



## **FLOWFORM® APPLICATIONS IN WATER TREATMENT**

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### **Biological sewage systems**

#### **Human Community 'Black-Water' Treatment**

The combination of lagoons and reed-beds with Flowform cascades is an efficient way of establishing a biological wastewater treatment system. Bacteria treat waste passing through a constructed reed bed. Aerobic bacteria are associated with the rhizosphere (root zone) of the reeds, and anaerobic bacteria with the surrounding sediments. Within this bacterial matrix, organic wastes, nutrients and a variety of chemical compounds can be broken down and stabilized (Worrall 1992).

The first major Flowform effluent project was commissioned in 1973 for Järna Rudolf Steiner Seminariet, Sweden, and was observed augmenting the natural processes over many years. This led to a research project in the 1980s at the Warmonderhof Biodynamic Training Institute in Holland. Since the 1970's many such systems have been built and are functioning successfully round the world.

#### **'Grey-Water' systems**

Apart from black-water systems such as Järna and Warmonderhof, Flowform cascades can be to improve water quality in combination with filters in grey-water systems (non-sewage wastewater from laundry and showers). One example of such systems receiving communal laundry water has been set up in a small community near 'The Channon' in New South Wales, Australia, using a gravel filter and a reed bed in connection with a Flowform cascade. Resulting water can be used effectively for irrigation, or returning to open nature in a condition that adds quality to nature.

## **Dairy Shed Effluent Transformation into Liquid Fertilizer**

Dairy farming worldwide is a challenge for the environmentally acceptable treatment of wastes coming from milk producing farms.

Nutrient-rich farm-dairy effluent (FDE), which consists of cow excreta diluted with wash-down water, is a by-product of dairy cows spending time in yards, feed-pads, and the farm dairy. Traditionally, FDE has been treated in standard two-pond systems and then discharged into a receiving fresh water stream. Using the normal method of sluicing the cowshed waste out into standing ponds that are treated through sedimentation, sunlight and slow pond current movement, the effluent stays anaerobic in the ponds, and when it is sprayed out on the farm paddocks, grass grows rank and dark green, collapsing with strong growth. The herd cannot be returned to such fields for a month because of health issues associated with the anaerobic sludge.

Research on the effects of land-treating FDE, and its affects on water quality, has shown that between 2 and 20% of the nitrogen (N) and phosphorus (P) applied in FDE is leached through the soil profile. In all studies, the measured concentration of N and P in drainage water was higher than the ecological limits considered likely to stimulate unwanted aquatic weed growth.

In New Zealand and Australia, some ten dairy farms have had Flowform technology installed adjacent their milking shed so its twice-daily effluent wash-out is transformed through a Flowform cascade, sometimes in conjunction with Biodynamic compost preparation.

With effluent being treating in large open buried tanks over a two or three-week period, the waste can be transformed successfully into a liquid fertiliser which is then sprayed onto paddocks. The grass is able to take this up as food without stress and cows are able to return to the field within three days.

The practical success of these applications implies that other similar projects would work in other situations, with appropriate fine-tuning.

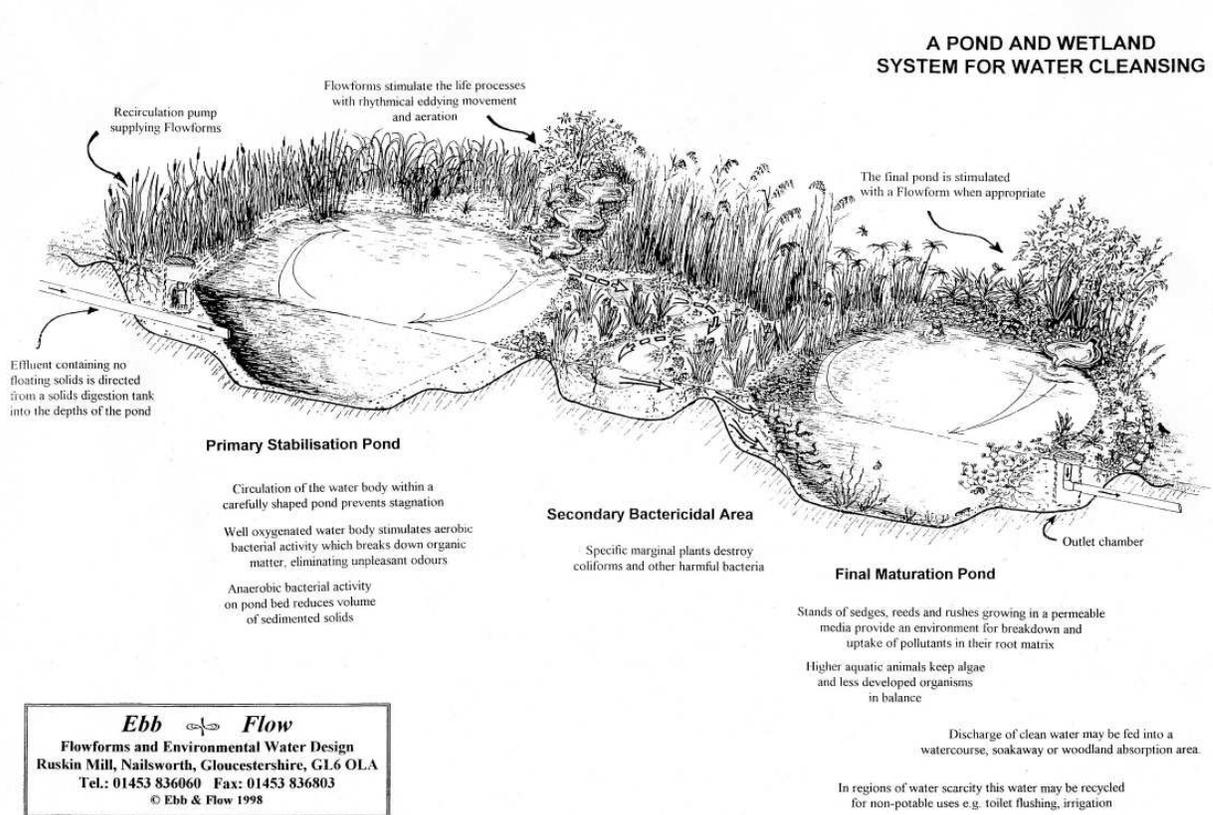
It is evident that cascades are useful for the introduction of oxygen, apart from the effects of rhythm providing an environment to support microorganisms which themselves incorporate rhythmical processes. Used in conjunction with suitable water lifting techniques, damage to microorganisms is virtually excluded. Orthodox oxygenation methods often have a harmful effect on the very organisms that are demanding oxygen in their activity of detoxifying the pollutants.

Flowform cascades also generate a rhythmical environment, which is sensitively related and supportive to these organisms that are by their very nature rhythmical. These systems indicate ways to support and enhance

biological purification processes, revitalise purified effluents and accelerate their re-entry into the natural cycle.

They also transform a pollutant by-product into a valuable liquid fertiliser and help the farmer manage his land and avoid regional council fines.

**Fig. 16 a: A Pond and Wetland system** for water cleansing, sketch from Ebb & Flow Ltd, Ruskin Mill.



**16b: Cascades with lagoons and reed beds** in Järna, Sweden (left), and Theedingsweert, Holland (right)



## **Other Effluent Treatment**

**In a pig slurry project at Broom Farm near Forest Row, Sussex,** David Clements worked with Flowform treatment in the 1970s. In this project, the liquid was turned successfully into aerobically transformed 'sweet smelling' liquid fertiliser.

**In a chicken abattoir in Byron Bay, NSW, Australia,** Flowform Vortex cascades were installed to influence the effluent liquids. This abattoir slaughtered 26,000 chickens per week and the washing from the slaughter room went through a clarifier into a 4.3 megalitre pond. From there water was used for irrigation on an onsite turf farm. However the stench caused neighbours to complain and the Environmental Protection Agency were about to close them down when the Flowform project was started. Dissolved oxygen readings were zero to start, which was most unusual. Three sets of seven Vortex models were installed and within two weeks of continuous running the pond's dissolved oxygen was 2.3 ppm. By the end of the sixth week we had readings of 6.3ppm and by then the abattoir's neighbours were ringing to inquire where the smells had gone. The Environmental Protection Agency extended their license, with the added construction of gravel filters and reed beds,

## **Farming Applications**

Applications of Flowform cascades for farming are related mostly to mixing and treatments of different biologically catalytic liquids. In New Zealand and Australia especially, Flowform biodynamic stirring is being used extensively on a large scale. There, large areas of inaccessible hilly grasslands are sprayed by air via helicopters and planes.

Many thousands of hectares have been granted Biodynamic Demeter certification with use only of Flowform stirring methods, which follow the essence of Dr Steiner's indications on how this could be done.

Flowform installations are useful not only for mixing preparations, but are in continual use for treatment of liquid manures, seaweed and fish fertiliser production, irrigation water for plants and drinking water for animals.

## **Food and Drinking Water Processing**

Water quality has become a major concern in connection with food processing. Mostly such water is taken from town water supply, filtered and possibly enriched with minerals and then used. However the water has been under pressure moving through pipes, cut off from its natural movement and

while chemically and organically positive it may well not be strong in its capacity to support life energetically.

At Herzberger bakery in Fulda, Germany, water used for baking bread was run over a cascade of granite steps followed by a stack of Flowform vertical Glonn models. (Fig. 27).

A new Flowform technology was also installed in the Bio-Sophia factory in Lillehammer, Norway to service various aspects in the production of grain milk: washing, swelling, cooking, fermenting and diluting. The five and a quarter meter high water treatment unit with ceramic cascades was housed in a protective polyhedron. The field of form created within the polyhedron is shown to have an additional sensitising effect upon the process (Wilkes 2003).

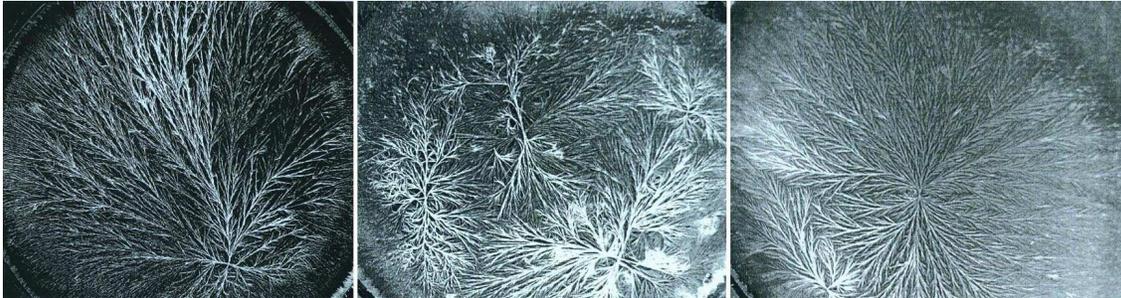
**Fig. 17: Flowform water treatment installation** for Bio-Sophia in Lillehammer



At Giubiasco in Switzerland, drinking water is gathered from springs high in the mountains for the town supply. The energy generated through falling through pipes down to the valley is extracted with a turbine and generator before it enters the municipal system. Through this process, however the water appears to become more aggressive and was attacking

the walls of the concrete reservoir. For this reason Flowform cascades were installed after the turbine to renaturalise the water. The success of this was indicated by crystallisation tests (Fig. 18).

**Fig. 18: Copper chloride crystallisation images** from a French laboratory showing spring water from Valle Morobbia (left), after a turbine (middle), and after Flowform treatment (right). The central picture shows high levels of entropy or disorder, while the right picture shows a return to harmonic forms similar to the original spring water. This is a fine example of energetic pollution where the chemical and organic quality of the water remains the same through out.



## **Industrial**

Once planners and engineers realize that water has energetic quality issues around information frequencies and active freshness, Flowform technology could be used before, during or after processes in any factory that reduces water quality while using it for profit.

Special Flowform designs could also be used for mixing various liquids very specifically, with the ability to focus on any or all of laminar, rhythmic or chaotic flows.

## **Other Flowform Applications that also Improve Water Quality**

### **Landscape / Waterscape**

Clients have reported repeatedly that plants and animals in the vicinity of Flowform cascades have responded with more activity and better health.

### **Interior Design**

Flowform vessels can be used effectively for humidifying dry environments, especially in dry northern winters and the larger cascades with strong waterfalls emit large negative ion impulses.

## **Health and Well-being**

There are a variety of uses with medical applications wherever life-supporting liquids are used.

There is a use in homeopathic production where large volumes requiring manufacture extend human capacities of hand mixing.

Therapeutic results from Flowform water movement have been reported worldwide for decades, relaxing and calming people with various soul and physical conditions, helping with sleep disorders, and relieving depression and helping process emotional blocks. Much more research is needed in this area, particularly regarding physiological responses.

## **Educational**

Flowform streams have been installed in many kindergartens and schools, and observations show that children react most positively to the rhythmical environment. Over-active children tend to calm down and become more focused, introverted quiet children become more engaged and social skills with cooperative language tend to develop.

Flowform playgrounds appear to influence the development of many senses as well, giving the experience of flowing water to many city children who often have no relationship to living nature.

As an educational tool it is regarded very highly, and provides a central focus for the school community too.

## **Tap Water Treatment**

Tap water is often highly mineralised, and after delivery to the home or office sink, is often filtered or distilled. However, filtering or distillation does not change the information frequencies within such water that has been removed from the health giving influences of movement in nature.

Flowform water units offer a means of returning this life supporting capacity to tap water through a flow action that nature itself uses to improve water in both mountain streams and within living organisms.

## **Pond Treatment (refer to Oxygenation Report)**

Numerous observations show that **Flowform cascades oxygenate ponds effectively but also change the flora and fauna to become similar to those in a stream. This can mean a significant**

**reduction in the number of mosquitos,as they breed only in semi-stagnant or stagnant ponds.**

In New Zealand, Flowform cascades were installed in at least five **swimming pools**, some conventional and other specially designed as natural swimming pools that include small wetland systems, filtering reed beds and other natural features. This appears to be a balanced ecosystem, in which the use of chlorine can be avoided completely (Pearsall and Innes 2000).

Generally, these cascades greatly reduced the need for treatment chemicals, while also increasing a sparkle, freshness and smoothness of the water. Professional pool managers consider these water quality observations as equally valid in telling us about actually improved water.

There have been numerous reports over the years of remarkable changes to seimi-stagnant or stagnant ponds of captured water, when thatw ater is recirculated through Flowform® Superstreams™

## **Agriculture**

**Biodynamic Preparations:** extensive use of Flowform stirring in New Zealand and Australia shows conclusively that this method activates the liquid biodynamic preparations very well, with up to 10,000 hectares being certified Demeter quality in the 1990s, where only Flowform vessels have been used for stirring. (Peter Proctor 1997, Trousdell 1990)

**Compost Tea stirring:** this method of preparing life-supporting liquids for soils and plants is widely associated with Flowform technology.

**Plant Germination:** field and laboratory trials in New Zealand, the UK and Germany have shown that germinated seeds when started with Flowform water tend to continue overall stronger growth for their entire life.

Morphology Plant Studies with coriander over three years in NZ in the early 1990s by Menzo de Boom, Hans Mulder and Iain Trousdell, showed a more balanced metamorphic leaf sequence with plants germinated and irrigated by Flowform treated water for the first three weeks of life, in comparison to control plants.

Plant Trials with water taken from differing lengths of Flowform cascades in the 1980s in Australia by David Julian and Scott Douglas indicated increasing and decreasing influences from smaller and larger numbers of vessels in a continuous cascade. Numbers over 12

consecutive vessels without a chaos chamber between did not necessarily result in continuously increasing life support effects. This is an interesting indication about chaos rhythm in need of more research.

**Aquaculture trials** gave positive responses from goldfish and captured trout in NZ, demonstrating that these fish preferred Flowform treated water.

**Hydroponics:** some trials in New Zealand showed that the plants grow stronger roots and foliage from water that flows through a Flowform cascade in the process of traversing the growing channels.

**Animal drinking water:** strong indications with pets and farm animals show that Flowform treated water is preferred, with increased consumption resulting.