City of Winnipeg
Water and Sewer Utilities
Public Utilities Board Hearing

December 19 and 20, 2011
Agenda

• Introduction of City Panel
• Overview of Operations – Moira Geer, CA
• Fund Accounting – Moira Geer, CA
• Capital – Geoffrey Patton, P. Eng.
• Legislation and Compliance – Kelly Kjartanson, P. Eng.
• Combined Sewer Systems – Cynthia Wiebe, P. Eng.
• Nitrogen – Arnold Permut, P. Eng
• Integration of Processes – Geoffrey Patton, P. Eng.
• Disconnection/Reconnection – Wanda Burns, CA
• Conservation Promotion – Duane Griffin, P. Eng.
• Agreements with Neighbouring Municipalities for City Services – Moira Geer, CA
Water and Waste Department

Vision
Excellence in environmental services

Mission
Serving the community by providing and continually improving drinking water, wastewater, land drainage, and solid waste services to the citizens of Winnipeg
## Sewage Treatment Plants

<table>
<thead>
<tr>
<th></th>
<th>North End Plant</th>
<th>South End Plant</th>
<th>West End Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population Served</strong></td>
<td>393,000</td>
<td>186,000</td>
<td>85,000</td>
</tr>
<tr>
<td><strong>Average Dry Weather Flow Recorded (ML/d)</strong></td>
<td>160</td>
<td>46</td>
<td>24</td>
</tr>
<tr>
<td><strong>Average Dry Weather Flow Design Capacities (ML/d)</strong></td>
<td>302</td>
<td>59</td>
<td>32</td>
</tr>
</tbody>
</table>
Sewer System Infrastructure

- 3 sewage treatment plants
- 2,346 kilometres of sewer mains
- 1,783 kilometres of land drainage sewers
- 119 kilometres of interceptor sewers
- 115 wastewater and land drainage pumping stations
- 71 stormwater retention basins
- 117 kilometres of primary dike
## Staffing

<table>
<thead>
<tr>
<th>Sewer Utility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater Services</td>
<td>237</td>
</tr>
<tr>
<td>Finance</td>
<td>48</td>
</tr>
<tr>
<td>Engineering</td>
<td>48</td>
</tr>
<tr>
<td>Environmental Standards</td>
<td>26</td>
</tr>
<tr>
<td>Customer Services</td>
<td>18</td>
</tr>
<tr>
<td>Information Technology</td>
<td>8</td>
</tr>
<tr>
<td>Human Resources</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>394</strong></td>
</tr>
</tbody>
</table>
Water Operations Background

[Map of water operations in Winnipeg, showing various reservoirs, aqueducts, and pumping stations, such as McPhillips Reservoir and Pumping Station, Wilkes Reservoir and Hurst Pumping Station, MacLean Reservoir and Pumping Station, and Deacon Reservoir and Booster Station. The map also highlights the Winnipeg River, Shoal Lake (Indian Bay), and the Lake of the Woods.]
Water Supply and Distribution

Water Treatment Plant site
Water System Infrastructure

- State-of-the-art drinking water treatment plant
- 5 water pumping and booster stations
- 194,530 water meters
- 1,850 kilometres of water service lines
- 2,543 kilometres of water mains
- 150 kilometres of feeder mains
- 157 kilometres of aqueduct
- 44 kilometres of branch aqueduct
Drinking Water Treatment Plant

State-of-the-art, modern facility designed for performance, safety and environmental sustainability
Drinking Water Treatment Plant

Drinking Water Treatment Process

Raw water → Flocculation Basins → Dissolved Air Floation Tanks → Ozone Chambers → Biological Activated Carbon Filters → Chlorine Chamber → Clearwell → Ultraviolet Light Chambers → 3 Area Pumping Stations & Reservoirs → To Distribution System

Chemicals and Processes:
- Sulphuric Acid
- Ferric Chloride Coagulant
- Ozone
- Sodium Bicarbonate
- Filter Aid
- Chlorine
- Sodium Hydroxide
- Fluoride
- Orthophosphate
- Chlorine
Drinking Water Treatment Plant Virtual Tour

• Posted on our website
• Illustrates our water treatment program from Shoal Lake to your tap
### Water Staffing

<table>
<thead>
<tr>
<th>Water Utility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Services</td>
<td>278</td>
</tr>
<tr>
<td>Finance</td>
<td>58</td>
</tr>
<tr>
<td>Engineering</td>
<td>42</td>
</tr>
<tr>
<td>Environmental Standards</td>
<td>9</td>
</tr>
<tr>
<td>Customer Services</td>
<td>19</td>
</tr>
<tr>
<td>Information Technology</td>
<td>9</td>
</tr>
<tr>
<td>Human Resources</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>427</strong></td>
</tr>
</tbody>
</table>
Fund Accounting

- Water Utility Fund (operations + capital)
- Sewer Utility Fund (operations + capital)
- Water Main Renewal Reserve
- Aqueduct Rehab Reserve (to be closed end of 2011)
- Sewer System Rehab Reserve
- Environmental Projects Reserve
### Capital Budget By Fund

**6 year Budget**

<table>
<thead>
<tr>
<th>Fund</th>
<th>2011 Budget ($ in thousands)</th>
<th>2011-2016 6 Yr Total Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Drainage and Flood Control</td>
<td>6,098</td>
<td>81,869</td>
</tr>
<tr>
<td>Waterworks System Fund</td>
<td>27,570</td>
<td>171,535</td>
</tr>
<tr>
<td>Sewage Disposal System Fund</td>
<td>47,590</td>
<td>905,740</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>81,258</strong></td>
<td><strong>1,159,144</strong></td>
</tr>
</tbody>
</table>
Capital Budget 1996-2016

Water and Waste Department Capital Budgets
# Waterworks System Fund

## Major Projects 2011-2016

<table>
<thead>
<tr>
<th>Capital Budget 2011 to 2016</th>
<th>6 Yr Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>($ in thousands)</td>
<td></td>
</tr>
<tr>
<td><strong>Watermain Renewals</strong></td>
<td>92,500</td>
</tr>
<tr>
<td><strong>Water Treatment Plant Upgrading</strong></td>
<td>10,000</td>
</tr>
<tr>
<td><strong>Waverley West Feedermain</strong></td>
<td>6,800</td>
</tr>
<tr>
<td><strong>Tache Booster Pumping Station</strong></td>
<td>5,300</td>
</tr>
<tr>
<td><strong>Water Supervisory Control and Data Acquisition (SCADA) Upgrade</strong></td>
<td>4,700</td>
</tr>
<tr>
<td><strong>Feedermain Condition Assessment and Rehabilitation</strong></td>
<td>4,500</td>
</tr>
<tr>
<td><strong>Water Supply Valve Installation/Replacement Program</strong></td>
<td>4,500</td>
</tr>
<tr>
<td><strong>Regional Pumping Stations Reliability Upgrades</strong></td>
<td>4,000</td>
</tr>
<tr>
<td><strong>Shoal Lake Aqueduct Asset Preservation</strong></td>
<td>4,000</td>
</tr>
<tr>
<td><strong>Ultraviolet Light Disinfection Upgrade/Rehabilitation</strong></td>
<td>4,000</td>
</tr>
<tr>
<td><strong>Saskatchewan Avenue Watermain</strong></td>
<td>3,900</td>
</tr>
</tbody>
</table>

**Total** 144,200

Total 6 Yr Water Works System Budget 171,535

Percent of Total Budget 84%
# Sewage Disposal System Fund

## Major Projects

### 2011-2016

<table>
<thead>
<tr>
<th>Capital Budget 2011 to 2016</th>
<th>6 Yr Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>($ in thousands)</td>
<td>------------</td>
</tr>
<tr>
<td>Nutrient Removal - NEWPCC</td>
<td>365,000</td>
</tr>
<tr>
<td>Biosolids - Alternative Disposal Delivery and Management System</td>
<td>150,000</td>
</tr>
<tr>
<td>Sewer Renewal</td>
<td>90,000</td>
</tr>
<tr>
<td>Combined Sewer Overflow (CSO) Management Strategy and Miscellaneous Mitigation</td>
<td>87,100</td>
</tr>
<tr>
<td>Primary Clarifier Covers - NEWPCC</td>
<td>25,500</td>
</tr>
<tr>
<td>Upgrading External Power Supply - NEWPCC</td>
<td>25,000</td>
</tr>
<tr>
<td>Water Pollution Control Centre Reliability Upgrades</td>
<td>20,000</td>
</tr>
<tr>
<td>Grit Handling Upgrades - NEWPCC</td>
<td>18,900</td>
</tr>
<tr>
<td>New Discharge Chamber - NEWPCC</td>
<td>15,000</td>
</tr>
<tr>
<td>Raw Sewage Pump Replacement - NEWPCC</td>
<td>14,750</td>
</tr>
<tr>
<td>New Surgewell - NEWPCC</td>
<td>13,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>824,250</strong></td>
</tr>
</tbody>
</table>

Total 6 Yr Sewage Disposal System Budget 905,740

Percent of Total Budget 91%
## Land Drainage and Flood Control

### Major Projects

**2011-2016**

<table>
<thead>
<tr>
<th>Capital Budget 2011 to 2016</th>
<th>6 Yr Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>($ in thousands)</td>
<td></td>
</tr>
<tr>
<td>Combined Sewer Flood Relief</td>
<td>45,000</td>
</tr>
<tr>
<td>Outfall Rehabilitation</td>
<td>8,508</td>
</tr>
<tr>
<td>Primary Dike Upgrading</td>
<td>6,386</td>
</tr>
<tr>
<td>Flood Pumping Station Rehabilitation</td>
<td>6,000</td>
</tr>
<tr>
<td>Land Drainage and Combined Sewers Outfall Gate Structures</td>
<td>5,450</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>71,344</strong></td>
</tr>
</tbody>
</table>

Total 6 Yr Land Drainage and Flood Control Budget: 81,869

Percent of Total Budget: 87%

---

*Image of the City of Winnipeg logo.*
Regulatory/Compliance Framework for the City of Winnipeg Water and Wastewater Utilities

Kelly Kjartanson, M.Sc., P.Eng.
Manager of Environmental Standards
Agenda

• Overview of regulatory/compliance framework
• Provincial legislation, regulations and licences
• Federal requirements
• Winnipeg Water and Sewer By-laws
• Compliance submissions for the Province and Canada
• Additional compliance related matters
• Performance of utilities respecting regulatory requirements
• Summary
Overview of Regulatory Framework
Provincial Legislation, Regulations and Licences – Wastewater Utility

• Environment Act
  – Biosolids Licence #1089 ERR
  – West End Sewage Treatment Plant Licence #2669 ERR
  – North End Sewage Treatment Plant Licence #2684 RRR
  – South End Sewage Treatment Plant Licence #2716 R
  – Water and Wastewater Facility Operators Regulation 77/2003

• Water Protection Act
  – Nutrient Management Regulation

• Bill 46 “Save Lake Winnipeg Act”
Provincial Legislation, Regulations and Licences – Water Utility

• Drinking Water Safety Act
  – Drinking Water Safety Regulation 40/2007
  – Drinking Water Quality Standards Regulation 41/2007
  – Operating Licence PWS-09-412 RR

• Environment Act
  – Water and Wastewater Facility Operators Regulation 77/2003
Federal Requirements
Wastewater Utility

• Canadian Environmental Protection Act
  – National Pollutant Release Inventory
  – Greenhouse Gas Emissions Reporting

• Fisheries Act
  – Wastewater Systems Effluent Regulations (proposed)
Federal Requirements
Water Utility

• Federal, Provincial, Territorial Guidelines for Canadian Drinking Water Quality
• Canadian Environmental Protection Act
  – National Pollutant Release Inventory
  – Greenhouse Gas Emissions Reporting
Winnipeg By-laws
Winnipeg Sewer By-law

- Current version effective January 1, 2011 (No. 92/2010)
  - new by-law
  - includes many topical improvements including Pollution Prevention Planning requirements (January 1, 2012)
    - actively enforced by departmental staff
- Lays out requirements to administer wastewater utility and protect public health and the environment
- Earlier versions effective 1988, 1998
Winnipeg Water Works By-Law

- Current version effective October 1, 1973 (No. 504/73)
  - actively enforced by departmental staff
  - undergoing a complete review and rewrite
- Lays out requirements to administer water utility and ensure public health is protected
- Amendments routinely made to keep by-law up-to-date (e.g., backflow prevention requirements)
Compliance Submissions
Compliance Submissions for the Province Wastewater Utility

- Monthly monitoring compliance submissions
- Yearly submission of Schedule A (priority pollutants) and trout toxicity test results
- Yearly submission of Wastewater Hauler Reports
- Yearly submission of Biosolids Report
- Immediate notification/reports of any wastewater spills
# City of Winnipeg

## Water and Waste Department

## West End Water Pollution Control Centre Monitoring Data

### December 2010

<table>
<thead>
<tr>
<th>Date</th>
<th>Raw Sewage</th>
<th>Final Effluent</th>
<th>Final Effluent Grab Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily Flow</td>
<td>24 Hour Composite</td>
<td>Temp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TSS (mg/L)</td>
<td>cBOD5 (mg/L)</td>
</tr>
<tr>
<td>1-Dec-10</td>
<td>25.8</td>
<td>4.18</td>
<td>108</td>
</tr>
<tr>
<td>2-Dec-10</td>
<td>26.0</td>
<td>4.17</td>
<td>109</td>
</tr>
<tr>
<td>3-Dec-10</td>
<td>27.0</td>
<td>4.41</td>
<td>119</td>
</tr>
<tr>
<td>4-Dec-10</td>
<td>27.9</td>
<td>4.37</td>
<td>122</td>
</tr>
<tr>
<td>5-Dec-10</td>
<td>28.7</td>
<td>4.51</td>
<td>130</td>
</tr>
<tr>
<td>6-Dec-10</td>
<td>28.0</td>
<td>4.34</td>
<td>133</td>
</tr>
<tr>
<td>7-Dec-10</td>
<td>26.9</td>
<td>5.08</td>
<td>136</td>
</tr>
<tr>
<td>8-Dec-10</td>
<td>27.0</td>
<td>5.34</td>
<td>144</td>
</tr>
<tr>
<td>9-Dec-10</td>
<td>27.1</td>
<td>5.22</td>
<td>142</td>
</tr>
<tr>
<td>10-Dec-10</td>
<td>27.1</td>
<td>5.57</td>
<td>151</td>
</tr>
<tr>
<td>11-Dec-10</td>
<td>26.0</td>
<td>5.68</td>
<td>159</td>
</tr>
<tr>
<td>12-Dec-10</td>
<td>28.5</td>
<td>6.11</td>
<td>167</td>
</tr>
<tr>
<td>13-Dec-10</td>
<td>27.3</td>
<td>6.11</td>
<td>167</td>
</tr>
<tr>
<td>14-Dec-10</td>
<td>26.9</td>
<td>6.47</td>
<td>174</td>
</tr>
<tr>
<td>15-Dec-10</td>
<td>26.7</td>
<td>6.58</td>
<td>175</td>
</tr>
<tr>
<td>16-Dec-10</td>
<td>26.5</td>
<td>6.72</td>
<td>175</td>
</tr>
<tr>
<td>17-Dec-10</td>
<td>26.4</td>
<td>6.96</td>
<td>184</td>
</tr>
<tr>
<td>18-Dec-10</td>
<td>27.2</td>
<td>7.35</td>
<td>200</td>
</tr>
<tr>
<td>19-Dec-10</td>
<td>27.8</td>
<td>7.14</td>
<td>198</td>
</tr>
<tr>
<td>20-Dec-10</td>
<td>26.3</td>
<td>7.22</td>
<td>190</td>
</tr>
<tr>
<td>21-Dec-10</td>
<td>25.4</td>
<td>6.72</td>
<td>171</td>
</tr>
<tr>
<td>22-Dec-10</td>
<td>25.4</td>
<td>7.16</td>
<td>162</td>
</tr>
<tr>
<td>23-Dec-10</td>
<td>25.6</td>
<td>6.88</td>
<td>176</td>
</tr>
<tr>
<td>24-Dec-10</td>
<td>26.2</td>
<td>7.14</td>
<td>187</td>
</tr>
<tr>
<td>25-Dec-10</td>
<td>25.1</td>
<td>6.86</td>
<td>162</td>
</tr>
<tr>
<td>26-Dec-10</td>
<td>23.9</td>
<td>7.03</td>
<td>168</td>
</tr>
<tr>
<td>27-Dec-10</td>
<td>24.5</td>
<td>6.74</td>
<td>165</td>
</tr>
<tr>
<td>28-Dec-10</td>
<td>24.2</td>
<td>6.81</td>
<td>160</td>
</tr>
<tr>
<td>29-Dec-10</td>
<td>23.9</td>
<td>6.85</td>
<td>164</td>
</tr>
<tr>
<td>30-Dec-10</td>
<td>24.2</td>
<td>6.54</td>
<td>158</td>
</tr>
<tr>
<td>31-Dec-10</td>
<td>24.8</td>
<td>6.20</td>
<td>154</td>
</tr>
</tbody>
</table>

**Max:** 28.7  **Min:** 23.0  **Average:** 26.3  **Gec.Mean:** 25.6

Notes:
1. * = 30 day rolling average
2. Effluent ammonia load based upon Raw Sewage flows and Final Effluent NH3-N concentrations
3. NR - not recorded or no result; NA - not analyzed; NS - no sample
4. Final Effluent flow data unavailable
5. Where - values are reported 50% of the MDL is used for calculated results
6. Licence No. 2666 E RR
7. Total Nitrogen results are calculated from TKN and nitrate values.
ENVIRONMENT ACT LICENCE #1089E RR

SOLIDS DEWATERING, TEMPORARY BIOSOLIDS STORAGE and APPLICATION TO AGRICULTURAL LAND

2010
Compliance Submissions for the Province Water Utility

- Weekly distribution system chlorine residuals
- Monthly monitoring compliance submissions
- Monthly fluoride report submission
- Quarterly trihalomethanes results submission
- Annual Lead Report
- Annual Water Quality Report
- Corrective Action Reports submitted as required
## WATER TREATMENT PLANT TURBIDITY ON-LINE SAMPLING REPORT

<table>
<thead>
<tr>
<th>Date</th>
<th>Turbidity (NTU)</th>
<th>Filter #1</th>
<th>Filter #2</th>
<th>Filter #3</th>
<th>Filter #4</th>
<th>Filter #5</th>
<th>Filter #6</th>
<th>Filter #7</th>
<th>Filter #8</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/1/2010</td>
<td>1.29</td>
<td>0.17</td>
<td>0.25</td>
<td>0.11</td>
<td>0.15</td>
<td>0.12</td>
<td>0.16</td>
<td>0.08</td>
<td>0.15</td>
</tr>
<tr>
<td>12/2/2010</td>
<td>1.28</td>
<td>0.18</td>
<td>0.28</td>
<td>0.12</td>
<td>0.20</td>
<td>0.06</td>
<td>0.26</td>
<td>0.10</td>
<td>0.20</td>
</tr>
<tr>
<td>12/3/2010</td>
<td>1.29</td>
<td>0.15</td>
<td>0.27</td>
<td>0.08</td>
<td>0.13</td>
<td>0.11</td>
<td>0.28</td>
<td>0.08</td>
<td>0.24</td>
</tr>
<tr>
<td>12/4/2010</td>
<td>1.24</td>
<td>0.16</td>
<td>0.25</td>
<td>0.08</td>
<td>0.14</td>
<td>0.13</td>
<td>0.35</td>
<td>0.08</td>
<td>0.19</td>
</tr>
<tr>
<td>12/5/2010</td>
<td>0.97</td>
<td>0.15</td>
<td>0.25</td>
<td>0.09</td>
<td>0.22</td>
<td>0.13</td>
<td>0.20</td>
<td>0.06</td>
<td>0.13</td>
</tr>
<tr>
<td>12/6/2010</td>
<td>0.90</td>
<td>0.17</td>
<td>0.24</td>
<td>0.14</td>
<td>0.19</td>
<td>0.17</td>
<td>0.20</td>
<td>0.11</td>
<td>0.24</td>
</tr>
<tr>
<td>12/7/2010</td>
<td>0.90</td>
<td>0.18</td>
<td>0.31</td>
<td>0.12</td>
<td>0.22</td>
<td>0.17</td>
<td>0.25</td>
<td>0.10</td>
<td>0.20</td>
</tr>
<tr>
<td>12/8/2010</td>
<td>0.91</td>
<td>0.20</td>
<td>0.25</td>
<td>0.15</td>
<td>0.37</td>
<td>0.17</td>
<td>0.27</td>
<td>0.11</td>
<td>0.23</td>
</tr>
<tr>
<td>12/9/2010</td>
<td>0.96</td>
<td>0.17</td>
<td>0.30</td>
<td>0.13</td>
<td>0.24</td>
<td>0.16</td>
<td>0.27</td>
<td>0.13</td>
<td>0.30</td>
</tr>
<tr>
<td>12/10/2010</td>
<td>1.19</td>
<td>0.15</td>
<td>0.29</td>
<td>0.08</td>
<td>0.34</td>
<td>0.15</td>
<td>0.54</td>
<td>0.11</td>
<td>0.27</td>
</tr>
<tr>
<td>12/11/2010</td>
<td>1.13</td>
<td>0.14</td>
<td>0.27</td>
<td>0.12</td>
<td>0.28</td>
<td>0.15</td>
<td>0.25</td>
<td>0.14</td>
<td>0.15</td>
</tr>
<tr>
<td>12/12/2010</td>
<td>1.24</td>
<td>0.14</td>
<td>0.41</td>
<td>0.12</td>
<td>0.17</td>
<td>0.15</td>
<td>0.27</td>
<td>0.14</td>
<td>0.28</td>
</tr>
<tr>
<td>12/13/2010</td>
<td>1.19</td>
<td>0.10</td>
<td>0.25</td>
<td>0.07</td>
<td>0.22</td>
<td>0.13</td>
<td>0.39</td>
<td>0.09</td>
<td>0.20</td>
</tr>
<tr>
<td>12/14/2010</td>
<td>1.43</td>
<td>0.07</td>
<td>0.29</td>
<td>0.10</td>
<td>0.31</td>
<td>0.07</td>
<td>0.43</td>
<td>0.05</td>
<td>0.25</td>
</tr>
<tr>
<td>12/15/2010</td>
<td>1.09</td>
<td>0.16</td>
<td>0.29</td>
<td>0.12</td>
<td>0.16</td>
<td>0.10</td>
<td>0.20</td>
<td>0.08</td>
<td>0.24</td>
</tr>
<tr>
<td>12/16/2010</td>
<td>1.09</td>
<td>0.17</td>
<td>0.29</td>
<td>0.15</td>
<td>0.29</td>
<td>0.14</td>
<td>0.37</td>
<td>0.12</td>
<td>0.25</td>
</tr>
<tr>
<td>12/17/2010</td>
<td>1.37</td>
<td>0.11</td>
<td>0.32</td>
<td>0.08</td>
<td>0.29</td>
<td>0.16</td>
<td>0.29</td>
<td>0.05</td>
<td>0.25</td>
</tr>
<tr>
<td>12/18/2010</td>
<td>1.92</td>
<td>0.16</td>
<td>0.29</td>
<td>0.13</td>
<td>0.23</td>
<td>0.13</td>
<td>0.29</td>
<td>0.12</td>
<td>0.26</td>
</tr>
<tr>
<td>12/19/2010</td>
<td>0.99</td>
<td>0.18</td>
<td>0.27</td>
<td>0.15</td>
<td>0.27</td>
<td>0.14</td>
<td>0.35</td>
<td>0.12</td>
<td>0.25</td>
</tr>
<tr>
<td>12/20/2010</td>
<td>1.00</td>
<td>0.05</td>
<td>0.16</td>
<td>0.05</td>
<td>0.16</td>
<td>0.05</td>
<td>0.16</td>
<td>0.06</td>
<td>0.20</td>
</tr>
<tr>
<td>12/21/2010</td>
<td>0.90</td>
<td>0.16</td>
<td>0.15</td>
<td>0.16</td>
<td>0.25</td>
<td>0.13</td>
<td>0.24</td>
<td>0.12</td>
<td>0.18</td>
</tr>
<tr>
<td>12/22/2010</td>
<td>0.97</td>
<td>0.05</td>
<td>0.29</td>
<td>0.05</td>
<td>0.20</td>
<td>0.10</td>
<td>0.20</td>
<td>0.06</td>
<td>0.20</td>
</tr>
<tr>
<td>12/23/2010</td>
<td>0.91</td>
<td>0.18</td>
<td>0.26</td>
<td>0.14</td>
<td>0.19</td>
<td>0.17</td>
<td>0.29</td>
<td>0.13</td>
<td>0.16</td>
</tr>
<tr>
<td>12/24/2010</td>
<td>0.50</td>
<td>0.17</td>
<td>0.28</td>
<td>0.15</td>
<td>0.27</td>
<td>0.17</td>
<td>0.27</td>
<td>0.13</td>
<td>0.25</td>
</tr>
<tr>
<td>12/25/2010</td>
<td>0.25</td>
<td>0.15</td>
<td>0.29</td>
<td>0.16</td>
<td>0.24</td>
<td>0.13</td>
<td>0.24</td>
<td>0.12</td>
<td>0.18</td>
</tr>
<tr>
<td>12/26/2010</td>
<td>0.58</td>
<td>0.21</td>
<td>0.29</td>
<td>0.17</td>
<td>0.36</td>
<td>0.30</td>
<td>0.28</td>
<td>0.14</td>
<td>0.17</td>
</tr>
<tr>
<td>12/27/2010</td>
<td>0.51</td>
<td>0.19</td>
<td>0.28</td>
<td>0.16</td>
<td>0.30</td>
<td>0.21</td>
<td>0.25</td>
<td>0.17</td>
<td>0.28</td>
</tr>
<tr>
<td>12/28/2010</td>
<td>0.75</td>
<td>0.15</td>
<td>0.25</td>
<td>0.12</td>
<td>0.22</td>
<td>0.17</td>
<td>0.28</td>
<td>0.12</td>
<td>0.20</td>
</tr>
<tr>
<td>12/29/2010</td>
<td>0.76</td>
<td>0.14</td>
<td>0.27</td>
<td>0.10</td>
<td>0.22</td>
<td>0.15</td>
<td>0.33</td>
<td>0.10</td>
<td>0.22</td>
</tr>
<tr>
<td>12/30/2010</td>
<td>0.75</td>
<td>0.13</td>
<td>0.16</td>
<td>0.11</td>
<td>0.14</td>
<td>0.10</td>
<td>0.24</td>
<td>0.08</td>
<td>0.21</td>
</tr>
<tr>
<td>12/31/2010</td>
<td>0.74</td>
<td>0.15</td>
<td>0.28</td>
<td>0.11</td>
<td>0.25</td>
<td>0.10</td>
<td>0.24</td>
<td>0.08</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Total Number of Measurements Taken, A: 168905
Turbidity Standard for Monitoring Location (NTU): 0.3
Number of Measurements: 169172
Compliance with Turbidity Standard, C = A/D x 100%
<table>
<thead>
<tr>
<th>Date</th>
<th>Free Chlorine (mg/L)</th>
<th>Total Chlorine (mg/L)</th>
<th>Date</th>
<th>Free Chlorine (mg/L)</th>
<th>Total Chlorine (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-Dec-2010</td>
<td>1.10</td>
<td>1.37</td>
<td>02-Dec-2010</td>
<td>1.03</td>
<td>1.31</td>
</tr>
<tr>
<td>03-Dec-2010</td>
<td>0.94</td>
<td>1.07</td>
<td>04-Dec-2010</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>05-Dec-2010</td>
<td>NS</td>
<td>NS</td>
<td>06-Dec-2010</td>
<td>0.94</td>
<td>1.07</td>
</tr>
<tr>
<td>07-Dec-2010</td>
<td>1.01</td>
<td>1.19</td>
<td>08-Dec-2010</td>
<td>0.98</td>
<td>1.18</td>
</tr>
<tr>
<td>09-Dec-2010</td>
<td>1.11</td>
<td>1.35</td>
<td>10-Dec-2010</td>
<td>1.12</td>
<td>1.31</td>
</tr>
<tr>
<td>11-Dec-2010</td>
<td>NS</td>
<td>NS</td>
<td>12-Dec-2010</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>13-Dec-2010</td>
<td>NS</td>
<td>NS</td>
<td>14-Dec-2010</td>
<td>OL</td>
<td>OL</td>
</tr>
<tr>
<td>15-Dec-2010</td>
<td>1.25</td>
<td>1.58</td>
<td>16-Dec-2010</td>
<td>1.28</td>
<td>1.49</td>
</tr>
<tr>
<td>17-Dec-2010</td>
<td>OL</td>
<td>OL</td>
<td>18-Dec-2010</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>19-Dec-2010</td>
<td>NS</td>
<td>NS</td>
<td>20-Dec-2010</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>21-Dec-2010</td>
<td>1.00</td>
<td>1.24</td>
<td>22-Dec-2010</td>
<td>OL</td>
<td>OL</td>
</tr>
<tr>
<td>23-Dec-2010</td>
<td>1.12</td>
<td>1.34</td>
<td>24-Dec-2010</td>
<td>1.07</td>
<td>1.33</td>
</tr>
<tr>
<td>25-Dec-2010</td>
<td>NS</td>
<td>NS</td>
<td>26-Dec-2010</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>27-Dec-2010</td>
<td>NS</td>
<td>NS</td>
<td>28-Dec-2010</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>29-Dec-2010</td>
<td>0.98</td>
<td>1.21</td>
<td>30-Dec-2010</td>
<td>0.98</td>
<td>1.21</td>
</tr>
<tr>
<td>31-Dec-2010</td>
<td>0.91</td>
<td>1.14</td>
<td>Total number of measurements taken, A: 17</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

Comments:
The Water Treatment Plant was shutdown on December 14, 17, 20, and 22 for maintenance. Samples were not collected on December 27 and 28 due to these days being holidays.

Printed From: /N:\Compliance Reporting\WTP\Report Templates.xls
Printed by: J. Jones
Report Compiled By: J. Jones
Approved in LMS By: S. Fletcher
Date Approved: 6-Jan-11
## UV Monitoring Report – Monthly

<table>
<thead>
<tr>
<th>Date</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
<th>Total</th>
<th>Total Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/1/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/2/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/3/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/4/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/5/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/6/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/7/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/8/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/9/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/10/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/11/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/12/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/13/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/14/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/15/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/16/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/17/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/18/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/19/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/20/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/21/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/22/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/23/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/24/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/25/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/26/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/27/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/28/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/29/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/30/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/31/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total (ML):** 0.10 0.00 1,846.17 1,846.53 3.26 2.62 457.36 415.34 6.96 0.00 227.03 227.03 6.13 1.30 1058.65 1699.48 0.22 0.00 1591.05 1501.91 0.07 0.72 360.19 380.97 3.84 4.53 1959.59 2509.36

**Report Created:** Tuesday, January 04, 2011

**Water Volume [%]:**
- Untreated: 61.1%
- Sludge Dose: 61.1%
- To Dose: 99.3%

**Notes:**
1. UV Comparative Dose: 18.1 mg/L.
2. Submittal Days: 1
3. Original Signed By: [Name]
4. Reviewed By: [Name]
5. Approved By: [Name]
2010

ANNUAL REPORT

CITY OF WINNIPEG WATER SUPPLY SYSTEM
Monday, December 6, 2010

Mr. Gilbert Bushati
Senior Drinking Water Officer
Manitoba Water Stewardship, Office of Drinking Water
1007 Century Street
Winnipeg MB R3H 0W4

Our Incident/Report: 28-2010
LIMS Reference No. 28038

RE: CORRECTIVE ACTION REPORT

WATER SYSTEM: Winnipeg Public Water System
WATER SYSTEM CODE: 252.00
LOCATION OF NON-COMPLIANT INCIDENT: Winnipeg 3-Dist NE-06
OPERATOR IN CHARGE: NA
INCIDENT REPORTED BY: Steve Fletcher, Supervisor of Analytical Services Branch
TYPE OF NON-COMPLIANT INCIDENT: Low positive Total Coliform (<10 CFU/100mL), 3 MR 41/2007
INCIDENT DATE: November 29, 2010
DESCRIPTION OF CORRECTIVE ACTIONS: AS SOON AS POSSIBLE: Re-sampled original location, also tested for turbidity, free-total chlorine, temperature and contacted the ODWW.
TEST RESULTS: See Attached

NOTES/COMMENTS:
1. All microbiological tests performed by contract laboratory.
2. LIFEDOWN STREAM testing performed when EC is >0.1/100mL, TC is >10/100mL or when resample/consecutive sample is positive for EC or TC or as directed by the Manager of Environmental Standards Division or the Office of Drinking Water.
3. INITIAL chlorine, turbidity and temperature only tested at the required 30 sample locations.
4. NR-No Result due to laboratory/analyst error.

EMERGENCY REPORTING IS REQUIRED WHERE A POTENTIAL HEALTH RISK IS INVOLVED. FOLLOW THE INSTRUCTIONS OF YOUR DRINKING WATER OFFICER ON SITUATIONS REQUIRING IMMEDIATE REPORTING.

DISTRIBUTION:
Forward the original to the Drinking Water Officer with the quarterly compliance submissions.
Contact the Drinking Water Officer for any comments, questions or concerns.

Environment Standards Division • Division des normes environnementales
2230 Main Street • 2230, rue Main • Winnipeg • Manitoba R2V 4T8
fax/téléc. (204) 339-2147 • www.winnipeg.ca
Compliance Submissions for Canada

- National Pollutant Release Inventory
  - annual submission respecting applicable water and wastewater facilities
- Greenhouse Gas Emissions Reporting
  - annual submission respecting applicable water and wastewater facilities
Additional Voluntary Compliance Efforts

- Certification of Water and Wastewater Operators
  - conducted internal audit of compliance with Provincial regulation in 2010
- Provide Winnipeg Regional Health Authority with monthly Water Quality Reports
- Provide Provincial regulators with annual Water Main Cleaning Program Water Quality Monitoring Summary Report
- Monitoring of rivers and small streams
- Sanitary surveys of Shoal Lake
Operators Certification Audit Review
Audit of Compliance with Water and Wastewater Facility Operators Regulation 77/2003

Renée Grosselle, B. Sc.
Supervisor of Compliance Reporting Branch

Kelly Kjartanson, M. Sc., P. Eng.
Manager of Environmental Standards Division

April 2010
### Monthly Water Quality Report

**Date:** December 2010

**Water Quality Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Cell Planning</th>
<th>Cell Regular</th>
<th>Cell Regular</th>
<th>Cell Regular</th>
<th>Cell Regular</th>
<th>Cell Regular</th>
<th>Cell Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine</td>
<td>3.51</td>
<td>3.00</td>
<td>3.51</td>
<td>3.00</td>
<td>3.51</td>
<td>3.00</td>
<td>3.51</td>
</tr>
<tr>
<td>Free Chlorine Residual</td>
<td>2.50</td>
<td>2.00</td>
<td>2.50</td>
<td>2.00</td>
<td>2.50</td>
<td>2.00</td>
<td>2.50</td>
</tr>
<tr>
<td>Total Chlorine Residual</td>
<td>5.00</td>
<td>4.00</td>
<td>5.00</td>
<td>4.00</td>
<td>5.00</td>
<td>4.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Fluoride</td>
<td>0.95</td>
<td>0.85</td>
<td>0.95</td>
<td>0.85</td>
<td>0.95</td>
<td>0.85</td>
<td>0.95</td>
</tr>
<tr>
<td>Fluoride (mg/L, max)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Phosphate (mg/L, max)</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>pH</td>
<td>7.50</td>
<td>7.50</td>
<td>7.50</td>
<td>7.50</td>
<td>7.50</td>
<td>7.50</td>
<td>7.50</td>
</tr>
<tr>
<td>Conductivity (μS/cm)</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>Nitrate (mg/L, max)</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Soluble silica (mg/L)</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>Total solids (mg/L)</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
</tbody>
</table>

**Bacteriological Monitoring Summary**

- **Total Coliform:**
  - Water Treatment Plant: Clearwell
  - Water Treatment Plant: Desp Branch 1
  - Water Treatment Plant: Desp Branch 2
  - Mobil Station Discharge
  - Hurst Station Discharge
  - Parkland Station Discharge
  - Distribution System (MPCP)

- **E. Coli:**
  - Water Treatment Plant: Clearwell
  - Water Treatment Plant: Desp Branch 1
  - Water Treatment Plant: Desp Branch 2
  - Mobil Station Discharge
  - Hurst Station Discharge
  - Parkland Station Discharge
  - Distribution System (MPCP)

**Disinfection System Water Quality Summary**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Average, Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Chlorine Residual</td>
<td>2.50, 3.00</td>
</tr>
<tr>
<td>Conductivity (μS/cm)</td>
<td>1500</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>1.00</td>
</tr>
<tr>
<td>pH</td>
<td>7.50</td>
</tr>
</tbody>
</table>

**Remarks:**

- [Signatures and Approvals]

**Prepared By:** [Signature]

**Approved By:** [Signature]
2010 Water Main Cleaning Program

Water Quality Monitoring Summary Report

December 2010
### City of Winnipeg
**Water and Waste Department**

**2011 RIVERS SURVEY MONITORING REPORT**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Assiniboine River Sampling Locations</th>
<th>Red River Sampling Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Headpont Bridge</td>
<td>Fort Garry Bridge</td>
</tr>
<tr>
<td><strong>Survey Date</strong></td>
<td>May 11, 2011</td>
<td>West Perimeter Bridge</td>
<td>Norwood Bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assiniboine Park Foot Bridge</td>
<td>Redwood Bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Main Street Bridge</td>
<td>North Perimeter Bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Logofort Bridge</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>12.3 NS</td>
<td>NS 12.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.3 NS</td>
<td></td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>mg/L</td>
<td>9.9 NS</td>
<td>NS 10.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.1 NS</td>
<td></td>
</tr>
<tr>
<td>Oxygen Saturation</td>
<td>%</td>
<td>93 NS</td>
<td>NS 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95 NS</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>units</td>
<td>8.14 NS</td>
<td>NS 8.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.16 NS</td>
<td></td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>mg/L</td>
<td>726 NS</td>
<td>NS 560</td>
</tr>
<tr>
<td></td>
<td></td>
<td>740 NS</td>
<td></td>
</tr>
<tr>
<td>Turbidity</td>
<td>NTU</td>
<td>250 NS</td>
<td>NS 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>240 NS</td>
<td></td>
</tr>
<tr>
<td>Total Organic Carbon</td>
<td>mg/L</td>
<td>128 NS</td>
<td>NS 49.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>125 NS</td>
<td></td>
</tr>
<tr>
<td>Chlorophyll a</td>
<td>µg/L</td>
<td>13 NS</td>
<td>NS 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 NS</td>
<td></td>
</tr>
<tr>
<td>Ammonia Nitrogen</td>
<td>mg/L N</td>
<td>0.015 NS</td>
<td>NS 0.034</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0.003 NS</td>
<td></td>
</tr>
<tr>
<td>Nitrate Nitrogen</td>
<td>mg/L N</td>
<td>0.439 NS</td>
<td>NS 0.530</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0.433 NS</td>
<td></td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen</td>
<td>mg/L N</td>
<td>&lt;2.0 NS</td>
<td>NS &lt;2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;2.0 NS</td>
<td></td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>mg/L N</td>
<td>&lt;2.0 NS</td>
<td>NS &lt;2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;2.0 NS</td>
<td></td>
</tr>
<tr>
<td>Soluble Phosphorus</td>
<td>mg/L P</td>
<td>0.00 NS</td>
<td>NS 0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 NS</td>
<td></td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>mg/L P</td>
<td>&lt;0.30 NS</td>
<td>NS &lt;0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.40 NS</td>
<td></td>
</tr>
<tr>
<td>Escherichia Coliform</td>
<td>colonies/100 mL</td>
<td>4 NS 20</td>
<td>NS 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 NS</td>
<td></td>
</tr>
<tr>
<td>Fecal Coliform</td>
<td>colonies/100 mL</td>
<td>0 NS 20</td>
<td>NS 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 NS</td>
<td></td>
</tr>
</tbody>
</table>

**Weather Conditions during monitoring:** Winds NW at 33 km/hr with 100% cloud cover. Average air temperature during survey at 5°C.

**Notes:**
1. LIMS Reference No.: 29405
2. Calculated values
3. Analyzed by contract laboratory.
4. Red River elevation at South Floodway Control Gates: 746.9 ft.
5. There are no samples at the West Perimeter Bridge or the South Floodway Control Gates due to construction.

**Report Compiled By:** J. Jones
**Approved in LIMS By:** S. Fletcher
**Date Approved:** 30-May-11

**File No.:** 040-14-09-03-00
Performance of Utilities Respecting Regulatory/ Licence Requirements
Performance of Water Utility

• Office of Drinking Water 2010 Annual Audit Report found 100% compliance in all categories
• No warnings issued or charges laid
• Water Utility continues to be in compliance with licence, regulations and guidelines
Performance of Wastewater Utility

- Wastewater Utility generally in compliance with licences and regulations
- No warnings issued or charges laid
- Some non-compliance on daily limits under discussion with MB Conservation
- South End Sewage Treatment Plant process upset in October/November 2011
Summary for Water and Wastewater Utilities
Summary
Water and Wastewater Utilities

• Manage a myriad of Federal and Provincial requirements in legislation, regulation, licence and guideline format
• Sample, monitor, and test utility infrastructure more than required; City lab accredited by CALA
• Submit compliance reports on a weekly, monthly, quarterly and annual basis to both levels of government as required
• Practice internal due diligence through discussion of monthly compliance reports by Department Management Team
Summary
Water and Wastewater Utilities (cont’d)

• Practice external due diligence with biannual wastewater compliance meetings with Provincial staff; water compliance meetings usually held annually
• Update and enforce by-laws (Water Works and Sewer) to protect public health, safety and the environment
• Comply with regulatory and licence requirements
• Provide most compliance information on the Winnipeg website in the spirit of transparency
Water Pollution Control Centre licensing and monitoring

The City of Winnipeg operates three wastewater treatment plants to protect public health and the freshwater environment. Under The Manitoba Environment Act, developments such as wastewater treatment plants must be licensed. Based on recommendations from the Clean Environment Commission in 2003, Manitoba Conservation issued the following:

- North End Water Pollution Control Centre
- South End Water Pollution Control Centre
- West End Water Pollution Control Centre
  [Manitoba Environment Act Licence No. 2669RRR](#) (revised June 19, 2009) (pdf - 775kb)

Manitoba Conservation also requires a licence for our biosolids operation:

- [Manitoba Environment Act Licence No. 1089ERR](#) (under review) (pdf - 3,994kb)

**Compliance reporting**

The above licences set terms and conditions that the City is required to meet in operating the wastewater treatment plants. The licences require that we regularly monitor plant operations and the quality of effluent discharged from the plants to the rivers. This includes daily routine tests for biochemical oxygen demand and for nutrients such as phosphorus. We also test for heavy metals at varying times each year. The routine tests are reported on a monthly basis to Manitoba Conservation and the non-routine tests are reported yearly:

- [North End Water Pollution Control Centre monthly compliance reports](#)
- [South End Water Pollution Control Centre monthly compliance reports](#)
- [West End Water Pollution Control Centre monthly compliance reports](#)
Water quality test results

We test Winnipeg drinking water to ensure compliance with our Operating Licence, the regulations and Guidelines for Canadian Drinking Water Quality. These guidelines apply to treated water only, that is, fresh water that people consume from a cold water tap. Therefore, the majority of the guidelines do not apply to the tests we take on the raw water at Shoal Lake and the Water Treatment Plant because Winnipeg residents don't consume the water directly from either of these locations. The exception is the test results for herbicides, pesticides and PCBs at the Water Treatment Plant raw. The guidelines apply to treated water but we test the water at the Water Treatment Plant raw because the water distribution system downstream from this point is a closed system that should prevent the water from being contaminated by these chemicals. If you would like more information on water quality, visit Health Canada.

2010 test results are provided for:

- Shoal Lake
- Water Treatment Plant raw
- Water Treatment Plant treated
- Winnipeg distribution system

The historical reports below include test results for Deacon Reservoir because, before the Water Treatment Plant was built, sampling was done at the Deacon Reservoir outlet.

- 2009 test results:
Combined Sewer Wastewater Collection System

Cynthia Wiebe, P.Eng.
Wastewater Collections Planning Engineer
Outline

• Wastewater Collection System
• Regulatory Information
• Combined Sewer Overflow Project Updates
• Development of a Long-Term Combined Sewer Overflow Program
Wastewater Collection System
Wastewater Collection System

- 43 combined sewer districts
- 79 combined sewer outfalls
• Older parts of the city (pre-1960) have combined sewers
  – approximately 27% of the city
• During dry weather, all wastewater is treated
• During wet weather, both systems have the potential for basement flooding
• Combined systems can experience overflows
Combined Sewer Overflows

- Response to wet weather – protects citizens from basement flooding
- On average, overflows occur about 22 times/year
- Dilute mixture of sewage and rainwater
- Major impact is a temporary increase in fecal coliform levels
- Typically only 1% of the total annual sewage is lost to overflows
Regulatory Information
Background

• Clean Environment Commission (CEC) hearings held in 1991 and 1992 to better understand the use of the rivers in the Winnipeg area

• As a result, CEC recommended that the City investigate the impacts of CSOs on river water quality

• In response, the City began a Combined Sewer Overflow Management Strategy Study in 1994
  – focused on conceptual level controls
  – provided a good resource and foundation for future spending and planning
Background

- CEC hearings held in 2003 on the continued operation and future development of the wastewater collection and treatment systems
- Recommendations:
  1. Combined sewer overflows
     - develop a plan to reduce CSOs within 20 - 25 years
     - reduce CSOs through operational and capital projects
  2. Public notification system
     - implement a system to inform the public whenever there is a release of raw sewage to the local rivers
Provincial Regulation Status

- Awaiting a CSO licence from Provincial regulators
- Had preliminary discussions with Manitoba Conservation
  - indication is that the licence will be coming shortly
- Goal is to work collaboratively with regulators
  - achieve a risk-based approach to CSO control
  - develop methods to evaluate CSO mitigation and licence compliance
Federal Guidelines

• Canada-wide strategy for managing municipal wastewater effluent endorsed in 2009
• Goal is to minimize the impact of CSOs on our rivers and Lake Winnipeg by meeting the national standards
  – no increase in CSO frequency due to development
  – no dry weather overflows, except during spring thaw and emergencies
  – remove floatable materials where possible
• Province may determine additional objectives
CSO Project Update
Improvements to Date

• Identifying and reducing dry weather overflows through system upgrades
  – upgrading pumps, raising weirs, replacing pipes

• Identifying and removing large flows into the sewer system (e.g., ditches connecting to the sewer system)

• Using high level sewer warning alarms at overflow locations to provide time for crews to respond and prevent overflows where possible

• Enhancing computer system for monitoring sewer infrastructure (e.g., alarms, pumps, flows)
Public Notification System

Sewer overflow information system

winnipeg.ca/waterandwaste/sewage/overflow/present.stm

• Reports on the likelihood of an overflow event based on the number of high level alarms being received at the control centre
• Indicates only that an overflow is imminent, but not necessarily that an actual overflow is occurring
CSO Related Capital Projects / Initiatives

• Work to date to reduce CSOs
  – CSO Outfall Monitoring Program
  – Pilot Stormwater Retention Tank
  – Combined Sewer Separation Projects
  – Low-Impact Development Standards
  – Combined Sewer Relief Studies
  – Interceptor and collection system sewer flow monitoring
  – Combined sewer renewals and replacements
  – Lift station improvements and capacity upgrades
Development of a Long-Term CSO Program
CSO Master Plan

• 2002 CSO study outlines various CSO strategies
  – $450 million to $1.5 billion (2002 dollars)

• CSO Master Plan objectives include:
  – review and update the 2002 CSO Management Study
  – create a city-wide hydraulic computer sewer model
  – recommend a long-term plan to reduce CSOs

• Issued a Request for Qualifications in December 2011 for the Development of a CSO Master Plan
  – shortlist qualified consultants for the proposal phase
  – will build on the foundation set by the 2002 study and knowledge gained through recent capital projects

• Is expected to take 3 to 5 years to complete
Summary

• Committed to improving our sewer infrastructure and decreasing the impact of CSOs on our rivers and Lake Winnipeg
  – continue to carry out capital projects and operational improvements to reduce CSOs
  – develop a long-term plan to address CSOs
• Dedicated to working with Provincial regulators to create a sustainable risk-based approach to CSO control
Bill 46 and Total Nitrogen Removal

Arnold Permut M.Sc., P.Eng
Wastewater Planning Engineer
Outline

• Background
• Overview – Wastewater Treatment
• Bill 46 – Treatment Requirements
• Total Nitrogen Removal
• Science and Experience – Total Nitrogen Removal
• Cost of Total Nitrogen Removal
• City Recommendation
• Summary
Background

• 2003 Clean Environment Commission (CEC) report recommended that the City reduce the following in wastewater treatment plant discharges based on a 30-day rolling average:
  - phosphorous - 1.0 milligrams per litre
  - total nitrogen - 15 milligrams per litre

• In January 2008, City responded to the Province:
  - advised that we will comply with the licence requirement for control of ammonia once the North End Sewage Treatment Plant is upgraded, and
  - requested the requirement for total nitrogen removal be removed from our licence
Background (cont’d)

• September 2008, Minister of Conservation ordered the CEC to investigate nutrient (nitrogen and phosphorus) reduction and ammonia (a form of nitrogen) treatment at Winnipeg’s sewage treatment plants

• March 2009, CEC report reaffirmed the 30-day rolling average limits:
  phosphorus discharges - 1.0 milligrams per litre
  nitrogen discharges - 15 milligrams per litre
Wastewater Treatment at the North End Sewage Treatment Plant

1. Preliminary treatment:
   - Bar Screens
   - Grit Removal

2. Primary treatment:
   - Primary Clarifier
   - SBR

3. Secondary treatment:
   - HPO bioreactors
   - Secondary clarifier

4. Disinfection:
   - UV disinfection

5. Centrate treatment:
   - Anaerobic digestion

6. Biosolids treatment:
   - Biosolids to Landfill

Raw influent flows through the process, ending with the final effluent.
Bill 46 Treatment Requirements
North End Treatment Plant Only

• Phosphorus
  – treat to required limit using biological processes only (no chemical treatment)

• Reuse of phosphorus
  – support this and continue to evaluate new, cost effective technologies
  – biosolids composting trial will turn 20% of wastewater solids into reusable compost; submitting a plan to Manitoba Conservation seeking alterations to the existing Biosolids Licence
  – may recover phosphorus in a form that can be used in the manufacture of commercial fertilizer
Bill 46 Treatment Requirements
All Sewage Treatment Plants

• City does not concur with the proposed ammonia **daily** limit requirement (varies by month and by plant)
  – considerable cost for no demonstrable benefit
  – overdesign of treatment plants for wet weather flows
  – continuing our discussions with Province regarding limit
Total Nitrogen Removal
Two Step Process

• Step 1: Ammonia (NH₃) is converted to nitrate (NO₃):
  \[ \text{NH}_3 + \text{O}_2 \rightarrow \text{NO}_3 \]

• Step 2: Nitrate is converted to nitrogen gas
  \[ \text{NO}_3 + \text{carbon} \rightarrow \text{N}_2(g) \]

• Current licence states that North End Sewage Treatment Plant, as of December 31, 2014, must not discharge effluent in which “the concentration of total nitrogen of the effluent is in excess of 15 milligrams per litre as determined by the 30-day rolling average” (i.e., monthly average)
Scientific Evidence Does Not Support a Total Nitrogen Limit

- Some forms of algae can convert nitrogen gas in the atmosphere into a nutrient (nitrogen fixers)
- Total nitrogen removal will limit green algae, but then gives nitrogen-fixing algae (i.e., blue-green algae) a competitive advantage
- Blue-green algae (cyanobacteria) do not need nitrogen from water - takes it from the air as needed
Scientific Evidence Does Not Support a Total Nitrogen Limit (cont’d)

• Blue-green algae are harmful to humans and animals since they produce the following toxins:
  – neurotoxins (cause damage to nerves and nerve tissue)
  – hepatoxins (cause damage to the liver)
  – endotoxins (cause excessive internal bleeding; severe diarrhea; fever; affects resistance to bacterial infections)
Nitrate Removal Not Beneficial to Lake Winnipeg

Explosive algae growth is by N-fixers
(Dr. D Shindler’s conclusions, verified by Dr. H Kling)

63 prominent scientists wrote to the Manitoba Clean Environment Commission.

“Removing nitrogen will at best do nothing, and at worst, increase the dominance of the filamentous nitrogen-fixing cyanobacteria.”
Research Proves Phosphorus is Key Nutrient

- Whole lake experiment to understand the algal response to carbon (C), nitrogen (N) and phosphorus (P) additions
- Phytoplankton (algae) growth limited by P supply
- Controlling N input to lakes may adversely affect water quality
- Low nitrogen conditions favour blue-green algae (cyanobacteria)

Source: David W. Schindler, 1977 SCIENCE, VOL. 195, p260-262
Science Supports

• Phosphorus is the key element in eutrophic lakes (rich in nutrients, supporting a dense plant population, but depriving animal life of oxygen)
  – remove aggressively

• Total nitrogen removal will not benefit Lake Winnipeg
  – may result in detrimental outcome

• Not implementing a total nitrogen limit helps green algae compete against harmful blue-green algae, minimizing harm caused by blue-green algae
Real World Experience

• Toronto wastewater treatment system
  – serves 2.6 million people
  – discharges to Lake Ontario & Don River
  – only removes phosphorus (no nitrogen removal)

• The Great Lakes have recovered from eutrophication
  – other cities discharging to the Great Lakes remove phosphorus only
  – total nitrogen removal was not a significant factor in Great Lakes recovery
Cost of Total Nitrogen Removal

• Financial cost
  – increases size and operating cost of facilities
  – larger sewage treatment plants (North End and South End) would be required

• Environmental cost
  – increased carbon footprint (carbon source required for nitrate removal)
  – increased energy requirements to operate
City Recommendation

• Focus resources on phosphorus reduction and phosphorus reuse as supported by scientific studies and practical experience elsewhere (i.e., Toronto and Lake Ontario, other Great Lakes)
Summary

• Dedicated to improving both our sewer infrastructure and our sewage treatment program to help protect the quality of water in the Red River, Assiniboine River and Lake Winnipeg
• Plan to remove phosphorus to limits in Bill 46
• Continue to explore sustainable, practical reuse of nutrients
  – compost, phosphorus-based fertilizer
Summary (cont’d)

• Based on our vision statement, “excellence in environmental services”, we do not support the total nitrogen limit in Bill 46 / North End Sewage Treatment Plant licence
  – gives harmful blue-green algae a competitive advantage in Lake Winnipeg
  – increased financial and environmental cost
  – eliminating a total nitrogen limit provides greater protection to the environment and public and animal health

• Continuing discussions with the Province regarding ammonia and nitrogen limits
Asset Management - Integration of Management Processes

Geoffrey Patton P. Eng.
Asset Management Engineer

Winnipeg
Definition of Asset Management

“An integrated set of processes to minimize the lifecycle costs of owning, operating, and maintaining assets, at an acceptable level of risk, while continuously delivering established levels of service.”

References:
- Implementing Asset Management: A Practical Guide (AMWA, NACWA, WEF)
- City of Winnipeg Draft Comprehensive Asset Management Administrative Standard
Drivers of Asset Management

- Aging infrastructure
- Public demands for high level of service
- Regulations
- Population growth or decline
- Liability / risk management
- Limited financial resources
- Increased accountability
Challenges of Differing Asset Service Life

Lifespan of Assets

- Roads
- Water
- Sewer
- Other Utilities

Time
Road Right of Way

- Other
  - reactive maintenance
  - festivals

- Cathodic Protection

- Water Main Renewal

- Sewer Main Renewal

- Street Renewal - Maintenance

- Street Renewal - Capital

- External Agencies
  - MB Hydro etc

- Basement Flood Relief / CSO

**Right of Way**
- coordination of work
- traffic control
Coordination between Street and Underground Renewal Programs

• Proposed project locations exchanged using spatially enabled databases
• Renewal budget limitations discussed in advance
• Challenges
  – change in street renewal treatment
  – cancellation of projects
Underground Structures Committee

• Established in 1974
• City Departments
  – Public Works, Water and Waste, Property Planning and Development, Corporate Support Services
• Manitoba Hydro, MTS Allstream, AT&T Canada
• Formulate and adopt standard locations for future underground construction by utilities
• Coordinate construction on or under streets
• Records of structures within the right of way
Envista

• Web-based infrastructure coordination tool to identify project conflicts and opportunities
• Used by Underground Structures Committee for project location communication and coordination
• Use started in 2010
• www.envista.com
Benefits of Asset Management

- Provides better and consistent levels of service
- Reduces total cost of asset ownership
- Reduces and manages risk
- Improved communication/coordination
- Improves information transfer and knowledge retention
Water Services
Disconnection / Reconnection

Wanda Burns, C.A.
Assistant Controller, Revenue
Disconnection Policies

• Disconnection
  – turning off the water to a property to obtain payment for overdue water accounts failing all other attempts to collect

• Adding unpaid water and sewer charges to the property tax bill
  – authorized under the City of Winnipeg Charter Act (section 210 (4)(c)(iii))

• Property owners and tenants are treated equally
  – landlords advised of overdue balances
  – landlords required to approve a tenant’s payment arrangements
Disconnection Procedures

• A minimum of 70 days between the bill date and disconnection
  – reminder notice mailed 40 days after bill date
  – turn off notice mailed 60 days after bill date
  – contact by phone 60 - 70 days after bill date

• Review account and property information to identify any reason the water should not be disconnected
Disconnection Procedures (cont’d)

• Disconnections
  – ensure customer has a same day payment option on the day after disconnection

• Following disconnection
  – revisit property if customer does not contact us 30 days after disconnection
  – advise health inspectors if property is occupied and residents require assistance
Reconnection Policies

• Reconnect water service only after full payment, including a reconnection fee
• If customer is reconnected based on payment arrangements, water service is subject to immediate disconnection if arrangements are not kept
Disconnection Statistics

2010 Disconnections

Month
Water Conservation Promotion

Duane Griffin, P. Eng.
A/Water Planning & Project Delivery Branch Head
Winnipeg was Booming at the Onset of this Century

“CHICAGO of the NORTH”

Population

- 1874 - 1,869
- 1890 - 23,000
- 1902 - 50,000
- 1910 - 132,720
- 1913 - 215,000
- 1920 - 250,000
Our Water Supply

Existing Water Supply System

Figure 3-1
Aqueduct capacity
385 million litres per day

Water treatment plant capacity
400 million litres per day
Previous Per Capita Projection

Aqueduct Capacity

30ML/d Groundwater

Additional Water Source

Year

Water Demand (M.L/d)
Water Conservation Program Mission

“To increase water use efficiency in Winnipeg without negatively impacting the quality of life enjoyed by Winnipeggers, to defer expansions to the water supply system.”
Water Conservation Research

- 1994: The City of Winnipeg Water Supply Plan
- 1994: The City of Winnipeg in partnership with FortWhyte Alive in Water Efficient Landscaping
- 1994: The City of Winnipeg Water Conservation Database and Waterfront Website
- 1994: The City of Winnipeg Pilot Toilet Rebate Program
Water Conservation Research

- 1995: Industrial Water Consumption Customer Survey
- 1996: The City of Winnipeg in partnership with FortWhyte Alive in the Youth Education Program
- 2009: Residential Toilet Replacement Credit Program
  - 2009 - 981 credits approved
  - 2010 - 2722 credits approved
  - 2011 - 4166 credits (budget maximum)

Of the 28 businesses surveyed:

- 95% noted the reason for conserving water is financial savings
- 80% indicated a willingness to share ideas with other industries either through a group forum or through written correspondence
- 80% practice energy conservation and/or recycling
- 77% expect their water consumption to decrease or remain the same in the next 5 – 10 years
- 70% have a committee or individual which/who is responsible for implemented changes in the workplace
- 70% practice improvement initiatives
- 55% practice water conservation
- 50% have conducted a water audit
Slow the Flow Youth Education (1996)

• Partnered with FortWhyte Alive to deliver the Slow the Flow Water Education Program

• Program goals are:
  – develop a general awareness of water conservation
  – create life-long water conservationists – the decision makers of the future
  – enhance existing core subjects with relevant lifestyle information
City of Winnipeg - Water Usage by User Group (2010)

- Residential: 58%
- Commercial: 23%
- Industrial: 4%
- Non-Revenue: 15%
Winnipeg residential indoor water use

- Toilet Leaks: 6%
- Faucets: 9%
- Baths: 10%
- Washing Machines: 18%
- Showers: 20%
- Dishwashers: 3%
- Cleaning: 1%
- Drinking Water: 1%
- Toilets: 32%
Factors Affecting Residential Water Use Projections

**Long Term Effect**
- Demographics
- Public Education - school - general
- Price Elasticity
- New Technologies Available

**Short Term Effect**
- Price Elasticity

**LIFESTYLE**
- Habits
- Showering frequency & duration
- Laundry frequency
- Outdoor use (Avg. ~ 6%)

**TECHNOLOGY**
- Toilets
- Showerheads
- Laundry

**WATER USE**
- LCD
- MLD

**Factors Affecting Residential Water Use Projections**

**Long Term Effect**
- Habits
- Showering frequency & duration
- Laundry frequency
- Outdoor use (Avg. ~ 6%)

**Short Term Effect**
- Price Elasticity

**Long Term Effect**
- New Technologies Available
- New Accounts
- Renovation Rates

**Population Growth**

**LCD – Litres per capita per day**

**MLD – Millions of litres per day**
Usage Per Person in Age Group

Base Usage Per House = 221 Litres/Home/Day
Market Change due to Technology Acceptance

Overlapping S-Curves of 13L and 6L toilets (c)

Toilet Sales By Type in Winnipeg

Percentage of Units

Year

6L
13L
Transition in Toilets Used
(4% Renovation Rate)
Residential Indoor Water Use

Effects of Technology Change

1992 (228 LCD)

- Toilets: 73
- Washers: 41
- Dishwasher: 7
- Cooking/Drinking: 2
- Cleaning: 2
- Toilet Leaks: 14
- Faucets: 20
- Bath: 23
- Showers: 46

2004 (217 LCD)

- Toilets: 59
- Washers: 41
- Dishwasher: 7
- Cooking/Drinking: 2
- Cleaning: 2
- Toilet Leaks: 14
- Faucets: 20
- Bath: 23
- Showers: 49

2019 (196 LCD)

- Toilets: 41
- Washers: 37
- Dishwasher: 7
- Cooking/Drinking: 2
- Cleaning: 2
- Toilet Leaks: 14
- Faucets: 20
- Bath: 23
- Showers: 48

2046 (174 LCD)

- Toilets: 30
- Washers: 33
- Dishwasher: 7
- Cooking/Drinking: 2
- Cleaning: 2
- Toilet Leaks: 14
- Faucets: 20
- Bath: 23
- Showers: 42
Billed Water Consumption By Block (1989 - 2010)
Water Demand Projections

ML/d

Year

2003 Projection
Actual Pumpages
Aqueduct Capacity
2004 Conference Board

Slow the Flow
What Does This Mean?

- Residential, commercial and industrial customers using less water today than in 1990
- Trend is toward more water efficient fixtures
- Don’t require another aqueduct
- Water treatment plant capacity has been reduced
- Expansion of in-town reservoirs have been deferred
Agreements with Neighbouring Municipalities for City Services

Moira Geer, CA
Rural Municipality of East St. Paul

- For City water, sewer and land drainage services
- Since 1976
- Frontage levies and hydrant charged to municipality
- Water and sewer services billed directly to property owners
Service-Sharing with Other Neighbouring Municipalities

• On December 14, 2011, City Council:
  – approved Basic Terms for Service Sharing Agreements for the Provision of Water and Sewer Services to Neighbouring Municipalities
  – authorized the City’s Chief Administrative Officer to negotiate and finalize service sharing agreement with the Municipality of West St. Paul
  – passed a resolution requiring all future negotiated service sharing agreements or amended service sharing agreements to be approved by City Council