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**MAGIC LAKE ESTATES WATER AND SEWER LOCAL SERVICES COMMITTEE
REPORT ON OPERATIONS
TUESDAY, 15 FEBRUARY 2011**

As requested by the Magic Lake Estates Water and Sewer Local Services Committee at its April 8, 2008 meeting, this report provides information relating to the operation of the Magic Lake Estates water and sewer systems.

Drinking Water Supply and Demand

Buck Lake levels are shown in Figure 1, compared to the 15-year average (pre-2008) and 2008-2010 levels. Buck and Magic Lakes were both at full pool at the end of January.

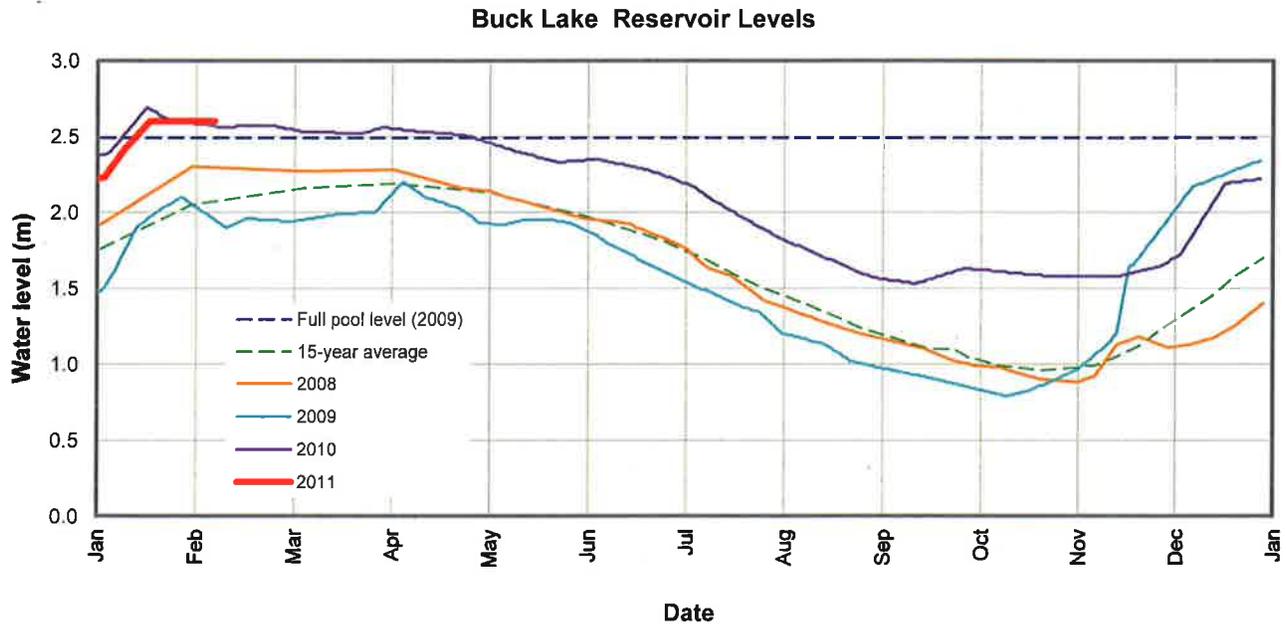


Figure 1. Buck Lake Levels

The total water production by the Buck Lake and Magic Lake water treatment plants in 2010 was 191,664 cubic metres (m³). This production is 5.4% lower than 2009, and 9.7% lower than the same period in 2008, primarily due to declining water production in the months of January to July (Figures 2 and 3). Daily average and overnight flows are shown in Figure 4.

Drinking Water Quality

Water supplied by the Magic Lake Estates water service is safe to drink, and typically meets most of the guidelines set out in the Health Canada *Guidelines for Canadian Drinking Water Quality (GCDWQ)* and the requirements of the British Columbia *Drinking Water Protection Act and Regulation* as administered by the Vancouver Island Health Authority (VIHA). However, turbidity of the treated water is frequently greater than the GCDWQ guideline limit of 1 NTU. Turbidity results are shown in Figure 5. A new water treatment plant to be constructed by 2013 will consistently maintain treated water turbidity below 1 NTU.

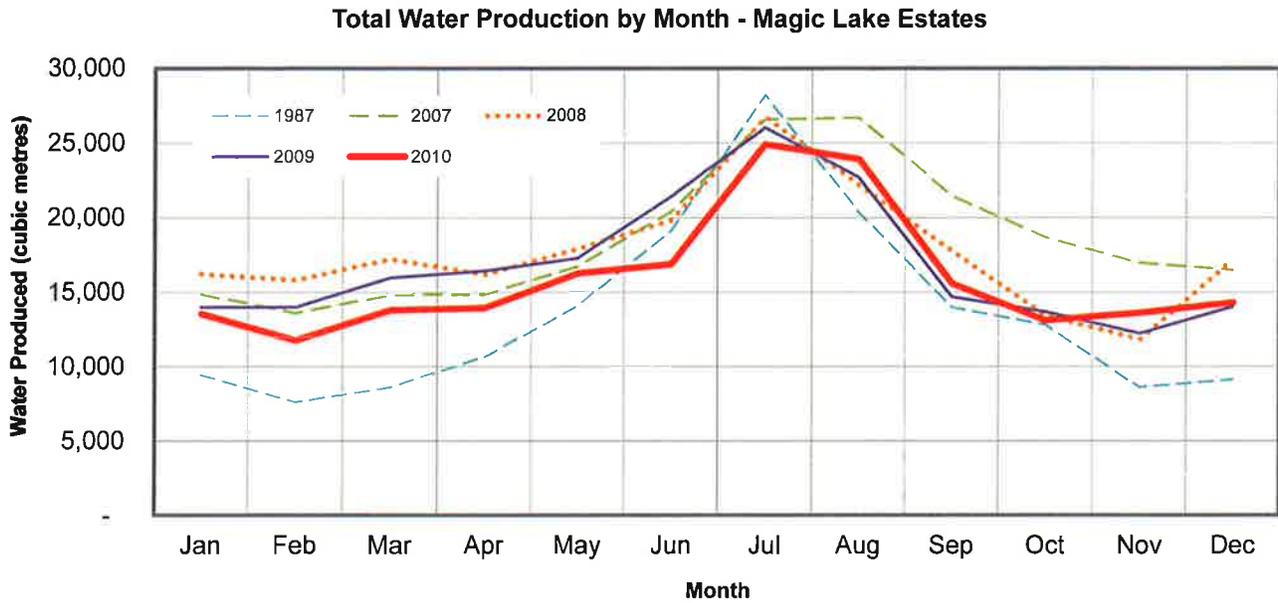


Figure 2. Monthly Water Production

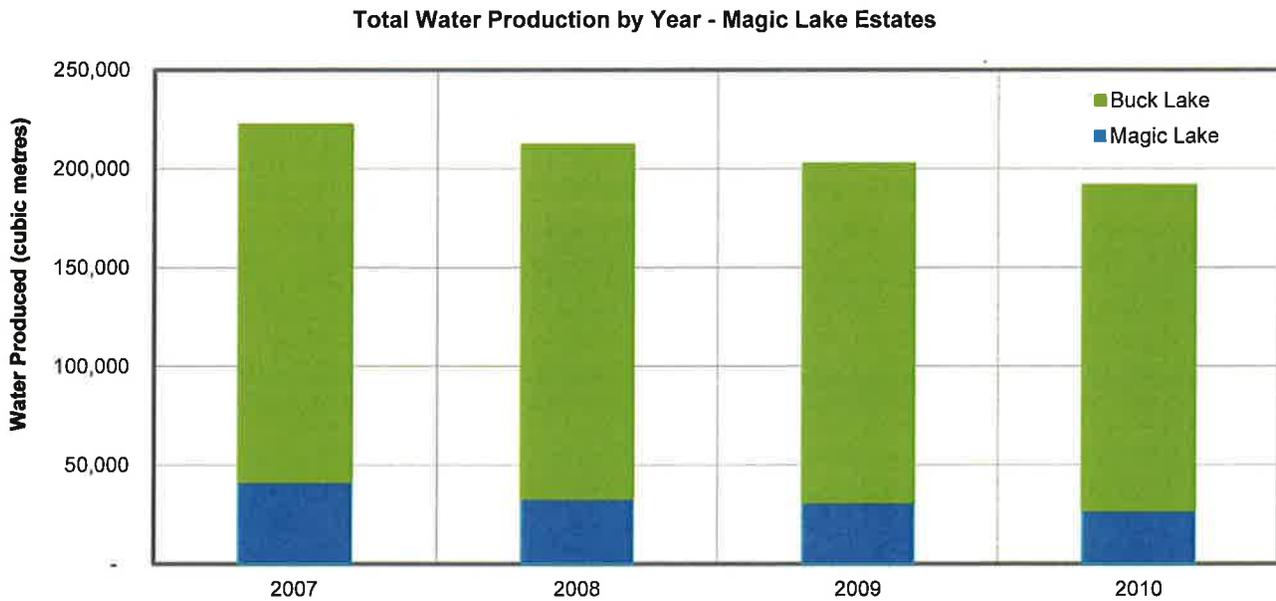


Figure 3. Total Annual Water Production, 2007-2010

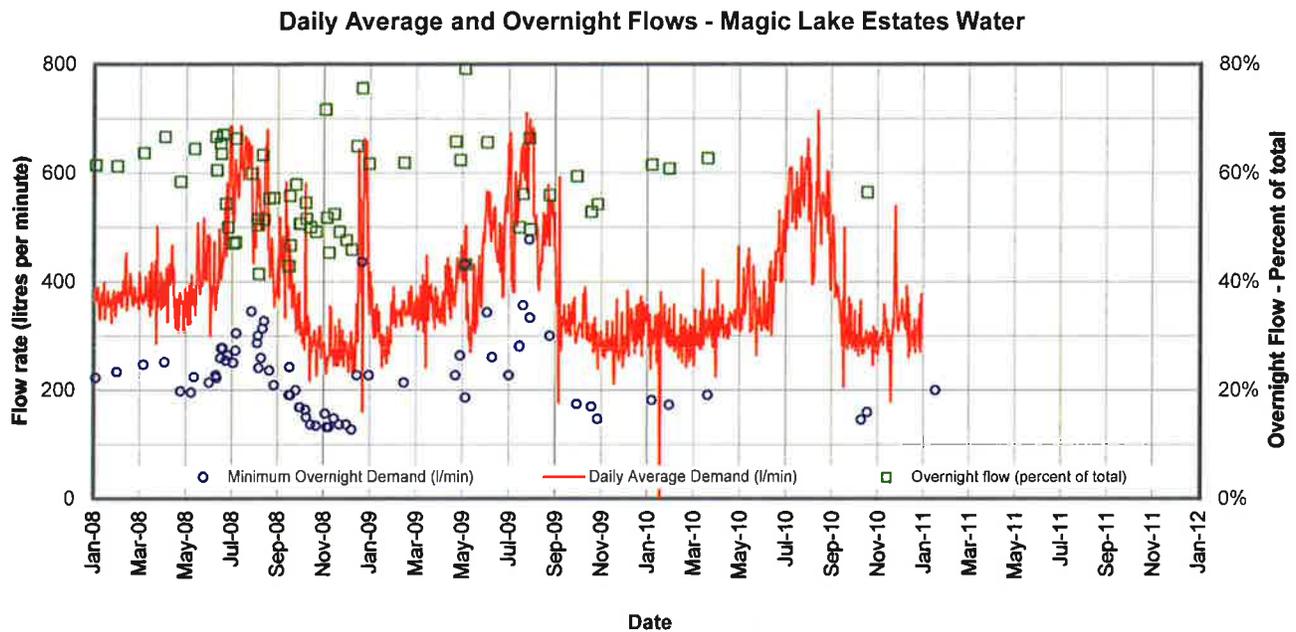


Figure 4. Daily Average and Minimum Overnight Flows

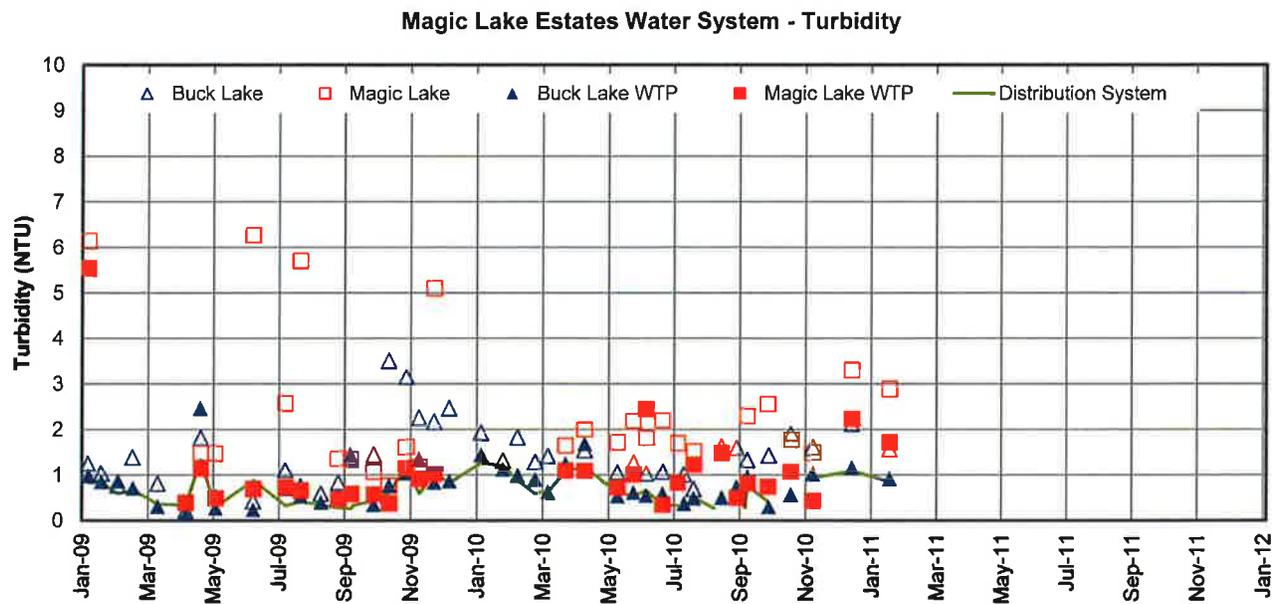


Figure 5. Raw and treated water turbidity

Drinking Water Operations

November and December 2010 were very busy due to heavy rain, wind, power failures, freezing and thawing. A summary of significant operational events in September to December 2010 follows:

- Sep 2010
 - Magic Water Treatment Plant (WTP) - ozone system down briefly – repair air separator
 - Buck WTP - intake line floating – install temporary intake through culvert
 - Buck WTP - divers over to re-sink line – could not pressure test due to leaking valves in plant – foot valve clogged with weeds

- Oct 2010
 - Buck WTP - ozone generator rebuilt (scheduled maintenance)
 - Buck WTP - rebuild lake intake pump section of valve work
 - Buck WTP - intake line back in service – temporary line saved for future emergencies
 - Buck Lake dam - locate water main across dam for seismic drilling (expose w/ excavator - no blueprints of this section)

- Nov 2010
 - Buck WTP – divers back for pressure test again – found another leak in above ground pipe – repaired
 - Some meter installations repaired from heavy rain damage, then freeze damage later in the month
 - Buck WTP – pipework repaired at plant and intake back in service – saved temporary intake
 - Some damage from freezing, numerous resident complaints of no water – nearly all homeowner problems, not CRD infrastructure
 - Magic WTP – repairs to ozone equipment

- Dec 2010
 - Water complaints of color. Samples taken to lab for analysis – likely caused by rapid onset of freezing, causing plant die-off
 - Continued work on meter project – insulating and repairs as required (high number of installs – this is predicted follow up work)
 - 4-½ inch alder removed at homeowner’s request

Metering Project

The metering project is substantially complete, and meters have been read quarterly by radio since September 2010. Outstanding work includes the installation of two meters where site conditions prevent a typical installation at the property line, commissioning of 11 radio read transceivers, and inspection/winterization of approximately 100 meters. The meters were read twice in January to determine leakage loss rates. It was determined that 40 connections were using more than 1,000 litres per day, of which seven were using more than 4,500 litres per day. Four of these were found to be substantial leaks on private property, which have since been isolated. As a result, winter overnight flow rates are expected to decrease by roughly 50%, from about 200 to 100 litres per minute, or from 60% to 45% of total production. Of the overall metering budget of \$1,188,279 and the 2010 budget of \$254,000, approximately \$20,000 remains unspent and uncommitted. It is estimated that the remaining work will be completed within budget, and by March 31 2011.

Water System Upgrade Project

The water treatment and distribution project has progressed through the pre-design phase since the consulting contract was awarded to AECOM in 2010. The work is slightly behind schedule. A status report and summary of project activities to January 14, 2011 by AECOM is provided in Attachment 1.

Consultant Klohn Crippen Berger (KCB) has completed seismic exploration of the Buck Lake Dam and has met with Ministry of Environment to verify design requirements for a spillway structure. Based on a draft report, KCB

is expected to recommend additional seismic exploration on the smaller East dam. The seismic evaluation of the larger west dam is considered to be complete, and spillway design is in progress. KCB expects to submit a draft design report and preliminary construction cost estimate for the spillway late February.

Wastewater Operations

A summary of significant operational events in September to December 2010 follows:

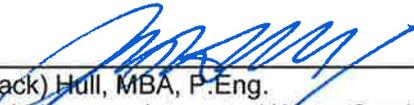
- | | |
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| Sep 2010 | <ul style="list-style-type: none">• Schooner Wastewater Treatment Plant (WWTP) - air system required bearing replacement in blowers• Plugged sewer on Pirates Rd – cleared by roto-rooter |
| Oct 2010 | <ul style="list-style-type: none">• No significant events |
| Nov 2010 | <ul style="list-style-type: none">• No significant events |
| Dec 2010 | <ul style="list-style-type: none">• Heavy rain - numerous 'out of compliance' reports generated by CRD to the Provincial Emergency Program for excessive flow at WWTPs.• Meeting with MOE regarding flows, reporting, follow-up. No immediate action required by MOE. Rainwater inflow to sewers washes all the sludge out of the plants, impacting treatment performance during and after heavy rainfall events. |



Colwyn Sunderland, ASCT
Local Services Engineering Coordinator



Tim Tanton, P.Eng.
Senior Manager, Infrastructure Engineering
Concurrence



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

CS:ls



AECOM
200 – 415 Gorge Road East 250 475 6355 tel
Victoria, BC, Canada V8T 2W1 250 475 6388 fax
www.aecom.com

**CRD Integrated Water Services
Magic Lake Estates Water System Study
Project Status - 14 January, 2011**

1. Summary/Overview:

Overall the Water System Review is slightly behind AECOM's proposed schedule which showed project completion by Fall of 2012. However, there remains more than adequate time to meet the funding deadline of completing the treatment and infrastructure upgrades before the end of 2013. Most of the conclusions related to the water distribution system evaluation, including development of an infrastructure replacement program, have been completed, but the report related to the work is currently in Draft form. Although much of the treatment process and its configuration have been confirmed, the water treatment evaluation and design component of the project lags the proposed schedule by several months, primarily due to limited availability of senior AECOM staff time. Efforts will be made to make up schedule so that construction of the treatment plant can begin in late 2011 as planned.

2. Water Distribution System Evaluation:

The following elements of the distribution system evaluation have been completed or nearly completed:

- Development and calibration of computer model of water system
- Analysis of current and future demands
- Determination of system deficiencies and upgrading required for normal demand conditions
- Development of firefighting flow requirements
- Analysis of current and future fireflow conditions and determination of upgrading required
- Determination of system storage requirements and development of a strategy for upgrading
- Analysis of available information regarding system leakage which impacts the priorities for system replacement
- Audit of the distribution system components in accordance with Public Service Accounting Board requirements
- Determination for each of the assets of expected life, remaining life and net book value
- Preparation of a replacement program for essentially all of the system's original assets over the next 10 years, levelled so that annual expenditures are similarly-valued.
- Preparation of a Draft summary report.

3. Water Treatment Evaluation:

The following aspects of the water treatment system evaluation and upgrading have been completed or are underway:

- Evaluation of the water quality information to confirm the need for water treatment (filtration plus disinfection)
- Assessment of the current treatment trains and existing equipment confirms the need for replacement rather than re-use
- Examination of the Buck Lake treatment plant confirms the need for relocation and rebuilding
- Confirmation of the treatment train recommended in the 2006 assessment by EarthTech (now AECOM)
- In consideration of operational issues, proposal that a single new treatment facility be constructed at the existing Magic Lakes site
- Preliminary discussion with VIHA to notify them of the proposed treatment facilities upgrading
- Preparation of purchasing documents for treatment process equipment pre-selection.