

# Town of Roblin's effluent irrigation project

By Lynne Bereza, AMM Communications Coordinator

The Town of Roblin is situated in Manitoba's Parkland region, about 230 km northwest of Brandon. Like most communities that dot the prairie landscape, Roblin relies on lagoons fed by the town's 1,818 residents, as part of its effluent treatment process. A standard lagoon system is comprised of a primary cell and one or more secondary cells that provide the proper conditions to allow nature to treat the sewage before discharge.

Also like most communities, Roblin was faced with the problem of how to dispose of its effluent in an environmentally responsible manner. To achieve this, the Town of Roblin undertook an initiative to handle their effluent sustainably, in order to protect the Shell River, which flows from the Duck Mountains south to Lake of the Prairies, and to help their community grow.

## Background

In 1993, the Town of Roblin began irrigating its effluent into the northeast quarter of section 20-25-28 W1. The objective was to reduce the need for Roblin to discharge their effluent into the Shell River, and instead use the nutrients found in the effluent for forage growth.

However, wet weather conditions in the 1990s resulted in the production of too much liquid to be disposed of properly through the irrigation system. Water ponding and problems with soil salinity developed. As a result, the Town was forced to shut down irrigation in 1999 and 2000 and investigate a number of other potential disposal methods that could be incorporated into its overall effluent management scheme. Their investigation led to a decision to build a constructed wetland next to the lagoon cells. This 16-hectare (40 acres) wetland, in operation since 2001, offers an alternative method of treating and utilizing the town's effluent, in addition to the irrigation of forages. It includes a 6 to 8 hectare (15 to 20 acres) hybrid poplar plantation next to the lagoon area for post-secondary treatment of a portion of the effluent.

Roblin's effluent management program now consists of three main components: primary and secondary lagoon cell operation, the irrigation site, and the constructed wetlands.

## Primary and secondary lagoon cell operation

Effluent first enters the primary lagoon cell 1 (see diagram) where heavy organic matter settles out while the lighter organic matter remains suspended. With assistance from the sun and wind, bacteria break down this organic matter and purify the effluent. As the effluent quality improves, the cleaner liquid is transferred in the secondary cells (2, 3 and 4) where the purification process continues. Once the effluent reaches a quality sufficient to meet environmental requirements for disposal, the secondary cells are discharged into one of two possible destinations: it can be irrigated into forages, or pumped into the constructed wetland.

## Irrigation site

Irrigating the effluent from primary lagoon cell 4 onto forages allows the remaining nutrients and other chemicals in the effluent to be broken down and absorbed by the forage crop. This forage crop consists of slender wheatgrass, tall wheatgrass, tall fescue, Russian wild rye grass, and sweet clover. This mixture of species was chosen for its ability to grow under saline conditions and to serve as hayland.

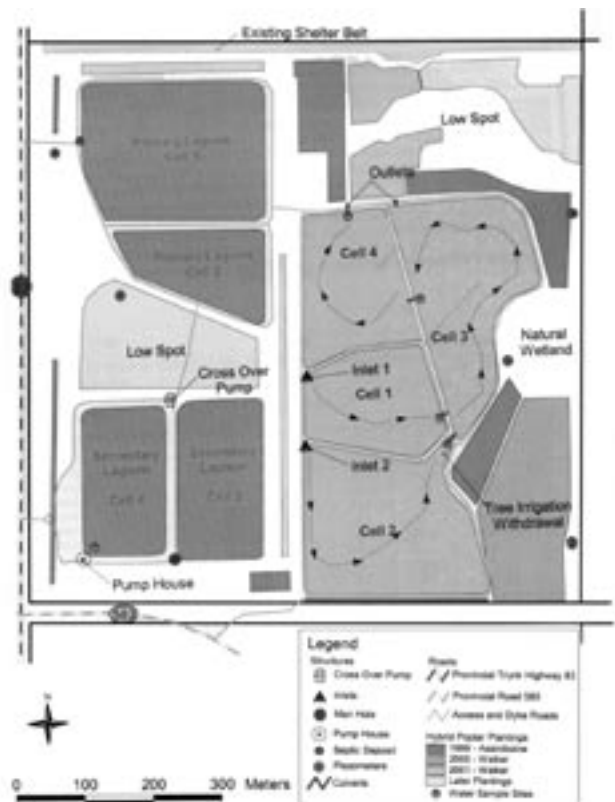
### Did You Know?

An important part of the irrigation site is to maintain a healthy growing stand of grasses. This is accomplished, in part, by harvesting the grasses for use as feed for local livestock to promote optimal growth rates. There was one cut of hay taken off during July of 2003, when a local farmer cut and baled 293 bales.

## Wetlands

A constructed wetland is a marsh that has been designed, built and operated for a particular purpose, often at a site that was not previously a wetland. Roblin's wetland cells were designed with islets, a range of depths from deep pools to very shallow areas, and seeded with a number of species including the common cattail, great bulrush, and reed grass. Other species of grasses have also flourished in and around the wetlands.

Hybrid poplar trees that are planted around the lagoons, wetland cells and other adjacent areas, not only provide seepage control, but provide an additional use for the effluent. The poplar stands consist of 5,000 Assiniboine and 7,500 Walker poplars. Since these trees grow quickly and require a great deal of moisture for growth, large amounts of effluent can be used for irrigating the trees.



Detailed layout of the municipal lagoon and constructed wetlands.

The Town of Roblin received assistance in this project from Manitoba Agriculture and Food, Manitoba Conservation, Manitoba Water Services Board, and the Prairie Farm Rehabilitation Administration (PFRA).

“With progressive thinking and ingenuity, the Town of Roblin has realized a number of benefits.”

**Conclusion**

These innovations, along with future actions to reduce effluent production, will have many positive benefits for the Town of Roblin:

- They will improve the Town’s ability to properly dispose of its effluent, limiting the amount of nutrients being discharged into the Shell River. This will assist in maintaining the water quality in the river for local people, fish, wildlife and recreation.
- Reducing the amount of effluent disposed of through the irrigation system enables better management of crop irrigation and maximizes crop production, and reduces possible damage to the irrigation site.
- The constructed wetlands and hybrid poplar plantation will provide an excellent habitat for wildlife and birds, and outdoor education opportunities for local schools.

With progressive thinking and ingenuity, the Town of Roblin has realized a number of benefits and at the same time reduced the impact on the Shell River by reducing surface water discharges from their lagoons. The Town is also looking at reducing the amount of effluent being produced, through the implementation of a water conservation plan and a possible plan to control ground water infiltration into the sewage system.

For more information, please call the Town of Roblin at (204) 937-8333. \$

*Sources:*

- *Town of Roblin – Alternative Effluent Management/Upper Assiniboine River Basin Study brochure, January 2000*
- *Town of Roblin Effluent Irrigation and Constructed Wetland 2003 Annual Report*




Application of effluent into wetland cell 2 (August, 2003).



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