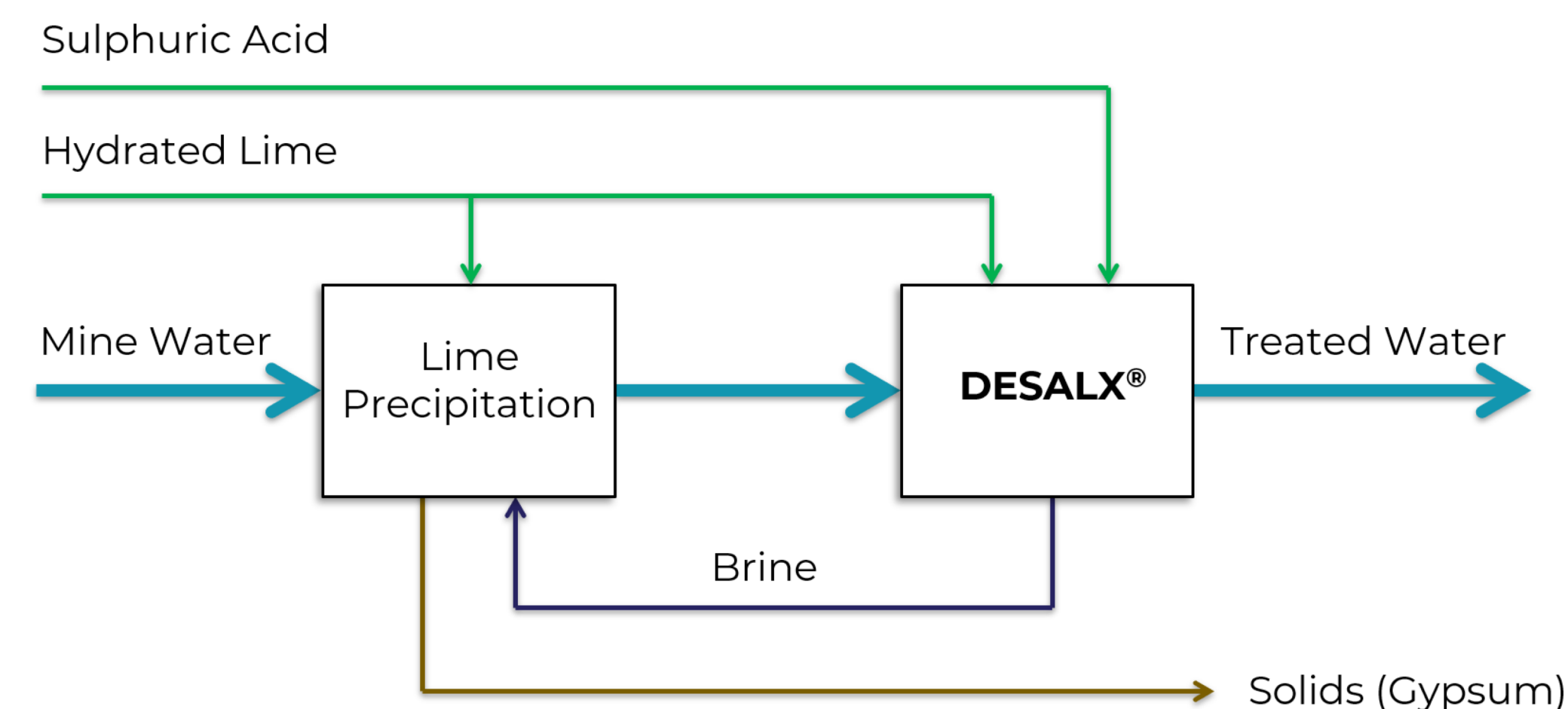
Clean TeQ Water's DESALX[®] builds on our CIF[®] (continuous ionic filtration) technology, which automatically moves resins between vertical columns after adsorption to regenerate them and acts as a fixed bed filter for solids. DESALX[®] removes multivalent cations such as calcium and magnesium in the first CIF[®] stage, and then removes multivalent anions such as sulphate in the second CIF[®] step.



DESALX[®] reduces the TSS, TDS, trace metals and hardness of the water without removing monovalent ions such as sodium and chloride, allowing water to be reused or in some cases even to drink, without producing liquid brines.

ZLD Potential

Leaving sodium and chloride in the water prevents the production of saline brines, and instead only creates gypsum solids through lime precipitation. If lime precipitation isn't available on site, a high-density sludge clarifier can be used for dewatering the brine, creating low hazard sludge waste (25-50% w/w).



Various Applications

Typical Sources		Typical Uses	
Groundwater		Process Water	
Mine Wastewater		Drinking Water	
Oil/Gas Produced Water		Irrigation Water	

Example Influent		Example Effluent	
TDS	1200 - 3000 ppm	TDS	500 - 1500 ppm
SO ₄	800 - 1500 ppm	SO ₄	250 - 500 ppm
Ca	100 - 500 ppm	Ca	<50 ppm
Mg	100 - 300 ppm	Mg	<30 ppm
Na	0 - 250 ppm	Na	0 - 250 ppm
Cl	0 - 350 ppm	Cl	0 - 350 ppm

A Range of Benefits

- ✓ Removes di- and tri-valent cations and anions through a complimentary process
- ✓ Efficient calcium, magnesium, and sulphate removal for brackish water
- ✓ A low volume of gypsum based sludge as the only waste stream
- ✓ No scaling/fouling issues and no blocking up, even with high suspended solids
- ✓ Very low OPEX, typically 0.4-0.8 USD/m³

Site Synergy

While in many situations DESALX[®] is a Reverse Osmosis alternative, saving CAPEX and OPEX and removing the brine problem, it can also compliment RO. By removing suspended solids and scale forming ions DESALX[®] can be a pre-treatment for RO, reducing system cost, operating cost, and increasing the life of the membranes, and the total system recovery.

A Golden Solution

Clean TeQ Water installed a 2MLD water treatment plant at a gold mine in Australia. The mine has an excess of water from dewatering underground mines, which requires treatment before being reinjected into an aquifer for storage. The feed water was high in hardness, sulphates, antimony and arsenic. The antimony and arsenic were reduced using precipitation before proceeding to DESALX[®], which produced water suitable for aquifer reinjection. At times the DESALX[®] effluent will be sent to a Reverse Osmosis plant which upgrades the water for re-use without intermediate steps.



Species	Unit	Before Precipitation	Before DESALX [®]	After DESALX [®]
Flow rate	(m ³ /h)	83.3	83	71
pH	-	6.8	4.5	6.0-9.0
Total Dissolved Solids	ppm	7,400	7,400	5,848
Calcium	ppm	300	300	85
Magnesium	ppm	321	321	96
Sulphate	ppm	1515	1515	700
Iron (soluble)	ppm	1	5	0.1
Total Arsenic (soluble)	ppm	0.5	0.03	0.03
Antimony (soluble)	ppm	13	0.05	0.05