SOLUTEK

Remediating the World's Wastewater

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Solutions Ecologique

Clean Water Gives Life

Solutek Organic Water Treatment

Treats the cause not just the symptoms

Solutek is a proven new age water treatment product providing multiple benefits and outcomes. It differs substantially from traditional products and technologies in that Solutek works at the cellular level, to stimulate both the metabolic and reproductive rate of the naturally occurring, desirable (aerobic) bacteria. This allows the desired bacteria to become and remain dominant, by out-competing the undesirable organisms which would otherwise use the same food source to generate malodours.

Solutek, when used as specified, has been shown to have the following profound beneficial effects:

- Sewage odour is significantly reduced if not totally eliminated by ensuring aerobic bacteria thrive;
- Biological sewage treatment processes are enhanced, including the control of fats, oils & grease;
- Biosolids generation is reduced due to the enhanced biological processes effectively scavenging the carbon rich content;
- Infrastructure maintenance and replacement costs are substantially reduced through minimising blockages caused by fats and corrosion caused by anaerobic conditions respectively;
- Environmental outcomes are improved providing a better quality effluent with lower BOD & SS (promoting effluent re-use);

Solutek is a proven and preferred treatment 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.

The use of a non-chemical product enables these desired outcomes to be achieved without creating secondary environmental issues as is common with most hazardous chemicals.

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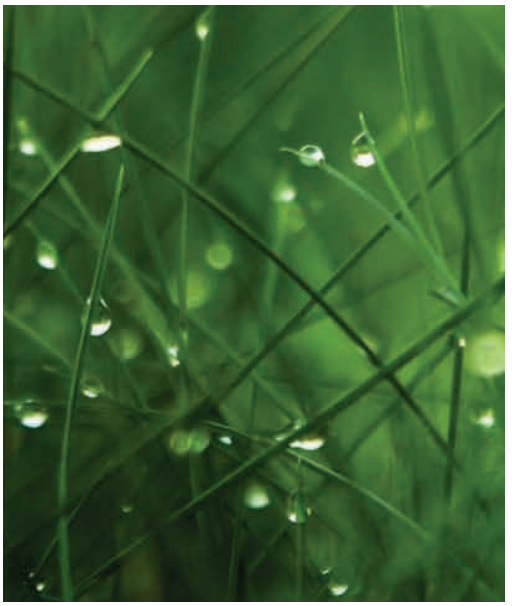
What is Solutek Organic Concentrate?



Solutek Organic Concentrate is an organic solution whose components are extracted from sustainably harvested, naturally occurring marine flora. Working at the cellular level, it stimulates the naturally occurring bacteria that may be functioning improperly because they have been inhibited by oxidants, poisons, or extremes of temperature or age.

Solutek is not a “live cell” bacterial (bio-culture) or enzyme concoction and cannot introduce renegade bacteria into your system. It is 100% biodegradable, user and environmentally safe, non-hazardous, non-flammable and non-corrosive. Used as instructed it cannot harm the water purification system, field personnel or equipment.

Solutek is a liquid used to treat raw sewage to prevent septicity occurring in the network and delivering the raw sewage “fresh” to the plant in a chemically unaltered state.

How does Solutek work?

Solutek Organic Concentrate contains a multiplicity of active elements. The principal active ingredient, and the material which sets this product apart from competing products, is a cell regulator. This regulator is necessary for the proper functioning of almost all microorganisms, most plants and most animals. Solutek Organic Concentrate, by design, does not contain any free cell regulator, which is fragile and would decompose before the product could be used; Solutek Organic Concentrate provides the precursor of this cell regulator, which is very stable and remains active for many years. A healthy cell will naturally produce all of the cell regulator that is required. Therefore, in a perfect world there would be no need to supply a supplementary source of this cell regulator.

Unfortunately, stress induced by high and low temperatures, environmental toxins, lack of a balanced supply of nutrients and competition for common building blocks by other parts of the cell, frequently lower or block the synthesis of this regulator by the cell. In these cases Solutek can produce remarkable results.

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Solutek Organic Concentrate is therefore a stimulant of the naturally present bacteria. It is an alternate, easily metabolized, food source for the microbes in the raw sewage. This facilitates significant growth in the population and size of the desired bacteria, increasing their metabolic rate and making them dominant. It does this by supplying the bacteria with the material that encourages cell duplication.

Solutek Organic Concentrate must be added constantly to ensure this domination persists over the sulfur- and sulfate-reducing bacteria in competing for the available food source. Sulfur- and sulfate-reducing bacteria use the sulfur/sulfate present in sewage and other waste waters as an energy source, producing Hydrogen Sulfide gas (H2S) as a by-product. Hydrogen sulfide is the major cause of sewage odour with its disagreeable rotten egg smell. The bacteria usually present in sewage require oxygen for their metabolic processes; for many bacterial types, molecular oxygen (O_2) dissolved in the raw sewage is the preferred source. However, when no freely available dissolved Oxygen is present, chemically combined sources of Oxygen may be used, e.g., nitrates (NO_3-) and sulfates (SO_4 2-). It is the biological reduction of sulfates and organic sulfur compounds under anaerobic conditions which lead to the generation of hydrogen sulfide.

The most important benefit of the Solutek treatment is the cleansing of the grease & bio-slime (biofilm) from the sewer infrastructure, preventing the sulfate-reducing bacteria from colonizing and thus substantially reducing sulfide production.

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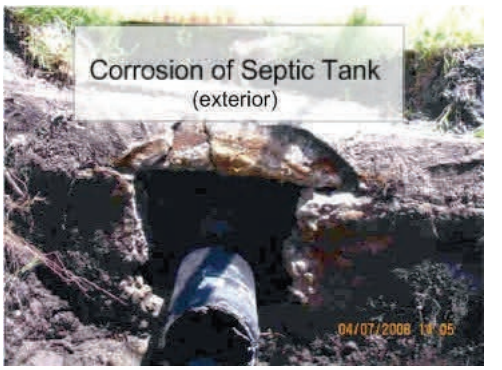
Production and effects of Hydrogen Sulfide

Sewage contains bacteria, sulfate, and organic matter, so it has the elements required for sulfide generation. One further condition is necessary: the reduction of sulfate to sulfide can only occur under anaerobic conditions. In the absence of dissolved oxygen (consumed by the decomposition of organic matter), nitrate can provide oxygen for bacteria and can thus prevent septic conditions developing.

When all the “available” oxygen has been consumed by the facultative anaerobic bacteria, the conditions will be strictly anaerobic. The anaerobic state that develops regularly in aged sewage is due to the many kinds of bacteria and decomposing organic matter present that rapidly consume the dissolved oxygen.

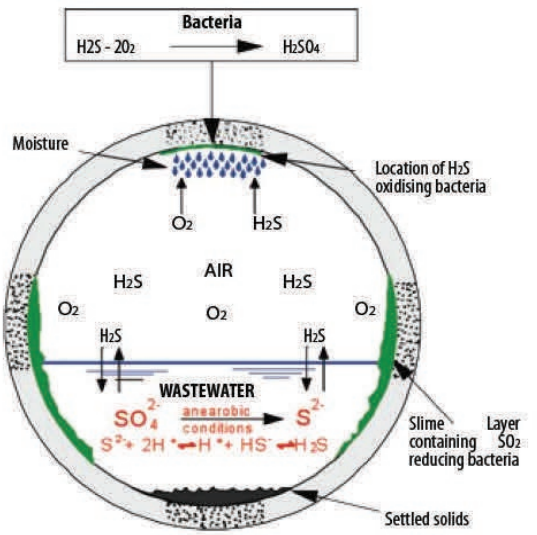
The water surface exposed to the atmosphere in a partially filled sewer does allow the absorption of oxygen at the interface. However, the rate of absorption is slow, and the bacterial action may deplete it to concentrations promoting anaerobic bacteria. There is frequently an aerobic (oxygen containing) zone in the slime layer where it is in contact with the flowing stream. In a typical case the aerobic zone can extend into the slime layer to a shallow depth, but it may be deeper if the stream carries sufficient dissolved oxygen.

Sulfates and part of the organic nutrients diffuse through the aerobic zone and into deeper layers, hence supplying the requirements of bacteria that produce sulfide, and so it comes about that sulfide generation can occur even when the stream contains dissolved oxygen, but is unlikely to occur if nitrate were present as it will diffuse into the lower layers of the slime and provide a source of oxygen to prevent septicity.



The zone where sulfide is produced is generally only a few tenths of a millimeter in thickness. The sulfate or the organic nutrients are used up in that distance and unless the slime layer is quite thin, there is a deeper layer that is relatively inactive.

How Long Does Solutek Take To Work?



Unlike chemicals, Solutek requires time to biologically "cleanse & control" the sewer main or pump station. It is not a quick fix, but is a lasting one. Odour reduction, whether it be sulfide produced or from other malodorous compounds, should be noticeable within one to two weeks. It has been observed that the odour is appreciably reduced even though dissolved sulfides are detected. Any significant reduction in dissolved sulfides (and hence H_2S) will not be observed until the sewer network is stripped of fats, grease and slimes by the action of Solutek. It will be evident from a rise in dissolved oxygen at the entry point to the treatment works that dissolved sulfides are being reduced. Depending on the length, age and condition of the network, this process could take from two to six months before the sulfides in the network are stabilised to the lowest practical level.

How Is Solutek Applied?

Solutek Organic Concentrate is a liquid product and is applied continuously. The dose rate is based on the flow of the sewage stream and the organic load. In the case of sewage treatment an initial start up dose of 15 to 20 mg/L is applied for 30 days to commence the "cleansing" process.

The dose is then reduced to 10 to 15 mg/L for a further 30 days and the performance monitored. The ideal maintenance dose is around 5 to 10 mg/L although this varies according to the local conditions. Solutek dosing systems are usually set up at pump stations in the reticulation system, upstream from any point where the raw sewage is septic. The injection system may be controlled by a simple timer and dosing pump set-up, through to a commercially available constant-run unit. The dosing pump system can be as simple or as sophisticated as required based on business cost, accuracy and maintenance drivers.

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Benefits of Using Solutek

The most immediate result noticed after the addition of Solutek Organic Concentrate will be the significant odour reduction. After prolonged addition of Solutek, the operators will observe the following:

- The pipe walls will be mostly free (if not totally clear) from fat and slime build-up. This can be confirmed by the use of a CCTV camera to view the treated pipes;

- With the reduction of fat & grease in the sewer mains and pump stations, there will be a marked reduction of sewer chokes in the treated reticulation system. This will result in less overflows/emergency work for maintenance crews and their consequential environmental impacts;

- Scientific test results will show a lowering of dissolved sulfides that can be attributed to the bio-slimes being stripped;

- With a reduction in dissolved sulfides in the raw sewage there is less chance of H_2S gas being produced, thus lessening the potential of corrosion to the infrastructure. This is a direct saving for the community as pipe-works replacement is expensive;

- The sewage colour at the end of the treated main will be lighter (straw colored) due to the increased dissolved oxygen (DO) levels. Increased DO at the inlet works will ensure the aeration set-points at the plant are attained with minimal energy, thereby reducing the energy needs/costs and associated Greenhouse Gas generation;

- Sludge at the plant (if all of the sewerage system is treated) will be reduced as the volatile and semi-volatile organic components of the biosolids are metabolised more efficiently due to the stimulated bacteria. The sludge will settle better and experience has shown that sludge volumes may be reduced by 20% to 50%.

- The pH of the raw sewage is more stable.

- The reuse of effluent is a distinct possibility because the wastewater treatment plant process, enhanced by Solutek and the treated water, will be generally free from odour and of better quality.

SOLUTEK

A simple and economical solution…

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

SolEco
Solutions Ecologique

Registered Office:
Kowloon, Hong Kong
Operations & Manufacturing:
Geelong, Australia
Telephone:
+ 61 43 44 33 565

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