# Reduction of algae and odours leads to increased capacity of lagoon

Treatment of municipal wastewater in lagoon-based wastewater treatment plants (WWTPs) is prevalent in Canada and very cost-effective for smaller communities where land is available and inexpensive. In fact, lagoons are, by far, the most popular wastewater treatment technology, and represent over 65 per cent of all existing WWTPs in Canada (2007). Approximately 800 municipal wastewater treatment facilities are using lagoons in Canada, with 150 of them in Ontario.

Lagoons are generally inexpensive to build, simple to operate and, when properly designed and maintained, produce a treated effluent that can be discharged to the environment with minimal impact.

Community growth and increasingly stringent environmental regulations can necessitate expansion or replacement of lagoon-based systems with more costly mechanical treatment plants, unless improved performance or increased capacity can be realized through optimization approaches.

While lagoons are often considered to be passive treatment processes over which the operator has limited control, the operator can take measures to improve performance, reduce costs and generally optimize operation. Improvements in lagoon operations could potentially: realize additional capacity in the plant; improve effluent quality to reduce the impact on the natural environment and meet more stringent permit requirements; reduce energy use and costs; reduce chemical use and costs; and, reduce odour emissions.

Nakusp, British Columbia, is a community using a sewage lagoon for a segment of their wastewater treatment. Nakusp is a village located on the shores of Upper Arrow Lake, a portion of the Columbia River, in the West Kootenay region of B.C. It has a population of around 1,569 and it is known primarily for its nearby hot springs, a popular destination for tourists, as well as its picturesque mountain lakeside setting.

*Truckload of Hexa-Covers added to the Nakusp lagoon.*

Being close to its maximum capacity for both sewer and water treatment was restricting its population growth. Nakusp needed to look at improvements to its existing water treatment system. Either it needed to build an expensive, all new process or somehow upgrade the existing wastewater treatment facility and lagoon. The inability of the sewage lagoon to empty in time for more waste input was a sign that major changes needed to be made.

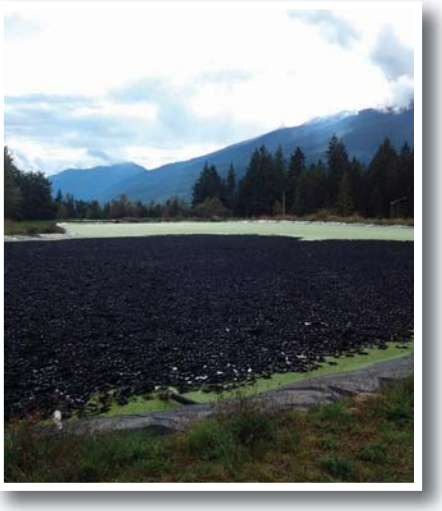
**Hexa-Covers are designed so that the tile edges will "key" into each other. After 24 hours, the covers automatically link to each other, creating the lagoon cover.**

Mike Pedersen, Director of Operations for Nakusp, looked at alternative solutions to control the massive amounts of algae in the pretreatment lagoon. Familiar with the Hexa-Cover® floating tiles, he felt the product could

nicely cover the lagoon, controlling the algae growth as the sunlight would not be able to penetrate into the water. Additionally, the tiles would enable the aeration process and fluctuating water levels to continue.

Hexa-Cover floating tiles provide an ideal cover for all forms of surface liquid. The immediate advantages are that Hexa-Cover covers up to 99 per cent of the lagoon's total surface. This eliminates up to 95 per cent of evaporation and ensures that organic growth such as algae is eliminated, since sunlight cannot penetrate the cover. For Nakusp, the expectation of the Hexa-Covers was that they would prohibit the algae blooms in the sewer lagoons, resulting in a reduction of the amount of sludge to be managed, and therefore, having the water reenter the river system faster.

The project began in September 2013. 103,600 Hexa-Cover tiles were placed into the lagoon to completely cover the 3700 $m^2$ surface. The floating tiles are very easily installed. They are simply poured onto the surface and, under the effects of the wind and movement of the liquid, will form themselves into a "lid". They are designed so that the tile edges will "key" into each other. After 24 hours, the covers automatically linked to each other, creating the lagoon cover.



*103,600 Hexa-Cover tiles were placed into the lagoon.*

In addition to reducing the algae growth, the Hexa-Covers offer other benefits, such as:

- There will always be free access to the liquid, for measuring, emptying, mixing, etc.
- Significant reduction in odours, evaporation and emissions (up to 95 per cent).
- Reduces use of chemicals and other additives.
- Significant reduction in evaporation and emissions.
- The need to use potentially harmful additives will be reduced.
- There are no running costs incurred by their use. In fact, in most situations there will be a reduction of total costs, since water consumption will be reduced and there will be energy savings in connection with cooling and mixing of the liquid.

The village has been very proactive in wastewater treatment and has been able to take advantage of provincial green technology grants. A water reclamation system and the installation of the Hexa-Covers were covered through the grant monies.

*For further information, visit www.greatario.com*