



Making a difference...together

**MAGIC LAKE ESTATES WATER AND SEWER SERVICES  
ANNUAL REPORT  
20 AUGUST 2011**

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## **DRINKING WATER SYSTEM**

### **Operations**

The Magic Lake Estates (MLE) water system has operated reliably in the past year. Significant events and activities included:

- Cleaning and inspection of intake screens at both lakes.
- Start-up and commissioning of the customer water meters, and correction of minor deficiencies.
- Numerous problems related to power outages in winter and spring.
- Replacement of a variable speed motor drive in the Buck Lake water treatment plant.
- Increased frequency of water testing.
- Meetings with consultants relating to the upgrade projects.
- Implementation of a new weekly dam inspection and maintenance program.
- Refurbishment of Chlorine analyzers at both water treatment plants.

### **Drinking Water Quality**

Typical Magic Lake Estates water quality characteristics include:

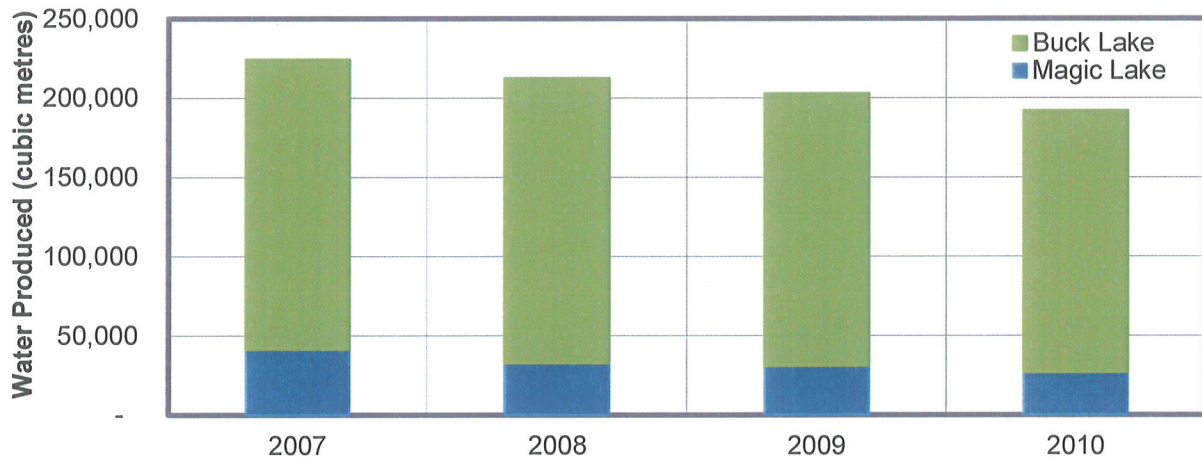
- Treated water is bacteriologically safe to drink
- Treated water turbidity (cloudiness) is frequently greater than the *Guidelines for Canadian Drinking Water Quality* (GCDWQ) limit of 1 NTU
- Total organic carbon is moderate to high (typically 6-8 milligrams per litre (mg/L)). This can cause the disinfection by-products such as THMs to be high
- Total trihalomethanes (THMs) occasionally exceed the GCDWQ limit of 100 mg/L
- Metals are typically below limits
- The raw source water is quite coloured but once chlorinated falls within the limit of 15 TCU.
- The water sources are subject to algal blooms which can affect taste and odour and clog home filters

By year end, Water Quality Division staff will be posting water quality data collected from this drinking water system on the CRD website.

### **Water Supply and Demand**

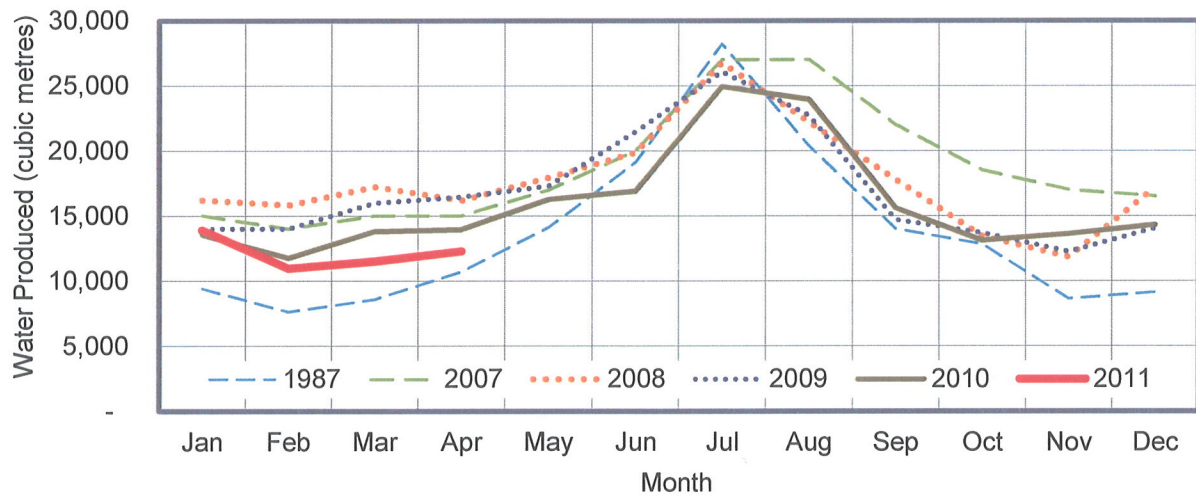
Total annual water production through the two MLE water treatment plants has decreased by approximately 10,000 m<sup>3</sup> (about 5%) in each of the past three years (Figure 1).

Figure 1. Total Annual Water Production



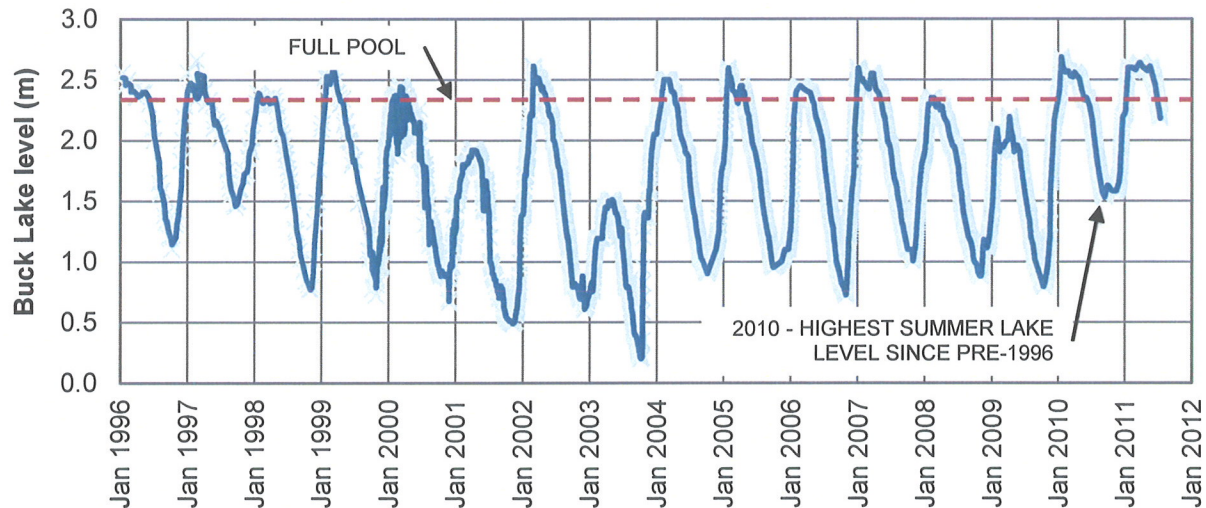
The reduction in annual water production is attributed to substantial reductions in baseline (winter) flow since 2007, while summer production has remained essentially unchanged (Figure 2).

Figure 2. Total Water Production by Month



The reduction in demand may be increasing the amount of water retained through the summer in the Buck Lake reservoir. The minimum reservoir level of 1.53m in 2010 is the highest on digital record (Figure 3). Weather also has a large influence on reservoir drawdown; however, lower water demand decreases the risk that the reservoir will not completely refill in the winter due to weather (which has occurred roughly one in every five years on average since 1996).

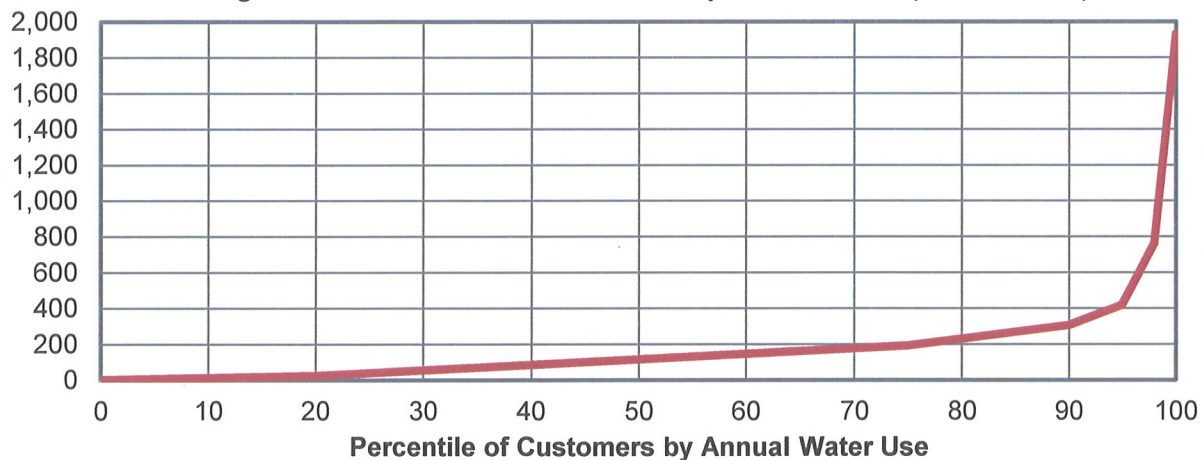
**Figure 3. Buck Lake Levels 1996-2011**



The customer meter installation project is complete, and installed meters have been read every three months since June 2010. Based on the available meter data, the total amount of water delivered to customer connections in 2010 is estimated to be roughly 150,000 m<sup>3</sup>, or 152 m<sup>3</sup> per connection based on 997 connections. The difference between total production through the plants and total metered customer use, called non-revenue water, of roughly 40,000 m<sup>3</sup> equates to 21% of total production. Non-revenue water is attributed primarily to system leaks, firefighting and system flushing (filters and distribution system) activities.

A distribution of estimated water demand per customer connection based on the available data is shown in Figure 4. About 20% of customers use less than 20 m<sup>3</sup>/year, half use less than 120 m<sup>3</sup>/year and 75% use less than 200 m<sup>3</sup>/year of water; evidence of the seasonal nature of occupancy and use of a large proportion of connected dwellings. About 100 connections are estimated to use more than 300 cubic metres per year of water, representing a significant opportunity for water savings.

**Figure 4. Estimated Annual Water Use per Connection (cubic metres)**



The Magic Lake Estates Water and Sewer Local Services Committee is considering options for introducing a water usage charge. After a full year of quarterly meter reading data has been collected,

the Committee will work with staff to develop and present alternatives to the community in 2012. A consumption charge may then be implemented in January 2013.

### **Water System Upgrade Project**

In 2009 the CRD was awarded a federal/provincial Building Canada Fund grant of \$5.25 million for upgrades to the MLE water system, including \$0.33 million for sewage treatment upgrades to accommodate waste that will be discharged from a new water treatment plant. The project includes the construction of a new water treatment plant to serve the entire distribution system, interconnecting raw water pipelines from both lakes to the plant location (enabling the entire service area to receive water from either Buck or Magic Lake), a comprehensive review of the water distribution system, and distribution system improvements including the replacement of up to 2 km of aging watermains. The Buck Lake dam also requires significant capital work to meet Ministry of Environment (MOE) dam safety requirements, including the construction of a new open channel spillway. Although this work is not included in the grant, it is included in the scope and overall cost of the upgrade project. The overall project budget is \$8.85 million.

The engineering consultant for the treatment and distribution upgrades, AECOM Canada Ltd., has completed pre-design studies for treatment and distribution, and detail design is in progress. Proposals were received August 3, 2011 to supply the process equipment package for the water treatment plant. Construction is expected to begin early in 2012.

The engineering consultant for the Buck Lake dam improvements, Klohn Crippen Berger Ltd., has completed a seismic assessment and design of a new spillway. The spillway design is being reviewed with the Ministry of Environment, and is ready for tender pending Ministry acceptance. Construction will likely be scheduled for early fall 2012 to coincide with seasonal low levels in the Buck Lake reservoir and favourable weather.



## **SEWER SYSTEM**

### **Permit Compliance – Marine Discharges**

Both the Schooner and Cannon wastewater treatment plants have operated out of compliance with permits at times during the past several years. The most persistent compliance problems relate to excessive flows during wet weather due to inflow and infiltration (leakage of rainwater runoff and groundwater into sewers). These conditions cause the discharge flow rates to exceed permit limits, and excessive flow rates through the treatment plants also occasionally cause effluent quality limits to be exceeded.

Despite substantial operational improvements over the past three years, it has become evident that capital improvements will be required to bring the two discharges back into full regulatory compliance, including a program of collection system improvements to reduce inflow and infiltration. The Ministry of Environment has asked the CRD to initiate this work, and an engineering study of the sewer system currently in progress will result in a recommended plan to achieve full regulatory compliance.

### **Engineering Study**

The 2011 Capital Plan for the MLE Sewer Service includes \$50,000 for an engineering study and asset management plan to address the needs for upgrading or replacement of sewer system assets. The study is intended to prioritize capital works, and to produce conceptual designs and cost estimates for priority projects in order that the MLE Committee can consider a public approval process to borrow funds. A contract to complete the study was awarded to Stantec Inc. in June 2011, and was approximately 50% complete at the end of July.

### **Operations**

Aside from the wet weather problems noted above, the Schooner and Cannon plants perform remarkably well for their age and condition. Significant events and activities in the past year included:

- Sewer flushing and roto-rooting
- Higher than normal time out of compliance due to wetter than normal winter and spring
- Numerous problems related to power outages in winter and spring
- Refurbishment of return activated sludge pump at Schooner wastewater treatment plant

### **Chart Drive Septic System**

The Chart Drive septic system is at the end of its useful life and requires replacement. Pending completion of the sewer system engineering study, staff are monitoring the system closely for evidence of failure. The system has operated without evidence of problems in the past year.

## **ANNUAL BUDGET AND FINANCIAL REPORT**

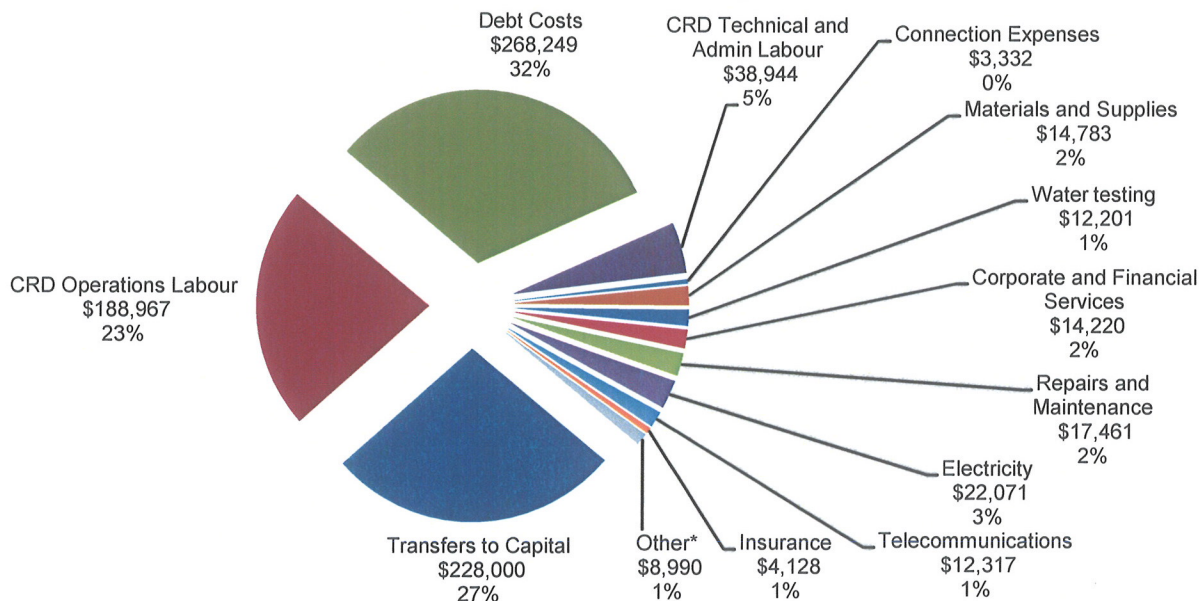
Attached are copies of the *Statements of Financial Activities (Unaudited)* as prepared by CRD Finance and Corporate Services for the year 2010. The statements provide an overview of the revenues and expenditures for the year.

*Revenue* includes parcel taxes (*transfers from government*) and user fees (*sale of services*), and small amounts for interest on savings and miscellaneous revenue such as connection charges and late payment charges (*other revenue*).

*Expenditure* includes all costs of providing the service. *General government services* include budget preparation, financial management, loan administration, utility billing, and risk management services. *Other fiscal services* include administration costs for loans. *Other* includes all other costs to administer and operate the water system, and the principal and interest payments on borrowing to finance capital projects. A breakdown of actual 2010 expenditures for the Magic Lake Water and Sewer Services is shown in Figures 5 and 6.

The difference between *revenue* and *expenditure* is reported as *net revenue (expenditure)*. Any transfers to or from capital or reserve accounts for the service (*transfers to own funds*, or *transfers from own funds*) are deducted and the *net change in fund balance* is added to any surplus or deficit carry forward from the prior year (*opening balance*), yielding a *closing balance* (surplus or deficit) that is carried forward to the following year. Regional District services are not permitted to plan to carry forward a deficit, so a deficit in a given year usually requires a tax or fee increase in the following year to recover costs and prevent a subsequent deficit.

**Figure 5. MLE Water 2010 Actual Expense \$605,963**



\*Includes travel expenses, meeting expenses, printing, postage, advertising, permits and licenses

**Magic Lake Water #1 and #2**

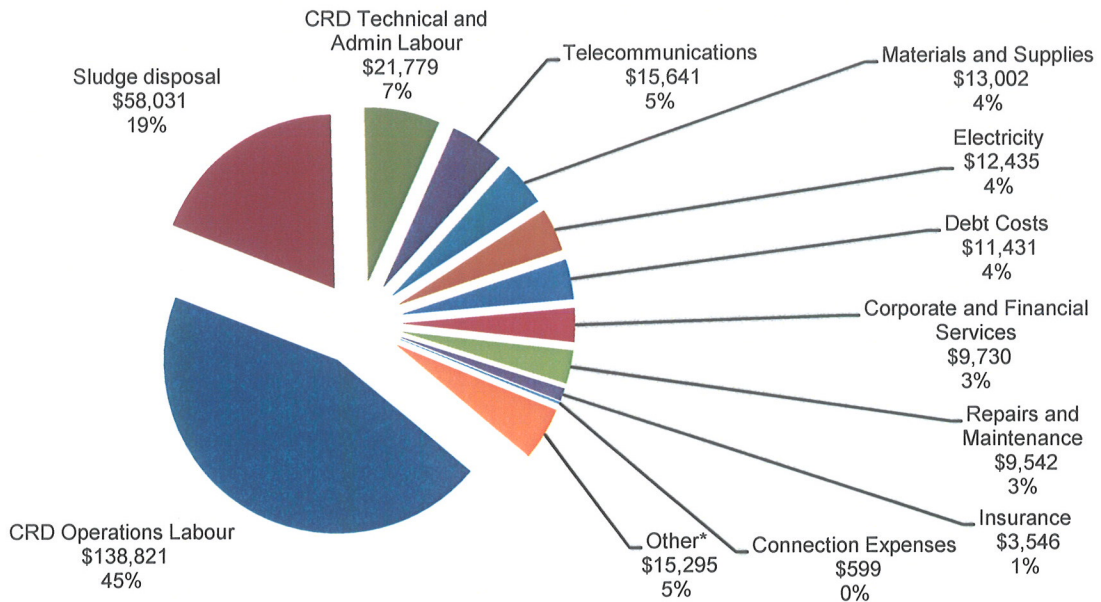
Magic Lake Estates includes two water services. Magic Lake #1 is the primary service, which provides for the operation and maintenance of the water system and most of its capital improvements. Magic Lake #2 was established in 2000 to fund the debt servicing for a watermain replacement project in 2000 and 2001. The area boundaries for both services are the same, except that owners who elected to prepay their parcel tax for the watermain replacement project are excluded from the Magic Lake #2 service and are not assessed a parcel tax for the service. The financial statement includes both services.

**Magic Lake Water – 2010 Statement of Financial Activities**

The MLE water 2010 revenue of \$1,075,120 included \$806,023 parcel tax (including MLE#2 parcel tax of \$237,029) and \$249,750 user fees. The total expenditures were \$605,963 for operation and administration of the service, including all operating expenses and the MLE #2 debt servicing cost of \$238,928.

The difference between revenue and expenditures in 2010 amounted to a net revenue of \$469,157. Of this, \$228,000 was transferred to the capital fund for the upgrade project. The remainder was applied to the surplus opening balance of \$136, resulting in a net surplus of \$241,293 carried forward to 2011.

**Figure 5. MLE Sewer 2010 Actual Expense \$309,852**



\*Includes travel expenses, meeting expenses, printing, postage, advertising, permits and licenses

The MLE sewer 2010 revenue of \$432,506 included \$272,220 parcel tax and \$155,421 user fees. The total expenditures were \$309,852 for operation and administration of the service, including all operating expenses and debt servicing costs.

The difference between revenue and expenditures in 2010 amounted to a net revenue of \$122,654. Of this, \$87,277 was transferred to the reserve fund. The remainder was applied to the deficit opening balance of \$35,377, resulting in a zero closing balance.

Tim Tanton, MPA, PEng  
Senior Manager, Infrastructure Engineering

J.A. (Jack) Hull, MBA, PEng  
General Manager, Integrated Water Services  
Concurrence

Attachment: 1  
CS/TT:ls



## CAPITAL REGIONAL DISTRICT

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**WATER REVENUE FUND**  
**Statement of Financial Activities (Unaudited)**  
**For the Year Ended December 31, 2010**

		Magic Lake Estates Water Supply
<b>Revenue</b>		
Transfers from government	\$	806,023
Sale of services		249,750
Other revenue from own sources:		
Other licenses and permits		-
Interest earnings		2,386
Other revenue		16,227
Grants in lieu of taxes		734
		<u>1,075,120</u>
<b>Expenditure</b>		
General government services		14,220
Other		575,011
Other fiscal services		16,732
		<u>605,963</u>
<b>Net revenue (expenditure)</b>		469,157
Transfers to own funds:		
Water Capital Fund		228,000
Reserve Funds		-
Equipment Replacement Fund		-
Transfers from own funds:		
Reserve Funds		-
<b>Change in fund balance</b>		241,157
Opening balance		136
<b>Closing balance</b>	<b>\$</b>	<u><u>241,293</u></u>



## CAPITAL REGIONAL DISTRICT

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### Sewer Revenue Fund Statement of Financial Activities (Unaudited) For the Year Ended December 31, 2010

	Magic Lake Estates Sewerage System
<b>Revenue</b>	
Transfers from government	\$ 272,220
Sale of services	155,421
Other revenue from own sources:	
Permits	-
Interest earnings	380
Other revenue	4,136
Grants in lieu of taxes	349
	<hr/> 432,506
<b>Expenditure</b>	
General government services	9,730
Other	299,261
Salaries and wages	-
Other fiscal services	861
Recovery	-
	<hr/> 309,852
<b>Net revenue (expenditure)</b>	122,654
Transfers to own funds:	
Sewer Capital Fund	-
Reserve Funds	87,277
Equipment Replacement Fund	-
Transfers from own funds:	
Sewer Capital Fund	-
Revenue Funds	-
Reserve Funds	-
	<hr/>
<b>Change in fund balance</b>	35,377
Opening balance	(35,377)
<b>Closing balance</b>	<hr/> \$ - <hr/>