

Effluent and Blackwater Remediation Applications

HYDROSMART technology is showing unique abilities as a remedy for the problems of effluent or Blackwater waste giving the water treatment industry **low cost** and **environmentally healthy** solutions.

The reasons why:

Reduced chemical activity

The Hydrosmart frequencies in a body of water neutralize the bonding mechanisms of minerals stopping them reacting with each other.

Less chemical reactions means:

- **less odours**
- **less toxic effects** on bacteria that are good for the digestion and swift break down of effluent.
- **more oxygen** as the available oxygen doesn't bond with chemicals in the water.

Faster digestion rates

More available oxygen in the water and the lack of chemical toxicity creates ideal conditions for the bacteria to breed, this means the chemicals get digested much faster by the **increased number of bacteria**.

The reduced bonding ability causes the larger chemical compounds to become unstable and break down into tiny (sub 4 micron) particles.

The beneficial bacteria now have their food in tiny **bite size pieces**.

In practice we find they process up to 4 times the effluent they normally can.

Improved water clarity and light transmission

Smaller particles produced by Hydrosmart provide a gradual improvement in the water clarity, (Large particles absorb and scatter light - giving murky water. Tiny particles let the majority of it pass through – giving clear water). This in turn allows for much more effective penetration of sunlight (or of UV light in disinfection systems).

Temperature inversions and anaerobic dead zones

In open bodies of effluent water such as treated effluent, murky water prevents sunlight penetrating to the lower levels, creating surface heating. This results in a temperature inversion, which prevents the thermal or vertical movement within the water body. This results in an anaerobic dead zone with no beneficial bacteria. These issues are normally resolved by big aeration systems powered by large electric motors, which are expensive to operate.

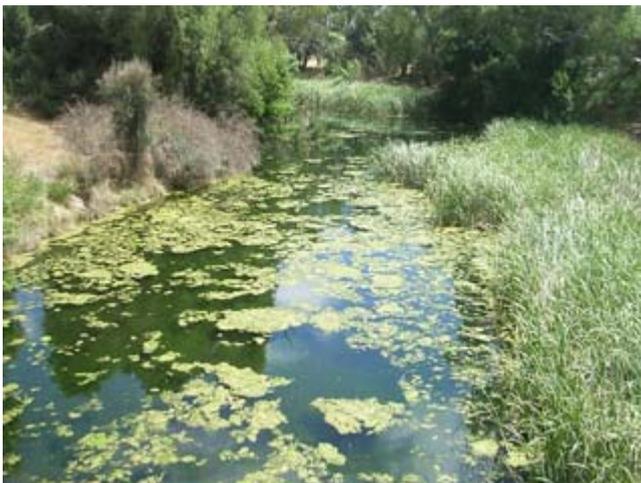
The improved water clarity that results from Hydrosmart treatment, **allows sunlight to penetrate to the lower levels, and reduces surface heating** which in effect removes the

conditions that created the temperature inversion. **Vertical water movement resumes** and beneficial bacteria re-establish themselves in the much less toxic environment created by the resonance frequencies.

Algae control

The majority of algae and fungal formations need a substrate like scale or bio-film to form on or anchor to, or mineral deposits that are large enough to form on. Hydrosmart progressively removes the bio-films along with the scale deposits and changes the minerals in the flow into tiny sub 4 micron particles. Consequently the **algae and fungal formations lose their growing base** and cease to feed or breed.

The following photographs show the successful treatment of algae in the Burra Creek in the township of Burra Sth Aust, following the installation of 2 Hydrosmart systems.



Before



After

Chlorine dosed sewage treatment plants

Even in Chlorine dosed systems Hydrosmart treatment provides significant benefits.

Because the particles in the water are no longer reacting, the chlorine remains largely as free chlorine and does not react into chlorides and chloramines. **Much less chemical dosing is therefore needed** to maintain the required free chlorine levels. This greatly reduces the chemical load and cost on the treated effluent.

Benefits for UV treatment systems

Reducing the particle size **eliminates bacterial shielding** by the large particles that are usually suspended in the water and increases water clarity, allowing for **maximum UV light transmission**. With the removal of biofilm and sludge deposits built up on UV tubes or the reflector surfaces the effectiveness of the UV system is once again enhanced and maintained at optimum levels.

Mullana Nursing Home



UV system with scale and bio-film build up.



Same UV system after 3 weeks of Hydrosmart treatment.

In this case, a UV system was rendered inoperative by the bio-film build up and bacterial shielding. The photographs clearly show the results of the bio-film and algae removal and the dramatic improvement in water clarity that the tiny particle size produces.

Other benefits

The non reactive small particles are particularly relevant to sewage treatment plants as they can now operate much more effectively in a **soft water environment**.

The **de-scaling and corrosion prevention** of all equipment in contact with the treated water has the plant running at **optimum efficiency with much less maintenance**.

All of these benefits are achieved by a system that **adds nothing to the water** other than resonance frequencies, and has operating costs of less than \$10 per year.