

Municipal Innovation Awards Program

Submission Form



SUBMISSION DEADLINE: FEBRUARY 6th/06

The Municipal Innovation Awards Program is an annual AMM-sponsored awards program that recognizes excellence in municipal practices that improve governance, administration, service delivery or intermunicipal cooperation.

Part 1:

Name of municipality/municipalities: **Rural Municipality of Victoria**

Type of municipal innovation (circle type that most describes your innovation):

- | | |
|--|--|
| <input checked="" type="checkbox"/> Better Municipal Business Practice | <input type="checkbox"/> Service Sharing |
| <input type="checkbox"/> Tax Sharing | <input type="checkbox"/> Restructuring |

Date implemented:

**January, 2003 – Pilot testing initiation
August 2005 Final Governmental Approvals received**

Part 2:

Along with this form, please provide a description of no more than 5 pages summarizing the innovation and including information about:

- **The reason your municipality/municipalities adopted a new way of doing things:**
 - Why did you look for an innovative approach?

The Community of Holland in the Rural Municipality of Victoria, like so many small towns in Manitoba, has been plagued with well water from which manganese could not be consistently removed with conventional treatment methods. In addition, the tap water in Holland was known for its bad taste and unpleasant odor. It was common for residents of the community to buy bottled water. Our water treatment plant was in need of an upgrade; therefore the RM used this as an opportunity to make some fundamental changes. The upgrades could proceed only if changes could be done at a moderate price and in accordance to Manitoba regulations.

- Why did you choose the approach that you did?

In Manitoba, it is common practice to use membrane filtration as the water treatment method of choice in situations like ours. Using membranes would have had the added benefit of removing hardness; however upgrades would have been required to the sewage treatment system to handle the increase in wastewater, which is a component of membrane filtration. Overall, a membrane system would have required a greater capital investment and had higher operating costs.

J. R. Cousin Consultants Ltd., our engineering consultant, provided an option that, although it did not address hardness, did address the staining, taste and odor concerns and at a lower cost than membrane filtration. We were fortunate to have an innovative and creative engineering firm at our side, who introduced us to Osorno Enterprises Inc., a Manitoba technology company that was able to demonstrate the benefits of chlorine dioxide in the treatment and disinfection of our water.

- **The process used to implement the innovation:**

- How did you plan, build support for, and finally implement the innovation?

In several meetings between council, our consultant, the technology company, and in part the Manitoba Water Services Board and the Office of Drinking Water, consensus was reached to complete a pilot project, initially planned to be conducted for 6 months. Because this was a “first of its kind”, Osorno waived costs to the R.M. of Victoria. Osorno's cost was partly offset by a grant from the National Research Council of Canada for this innovative approach, and by a grant under the Technology Commercialization Program of the Province of Manitoba. The improvement of water quality during this pilot project was quite obvious, especially the substantial improvement of taste. As a result, obtaining support from the community was very easy.

- Why did you select the process that you did?

Chlorine dioxide addressed the staining and taste and odor issues. It was decided to choose this system at lower cost than alternate treatment technologies and forego further treatment for hardness removal that the other technologies provided. The system in place has a much lower level of chemicals added to the water, which is an added benefit. We gave it a try - and with the assistance of J. R. Cousin Consultants Ltd. and Osorno Enterprises Inc., we succeeded.

- **The impacts of the innovation:**

- What benefits such as cost savings, new economic development, or improved service were realized?

Good tasting water that is aesthetically pleasing in terms of taste and odor is expected in a municipal system. For us as a municipality, it is paramount that we provide good water at reasonable cost to our citizens. In this context, we improved our service.

While there are other water treatment technologies that could have provided us with higher quality water, the use of chlorine dioxide provided the desired water quality at a significantly lower expense, thus a cost savings was also realized.

- What makes you the most proud about your innovation?

In the regional context, people from outside the serviced area that come to the community are now surprised that the taste and odor of the water in Holland has changed so much - the once infamous Holland tap water has become good water. In a wider context, we are proud that a technology first implemented in Brussels, Belgium in 1956, has found its way into Canada by way of our community, which has drawn many of its initial immigrants from Belgium.

The Community of Holland is now the first community in Canada to use chlorine dioxide in the treatment and primary disinfection of its potable water supply. We are proud to be on the leading-edge of technology, especially in an area of such vital importance as drinking water.

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PROJECT SUMMARY

Background

For many years, the Community of Holland was impacted by poor water quality. Residents of Holland were concerned with the unpleasant taste and odor of the water as well as the staining effect, especially in fixtures and when washing clothes. They wanted a water supply with improved taste and less staining effects. The poor taste was attributed to by-products that are produced when ammonia combines with chlorine used in the disinfection process. Many residents took to purchasing bottled water, and many visitors to the community, including visiting sports teams brought water with them, as they would not drink the community's tap water.

Staining was primary due to elevated manganese levels in the water. Pilot testing was undertaken to determine if chlorine dioxide, which is known to be a powerful oxidant, would be effective in oxidizing manganese such that it could be removed by filtration. At the same, the use of chlorine dioxide as a primary water disinfectant, instead of chlorine, was examined.

Based upon successful pilot test results a plan was developed to use chlorine dioxide as a primary potable water disinfectant. The complete transition occurred over a long time frame.

Initially the hypochlorite dosage was gradually lowered to a level that still met regulatory requirements, while at the same time the dosage of chlorine dioxide was slowly increased. At all times, chlorine dioxide levels were monitored carefully so that legal maximum limits would not be reached. On August 27, 2005, Holland (RM of Victoria) completely terminated the dosing of hypochlorite (chlorine) solution into their drinking water, which effectively changed the primary disinfectant of their water to chlorine dioxide. Hypochlorite feed equipment is now only maintained as a stand-by disinfectant, in case it is ever needed.

The initial goal of decreasing staining from the effects of manganese has largely been accomplished. The end result of the new chlorine dioxide disinfection system also includes much better tasting water for the Community of Holland. The community residents have indicated that the taste and odor of the water have improved significantly, and are pleased with the results.

LOCAL PRESS

The project was well-summarized in the following article, which appeared in the Fall 2004 issue of the Municipal Leader:

“CLEAN WATER FOR HOLLAND

Thanks to a state-of-the-art water disinfecting process, the citizens of Holland in central Manitoba are enjoying safe drinking water. The process utilizes chlorine dioxide in conjunction with far lower levels of the more familiar product-chlorine. The chlorine dioxide process certainly isn't new, having been used for 50 years in Brussels, Belgium. Introduced in the United States 15 years ago, chlorine dioxide is now disinfecting tap water enjoyed by 20 million Americans. Worldwide, 400 million people use water treated in this manner, including the 400 citizens of Holland in the RM of Victoria.

The Holland demonstration project was a made-in-Manitoba solution. It was sponsored by Osorno Enterprises Inc. and supervised by J. R. Cousin Consultants Ltd., both Winnipeg-based companies. Winnipeg's Avalon Institution of Applied Science Inc. carried out essential project research, while the Research Council of Canada, IRAP program and the Technology Commercialization Program and the Technology Commercialization Program, Province of Manitoba.

Chlorine dioxide, or ClO₂, is an extremely effective and powerful biocide. It also functions via an oxidative rather than a chlorinating reaction, thus eliminating the formation of chlorinated organic compounds that may increase the risk of cancer in consumers. Since its effects are longer lasting than chlorine, a smaller dosage of ClO₂ is required. Finally, ClO₂ is generated on site, thereby eliminating the need for site storage and/or transportation of chlorine.

Other advantages of using chlorine dioxide rather than chlorine in municipal water treatment include:

- *The bacterial efficiency is relatively unaffected by pH values between 4 and 10;*
- *ClO₂ is superior to chlorine in the destruction of spores, bacteria, viruses and other pathogen organisms on an equal residual basis;*
- *The required contact time for ClO₂ is lower;*
- *Chlorine dioxide has better solubility;*
- *ClO₂ destroys phenols (carbolic acids) and has no distinct smell; and*
- *Chlorine dioxide is better at removing iron and manganese compounds than chlorine.*

*Ivan Bruneau, CAO for the RM of Victoria, says the system is working very well and the officials and the citizens of Holland are quite happy with the results. The RM is now involved in the licensing process with Manitoba Conservation, having received conditional approval for the system. Talks concerning the system began back in November of 2002 at the AMM Convention Trade Show where **Jerry Cousin** of J. R. Cousin Consultants introduced us to **Peter Hombach** of Osorno. After much discussion and testing, the system was installed during the last week of July of this year.”*

Jerry Cousin speaks highly of the simple, self-contained chlorine dioxide system. He says, “In a number of Manitoba municipalities, chlorine is not compatible with the well water in that higher doses are required to achieve the free chlorine residual (making the water safe for consumption). That was the case in Holland. Citizens were complaining about the odor and the taste of chlorine, but more chlorine was required to achieve the free chlorine residual required by Manitoba Conservation.”

Many tests were carried out whereby differing levels of chlorine and chlorine dioxide was used to disinfect Holland’s water - all the time in keeping with provincial guidelines. Even now, there is still some chlorine in the water supply. Jerry adds, “The chlorine may be eliminated entirely if that is the wish of the residents. First, though, licensing must be approved, and then any adjustments of the chlorine level must coincide with provincial regulations.”

Osorno’s Peter Hombach says the advantages of chlorine dioxide are overwhelming. “The process has really caught on in the US in the past 15 years. Now, it will be benefiting Canadians. An abundance of iron and manganese in well water is a common problem throughout the prairies, so the future for chlorine dioxide looks very promising.” It appears that the residents of Holland, Manitoba agree.”