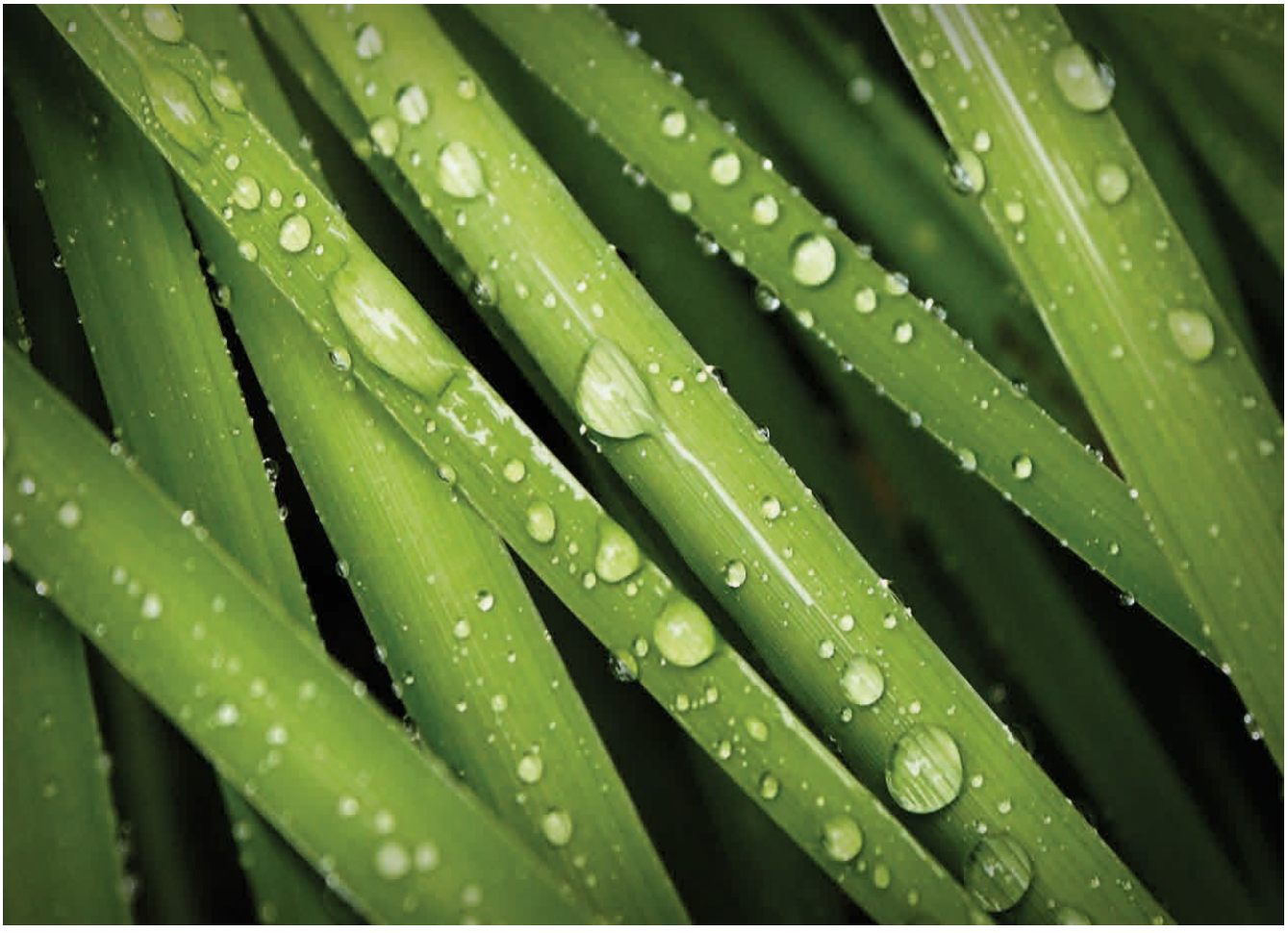
SolEco
"Solutions Ecologique"

Remediating the World's Wastewater



PRODUCT OVERVIEW

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Background

SolEco Limited has developed ground-breaking water treatment products with the potential to achieve significant water quality improvements and that allows users to delay or avoid costly capital works programmes.

They allow for efficient re-use of water in certain circumstances: They are natural bio-organic products that contain no "live" organisms; are completely safe to use and are not classified as Hazardous Chemicals.

These organic concentrates have been cleared by United States Customs for entry to the U.S.A. and by the U.S. Coast Guard for discharge into U.S. ports and harbours.

*Solutek, SolEco's flagship product, is well proven and has been in use in Australia and New Zealand for more than 18 years and in Malaysia for 8 years.

How they work

The essence of SolEco's natural bio-organic concentrates capability is based on Cell Signalling.

SolEco's formulations are designed to activate beneficial bacteria and to massively enhance their growth and reproduction helping them breakdown contaminants protecting the dissolved oxygen in effluent streams. They stimulate beneficial bacteria to out-compete damaging bacteria.

Key Benefits

- ⇒ Substantial reduction in BOD (Biological Oxygen Demand) and COD (Chemical Oxygen Demand)
- ⇒ Substantial reduction in TSS (Total Suspended Solids)
- ⇒ Substantial reduction in Oil & Grease in the effluent
- ⇒ Reduction (or elimination) of hydrogen sulphide (odour)
- ⇒ Lower corrosion and maintenance costs
- ⇒ Potential to delay or avoid capital investment needed to address population growth

***Solutek is a proven and preferred treatment used by many water authorities around the world.**

The economic and environmental advantages of Solutek, when compared to chemical treatments, Oxygen injection and bacterial additives is undeniable.

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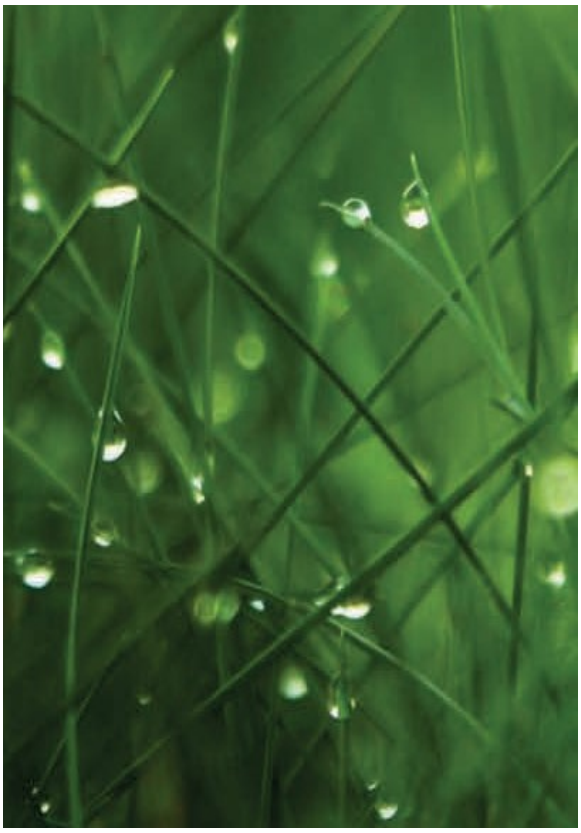
Where to add organic concentrates

SolEco's natural bio-organic concentrates are best added to the effluent stream as far "up-stream" in the system as practical.

In addition, they are highly effective when added in the effluent stream in locations with high residency times (e.g. in equalisation tanks).



Applications

- ⇒ Sewage Treatment Plants
- ⇒ Dairy effluent
- ⇒ Slaughterhouse effluent
- ⇒ Fracking water remediation
- ⇒ Aquaculture
- ⇒ Hospitals effluent
- ⇒ Reverse osmosis membrane maintenance
- ⇒ Irrigation/Agriculture

Amount of time needed to drive water quality improvement

SolEco's natural bio-organic concentrates work progressively to improve the water quality within infrastructure such as pipe work and treatment plants.

There is typically a legacy of oil, grease and fat (and other carbonaceous waste) that has built up within the operation over a period of years.

SolEco's natural bio-organic concentrates take some time - typically 6 to 12 weeks - to break down this material.

During this time the dosing level may be higher than the ongoing dosing usage.

Once the legacy material has been broken down ongoing dosing with our natural bio-organic concentrates maintains a healthy bacteria population in the system.

Malodour is typically massively reduced in the first 5 to 7 days.

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Overview—Sewage Treatment

SolEco's natural bio-organic concentrate for sewage - Solutek - is currently in use in multiple sewage treatment plants. It performs effectively, saving our clients' money, improving water quality and removing problems such as odour and corrosion issues.

Dosing

Solutek is typically dosed in the following way for sewage treatment:

Stage	Period	Amount (ppm)
Initial	1 - 6 weeks	16
Transition	6 - 13 weeks	14
Maintenance	13 + weeks	10

Ideally, the Solutek is added in Lift wells (pump stations) at the "head-waters" of the sewage system and in the holding ponds (or tanks) before the re-oxygenation phases.

Table One – Sewage

This table describes the amount of Solutek dosed for:

⇒ Initial

⇒ Transition

⇒ Maintenance

Throughput of STP (million litres / day)	Initial dosing (16 ppm) Litres/day	Transition dosing (14 ppm) Litres/day	Maintenance dosing (10 ppm) Litres/day
100	1600	1400	1000
50	800	700	500
25	400	350	250
10	160	140	100
5	80	70	50
1	16	14	10

Overview—Frac Water Remediation

Solutek may be used to improve the quality of water after it is used in the Fracking process. It is effective in being a pre-treatment for the water before it reaches RO units or tangential filters. Solutek dosing for Fracking water is at a much higher volume than those for sewage treatment.

For Frac water remediation Solutek is best added to the ponds during the settling phase. It is also added in the holding pond / tank before the RO unit or filters.

Throughput of plant (million litres per day)	Initial dosing	Initial dosing	Initial dosing
20	2000	1700	1400
10	1000	850	700
5	500	425	350
2	200	170	140
1	100	85	70

Overview—Algae in standing water

Solutek may be effective in reducing the presence of algae in standing water.

Solutek has the ability to reduce the amount of free phosphorus and nitrates within the water; as a result algae (which depend on these nutrients for growth) may be reduced. SolEco needs to perform a careful evaluation of the water quality before we can determine whether Solutek can address the algae within the water body.

During the water testing we determine:

- ⇒ The type of algae present (and its resilience)
- ⇒ The amount of phosphorus in the water
- ⇒ The amount of nitrates in the water
- ⇒ The BOD and COD of the water (the degree of septicity)

Based on this information a judgement is made on whether Solutek can improve the water conditions so that algae blooms are reduced.

Odour Removal

Malodour (caused by hydrogen sulphide) in sewage systems is usually affected and reduced substantially in the first 3 to 5 days, however in some cases it may take 5 to 8 days.

As the sewage system is moved from anaerobic to aerobic conditions the formation of hydrogen sulphide is curtailed thus removing the odour.

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Overview—Dairy wastewater remediation

Solutek may be used to improve the quality of water after it is used in the dairy production process. It is effective in being a pre-treatment for the water before it discharges to centralised treatment authorities. Solutek dosing for dairy waste water is at a higher dose than those for sewage treatment.

For dairy wastewater remediation Solutek is best added to the effluent stream at equalisation tanks.

Table Three – Dairy Wastewater Doses

Throughput of plant (million litres per day)	Initial dosing (25 ppm) Litres/day	Transition dosing (22 ppm) Litres/day	Maintenance dosing (20 ppm) Litres/day
20	500	440	400
10	250	220	200
5	125	110	100
2	50	44	40
1	25	22	20

Typical Average Dosage Situations

Application	Dose in ppm
Wastewater (Sewage)	8-12
Dairy	18-28
Slaughterhouses/Meat Packing	16-25
Frac Water	70-120
Aquaculture	5-10
Hospitals	8-12
Membrane Maintenance	6-10
Agriculture/Irrigation	3-5

Overview—Solutek

Solutek is SolEco's flagship product. It works in partnership with beneficial bacteria to help remediate polluted waters and effluent streams.

Solutek acts as a cell signalling agent to help stimulate the growth and reproductive rate of beneficial bacteria. Those bacteria then outcompete problematic bacteria to help keep the oxygen in the water.

This has the following impacts on polluted waters:

⇒ reduces anaerobic conditions so that hydrogen sulphide (rotten egg gas) formation is greatly reduced. This removes one of the key agents for the corrosion of steel and reinforced concrete in the treatment system

⇒ helps the beneficial bacteria consume carbonaceous waste and oils and grease from the water column

⇒ helps keep the oxygen in the water creating a significant improvement in BOD/COD in the water or effluent

This partnership with effective biology can limit the need to aerate the water with power-intensive mechanical engineering approaches, thus reducing electricity costs.

All SolEco's natural bio-organic solutions are extracted from sustainably harvested, naturally occurring marine flora.

They do NOT contain 'live-cell' bacteria (bio-culture) or enzyme concoctions and cannot introduce renegade bacteria into your system.

They are:

⇒ 100% bio-degradable,

⇒ are user and environmentally safe,

⇒ non-hazardous,

⇒ non-flammable and non-corrosive.

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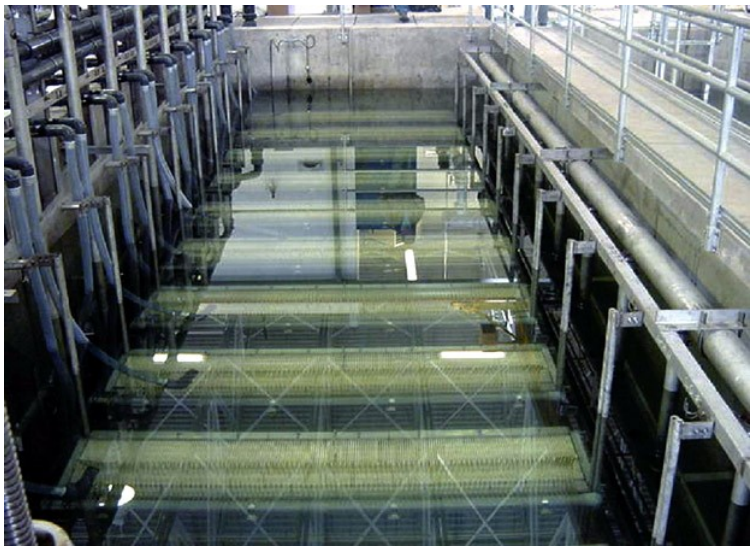
Xytech M

Xytech M has been especially formulated to reduce maintenance costs and limit the time needed to manage maintenance within water treatment plants.



Engineering systems within modern water treatment plants are reliant on the use of advanced filtration and membrane technology.

Unfortunately, these components are subject to fouling and being coated by carbonaceous materials that limit their effectiveness. Removal and cleaning of these components is a time consuming and costly exercise.

Xytech M assists beneficial bacteria to dissolve and digest some of these carbonaceous materials. This is designed to:

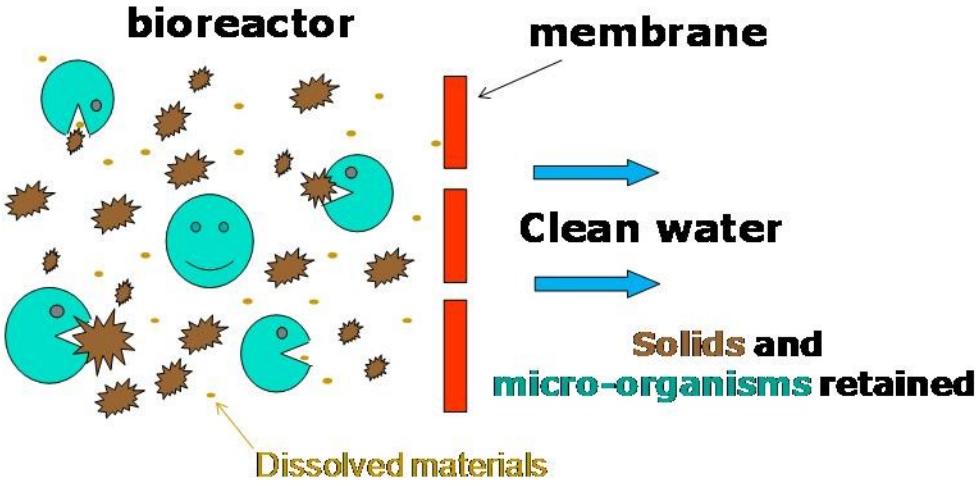
⇒ improve the lifespan of the filters and membranes within the treatment plant

⇒ reduce the amount of backwashing and intervention required to keep the components operational

⇒ limit the cost related to skilled contractors having to repair or clean the system

⇒ improve the time that the systems are on-line

Soleco have formulated Xytech M to be a modest investment by plant engineers to ensure a healthy financial return generated from lower maintenance costs.



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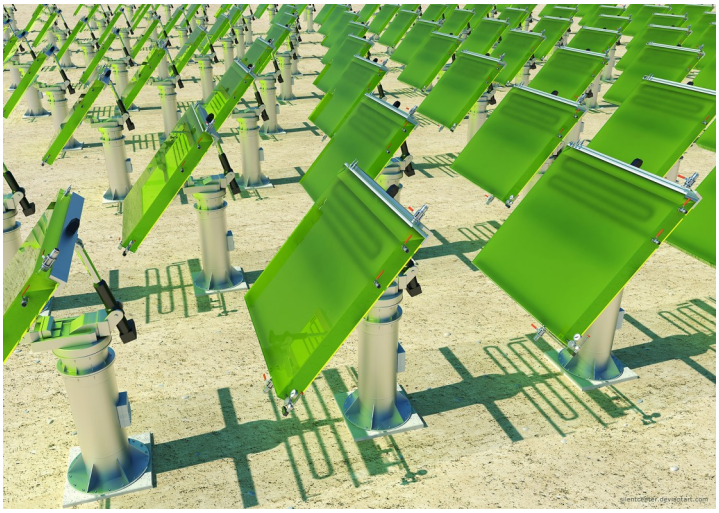
Xytech EAP



Xytech EAP (Enhanced Algae Production) - Increased algae growth is of particular interest to some industries, especially related to bio-diesel, food production and pharmaceutical manufacture.

Some species of algae are particularly effective in the formation of lipids which can be extracted and converted to bio-diesel. Such systems are known as photo-bioreactors.

Soleco has worked closely with its key partners to develop:

⇒ designs of photo-bioreactors that incorporate the use of Xytech EAP

⇒ allow for the enhanced growth of the algae within the photo-bioreactors yet take into account the key operational parameters such as sunlight, heat, flow and capital cost

Solutions that take the manufacture of bio-diesel from being a financially marginal proposition to one where the business case is compelling.

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Odour control
Energy reduction
Corrosion control
Biosolids/sludge reduction
Extended infrastructure life
Improved treated effluent quality

The community benefits via the local water service provider significantly reducing it's operational and capital expenditure

Geelong, Australia

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