Regional Municipality of Waterloo
Planning and Works Committee
Agenda
Tuesday, October 6, 2015
11:00 a.m. – Note Time Change (Immediately Following Closed Session)
Regional Council Chamber
150 Frederick Street, Kitchener

1. Motion to Reconvene Into Open Session
2. Declarations of Pecuniary Interest under The Municipal Conflict Of Interest Act
3. Delegations

Consent Agenda Items
Items on the Consent Agenda can be approved in one motion of Committee to save time. Prior to the motion being voted on, any member of Committee may request that one or more of the items be removed from the Consent Agenda and voted on separately.

4. Request to Remove Items from Consent Agenda
5. Motion to Approve Items or Receive for Information
Recommendation:


5.2 PDL-CPL-15-39, Study Update – Balancing Environmental Protection and Transportation, the Laurel Creek Headwaters Environmentally Sensitive Landscape Case Study

Recommendation:

That Regional Council authorize staff to hold an Open House on October 27, 2015 in order to present the preliminary findings of the Laurel Creek Headwaters Environmentally Sensitive Landscape Case Study and to receive further public input to inform the completion of the study, as described in Report No. PDL-CPL-15-39, dated October 6, 2015.

5.3 PDL-LEG-15-65, Authorization to Expropriate Lands (1st report) For Ottawa Street (Regional Road 4) Improvements Project (Dreger Avenue to Midland Road), in the City of Kitchener

See Recommendation on page 40

Regular Agenda Resumes

6. Reports - Planning, Development and Legislative Services

Community Planning

6.1 PDL-CPL-15-51, Region of Waterloo Comments on the Review of the Conservation Authorities Act

Recommendation:

That the Regional Municipality of Waterloo forward Report PDL-CPL-15-51, dated October 6, 2015, to the Ministry of Natural Resources and Forestry as input to the review of the Conservation Authorities Act.

Reports - Transportation and Environmental Services

Commissioner’s Office

6.2 TES-15-03/COR-15-02, Corporate Asset Management Strategy Project Update (Staff Presentation) (For Information)
Transportation

6.3 **TES-TRP-15-21**, Transportation Master Plan Update: Scope of Work (For Information)  

Water Services


**Recommendation:**

That the Regional Municipality of Waterloo approve in principle the Source Protection Plan Incentive Program as outlined in report TES-WAS-15-25 dated October 6, 2015 as the basis for continuing the development of the Incentive Program.

And That the Regional Municipality of Waterloo approve an incentive program with an end date of August 16, 2017 for small septic system owners as outlined in report TES-WAS-15-25 dated October 6, 2015.


6.6 **TES-WAS-15-30**, Biosolids Strategy – Engagement Update (For Information)  

6.7 **TES-WAS-15-31**, Water Financial Plan

**Recommendation:**

That the Regional Municipality of Waterloo take the following actions, in accordance with Report TES-WAS-15-31 dated October 6, 2015:


3. Endorse the financial plans as financially viable;

4. Approve the submission of the financial plans to the Ministry of Municipal Affairs and Housing in accordance with the ‘Safe Drinking Water Act’; and
5. Authorize the Commissioner, Transportation and Environmental Services, to sign all documentation related to this matter.

6.8 **TES-WAS-15-32**, Greenbrook Water Treatment Plant Update (For Information)  

6.9 William Street and Strange Street Water Supply Systems Class Environmental Assessment – **Information Package** in Advance of Public Consultation Centre No. 2

7. **Information/Correspondence**

7.1 Council Enquiries and Requests for **Information Tracking List**

8 **Other Business**

9. **Next Meeting** – October 27, 2015

10. **Adjourn**
### Next Meetings

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<tr>
<td><strong>Planning and Works Committee</strong></td>
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<tr>
<td>October 27, 2015</td>
<td>1:00 P.M.</td>
<td>Planning and Works Committee</td>
<td>Council Chamber 2&lt;sup&gt;nd&lt;/sup&gt; Floor, Regional Administration Building 150 Frederick Street Kitchener, Ontario</td>
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<td><strong>Transportation and Environmental Services</strong></td>
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<td>Tue., October 20, 2015</td>
<td>5:00 P.M. – 7:00 P.M.</td>
<td>William Street and Strange Street Water Supply Systems Class Environmental Assessment – Public Consultation Centre No. 2</td>
<td>Region of Waterloo Public Health and Social Services Building 99 Regina Street South 5&lt;sup&gt;th&lt;/sup&gt; floor Waterloo, Ontario</td>
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<tr>
<td>Thur., October 22, 2015</td>
<td>5:00 P.M. – 7:00 P.M.</td>
<td>William Street and Strange Street Water Supply Systems Class Environmental Assessment – Public Consultation Centre No. 2</td>
<td>St. John Catholic Elementary School 99 Strange Street Kitchener, Ontario</td>
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Region of Waterloo

Planning, Development and Legislative Services

Community Planning

To: Chair Tom Galloway and Members of the Planning and Works Committee

Date: October 6, 2015   File Code: D18-01

Subject: Monthly Report of Development Activity for August 2015

Recommendation:


Summary:

In accordance with the Regional By-law 01-038, as amended, the Commissioner of Planning, Development and Legislative Services has:

- Approved the following part lot control exemption by-law;
- Accepted the following plan of condominium;
- Draft approved the following plans of subdivision and plan of condominium;
- Modified the following draft plan of subdivision; and
- Released for registration the following plan of subdivision and plans of condominium

Report:

City of Cambridge

Draft Approval of Plan of Subdivision 30T-13102

Applicant: Grand Ridge Estates Ltd.

Location: Extension of Freure and Salisbury Avenue

Proposal: To permit the development of 159 residential single detached units and 108 residential townhouse units.

Regional Processing Fee: Paid August 7, 2015

Commissioner’s Approval: August 20, 2015
Draft Approval of Plan of Subdivision 30T-13102

Came Into Effect: September 10, 2015

Draft Approval of Plan of Subdivision 30T-11102

Applicant: Millgate Holdings Inc.
Location: 140 Old Mill Road
Proposal: To permit the development of an industrial business park consisting of 14 industrial lots, a stormwater management facility, an open space block and a future development block serving as a potential temporary noise attenuation berm.

Regional Processing Fee: Paid August 18, 2015
Commissioner’s Approval: August 20, 2015
Came Into Effect: September 10, 2015

City of Kitchener

*Plan of Condominium Application 30CDM-15203

Date Accepted: July 29, 2015
Applicant: 2335945 Ontario Inc.
Location: 445 King Street West
Proposal: To permit the development of 212 residential apartment condominium units, 1 commercial unit and 2 units that allow for commercial and residential use.

Regional Processing Fee: Paid July 29, 2015

*Registration of Draft Plan of Subdivision 30T-11203

Draft Approval Date: June 25, 2012
Phase: Stage 2
Applicant: 1841362 Ontario Inc.
Location: 1 Adam Street
Proposal: To permit the development of 19 residential townhouse condominium units.

Regional Processing Fee: Paid July 17, 2015
Commissioner’s Release: July 27, 2015
Registration of Draft Plan of Condominium 30CDM-14208

Draft Approval Date: February 5, 2015
Phase: Entire Plan
Applicant: 22404445 Ontario Inc.
Location: 85 Gage Avenue
Proposal: To permit the development of 28 residential townhouse condominium units.

Regional Processing Fee: Paid July 29, 2015
Commissioner’s Release: July 29, 2015

*These applications were not included in the July Report

Registration of Draft Plan of Condominium 30CDM-14205

Draft Approval Date: July 13, 2015
Phase: Stage 1
Applicant: Deerfield Homes Ltd.
Location: 388 Old Huron Road
Proposal: To permit the development of 36 residential apartment condominium units

Regional Processing Fee: Paid August 5, 2015
Commissioner’s Release: August 21, 2015

City of Waterloo

Modification to Draft Plan of Subdivision 30T-05404

Draft Approval Date: May 1, 2014
Applicant: 1353843 Ontario Limited (Cook Homes)
Location: 353 Woolwich Street
Proposal: To redline revisions to the plan to remove two (2) residential lots on the north side of Steeplechase Way, and to widen eleven (11) residential lots on the north side of Steeplechase Way.

Regional Processing Fee: Paid April 14, 2015
Commissioner’s Approval: August 24, 2015
Came Into Effect: Immediately
Township of Wilmot

Draft Approval of Plan of Condominium 30CDM-15601

Applicant: Freda Klassen
Location: 61 Greenwood Drive, New Hamburg
Proposal: To permit the development of 3 residential condominium townhouse units.

Regional Processing Fee: Paid August 18, 2015
Commissioner’s Approval: August 27, 2015
Came Into Effect: September 17, 2015

Registration of Draft Plan of Condominium 30CDM-01601

Draft Approval Date: April 17, 2002
Phase: Phase 7
Applicant: Stonecroft Corporation
Location: Haysville Road, New Hamburg
Proposal: To permit the development of 53 residential single detached condominium units.

Regional Processing Fee: Paid June 30, 2015
Commissioner’s Release: August 17, 2015

Township of Woolwich

Part Lot Control Exemption By-law 55-2015

Applicant: Hazad Construction Company Limited
Location: Golf Course Road
Proposal: To permit the creation of 4 semi-detached units.

Regional Processing Fee: Paid August 28, 2015
Commissioner’s Approval: August 28, 2015

Area Municipal Consultation/Coordination:

These planning approvals and releases, including consultations with Area Municipalities, have been completed in accordance with the Planning Act. All approvals included in this report were supported by the Area Municipal Councils and/or staff.
Corporate Strategic Plan:

This report reflects actions taken by the Commissioner in accordance with the Delegation By-law adopted by Council. The activities of Focus Area A: Growth Management and Prosperity.

Financial Implications:

Nil.

Other Department Consultations/Concurrence:

Nil.

Attachments:

Nil.

Prepared By: Andrea Banks, Program Assistant

Approved By: Rob Horne, Commissioner, Planning, Development and Legislative Services
Region of Waterloo
Planning, Development and Legislative Services
Community Planning

To: Chair Tom Galloway and Members of the Planning and Works Committee
Date: October 6, 2015 File Code: D10-20
Subject: Study Update - Balancing Environmental Protection and Transportation, the Laurel Creek Headwaters Environmentally Sensitive Landscape Case Study

Recommendation:

That Regional Council authorize staff to hold an Open House on October 27, 2015 in order to present the preliminary findings of the Laurel Creek Headwaters Environmentally Sensitive Landscape Case Study and to receive further public input to inform the completion of the study, as described in Report No. PDL-CPL-15-39, dated October 6, 2015.

Summary:

In May 2013, Regional Council endorsed a study to identify opportunities to better balance transportation and environmental considerations in Environmentally Sensitive Landscapes (ESLs). The overall goal of the study is to identify measures to address potential conflicts between transportation, environmental features and wildlife in areas where roads are located in ESLs or other environmentally significant areas. Regional staff subsequently initiated this work focusing on the Wilmot Line- Kressler Road corridor within the Laurel Creek Headwaters ESL as a case study.

This study is not meant to fulfill the requirements of the Environmental Assessment Act with respect to any potential upgrades to Wilmot Line in the future. It is also not an Environmental Impact Statement under the Regional Official Plan (ROP). If upgrades to Wilmot Line are proposed in the future, a formal Environmental Impact Statement (or...
similar study) in accordance with the ROP will likely have to be completed as part of the EA process, depending on the nature of the project. However, staff expect that the recommendations from this study will help inform future environmental and transportation study requirements where ESLs are impacted by roads.

An initial public open house was held on February 26, 2015 to inform residents and other stakeholders of the study and obtain feedback, and staff received 38 written submissions that were reviewed and considered as part of the study’s draft report.

In recent years, the Township of Wilmot has expressed interest in upgrading the surface of Wilmot Line within the ESL from its current gravel condition to a hard surface (tar/chip or pavement). The Project Team has given careful consideration to the Township’s interests throughout the study process and Township staff has been actively involved throughout the study process. It was not within the scope of the study to determine whether or not Wilmot Line should be upgraded, as this decision rests with the Township in accordance with associated EA requirements.

Preliminary findings related to transportation within the Case Study Area include, but are not limited to, the following:

- Current traffic volumes are less than 1000 Average Annual Daily Traffic (AADT) along the unpaved section of Wilmot Line, which are well below the typical traffic capacity of a paved two-lane rural road. However, in portions of the Case Study Area current traffic volumes are high enough that hard surface treatment may become economically viable from a maintenance perspective;
- Collisions are not a significant issue as there is less than one collision per million vehicle kilometres (MVKM);
- Cyclists and pedestrians are observed to be using the roads within the Case Study Area and conflicts between vehicular traffic and these users have been identified by the public as an issue that requires attention; and
- Within the unpaved portion of Wilmot Line, the 85th percentile speeds are generally much higher than the posted speed limit indicating that vehicles are excessively speeding.

Based on public input received to date and technical information gathered as part of the study process, potential measures that would help better balance environmental protection and transportation considerations without road upgrades being undertaken within the Wilmot Line – Kressler Road corridor (Case Study Area) include:

- Wildlife warning signage at potential wildlife crossing locations along the length of the Case Study Area;
- Temporary road closure (similar to Stauffer Drive in Kitchener) during spring breeding migrations in the location of Blanding’s Turtle and Snapping Turtle
habitat, if warranted following completion of detailed amphibian breeding surveys;
- Modifications to road and ditch maintenance practices such as regular inspections, conducting maintenance practices outside of breeding seasons, and ditch vegetation management within the right-of-way;
- Improved stormwater management measures to control runoff and reduce sedimentation to watercourses such as ditch block controls, rock check dams and/or sediment traps;
- Further monitoring of traffic in the area to better understand travel patterns and volumes; and
- Further monitoring of wildlife movement including conducting specific road mortality surveys, habitat assessments, and breeding call surveys.

In the event that the Township wishes to consider upgrades to Wilmot Line, some potential measures that should be evaluated through an Environmental Assessment or Environmental Impact Statement include:

- Investigating operational modifications to the surrounding road network, including improving alternative routes or considering road closures;
- Installing new wildlife crossing structures and exclusionary fencing at certain locations;
- Developing measures to separate vehicular traffic from cyclists and pedestrians;
- Investigating traffic calming measures such as reducing or narrowing the travelled portion of the road at certain locations; and
- Developing a stormwater management strategy including techniques such as ditch maintenance practices/ditch treatments, bioswales and sediment traps or ponds adjacent to watercourses.

Regional staff recommend holding a second public open house later this fall to present preliminary findings and recommendations of the study so that interested persons will have an opportunity to provide further input prior to the finalization of the study report. This open house would take place on Tuesday, October 27, 2015 from 5:00 pm to 8:00 pm at the Waterloo Region Emergency Services Training and Research Complex (WRESTRC), located at 1001 Erb’s Road in Waterloo (Landfill Gate #3). Details of the public open house would be advertised in the local newspapers and online. Residents within the ESL would be sent an invitation to attend the open house by mail. In addition, the draft study report will be made available on the Regional website and in the Regional Councillors’ library.

Following the second open house, Regional staff and the project team would consider public input and revise the study’s draft final report, if necessary. The results and recommendations will then be presented to Regional Council and Area Municipalities (as requested), tentatively later in 2015 or early 2016.
Report:

In May 2013, Regional Council endorsed a case study to identify opportunities to better balance transportation and environmental considerations in Environmentally Sensitive Landscapes (ESLs). This study originated with a recommendation by the Laurel Creek Headwaters ESL Public Liaison Committee about the future stewardship of Wilmot Line within the ESL. Regional staff subsequently initiated a case study focusing on the Laurel Creek Headwaters ESL. The overall goal of the study is to identify measures to address potential conflicts between transportation, environmental features and wildlife in areas where roads are located in ESLs or other environmentally significant areas.

ESLs are designations in the Regional Official Plan that contain concentrations of significant environmental features such as woodlands, wetlands, watercourses, small lakes, groundwater recharge areas and the habitat of endangered and threatened species as well as farms, aggregate operations and small settlements. The Laurel Creek Headwaters ESL is located within four Area Municipalities: the City of Waterloo and the Townships of Wellesley, Wilmot, and Woolwich (see Attachment A). This 2,043 hectare (5,048 acres) ESL was identified based on the concentration of Environmentally Sensitive Policy Areas (ESPAs) and Provincially Significant Wetlands (PSWs) comprising the headwaters of Laurel Creek and adjoining headwaters areas of Martin and Bamberg Creeks. It also contains three small kettle lakes: Bamberg Bog Lake, Paradise Lake and Sunfish Lake.

Significant features in the ESL include the Sunfish Lake – Laurel Creek PSW Complex, seven ESPAs, 21 woodlands that meet the Significant Woodland criteria in the Regional Official Plan and one Regional Forest. These natural features sustain a rich array of significant plants and animals. A total of 56 wildlife species have been recorded in the ESL of which 22 are provincially and/or federally significant. Together, these features and wildlife species make the Laurel Creek Headwaters ESL one of the most important parts of the Region’s Greenlands Network.

Objectives of the Study

This study is not intended to fulfill the requirements of the Environmental Assessment Act with respect to any potential upgrades to Wilmot Line in the future. It is also not an Environmental Impact Statement under the Regional Official Plan (ROP). If upgrades to Wilmot Line are proposed in the future, a formal Environmental Impact Statement (or similar study) in accordance with the ROP will likely have to be completed as part of the EA process depending on the nature of the project. However, staff expect that the recommendations from this study will help inform future environmental and transportation study requirements where ESLs are impacted by roads.
The objectives of the study as outlined in the Terms of Reference are to:

- Enhance and protect the social value of the ESL;
- Protect creeks, wetlands, threatened or endangered species as well as other wildlife species characteristic of the landscape from the effects of increased traffic and required road maintenance;
- Retain or potentially enhance the scenic quality and rural character of roads in accordance with the ESL policies in the Region’s Official Plan; and
- Consider the environmental impacts of recreational uses such as hiking, jogging, horseback riding, cycling, and skiing on roads and adjacent publicly accessible lands.

As part of the Laurel Creek Headwaters ESL case study, issues and potential solutions associated with the above objectives are being addressed in the following study components:

- Transportation - Focusing on identifying issues and recommending measures to reduce potential conflicts between road users (e.g. cars, truck traffic, pedestrians, cyclists, joggers) along the Wilmot Line - Kressler Road corridor;
- Environmental Impacts - Focusing on identifying issues and recommending measures to reduce potential impacts on natural features, functions and species (e.g. sedimentation, pollutants caused by vehicles, snow clearing and road grading); and
- Wildlife Movement – Focusing on identifying and assessing wildlife crossings (e.g. mammals, amphibians, reptiles) on Wilmot Line in the vicinity of Monastery Creek and Laurel Creek, and opportunities to reduce wildlife mortality at these locations (e.g. signage, eco-passages, reduced speed limits).

The project team refined the scope of the study to focus on the eastern part of the ESL where potential impacts on wildlife and environmental features could be more significant as a result of traffic entering and exiting the City of Waterloo (please see Attachment A). This study area includes Kressler Road (Regional Road 16), Wilmot Line, and the following Regional and Area Municipal roads that intersect with them: Erbsville Road (Regional Road 70), Weimar Line (Regional Road 14), Cedar Grove Road, Conservation Drive, Berlett’s Road, Wideman Road, and Carmel-Koch Road.

**Public Consultation**

An initial public open house was held on February 26, 2015 to inform residents and other stakeholders of the study and obtain feedback. Approximately 100 members of the public attended the open house in addition to members of Regional and Area Municipal Councils. In addition, attendees were asked to fill out a questionnaire.
regarding environmental impacts that they have observed in the ESL and potential measures that could be used to address these impacts. As a result, staff received 38 written submissions that were reviewed and considered as part of the study’s draft report.

Responses from the public were summarized into four themes: wildlife impacts, pollution, transportation concerns, and potential mitigation measures.

**Wildlife Impacts**

Many public responses described the fondness the community has for the natural features and diverse wildlife that the ESL supports. In addition, many of the responses discussed wildlife mortality along ESL roads. Comments included concerns for White-tailed Deer, frogs (including Spring Peepers), turtles (including Snapping Turtles), Monarch butterflies, snakes (including Milksnakes), salamanders, and several other species. Other concerns included habitat loss/infringement; loss of wetland features; reduction in biodiversity; and loss of significant species. Other concerns included loss of natural resources provided by the ESL including but not limited to pollination, erosion control, and carbon sequestration; reduced breeding success of reptiles and amphibians; and downstream effects to fish communities. Concerns were largely associated with the Wilmot Line but some people were also concerned about the impacts of the trails within the ESL in the Case Study Area.

**Pollution**

Many responses noted that roads and vehicle use can result in pollution that alters environmental conditions as well as deteriorates the quality of natural features. Impacts may include the introduction of contaminants including oil, gas, salt, exhaust, washer fluid, and garbage; increased sedimentation; increased salinity of both water and soil; salt scalding of vegetation; increased dust and traffic noise.

**Transportation Concerns**

Several transportation related concerns were listed focusing primarily on road maintenance and safety. Safety concerns included the high occurrence of speeding vehicles, poor sightlines for vehicles, and safety of cyclists and pedestrians sharing the road with cars. Several responses stated that there is poor road maintenance within the bounds of the Case Study Area as pot holes, road wash-outs, and icy patches are frequent. The majority of the questionnaires expressed concerns about increasing traffic volumes in the near future due to increased residential and commercial development within north and west areas of Waterloo.

**Potential Mitigation Measures**

Potential mitigation measures proposed by the public within the Case Study Area included:
Implementing public education measures such as signage of significant species found within the area;
Reducing speed limits and increasing enforcement;
Constructing wider road shoulders to reduce conflicts between motorized and non-motorized users;
Maintaining the scenic nature of the road profile (e.g. rolling hills);
Closing Wilmot Line partially during known high wildlife road crossing periods;
Closing part of Wilmot Line completely;
Maintaining Wilmot Line as a gravel road;
Avoiding additional lighting to reduce impacts to wildlife;
Avoiding obstructions to wildlife crossings such as medians;
Creating larger buffer zones between the road and environmental features;
Installing wildlife passages above or below roadways;
Reducing the use of trails within the ESL;
Prohibiting any further trail development; and
Improving the surrounding road network to reduce traffic backups that result in increased road use through non-arterial roads such as Wilmot Line.

Preliminary Findings for the Case Study Area

Transportation Considerations

Preliminary findings related to transportation within the Case Study Area include the following:

- Wilmot Line is a minor part of the Township road network and is classified as a “rural local township road”;
- Based on Transportation Association of Canada and Regional guidelines, the travelled portion of the road allowance is acceptable to permit the safe passage of two travel lanes of traffic for the current traffic volumes;
- There are significant grades on segments of the gravel portion of the road in the Case Study Area that exceed the maximum desirable grade referenced in the Geometric Design Guide for Canadian Roads published by the Transportation Association of Canada for major transportation facilities (6%) but close to the acceptable range for minor facilities (8%);
- Current traffic volumes are less than 1000 Average Annual Daily Traffic (AADT) along the unpaved section, which are well below the typical traffic capacity of a paved two-lane rural road. However, in portions of the Case Study Area current traffic volumes are high enough that hard surface treatment may become economically viable from a maintenance perspective;
- Trucks are present in the Case Study Area and account for about 2-4% of the total volume which is within the expected range for Regional and Township roads;
• Collisions are not a significant issue as there is less than one collision per million vehicle kilometres (MVKM);
• Cyclists and pedestrians are observed to be using the roads within the Case Study Area and conflicts between vehicular traffic and these users have been identified by the public as an issue that requires attention;
• The majority of reported collisions in the Case Study Area involved single vehicles leaving the travelled portion of the roadway;
• The posted speed limit within the Case Study Area is 60 km/h and all roads leading to Wilmot Line are hard-surfaced. In terms of traffic control, all side street approaches to the Case Study Area have stop control but there is no stop control on Wilmot Line itself;
• Within the unpaved portion of Wilmot Line, the 85th percentile speeds are generally much higher than the posted speed limit indicating that vehicles are excessively speeding; and
• The Terms of Reference for this study did not include analysis of potential future development impacts on traffic patterns and/or volumes in the Case Study Area and therefore no conclusions have been made in this regard.

Environmental Features and Functions

Preliminary findings related to environmental features and functions include the following:

• The Laurel Creek ESL contains many significant features including but not limited to the Sunfish Lake-Laurel Creek Provincially Significant Wetland (PSW) Complex, seven Environmentally Sensitive Policy Areas (ESPAs), one Regional Forest, 21 woodlands that meet the Significant Woodland criteria in the Regional Official Plan (ROP), and 2 regionally significant Areas of Natural and Scientific Interest (ANSIs);
• The ESL has a rich diversity of species as a total of 56 wildlife species have been recorded within the ESL of which 22 are provincially and/or federally significant;
• Groundwater quality in the ESL is generally good and chloride levels in groundwater are generally lower than other groundwater features in the Region;
• Surface water quality in Laurel Creek and Monastery Creek within the case study area is generally good when compared to other portions of these creeks outside of the ESL. However, Monastery Creek exhibits somewhat poorer water quality due to agricultural activities and channel erosion in the headwaters;
• Chloride concentrations in Laurel Creek and Monastery Creek are the lowest in the watershed and are well below guidelines. These data suggest that road runoff is not leading to elevated chloride concentrations under current conditions; and
• The presence of Brown Trout spawning sites within and downstream of the ESL represent highly sensitive habitat locations that may be impacted by sources of sediment and other contaminants entering streams from within the ESL.
Wildlife Movement

Preliminary findings related to wildlife movement within the Case Study Area include the following:

- Based on current traffic volumes (average 60 vehicles per hour at certain locations on Wilmot Line) turtles and frogs have a 30% chance of mortality if they cross the road;
- Four locations, known as Wildlife & Hydrological Crossing Locations, within the Case Study Area were identified as having the highest likelihood of wildlife road crossings:
  1. North of the Cedar Grove Road and Wilmot Line intersection;
  2. Laurel Creek crossing at Wilmot Line;
  3. Southeast of Wideman Road and Wilmot Line intersection; and
  4. Monastery Creek crossing at Wilmot Line.
- The Terms of Reference for this study did not include road mortality surveys, habitat assessments or species specific breeding studies within the Case Study Area and therefore no conclusions have been made in this regard.

Preliminary Recommendations for the Case Study Area

In recent years, the Township of Wilmot has expressed interest in upgrading the surface of Wilmot Line within the ESL from its current gravel condition to a hard surface (tar/chip or pavement). The Project Team has given careful consideration to the Township’s interests throughout the study process and Township staff has been actively involved throughout the study process. It was not within the scope of the study to determine whether or not Wilmot Line should be upgraded, as this decision rests with the Township in accordance with associated EA requirements. The study did conclude that current traffic volumes are less than 1000 Average Annual Daily Traffic (AADT) along the unpaved section of Wilmot Line, which are currently well below the typical traffic capacity of a paved two-lane rural road. However, in portions of the Case Study Area current traffic volumes are high enough that hard surface treatment may become economically desirable from a maintenance perspective.

The Project Team is of the opinion that hard surfacing of gravel roads can help in mitigating impacts by reducing:

- Dust generated from vehicles;
- Sedimentation in watercourses;
- Frequency of ditch cleanouts; and
- Operational/maintenance costs related to all of the above.

However, the hard surfacing of gravel roads in isolation without other mitigation can create impacts to residents and the environment such as increased:
• Traffic speeds (and potentially volumes);
• Conflicts between motorized and non-motorized users;
• Wildlife road mortality;
• Erosion as a result of increased stormwater runoff volume and velocities; and
• Contamination of watercourses as a result of road salting.

Based on public input received to date and technical information gathered as part of the study process, preliminary recommendations for potential measures that could help better balance environmental protection and transportation considerations without road upgrades being undertaken within the Wilmot Line – Kressler Road corridor (Case Study Area) are listed below. In addition, these potential measures could not only apply to the Case Study Area but could also be considered for roads in other ESLs when crossing environmentally significant areas:

• Wildlife warning signage at potential wildlife crossing locations along the length of the Case Study Area;
• Temporary road closure (Similar to Stauffer Drive in Kitchener) during spring breeding migrations at crossing location 3 (potential Blanding’s Turtle and Snapping Turtle habitat), if warranted following completion of detailed amphibian breeding surveys;
• Modifications to road maintenance practices such as regular inspections, conducting maintenance practices outside of breeding seasons and ditch vegetation management at crossing locations 2, 3, and 4;
• Improved stormwater management measures to control runoff and reduce sedimentation to watercourses such as ditch block controls, rock check dams and/or sediment traps;
• Further monitoring of traffic in the area to better understand travel patterns and volumes; and
• Further monitoring of wildlife movement including conducting specific road mortality surveys, habitat assessments, and breeding call surveys.

In the event that the Township wishes to consider upgrades to Wilmot Line, some potential measures that should be evaluated through an Environmental Assessment or Environmental Impact Statement include:

• Investigating operational modifications to the surrounding road network including improving alternative routes or considering road closures;
• Installing new wildlife crossing structures and exclusionary fencing at sites 2, 3, and 4 listed above;
• Developing measures to separate vehicular traffic from cyclists and pedestrians;
• Investigating traffic calming measures such as reducing or narrowing the travelled portion of the road at certain locations; and
• Developing a stormwater management strategy including techniques such as ditch maintenance practices/ditch treatments, bioswales and sediment traps or ponds adjacent to watercourses.

Proposed Next Steps and Work Plan

Regional staff recommend holding a second public open house this fall to present the findings and recommendations of the study so that interested persons will have an opportunity to provide further input prior to the finalization of the study report. It would take place on Tuesday, October 27th from 5:00 pm to 8:00 pm at the Waterloo Region Emergency Services Training and Research Complex (WRESTRC), located at 1001 Erb’s Road in Waterloo (Landfill Gate #3). Details of the public open house would be advertised in the local newspapers and online. Residents within the ESL would be sent an invitation to attend the open house by mail. The information package for the open house is included as Attachment B to this report. In addition, the draft study report will be made available on the Regional website and in the Regional Councillors’ library.

Following the second open house, Regional staff and the project team would review and consider public input received and finalize the study’s report accordingly. Following completion of the report, Regional staff and the project team would present results and recommendations to Regional Council, the City of Waterloo and the Townships of Wellesley, Wilmot and Woolwich, tentatively later in 2015 or early in 2016.

Area Municipal Consultation/Coordination

Staff from the Townships of Wellesley, Wilmot, and Woolwich and the City of Waterloo serve on the study project team, and would be attending the public open house and advising on the completion of the work.

Corporate Strategic Plan:

This study supports Focus Area 1.1 – Integrate environmental considerations into the Region’s decision making and Focus Area 1.5 – Restore and preserve green space, agricultural land and sensitive environmental areas.

Financial Implications:

The total budget for this study is $78,000 (plus applicable taxes) and is being funded by the Community Environmental Fund (as noted in Report P-13-055) and the approved 10-year Transportation Capital Program.

Other Department Consultations/Concurrence:

Staff from Transportation and Environmental Services is participating in the completion of this study.
Attachments:

Attachment A - Location of Laurel Creek Headwaters Environmentally Sensitive Landscape and Study Area

Attachment B – Draft Public Open House #2 Information Package

Prepared By:  Tim Van Hinte, Principal Planner

Approved By: Rob Horne, Commissioner, Planning, Development and Legislative Services
Attachment A - Location of Laurel Creek Headwaters Environmentally Sensitive Landscape and Study Area
INFORMATION HANDOUT

Balancing Environmental Protection and Transportation: The Laurel Creek Headwaters Environmentally Sensitive Landscape (ESL) Case Study

Public Open House #2

October 27, 2015

Waterloo Region Emergency Services Training and Research Complex (WRESTRC)

1001 Erb’s Road, Waterloo (Landfill Gate 3)

5:00– 8:00 P.M.
Introduction

The Region of Waterloo has undertaken a study with the goal of balancing environmental protection and transportation considerations in the Region’s Environmentally Sensitive Landscapes (ESL), using the Laurel Creek Headwaters ESL as a case study. The study will consider protecting creeks, wetlands, forests and wildlife species in the ESL from the effects of increased traffic, road maintenance, and recreational uses.

Purpose of the Open House

This is the second open house for this project. The first open house was held on February 26, 2015. The purpose of today’s Public Open House is to present the study’s preliminary findings and recommendations. In addition, you will have the opportunity to discuss your questions with Regional staff and the project team.

In addition, you are encouraged to provide comments on the attached Comment Form. Please send this form to Regional staff no later than November 10, 2015.

What is an Environmentally Sensitive Landscape (ESL)?

Environmentally Sensitive Landscapes are areas in Waterloo Region that have significant environmental features, such as wetlands, rivers and creeks, groundwater recharge areas and the habitat of endangered and threatened species. They also include farms, villages, small towns and outdoor recreation areas. ESLs are protected through policies in the Region’s Official Plan.

Location of Laurel Creek Headwaters ESL and Study Area

The Laurel Creek Headwaters ESL is located in the northwest part of Waterloo Region, immediately to the west of the City of Waterloo’s the urban area boundary (see Figure 1). The ESL includes several important ecological features such as woodlands, wetlands, coldwater fisheries, and habitat for Provincially and Regionally significant plants and animals.

At 2,043 hectares (5,048 acres), the Laurel Creek Headwaters is a rolling landscape that includes three small lakes: Bamberg Bog Lake, Paradise Lake and Sunfish Lake. Most of the landscape is drained by Laurel Creek and its tributaries, Beaver Creek and Monastery Creek.
What is the purpose of the study?

The objectives of this study are to balance transportation and environmental considerations in the Region’s ESLs, and in particular the Laurel Creek Headwaters ESL, by focusing on:

- Enhancing and protecting the social value of the ESL;
- Protecting creeks, wetlands, threatened or endangered species, as well as other wildlife species characteristic of the landscape, from the effects of increased traffic and required road maintenance;
- Retaining or potentially enhancing the scenic quality and rural character of roads in accordance with the ESL policies in the Region’s Official Plan;
- Assessing the impacts of recreational uses such as hiking, jogging, horseback riding, cycling, and skiing on roads and adjacent publicly accessible lands; and
- Identifying potential issues affecting the safety of road users.
As part of the Laurel Creek Headwaters ESL case study, issues and potential solutions associated with the above objectives are being addressed in the following study components:

- **Transportation** - Focusing on identifying potential issues and recommending solutions to reduce conflicts between road users (e.g. cars, truck traffic, pedestrians, cyclists, joggers) along the Wilmot Line - Kressler Road corridor;

- **Environmental Impacts** - Focusing on identifying potential issues and recommending solutions to reduce impacts on natural features, functions and species (e.g. sedimentation, pollutants caused by vehicles, snow clearing and road grading); and

- **Wildlife Movement** – Focusing on identifying and assessing wildlife crossings (e.g. mammals, amphibians, reptiles) on Wilmot Line in the vicinity of Monastery Creek and Laurel Creek, and opportunities to reduce wildlife mortality at these locations (e.g. signage, eco-passages, reduced speed limits).

This study is not meant to fulfill the requirements of the Environmental Assessment Act with respect to any potential upgrades to Wilmot Line in the future. It is also not an Environmental Impact Statement under the Regional Official Plan (ROP). If upgrades to Wilmot Line are proposed in the future, a formal Environmental Impact Statement (or similar study) in accordance with the ROP may have to be completed as part of the EA process, depending on the nature of the project. However, Regional staff expects that the recommendations from this study will help inform future environmental and transportation study requirements where ESLs are impacted by roads.

**Preliminary Findings for the Case Study Area**

**Transportation Considerations**

Preliminary findings related to transportation within the Case Study Area include the following:

- Wilmot Line is a minor part of the Township road network and is classified as a “rural local township road”;
- Based on Transportation Association of Canada and Regional guidelines, the travelled portion of the road allowance is acceptable to permit the safe passage of two travel lanes of traffic for the current traffic volumes;
- There are significant grades on segments of the gravel portion of the road in the Case Study Area that exceed the maximum desirable grade referenced in the Geometric Design Guide for Canadian Roads published by the Transportation Association of Canada for major transportation facilities (6%) but close to the acceptable range for minor facilities (8%);
- Current traffic volumes are less than 1000 Average Annual Daily Traffic (AADT) along the unpaved section, which are well below the typical traffic capacity of a paved two-lane rural road. However, in portions of the Case Study Area current traffic volumes are high enough
that hard surface treatment may become economically viable from a maintenance perspective;

- Trucks are present in the Case Study Area and account for about 2-4% of the total volume which is within the expected range for Regional and Township roads;

- Collisions are not a significant issue as there is less than one collision per million vehicle kilometres (MVKM);

- Cyclists and pedestrians are observed to be using the roads within the Case Study Area and conflicts between vehicular traffic and these users have been identified by the public as an issue that requires attention;

- The majority of collisions in the Case Study Area involved single vehicles leaving the travelled portion of the roadway;

- The posted speed limit within the Case Study Area is 60 km/h and all roads leading to Wilmot Line are hard-surfaced. In terms of traffic control, all side street approaches to the Case Study Area have stop control but there is no stop control on Wilmot Line itself;

- Within the unpaved portion of Wilmot Line, the 85th percentile speeds are generally much higher than the posted speed limit indicating that vehicles are excessively speeding; and

- The Terms of Reference for this study did not include analysis of potential future development impacts on traffic patterns and/or volumes in the Case Study Area and therefore no conclusions have been made in this regard.

Environmental Features and Functions

Preliminary findings related to environmental features and functions include the following:

- The Laurel Creek ESL contains many significant features including but not limited to the Sunfish Lake-Laurel Creek Provincially Significant Wetland (PSW) Complex, seven Environmentally Sensitive Policy Areas (ESPAs), one Regional Forest, 21 woodlands that meet the Significant Woodland criteria in the Regional Official Plan (ROP), and 2 regionally significant Areas of Natural and Scientific Interest (ANSIs);

- The ESL has a rich diversity of species as a total of 56 wildlife species have been recorded within the ESL of which 22 are provincially and/or federally significant;

- Groundwater quality in the ESL is generally good and chloride levels in groundwater are generally lower than other groundwater features in the Region;

- Surface water quality in Laurel Creek and Monastery Creek within the case study area is generally good when compared to other portions of these creeks outside of the ESL. However, Monastery Creek exhibits somewhat poorer water quality due to agricultural activities and channel erosion in the headwaters;

- Chloride concentrations in Laurel Creek and Monastery Creek are the lowest in the watershed and are well below guidelines. These data suggest that road runoff is not leading to elevated chloride concentrations under current conditions; and
• The presence of Brown Trout spawning sites within and downstream of the ESL represent highly sensitive habitat locations that may be impacted by sources of sediment and other contaminants entering streams from within the ESL.

Wildlife Movement

Preliminary findings related to wildlife movement within the Case Study Area include the following:

• Based on current traffic volumes (average 60 vehicles per hour at certain locations on Wilmot Line) turtles and frogs have a 30% chance of mortality;
• Four locations, known as Wildlife & Hydrological Crossing Locations, within the Case Study Area were identified as having the highest likelihood of wildlife road crossings:
  1. North of the Cedar Grove Road and Wilmot Line intersection;
  2. Laurel Creek crossing at Wilmot Line;
  3. Southeast of Wideman Road and Wilmot Line intersection; and
  4. Monastery Creek crossing at Wilmot Line.

• The Terms of Reference for this study did not include road mortality surveys, habitat assessments or species specific breeding studies within the Case Study Area and therefore no conclusions have been made in this regard.

Preliminary Recommendations for the Case Study Area

In recent years, the Township of Wilmot has expressed interest in upgrading the surface of Wilmot Line within the ESL from its current gravel condition to a hard surface (tar/chip or pavement). The Project Team has given careful consideration to the Township’s interests throughout the study process and Township staff has been actively involved throughout the study process. It was not within the scope of the study to determine whether or not Wilmot Line should be upgraded, as this decision rests with the Township in accordance with associated EA requirements. The study did conclude that current traffic volumes are less than 1000 Average Annual Daily Traffic (AADT) along the unpaved section of Wilmot Line, which are currently well below the typical traffic capacity of a paved two-lane rural road. However, in portions of the Case Study Area current traffic volumes are high enough that hard surface treatment may become economically desirable from a maintenance perspective.

The Project Team is of the opinion that hard surfacing of gravel roads can help in mitigating impacts by reducing:

• Dust generated from vehicles;
• Sedimentation in watercourses;
• Frequency of ditch cleanouts; and
• Operational/maintenance costs related to all of the above.
However, the hard surfacing of gravel roads in isolation without other mitigation can create impacts to residents and the environment such as increased:

- Traffic speeds (and potentially volumes);
- Conflicts between motorized and non-motorized users;
- Wildlife road mortality;
- Erosion as a result of increased stormwater runoff volume and velocities; and
- Contamination of watercourses as a result of road salting.

Based on public input received to date and technical information gathered as part of the study process, preliminary recommendations for potential measures within the Case Study Area that could help better balance environmental protection and transportation considerations without road upgrades being undertaken within the Case Study Area are listed below. In addition, these potential measures could not only apply to the Case Study Area but could also be considered for roads in other ESLs when crossing environmentally significant areas:

- Wildlife warning signage at potential wildlife crossing locations along the length of the Case Study Area;
- Temporary road closure (Similar to Stauffer Drive in Kitchener) during spring breeding migrations at crossing location 3 (potential Blanding’s Turtle and Snapping Turtle habitat), if warranted following completion of detailed amphibian breeding surveys;
- Modifications to road maintenance practices such as regular inspections, conducting maintenance practices outside of breeding seasons and ditch vegetation management at crossing locations 2, 3, and 4;
- Improved stormwater management measures to control runoff and reduce sedimentation to watercourses such as ditch block controls, rock check dams and/or sediment traps;
- Further monitoring of traffic in the area to better understand travel patterns and volumes; and
- Further monitoring of wildlife movement including conducting specific road mortality surveys, habitat assessments, and breeding call surveys.

In the event that the Township wishes to consider upgrades to Wilmot Line, some potential measures that should be evaluated through an Environmental Assessment or Environmental Impact Statement include:

- Investigating operational modifications to the surrounding road network including improving alternative routes or considering road closures;
- Installing new wildlife crossing structures and exclusionary fencing at sites 2, 3, and 4 listed above;
- Developing measures to separate vehicular traffic from cyclists and pedestrians;
- Investigating traffic calming measures such as reducing or narrowing the travelled portion of the road at certain locations; and
• Developing a stormwater management strategy including techniques such as ditch maintenance practices/ditch treatments, bioswales and sediment traps or ponds adjacent to watercourses.

Next Steps and Work Plan

1. Regional staff and the project team will review and consider public comments from the open house.

2. Preliminary study findings and recommendations will be presented to Area Municipal Councils (as requested) and Regional staff will consider comments prior to the final report being completed.

3. The study’s final report will be completed.

4. The study’s final report will be presented to Regional Council.

Additional Information:

The study is available for you to view online on the Region’s website at:

[www.regionofwaterloo.ca/esl](http://www.regionofwaterloo.ca/esl)

Contact:

Tim Van Hinte, Principal Planner
Region of Waterloo
Phone: 519-575-4500 ext. 3649
tvanhinte@regionofwaterloo.ca

Todd Fell, Project Manager
Dougan & Associates
Phone: 519-822-1609 ext. 23
tfell@dougan.ca
COMMENT FORM

Please complete and hand in this sheet so that your views on the ESL case study can be considered. If you cannot complete your comments today, please take this home and mail, fax or email your comments by **November 10, 2015** to:

Tim Van Hinte, Principal Planner (Environmental)
Region of Waterloo
150 Frederick St., 8th Floor, Kitchener, ON N2G 4J3
Fax: 519-575-4449
tvanhinte@regionofwaterloo.ca

Please provide any comments that you have concerning the study’s findings and recommendations

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Thank you for your input!
LAUREL CREEK HEADWATERS

Environmentally Sensitive Landscape 1

Municipality: City of Waterloo, Townships of Wellesley, Wilmot, and Woolwich
General Location: Northwest corner of Waterloo, southeast corner of Wellesley Township, northeast corner of Wilmot Township, southwest corner of Woolwich Township
Ownership: Private/Some Public
Size: 2,043 hectares (5,048 acres)
Physiographic Region: Waterloo Moraine
Eco-region: Wilmot
Soils: Sands, fine sands, and gravels occur with deep organic soils

General Description

Straddling the northern end of the Waterloo Moraine, the Laurel Creek Headwaters is a rolling landscape punctuated by three small kettle lakes, Bamberg Bog Lake, Paradise Lake and Sunfish Lake. The latter is a rare meromictic lake. Most of the landscape is drained by Laurel Creek and its tributaries Beaver Creek and Monastery Creek. The western part of the landscape drains to tributaries of Bamberg Creek, and the extreme northern part around Paradise Lake to Martin Creek. Significant reaches of Laurel Creek and its major tributaries support coldwater fisheries.

Rolling topography and extensive wetlands make much of the area unsuitable to agriculture, and thus a significant proportion of the landscape has been left in its natural state. The natural areas within this landscape consist of a mix of upland and lowland forest. Upland forests are dominated primarily by Sugar Maple and Beech. Associated with this are some long-established Hemlock stands. Most of the wetlands are Provincially Significant, and typically consist of fine cedar swamps. Other swamp communities associated with the creek systems consist of high quality Tamarack...
swamp, Hemlock-Cedar-Balsam Fir-Yellow Birch wetland forest, and Silver Maple swamp. There are also small areas of marsh and open wet meadows. The area has been observed to sustain many significant species of plants and animals, and has a notable diversity of ferns.

**ESL Criteria Fulfilled (based on ROP Policy 7.B.5)**

To qualify for designation as an Environmentally Sensitive Landscape, an area must

A. **Fulfill all of the following:**

   i) **A geographically and ecologically definable landscape**

   The landscape contains the headwaters of Laurel Creek as well as some abutting headwaters areas of Martin and Bamberg Creeks within the northern extent of the Waterloo Moraine. The upland woodlands are predominantly maple-beech woodlands, while the wetlands are for the most part cedar or mixed swamps along watercourses or in small depressions within the moraine. Native species of plants and animals recur in many of the natural areas indicating that these are part of a larger regional population.

   ii) **Contain natural features that are contiguous, linked or sufficiently close to allow for movement of flora or fauna through the area**

   Laurel Creek and its upper tributaries link most of the natural features together. Natural areas in the adjoining watersheds are close enough to these areas to permit many species to move from one to another.

   iii) **Not be bisected by major highways**

   The area is traversed only by two-lane Regional and local roads.

   iv) **Located primarily outside areas designated for fully serviced urban development by Area Municipalities and established Settlement Areas**

   The ESL lies within the Protected Countryside designated in the Regional Official Plan. Its eastern limits coincide with the western extent of lands designated for residential development in the City of Waterloo Official Plan. It contains the Sunfish Lake and Paradise Lake settlements and some of the easternmost parts of Bamberg.

   and

B. **Contain any two of the following designated natural features:**

   ii) **Environmentally Sensitive Policy Area**
The landscape contains the following Environmentally Sensitive Policy Areas:

7. Bamberg Swamp and Bog Lake
8. Paradise Lake
10. Sunfish Lake
17. Schaefer’s Woods
19. Forested Hills
75. Optimist Swamp and Forest
76. Schneider Woods

iii) **Provincially Significant Wetland**

The landscape contains the following Provincially Significant Wetland:

- Sunfish Lake-Laurel Creek Provincially Significant Wetland Complex.

iv) **Regionally Significant Earth Science Area of Natural and Scientific Interest**

Sunfish Lake has been identified by the Province as a regionally significant earth science site.

vi) **Significant Woodlands**

The area contains large woodlands which will likely fulfill the criteria for significant woodlands.

C. **contain any two of the following associated natural features:**

i) **rivers, major stream valleys, floodplains and associated hazard lands**

The landscape contains the headwater reaches of Laurel Creek and two of its major tributaries, Beaver and Monastery Creeks.

ii) **woodlands greater than four hectares in extent**

There are a number of woodlands outside the ESPA's in the landscape.

iii) **forest interior habitat**

Some of the ESPA's are sufficiently large to afford forest interior habitat.

v) **significant landforms such as moraines, kettle lakes, kames, eskers, and drumlins**

This landscape contains three kettle lakes in its characteristic moraine
vi) **Significant Wildlife Habitat identified by the Ministry of Natural Resources**

The Ministry of Natural Resources has identified a Provincially rare species within the landscape. The cedar swamps also provide winter habitat for a sizeable deer population.

and

D. **sustain any two of the following environmental functions:**

i) **significant groundwater storage, recharge, or discharge**

The Waterloo Moraine is a very significant recharge area. In addition, it supplies shallow groundwater discharge to the wetlands and some of the creeks within the landscape.

ii) **sustains a fishery resource**

The upper Laurel Creek system is known to be a coldwater fishery with a resident Brook Trout population.

iii) **provides diverse natural habitats**

The varied topography and drainage regimes of the landscape sustain a variety of ecological communities. These include both shallow and deep (meromictic) lakes, stream corridors, conifer and hardwood swamps, and open wetlands. The higher elevation areas support upland woodlands typical of the Great Lakes – St. Lawrence forest zone. The diverse habitats sustain a wide array of native flora and fauna. The rich variety of ferns and breeding birds is especially noteworthy.

iv) **provides habitat for provincially or Provincially significant species**

The following Regionally Significant species have been observed within the landscape:

**Plants**

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asclepias tuberosa</td>
<td>Butterfly Milkweed</td>
</tr>
<tr>
<td>Botrychium dissectum</td>
<td>Cut-leaved Grape Fern</td>
</tr>
<tr>
<td>Botrychium dissectum</td>
<td>Cut-leaved Grape Fern</td>
</tr>
<tr>
<td>Botrychium matricariifolium</td>
<td>Daisy-leaved Grape Fern</td>
</tr>
<tr>
<td>Botrychium multifidum</td>
<td>Leathery Grape-Fern</td>
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</tr>
<tr>
<td>Botrychium oneidense</td>
<td>Oneida Grape Fern</td>
</tr>
<tr>
<td>Botrychium rugulosum</td>
<td>Ternate Grape Fern</td>
</tr>
<tr>
<td>Botrychium simplex</td>
<td>Dwarf Grape Fern</td>
</tr>
<tr>
<td>Carex lasiocarpa</td>
<td>Hairy-fruited sedge</td>
</tr>
<tr>
<td>Carex scabrata</td>
<td>Rough Sedge</td>
</tr>
<tr>
<td>Corallorhiza striata</td>
<td>Striped Coral-root</td>
</tr>
<tr>
<td>Corallorhiza trifida</td>
<td>Early Coral-root</td>
</tr>
<tr>
<td>Cypripedium acaule</td>
<td>Moccasin-flower</td>
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<tr>
<td>Dalibarda repens</td>
<td>Dewdrop</td>
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<tr>
<td>Dennstaedtia punctilobula</td>
<td>Eastern Hay-scented Fern</td>
</tr>
<tr>
<td>Diplazium pycnocarpon</td>
<td>Narrow-leaved Glade Fern</td>
</tr>
<tr>
<td>Eleocharis intermedia</td>
<td>Intermediate Spike-rush</td>
</tr>
<tr>
<td>Elymus trachycaulus</td>
<td>Slender Wheat Grass</td>
</tr>
<tr>
<td>Galium tinctorium</td>
<td>Stiff Marsh Bedstraw</td>
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<tr>
<td>Gaylussacia baccata</td>
<td>Black Huckleberry</td>
</tr>
<tr>
<td>Lonicera oblongifolia</td>
<td>Swamp Fly-honeysuckle</td>
</tr>
<tr>
<td>Lycopodium annotinum</td>
<td>Stiff Clubmoss</td>
</tr>
<tr>
<td>Lycopodium clavatum</td>
<td>Running Clubmoss</td>
</tr>
<tr>
<td>Lycopodium dendroideum</td>
<td>Round-branched Ground-pine</td>
</tr>
<tr>
<td>Monarda didyma</td>
<td>Oswego Tea</td>
</tr>
<tr>
<td>Ophioglossum pusillum</td>
<td>Northern Adder's-tongue Fern</td>
</tr>
<tr>
<td>Osmunda claytoniana</td>
<td>Interrupted Fern</td>
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<tr>
<td>Panax quinquefolius</td>
<td>American Ginseng</td>
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<tr>
<td>Phegopteris connectilis</td>
<td>Northern Beech Fern</td>
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<tr>
<td>Picea mariana</td>
<td>Black Spruce</td>
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<tr>
<td>Polypodium virginianum</td>
<td>Rock Polypody</td>
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<tr>
<td>Polystichum braunii</td>
<td>Braun's Holly Fern</td>
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<td>Potamogeton epihydrus</td>
<td>Ribbon-leaf Pondweed</td>
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<tr>
<td>Ranunculus fascicularis</td>
<td>Early Buttercup</td>
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<tr>
<td>Plant Name</td>
<td>Common Name</td>
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</tr>
<tr>
<td>Ranunculus aquatilis</td>
<td>Eastern White Water-crowfoot</td>
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<tr>
<td>Scirpus acutus</td>
<td>Hard-stemmed Bulrush</td>
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<tr>
<td>Viburnum lantanoises</td>
<td>Hobblebush</td>
</tr>
<tr>
<td>Viola renifolia</td>
<td>Kidney-leaved Violet</td>
</tr>
<tr>
<td>Viola selkirkii</td>
<td>Great-spurred Violet</td>
</tr>
</tbody>
</table>

**Breeding Birds**

<table>
<thead>
<tr>
<th>Bird Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accipiter cooperii</td>
<td>Cooper's Hawk</td>
</tr>
<tr>
<td>Accipiter striatus</td>
<td>Sharp Shinned Hawk</td>
</tr>
<tr>
<td>Ardea herodias</td>
<td>Great Blue Heron</td>
</tr>
<tr>
<td>Buteo lineatus</td>
<td>Red-shouldered Hawk</td>
</tr>
<tr>
<td>Dendroica cerulean</td>
<td>Cerulean Warbler</td>
</tr>
<tr>
<td>Dendroica discolor</td>
<td>Prairie Warbler</td>
</tr>
<tr>
<td>Dendroica pensylvanica</td>
<td>Chestnut-sided Warbler</td>
</tr>
<tr>
<td>Dendroica virens</td>
<td>Black-throated Green Warbler</td>
</tr>
<tr>
<td>Melanerpes erythrocephalus</td>
<td>Red-Headed Woodpecker</td>
</tr>
<tr>
<td>Oporornis philadelphia</td>
<td>Mourning Warbler</td>
</tr>
<tr>
<td>Pipilo erythropthalmus</td>
<td>Rufous-sided Towhee</td>
</tr>
<tr>
<td>Regulus satrapa</td>
<td>Golden-crowned Kinglet</td>
</tr>
<tr>
<td>Seiurus noveboracensis</td>
<td>Northern Waterthrush</td>
</tr>
<tr>
<td>Sitta canadensis</td>
<td>Red-breasted Nuthatch</td>
</tr>
<tr>
<td>Strix varia</td>
<td>Barred Owl</td>
</tr>
<tr>
<td>Troglodytes troglodytes</td>
<td>Winter Wren</td>
</tr>
<tr>
<td>Vermivora chrysoptera</td>
<td>Golden-winged Warbler</td>
</tr>
<tr>
<td>Vermivora pinus</td>
<td>Blue-winged Warbler</td>
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<tr>
<td>Vermivora ruficapilla</td>
<td>Nashville Warbler</td>
</tr>
<tr>
<td>Wilsonia canadensis</td>
<td>Canada Warbler</td>
</tr>
<tr>
<td>Wilsonia citrina</td>
<td>Hooded Warbler</td>
</tr>
<tr>
<td>Zonotrichia albicollis</td>
<td>White Throated Sparrow</td>
</tr>
</tbody>
</table>
Amphibians
Rana palustris  Pickerel Frog

Insects
Pieris napi  Mustard White Butterfly

Mammals
Parascalops breweri  Hairy-tailed Mole

v) serves as a natural corridor or provides linkage functions.

The stream corridors and associated wetlands and woodlands that cross the landscape permit the movement of native flora and fauna over considerable distances, and serve as ecological linkages among the upper Laurel, Bamberg Creek /Nith River, and martin Creek watersheds.

Revised: August 10, 2012

Printed on: October 1, 2015
Region of Waterloo
Planning Development and Legislative Services
Legal Services

To: Chair Tom Galloway and Members of the Planning and Works Committee
Date: September 15, 2015
File Code: L07-90
Subject: Authorization To Expropriate Lands (1st Report) For Ottawa Street (Regional Road 4) Improvements Project (Dreger Avenue To Midland Road), In The City Of Kitchener

Recommendation:
That The Regional Municipality of Waterloo direct and authorize the Regional Solicitor to take the following actions with respect to the expropriation of lands for the widening and reconstruction of Ottawa Street (Regional Road 4) from Dreger Avenue to Midland Road in the City of Kitchener in the Region of Waterloo as detailed in report PDL-LEG-15-65 dated September 15, 2015.

a) Complete applications(s) to the Council of the Regional Municipality of Waterloo, as may be required from time to time, for approval to expropriate land, which is required for the reconstruction of Ottawa Street with new cycling lanes, curb and gutters, sidewalks and multi-use trails, transit stops, as wells as replacement of storm sewer and a trunk watermain.and described as follows:

Fee Simple Partial Taking:
   i. Part of Lot 1, Registered Plan 1152 being Parts 1 and 2 on 58R-18642 (520 Franklin Street North, Kitchener);
   ii. Part of Lot 22, Registered Plan 1152 being Parts 3, 4, 5, 6, 7 and 8 on 58R-18642 (38 Evelyn Crescent, Kitchener);
   iii. Part of Lot 23, Registered Plan 1152 being Parts 9, 10 and 11 on 58R-18642 (42 Evelyn Crescent, Kitchener);
   iv. Part of Lot 24, Registered Plan 1152 being Parts 12, 13 and 14 on 58R-18642 (46 Evelyn Crescent, Kitchener);
   v. Part of Lot 37, Registered Plan 1152 being Parts 15 and 16 on 58R-18642 (6 Dreger Avenue, Kitchener);
vi. Part of Block G, Registered Plan 1170 and Part of Lot 2 Registered Plan 976 being Part 2 on 58R-18641 (29 Midland Drive, Kitchener);

b) Serve notices of the above applications(s) required by the Expropriations Act (the "Act");

c) Forward to the Chief Inquiry Officer any requests for a hearing that may be received within the time prescribed by the Act;

d) Attend, with appropriate Regional staff, at any hearing that may be scheduled;

e) Discontinue expropriation proceedings or any part thereof, in respect of the above described lands, or any part thereof, upon the registration on title of the required documentation to complete a transaction whereby the required interests in the lands are conveyed or if otherwise deemed appropriate in the opinion of the Commissioner of Transportation and Environmental Services and the Regional Solicitor; and

f) Do all things necessary and properly to be done and report thereon to Regional Council in due course.

Summary: NIL

Report:
Regional Council approved improvements on Ottawa Street between the Highway 7 Eastbound Ramp and Lackner Boulevard in Kitchener on April 22, 2015, under By-Law 15-026 as outlined in Report TES-DCS-15-09.

Some of the improvements will include: reconstruction of the existing roadway, storm sewer improvements, urbanization from Old Chicopee Drive to Heritage Drive, new trunk watermain installation from Heritage Drive to Keewatin Avenue, widening of Ottawa Street to four lanes, including turning lanes between Old Chicopee and Heritage Drive, construction of designated on-road cycling lanes on both sides of the road, construction of off-road multi-use trails at the project’s east and west limits for improved trail connectivity as well as enhanced community facility connections along at the project’s east limit, construction of new sidewalks on the north and south sides of Ottawa St. where none currently exist and new pedestrian refuge islands at Nottingham Ave., Montcalm Dr. and McGee Ave. The construction is scheduled to occur over two years in 2016 (River Road to Lackner Blvd.) and 2017 (River Road to Highway 7) with surface asphalt paving in 2018. For reference purposes the Project Area is shown on the sketch attached as Appendix “A”.
The implementation of the improvements directly impacts 8 properties as shown in the Appendix “A” to this report. Land acquisitions as outlined in the Recommendation are required from 6 of the properties and they are for fee simple partial takings for road widening purposes and transit shelters. There are also acquisitions of two additional partial takings, being the Waterloo Catholic District School Board from their property known municipally as 39 Midland Drive and the City of Kitchener from their property at the north-east corner of Nottingham Avenue and Ottawa Street, that have not been included in the expropriation, as a negotiated agreement is expected.

All of the affected property owners, or their representatives, have been contacted by Legal Services Real Estate staff by one or more of the following means: in-person meeting, telephone, written correspondence and/or e-mail to discuss the required acquisitions and have been informed of the Region’s intention to commence the expropriation process, including this Report going forward to ensure project time lines are met. All property owners have been provided with the Region’s expropriation Information sheet explaining the expropriation process. A copy of the Expropriation Information Sheet is attached as Appendix “B”. The owners have further been advised it is the Region’s intent to seek a negotiated settlement prior to completion of the Expropriation process and that the process has been commenced only to ensure possession of the required lands by the date set by Project staff in order to keep the project timeline in place.

As a result of on-going discussions with the property owners and completion of detailed design of the project improvements the property impacts on some of the properties have been reduced.

Should a negotiated settlement be reached with any of the property owners and a conveyance of the required acquisition completed before the expropriation process is complete, the expropriation process with respect to such lands would be discontinued by the Regional Solicitor.

It should be noted that the expropriation of the lands is on an “as is” basis and upon acquisition the Region assumes all responsibility for the lands.

A list of the individual and corporate owners of the fee simple interest in the subject lands is attached as Appendix “B”. Regional staff have conducted corporate profile searches of affected corporate property owners and the directors and officers are listed for each. This list does not include tenants, easement holders or holders of security interests in the subject lands. The corporate profile information has been attached as Appendix “C”.
Corporate Strategic Plan:
This Project supports the following two strategic objectives of the Corporate Strategic Plan: to optimize existing road capacity to safely manage traffic throughout Waterloo Region, and to develop, promote and integrate active forms of transportation (cycling and walking).

Financial Implications:
The approved 2015 Transportation Capital Program includes a budget of $9,165,000 in the years 2015 to 2018 for the Ottawa Street N. (Lackner Blvd. to Highway 7 EB Ramp) project (#5680) to be funded from the Roads Rehabilitation Reserve Fund (95%, $8,695,000) and the Development Charges Reserve Fund (5%, $470,000). Sufficient funding for the acquisitions outlined within this report is available in the project budget.

Other Department Consultations/Concurrence:
Transportation and Environmental Services and finance staff has been consulted in the preparation of this report.

Attachments
Appendix “A” – Sketch of Subject Properties
Appendix “B” – Expropriation Information Sheet
Appendix “C” – Corporate Profiles

Prepared By: Brian Timm, Property Agent
Approved By: Debra Arnold, Regional Solicitor, Director of Legal Services
OTTAWS STREET
(REGIONAL ROAD 4)
HIGHWAY 7 (EAST BOUND RAMP) TO RIVER ROAD – 2016
RIVER ROAD TO LACKNER BOULEVARD – 2017
CITY OF KITCHENER
Appendix “B”

The following information is provided as a general overview of the expropriation process and is not legal advice. For complete information, reference should be made to the Ontario Expropriations Act as well as the more detailed information in the Notices provided under that Act.

Expropriation Information Sheet

What is Expropriation?

Governmental authorities such as municipalities, school boards, and the provincial and federal governments undertake many projects which require them to obtain land from private property owners. In the case of the Regional Municipality of Waterloo, projects such as the construction or improvement of Regional Roads sometimes require the purchase of land from private property owners. In many cases, the Region of Waterloo only needs a small portion of the private property owner’s lands or an easement for related purposes such as utilities, although in certain instances, entire properties are required.

Usually the governmental authority is able to buy the land required for a project through a negotiated process with the affected property owners. Sometimes, however, the expropriation process must be used in order to ensure that the land is obtained within a specific timeline. Put simply, an expropriation is the transfer of lands or an easement to a governmental authority for reasonable compensation, including payment of fair market value for the transferred lands, without the consent of the property owner being required. In the case of expropriations by municipalities such as the Region of Waterloo, the process set out in the Ontario Expropriations Act must be followed to ensure that the rights of the property owners provided under that Act are protected.

IMPORTANT NOTE: The Region of Waterloo tries in all instances to obtain lands needed for its projects through a negotiated agreement on mutually acceptable terms. Sometimes, the Region of Waterloo will start the expropriation process while negotiations are underway. This dual approach is necessary to ensure that the Region of Waterloo will have possession of all of the lands needed to start a construction project on schedule. However, it is important to note that Regional staff continues to make every effort to reach a negotiated purchase of the required lands on mutually agreeable terms while the expropriation process is ongoing. If agreement is reached, expropriation
proceedings can be discontinued and the land transferred to the Region of Waterloo in exchange for payment of the agreed-upon compensation.

What is the process of the Region of Waterloo under the Expropriations Act?

- Regional Council considers a request to begin an application under the Expropriations Act to obtain land and/or an easement for a specific Regional project. No decision is made at this meeting to expropriate the land. This step is simply direction for the Region of Waterloo to provide a “Notice of Application for Approval to Expropriate” to affected property owners that the process has started to seek approval to expropriate the land.

- As stated in the Notice, affected property owners have 30 days to request a Hearing to consider whether the requested expropriation is “fair, sound and reasonably necessary in the achievement of the objectives” of the Region of Waterloo. This Hearing is conducted by a provincially-appointed Inquiry Officer. Prior to the Hearing, the Region of Waterloo must serve the property owner with a Notice setting out its reasons or grounds for the proposed expropriation. Compensation for lands is not determined at this Hearing. The Inquiry Officer can order the Region of Waterloo to pay the property owner up to $200.00 as compensation for the property owner’s costs in participating in this Hearing, regardless of the outcome of the Hearing.

- If a Hearing is held, a written report is provided by the Inquiry Officer to the property owner and the Region of Waterloo. Council must consider the Report within 90 days of receiving it. The Report is not binding on Council and Council may or may not accept the findings of the Report. After consideration of the Report, Council may or may not approve the expropriation of the land or grant approval with modifications. A property owner may wish to make written and/or verbal submissions to Council at the time that it is considering the Report.

- If no Hearing is requested by the property owner, then Council may approve the expropriation of the land after expiry of a 30 day period following service of the Notice of Application for Approval to Expropriate.

- If Council approves the expropriation then, within 3 months of this approval, the Region of Waterloo must register a Plan at the Land Registry Office that describes the expropriated lands. The registration of this Plan automatically transfers title of the lands to the Region of Waterloo, instead of by a Deed signed by the property owner.

- Within 30 days of registration of the Plan, the Region of Waterloo must serve a Notice of Expropriation on the affected property owner advising of the expropriation. Within 30 days of this Notice, the property owner may serve the Region of Waterloo with a Notice of Election selecting the valuation date under the Expropriations Act for calculation of the compensation.

- In order to obtain possession of the expropriated lands, the Region of Waterloo must also serve a Notice of Possession setting out the date that possession of the land is required by
the Region of Waterloo. This date has to be 3 months or more from the date that this Notice of Possession is served on the affected property owner.

- Within 3 months of registration of the Plan, the Region of Waterloo must provide the affected property owner with payment for the full amount of the appraised fair market value of the expropriated land or easement and a copy of the appraisal report on which the value is based. If the property owner disagrees with this amount, and/or claims other compensation and/or costs under the *Expropriations Act*, the compensation and/or costs matter may be referred to a provincially-appointed Board of Negotiation in an effort to reach a mediated settlement and/or an appeal may be made to the Ontario Municipal Board (OMB) for a decision. In any event, the Region of Waterloo continues in its efforts to reach a negotiated settlement with the affected property owner prior to the OMB making a decision.
Appendix “C”

Corporate Profiles

1. 29 Midland Drive, Kitchener, ON
   • Owner: The Roman Catholic Episcopal Corporation of the Diocese of Hamilton in Ontario
   • Annual Return: June 21, 2010
   • Directors/Officers:
     David Douglas Crosby

2. 42 Evelyn Crescent, Kitchener, ON
   • Owner: Parents For Community Living Kitchener-Waterloo Inc.
   • Annual Return: November 10, 2014
   • Directors/Officers:
     John Badham, Chris Barker, Daren D Becks, Timothy Flannery, Gary Howell, Marion Kelterborn, Chris Lasovich, Katherine Loveys, Alexandra Milne, Timothy O’Leary, Shereen Rowe, Larry Scanlon, Brittany Seigner, Sharath Thundiyil.
Region of Waterloo
Planning, Development, and Legislative Services
Community Planning

To: Chair Tom Galloway and Members of the Planning and Works Committee
Date: October 6, 2015
File Code: D03-80
Subject: Region of Waterloo Comments on the Review of the Conservation Authorities Act

Recommendation:

That the Regional Municipality of Waterloo forward Report PDL-CPL-15-51, dated October 6, 2015, to the Ministry of Natural Resources and Forestry as input to the review of the Conservation Authorities Act.

Summary:

On July 20, 2015, the Province posted a Discussion Paper on the Environmental registry to launch a review of the Conservation Authorities Act. The discussion paper focuses on three main aspects of conservation authorities, (1) governance, (2) funding, and (3) roles and responsibilities. The Region of Waterloo is rather unusual in that it is located entirely within the area of only one of the 36 conservation authorities, the Grand River Conservation Authority (GRCA). Other upper-tier municipalities may lie within the boundaries of two to five conservation authorities. The comments expressed in this report will therefore reflect the experience of Regional staff in working with the GRCA over several decades.

Overall, the Region of Waterloo enjoys a strong collaborative working relationship with the GRCA based on mutual respect for each agency’s mandate, expertise, and professional competence. Regional staff depend on the GRCA for its expert help in conducting watershed studies which the Province identifies as the appropriate scale for long-term integrated planning. The Region also values the hydrological and geotechnical expertise of Authority staff in the development review process, its vital flood control activities, and the ongoing stewardship of the Grand River and its
tributaries. In addition, staff support the role of conservation authorities operating Conservation Areas throughout the Province as these are greatly enjoyed by the public. The GRCA’s tree production and planting programs and the delivery of the Rural Water Quality program are also valued. In the past, the Region has supported the Authority’s conservation land acquisition and tree planting initiatives through grants from the Community Environmental Fund.

As Ontario’s planning legislation and regulatory structures evolved in the 1990s and 2000s, the roles and responsibilities of conservation authorities have also changed beyond what they were in 1946 when the Act was passed. This has resulted in some municipalities expressing concern about perceived “scope creep” and duplication by their respective conservation authorities. This may be a result of the rather broad scope of powers in the Conservation Authorities Act “to study and investigate the watershed and to determine a program whereby the natural resources of the watershed may be conserved, restored, developed and managed.” Beginning in the 1990s, successive Provincial Policy Statements have made municipalities responsible for the conservation of natural heritage. Most larger municipalities are now quite capable of protecting natural heritage, but continue to rely on conservation authorities to advise on stormwater management affecting wetlands. It is therefore recommended that consideration be given to revising section 21(1) of the Act to reflect the fact that natural heritage planning is now vested with municipalities, but at the same time allow municipalities to enter into Memoranda of Understanding (MOUs) with their conservation authorities to delegate natural heritage planning and thereby avoid duplication of processes in the planning process.

It would also be appropriate at this time to provide clearer definition of the relationship of the Province to conservation authorities and municipalities with respect to watershed management. The Province could play a valuable role in co-ordinating and funding research into technical and policy matters of common concern to conservation authorities such that authorities with fewer resources would not be disadvantaged. As flood control infrastructure ages and rainfall events seem to be becoming more extreme, the Province needs to be a more effective partner with conservation authorities and municipalities.

Report:

On July 20, 2015, the Province posted a Discussion Paper on the Environmental registry to launch a review of the Conservation Authorities Act. The discussion paper focuses on three main aspects of conservation authorities, (1) governance, (2) funding and (3) roles and responsibilities. The comments in this report reflect the experience of Regional staff in working with the Grand River Conservation Authority (GRCA) over several decades.
Conservation Authorities are a long-established and valuable component of the governmental structure of Ontario. The 36 conservation authorities are located in the most populated areas of the Province, all but five of them in a broad triangular area stretching from Windsor to the base of the Bruce Peninsula to the Quebec border. Conservation authorities have been established pursuant to the Conservation Authorities Act, 1946. As provided for by the Act, each authority was established as an initiative of two or more municipalities occupying particular watersheds. The boundaries of the conservation authorities correspond more-or-less to watershed boundaries rather than anthropogenic municipal boundaries. This permits them to manage water resources in the most appropriate landscape context. The Region of Waterloo is rather unusual in that it is located entirely within the area of one conservation authority, the Grand River Conservation Authority (GRCA). Many other municipalities lie within the areas of two to five conservation authorities. Covering 6,965 square kilometres and 290 kilometres from Dundalk to Lake Erie, the GRCA is also one of the largest conservation authorities. It comprises several flourishing cities, many towns and villages, expanses of productive agricultural land, and many areas of diverse natural heritage.

As Ontario’s planning legislation and regulatory structures evolved in the 1990s and 2000s with a sequence of updates to the Provincial Policy Statement and several amendments of the Planning Act, the roles and responsibilities of conservation authorities have also changed beyond what they were in 1946 when the Conservation Authorities Act was enacted.

**Governance and Funding**

In accordance with sub-section 4 of the Act, the Region acts in the place of the Area Municipalities for the purpose of appointing representatives to the Board. This ensures a good level of accountability to the municipalities. As the most populous municipality within the Grand River watershed, the Region is well-represented on the Board and contributes significantly to the funding of the Authority. Regional staff are generally satisfied with this arrangement as it provides essential services in a timely and responsive manner.

**Roles and Responsibilities**

Reports prepared by other municipalities on the Conservation Authorities Act review, have outlined a number of concerns with their conservation authorities’ mandate and operations. In the Region’s case, dealing with only one conservation authority has simplified the matter of relationships. Moreover, a strong collaborative working relationship has developed over many years based on mutual respect for each agency’s mandate, expertise and professional competence (as is also the case with the Area Municipalities). Regional staff depend on the GRCA for its expert help in conducting watershed studies. This is an important role in that the Provincial Policy Statement
identifies the watershed as the appropriate scale for long-term integrated planning. GRCA involvement in watershed studies takes the form of carrying out extensive monitoring programs prior to commencing the study and providing expert input throughout the course of the study. Staff also value the hydrological and geotechnical expertise provided by Authority staff through the development review process, its vital flood control activities, and the ongoing stewardship of the Grand River and its tributaries.

Comments from some other municipalities speak of perceived “scope creep” and duplication by their respective conservation authorities. This may be a result of the rather broad scope of powers in the Conservation Authorities Act. For example, subsection 21(1) gives a conservation authority power “to study and investigate the watershed and to determine a program whereby the natural resources of the watershed may be conserved, restored, developed and managed.” This may have been quite appropriate in 1946 when few municipalities would have had environmental planners on staff. Beginning in the 1990s, however, successive Provincial Policy Statements have made municipalities more responsible for the identification and conservation of natural heritage. Clarification of conservation authorities’ roles in the contemporary planning environment was addressed by the Conservation Authorities Liaison Committee (CALC) in 2010 and is expected to be further clarified through the present review process.

Most larger municipalities are now quite capable of protecting natural heritage, but continue to rely on conservation authorities to advise on technical matters such as stormwater management affecting wetlands and watercourses and slope stability. A case can be made for small rural municipalities to contract with their conservation authority to do specialised natural heritage planning. It is therefore recommended that consideration be given to revising section 21(1) of the Act to reflect the fact that natural heritage planning is now vested with municipalities, but at the same time allow municipalities who wish to enter into Memoranda of Understanding (MOUs) with their conservation authorities to specify natural heritage planning roles and thereby avoid duplication of processes in the planning process.

Discussion of the role and responsibilities of conservation authorities without reference to the Province would be incomplete. As the ministry responsible for conservation authorities and natural heritage conservation, the Ministry of Natural Resources and Forestry has a vital role to play. For example, individual conservation authorities may, depending on their capacity, carry out various research projects within their respective watersheds. To avoid duplication of effort or disadvantaging smaller conservation authorities, the Province could play a role in conjunction with Conservation Ontario in co-ordinating and financing relevant research. Moreover, as much flood control infrastructure was constructed many years ago and as climate change appears to be generating more extreme flood events, the Province needs to provide more appropriate
financial assistance to allow conservation authorities to maintain and refurbish these structures.

Staff also support the role of conservation authorities operating Conservation Areas as these are greatly enjoyed by the public and provide many opportunities for education. The GRCA’s tree production and planting programs are also valued as they have restored many acres of marginal land. In the past, the Region has supported the GRCA’s conservation land acquisition and tree planting initiatives through grants from the Community Environmental Fund.

Conclusion

The Region of Waterloo enjoys a strong relationship with the Grand River Conservation Authority. Close collaborative relationships among the GRCA, Area Municipalities and the Region are based upon clear delimitation of areas of jurisdiction and the development of collegial working relationships. As “scope creep” has been identified as a cause of duplication in some other municipalities, it is recommended that the powers of conservation authorities with respect to natural heritage be revised to reflect municipal responsibilities defined in the Provincial Policy Statement. There should still be provision for small rural municipalities to enter into Memoranda of Understanding (MOUs) with their conservation authorities to carry out natural heritage on a watershed basis if they so choose.

It would also be appropriate at this time to provide clearer definition of the relationship of the Province to conservation authorities and municipalities with respect to watershed management. The Province could play a valuable role in co-ordinating and funding research into technical and policy matters of common concern to conservation authorities such that authorities with fewer resources would not be disadvantaged. As flood control infrastructure ages and rainfall events seem to be becoming more extreme, the Province needs to be a more effective partner with conservation authorities and municipalities.

Area Municipal Consultation/Coordination

Regional and Area Municipal staff collaborate with the GRCA on watershed studies, development applications, and many infrastructure projects.

Corporate Strategic Plan:

Collaboration with the Grand River Conservation Authority is a partnership that has enabled the Region and Area Municipalities to pursue Strategic Objectives 1.4 to protect the quality and quantity of our drinking water and 1.5 to restore and preserve green space, agricultural land, and sensitive environmental areas.
Financial Implications:
Nil.

Other Department Consultations/Concurrence:
Nil.

Attachments:
Nil.

Prepared By:  Chris Gosselin, Manager, Environmental Planning and Stewardship

Approved By:  Rob Horne, Commissioner, Planning, Development and Legislative Services
To: Chair Tom Galloway and Members of the Planning and Works Committee  
Date: October 6, 2015  
File Code: C06-60  
Subject: Corporate Asset Management Strategy Project Update  

Recommendation:  
For Information  

Summary:  
This report is to update Council on the Corporate Asset Management Strategy Project accomplishments and progress achieved to date. This report provides information relating to the Corporate Asset Management Governance Structure, Asset Management Plan, and the procurement and implementation of a Corporate Asset Management System (this includes a Work Management System, Decision Support System(s) and Professional Services support).

The objective of the Corporate Asset Management Strategy Project was to work with Transportation and Environmental Services and Corporate Services towards the further development and implementation of asset management (AM) best practices. Although the Region of Waterloo (Region) has always practiced AM, the methodologies were not always applied consistently throughout each Department and Division. The AM Strategy project has allowed staff to understand and implement industry best practices, and develop processes and policies for managing the Region’s physical assets. Implementation of these processes and policies has resulted in better collaboration between departments and divisions, improved project planning, repeatable decision making and overall cost savings. This report describes these benefits in greater detail and outlines the next steps to further the implementation of best Asset Management practices at the Region.
Asset Management is an integrated set of processes and best practices that minimize the lifecycle costs of owning, operating, and maintaining assets, at an acceptable level of risk, while continuously delivering established levels of service. Two main tools to assist in AM include a Work Management System (WMS) and a Decision Support System (DSS). The WMS is used to plan, generate, track and monitor the day-to-day activities that are required to operate and maintain Region assets. The DSS is used to assist the development of capital programs by prioritizing and managing projects, and tracking the overall performance and condition of the assets. In its simplest form, asset management answers the following questions:

1. What is the current state of our assets?
   a. What do we own and what is it worth?
   b. What condition is it in?
   c. What is the remaining useful life?

2. What is the required Level of Service?
   a. What is the demand?
   b. What is required by regulations and legislation?
   c. What is my performance?
   d. What will the Level of Service cost?

3. Which assets are critical to performance?
   a. How do they fail?
   b. How can they fail?
   c. What is the cost to repair or replace?
   d. What are the consequences of failure?

4. What is the best minimum lifecycle cost based on Capital Improvement Plan, and Operation and Maintenance strategies?
   a. What alternate options are there?
   b. Which options are most feasible for the Region?
5. Given the above, what is the best long-term funding strategy?

   a. Is there an infrastructure deficit or gap and how much is it?

By answering these questions the Region can ensure that the right projects are being done at the right cost, at the right time and for the right reasons.

In 2011, Transportation and Environmental Services (TES) Department and Facilities Management and Fleet Services (FFM) worked together on the Corporate Asset Management Strategy Project. The objective of this project was to work collectively with all affected business units and operating areas towards the development of asset management (AM) best practices.

A Corporate Asset Management Policy that defines the AM strategy is currently under review and will be presented to Regional Council for endorsement later this year.

The Region owns assets with a total replacement value of approximately $5.5 billion covering a wide range of different asset types. In 2015, we will spend approximately $600 million maintaining and operating these assets to meet expected service levels. The breakdown of asset valuation, as well as, the capital and operating budget for each division is outlined in the table below. Appendix A shows a more detailed list of assets within the Region.
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<th>Division or Section</th>
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<th>2014 Asset Replacement Cost ($000’s)</th>
<th>2015 Capital Budget ($000’s) (excludes RDC funded projects)</th>
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**Summary of Progress and Benefits to Date**

The AM strategy has allowed staff to implement industry best practices, policies and available processes for managing the Region’s assets. Progress to date is summarized below:

1. Prepared Initial Asset Management Plans for each participating division

2. Defined Level of Service (LOS), Failure Modes and Risk Analysis and processes to apply these to each asset. Defined Maintenance, Renewal and Capital Planning Framework and Processes

3. Developed processes to prioritize and optimize capital and maintenance activities to achieve best value to the community
4. Prepared maintenance and capital improvement plans based on risk and life cycle analysis

5. Improved benchmarking processes to measure infrastructure performance over time

6. Forecasted needs to develop comprehensive long range financial plans

7. Improved data collection and information systems to support asset management decisions

8. Enhanced staff asset management knowledge, skills and corporate memory.

The Region has enhanced its asset management knowledge and is moving to a more advanced program by implementing the above best practices and processes. While progress has been made, there are still opportunities to make further changes and improvements. Some of the benefits achieved to date are as follows:

- A number of divisions have made significant improvements to their asset inventory and maintenance management system. By tracking and categorizing assets, those divisions are able to better understand and forecast failures, repair and replacement costs, and schedules. Maintenance work can now be better predicted and planned, reducing costly failures

- Many divisions have started to assess the risk of asset failure, allowing staff to prioritize both maintenance and capital work so that both critical and non-critical assets are maintained and replaced appropriately. A significant amount of work is required to expand these processes to all Region-owned assets

- The Transportation Division has deferred over $8M in the 10 year Capital Program in road projects through a more proactive maintenance program without impacting the level of service or road quality

- Further performance and condition assessment of watermains resulted in a deferral of over $8M in replacement projects in the Water Services Division 10 year Capital Program without impacting the level of service

- Incorporating AM best practices has resulted in the optimization of the 10 year Water Capital Program in all areas

**Corporate Asset Management Next Steps**

As part of the asset management strategy, the Region will continue to develop a formal Corporate Asset Management Program. Representatives from each division will work
together to further implement AM processes, practices and procedures to ensure the Region is managing its assets effectively and consistently providing best value to the community. The following are some of the key next steps of the Corporate Asset Management Program.

**Corporate Asset Management Governance Structure**

A Corporate Asset Management Governance Structure was implemented to build on the structure used during the Corporate Asset Management Strategy Project to ensure that there is a single consistent corporate direction and ensures consistent processes are applied among the various program areas.

A Steering Committee consisting of the Commissioners and two Directors each from Corporate Services (CS) and Transportation & Environmental Services (TES) has been created. The Steering Committee will provide overall direction to the program. An AM Implementation Group has been formed to support the governance structure which includes representation from the operating divisions, Finance (procurement and corporate finance), Human Resources and Information Technology (IT). This structure provides input, general project direction, ensures acceptance and buy-in to asset management principles and coordinates the work across departments and divisions. Staff within each division gathers information, provides comments, tests concepts and strategies and completes the actual asset management activities.

**Updated Corporate Asset Management Plan**

The Asset Management Plan (AM Plan) is a long range planning document that is used to provide a rational framework for managing the Region’s assets. The AM Plan is intended to improve the Region’s ability to meet its corporate goals and objectives in a way that best services its customers.

The AM Plan presents a Corporate Framework and provides systematic and repeatable processes to manage costs, risks and levels of service for the Region’s assets. The AM Plan identifies medium to long term cost forecasts and assists in predicting future problems that may hinder service delivery. This creates opportunities for the asset managers and operators to remove physical and financial barriers before they negatively impact customer levels of service. The AM Plan is required by the Province and Federal Government for municipalities to apply for infrastructure funding. The Region currently meets the provincial and federal requirements.

Initial AM Plans were completed by both TES and FFM in 2012. Staff is currently working on an updated Corporate AM Plan which will be presented to Regional Council in early 2016.
Asset Management System Implementation

The AM System Implementation Project will include a centralized, Corporate WMS and DSS(s). Implementation of an AM System will ensure the Region has a complete and consistent asset inventory, data definition and business process integration for all phases of asset lifecycles (from procurement to decommissioning) and related operational activities.

The Region currently has a number of WMS’s in use. Many of these systems are at or nearing the end of their useful life and generally no longer supported by their vendors. These systems require either upgrading or replacement to meet current business needs and requirements. This is an expensive and complex undertaking and there is an opportunity to instead replace the various WMSs with a common system that will be used throughout the Region to be more efficient and effective. Having a common WMS will allow easy sharing of information and expertise, and greatly simplify the support required from IT. Replacing several systems with one is a large undertaking but will produce long term benefits and better information sharing with Council, allowing consistent information presentation capabilities across various asset categories, over the long term.

As part of the AM Systems implementation, the DSS(s) will assist in capital program planning, prioritizing and managing projects, and tracking the overall performance and condition of the assets.

The AM System purchase will consist of a two stage Request for Proposal process.

- Request for Proposal 1 – Includes the selection and purchase of a corporate Work Management System (includes software, modules and licenses). This Request for Proposal is currently being prepared and a report outlining staff recommendation will be presented to Regional Council in early 2016.

- Request for Proposal 2 – Includes the Professional Support Services to implement the Work Management System as well as the purchase and implementation of one or more software products to meet necessary requirements for a Decision Support System(s). Staff anticipate a report to Regional Council with a recommendation on the preferred Professional Support Services in the summer of 2016.

The Region will gain productivity advantage by efficient sharing of asset information between area municipalities and other partners such as Ontario Clean Water Agency (OCWA). Transportation and water assets, in particular, are part of an integrated network where services are optimized and shared between the various local area municipalities.
The Asset Management Steering Committee and Implementation Group will jointly develop the evaluation criteria to be used in this process. These criteria will include efficient sharing of information among municipalities and stakeholders, vendor experience and references, price, integration with existing systems as well as other considerations.

**Departmental Implementation Next Steps**

Changes will be required within TES and CS to fully implement the Corporate Asset Management Strategy Project. TES will, through a minor reorganization process, create a small group that will be responsible for the overall implementation of asset management in the department. This group will be created using existing Full Time Equivalents and will be funded from the capital program (similar to Design and Construction funding). It is anticipated that the group will consist of one management position reporting to the Commissioner of TES and up to three additional redeployed existing positions.

Corporate Services has already created a position of Manager, Planning and Performance Management and the project will be further supported by the Director, Financial Services and Development Financing as well as the Manager, Infrastructure Financing.

**Corporate Strategic Plan:**

The project meets the Corporate Strategic Plan objective to develop, optimize and maintain infrastructure to meet current and projected needs under Strategic Focus Area 2 - Growth Management and Prosperity.

**Actions:**

2.2.1 Continue to prioritize and implement capital program projects required to meet community needs and ensure sustainability.

2.2.2 Develop and implement a comprehensive asset management strategy to achieve optimal long-term value from regional infrastructure.

**Financial Implications:**

Through this process the Region intends to replace several major systems (6+), affecting multiple departments, and impacting business processes for over 500 staff. The connectivity needs to other existing Regional systems (Email, Financials, Human Resources, Geographic Information Systems, etc.) are very high. At rough estimate there will be approximately 20 interfaces to existing systems that will need to be built, tested, and maintained without adversely impacting those other
environments. This is the largest IT system implementation the Region has yet to undertake, and requires significant resources both for IT Project Management and for Technical Support.

The approved 2015 capital budget and forecast includes $10.4 million from 2015 to 2018 to implement an Asset Management System. These expenditures will be funded from Regional Development Charges ($1,560,000; 15%), Water and Wastewater User Rates ($4,440,000; 43%), the Roads Rehabilitation Reserve ($3,350,000; 32%) and Debentures ($1,070,000; 10%).

The estimated breakdown for the Asset Management System capital budget is outlined below:

<table>
<thead>
<tr>
<th>Cost ($000’s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM System Hardware and Software</td>
</tr>
<tr>
<td>$3,700</td>
</tr>
<tr>
<td>Professional Services and Implementation</td>
</tr>
<tr>
<td>$3,500</td>
</tr>
<tr>
<td>IT Project Mgmt and Technical Support</td>
</tr>
<tr>
<td>$1,800</td>
</tr>
<tr>
<td>Contingency</td>
</tr>
<tr>
<td>$1,400</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>$10,400</td>
</tr>
</tbody>
</table>

In addition to the capital costs for implementing this system there will be operating costs relating to both the maintenance and support of the system. Staff are currently reviewing the requirements for this project and an update will be included in a Council report in early 2016.

**Other Department Consultations/Concurrence:**

Staff from Corporate Services have been involved in the Corporate Asset Management Program and consulted in the preparation of this report.

**Attachments:**

Appendix A – Region of Waterloo Current Asset List

**Prepared By:** Richard Pinder, Senior Project Engineer - Asset Management

Charles Allen, Manager, Planning and Performance Management
Approved By:  **Thomas Schmidt**, Commissioner, Transportation and Environmental Services

**Craig Dyer**, Commissioner of Corporate Services/Chief Financial Officer
APPENDIX A

Region of Waterloo Current Asset List

Airport

- 360,000 square metres of asphalt which consists of 2 runways, 5 taxiways, 5 Aircraft parking aprons and a series of groundsie roads and vehicle parking lots
- 49,000 metres of storm sewer
- 500 edge lights, 40 guidance signs, 4 precision approach path indicator (PAPI) systems, 2 approach lighting systems, 8 constant current regulators including approximately 28,392 metre of underground cabling
- 2 emergency generators and a computerized control system located in a dedicated field electric centre
- 2,233 metres of overhead and 442 metres of underground 3 phase hydro distribution including 13 pole mount transformers, 5 pad mount transformers, 3 load break switches and 46 hydro consumption meters
- 32 street lights and light standards including underground cabling 2,258 meters of underground fibre optic telecommunication cabling.
- 5 administration and maintenance operations buildings
- 32 camera CCTV security system including cabling and digital video recording system
- 24,000 metres security / wildlife fencing network including 50 security gates
- 2,600 metres water pipeline network including 22 gate valves, 8 curb stops and 13 fire hydrants.
- 1,700 metres sanitary pipeline including 21 sanitary manholes and 1 pumping station

Facilities

- 714 building totaling an area of 6,081,415 square feet. These buildings include:
  - 3 ambulance stations
  - 5 child care centres
  - 3 gas generation facilities
- 5 high rise housing facilities
- 30 mid rise housing facilities
- 194 townhouses
- 124 detached and semi housing facilities
- 1 library
- 2 long term care facilities
- 28 museum buildings
- 22 offices
- 14 maintenance/office/storage facilities
- 61 out buildings (sheds, salt domes etc)
- 4 training facilities
- 4 transit terminals
- 8 waste transfer stations
- 77 waste water buildings
- 129 water buildings

**Fleet**

- 956 total vehicles which include:
  - 761 light vehicles
  - 105 medium vehicles
  - 90 heavy vehicles

**Grand River Transit**

- 238 conventional buses
- 30 MobilityPLUS buses
- 2 forklift
- 2 sweeper
• 3 service vehicles
• 11 supervisor vans
• 1 MP supervisor van with wheelchair lift

**Transportation**

• 1,726 lane kms of roadways
• 170 bridges and major culverts
• 484 signalized intersections
• 17,265 linear meters of noise walls
• 72,428 linear meters of guiderails
• 13,338 square meters of retaining walls
• 330 linear kms of storm pipes
• 1,036 storm water culverts
• 4,449 storm man holes
• 6,000 storm catch basins
• 11 storm water management ponds

**Waste Management**

• 1 engineered landfill
• 1 bulk transfer station
• 6 small vehicle transfer stations
• 1 Material Recycling Centre
• 2 household hazardous waste facilities
• 1 composting facility
• 2 administration buildings
• 2 heavy equipment maintenance shops
- 7 scales and scale houses
- 3 landfill gas Collection systems with over 150 gas wells and 50 km of collection piping
- 13 groundwater extraction wells
- 2 extraction well houses
- 6 leachate pump stations with over 10 km of discharge piping
- 7 storm water management ponds
- Over 10 km of haul roads

**Water Services**
- 111 wells
- 1 surface water treatment plant
- 25 groundwater treatment systems
- 1 raw water storage facility
- 17 treated water storage facilities
- 14 water pumping stations
- Approximately 400 km of watermains
- 13 waste water treatment plants
- 6 sewage pumping stations
- 1 biosolids storage lagoon
- 1 biosolids transfer facility
Region of Waterloo
Transportation and Environmental Services Department
Transportation Division

To: Chair Tom Galloway and Members of the Planning and Works Committee

Date: October 6, 2015

File Code: D09-90/2016 TMP

Subject: Transportation Master Plan Update: Scope of Work

Recommendation: For information.

Summary: Nil.

Report:

A transportation master plan (TMP) defines how the transportation system will grow and change in the coming decades. The TMP provides the justification for the Transportation Capital Program, updates to the Regional Development Charges By-Law, and many other strategic plans. Preparation of a TMP provides a periodic opportunity to accomplish the following tasks:

- Review the current state and long-term vision for transportation;
- Analyze the overall transportation system in a strategic manner;
- Integrate transportation planning with other strategic plans; and
- Consult with a broad range of stakeholders.

Moving Forward 2031, the current TMP, was approved by Council in 2010 in response to several new provincial and local policy initiatives that have a significant influence on the future direction of transportation in Waterloo Region. These include the Growth Plan for the Greater Golden Horseshoe, the Regional Growth Management Strategy, the Regional Official Plan and the Rapid Transit Project. Moving Forward 2031 involved significant public consultation and resulted in a vision to have a transportation system that would accomplish the following goals:

- Optimize the transportation system;
- Promote transportation choice;
• Foster a strong economy; and
• Support sustainable development.

Appendix A provides more details about the goals of Moving Forward 2031. Changes to provincial and local policy initiatives (i.e. new growth forecasts in the provincial growth plan and approval of the Regional Official Plan) mean it is now time to update the TMP. The Project Team met on August 25, 2015 to initiate this work and recommended that, subject to confirmation through public consultation, the Region maintain the vision and goals developed through the Moving Forward 2031 process. This includes the focus on promoting transportation choice, investing in public transit, cycling and walking, and reducing the reliance on travelling by driving alone.

The Project Team recommends a team of Regional staff directing work by consultants, organized as shown in Appendix B. The study would occur over an 18-24 month timeframe and include the following elements:

• Review of existing conditions and progress towards current TMP goals;
• Updated transportation demand forecasting to 2041 including the use of a range of growth forecasts;
• Development and prioritization of major policies, initiatives and projects;
• Public consultation;
• Integration of the Active Transportation Master Plan, Go Transit and Rapid Transit most recent plans into the TMP; and
• Coordination of the Transportation Master Plan with other Region Master Plans (i.e. Wastewater and Water Master Plans) and local municipal transportation plans.

Planning to 2041 means contemplating changes to the transportation system for the next 25 years, and necessarily implies a great deal of uncertainty about the future. The Project Team discussed the importance of developing a TMP that considers key “drivers” of change and is resilient to changes in these drivers. The consultant will be asked to develop briefings of the following emerging trends and issues and how they may affect the evolution of the overall transportation system:

• Goods movement;
• Greenhouse gas emissions and air quality;
• “Big data” (predictive analytics);
• The aging population and demographic shifts in population and employment;
• Changes in growth forecasts and actual growth
• Transportation Demand Management at employers;
• Autonomous and connected vehicles;
• Land use planning and emissions management;
• Electrification of transportation (i.e. electric cars, trains, etc.);
• Economic performance of transportation systems;
- Health and transportation; and
- Mobility management (i.e. transition from vehicle ownership to trip management).

Updating the TMP provides an opportunity to examine the operational management of the transportation system and to explore possible opportunities for improvement. As an example, currently, the area municipalities are responsible for the maintenance of sidewalks on Regional roads with snow clearing either done directly by the area municipality or by fronting residents. However, making meaningful progress towards the TMP goals may require a rethinking of this approach. It may be appropriate for a separate working group, reporting back to the overall TMP process, to initiate discussions with the area municipalities on this subject.

The TMP update also provides an opportunity to review topics of a strategic nature that may not affect all area municipalities. It is anticipated that these will be identified by the Municipal Advisory Group as the project proceeds. For example, the Township of Woolwich has requested that the TMP update consider a bypass road around Elmira.

It should be noted, as part of the TMP update, there will be coordination with other Region Master Plans (Wastewater and Water) and local municipal transportation plans.

**Next Steps:**

Staff will prepare a Terms of Reference for the TMP update and issue a Request for Proposals to qualified consulting firms to undertake the work. The intention is to have an agreement signed with the consulting team by the end of 2015. The project is expected to take 18-24 months and be complete by the end of 2017.

**Corporate Strategic Plan:**

The TMP update is a major initiative that touches on all strategic objectives in the Sustainable Transportation focus area of the 2011-2014 Strategic Plan. It also contributes to many strategic objectives in the Protect and Enhance the Environment and Growth Management and Prosperity focus areas.

**Financial Implications:**

The 2015 Transportation Capital Program identifies $400,000 from the Regional Development Charges reserve fund to undertake this project. Consultations with other regional municipalities currently undertaking transportation master plans indicated that the total cost of completing the TMP update may be closer to $600,000-750,000. Completion of the Terms of Reference will narrow this range and additional funds can be allocated in 2016-2017, as necessary.

The Federation of Canadian Municipalities awarded $350,000 from the Green Municipal Fund to the Region in 2009 for Moving Forward 2031. Staff intend to pursue similar funding opportunities for the TMP update.
Other Department Consultations/Concurrence:

In addition to the Transportation Division, the Project Team comprises members of Regional Council (Tom Galloway and Elizabeth Clarke) and staff from the following divisions:

- Community Planning;
- Corporate Communications;
- Design and Construction;
- Healthy Living;
- Rapid Transit;
- Transit Services;
- Finance; and
- Fleet and Facilities.

As the project progresses, staff from other divisions will be consulted as required.

Attachments

Appendix A – Current Transportation Master Plan Approved Goals
Appendix B – Proposed Study Organizational Structure

Prepared By: Geoffrey Keyworth, Acting Manager, Transportation Planning

Approved By: Thomas Schmidt, Commissioner, Transportation and Environmental Services
Current Transportation Master Plan Approved Goals

Optimize the Transportation System: Make the most of what exists, preserve and maximize the use of facilities and services, and avoid or defer the need for new infrastructure that does not support the other goals.

Promote Transportation Choice: Provide and maintain a transportation system that offers competitive choices for moving people and goods in an integrated and seamless manner while minimizing single-occupancy vehicle trips.

Foster a Strong Economy: Provide a transportation system that supports the retention of existing businesses and attraction of sustainable economic activity.

Support Sustainable Development: Provide and maintain a transportation system that supports sustainable growth in both urban and rural areas and reduces transportation contributions to climate change.

The goal of the plan is to create:

- A transportation network that centres on transit, with a rapid transit system connecting Waterloo, Kitchener and Cambridge;
- More cycling lanes and pedestrian-friendly routes;
- An expanded bus network, including more express bus service to feed rapid transit stations and better serve the busy residential and commercial centres beyond the rapid transit corridor;
- Planned road improvements to ensure movement of goods, relieve traffic problems or support transit; and
- Supporting policies to help the Region encourage transit ridership, cycling and walking, manage congestion and promote vibrant urban places.

The plan sets a goal that, by 2031, 15 percent of all trips in Waterloo Region be by transit, and 12 percent of all trips be by cycling or walking.
Proposed Study Organizational Structure

- **Regional Council**
  - **Corporate Leadership Team**
  - **Project Team**
    - Transportation (4) (PM, Assistant PM, Director, Manager of Program Development)
    - Design and Construction (1)
    - Transit Services (1)
    - Rapid Transit (1)
    - Community Planning (2)
    - Public Health (1)
    - Corporate Communications (1)
    - Finance (1)
    - Fleet and Facilities (1)
    - Regional Council (2)
  - **Consultant**
  - **Technical Team** (Project Management Team)
    - Project Manager (Manager, Strategic Transportation Planning)
    - Assistant Project Manager (Engineer II)
    - Consultant Project Manager
  - **Municipal Advisory Group** (MAG)
    - Representatives from all area municipalities
  - **Regulatory Agency Advisory Group** (RAAG)
    - Grand River Conservation Authority
    - Provincial Ministries
    - Metrolinx/GO Transit
    - Surrounding Municipalities
  - **Ad Hoc Working Groups** (as needed)
Region of Waterloo
Transportation and Environmental Services
Water Services

To: Chair Tom Galloway and Members of the Planning and Works Committee
Date: October 6, 2015  File Code: E06-05
Subject: Source Water Protection Plan Incentive Program – Guiding Principles

Recommendation:

That the Regional Municipality of Waterloo approve in principle the Source Protection Plan Incentive Program as outlined in report TES-WAS-15-25 dated October 6, 2015 as the basis for continuing the development of the Incentive Program.

And That the Regional Municipality of Waterloo approve an incentive program with an end date of August 16, 2017 for small septic system owners as outlined in report TES-WAS-15-25 dated October 6, 2015.

Summary:

To protect the quality and quantity of drinking water sources, the ‘Clean Water Act’ (2006) established a process to create locally-developed Source Protection Plans (SPP) for each watershed in Ontario. Policies to protect drinking water sources in Waterloo Region are in the Grand River SPP. Currently, Region staff anticipate Provincial approval of the Grand River SPP by the end of 2015 with an implementation date in late spring or early summer 2016. The Region is responsible for implementing a range of policy tools, including prohibition, risk management plans, incentives and education.

The Region is required to develop an incentive program as directed by the Grand River SPP but has discretion on the form and content. Staff propose developing the Source Protection Incentive Program (SPIP) on the following guiding principles: share cost of projects; encourage beneficial management practices; and fund beyond compliance. As noted in previous reports to Regional Council, incentives are only available to private property owners and not to area municipalities, the Grand River Conservation Authority or the Region. If approved, staff would provide detailed implementation guidelines for Regional Council’s consideration prior to the Grand River SPP implementation date.
Although the Grand River SPP is not yet approved, the area municipalities are required to complete inspections of the approximately 650 small septic systems that are ‘significant’ in the Grand River SPP by August 16, 2017. To meet this deadline, they have started their process; however, owners have been reluctant to participate early. It is recommended that the Region provide incentives for septic system owners to pump out their tanks prior to the required inspections. Incentives would encourage early action and assist the area municipalities in meeting their deadline. The grants would only be available until the inspection deadline and would decrease each year to encourage early action. This program would run parallel to but separate from the SPIP due to the short timelines.

Report:

Background

The Source Protection Plan policies will protect municipal drinking water sources

To protect the quality and quantity of drinking water sources, the ‘Clean Water Act’ (2006) established a multi-step, multi-year process to create a Source Protection Plan (SPP) for each watershed in Ontario. Policies to protect drinking water sources in Waterloo Region are in the Grand River SPP.

Over the last eight years, Region staff worked collaboratively with staff from the local municipalities and Grand River Conservation Authority (GRCA) to assess risks and develop policies. Regional Council received reports throughout this process and provided comments to the Lake Erie Source Protection Committee (SPC), the multi-stakeholder group responsible for the Grand River SPP.

For more background on the policy development process, including draft policies, rationale, cost estimates and public consultation, are outlined in council-approved reports TES-WAS-15-12 (March 24, 2105), E-13-003 (January 8, 2013), E-12-089 (September 25, 2012), and E-12-075 (August 14, 2012). In addition, to read the proposed policies, a complete copy of the Grand River SPP is available at http://www.sourcewater.ca/.


On July 22, 2015, the GRCA submitted the Grand River SPP to the Ministry of Environment and Climate Change (MOECC) for final approval. Currently, Region staff anticipate plan approval by the end of 2015. Once approved, the MOECC will identify an effective date for the SPP, which staff anticipate to be three to six months from the date of SPP approval. Therefore, at this time, the earliest that staff expect to be implementing the SPP will be April 1, 2016; however July 1, 2016 is preferred.
Understanding the Region’s Implementation Role

The Region is required to implement many Source Protection Plan policies, including providing incentives

The Grand River SPP includes policies to prohibit and/or manage activities that may affect Waterloo Region drinking water sources. Each policy identifies the responsible agency, specific activity, applicable location, and policy tool. The Region is responsible for implementing a range of policy tools, including prohibition, risk management plans, incentives, and education.

Staff are preparing for implementation, including the design of the risk management process, development of By-laws, and design of incentive programs. In 2012, the 10-year implementation costs to the Region, over and above those incurred and planned for existing source protection activities and existing staff, were estimated to be $9,400,000 (E12-075), and assumed an implementation date in 2013. This estimate included $5,190,000 allocated for incentives over a ten-year period. Since then, these initial cost estimates continue to be refined to reflect:

- later implementation dates due to delayed Provincial reviews and approvals
- expenses already incurred for implementation preparation
- increased understanding of the implementation scope and responsibilities
- additional details from the Province about the five-year SPP update process.

To-date, these changes are relatively minor and were incorporated into Water Services budgets as part of the 2014 and 2015 budget processes.

Region Council directed staff to develop an incentive program as required by the SPP

The Region is required to develop an incentive program as directed by the policies but has discretion on the form and content. Incentive policies apply to existing activities (e.g. salt storage, manure application, chemical storage). On August 14, 2012, Regional Council directed staff to develop detailed implementation guidelines for the incentive program for consideration (E-12-075). This report, TES-WAS-15-25 (October 6, 2015), outlines the principles and rationale for the incentive program and with Regional Council’s approval staff would build on this foundation and develop the details for Regional Council’s approval before implementation.

Incentives can help improve the implementation of more restrictive policies

The incentive policies apply in one of the two following scenarios:

- Incentives provided in parallel with policies that are more restrictive. For many
activities, Risk Management Plans will be required to be negotiated with the Risk Management Official and may require upgrades to existing structures or practices (e.g. requirements for spill protection, staff training and/or site assessments), the implementation of which will be at the owners/operators expense and would be beyond what is required in other areas. This could occur in our highest priority areas: those closest to the wells and for activities which contribute to known water quality concerns (e.g. winter salt application). Incentives would ease the burden of landowners required to have risk management plans that result in additional expense and may improve the risk management plan negotiation process and on-going compliance.

- Incentives are the only tool used to manage an activity. This applies in areas farther from the well with a lower risk to our water sources. Incentives would encourage voluntary adoption of water protection behaviours.

**Developing the Source Protection Incentive Program**

**SPP Incentive Program would build on the successful Business and Rural Water Quality programs**

The Source Protection Incentive Program (SPIP) would build on the experience, lessons learned, and successes of the former Business Water Quality Program (BWQP), which ran between 2001 and 2005, and the 17-year-old Rural Water Quality Program (RWQP). Through these programs the Region provided grants to businesses and farmers respectively, to voluntarily implement beneficial management practices to protect surface and groundwater quality.

The BWQP and RWQP shared similar guiding principles, which are the principles upon which the SPIP will be designed:

- **Share cost of projects**
  - The Region would provide one-time funding for a percentage of the total project cost to a maximum amount. The applicant would be required to contribute a portion. This helps promote “ownership” and ensures appropriate implementation.

- **Encourage beneficial management practices**
  - The Region would gather input from consultants, industry experts and property owners about current industry practices and identify opportunities to improve standard practices through incentives. The eligible practices would include site assessments, capital and procedural projects, such as training.

**Create project guidelines to improve water protection and maximize funding**

To improve water protection and maximize funding, the SPIP guidelines would include
eligibility criteria, project descriptions, grant rates, and grant maximums. These components would be based on technical analysis, past experience, and industry and property owner input.

Eligibility criteria would ensure that funding is provided to projects for which an SPP incentive policy applies within Waterloo Region and funding would be available for all eligible property owners. The criteria would also specify legal requirements (e.g. compliance with Ontario Building Code), applicant eligibility (e.g. engaged in a ‘significant’ threat activity), and authorized project expenses (e.g. purchased materials). Funding is only available for existing activities.

For each threat category, project descriptions would identify the intended outcome of the project and allow flexibility to meet individual property requirements. In addition, grant rates (cost-share percentages) and grant maximums, would be specified. Grant rates and maximums would consider typical project costs, availability of alternate funding sources, and the potential to protect water.

Staff propose developing the SPIP in two stages as outlined below:

- **Stage One: Program Principles**
  - Develop the program principles to provide direction for the detailed program design, as outlined in this report, TES-WAS-15-25 (October 6, 2015).

- **Stage Two: Detailed Program Design**
  - Develop implementation guidelines, including eligibility criteria, eligible projects, grant rates, grant maximums, and approval process, based on input from consultants, industry experts, and property owners.
  - Before implementation, staff would present the detailed program design for Regional Council’s consideration prior to the SPP effective date (spring/summer 2016).

As noted in Regional council-approved reports TES-WAS-15-12 and E-12-075, incentives would only be provided to private property owners and not for activities being undertaken by local area municipalities, the GRCA, or the Region. This approach is consistent with MOECC source protection principles that promote sharing of the financial burden for implementation among those implementing the activities and municipal/provincial tax and user rate budgets.

On January 14, 2013, The City of Waterloo approved a recommendation “…that Council request the Region of Waterloo to provide funding to support implementation of the Source Protection Plan.” A copy of this letter dated February 7, 2013 is provided in Attachment 1. As noted throughout this report, the Region is committed to providing incentive funding as well as funding existing and new staff resources to support source protection implementation. Staff is not recommending any action be taken with respect to providing incentives to government agencies for activities on public properties unless
directed by Regional Council. As noted in TES-WAS-15-12, costs to implement the policies on Region-owned properties would be funded through the department responsible to the threat activities (e.g., Facilities, Transportation, etc.) and can be accommodated through the annual budget review process as necessary.

Preliminary Incentives for Septic Systems

Incentives help manage impact from septic systems

Septic systems are potential threats to water quality under the ‘Clean Water Act.’ Therefore, the Grand River SPP has policies to manage them, including incentives for small septic systems. Under the Ontario Building Code, local municipalities must inspect all septic systems identified as a significant activity in the SPP by August 16, 2017 (five years from the approval date of the Grand River Assessment Report). This applies to approximately 650 small septic systems in Waterloo Region.

Although the Grand River SPP is not yet approved, to ensure they meet the Building Code deadline the area municipalities have started their septic inspection program. Septic owners have been reluctant to participate early and there has been little participation. It is recommended that the Region provide incentives for septic system owners to pump out their tanks prior to the required inspections. Incentives would be offered to encourage early action, minimize the burden of this new process for owners, and assist the local area municipalities meet their deadline. This program would run parallel but separate from the SPIP due to the short timelines.

Region staff collaborated with local area municipalities to develop an incentive program that would encourage early action from small septic system owners. Small septic system owners required to have an inspection would be eligible for incentives. Inspections are most effective with an empty septic tank, so eligible small septic system owners would receive a grant for municipally accepted tank pump-outs.

Incentives for small septic systems would be tiered and available for a limited time

The grants would be available only until the inspection deadline: August 16, 2017. In addition, the grant rate would decrease each year to encourage early action. The grants are based on the average cost of $325, not including tax, to pump a septic tank based on a survey of five local companies. Therefore, eligible small septic system owners, depending on the year of inspection, would receive the following one-time grant to pump out their small septic system:

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate (%)</th>
<th>Grant ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>80</td>
<td>260</td>
</tr>
<tr>
<td>2016</td>
<td>60</td>
<td>195</td>
</tr>
<tr>
<td>2017*</td>
<td>40</td>
<td>130</td>
</tr>
</tbody>
</table>

* Only available until August 16, 2017
Grants would apply retroactively to the initiation date of each municipality’s inspection program (May/June 2015) for all eligible small septic system owners. Based on the above grant rates and assuming an equal distribution of septic inspections in each year, the estimated cost of these incentives is approximately $125,000. If all 650 systems were inspected in year one at the highest grant rate, the maximum cost would be $169,000. This represents less than 4% of the total incentive program budget. Region staff would work with local area municipal staff to develop an efficient process to provide residents with these grants.

**Corporate Strategic Plan:**

Development of the Source Water Protection Incentive Program relates to the Strategic Objective 1.4, to “Protect the quality and the quantity of our drinking water sources.” Action 1.4.2 states that the Region of Waterloo should “Integrate the Provincial Water Protection Strategy & Regional Source Protection Plan to minimize the risk of historic, existing and future land uses on municipal water supplies.”

**Financial Implications:**

The approved 2015 Water Capital Budget and Ten-Year Forecast contains $5,190,000 for ‘Clean Water Act’ incentives between 2015 and 2024 and are funded entirely from the Water Reserve Fund. The cost of the septic system incentive program would vary between $85,000 and $169,000 with an anticipated cost of $125,000.

**Other Department Consultations/Concurrence:**

Legal Services has been and continues to be involved in the development of the incentive program.

**Attachment A:** Letter from City of Waterloo, dated February 7, 2013

**Prepared By:** Leanne Lobe, Supervisor, Source Water Protection Programs

**Approved By:** Thomas Schmidt, Commissioner, Transportation and Environmental Services
February 7, 2013

Kris Fletcher
Regional Clerk
Region of Waterloo Administrative Headquarters
150 Frederick St.
P.O. Box 9051, Station C
Kitchener, ON  N2G 4J3

Dear Ms. Fletcher,

On January 14, 2013, City of Waterloo Council passed the following motion related to Source Protection planning.

Moved by Councillor Freeman, seconded by Councillor Witmer:

“1) That Council approve DS2012-085 and direct staff to forward it to the Lake Erie Region Source Protection Committee for information,

2) that Council request the Province to provide funding to support municipal implementation of the Source Protection Plan; and

3) that Council request the Region of Waterloo to provide funding to support implementation of the Source Protection Plan.”

Carried Unanimously

As outlined in the attached Staff Report, the Source Protection Plan will have implications for the City of Waterloo as a landowner, regulatory body and municipal service provider. To help offset implementation costs, the City is requesting funding from the Region of Waterloo.
Thank you for considering this request.

Sincerely,

[Signature]

Mayor Brenda Halloran
City of Waterloo

Encl.

cc: Eric Hodgins, Manager, Hydrogeology and Source Water, Region of Waterloo
Region of Waterloo

Transportation and Environmental Services

Water Services

To: Chair Tom Galloway and Members of the Planning and Works Committee

Date: October 6, 2015       File Code: E07-70


Recommendation:

For information only.

Summary:

The Region of Waterloo and City of Guelph financed ground-breaking research into the performance of a technology that treats residential hard water without the need for salt and recharge water. The technology employs a process referred to as nucleation assisted crystallization (NAC) or template assisted crystallization (TAC) to effectively prevent scale buildup in household water heaters and appliances.

An initial market study revealed that the technology was developed in Germany and licensed for use in North America in 2002. Few of the units are currently being sold in North America.

To determine the life expectancy of the NAC/TAC technology, two models were performance tested during 2015 at the William Street Pumping Station in Waterloo. After two rounds of testing, it was concluded that the NAC/TAC is a viable technology for treating hard water in the region and the NAC/TAC media will remain effective in a local household with three people for approximately four years based on typical usage.

A next step will be for staff to bring terms of reference to Committee and Council for further study into the performance of NAC/TAC in actual households. Future research will also examine the impacts and sustainability of salt-based water softening in Waterloo Region/Guelph.
Report:

Waterloo Region and the City of Guelph mainly draw drinking water from groundwater sources defined as “hard water.” Hard water is healthy to drink, but contains calcium, magnesium and other minerals that can form scale on water heaters, appliances and fixtures. To prevent scaling, an estimated 154,500 (72 per cent) of households in Waterloo Region and Guelph use ion exchange water softeners that remove the scaling minerals. These water softeners waste at least three billion litres of backwash water per year and discharge 51,000 tonnes of salt into sanitary sewers.

From 2009 to 2011, Waterloo Region and the City of Guelph jointly funded performance testing of several locally available water softeners. With the results, the municipalities launched an independent web site, watersoftenerfacts.ca, to educate the public about how water softeners work, and what to look for when buying an efficient model.

The next step was to find alternative, sustainable technologies that treat hard water without using salt and consuming backwash water. Four promising technologies were identified in a recent study commissioned by the Water Reuse Research Foundation (WRRF) in the U.S. Researchers from Arizona State University and HDR Engineering tested four “no-salt” alternatives to ion exchange softening:

- Capacitive Deionization
- Electrically Induced Precipitation
- Nucleation Assisted Crystallization or Template Assisted Crystallization (NAC/TAC)
- Electromagnetic Water Treatment

The study concluded that all four technologies prevented scale buildup on water heating elements, with “the most promising technology” being Nucleation Assisted Crystallization (NAC), also known as Template Assisted Crystallization (TAC). The results for NAC/TAC showed scale reductions of over 90 per cent, which matches the effectiveness of ion exchange water softening. The retail price of the NAC/TAC units is also competitive with ion exchange softeners.

The NAC/TAC units use polymeric beads with nucleation sites to convert dissolved hardness into microscopic crystals. These crystals are then released by the beads (or “media”) and remain as insoluble particles that will not form scale on surfaces. No salt, water, or energy is required. Figure 1 below illustrates the crystallization process.
NAC/TAC Study Results

During 2014 – 2015, the Region and City of Guelph jointly financed a market study and performance test of NAC/TAC. The Council-approved study focused on answering these main questions:

1. Who manufactures and supplies NAC/TAC?
2. How many units are in use and what do people think about them?
3. How long will the technology work before the media reaches exhaustion?

Adventus Research and Consulting and Metroline Research Group completed the NAC/TAC background research. The following are key points derived from reports dated August 2014 and January 2015:

- The technology was developed in Germany 20 years ago, and is widely accepted for use in commercial and residential applications throughout Europe.
- Its performance has been certified by the German Technical and Scientific Institute for Gas and Water (DVGW).
- The technology was licensed for use in North America in 2002 and has passed NSF health/safety standards.
- Seven known manufacturers supply North America, with media supplied from two sources: WATCH GmbH, Germany (Filtersorb), and Next Filtration, U.S.A. (TAC). See Attachment A for a list of known manufacturers.
- There are three known local retailers and at least six wholesalers of TAC/NAC in Ontario.
An estimated 9,000 to 14,000 units are sold annually in North America, with few being sold in Waterloo Region/Guelph.

TAC/NAC users generally appreciate that they take little to no effort to operate.

Users appreciate the positive environmental impact of using a system that requires no salt and backwash water to operate.

Local TAC/NAC users reported mixed levels of satisfaction overall, with only one “unhappy” user.

NAC/TAC Performance Testing – Waterloo

Following the market research, questions remained about how long the NAC/TAC units would perform effectively while treating local source water. To answer this question, Water Services Division modified the existing water softener test rig at William St. Pumping Station in Waterloo to test the performance of NAC/TAC units. The project team included the technical expertise of Dr. Peter Fox, Arizona State University. Dr. Fox was a key researcher involved in the earlier WRRF water treatment study. Technical support was also provided by Eramosa Engineering and Waterloo Region’s Laboratory Services.

Two rounds of performance tests were carried out on two NAC/TAC units during 2015. The products tested simultaneously were: Watts OneFlow Anti-Scale System, model OF744-10 (TAC media), and Pelican Water Systems Natursoft model NS3 (Filtersorb media). Each of the units has a maximum flow capacity of 10 U.S. gallons per minute.

The automated test ran flows of five gallons per minute through each of the units for five hours on and one hour off each day, for a total volume of 6,000 gallons (22,712 litres) per day. The average three-person household in Waterloo Region would use that amount of water in 37.8 days. The first test ran for 44 days and the second test ran for 46 days, which is the equivalent household usage of 4.5 and 4.75 years respectively.

Extensive laboratory testing was completed before, during and after the study to detail source water and treated water composition. A key measure was the amount of free calcium in water entering the units compared to the amount of free calcium in water flowing out of the units. For the technology to be working, the total free calcium in treated water must be lower than non-treated water. For more details on the test methodology and results, see Attachment B: Regional Municipality of Waterloo Nucleation Assisted Crystallization/Template Assisted Crystallization Performance Study – Life Expectancy of NAC/TAC Media and Assessment of Testing Method, by Peter Fox, Arizona State University, September 10, 2015.

NAC/TAC Performance Study Conclusions

The Waterloo Region/Guelph study results showed the NAC/TAC units remained...
effective beyond the 4-year consumption mark. In round one, one of the test units effectively processed the equivalent of 4.5 years of a 3-person household’s water. In round two, the second test unit successfully treated an equivalent of 4.75 years of water. This supports the manufacturers’ claims that the technology will operate effectively for 3-5 years.

A second finding was that manganese in the source water eventually fouled the NAC/TAC media, although manganese concentrations were below the manufacturers’ recommended maximum. NAC/TAC media may last longer if located farther away from the drinking water treatment plant due to the elevated chlorine levels immediately following treatment. Dr. Fox suggests elevated chlorine residuals may cause manganese to oxidize on the media. In residential applications, residual chlorine levels would likely be lower, which would reduce the risk of manganese buildup on the NAC/TAC media.

The purchase prices for NAC/TAC units tested by Waterloo Region/Guelph were comparable to purchase prices for equivalent ion exchange water softeners (estimated range $999-$1,499). The price to replace exhausted NAC/TAC media every four years ranges from $250 to $875, which is $62 to $218 on an annual basis. This compares favourably with the estimated annual operating costs of ion exchange water softening, of $125 to $248 per year per household for salt, water and energy (Region of Waterloo Residential Water Softener Performance Study Testing Report, October 5, 2012).

Next Steps

The Region of Waterloo and Guelph will publish the results of the NAC/TAC study on the joint website, www.watersoftenerfacts.ca.

The Region of Waterloo will continue to study NAC/TAC in partnership with Guelph during 2016. Further research needs to be done on the effect NAC/TAC will have on actual residents’ plumbing both in the short- and long-term. A good way to move forward is with a pilot project installing NAC/TAC units in selected households and monitor the results. At the same time, participants would be encouraged to provide feedback on their experiences with the technology. To answer these questions and more, Water Services staff will work with Guelph to develop a terms of reference, cost estimate and timeline that will be brought to Committee and Council for approval by early 2016.

Study is also required to further detail the impacts of ion exchange water softening on the local environment both now and in the future. How sustainable is salt-based water softening for future generations? Some jurisdictions in the United States have banned salt-based water softening due to the water wastage and salt loading in wastewater. Salt-based water softening contributes to higher salinity, referred to as total dissolved solids (TDS). High TDS levels can affect the ability to produce and use recycled water for commercial and agricultural applications. In order to provide a better understanding
of what the local impacts are of salt-based water softening, staff will work with Guelph to
develop research terms of reference, cost estimate and timeline that will be brought to
Committee and Council for approval by early 2016.

**Water Efficiency Advisory Committee Review**

The Water Efficiency Advisory Committee reviewed the NAC/TAC study results, as
detailed in this report, on September 23, 2015. Suggestions were made to staff
regarding plans for future study. The members felt it will be important to field test the
units with residents currently using ion exchange water softeners to learn more about
their experiences with things like soap usage and the aesthetic quality of water
produced. Staff is also encouraged to study the long term impacts that salt-based water
softeners have on the local environment.

**Corporate Strategic Plan:**

Implementation of Water Efficiency programs relates to the Strategic Objective 1.4, to
“Protect the quality and the quantity of our drinking water sources.”

**Financial Implications:**

Total costs for market research and two rounds of NAC/TAC performance testing from
2014 to August 2015 were $45,000. Final invoicing will bring the total project cost to
$50,000. At 50 per cent cost sharing with Guelph, the net capital cost to Waterloo
Region is $25,000 funded from the 2015 Capital Budget.

Future research into water softeners and alternative technologies will be financed from
the proposed 2016 Capital Budget. Water Efficiency Capital Budget is financed through
development charges.

**Other Department Consultations/Concurrence:** Nil

**Attachments**

Attachment A – Known TAC/NAC Manufacturers

Attachment B - Regional Municipality of Waterloo Nucleation Assisted
Crystallization/Template Assisted Crystallization Performance Study – Life Expectancy
of NAC/TAC Media and Assessment of Testing Method, by Peter Fox, Arizona State
University, September 10, 2015 (Executive Summary)

**Prepared By:** Steve Gombos, Manager, Water Efficiency

**Approved By:** Thomas Schmidt, Commissioner, Transportation and Environmental
Services
### ATTACHMENT A – Known NAC/TAC Manufacturers

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Media Used</th>
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<tr>
<td>Watts Water Technologies</td>
<td>TAC (by Next Filtration)</td>
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<tr>
<td>Next Filtration Technologies</td>
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<tr>
<td>WaterGroup</td>
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<tr>
<td>Pelican Water Systems</td>
<td>Filtersorb (by WATCH GmbH)</td>
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<td>Aquasana</td>
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Final Report

Regional Municipality of Waterloo

Nucleation Assisted Crystallization/Template Assisted Crystallization (NAC/TAC) Performance Study – Life Expectancy of NAC/TAC media and Assessment of Testing Method

Prepared by Dr. Peter Fox – Arizona State University

Executive Summary

Two different nucleation assisted crystallization/template assisted crystallization (NAC/TAC) treatment systems were selected for study at the William St Pumping Station located in Waterloo. Both systems were rated by the manufacturer to treat 10 gallons per minute (gpm) and both systems were operated at a flowrate of 5 gpm. The two systems were denoted Train 1 and Train 3. In order to simulate extended operation, the systems were operated for 5 hours followed by a 1 hour rest period. This resulted in a daily flow of 6,000 gallons per day which is comparable to 37.8 days of water use for a typical residential customer in Waterloo. Initial testing (Phase 1) was done by operating the systems for a total of 44 days and samples were taken for analysis 3 times a week. Measurement of both total calcium and free calcium using an ion selective electrode was used to assess treatment efficacy. If template assisted crystallization is working effectively, the free calcium ion concentration will decrease while there will be no change in the total calcium ion concentration. The maximum decrease in free calcium ion concentration was predicted to be 34 mg/l. The prediction was based on reducing the Langelier Index from +0.24 to 0 at 10°C which changes the water from scale forming to non-scale forming. Initial results were promising with a reduction in free calcium ion concentration of 33 and 27 mg/l for Trains 1 and 3, respectively. A rapid deterioration in performance occurred in Train 1 and performance also deteriorated in Train 3. Starting on day 17, measurements of free calcium ion concentrations began to exceed the total calcium concentrations, which is not logical. It was discovered that ion selective electrode was not working properly and the electrode was replaced. Measurements after day 36 were logical with free calcium ion concentrations consistent with total calcium concentrations. The criteria for a decrease in performance was set at a 50% decrease in the change in the free calcium ion concentration. Train 3 met this criteria after 44 days (equivalent to 4.5 years of operation) while Train 1 did not meet the criteria. The problems with the ion selective electrode make it difficult to assess exactly when Train 1 failed to meet the criteria. Media samples were removed after 44 days for analysis by scanning electron microscopy and EDX. Both media samples were colored and Train 1 media being
much darker than Train 3 media. Analysis showed the manganese oxide was the major component on the surface of the media with more manganese oxide on Train 1 media as compared to Train 3 media. Samples at the beginning and end of the experiment were analyzed for a complete suite of metals including iron and manganese. Removal of manganese in Train 1 occurred in both samples with an average removal of 0.055 mg/l. The influent manganese concentration of 0.037-0.040 mg/l is less than the manufacturers recommended maximum level of 0.05 mg/l. It is possible that placement of the treatment trains immediately after chlorination at the William St Pumping Station accelerated the fouling of the Train 1 media by manganese oxide. Chlorination will oxidize reduced manganese from the +2 to the +4 oxidation state and if the manganese is still reacting it is very likely to attach to a surface. It is not clear if this phenomena would occur at residences in the distribution system. Activated carbon pre-treatment might be effective at reducing manganese oxide fouling.

Because of the possible problems with the ion selective electrode during initial testing, a second more limited test (Phase 2) was completed using the same treatment train. The media was replaced with fresh virgin media and the treatment trains were operated as they were in the initial testing. Sampling frequency was twice a week and data interpretation was based on the reduction in free calcium ion concentration. A new calcium ion selective electrode was obtained for the second test run. The testing was done during July and August so the temperature ranged from 12.3-14.8°C which was 1-3 degrees higher than the initial testing. Train 3 was operated for 31 days while Train 1 was operated for 47 days. Train 3 met the criteria for a 50% reduction in the change in free calcium ion concentration until day 22 when the flowmeter for Train 3 failed and the test was terminated. It is not certain how much longer Train 3 would have continued to perform. Train 1 met the criteria until day 43 (equivalent to 4.4 years), however, the initial reduction in free calcium ion concentration in Train 1 was lower than Train 3. The second test confirmed the results from the first test regarding the estimated longevity of NAC/TAC media with the water quality tested.
Region of Waterloo
Transportation and Environmental Services
Water Services

To: Chair Tom Galloway and Members of the Planning and Works Committee

Date: October 6, 2015   File Code: E-13-8270

Subject: Biosolids Strategy – Engagement Update

Recommendation:

For information only.

Summary:

A Biosolids Strategy (Strategy) will be created to define the Region’s future biosolids management strategy, provide a long term environmentally sustainable plan and address associated infrastructure needs. As part of the Strategy development, the public indicated that increased information and opportunities to provide input were desired. Engagement activities for the upcoming fall/winter 2015 include: launch event on November 17, 2015, household telephone survey with results available this fall, and project charter development for the Strategy in fall/winter 2015. To assist and receive input for the Strategy, a Steering Committee, Planning and Technical Advisory Committee, and a Stakeholder Committee will be established in the fall/winter 2015. To complement these and other communications, a Strategy Program Identifier will be placed on all materials pertaining to the Strategy.

Report:

The Region of Waterloo provides wastewater treatment and biosolids management services to protect public health and the environment. As the Region grows, the volume of wastewater to be treated and biosolids to be managed will increase.

The Wastewater Treatment Master Plan provides direction on how to treat wastewater in the future.
The Biosolids Strategy will define the future biosolids management strategy; provide a long term environmentally sustainable plan and address the associated infrastructure needs.

In June 2015, Region Council approved the commencement of the Biosolids Master Plan study, an assignment that will follow the Municipal Class Environmental Assessment Process for master plans to develop the Region’s long-term Biosolids Strategy (Strategy) (TES-WAS-15-17). The duration of the Strategy development is over the next four years.

As part of the Strategy development, the public indicated that increased information and opportunities to provide input was desired. A Biosolids Consultation Plan and Biosolids Engagement Strategy were developed and outlined to Council in February 2015 (TES-WAS-15-07).

In line with these plans, some immediate communication and engagement activity are planned this fall/winter, 2015.

- **Launch Event:** A launch event for the Strategy will be held in the evening of November 17, 2015 at the Waterloo Region Museum. Science Journalist Bob McDonald is the guest speaker who will address the topic. Staff will also provide information on the background and process of the Strategy. Notification of the launch will be made by multiple formats that include advertisements, Environews, mailing lists, website and social media. Due to limited seating, registrants will need to register and be issued tickets for the guest speaker portion of the event, but will otherwise be open to the public for the evening.

- **Household Telephone Survey:** Approximately 500 citizens in the Region were randomly contacted in a telephone survey in September to understand their opinions and knowledge of biosolids. Members of the public will also be invited to complete survey questions on-line and at the launch event. Results of the survey will be used to refine the communications and engagement strategies.

- **Project Charter:** The Strategy will be guided by a project charter which will be developed with the assistance of assigned Councillors, local municipal staff and Region staff in fall/winter 2015. The Charter will outline how the Strategy will unfold.

There will be three main groups to assist the project team as the Biosolids Strategy progresses.

The first is a Steering Committee, formed by Regional staff from various departments, along with Councillors Galloway, Jowett and Strickland who have been assigned to the project. Their main role is to help guide the Strategy by receiving periodic updates and providing future direction.
The second is a Planning and Technical Advisory Committee, comprised of staff with respective expertise from the local municipalities, ministries, and GRCA. Their main role is to review and comment on the planning and technical aspects of the Strategy.

A third group, the Stakeholder Committee will be formed by inviting members of the public and organizations who would be interested in the Strategy so that input is received from multiple sectors within the community. An advertisement will be placed in the local newspapers for interested persons and organizations to apply to the Stakeholder Committee. Meetings with special interest groups will also be planned.

A preliminary list of ways to become informed about the Strategy is provided in Appendix A. Additional ways for the public to be informed about the Strategy are being prepared and staff will continue to provide updates as details become available. Information will also be posted on the Region’s website at:

http://www.regionofwaterloo.ca/biosolids

For easier recognition of these and other communication and engagement activities for the Strategy, a program identifier has been created in Appendix B. The program identifier will be placed on all materials pertaining to the Strategy.

**Corporate Strategic Plan:**

The Biosolids Strategy supports the Corporate Strategic Focus Area 2: “Growth Management and Prosperity”, Strategic Objective 2.2: “Develop, Optimize and Maintain Infrastructure to Meet Current and Projected Needs”.

**Financial Implications:**

The activities in this report are covered under the Region’s 2015 Ten Year Wastewater Capital Forecast that includes funding allocation of $1,415,000 for the biosolids master plan (project #8270), funded from the wastewater development charges fund (26.3%) and wastewater reserve fund (73.7%). There is no impact to the wastewater rate.

**Other Department Consultations/Concurrence:**

The subject matter of this report was discussed with Corporate Communications.

**Attachments**

Appendix A - Ways to Become Informed about the Biosolids Strategy

Appendix B – Biosolids Strategy Program Identifier

**Prepared By:** Kaoru Yajima, Sr. Project Manager, Water Services

**Approved By:** Thomas Schmidt, Commissioner, Transportation and Environmental Services
Appendix A: Ways to Become Informed about the Biosolids Strategy

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<th>Format</th>
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<td>Be added to Strategy notification list</td>
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<td>Attend Strategy launch event</td>
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Appendix B: Biosolids Strategy Program Identifier
Region of Waterloo
Transportation and Environmental Services
Water Services

To: Chair Tom Galloway and Members of the Planning and Works Committee
Date: October 6, 2015

File Code: C06-60/PWC/WS.11

Subject: Water Financial Plan

Recommendation:

That the Regional Municipality of Waterloo take the following actions, in accordance with Report TES-WAS-15-31 dated October 6, 2015:


3. Endorse the financial plans as financially viable;

4. Approve the submission of the financial plans to the Ministry of Municipal Affairs and Housing in accordance with the ‘Safe Drinking Water Act’; and

5. Authorize the Commissioner, Transportation and Environmental Services, to sign all documentation related to this matter.

Summary:

In 2007 the Ministry of Environment released Ontario Regulation 453/07 requiring that all municipalities complete a Financial Plan for their drinking water system. The Financial Plans for both the Water Services - Water Supply System and Water Distribution System for North Dumfries and Wellesley, Attachments A and B
respectively, have been prepared in accordance with the Ministry of the Environment - Financial Plans Ontario Regulation (O. Reg. 453/07).

Drinking water system owners are required to prepare a financial plan for their drinking water system as part of the new Municipal Drinking Water Licensing Program (MDWLP) as set out in Part V of the ‘Safe Drinking Water Act’ (SDWA). Details of the MDWLP and the current status of the Region’s program are highlighted in the report TES-WAS-15-16 dated June 16, 2015.

O. Reg. 453/07 also requires a resolution of Regional Council stating that the drinking water systems are financially viable. This resolution will then be forwarded with the approved plan to the Ministry of Municipal Affairs and Housing in accordance with the SDWA. Additionally, the financial plan is to utilize full cost accounting to determine the true cost of the drinking water system and to project costs for at least six years but recommends a longer term.

The financial plans for the Water Services - Water Supply System and Water Distribution System for North Dumfries and Wellesley were evaluated and found to be financially viable based on the detailed information from the 2015 Water Supply and Water Distribution User Rates.

Report:

The long-term financial sustainability of drinking-water systems is critical for the protection and continual delivery of safe drinking water today and into the future.

In 2007, the Ministry of Environment released Ontario Regulation 453/07 requiring that all municipalities complete a Financial Plan for their drinking water system. Drinking water system owners are required to prepare a financial plan for their drinking water system as part of the MDWLP as set out in Part V of the SDWA. Details of the MDWLP and the current status of the Region’s program are highlighted in the report TES-WAS-15-16 dated June 16, 2015.

The Water Services – Water Supply and Water Distribution financial plans have been prepared in accordance with regulation (O. Reg. 453/07) under the SDWA, 2002. The regulation also requires that the financial plan be approved by resolution of Council that specifies that the drinking water system is financially viable. The financial plan is to be based on full cost accounting to determine the true cost of the drinking water system and the projections must be for at least six years but a longer term plan is recommended.
Previous Legislation

The SDWA is part of a comprehensive legislation framework established by the Ontario Government to protect the safety and quality of Ontario’s Drinking Water.

In 2008, Region Council endorsed the Quality Management System Policy and Process for the water system in Report E-08-007. Water Services was formally awarded an accreditation by the Canadian General Standards Board (CGSB) on January 25, 2011. This accreditation was awarded based on the audit conducted on the Region of Waterloo Water Services Operation Plan.

Report No. E-11-045 provided an overview of the new MDWLP, roles and responsibilities, related timelines and an update on the progress made to date in satisfying the mandatory licensing requirements. This report identified the 21 key elements of the DWQMS. Earlier this year, Region council re-endorsed the Quality Management System, 14 operational plans, the Policy and Top Management in Report TES-WAS-15-16.

Highlights from the Financial Plans

Water Services - Water Supply

In preparing the Financial Plan, the financial impacts of the drinking water supply system have been considered based on the 2015 Water Supply User Rate and associated budget details. Based on the projected Financial Statements and the assumptions herein, the Water Supply system will be financially viable.


- Evaluation of the financial plans is based on the 2015 Water Supply User Rate and associated budget details along with the 2015 Ten Year Capital Plan.

- Water Supply relies on user fees and development charges to sustain its operations.

- The inflation adjusted costs to replace and purchase tangible capital assets are expected to be around $330 million over the next ten years. Almost 21% of these costs are related to the expansion of existing or the development of new facilities to increase capacity.
• Total inflation adjusted capital infrastructure costs, **including** capital studies and major repairs, are projected to be $560 million ($440 million not adjusted for inflation).

• Annual operating expenses are projected to increase from just under $50 million in 2015 to $64 million in 2025.

• Per capita consumption is expected to continue to gradually decline following the trend of the past 10 years. Total consumption is projected to increase by .35% over the next ten years based on historical trends that are slower than the projected population growth of 1.67% annually.

• Water rates increased by 4.9% in 2015, with a projected gradual decline in annual rate increases thereafter (based on 2015 User Rate for Water Supply).

• The financial plan has been prepared in accordance with the new Public Sector Accounting Standards. The financial plan must be updated at least every five years.

**Financial Implications**

• Based on the cash flow projections developed in this financial plan, Water Services – Water Supply will be financially viable and will supply safe drinking water for both the short term and long term.

• Revenue levels will gradually increase to continue to cover increasing annual operating and capital expenditures.

• No long-term debt will be required based on the existing model.

**Water Services - Water Distribution**

In preparing the Financial Plan, the financial impacts of the drinking water distribution system have been considered based on the 2015 Water Distribution User Rate and associated budget details. Based on the projected Financial Statements and the assumptions herein, Water Distribution will be financially viable.

• Water Distribution provides safe drinking water to the residents of Wellesley and North Dumfries.

• Evaluation of the financial plans is based on the 2015 Water Distribution User Rate.

• Water Distribution relies on user fees to sustain its operations.

• Certain water system tangible capital assets are aging. Over $10 million will need to be invested into the water distribution capital infrastructure over the next ten years.
• Water Supply charges are projected to increase at a rate of 8.9% in 2016-18, and 6.9% from 2019-2014 per year over the next ten years.

• Per capita consumption is assumed to increase modestly and total consumption is projected to increase by 13% as a result of population growth from 2015 to 2025.

• At these revenue levels, Water Distribution will slowly build its cash resources in order to replace current and future capital infrastructure, and deal with any unexpected expenditures.

• The financial plan has been prepared in accordance with the new Public Sector Accounting Standards. The financial plan must be updated at least every five years.

Financial Implications

• Based on the cash flow projections developed in this financial plan, the Water Services – Water Distribution will be financially viable and will distribute safe drinking water for both the short term and long term.

• Through its operating revenues and use of available reserves in the short term, it is projected that Water Distribution will achieve sufficient cash receipts to cover cash expenditures during the projected period.

• Revenue levels will gradually increase to allow Water Distribution to invest in a reserve fund for significant future capital investments.

• No long term debt will be required based on the existing model.

Following the endorsement of the Financial Plans by council, staff will submit the financial plans to the Ministry of Municipal Affairs and Housing in accordance with the ‘Safe Drinking Water Act’ and take the necessary actions to update the Municipal Drinking Water Licence.

Corporate Strategic Plan:

Appropriate water services supply and distribution support Environmental Sustainability: Protect and Enhance the Environment.

Financial Implications:

It is recommended that Regional Council should endorse each of the Water Services – Water System Financial Plans, as appended, as a financially viable plan.
Other Department Consultations/Concurrence:

The Corporate Services Department has been consulted throughout the preparation of this Financial Plan.

Attachments

Attachment A – Water Services Financial Plan - Water Supply
Attachment B – Water Services Financial Plan – Water Distribution

Prepared By: Danielle Bruyere, Manager, Finance and Administration, Water Services

Approved By: Thomas Schmidt, Commissioner, Transportation & Environmental Services
THE REGIONAL MUNICIPALITY OF WATERLOO
WATER SERVICES - WATER SUPPLY

FINANCIAL PLAN

FINAL DRAFT
This Financial Plan is subject to approval by Regional Council.

This Financial Plan was prepared for:

The Regional Municipality of Waterloo
Water Services – Water Supply
150 Frederica Street, 7th Floor
Kitchener, Ontario N2G 4J3

Prepared by:

Donna Smith

Date:

September 2015
THE REGIONAL MUNICIPALITY OF WATERLOO
WATER SERVICES - WATER SUPPLY
FINANCIAL PLAN

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APPENDIX ONE - PROJECTED FINANCIAL STATEMENTS

FINAL DRAFT
EXECUTIVE SUMMARY

In 2007, the Ministry of the Environment and Climate Change released Regulation 453/07 requiring all municipalities to complete a Financial Plan for their drinking water system. The Regional Municipality of Waterloo Water Services – Water Supply encloses its Financial Plan herein. It is prepared in accordance with the MOE Financial Plans Regulation (O. Reg. 453/07).

In preparing this Financial Plan, the financial impacts of the drinking water system have been considered. Based on the Projected Financial Statements and the assumptions herein, Water Supply will be financially viable, will provide safe drinking water for both the short term and long term and has appropriately planned to have adequate water supply as the Region continues to grow in the future.

Water Supply Operations

Regional Water Services operations can be separated in two groups: Water Supply and Water Distribution. Water Supply is responsible for water source protection, water efficiency and conservation, and the provision of a safe, clean and reliable drinking water supply system. The Region of Waterloo supplies water to Cambridge, Kitchener, Waterloo, Elmira, St. Agatha, Lloyd Brown, St. Jacobs, Baden and New Hamburg through its Integrated Urban System, and the Townships of Wellesley, New Dumfries, Wilmot and Woolwich through its rural water system. Key highlights of Water Supply’s Operations and Capital Plan include:

- Utilities; repairs and maintenance; and capital studies, source protection costs and major facility repairs are projected to increase by an annual average of 4.0% over the next ten years;
- All other operating expenses including personnel costs are projected to increase by 1.5%;
- Annual operating expenses are projected to increase from $58 million in 2015 to $81 million in 2025. The most significant costs are amortization; utilities; studies, source protection costs, and major facility repairs (budgeted through the capital plan); and personnel costs;
- The costs to replace and purchase tangible capital assets, referred to as capital costs herein, are expected to be around $330 million over the next ten years. Approximately 21% of these costs are related to the expansion of existing or the development of new facilities to increase capacity.
- Total projected cash expenditures, excluding amortization but including other operating expenses and capital costs, will increase substantially over the next ten years, fluctuating between $75 million and $120 million, depending on the annual capital projects.
Funding Plan
The achievements of the funding plan include:

✓ Water Supply relies on user fees and development charges to sustain its operations;
✓ Per capita consumption is assumed to continue to decline following the trend established in the last 10 years. Total annual consumption is projected to increase only by 0.3% annually over the next ten years. This compares to a projected population growth of 1.67% annually.
✓ No one-time government funding is projected to be received in the short-term;
✓ No debt will be required over the next ten years;
✓ Through a combination of operating revenues and regional development charges, it is projected that Water Supply will achieve sufficient cash receipts to cover cash expenditures during the projected period.

Financial Plan
Appendix One of this Financial Plan includes projected financial statements for Water Supply. These statements include a projected statement of financial position, projected statement of operations and projected statement of cash flow for the periods ending from December 31, 2015 to 2025.

As required, these statements are in accordance with the new Public Sector Accounting Standards. Actual results will vary from the projections herein and the differences may be material.

The financial plan must be updated every five years but it is recommended to be updated more frequently to reflect changes in operations, economic climate, financing costs, consumption and pricing.
INTRODUCTION
This financial plan of the Region of Waterloo’s Water Services - Water Supply (“Water Supply”) was prepared in accordance with Regulation 453/07 as approved by the Ontario Ministry of the Environment and Climate Change on August 14, 2007. In developing this plan, Water Supply's priority to provide environmentally sustainable water supply essential to the health, safety and prosperity of the community was maintained.

This financial plan incorporates previously written plans, including the ten year capital forecast and its various master plans. These ten year financial projections allow Water Supply to achieve financial viability, while providing safe drinking water over the short and long term.

Ministry of the Environment and Climate Change Financial Plans
Regulation 453/07
Drinking water system owners are required to prepare a financial plan for their drinking water system as part of the Municipal Drinking Water Licensing Program as set out in Part V of the Safe Drinking Water Act (SDWA). The financial plan must be prepared in accordance with the Ministry of the Environment and Climate Change Financial Plans Regulation 453/07.

Regulation 453/07 requires the following:
✓ the financial plan be approved by resolution of Council that specifies that the drinking water system is financially viable;
✓ full-cost accounting to be utilized to determine the true cost of the drinking water system; and
✓ projections be at least six years, but recommends a long term plan.

There are numerous recommendations and other guidelines that have been prepared to assist the municipalities in the development of their financial plan.

Regional Water Services
Regional Water Services operates and maintains the water system infrastructure within the Transportation and Environmental Services department of the Regional Municipality of Waterloo. Its mission is to provide environmentally sustainable water supply and wastewater treatment essential to the health, safety and prosperity of the community.

In addition to its mission statement, Water Services’ key management priorities include:

WATER SERVICES VISION
Water Services will continue to be a leading water and wastewater utility committed to providing efficient, reliable, responsible and responsive services.
• Ensuring compliance with Legislation;
• Managing infrastructure in a cost efficient and sustainable manner;
• Minimizing service interruptions and other emergencies; and
• Evaluating emerging technologies to determine cost effectiveness, and betterment of existing infrastructure and service delivery.

Water Services’ mission and priorities are also in line with the Region’s focus areas and assures their accomplishment through its own operations and philosophies. The Region’s key focus areas include:
• Environmental and Sustainable Growth;
• Healthy, Safe and Inclusive Communities;
• Thriving Economy;
• Sustainable Transportation; and
• Responsive and Engaging Government Services.

Water Services operates the water supply systems in the Cities of Cambridge, Kitchener and Waterloo, and the Townships of New Dumfries, Wellesley, Wilmot and Woolwich (referred in this report as Water Supply Operations). Water Services also operates the distribution systems in the Townships of North Dumfries and Wellesley (referred in this report as Distribution Operations). Distribution systems in the three Cities and the Townships of Wilmot and Woolwich are owned and operated by these municipalities. This financial plan relates to Water Supply Operations only.

WATER SUPPLY OPERATIONS

Water Supply is responsible for water source protection, water efficiency and conservation and the provision of a safe, clean and reliable drinking water supply system. The Region of Waterloo supplies water to residents of Cambridge, Kitchener, Waterloo, Elmira, St. Agatha, Lloyd Brown, St. Jacobs, Baden and New Hamburg through its Integrated Urban System, and the Townships of Wellesley, New Dumfries, Wilmot and Woolwich through its rural water systems. There are approximately 115 employees throughout the region who administer, maintain and/or operate the water supply systems.

There are a number of programs and policies already in place to ensure that Water Services and the Region’s priorities are accomplished. These include but are not limited to a quality management system, safety management system, asset management policies, source protection and conservation programs.

Operating Costs

Some of Water Supply’s key operating expenses include personnel costs, utilities, materials and supplies, water source protection costs, repairs and maintenance, and
interdepartmental administrative charges. As one of the largest Canadian communities that relies on groundwater for its main water supply, utility costs are high as significant energy is required to pump and treat the groundwater.

While most operating expenses are projected to increase by 1.5%, repairs and maintenances; utilities and capital studies, source protection costs and major facility repairs are projected to increase by an annual average of 4.0% over the next ten years. Annual operating expenses are projected to be approximately $47 million in 2015 and increasing to over $60 million in 2023. The projected operating expenses, excluding amortization and interest on long term debt, are set out below (in $thousands):

Capital Costs
To provide safe drinking water, the water system holds significant assets, including: the Mannheim surface water treatment plant; 16 groundwater treatment plants; 116 groundwater supply wells; 36 water storage facilities; 38 pumping stations; and 218 kilometres of treated water mains. These assets are referred to as tangible capital assets. Of its water, approximately 75% of the Region of Waterloo’s water supply is derived from ground water, while the remaining 25% is drawn from the Grand River.

Water Supply has a relatively new water supply system, with many of its existing capital assets having been built in the past 25 to 30 years.

WATER SYSTEM ASSETS
✓ 1 surface water treatment plant
✓ 16 groundwater treatment plants
✓ 116 groundwater supply wells
✓ 36 water storage facilities
✓ 38 pumping stations
✓ 218 km of treated water mains
In 2015, a long term water strategy and master plans was developed to ensure that there will be adequate water supply to meet the projected growth in the community. This Water Supply and Distribution Master Plan outlined plans to optimize operating efficiency and considered historic trends, current and forecasted population data. This plan is the basis for the projected capital expenditures summarized herein.

Ten Year Capital Plan
Over the projected period, approximately $560 million (inflation adjusted) will be spent related to capital infrastructure, as set out in the current ten year capital forecast. Of this amount, just over $115 million will be new construction to specifically accommodate the anticipated population growth, while the remaining $445 million will benefit both the existing and future users. Annual capital investments fluctuate between $40 million and $60 million per year beyond 2017 to accommodate the system expansions, upgrades and changes in the system to provide greater operating efficiencies.

This capital plan includes both the costs to replace and purchase tangible capital assets, which would be recorded as capital assets on the Statement of Financial Position, and studies, source protection costs and major facility repairs, which would be recorded as an operating expense item on the Statement of Operations.
Upon completion of future studies and plans, and after consideration for actual population growth, there may be additional changes to the ten year capital plan. Further if certain projects are not completed as set out in the capital plan, the impact will simply be a cash deferral or a larger Development Charges fund until the project can be completed.

**Total Cash Expenditures**

Water Supply has significant cash expenditures, including operating expenses and capital costs. These expenditures are projected to be just over $60 million in 2015, then increasing to fluctuate between $80 million and $110 million from 2019 to 2025. While operating costs increase fairly consistently, the majority of the increase in cash expenditures relates to capital cost increases.

Note that the aggregate cash expenditures cannot be found on any of the projected financial statements attached in Appendix One. Rather, these cash expenditures are gathered from the various statements to illustrate the cash required to sustain a safe drinking water system.
FUNDING PLAN

As discussed previously, cash expenditures are projected to fluctuate between $80 million and $100 million beyond 2018. To fund these critical expenditures, Water Supply will rely on user fees and regional development charges.

Operating Revenues

The majority of the operating revenues are user fees. User fees are a function of two variables: consumption and water rates. Consumption is driven by the Regional population and per capita consumption. The regional water rate is a uniform rate based on the cubic metres used.

Consumption

From 2005 to 2014, water consumption has continuously declined starting around 60 million cubic metres to 55 million cubic metres in 2014. The figures from 2005 to 2014 represents a decline in per capita consumption as a result of water conservation programs along with Regional bylaws regarding outdoor water use; programs at the municipal level to reduce extraneous water use and leakages; and initiatives of large industrial and commercial groups to optimize their operations by increasing efficiencies and recycling of their process waters.

![Graph showing water consumption trends](image)

Based on the water consumption trends for the last ten years, it is expected that water demands will grow at a lower rate, not following the anticipated annual population growth of approximately 1.6% between 2014 and 2025.
Water Rates

In 2014, user fees were approximately $50 million. In order to support both the operating and partly funded capital projects, the water rates will increase. Set out below are the water rate increases required to sustain Water Supply’s operations.

<table>
<thead>
<tr>
<th>% Increase in Projected Water Rates</th>
<th>2015</th>
<th>2016 to 2017</th>
<th>2018 to 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4.9%</td>
<td>3.9%</td>
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</tbody>
</table>

Summary of Operating Revenues

Over the projected period, operating revenues including user fees are expected to increase from $60 million in 2015 to $89 million in 2025, offsetting the operating and capital expenditures.

Regional Development Charges

Regional development charges are those charges recovered through new residential and non-residential development, as regulated through the Development Charges Act. Through this act, Water Services is eligible to recover a portion of its capital costs from
the amounts received through Regional Development Charges. The types of capital costs include projects that add capacity to the water system, and provide little benefit to the existing users, as well as projects that are required to maintain the quality of the overall system, and are beneficial to both the existing and future users.

While the Region collects development charges through the year, Water Supply cannot access these funds until it has incurred the capital costs. The development charges will cover up to 100% of the costs related to projects which will add capacity to the water system, and only a share of the costs related to projects that will benefit both existing and future users. Any unspent monies received from the development charges goes to the Regional Development Charges Fund, now simply referred to as deferred revenue on the financial statements.

Inflation adjusted development charges earned are expected to be about $12 million from 2016, $24 million from 2019 and fluctuate between $18 million and $25 million thereafter.

New Debt
It is not anticipated that any debt will be required to fund Water Supply’s capital expenditures.

Funding to Meet Cash Requirements
Recapping, the funds required to pay for Water Supply’s cash expenditures will be derived from operating revenues, development charges, other revenues as shown below. Based on the funding model presented, no debt is required to cover its capital costs.
Through accessing all of these sources, it is projected that Water Supply will achieve sufficient available cash to meet its annual expenditures.

**FINANCIAL PLAN**

The financial impacts of the drinking water system have been considered through the projected financial statements for years ending December 31, 2015 to 2025, included as Appendix One, and summarized below. These financial statements are required by the Financial Plans Regulation to include a full-cost accounting, meaning that all of the costs, whether operating, financial or capital, related to operating the drinking water system, must be included.
The projected financial statements include the following:

**Projected Statement of Financial Position**
- Financial assets and liabilities; and
- Other non-financial assets, including capital work in progress and capital assets.
- See Schedule One and Two for supporting detail

**Projected Statement of Operations**
- Revenues;
- Operating expenses, and interest on long term debt; and
- Amortization.

**Projected Statement of Cash Flow**
- Operating transactions;
- Financing (new debt and debt repayments) transactions; and
- Capital transactions (capital costs).
- All of the above will increase or decrease cash held by Wholesale.

These projected financial statements are prepared to conform to new Public Sector Accounting Standards. These statements reflect the Regional Municipality of Waterloo’s new accounting policies, along with estimates and assumptions related to the operations of Water Supply, and are based on 2014 actual results, as derived from Water Services – Water Supply internal financial statements of the Regional Municipality of Waterloo.

Actual results will vary from these projections and the differences may be material. Any future changes to accounting policies or key assumptions will impact these projected financial statements, and should be updated to reflect such changes.

**Public Sector Accounting Standards**
In 2006, the Canadian Institute of Chartered Accountant’s Public Sector Accounting Board approved that municipalities will prepare annual financial statements, utilizing full accrual accounting. In simple terms, full-accrual accounting means that all municipalities are required to include tangible capital assets in the financial statements.

**Projected Statement of Financial Position**
The projected statement of financial position reflects both the financial and non-financial assets of Water Supply.

**Net Financial Assets**
Net financial assets are the financial assets, or cash and cash equivalents in this case, offset by the liabilities (debt) of Water Supply. Net financial assets are projected to be as follows:
Liabilities include both debt and deferred revenue, which is the amount paid for Regional Development Charges, but not yet utilized. Long term liabilities continue to decline until fully repaid in 2021.

From 2015 to 2025, it is projected that net financial assets will fluctuate between $30 million and $52 million, a healthy level to continue to support future capital and/or unforeseen expenditures.

**Non-Financial Assets**

Non-financial assets include capital work in progress and capital assets. Capital work in progress includes capital projects which commenced but were ongoing at the end of the year. The capital assets represent the infrastructure required to provide safe drinking water to the community. Capital assets are broken down as land, land improvement, buildings, vehicles, machinery and equipment and water network.

These capital assets are recorded at net book value, which is their original cost, less accumulated amortization.

Below, the cost and net book value of the capital assets has been illustrated. It is projected that in 2015, the original cost of the capital assets required to provide safe drinking water is approximately $520 million. The net book value or the net cost remaining in the useful life, of those same assets is $303 million.
Accumulated Surplus

The accumulated surplus is a newer term in Municipal financial statements. It is essentially the accumulation of Water Supply’s excess of revenues over expenses over time. While accumulated surplus is an indicator of the net resources that the Region has to provide future services, there are number of other factors that must be considered in determining the overall financial sustainability of Water Supply. These factors include:

- The balance of the capital assets relative to the accumulated surplus balance. For example, in 2015, net capital assets makes up the majority of, or 89%, of the accumulated surplus balance; and

- The difference between the cost of using capital, i.e., amortization, and the cost of acquiring capital over the projected period. In 2017, the cost of using capital is $10 million, where the cost of acquiring capital is $22 million. This means that although accumulated surplus continues to rise, Water Supply must ensure that additional cash is available to cover the costs to acquire the capital to maintain the water system.

Overall, given the vast infrastructure of the Region of Waterloo’s water system, the projected accumulated surplus from 2015 to 2025 is reasonable and supports future sustainability.
Projected Statement of Operations

The projected statement of operations includes the revenues less the expenses, arriving at the excess or net revenues over expenses.

Revenues

Revenues include user fees, development charges and other revenues received. A chart illustrating the revenues earned over time, along with the debt taken, is shown on page 11.

Expenses

Expenses include a list of detailed projected expenses, including operating expenses, interest on long term debt and amortization. Amortization is the write off of the capital assets or the water system infrastructure over their useful life. It does not represent a cash expenditure.

Projected Statement of Cash Flow

The projected statement of cash flow is a very useful statement for a capital intensive organization such as Water Supply. This projected statement of cash flow summarizes the key transactions that either increase or decrease the organization’s cash balance. It is set out in three sections: operating transactions; capital transactions and financing transactions.

Projected operating transactions section is a summary of the projected net revenues over expenses, adjusted for any non-cash items. Projected capital transactions show the capital additions and sale of assets, if any, while the projected financing transactions reveal if any new debt will be incurred and the amount of debt that will be repaid.

In the Operations section of this financial plan, the cash expenditures, such as operating expenses, debt repayments and capital costs, were identified. In the Funding Plan section of this financial plan, the cash receipts, or funds required to cover the cash expenditures were discussed. These funds include operating revenues, development charges and minimal new debt.

As shown on the Projected Statement of Cash Flow, Water Supply maintains healthy cash levels through the projected period, even while there are reductions due to the repayment of the remaining long term debt and the utilization of the Regional Development Charges reserve.

SUMMARY

This Financial Plan has been prepared in accordance with the MOE Financial Plans Regulation (O. Reg. 453/07). The process in developing this plan has focused on the
achievement of Water Supply’s mission: to provide environmentally sustainable water supply essential to the health, safety and prosperity of the community.

This Financial Plan must be approved by a Regional Council resolution, indicating that based on this plan, it is concluded that Regional Water Services Water Supply is financially viable.

**FEEDBACK AND CONTINUOUS IMPROVEMENT**

The financial plan must be updated every five years but it is recommended to be updated more frequently to reflect changes in operations, economic climate, financing costs, consumption and pricing.
APPENDIX ONE

PROJECTED FINANCIAL STATEMENTS
OF
THE REGIONAL MUNICIPALITY OF WATERLOO
WATER SERVICES - WATER SUPPLY

FINAL DRAFT
THE REGIONAL MUNICIPALITY OF REGION OF WATERLOO - WATER SERVICES
WHOLESALE DIVISION
PROJECTED STATEMENT OF FINANCIAL POSITION

AS AT DECEMBER 31, 2014 TO 2025

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<td>882</td>
<td>446</td>
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<td>Deferred revenue</td>
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<td>36,278</td>
<td>35,162</td>
<td>31,467</td>
<td>28,872</td>
<td>25,578</td>
<td>14,046</td>
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<td>Capital work in progress</td>
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<td><strong>Capital assets (Schedule Two)</strong></td>
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<td>Vehicles</td>
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<td>Machinery and Equipment</td>
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<td>Total non-financial assets</td>
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<td>458,647</td>
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<td><strong>ACCUMULATED SURPLUS (SCHEDULE ONE)</strong></td>
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<td>$332,557</td>
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</table>

See accompanying notes and assumptions to these projected financial statements.

PROJECTED STATEMENT OF FINANCIAL POSITION

FINAL DRAFT

1896224 Page 27 of 60
THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
WHOLESALE DIVISION
PROJECTED STATEMENT OF FINANCIAL POSITION

AS AT DECEMBER 31, 2014 TO 2025

Notes and Assumptions:

Actual results achieved for the period covered will vary from this information presented. The differences may be
material.

See Region of Waterloo Annual Reports for the Year ended December 31, 2014 and 2015) for the Region’s
accounting policies.

1. The assets and liabilities for 2014 are derived from internal financial information of the Region of Waterloo.
   They have been restated to conform with Public sector accounting standards.

2. Capital work in progress represents capital projects which were started prior to the year end, but not
   completed. In the year in which the asset will be put into service, it will be capitalized to the appropriate
   capital asset account.
### REVENUES

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<td>Rate revenues</td>
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<td>Grants and subsidies</td>
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<td>24,013</td>
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<td>92,355</td>
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### EXPENSES

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<td>3,991</td>
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<td>4,200</td>
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<td>4,529</td>
<td>4,697</td>
<td>4,954</td>
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<td>1,167</td>
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<td>1,195</td>
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<td>1,151</td>
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<td>Grand River Conservation Authority</td>
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<td>4,299</td>
<td>4,588</td>
<td>4,909</td>
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<td>75,979</td>
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### ANNUAL SURPLUS

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</thead>
<tbody>
<tr>
<td></td>
<td>$12,384</td>
<td>$6,718</td>
<td>$15,592</td>
<td>$17,306</td>
<td>$22,268</td>
<td>$26,044</td>
<td>$26,278</td>
<td>$27,472</td>
<td>$19,528</td>
<td>$20,947</td>
<td>$19,644</td>
<td>$13,803</td>
</tr>
</tbody>
</table>

See accompanying notes and assumptions to these projected financial statements.

---

**THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES**

**WHOLESALE DIVISION**

**PROJECTED STATEMENT OF OPERATIONS**

**FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025**

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1896224  Page 29 of 60
THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
WHOLESALE DIVISION
PROJECTED STATEMENT OF OPERATIONS
FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

($) THOUSANDS

Notes and Assumptions:

Actual results achieved for the period covered will vary from this information presented. The differences may be material.

See Region of Waterloo Annual Reports for the Year ended December 31, 2014 and 2015 for the Region’s accounting policies.

1. The revenues and expenses for 2014 are derived from internal financial information of the Region of Waterloo - Wholesale Division. They have been restated to conform with new generally accepted accounting principles.

2. Operating revenues includes waterworks fees, other customer and miscellaneous charges. The water rate structure charged to customers will change during this projected period and all of these charges will be included within the new water rate structure. The majority of these charges depend on both the water rates and the billable consumption.

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<tbody>
<tr>
<td>Annual increase (decrease)</td>
<td>-0.704%</td>
<td>0.350%</td>
<td>0.325%</td>
<td>0.350%</td>
<td>0.325%</td>
<td>0.350%</td>
<td>0.325%</td>
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<td>0.325%</td>
<td>0.350%</td>
<td>0.325%</td>
<td>0.350%</td>
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<tr>
<td>Projected water consumption ('000 m3)</td>
<td>54,967</td>
<td>54,580</td>
<td>54,771</td>
<td>54,949</td>
<td>55,141</td>
<td>55,320</td>
<td>55,514</td>
<td>55,664</td>
<td>55,875</td>
<td>56,071</td>
<td>56,256</td>
<td>56,442</td>
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<tr>
<td>Projected operating revenues</td>
<td>60,984</td>
<td>52,967</td>
<td>55,305</td>
<td>57,684</td>
<td>59,815</td>
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<td>63,550</td>
<td>65,605</td>
<td>67,727</td>
<td>69,935</td>
<td>72,201</td>
<td>74,540</td>
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<tr>
<td>Percentage increase</td>
<td>4.9%</td>
<td>3.9%</td>
<td>3.9%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.9%</td>
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</tbody>
</table>

3. Other revenue include one time monies received.

4. These revenues will cover portions of costs related to capital budget.

5. Interest earned on the cash balance and the RDC reserve monies has been calculated at the rate of 2.5% and 2.0% respectively.

6. Amortization is calculated on a straight-line basis by allocating the cost of the asset through amortization evenly over the useful life of the asset. Amortization of the buildings and water network assets commences in the year following the purchase. Amortization of fleet and machinery and equipment begins in the year of acquisition applying the half year rule. Useful life of existing assets is based on their current age and remaining life expectancy as assessed in the Region of Waterloo Valuation of Water and Wastewater Assets report, dated May 2008. The average useful life of new network is 75 years, buildings is 33 years, machinery and equipment is 20 years and fleet is 6 years.

7. Operating expenditures will increase annually by 1.5% each year.

8. Interest on long-term debt, includes interest on the existing debentures and any new debentures purchased during the projected period.

| Existing long term debt | $395 | $302 | $203 | $95 | $42 | $29 | $15 | $ | $ | $ |
| New debentures | 4.9% | - | - | - | - | - | - | - | - | - | - |
| Total | $395 | $302 | $203 | $95 | $42 | $29 | $15 | $ | $ | $ |

See Schedule Two for the detailed terms of the existing debentures and the assumptions related to any new debentures received.

FINAL DRAFT
### THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES

**WHOLESALE DIVISION**

**PROJECTED STATEMENT OF CASH FLOWS**

**FOR THE YEARS ENDING DECEMBER 31, 2015 TO 2025**

<table>
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<td><strong>OPERATING ACTIVITIES</strong></td>
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<td></td>
<td></td>
<td></td>
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<td>Projected annual surplus (deficiency)</td>
<td>$ 6,718</td>
<td>$ 15,592</td>
<td>$ 17,306</td>
<td>$ 22,286</td>
<td>$ 26,044</td>
<td>$ 26,278</td>
<td>$ 27,472</td>
<td>$ 19,528</td>
<td>$ 20,947</td>
<td>$ 19,644</td>
<td>$ 13,803</td>
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<td>Deduct non-cash items:</td>
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<tr>
<td>Amortization</td>
<td>10,141</td>
<td>9,358</td>
<td>10,046</td>
<td>10,751</td>
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<td>13,306</td>
<td>14,654</td>
<td>16,125</td>
<td>17,215</td>
<td>17,830</td>
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<td>(3,576)</td>
<td>(3,680)</td>
<td>7,768</td>
<td>1,167</td>
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<td>(3,695)</td>
<td>(2,515)</td>
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<td>(479)</td>
<td>(307)</td>
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<td>(2,282)</td>
<td>(2,381)</td>
<td>(1,217)</td>
<td>(421)</td>
<td>(434)</td>
<td>(445)</td>
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<tr>
<td><strong>Net change in cash from financing transactions</strong></td>
<td>(2,190)</td>
<td>(2,282)</td>
<td>(2,381)</td>
<td>(1,217)</td>
<td>(421)</td>
<td>(434)</td>
<td>(445)</td>
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<td><strong>CAPITAL ACTIVITIES</strong></td>
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<td>Land improvements</td>
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<td>(1,407)</td>
<td>(1,520)</td>
<td>(3,475)</td>
<td>(3,149)</td>
<td>(3,932)</td>
<td>(4,773)</td>
<td>(4,826)</td>
<td>(4,016)</td>
<td>(3,348)</td>
</tr>
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<td>Vehicles</td>
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<td>(528)</td>
<td>(491)</td>
<td>(414)</td>
<td>(441)</td>
<td>(160)</td>
<td>(289)</td>
<td>(657)</td>
<td>(558)</td>
<td>(481)</td>
<td>(492)</td>
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<td>Machinery and Equipment</td>
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<td>(11,149)</td>
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<td>(16,337)</td>
<td>(14,183)</td>
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<td>(11,150)</td>
<td>(3,563)</td>
<td>(7,904)</td>
<td>(5,303)</td>
<td>(4,917)</td>
<td>(4,201)</td>
<td>(4,201)</td>
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<td><strong>Net change in cash from capital activities</strong></td>
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<td>(15,882)</td>
<td>(22,174)</td>
<td>(23,941)</td>
<td>(43,583)</td>
<td>(33,997)</td>
<td>(35,329)</td>
<td>(41,042)</td>
<td>(41,223)</td>
<td>(34,227)</td>
<td>(25,568)</td>
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<td><strong>PROJECTED NET CHANGE IN CASH AND CASH EQUIVALENTS</strong></td>
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<tr>
<td>Cash, beginning of the year</td>
<td>68,366</td>
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<td>70,122</td>
<td>70,868</td>
<td>73,382</td>
<td>71,856</td>
<td>61,810</td>
<td>62,655</td>
<td>63,086</td>
<td>60,241</td>
<td>55,129</td>
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<tr>
<td>Cash, end of the year</td>
<td>3</td>
<td>$ 69,320</td>
<td>$ 70,122</td>
<td>$ 70,868</td>
<td>$ 73,382</td>
<td>$ 71,856</td>
<td>$ 61,810</td>
<td>$ 62,655</td>
<td>$ 63,086</td>
<td>$ 60,241</td>
<td>$ 55,129</td>
</tr>
</tbody>
</table>

See accompanying notes and assumptions to these projected financial statements.
THE REGIONAL MUNICIPALITY OF WATERLOO
WHOLESALE DIVISION
PROJECTED STATEMENT OF CASH FLOWS
FOR THE YEARS ENDING DECEMBER 31, 2015 TO 2025

Notes and Assumptions:

Actual results achieved for the period covered will vary from this information presented. The differences may be material.

See Region of Waterloo Annual Reports for the Year ended December 31, 2014 and 2015 for the Region’s accounting policies.

1. See Schedule One for the details of the financing transactions.
2. See Schedule Two for the details of the capital transactions.
3. The balance of the cash and cash equivalents at the end of each year reflects the monies available for the future capital expenditures. Interest earned on this balance has been calculated at the rate of 3.5%.
THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
WHOLESALE DIVISION
SCHEDULE OF PROJECTED LIABILITIES AND ACCUMULATED SURPLUS

FOR THE YEARS ENDING DECEMBER 31, 2015 TO 2025

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<tr>
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<td>$7,183</td>
<td>$4,901</td>
<td>$2,520</td>
<td>$1,303</td>
<td>$882</td>
<td>$448</td>
<td>$ -</td>
<td>$ -</td>
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<td>$ -</td>
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<td>Repayments on existing debt</td>
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<td>(2,282)</td>
<td>(2,381)</td>
<td>(1,217)</td>
<td>(421)</td>
<td>(434)</td>
<td>(448)</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Total</td>
<td>$7,183</td>
<td>$4,901</td>
<td>$2,520</td>
<td>$1,303</td>
<td>$882</td>
<td>$448</td>
<td>$ -</td>
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<td>$ -</td>
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</tr>
</tbody>
</table>

| New debentures | 2 | | | | | | | | | | |
| Opening | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Repayments | - | - | - | - | - | - | - | - | - | - | - |
| New debentures | - | - | - | - | - | - | - | - | - | - | - |
| Total | $7,183 | $4,901 | $2,520 | $1,303 | $882 | $448 | $ - | $ - | $ - | $ - | $ - |

| DEFERRED REVENUE | 3 | | | | | | | | | | |
| Opening | $38,796 | $38,279 | $35,182 | $31,487 | $28,972 | $25,578 | $14,046 | $13,570 | $13,283 | $13,402 | $8,574 |
| Collections | 7,278 | 8,500 | 11,000 | 15,000 | 20,000 | 12,000 | 24,000 | 22,000 | 25,000 | 20,000 | 15,000 |
| Appropriations to revenue | (9,567) | (12,368) | (15,461) | (18,226) | (24,004) | (24,013) | (24,839) | (22,569) | (25,029) | (24,895) | (18,234) |
| Total | $38,279 | $35,182 | $31,487 | $28,972 | $25,578 | $14,046 | $13,570 | $13,283 | $13,402 | $8,574 | $5,447 |

| ACCUMULATED SURPLUS | 4 | | | | | | | | | | |
| Opening | $292,941 | $299,659 | $315,251 | $332,557 | $354,825 | $380,869 | $407,147 | $434,619 | $454,147 | $475,094 | $494,738 |
| Excess revenues over expenses | 6,718 | 15,592 | 17,306 | 22,268 | 26,044 | 26,278 | 27,472 | 19,528 | 20,947 | 19,644 | 13,803 |
| Closing | $299,659 | $315,251 | $332,557 | $354,825 | $380,869 | $407,147 | $434,619 | $454,147 | $475,094 | $494,738 | $608,541 |

See accompanying notes and assumptions to these projected financial statements.
THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
WHOLESALE DIVISION
SCHEDULE OF PROJECTED LIABILITIES AND ACCUMULATED SURPLUS
FOR THE YEARS ENDING DECEMBER 31, 2015 TO 2025

($) THOUSANDS)
Notes and Assumptions:

1. Accounts payable and accrued liabilities related to the Wholesale Division are integrated into the Region’s accounts payable system and can not be easily identified. For the purposes of these projections, it is assumed that expenses are paid immediately.

2. Currently, the Wholesale Division holds five debentures with the following principal payments owing up to

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<td><strong>Financed in 2008, maturity 2018</strong></td>
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<tr>
<td>Greenland Systems Upgrade</td>
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<td>$436</td>
<td>$223</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>Storage/Maintenance building</td>
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<td>$1,477</td>
<td>$1,444</td>
<td>$565</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
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<td><strong>Total</strong></td>
<td>$2,199</td>
<td>$2,116</td>
<td>$1,699</td>
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<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
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3. The Wholesale Division will not require new debt to fund its future capital costs. Future capital costs will be funded through its operations.

4. Deferred revenue is the amount of development charges which have been received but the Region cannot use until eligible capital costs have been incurred.

SCHEDULE ONE - NOTES AND ASSUMPTIONS
PAGE 2 OF 2

FINAL DRAFT

1896224 Page 34 of 60
## THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
### WHOLESALE DIVISION
### SCHEDULE OF PROJECTED CAPITAL ASSET ACQUISITIONS, DISPOSALS AND ACCUMULATED AMORTIZATION
### FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

### (S THOUSANDS)

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<td>$6,425</td>
<td>$6,425</td>
<td>$6,425</td>
<td>$6,425</td>
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<td>$6,425</td>
<td>$6,425</td>
<td>$6,425</td>
<td>$6,425</td>
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<tr>
<td>Land improvements</td>
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<td>46,675</td>
<td>47,220</td>
<td>47,656</td>
<td>48,126</td>
<td>49,202</td>
<td>50,177</td>
<td>51,394</td>
<td>52,671</td>
<td>54,365</td>
<td>55,609</td>
<td>56,645</td>
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<td>Vehicles</td>
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<td>1,839</td>
<td>1,967</td>
<td>1,984</td>
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<td>2,348</td>
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<td>131,199</td>
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<td>135,552</td>
<td>140,207</td>
<td>143,658</td>
<td>147,350</td>
<td>151,077</td>
<td>157,034</td>
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<td>193,647</td>
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<td>$543,562</td>
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<td>$563,052</td>
<td>$592,599</td>
<td>$604,774</td>
<td>$615,187</td>
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### Capital assets - Accumulated amortization (Page 3)

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<td>80,988</td>
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<td>72,567</td>
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<td>$192,018</td>
<td>$179,895</td>
<td>$173,526</td>
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### Capital assets - Net book value

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</thead>
<tbody>
<tr>
<td>Land</td>
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<td>$6,425</td>
<td>$6,425</td>
<td>$6,425</td>
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<td>$6,425</td>
<td>$6,425</td>
<td>$6,425</td>
<td>$6,425</td>
</tr>
<tr>
<td>Land improvements</td>
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<td>17,184</td>
<td>16,867</td>
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<td>16,792</td>
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<tr>
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<td>81,979</td>
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### SCHEDULE TWO
### PAGE 1 OF 4

See accompanying notes and assumptions to these projected financial statements.
### Capital Cost

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<td><strong>Land</strong></td>
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<td>184,417</td>
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<td>191,255</td>
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<tr>
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<td>(41)</td>
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<td>1,952</td>
<td>1,962</td>
<td>1,727</td>
<td>1,859</td>
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<td>2,084</td>
<td>2,116</td>
<td>2,249</td>
<td>2,314</td>
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<tr>
<td><strong>Machinery and Equipment</strong></td>
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<td>131,109</td>
<td>132,657</td>
<td>135,563</td>
<td>140,207</td>
<td>143,658</td>
<td>147,366</td>
<td>151,977</td>
<td>157,038</td>
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<td>2,359</td>
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<td>132,657</td>
<td>135,563</td>
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<td>(9,010)</td>
<td>(5,798)</td>
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<td>(5,798)</td>
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<td>$534,051</td>
<td>$543,052</td>
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<td>$583,952</td>
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<td>(12,765)</td>
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<td>$519,790</td>
<td>$526,372</td>
<td>$534,051</td>
<td>$543,052</td>
<td>$553,744</td>
<td>$569,679</td>
<td>$583,952</td>
<td>$592,599</td>
<td>$604,774</td>
<td>$616,187</td>
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</table>

See accompanying notes and assumptions to these projected financial statements.
## THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
### WHOLESALE DIVISION

### SCHEDULE OF PROJECTED CAPITAL ASSET ACQUISITIONS, DISPOSALS AND ACCUMULATED AMORTIZATION

FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

### Accumulated Amortization

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<tr>
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<td>$ 26,730</td>
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<td>$ 0</td>
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<td>$ 0</td>
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<tr>
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<td>$ 26,730</td>
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<tr>
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<td>$ 89,901</td>
<td>$ 91,951</td>
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<td>$ 92,203</td>
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<td>$ 81,722</td>
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<td>$ 72,126</td>
<td>$ 63,673</td>
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<td>$ 52,975</td>
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<tr>
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<td>$ 3,861</td>
<td>$ 3,984</td>
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<td>$ 92,203</td>
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<td></td>
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<tr>
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<tr>
<td>Closing</td>
<td>$ 1,050</td>
<td>$ 1,158</td>
<td>$ 1,379</td>
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<td>$ 1,391</td>
<td>$ 1,391</td>
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<tr>
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<td>$ 80,590</td>
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<td>$ 93,591</td>
<td>$ 93,591</td>
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</tr>
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</table>

### SCHEDULE TWO

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See accompanying notes and assumptions to these projected financial statements.
THE REGIONAL MUNICIPALITY OF WATRLOO - WATER SERVICES
WHOLESALE DIVISION
SCHEDULE TWO

FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

Notes and Assumptions:
Actual results achieved for the period covered will vary from this information presented. The differences may be material.
See Region of Waterloo Reports for the Year ended December 31, 2014 and 2015 (when available) for the Region’s accounting policies.

1. The actual capital assets costs, additions, disposals, accumulated amortization have been provided by the Region of Waterloo finance department.

2. Additions are defined as capital outlays, valued at cost, which have been put into service to provide future benefits.
The projected additions are based on the Regional Municipality of Waterloo Ten Year Capital Forecast.

3. If a capital outlay is incurred, it is assumed that it will be replacing an existing asset. The cost of the disposed asset is based on the purchase price of the new asset, discounted at 2.5%, assuming it was purchased a number of years ago depending on the asset category, as follows:

<table>
<thead>
<tr>
<th>Purchased Years Ago</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Land improvements</td>
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<td>Buildings</td>
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</tr>
<tr>
<td>Vehicles</td>
<td>6</td>
</tr>
<tr>
<td>Machinery and equipment</td>
<td>15</td>
</tr>
<tr>
<td>Water Network</td>
<td>30</td>
</tr>
</tbody>
</table>

4. Amortization is calculated on a straight-line basis by allocating the cost of the asset through amortization evenly over the useful life of the asset. Amortization of the buildings and water network assets commences in the year following the purchase. Amortization of fleet and machinery and equipment begins in the year of acquisition applying the half-year rule. Useful life of existing assets is based on their current age and remaining life expectancy as assessed in the Region of Waterloo Valuation of Water and Wastewater Assets report, dated May 2008. The average useful life of new water network is 75 years, buildings is 33 years, machinery and equipment is 20 years and vehicles is 6 years.

5. It is assumed that any capital asset that has been replaced was fully amortized at the time of disposition.
THE REGIONAL MUNICIPALITY OF WATERLOO
WATER SERVICES - WATER DISTRIBUTION
FINANCIAL PLAN
This Financial Plan is subject to approval by Regional Council.

This Financial Plan was prepared for:

The Regional Municipality of Waterloo
Water Services – Water Distribution
150 Frederica Street, 7th Floor
Kitchener, Ontario  N2G 4J3

Prepared by:

[Signature]
Donna Smith

bain smith business valuation + consulting inc.
1111 Victoria Avenue East, 2nd Floor
Thunder Bay, ON  P7C 1B7

Date: September 2015
THE REGIONAL MUNICIPALITY OF WATERLOO
WATER SERVICES - WATER DISTRIBUTION
(TOWNSHIPS OF WELLESLEY AND NORTH DUMFRIES)
FINANCIAL PLAN

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APPENDIX ONE - PROJECTED FINANCIAL STATEMENTS

FINAL DRAFT
EXECUTIVE SUMMARY

In 2007, the Ministry of the Environment and Climate Change ("MOE") released Regulation 453/07 requiring all municipalities to complete a Financial Plan for their drinking water system. The Regional Municipality of Waterloo Water Services – Water Distribution encloses its Financial Plan herein. It is prepared in accordance with the MOE Financial Plans Regulation (O. Reg. 453/07).

In preparing this Financial Plan, the financial impacts of the drinking water system have been considered. Based on the Projected Financial Statements and the assumptions herein, Water Distribution will be financially viable; will distribute safe drinking water for both the short term and long term to the residents of Wellesley and North Dumfries.

Over the next ten years, Water Distribution’s key goals are to provide safe drinking water, improve current service levels and bring maintenance up to best practices, while maintaining competitive water rates.

Water Distribution Operations

Key highlights of Water Distribution’s Operations and Capital Plan include:

✓ Annual operating expenses are projected to increase from $1.9 million in 2015 to about $3.0 million in 2025. The most significant costs include amortization, wholesale water charges, repairs and maintenance, and personnel costs;

✓ Operating expenses are projected to increase by 5.3% annually;

✓ Certain water system tangible capital assets are aging. Almost $10.0 million will need to be invested into the water distribution capital infrastructure over the next ten years;

✓ Total annual projected cash expenditures, including operating expenses and capital costs, will range between $2.0 million and $3.9 million through the ten year period.

Funding Plan

The achievements of the funding plan include:

✓ Per capita consumption is assumed to increase modestly and total consumption is projected to increase by 13% as a result of population growth from 2015 to 2025;

✓ Distribution relies on user fees to sustain its operations. Water rate increases are necessary to meet its capital needs and operating expenditures in the short and long term;

✓ Water distribution sales will need to increase at a rate of 8.9% to 2018 and then decrease to 6.9% for the remaining years. At these revenue levels, Distribution will slowly build its cash resources in order to enable itself to replace current and future capital infrastructure and to manage any unexpected expenditures; and
✓ The Water Distribution rates continue to be comparable to other communities in the Region of Waterloo and the surrounding area.

Financial Plan

Appendix One of this Financial Plan includes projected financial statements for Water Distribution. These statements include a projected statement of financial position, projected statement of operations and projected statement of cash flow for the periods ending from December 31, 2015 to 2025.

As required, these statements are in accordance with the new Public Sector Accounting Standards. Actual results will vary from the projections herein and the differences may be material.

The financial plan must be updated every five years but it is recommended to be updated more frequently to reflect changes in operations, economic climate, financing costs, consumption and pricing.
INTRODUCTION

This financial plan of the Region of Waterloo’s Water Services - Water Distribution (“Water Distribution”) was prepared in accordance with Regulation 453/07 as approved by the MOE on August 14, 2007. In developing this plan, Water Distribution's priority to provide environmentally sustainable water supply essential to the health, safety and prosperity of the community was maintained.

This financial plan incorporates previously written plans, including the ten year capital forecast. These ten year financial projections allow Water Distribution to achieve financial viability, while providing safe drinking water over the short and long term.

Ministry of the Environment and Climate Change Financial Plans

Regulation 453/07

Drinking water system owners are required to prepare a financial plan for their drinking water system as part of the Municipal Drinking Water Licensing Program as set out in Part V of the Safe Drinking Water Act (SDWA). The financial plan must be prepared in accordance with the Ministry of Environment Financial Plans Regulation 453/07.

Regulation 453/07 requires the following:

✓ the financial plan be approved by resolution of Council that specifies that the drinking water system is financially viable;

✓ full-cost accounting to be utilized to determine the true cost of the drinking water system; and

✓ projections be at least six years, but recommends a long term plan.

There are numerous recommendations and other guidelines that have been prepared to assist the municipalities in the development of their financial plan.

Regional Water Services

Regional Water Services operates and maintains the water system infrastructure within the Transportation and Environmental Services department of the Regional Municipality of Waterloo. Its mission is to provide environmentally sustainable water supply and wastewater treatment essential to the health, safety and prosperity of the community.

In addition to its mission statement, Water Services’ key management priorities include:

- Ensuring compliance with Legislation;
- Managing infrastructure in a cost efficient and sustainable manner;

WATER SERVICES VISION

Water Services will continue to be a leading water and wastewater utility committed to providing efficient, reliable, responsible and responsive services.
• Minimizing service interruptions and other emergencies; and
• Evaluating emerging technologies to determine cost effectiveness, and betterment of existing infrastructure and service delivery.

Water Services’ mission and priorities are also in line with the Region’s focus areas and assures their accomplishment through its own operations and philosophies. The Region’s key focus areas include:
• Environmental and Sustainable Growth;
• Healthy, Safe and Inclusive Communities;
• Thriving Economy;
• Sustainable Transportation; and
• Responsive and Engaging Government Services.

Water Services operates the water supply systems in the Cities of Cambridge, Kitchener and Waterloo, and the Townships of North Dumfries, Wellesley, Wilmot and Woolwich (referred in this report as Water Supply). Water Distribution systems in the three Cities and the Townships of Wilmot and Woolwich are owned and operated by the municipalities. Water Services also operates the distribution systems in the Townships of North Dumfries and Wellesley (referred in this report as Water Distribution). This financial plan relates to Water Distribution only.

WATER DISTRIBUTION

Water Distribution is responsible for delivering water to the residential and non-residential users in the Townships of Wellesley and North Dumfries. To provide safe drinking water, Water Distribution operates approximately 65 km of water mains. To achieve successful delivery of the water, Water Distribution incurs both operating and capital costs.

Operating Costs

Some of Water Distribution’s key operating expenses include personnel costs, wholesale water charges, and repairs and maintenance. Operating expenses are projected to increase by approximately 5.3% per year. Annual operating expenses are projected to be approximately $1.9 million in 2015 to $3.0 million in 2025, an average increase of 5.8% per year.

Capital Costs

Water Distribution's key tangible capital assets include watermains and water meters. The watermains are considered to be relatively new, with the majority having been built after 1970, and the water meters were replaced in 2014. In order to continue upgrading the current water system, it is projected that capital investments will continue to
increase from 2016 to 2025, due to system aging and population growth. The average annual capital costs will be $900,000.

**Total Cash Expenditures**

Distribution’s cash expenditures include operating expenses (excluding amortization, a non-cash item) and capital costs. These expenditures are projected to increase from $2.1 million in 2016 to $3.9 million in 2025.

![Cash Expenditures Diagram](image)

Note that the aggregate cash expenditures cannot be found on any of the projected financial statements attached in Appendix One. Rather, these cash expenditures are gathered from the various statements to illustrate the cash required to sustain a safe drinking water system.

**FUNDING PLAN**

To fund the above expenditures, Water Distribution will rely solely on operating revenues, short-term financing and a small amount of available reserves from previous years.

**Operating Revenues**

The majority of the operating revenues are user fees. Users are charged both a variable and a fixed water rate. The variable water rate is a function of both consumption and water rates. Consumption is driven by the population and per capital consumption. The Townships’ water rates are a variable rate based on the cubic metres used. The fixed rate is a monthly fixed amount that is charged to each user.
Consumption
From 2005 to 2014, water consumption fluctuated from year to year while population increased slightly. All water consumption is in cubic metres.

Wellesley and North Dumfries
Water Consumption and Population

It is projected that the annual per capita consumption will remain stable but overall consumption will increase as a result of further population increases. From 2015 to 2025, it is anticipated that the population will grow an average of 1.7% per year.
Water Rates
In 2014, user fees were about $1.7 million. In order to support both the operating and capital projects, and to continue to build a reserve for both future capital and possible unforeseen expenditures, the water rates will need to increase but at a slower rate than the past five years. Set out below are the water rate increases required to sustain Water Distribution’s operations.

<table>
<thead>
<tr>
<th>% Increase in Projected Water Rates</th>
<th>2016 to 2018</th>
<th>2019 to 2025</th>
</tr>
</thead>
</table>
| Flat rates will increase to $8 in 2015, $9 in 2017 and then to $10 in 2019, remaining stable thereafter.

Summary of Operating Revenues
Over the projected period, operating revenues, including user fees, are expected to increase from $2.1 million in 2015 to $4.3 million in 2025, offsetting the operating and capital expenditures. Along with the available reserves to be used in the short term and borrowing of $100,000 in 2015 (repaid in 2016), it is projected that these operating revenues will be sufficient to meet its planned annual expenditures in the long term.
FINANCIAL PLAN

The financial impacts of the drinking water system have been considered through the projected financial statements for years ending December 31, 2015 to 2025, included as Appendix One, and summarized below. These financial statements are required by the Financial Plans Regulation to include a full-cost accounting, meaning that the all of the costs, whether operating, financial or capital, related to operating the drinking water system, must be included.

The projected financial statements include the following:

- **Projected Statement of Financial Position**
  - Financial assets and liabilities; and
  - Other non-financial assets, including capital work in progress and capital assets.
  - See Schedule One and Two for supporting detail

- **Projected Statement of Operations**
  - Revenues;
  - Operating expenses, and interest on long term debt; and
  - Amortization.

- **Projected Statement of Cash Flow**
  - Operating transactions;
  - Financing (new debt and debt repayments) transactions; and
  - Capital transactions (capital costs).
  - All of the above will increase or decrease cash held by Wholesale.

These projected financial statements are prepared to conform to new Public Sector Accounting Standards. These statements reflect the Regional Municipality of Waterloo’s new accounting policies, along with estimates and assumptions related to the operations of Water Distribution, and are based on 2014 actual results, as derived from Water Services – Water Distribution internal financial statements of the Regional Municipality of Waterloo.

Actual results will vary from these projections and the differences may be material. Any future changes to accounting policies or key assumptions will impact these projected financial statements, and should be updated to reflect such changes.

**New Public Sector Accounting Standards**

In 2006, the Canadian Institute of Chartered Accountant’s Public Sector Accounting Board approved that municipalities will prepare annual financial statements, utilizing full accrual accounting. In simple terms, full-accrual accounting means that all municipalities will be required to include tangible capital assets in the financial statements.
Projected Statement of Financial Position

The projected statement of financial position reflects both the financial and non-financial assets of Water Distribution.

Net Financial assets

Net financial assets are the financial assets, or cash and cash equivalents, accounts receivable and short term liabilities. Net financial assets will continue to increase during the ten year period, allowing for funds to be saved for more significant capital expenditures in the future. As projected in the 2010 financial plan, net financial assets did decline in the past five years but not as much as projected. In 2015, the projected net financial assets are $300,000. Water Distribution will continue to build its net financial assets to a healthy level up to 2025.

Non-Financial Assets

Non-financial assets include the tangible capital assets, or infrastructure required to distribute safe drinking water to the community. The two types of capital assets include fleet and water network. These capital assets are recorded at net book value, which is their original cost, less accumulated amortization.

Below, the cost and net book value of the capital assets has been illustrated. It is projected that in 2015, the original cost of the tangible capital assets required to provide safe drinking water is approximately $15.8 million. The net book value or the net cost remaining in the useful life, of those same assets is $11.3 million.
Accumulated Surplus

The accumulated surplus is a newer term in Municipal financial statements. It is essentially the accumulation of Distribution’s excess of revenues over expenses over time. While accumulated surplus is an indicator of the net resources that the Region has to provide future services, there are number of other factors that must be considered in determining the overall financial sustainability of Distribution. These factors include:

- The balance of the capital assets relative to the accumulated surplus balance. For example, in 2015, net capital assets makes up the majority of, or 97%, of the accumulated surplus balance; and

- The difference between the cost of using capital, i.e., amortization, and the cost of acquiring capital over the projected period. In 2017, the cost of using capital is $292,000 where the cost of acquiring capital is $605,000. This means that although accumulated surplus continues to rise, Distribution must ensure that additional cash is available to cover the costs to acquire the capital to maintain the water system.

Overall, given the vast infrastructure of the Region of Waterloo’s Water Distribution System, it is important for the projected accumulated surplus to continue to build with a higher ratio of financial assets to capital assets than it has currently. This will ensure future sustainability for Water Distribution.

Projected Statement of Operations

The projected statement of operations includes the revenues less the expenses, arriving at the excess or net revenues over expenses. Revenues were discussed in the Funding Plan, while most expenses were discussed in the Operations section of this Plan. While expenses include operating costs, which were already discussed, they also include amortization. Amortization is the write off of the capital assets or the water system infrastructure over their useful life. It does not represent a cash expenditure.

Projected Statement of Cash Flow

The projected statement of cash flow is a very useful statement for a capital intensive organization such as Water Distribution. This projected statement of cash flow summarizes the key transactions that either increase or decrease the organization’s cash balance. It is set out in three sections: operating transactions; capital transactions and financing transactions.

Projected operating transactions section is a summary of the projected net revenues over expenses, adjusted for any non-cash items. Projected capital transactions show the capital additions and sale of assets, if any, while the projected financing transactions reveal if any new debt will be incurred and the amount of debt that will be repaid.

In the Operations section of this financial plan, the cash expenditures, such as operating expenses and capital costs, were identified. In the Funding Plan section of this financial
plan, the cash receipts, operating revenues in this case, or funds required to cover the cash expenditures were discussed.

This next chart below is a summary of those cash expenditures and receipts, which is essentially a summary of the Projected Statement of Cash Flow.

As shown on the Projected Statement of Cash Flow, Water Distribution will maintain a fairly consistent level of cash on an annual basis over the projected period.

**SUMMARY**

This Financial Plan has been prepared in accordance with the MOE Financial Plans Regulation (O. Reg. 453/07). The process in developing this plan has focused on the achievement of Water Distributions’ mission: to provide environmentally sustainable water supply essential to the health, safety and prosperity of the community.

This Financial Plan must be approved by a Regional Council resolution, indicating that based on this plan, it is concluded that Regional Water Services – Water Distribution is and will be financially viable.

**REGION OF WATERLOO - DISTRIBUTION FINANCIAL PLAN**

**FINAL DRAFT**
FEEDBACK AND CONTINUOUS IMPROVEMENT

The financial plan must be updated every five years but it is recommended to be updated more frequently to reflect changes in operations, economic climate, financing costs, consumption and pricing.
APPENDIX ONE

PROJECTED FINANCIAL STATEMENTS
OF
THE REGIONAL MUNICIPALITY OF WATERLOO
WATER SERVICES - WATER DISTRIBUTION

FINAL DRAFT
THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
WATER DISTRIBUTION
PROJECTED STATEMENT OF FINANCIAL POSITION

AS AT DECEMBER 31, 2014 TO 2026

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<td></td>
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<td>$632</td>
<td>$704</td>
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<td>$1,269</td>
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<td>308</td>
<td>309</td>
<td>310</td>
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</table>

| **LIABILITIES** |      |      |      |      |      |      |      |      |      |      |      |      |
| Borrowing facilities | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 |
| Net financial assets | $220 | $497 | $612 | $632 | $704 | $1,022 | $1,269 | $1,596 | $1,815 | $2,150 | $2,500 | $2,850 |

| **NON-FINANCIAL ASSETS** |      |      |      |      |      |      |      |      |      |      |      |      |
| Capital work in progress | $220 | $497 | $612 | $632 | $704 | $1,022 | $1,269 | $1,596 | $1,815 | $2,150 | $2,500 | $2,850 |

| **CAPITAL ASSETS (Schedule One)** |      |      |      |      |      |      |      |      |      |      |      |      |
| Water networks | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 | $10,452 |
| Mains and asphalt | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 | 928 |
| Fleet | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 |

| **ACCUMULATED SURPLUS** |      |      |      |      |      |      |      |      |      |      |      |      |
| Opening | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 |
| Closing | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 | $11,612 |

Notes and Assumptions:

1. Actual results achieved for the period subsequent to a forecast are presented; this difference is referred to as the deficit.


3. The capital work in progress for 2016 has been revised to include the Regional Water Services Capital Work in Progress.

4. The capital work in progress for 2017 has been revised to include the Regional Water Services Capital Work in Progress.

5. The capital work in progress for 2018 has been revised to include the Regional Water Services Capital Work in Progress.

6. The capital work in progress for 2019 has been revised to include the Regional Water Services Capital Work in Progress.

7. The capital work in progress for 2020 has been revised to include the Regional Water Services Capital Work in Progress.

8. The capital work in progress for 2021 has been revised to include the Regional Water Services Capital Work in Progress.

9. The capital work in progress for 2022 has been revised to include the Regional Water Services Capital Work in Progress.

10. The capital work in progress for 2023 has been revised to include the Regional Water Services Capital Work in Progress.

11. The capital work in progress for 2024 has been revised to include the Regional Water Services Capital Work in Progress.

12. The capital work in progress for 2025 has been revised to include the Regional Water Services Capital Work in Progress.

13. The capital work in progress for 2026 has been revised to include the Regional Water Services Capital Work in Progress.

14. The capital work in progress for 2027 has been revised to include the Regional Water Services Capital Work in Progress.

15. The capital work in progress for 2028 has been revised to include the Regional Water Services Capital Work in Progress.

16. The capital work in progress for 2029 has been revised to include the Regional Water Services Capital Work in Progress.

17. The capital work in progress for 2030 has been revised to include the Regional Water Services Capital Work in Progress.

18. The capital work in progress for 2031 has been revised to include the Regional Water Services Capital Work in Progress.

19. The capital work in progress for 2032 has been revised to include the Regional Water Services Capital Work in Progress.

20. The capital work in progress for 2033 has been revised to include the Regional Water Services Capital Work in Progress.

21. The capital work in progress for 2034 has been revised to include the Regional Water Services Capital Work in Progress.

22. The capital work in progress for 2035 has been revised to include the Regional Water Services Capital Work in Progress.

23. The capital work in progress for 2036 has been revised to include the Regional Water Services Capital Work in Progress.

24. The capital work in progress for 2037 has been revised to include the Regional Water Services Capital Work in Progress.

25. The capital work in progress for 2038 has been revised to include the Regional Water Services Capital Work in Progress.

26. The capital work in progress for 2039 has been revised to include the Regional Water Services Capital Work in Progress.

27. The capital work in progress for 2040 has been revised to include the Regional Water Services Capital Work in Progress.

28. The capital work in progress for 2041 has been revised to include the Regional Water Services Capital Work in Progress.

29. The capital work in progress for 2042 has been revised to include the Regional Water Services Capital Work in Progress.

30. The capital work in progress for 2043 has been revised to include the Regional Water Services Capital Work in Progress.

31. The capital work in progress for 2044 has been revised to include the Regional Water Services Capital Work in Progress.

32. The capital work in progress for 2045 has been revised to include the Regional Water Services Capital Work in Progress.

33. The capital work in progress for 2046 has been revised to include the Regional Water Services Capital Work in Progress.

34. The capital work in progress for 2047 has been revised to include the Regional Water Services Capital Work in Progress.

35. The capital work in progress for 2048 has been revised to include the Regional Water Services Capital Work in Progress.

36. The capital work in progress for 2049 has been revised to include the Regional Water Services Capital Work in Progress.

37. The capital work in progress for 2050 has been revised to include the Regional Water Services Capital Work in Progress.

38. The capital work in progress for 2051 has been revised to include the Regional Water Services Capital Work in Progress.

39. The capital work in progress for 2052 has been revised to include the Regional Water Services Capital Work in Progress.

40. The capital work in progress for 2053 has been revised to include the Regional Water Services Capital Work in Progress.

41. The capital work in progress for 2054 has been revised to include the Regional Water Services Capital Work in Progress.

42. The capital work in progress for 2055 has been revised to include the Regional Water Services Capital Work in Progress.

43. The capital work in progress for 2056 has been revised to include the Regional Water Services Capital Work in Progress.

44. The capital work in progress for 2057 has been revised to include the Regional Water Services Capital Work in Progress.

45. The capital work in progress for 2058 has been revised to include the Regional Water Services Capital Work in Progress.

46. The capital work in progress for 2059 has been revised to include the Regional Water Services Capital Work in Progress.

47. The capital work in progress for 2060 has been revised to include the Regional Water Services Capital Work in Progress.
### THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
### WATER DISTRIBUTION
### PROJECTED STATEMENT OF OPERATIONS
### FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

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<td></td>
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<td>Repairs and maintenance</td>
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<td>$1,161</td>
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See accompanying notes and assumptions to these projected financial statements.
THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
WATER DISTRIBUTION
PROJECTED STATEMENT OF OPERATIONS
FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

($ THOUSANDS)

Notes and Assumptions:

Actual results achieved for the period covered will vary from this information presented. The differences may be material.

See Region of Waterloo Annual Reports for the Year ended December 31, 2014 and 2015 (when available) for the Region’s accounting policies.

1. The revenues and expenses for 2014 are derived from internal financial information of the Regional Municipality of Waterloo - Water Services.

2. Rate revenues for North Dumfries and Wellesley are as follows:

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<tr>
<td>North Dumfries</td>
<td>396</td>
<td>384</td>
<td>390</td>
<td>396</td>
<td>402</td>
<td>408</td>
<td>414</td>
<td>419</td>
<td>424</td>
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<tr>
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<td>749</td>
<td>750</td>
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Projected rate revenues

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<td>North Dumfries</td>
<td>$1,398</td>
<td>$1,599</td>
<td>$1,754</td>
<td>$1,937</td>
<td>$2,142</td>
<td>$2,327</td>
<td>$2,527</td>
<td>$2,735</td>
<td>$2,962</td>
<td>$3,204</td>
<td>$3,469</td>
<td>$3,546</td>
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<td>Wellesley</td>
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<td>$2,000</td>
<td>$2,005</td>
<td>$2,006</td>
<td>$2,015</td>
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<tr>
<td><strong>Total</strong></td>
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<td>$3,754</td>
<td>$3,947</td>
<td>$4,142</td>
<td>$4,327</td>
<td>$4,527</td>
<td>$4,735</td>
<td>$4,962</td>
<td>$5,204</td>
<td>$5,469</td>
<td>$5,546</td>
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Percentage increase

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<td>10.4%</td>
<td>10.4%</td>
<td>10.4%</td>
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</tr>
<tr>
<td>Wellesley</td>
<td>10.6%</td>
<td>10.6%</td>
<td>10.6%</td>
<td>10.6%</td>
<td>10.6%</td>
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<tr>
<td><strong>Total</strong></td>
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<td>10.4%</td>
<td>10.4%</td>
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<td>10.4%</td>
</tr>
</tbody>
</table>

3. Flat rate revenue for North Dumfries and Wellesley is charged to each household on a monthly basis, as set out below:

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<tbody>
<tr>
<td>Flat monthly rate</td>
<td>$7</td>
<td>$8</td>
<td>$8</td>
<td>$9</td>
<td>$9</td>
<td>$10</td>
<td>$10</td>
<td>$10</td>
<td>$10</td>
<td>$10</td>
<td>$10</td>
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<tr>
<td>North Dumfries</td>
<td>1,775</td>
<td>1,840</td>
<td>1,845</td>
<td>1,850</td>
<td>1,855</td>
<td>1,860</td>
<td>1,865</td>
<td>1,870</td>
<td>1,875</td>
<td>1,880</td>
<td>1,885</td>
<td>1,890</td>
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<tr>
<td>Wellesley</td>
<td>1,800</td>
<td>2,000</td>
<td>2,005</td>
<td>2,006</td>
<td>2,015</td>
<td>2,020</td>
<td>2,020</td>
<td>2,020</td>
<td>2,020</td>
<td>2,020</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,575</td>
<td>3,840</td>
<td>3,850</td>
<td>3,855</td>
<td>3,865</td>
<td>3,875</td>
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<td>3,890</td>
<td>3,900</td>
<td>3,905</td>
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</table>

Projected flat rate revenues

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</thead>
<tbody>
<tr>
<td>North Dumfries</td>
<td>$290</td>
<td>$357</td>
<td>$370</td>
<td>$405</td>
<td>$417</td>
<td>$453</td>
<td>$466</td>
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<tr>
<td>Wellesley</td>
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<td>$392</td>
<td>$393</td>
<td>$393</td>
<td>$415</td>
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<tr>
<td><strong>Total</strong></td>
<td>$521</td>
<td>$649</td>
<td>$675</td>
<td>$736</td>
<td>$760</td>
<td>$832</td>
<td>$859</td>
<td>$860</td>
<td>$860</td>
<td>$896</td>
<td>$896</td>
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</tbody>
</table>

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Interest income</td>
<td>$17</td>
<td>$11</td>
<td>$12</td>
<td>$14</td>
<td>$18</td>
<td>$24</td>
<td>$33</td>
<td>$42</td>
<td>$50</td>
<td>$58</td>
<td>$72</td>
<td>$72</td>
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<tr>
<td>Revenue ND fromage and flakage</td>
<td>22</td>
<td>20</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
<td>$8</td>
</tr>
<tr>
<td>Other revenue</td>
<td>0</td>
<td>23</td>
<td>8</td>
<td>8</td>
<td>8</td>
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<td>8</td>
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<td>8</td>
<td>8</td>
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<tr>
<td><strong>Total</strong></td>
<td>$48</td>
<td>$54</td>
<td>$20</td>
<td>$22</td>
<td>$28</td>
<td>$32</td>
<td>$41</td>
<td>$50</td>
<td>$58</td>
<td>$68</td>
<td>$80</td>
<td>$80</td>
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</tbody>
</table>

4. Interdepartmental revenues reflect the amounts which will be received from wastewater collection reserve fund as well as from water vehicle reserve to cover portions of costs related to the capital budget.

5. Other revenue for North Dumfries and Wellesley includes includes recoveries, flakage, interest and other miscellaneous revenue.

6. Amortization is calculated on a straight-line basis writing off the cost of the asset through amortization evenly over the useful life of the asset. Amortization of the water network assets commences in the year following the purchase while the fleet amortization begins in the year of acquisition. Useful life of existing assets is based on their current age and remaining life expectancy as assessed in the Region of Waterloo Valuation of Water and Wastewater Assets report, dated May 2008. The average useful life of new water network, machinery and equipment, and fleet assets are 70,10 and 5 years respectively.

7. Operating expenditures will increase by 1.5% per year after 2015.

8. Interest on debt will be required on a short-term basis in the years 2016 and 2017 has been calculated at a rate of 4.5%.

9. To respond to projected growth and actual rates increases, wholesale water charges will increase by 6.9% per year.

FINAL DRAFT

PROJECTED STATEMENT OF OPERATIONS - NOTES AND ASSUMPTIONS

1896224

Page 57 of 60
THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES
WATER DISTRIBUTION
PROJECTED STATEMENT OF CASH FLOWS
FOR THE YEARS ENDING DECEMBER 31, 2015 TO 2025

($ THOUSANDS)

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<tbody>
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<td>OPERATING ACTIVITIES</td>
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<td></td>
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<tr>
<td>Projected annual surplus</td>
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<td>$229</td>
<td>$424</td>
<td>$484</td>
<td>$655</td>
<td>$722</td>
<td>$862</td>
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<td>$1,340</td>
<td>$1,373</td>
<td>$1,382</td>
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<td>267</td>
<td>292</td>
<td>318</td>
<td>345</td>
<td>354</td>
<td>349</td>
<td>342</td>
<td>361</td>
<td>398</td>
<td>347</td>
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<td>Add (deduct) working capital items</td>
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<td>Accounts receivable</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>(1)</td>
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<tr>
<td>Net change in cash from operating activities</td>
<td>468</td>
<td>518</td>
<td>718</td>
<td>802</td>
<td>1,000</td>
<td>1,076</td>
<td>1,211</td>
<td>1,502</td>
<td>1,701</td>
<td>1,771</td>
<td>1,729</td>
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<td>FINANCING TRANSACTIONS</td>
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</tr>
<tr>
<td>Short term and long term liabilities issued</td>
<td>1</td>
<td>100</td>
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<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Short term and long term liabilities repaid</td>
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<td>(121)</td>
<td>(21)</td>
<td>(23)</td>
<td>(24)</td>
<td>-</td>
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</tr>
<tr>
<td>Net change in cash from financing transactions</td>
<td>80</td>
<td>(121)</td>
<td>(21)</td>
<td>(23)</td>
<td>(24)</td>
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</tr>
<tr>
<td>CAPITAL ACTIVITIES</td>
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<tr>
<td>Capital work in progress</td>
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<td>(517)</td>
<td>(350)</td>
<td>(605)</td>
<td>(650)</td>
<td>(705)</td>
<td>(600)</td>
<td>(900)</td>
<td>(1,300)</td>
<td>(1,355)</td>
<td>(1,200)</td>
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<td>Capital asset purchases</td>
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</tr>
<tr>
<td>Net change in cash from capital activities</td>
<td>(450)</td>
<td>(350)</td>
<td>(605)</td>
<td>(650)</td>
<td>(705)</td>
<td>(600)</td>
<td>(900)</td>
<td>(1,300)</td>
<td>(1,355)</td>
<td>(1,200)</td>
<td>(1,300)</td>
</tr>
<tr>
<td>PROJECTED NET CHANGE IN CASH AND CASH EQUIVALENTS</td>
<td>98</td>
<td>45</td>
<td>90</td>
<td>129</td>
<td>271</td>
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<td>311</td>
<td>202</td>
<td>346</td>
<td>571</td>
<td>429</td>
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<tr>
<td>Cash, beginning of the year</td>
<td>389</td>
<td>487</td>
<td>532</td>
<td>622</td>
<td>751</td>
<td>1,022</td>
<td>1,298</td>
<td>1,609</td>
<td>1,810</td>
<td>2,156</td>
<td>2,727</td>
</tr>
<tr>
<td>Cash, end of the year</td>
<td>3</td>
<td>$487</td>
<td>$532</td>
<td>$622</td>
<td>$751</td>
<td>$1,022</td>
<td>$1,298</td>
<td>$1,609</td>
<td>$1,810</td>
<td>$2,156</td>
<td>$2,727</td>
</tr>
</tbody>
</table>

Notes and Assumptions:
Actual results achieved for the period covered will vary from this information presented. The differences may be material.
See Region of Waterloo Annual Reports for the Year ended December 31, 2014 and 2015 (when available) for the Region's accounting policies.
1. Debt of $100,000 will be required on a short-term basis to cover a portion of the capital costs in 2015.
2. See Schedule One for the details of the capital transactions.
3. The balance of the cash and cash equivalents at the end of each year reflects the monies available for future capital expenditures.
### THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES

#### WATER DISTRIBUTION

**SCHEDULE OF PROJECTED CAPITAL ASSET ACQUISITIONS, DISPOSALS AND ACCUMULATED AMORTIZATION**

FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

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</thead>
<tbody>
<tr>
<td><strong>Capital Assets - Cost</strong></td>
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<tr>
<td>Water Network</td>
<td>$14,071</td>
<td>$15,167</td>
<td>$15,397</td>
<td>$15,732</td>
<td>$16,140</td>
<td>$16,548</td>
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<td>$17,615</td>
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<td>$675</td>
<td>$675</td>
<td>$675</td>
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<td>$675</td>
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<tr>
<td>Fleet</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>$14,701</td>
<td>$15,842</td>
<td>$16,072</td>
<td>$16,407</td>
<td>$16,825</td>
<td>$17,423</td>
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<tr>
<td>Water Network</td>
<td>$4,048</td>
<td>$4,072</td>
<td>$4,151</td>
<td>$4,230</td>
<td>$4,309</td>
<td>$4,388</td>
<td>$4,467</td>
<td>$4,546</td>
<td>$4,625</td>
<td>$4,704</td>
<td>$4,783</td>
<td>$4,862</td>
</tr>
<tr>
<td>Machinery and Equipment</td>
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<td>Fleet</td>
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<tr>
<td><strong>Total</strong></td>
<td>$4,048</td>
<td>$4,072</td>
<td>$4,151</td>
<td>$4,230</td>
<td>$4,309</td>
<td>$4,388</td>
<td>$4,467</td>
<td>$4,546</td>
<td>$4,625</td>
<td>$4,704</td>
<td>$4,783</td>
<td>$4,862</td>
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<tr>
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<td>$675</td>
<td>$675</td>
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<tr>
<td><strong>Total</strong></td>
<td>$11,413</td>
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<td>$12,713</td>
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### Capital Cost

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<tbody>
<tr>
<td><strong>Water Network</strong></td>
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</tr>
<tr>
<td>Opening</td>
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<td>$14,071</td>
<td>$14,071</td>
<td>$14,071</td>
<td>$14,071</td>
<td>$14,071</td>
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</tr>
<tr>
<td><strong>Machinery and Equipment</strong></td>
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<tr>
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</tr>
<tr>
<td>Additions</td>
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<td>$45</td>
<td>$45</td>
<td>$45</td>
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**SCHEDULE ONE**

1896224

Page 59 of 60
## THE REGIONAL MUNICIPALITY OF WATERLOO - WATER SERVICES

### WATER DISTRIBUTION

#### SCHEDULE OF PROJECTED CAPITAL ASSET ACQUISITIONS, DISPOSALS AND ACCUMULATED AMORTIZATION

FOR THE YEARS ENDING DECEMBER 31, 2014 TO 2025

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**Notes and Assumptions:**

Actual results may vary from the information presented. Differences may be material.

1. The actual capital assets costs, additions, dispoal, accumulated amortization have been provided by the Region of Waterloo finance department.
2. Additions are made to an existing asset to extend, enlarge or expand the existing asset.
3. The capital asset is no longer maintained. It is assumed that it will not be replacing an existing asset. The cost of the disposed asset is based on the purchase price of the new asset, discounted at 2.5%, assuming that assets were depreciated 39 years ago. It is assumed that these are not replacing existing assets, except in 2023.
4. The calculation is based on the straight-line basis. The true cost of the disposed asset is based on the purchase price of the new asset, discounted at 2.5%, assuming that assets were depreciated 39 years ago. It is assumed that these are not replacing existing assets, except in 2023.
5. The calculation is based on the straight-line basis. The true cost of the disposed asset is based on the purchase price of the new asset, discounted at 2.5%, assuming that assets were depreciated 39 years ago. It is assumed that these are not replacing existing assets, except in 2023.

**FINAL DRAFT**
Region of Waterloo
Transportation and Environmental Services
Water Services

To: Chair Tom Galloway and Members of the Planning and Works Committee
Date: October 6, 2015   File Code: E06-20/GRBK
Subject: Greenbrook Water Treatment Plant Update

Recommendation: For information only.

Summary: Nil

Report:

The Greenbrook Water Treatment Plant (WTP) supplies approximately 5% of the average daily water demand of the Region’s Integrated Urban System (IUS), which includes the cities of Cambridge, Kitchener and Waterloo, and the towns of Elmira and St. Jacobs. This WTP treats water from five ground water wells (wells K1A, K2A, K4, K5 and K8) and uses a three-stage water treatment process including filters for removal of iron and manganese, an advanced oxidation process to remove 1,4 Dioxane, and multi-stage disinfection with Ultra Violet reactors, chlorine and chloramines (chlorine and ammonia).

The Greenbrook WTP has not been in operation since April 2, 2014, when an explosion occurred in the chemical storage area of the plant. This explosion was a result of mixing ammonia and chlorine in the storage tanks. Feed connections to the storage tanks are secured with cam lock caps (protective cover with distinct fitting) and identified with labels. However, despite of all the safety measures above, the company that is contracted to deliver chemicals at this WTP, Canada Colours and Chemicals Limited (subcontracted to Nachurs Alpine Solutions), fed ammonia directly into the chlorine storage tanks. When these two chemicals mixed together in the chemical storage tank a reaction occurred, which produced heat and a secondary compound susceptible to ignition. In this case, there was enough reaction and energy to create an explosion.
Report E-14-080 dated June 17, 2014, provided additional information about the above event and the investigation that followed the plant shut-down. The report also summarized further measures taken by Water Services to prevent re-occurrence of this type of event, and the approach for reconstruction of the impacted areas at this facility.

Following the clean up a full assessment of the structure and rehabilitation requirements was conducted. This assessment indicated that the structural integrity of the WTP building was sound, and only repairs isolated to the chemical storage area would be required. Based on this information, the repair of the Greenbrook WTP chemical area was completed. The total cost for the Greenbrook WTP repairs are estimated to be $750,000. It is expected that most of the funding for this project will be recovered from the insurance pool.

Reconstruction:

Most reconstruction work in the chemical area at the Greenbrook WTP has now been completed. The consultant is reviewing specific start-up considerations for the process equipment, with the final step being a complete disinfection of the treated water reservoirs. A commissioning plan was developed and implemented over a period of several weeks to ensure optimum operations of all treatments steps.

The chemical handling and storage facilities have been updated based on the “Chemical Handling Review” completed earlier this year. The chemical fill lines have been equipped with separate locked cabinets, with appropriate labelling inside and outside the cabinet. High level alarms will be installed in each of the chemical storage tanks. The deliveries will be during regular business hours, with exception for emergency deliveries. The keys will be held by Region of Waterloo staff who will attend all deliveries to verify connection to the proper chemical fill-line. Standard Operating Procedures (SOP) will be updated to reflect the changes.

Prevention:

In 2014, a consultant was hired to do an independent review of all Region water treatment sites that stored treatment chemicals. From the site inspections, it was determined that sixty-nine water systems have chemical storage, fifty-seven with sodium hypochlorite storage only, four with ammonium sulphate only and eight facilities with more than one chemical on-site. The sites with a chemical tank capacity of 1,800 liters or more were considered a large system and those with less than 1,800 litres were considered as small systems.

The consultant reviewed the administrative and engineering controls and conducted a systematic risk assessment to assess priority of sites. From the risk assessment, it was established that the sites with only one chemical were lower risk and the sites with multi
chemicals were medium to high risk depending on the volume of chemical on the site and the status of the administrative and engineering controls.

The ‘Three P’ approach to handling chemicals was adopted. This approach consists of Prepare, Protect & Prevent and provides a practical and easy to follow series of steps. Prepare consists of having detailed work procedures, standby equipment, communications and proper tools and instrumentation. Protect includes proper spill containment, prompt response to actions, training and spill handling procedures. Prevent involves prevention of spills and other events through safe work practices such as lock out tag out, work area inspection and controls and staging of tools and equipment into position.

Implementation:

A facilitated workshop with operations and health and safety staff was conducted; the outcome was site specific action plans. The key outcomes were as follows:

1. Ensure appropriate spill containment and enhance spill containment measures in offloading areas.
2. Evaluate whether additional engineering controls are beneficial (e.g. remote monitoring and/or tank level alarms) to prevent overfilling of tanks.
3. Improve separation between chemical storage areas and distance between chemical fill points.
4. Make fill line connections more distinct (visually) and/or more secure (e.g. colour coding, enhanced signage, separate locked cabinets, etc.).
5. Limit contractor access to only the fill points for the chemicals they are contracted to supply.
6. Have Region of Waterloo staff (or a second qualified person) verify connections to storage tanks as part of the chemical offloading process.
7. Formalize SOP for batch mixing ammonium sulphate.
8. Ensure WHMIS Workplace Labels on all day tanks or chemical transfer tanks.
9. Store powdered ammonium sulphate used for mixing in locked cabinet.
10. Secure lids on the chemical tanks.
11. Conduct feasibility study to evaluate potential for eliminating chloramination.

Next Steps:

All the recommended actions from the feasibility are underway or have been scheduled for future action.

At multi-chemical sites where contractors offload chemicals, access is limited to the fill points for the chemicals. Region staff is available to observe the chemical delivery acting to oversee the operation.
By spring 2016, Region staff will have addressed labelling; securing fill line connections, ammonium sulphate powder storage, and lids; update SOPs. There will be a review to evaluate whether additional engineering controls would be beneficial and to make fill line connections more distinct (visually) and/or more secure.

By spring 2017, Region staff will have addressed improvements/enhancements to the spill containment measures in the offloading areas; evaluated and increased separation distances between fill connections; incorporate any major changes not addressed up to this point in the capital program.

**Corporate Strategic Plan:**

Greenbrook WTP Repairs supports the Corporate Strategic Focus Area 2: “Growth Management and Prosperity,” Strategic Objective 2.2: “Develop, Optimize and Maintain Infrastructure to Meet Current and Projected Needs.”

**Financial Implications:**

In light of the emergency nature of this project, no funds had been allocated for repair and reconstruction of the Greenbrook WTP chemical area. The initial clean up project has gone well and has cost $205,000 to-date. The reconstruction costs are estimated to be $750,000. It is expected that the majority of the costs will be funded by the insurance coverage carried by the chemical delivery company. The Region's Insurance Claim Reserve and the Waterloo Regional Municipalities' Insurance Pool's Claims Reserve will be used as required to fund the depreciation deduction that the Contractor's insurer will apply to the payment.

The site specific action plans to address the chemical storage at the various facilities will be accommodated through existing operating budgets and any major changes will be addressed through future capital programs.

**Other Department Consultations/Concurrence:**

Corporate Services (Risk Management) was consulted in the preparation of this report.

**Prepared By:** Olga Vrentzos, Manager, Operations and Maintenance, Water Services

**Approved By:** Thomas Schmidt, Commissioner, Transportation and Environmental Services
William Street and Strange Street Water Supply Systems

Class Environmental Assessment
Public Consultation Centre No. 2

October 20, 2015 – 5:00 p.m. to 7:00 p.m.
Region of Waterloo
Public Health and Social Services Building
99 Regina Street South, 5th Floor, Waterloo
William Street and Strange Street Water Supply Systems
Class Environmental Assessment
Public Consultation Centre No. 2

October 22, 2015 – 5:00 p.m. to 7:00 p.m.
St. John Catholic Elementary School
99 Strange Street, Kitchener
Welcome!

This is your opportunity to provide comments and ask questions. We are here to help you:

• Understand the study and process
• Explain the Water Treatment Plant and Watermain Route alternatives
• Discuss your questions, hear your comments, and get your feedback
• Outline next steps

This Study follows the Municipal Class Environmental Assessment (EA) process
The Region's Perspective

Purpose of this Class EA Study

- More detailed review of the recommended alternative identified in the Water Supply and Distribution Master Plan
- Complete Phases 1 to 4 of the Municipal Class EA Process
- Provide opportunities for public input and comment
The Vision…Getting it Together

- Improved distribution flexibility and water quality
- Streamlined operations
- Reduced costs

- Allows for uninterrupted water supply during maintenance or in an emergency

Master Plan – Opportunity to combine William Street & Strange Street Water Systems
We are Examining the Following:

1. The location of a Water Treatment Plant
   - William Street
   - Strange Street or
   - Third Site

2. Routes for a new watermain to connect the William Street and Strange Street water supply systems.
Key Considerations:
The Region follows the Municipal Class Environmental Assessment (EA) process for municipal water projects.
Overall Considerations

The Strange Street and William Street sites both have:

- Cultural heritage
- Archaeological potential
- Various natural features, none would limit project
- Existing buildings would need upgrades to allow integration of treatment equipment
Groundwater Study Results

- New testing completed at William Street and review of recent testing at Strange Street
- Considered the water supply system as a whole (i.e. multiple well fields)
- Long-term monitoring is in place to ensure the water takings are sustainable
- **Results** - there is enough capacity in the well fields to support the planned water takings
Evaluation Criteria

Environment
- Effect on terrestrial habitats or ecological functions (e.g. wetlands)
- Presence of species at risk
- Potential contamination

Social, Cultural, Community
- Noise, dust, odour, traffic during construction
- Land availability, ownership, usage
- Public health and safety
- Archeological resources
- Cultural, heritage features

Financial
- Costs of construction
- Annual operating costs
- Potential future savings

Technical
- Constructability & complexity
- Treatment reliability
- Compatibility with existing infrastructure
- Energy use, efficiency
- Risk assessment, construction, sensitive features
## Alternatives Considered

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<tr>
<td>3 Water treatment at one or both sites without connecting the two sites</td>
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<td>4 Connect the two sites and manage water quality through blending of well water</td>
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<td>5C Connect the two sites with water treatment at both William and Strange Street sites</td>
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<tr>
<td>6 Connect the two sites with water treatment at a third site</td>
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Alternative 5A – Water Treatment
William Street Site

Advantages:
- Location suited for water supply in Waterloo
- No significant ecological impact
- Addresses water quality issues

Disadvantages:
- Heritage building features limit construction
- Limited Regional land ownership
- No flexibility to supply water to Kitchener

Estimated cost: $21M

Schedule C Class EA
Alternative 5B – Water Treatment
Strange Street Site

Advantages:
• Location suited for water supply in Kitchener with flexibility to supply to Waterloo
• No significant ecological impact
• Addresses water quality issues
• Regional land ownership

Disadvantages:
• Part of property on GRCA-designated flood plain
• Heritage building features limit construction

Estimated Cost: $25M
Schedule C Class EA

Based on the preliminary evaluation, this alternative ranked higher than the other alternatives.
Alternative 5C – Water Treatment At Both Sites

Advantages:
• Advantages similar to Alternatives 5a and 5b
• No watermain connecting the sites is required

Disadvantages:
• Disadvantages similar to Alternatives 5A and 5b
• Need to build two separate plants
• Increased operation and maintenance for two plants

Estimated Cost: $40M

Schedule C Class EA
Alternative 6 – Water Treatment

“New” Third Site

Advantages:

• Location suited for water supply in Kitchener with flexibility to supply to Waterloo
• Greenfield construction
• No impact to heritage sites

Disadvantages:

• Impact to existing park lands
• Limited Regional land ownership

Estimated Cost: $25M

Schedule C Class EA
# Preliminary Evaluation of WTP Site Alternatives - Scores

- Most Preferred → Least Preferred

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Watermain Route Alternative 1

Advantages:
• Opportunities to coordinate reconstruction of Union St. with City of Waterloo

Disadvantages:
• Potential to impact utilities
• Belmont Ave. recently reconstructed
• Potential impacts to Belmont Village businesses
• Union St. traffic congestion
• Potential impacts to Mutual Drive parking facility for Sun Life users

Estimated Cost: $1.08M

Route:
Belmont Ave. to Union St.
Length: 1,800m
Watermain Route Alternative 2

Route:
Belmont Ave to John St.
Length: 1,820m

Advantages:
• Less traffic impacted on John St. than Union St.

Disadvantages:
• Least direct route
• Belmont Ave. recently reconstructed
• Potential impacts to Belmont Village businesses
• Potential impacts to John St. residents
• Higher number of heritage properties along route

Estimated Cost: $1.09M
Watermain Route Alternative 3

Route:
Iron Horse Trail to Union St.
Length: 1,780m

Advantages:
• Opportunities to coordinate reconstruction of Union St. with City of Waterloo
• Opportunity to coordinate water main installation with Iron Horse trail improvements by City of Kitchener
• Fewer utility crossings

Disadvantages:
• Union St. traffic congestion
• Potential impacts to Mutual Dr. parking facility for Sun Life users
• Potential soil contamination on trail

Estimated Cost: $1.07M
Watermain Route Alternative 4

Route:
Iron Horse Trail to John St.
Length: 1,765m

Advantages:
• Less traffic impacted on John St. than Union St.
• Opportunity to coordinate water main installation with Iron Horse trail improvements by City of Kitchener
• Fewer utility crossings
• Most direct route

Disadvantages:
• Potential impacts to John St. residents
• Higher number of heritage properties along route
• Potential soil contamination on trail

Estimated Cost: $1.06M

Based on the preliminary evaluation, this alternative ranked higher than the other alternatives.
## Results of Preliminary Evaluation of Watermain Route Alternatives - Scores

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Most Preferred ➔ Least Preferred

Ranking of Alternatives: 3 4 2 1
In Summary Highest Ranking…
Water Treatment Plant Location
Alternative 5B

Strange Street

- Flexibility to supply water to both Kitchener and Waterloo
- Meets water quality objectives
- Land owned by Region; possible to construct outside flood plain
- Lower construction costs
In Summary Highest Ranking... Watermain Route Alternative 4

Iron Horse Trail and John Street

- Most direct route
- Less disruption to Belmont Village businesses, Mutual Dr. parking users
- Opportunity to coordinate with Iron Horse Trail construction
- Fewer utility crossings
What Happens Next?

**Late Fall 2015**
Consider comments received at this Public Consultation Centre, Confirm preferred solutions

**Winter 2016**
Develop and evaluate and identify alternative design concepts for preferred solutions, Public Consultation Centre 3

**Spring 2016**
Confirm Preferred Design Concepts, File Environmental Study Report for Public Review – Phase 4
Ways to Get Involved:

1. Completing the Comment Sheet Provided Today
2. Contacting the Region and/or Consultant or Project Manager
3. Attending the Winter 2016 Public Consultation Centre
4. Registering to Receive Future Notifications

Thank you for your participation!
We'd Like to Hear From You

Please deposit your comment sheet in the box provided or forward to the Region.

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