

## Partners for Climate Protection

### Greenhouse Gas Reduction Initiative of the Month

#### Ritchot, Manitoba's Ile des Chenes Arena Geothermal System



#### Municipal Profiles

Population: 5,478 (The Municipality of Ritchot is made up of four communities: Ile des Chenes, St. Adolphe, Ste. Agathe, and Grande Pointe.)

PCP Member since February 2010

#### Background

The Ile des Chenes (IDC) Arena was built in 1974 and, over the years, the concrete floor beneath the ice surface had become pitted and uneven. Renovating the ice plant would extend the life of the facility by 35 years and reduce maintenance costs; however, staff from the Local Arena Board and the Ritchot Community Development Corporation (CDC) soon saw that replacing the ice plant with a geothermal system would be an expensive proposition. To overcome the financial challenges, Ritchot decided to design a bigger geothermal heating and cooling system that would attract more funding and serve not just the arena, but the fire hall and community centre as well.\*

\*This article features the work undertaken on the IDC Arena only (pictured at right, photo courtesy of the Rural Municipality of Ritchot).

For additional information on the connections to the fire hall and the new Silver LEED community centre, please see FCM's Sustainable Community Awards web pages at <http://fcm.ca/home/awards/fcm-sustainable-communities-awards/2012-winners/energy-%E2%80%93-co-winner-1.htm>.



#### Implementation and Approach

Extensive work was done to retrofit the IDC Arena. Four natural-gas furnaces were replaced with geothermal heat pumps; heat-recovery ventilators were installed; and an air-cooled compressor was replaced with geothermal pumps for ice-making.

"We did a lot of research before undertaking this project," says Roger Perron, Economic Development Officer for the Ritchot CDC. "We needed to be confident in what we were talking about, in order to sell the idea to Council and the public, so we surrounded ourselves with experts from the geothermal industry."

That research included touring several other arenas in Manitoba that had already converted to geothermal for ice-making. "We looked at satisfaction levels and cost-savings," says Perron. "We then hired a geothermal consultant, who came highly recommended and had extensive experience in arena geothermal systems. Cost estimates were then obtained."



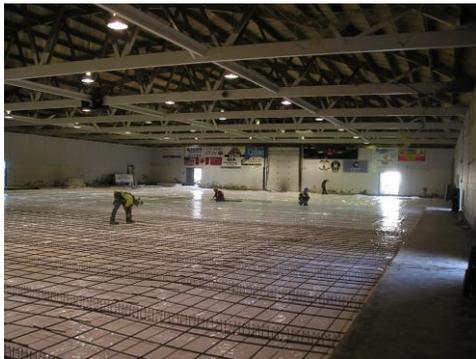
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Ritchot held an open house to allow the public to comment on the project. Once the community was on board, the project was brought before Council for approval and funding. Project costs to install the IDC's geothermal field and mechanical room were \$372,000, \$40,000 of which was a grant from the Province of Manitoba's Community Places program. This program provides funding to non-profit community organizations for projects related to facility construction, upgrading, expansion or acquisition. Total arena costs were \$1.2 million for all renovations, which included new concrete, bleachers, a Zamboni room and ice boards. Setting up the geothermal field and all lines within the arena cost \$600,000, which included connections to the fire hall and the new Silver LEED community centre.

Work began in May 2010. "By the end of September, we were making ice with geothermal," says Perron. The gas furnaces and other upgrades were completed by February 2011. "All the equipment needed for the project was easily obtainable," he adds, "and the contractor who did the work came from a neighboring town."



*Left: Geothermal loop is installed in the floor of the arena; Right: Concrete is poured over the loop. Photos courtesy of the Rural Municipality of Ritchot.*



In 2010–2011, Ritchot built a new LEED Silver community centre in Ile des Chenes, and the geothermal system from the arena was connected to it. "We also connected the local fire hall to the system, so our district geothermal system serves three buildings."

## Results

On a yearly basis, the electricity and natural-gas savings have been estimated at \$18,461, with annual GHG emission reductions of 33 tonnes. Beyond the electricity and natural gas savings, operating costs (maintenance, etc.) in the first full year of operation were reduced by \$15,000.

The retrofit has also extended the life of the facility, and has made the IDC Arena a more comfortable gathering place for residents. "The quality of the ice has improved, and we are able to continue renting ice for about 10 months of the year. With a new concrete surface, roller blading is one of the uses we now have that did not exist before," says Perron, adding that Ritchot also purchased a new electric Zamboni to replace its propane one, which has improved indoor air quality. "We also replaced the gas heaters in the fan viewing area with in-floor heated bleachers. Fans can now sit down and have heated seats!"

"Public reaction to the upgrade facility has been positive," reports Perron. "A lot of money was spent to renovate the facility, and since most of the work is buried, the public can't see it. So we put up photos of the work in the viewing area to give people a better understanding of the extent of the renovations."

*Geothermal piping being installed. Photo courtesy of the Rural Municipality of Ritchot.*



## Lessons Learned

All projects have challenges, and this project was no different. In particular, Perron says that getting the trades on site in a timely manner was sometimes difficult. “We needed to have the plant up and running by the end of September, as we had ice rentals in early October. Time frames were tight, and we had to ensure that we stayed on schedule. We met this challenge, but the trades were not able to complete the rest of the work until February, as they had other work commitments,” he adds. “The costs of renovations were also more than expected. As a result, some planned renovations—such as a lighting retrofit, conversion of a hot water tank, and new flooring—didn’t get done.”

For communities interested in a similar project, Perron says that a geothermal system is a viable option. “It costs more upfront, but the savings over the years more than compensate,” he says. “Our arena is always open to other municipalities who want to explore installing geothermal in their arenas.”

## Future Directions

As noted above, in the original project plans, instant gas heaters for domestic hot water were to be replaced with geothermal pumps, but this work could not be completed. Perron notes, however, that the arena committee is still looking to replace the system in 2013.

Perron also reports that the geothermal system may soon serve other buildings. “When we built the geothermal system, there was a discussion with the province, which wanted to locate an ambulance garage next to the fire hall,” he says. “Our present system will be able to accommodate this additional building.”

## Further Information

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The Partners for Climate Protection (PCP) program is a network of Canadian municipal governments that have committed to reducing greenhouse gases and acting on climate change. PCP is the Canadian component of ICLEI’s Cities for Climate Protection (CCP) network, which involves more than 1,200 communities worldwide. PCP is a partnership between the Federation of Canadian Municipalities (FCM) and ICLEI—Local Governments for Sustainability. PCP receives financial support from FCM’s Green Municipal Fund.