
Annex B Technical Studies

B.1 Water Master Plan

The major objective of the Water Master Plan was to update the 2009 IMP recommendations and cost estimates for water supply infrastructure, including the approximate timing of the recommended projects. Consideration of potential post-2031 development has also been included (2060 scenario). The scope of recommendations was expanded to include emergency power upgrades and specific pumping units (upgrade, replacement, or new) at pump stations. The City's water system model includes basic day and maximum day scenarios for existing, 2021, 2031, and 2060.

Report: 2013 Water Master Plan, Stantec (September 2013)

B.2 Wastewater Master Plan

The Wastewater Master Plan is presented in a document entitled "2013 Infrastructure Master Plan Wastewater Collection System Assessment, Stantec (September 2013)" which includes all technical analysis needed to support the project recommendations. The Wastewater Master Plan included an update to the existing Trunk Sewer Network Model to reflect the existing and 2031 development scenarios. The resilience of the 2031 trunk sewer system also has been evaluated by considering its performance in accommodating wastewater flows over a longer-term (2060) development scenario. The robustness of the existing system, and planned system expansions and upgrades, have been assessed by creating climate-change induced extraneous flow conditions. From this, the performance of the system-wide trunk sewer system and core-area sewer system under the various development scenarios and extraneous flow conditions was summarized. The Plan recommends system expansion and upgrade requirements, based on consideration of the 2031 OP planning horizon and longer-term 2060 development scenario. Special attention was placed on existing flow monitoring data and available water billing data over the last 10 years to determine any long term trends in domestic wastewater generation and inflow / infiltration rates, and to factor them into the recommended system expansion and upgrade projects.

Report: 2013 Infrastructure Master Plan Wastewater Collection System Assessment, Stantec (September 2013)

B.3 Servicing Case Studies for Rural Villages

The Servicing Case Studies for Rural Villages utilized a set of criteria that was developed specifically for this analysis in order to screen all of the City's villages and rank them strictly from a municipal servicing perspective. Six villages were thus selected for more detailed review as case studies: Cumberland, Constance Bay, Osgoode, Metcalfe, North Gower and Greely. Each of these six villages was evaluated for servicing from the central municipal network and also based on decentralized systems. Each of these scenarios was evaluated for three servicing extents: 1) Greenfield development only; 2) Greenfield development plus existing development; and 3) Greenfield development plus servicing the village core.

B.4 Vulnerability Assessments

The focus of Ontario's *Clean Water Act, 2006* is to ensure communities in Ontario are able to protect their municipal drinking water supplies (both surface water and groundwater sources) from overuse and contamination i.e. to protect existing and future sources of municipal drinking water. This is being accomplished through 19 watershed-based Source Protection Areas (SPAs) and Regions in the Province of Ontario. Assessment Reports look at each watershed's physical characteristics, water quality and quantity, and land use and inform how water is distributed throughout the watersheds and where there are risks of overuse or contamination. Assessment Reports are summaries of more detailed vulnerability analyses for each municipal well or well-field. The related Assessment Reports within the city of Ottawa are for the South Nation SPA, Rideau Valley SPA, and Mississippi Valley SPA, and are available at the following links.

[Assessment Report for South Nation Source Protection Area](#)

[Assessment Report for Rideau Valley Source Protection Area](#)

[Assessment Report for Mississippi Valley Source Protection Area](#)

B.5 Water Purification Plants Development Plan Update

The Water Purification Plants Development Plan Update covers the topics of water quality and regulatory requirements, process development, production facility development, as well as future development and improvements for the Lemieux and Britannia Water Purification Plants (WPPs). No process changes are required for either of the WPPs to meet current or anticipated future regulations for the production of safe

drinking water. The basic technology of chemically-assisted filtration remains viable, however, the cost/benefit of using technologies such as ultraviolet for enhanced disinfection is being studied.

B.6 Characterization of Ottawa's Watersheds

The Characterization of Ottawa's Watersheds, and its supporting information, provides a city-wide integrated documentation and analysis of environmental conditions required to assess environmental and watershed management issues. It provides existing conditions information for a range of environmental studies including; subwatershed plans, environmental management plans, Environmental Assessments and other projects where environmental conditions need to be addressed.

Information presented in the document includes: topography; geology; 120-year climate trends; extensive water quality and water temperature data; hydrology: (long term stream flows and variation by geology, evapotranspiration); inventories of land use and cover including imperviousness and agriculture activities.

The Characterization document provides the entry point to extensive available data sets, to be regularly refreshed from numerous sources, which will enable detailed site-specific analyses.

[The Characterization of Ottawa's Watersheds](#)

B.7 Stormwater Management Pond Review

The City has completed a screening level assessment of the capacity of larger SWM facilities with catchment areas that are not fully built out. The purpose of the assessment was to determine whether there is potential for the original design capacity of these existing SWM facilities to be exceeded as the catchment areas build out. These facilities were designed and constructed based on development plans at the time, and densities and development form have changed since that time. The review flagged existing ponds that may be subject to capacity constraints in future. Based upon this exercise, a number of existing ponds located outside the Greenbelt were identified that may be subject to future capacity constraints if their catchments continue to build out at a higher imperviousness than what was designed for, leading to elevated water levels and reduced levels of water quality treatment.

[Stormwater Management Pond Review](#) (Contact [Darlene Conway](#))

B.8 Adaptive Approaches in Stormwater Management

The City's Strategic Objectives, OP, IMP and implementing documents such as the City's Urban Design Guidelines and Wet Weather Infrastructure Management Plan all contain policies and directions related to adaptation to climate change. As an initial step in considering climate change adaptation for SWM and drainage infrastructure, the City has completed a best practices review of adaptive approaches to respond to the anticipated impacts of climate change on local rainfall patterns. The characterization and examples provided in this report are intended to guide efforts to achieve the City's policy goals.

[Adaptive Approaches in Stormwater Management](#) (Contact [Darlene Conway](#))

B.9 Groundwater Characterization Studies

The City has applied significant efforts towards the characterization of groundwater resources and has prepared or participated in the preparation of a number of Groundwater Characterization Studies:

- Golder Associates Ltd. (2003), Final Report - Groundwater Assessment and Review of Alternative Solutions - Village of Metcalfe, City of Ottawa, Ontario.
- Golder Associates Ltd. (2003), Final Report – Water and Wastewater – Alternative Servicing Solutions Study – Village of Cumberland, City of Ottawa, Ontario.
- Golder Associates Ltd. (2005), Groundwater Use Characterization of the Heart's Desire Community, Ottawa, Ontario.
- Dillon Consulting Limited (2004), Carp Road Corridor Groundwater Study.
- Dillon Consulting Limited (2006), Village of Constance Bay Groundwater Study.
- Dillon Consulting Limited (2006), Village of North Gower Groundwater Study.
- Dillon Consulting Limited (2011), Pineglen, Grenfell Glen and Merivale Gardens Areas Groundwater Study.
- Dillon Consulting Limited (2006), Village of Osgoode Groundwater Study.
- Jp2g Consultants Inc. (2006), Vernon Groundwater Characterization Study.
- Jp2g Consultants Inc. (2009), Richmond Water Quality Assessment – Richmond, Ontario.

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- Trow Associates Inc. (2010), Village of Fitzroy Harbour Groundwater Characterization Study – Final Report.
 - Trow Associates Inc. (2010), Groundwater Characterization Study – Village of Ashton – Final Report.
 - Trow Associates Inc. (2010), Groundwater Characterization Study – Village of Sarsfield – Final Report.
 - Totten Sims Hubicki Associates/Jacques Whitford Environment Limited (2003), Shields Creek Subwatershed Study – Draft – Interim Groundwater Study Report #2 – Version 0.2.

Annex C City Programs

C.1 Ottawa River Action Plan

In 2010, City council approved the implementation of 17 projects to be completed over the next five years that make up the Ottawa River Action Plan (ORAP), the City's working plan to protect the health of the Ottawa River. The 17 projects in ORAP not only address the problem of CSOs, but also the broader issues affecting the entire watershed. The development of a longer term WES (one of the 17 projects) will eventually provide a broader context for ORAP.

[Ottawa River Action Plan](#)

C.2 Long Range Financial Plan

Staff developed a long-range financial plan that identified the 10-year needs of the City and a plan that would provide a financing scheme, as outlined in a 2002 Report to Corporate Services and Economic Development Committee. The report includes information on debt eligibility, life cycle projects, growth projects, new programs and initiatives, summary of debt eligibility, interim process, other revenues and a number of recommendations including general recommendations, debt financing, and funding from other governments.

[Long Range Financial Plans](#)

The first part of the LRFP - Long-Range Financial Plan: First Steps - was approved by City Council in October, 2002.

- [Long-Range Financial Plan: First Steps](#)

Long Range Financial Plan II, a report endorsed by City Council in December, 2004, identifies the nature and magnitude of the financial challenges facing the rate-supported programs of the City of Ottawa:

- [Long-Range Financial Plan II](#)

The Long Range Financial Plan III 2006 (Part 1 and Part 2): Financial Profile of the City of Ottawa.

- [Long-Range Financial Plan III - Part 1 and Part 2](#)
- [LONG-RANGE FINANCIAL PLAN III 2006 \(PART 1 AND PART 2\): Financial Profile of the City of Ottawa](#)

Long Range Financial Plan IV:

- [Report to Finance and Economic Development Committee and Council: LONG-RANGE FINANCIAL PLAN IV \(PART 1\)](#)

Long Range Financial Plan IV – Water and Sewer Rate Supported Programs (January 27, 2012 Report):

- [Report to Environment Committee and Council: LONG RANGE FINANCIAL PLAN IV - WATER AND SEWER RATE SUPPORTED PROGRAMS](#)

Annex D Supporting Plans and Strategies

D.1 Comprehensive Asset Management (CAM)

CAM ensures the effective management of all tangible capital (physical) assets that the City uses directly or indirectly to deliver services to its customers. The CAM Policy defines Council's expectations around the management of the City's physical assets. The CAM Strategy articulates senior management's commitment to implementing the policy, including the necessary resources and timescales for implementation.

The purpose of the CAM Strategy is:

- To develop a set of actions aimed at improving and sustaining asset management practices across the organization.
- To ensure that these practices are applied consistently across the organization.
- To help the City maintain its assets at appropriate condition levels by applying the right intervention, on the right assets, at the right time recognizing risk and affordability.

While the CAM Policy is expected to remain relatively constant over time, the CAM Strategy will evolve in response to internal and external changes or challenges faced by the City.

[Comprehensive Asset Management Policy](#)

[Comprehensive Asset Management Framework](#)

[Comprehensive Asset Management Program – 2012 Stage of the Asset Report](#)

[Comprehensive Asset Management Strategy](#). This document defines Senior Management's commitment and approach to achieving the Council approved policy. It was approved by Senior Management Committee on August 23, 2013.

D.2 Water Efficiency Strategy

The following link provides more information on the [Water Efficiency Strategy](#), including the annual reports from 2006 to 2010.

D.3 Wet Weather Infrastructure Management Plan

The intent of the Wet Weather Infrastructure Management Plan (WW-IMP) is to develop and prioritize strategic programs for managing wet weather flows (WWFs) within the wastewater and stormwater collection systems. The WW-IMP is one of the 17 projects

that make up the Ottawa River Action Plan. The WW-IMP is also key in supporting the objectives of the IMP related to capacity for growth and the CAM Program related to the management of the City's sewer and drainage infrastructure. The objective of the WW-IMP is to recommend a set of initiatives or programs to cost-effectively provide:

- Flood Protection – reduce threats to human health and property damage from flooding;
- Capacity for Growth – reduce infrastructure capacity restrictions that could limit growth and intensification; and
- Pollution Control – minimize adverse impacts on water environment from combined and sanitary sewer overflows (CSOs and SSOs).

The focus of the WW-IMP is on improving the overall integration and coordination that occurs between the different departments to ensure the effective management of WWFs.

[Wet Weather Infrastructure Management Plan Executive Summary](#)

D.4 Source Protection Plans

Source Protection Plans contain policies to protect local sources of drinking water from contamination or overuse. These plans are designed to protect existing and future sources of drinking water by creating a set of policies that help ensure activities carried out near municipal wells and surface water intakes do not threaten the quality and quantity of the drinking water supply. The policies are developed through collaboration with the public, other Source Protection Regions (SPRs), local municipalities, and industry experts. Proposed SPPs for the Raisin-South Nation SPR and Mississippi-Rideau SPR can be found at the following links:

[Draft Source Protection Plan for Raisin-South Nation Source Protection Region](#)

[Draft Source Protection Plan for Mississippi-Rideau Source Protection Region](#)

The *Clean Water Act* requires that municipalities incorporate policies from the SPPs into their Official Plans and Zoning By-Laws. The City of Ottawa will also be required to enforce the SPP policies, through a Risk Management Official and Risk Management Inspector(s).

D.5 CDPs, TODs, Master Servicing Plans, and other Studies

The City may undertake concept plans, zoning studies or community design plans (CDPs) to translate the principles and policies of the Official Plan (OP) to the community scale. The City works with the community, landowners, local businesses, school boards and other interested parties on CDPs that form the backbone of any significant change in a community. The OP identifies the priority areas for the completion of CDPs and all CDPs must conform to the OP.

These Community Plans and Studies can take the form of CDPs, Secondary Studies, Transit-Oriented Development (TOD) plans, Urban Design Strategies, District Plans, Park Land Use and Design Studies, Transportation Management Implementation Plans, Community Improvement Plans, Corridor Studies, and Site Specific Policy Reviews. The CDPs and studies listed below have completed their public consultation phase and have been approved by City Council for implementation:

Completed Plans

- [Barrhaven South CDP](#)
- [Bank Street CDP](#)
- [Bayview/Somerset Area Secondary Study](#)
- [Beechwood CDP](#)
- [Carp Road Corridor CDP](#)
- [CDP for the Village of Carp](#)
- [Community Plan for the Village of Constance Bay](#)
- [Downtown Ottawa Urban Design Strategy](#)
- [East Urban Community - CDP For The Phase 1 Area](#)
- [Escarpment Area District Plan](#)
- [Fernbank CDP](#)
- [Greely CDP](#)
- [Leitrim CDP](#)
- [Mer Bleue CDP](#)
- [North Gower CDP](#)

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- [Old Ottawa East CDP](#)
 - [Orléans Industrial Park Land Use and Design Study](#)
 - [Queensway Terrace North](#)
 - [Richmond Road/Westboro CDP](#)
 - [Richmond Road/Westboro Transportation Management Implementation Plan](#)
 - [Riverside South CDP](#)
 - [South Nepean Town Centre CDP](#)
 - [St. Joseph Boulevard Community Improvement Plan](#)
 - [St. Joseph Boulevard Corridor Study](#)
 - [The Uptown Rideau CDP](#)
 - [TOD Plans](#)
 - [Village of Richmond CDP](#)
 - [Wellington Street West CDP](#)

The CDPs and studies listed below are currently in a development phase:

[Plans in progress](#)

- [Carling-Bayview Light Rail Transit Corridor CDP](#)
- [East Urban Community – CDP for the Phase 2 Area](#)
- [Kanata North CDP](#)
- [LRT Station Area TOD Studies](#)
- [Nicholas Mann Precinct Design Plan](#)
- [Rockcliffe lands CDP](#)
- [Stittsville Main Street CDP](#)
- [Scott Street CDP](#)
- [Vanier Site Specific Policy Review](#)

Other TOD Plans:

- Train TOD

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- St. Laurent TOD
 - Cyrville TOD

Master Servicing Plans:

- South Nepean Master Servicing Plan
- East Urban Community Master Servicing Plan
- Richmond Master Servicing Plan
- LeBreton Flats Master Servicing Plan
- Fernbank Community Master Servicing Plan
- Barrhaven South Master Servicing Plan

D.6 [Water Environment Strategy](#)

The City is developing a Water Environment Strategy (WES) to guide the protection and enhancement of watersheds and water resources in Ottawa. The need for a comprehensive planning and implementation framework was identified in the 2003 Environmental Strategy, with funding approved for its development under the Ottawa River Action Plan in 2010. The WES will:

- Identify the full range of water environment issues that exist within the city's boundaries such as the protection of aquatic habitats, protection of the City's water sources, and the protection of recreational beaches.
- Clarify roles and responsibilities amongst the various jurisdictions and parties responsible for water environment protection.
- Set short, mid, and long-term goals and objectives for improving delivery of water environment programs and services, including examination of City operating practices.
- Establish measurable and achievable targets by which to measure service delivery and environmental protection.
- Institute a monitoring and reporting framework to ensure the timely communication of results to Council and the public.

The WES is still under development. Refer to the [Water Environment Strategy](#) for the status of the Strategy development.