

--	--

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON MONDAY, OCTOBER 28, 2013
FROM:	JOHN BRAAM, P.ENG. MANAGING DIRECTOR – ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER
SUBJECT:	GREENWAY WASTEWATER TREATMENT PLANT EXPANSION & UPGRADE UPDATE

RECOMMENDATION

That, on the recommendation of the Managing Director – Environmental & Engineering Services and City Engineer, with respect to the expansion and upgrade of the Greenway Wastewater Treatment Plant:

- a) the following report **BE RECEIVED** and reported to the Municipal Council for its information;
- b) This report on the proposed expansion of the Greenway Pollution Control Centre **BE REFERRED** to the 2014 Wastewater and Treatment Budget deliberations.
- c) That Civic Administration **BE AUTHORIZED** to make the following budget adjustments to ES5233 Vauxhall Wastewater Treatment Plant Expansion (\$3,000k), ES5143 Hauled Liquid Waste Receiving (\$2.4M), ES5234 Adelaide Wastewater and Treatment Plant CSO (\$2.8M), and ES5431 Adelaide Wastewater Treatment Plan Expansion Ph 2 (\$1.9M) totaling \$10.1 million as part of the identified funding for the proposed Greenway Expansion in the 2014 Wastewater & Treatment Budget, subject to budget approval.
- d) The Civic Administration **BE DIRECTED** to hold a Public Information Centre to review the design with the public.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
--

CWC Report of 2012-05-14, Item 11, Consultant Appointment Greenway Wastewater Treatment Plant

CWC Report of 2011-12-09, Item 14, Request to Increase Scope of RV Anderson to prepare Roadmap for Greenway Expansion

CWC Report of 2012-04-02, Item 6, Emergency Repair of Greenway 4 Final

ETC Report of 2010-07-19, Item 9, Greenway Pollution Control Center Class Environmental Assessment (EA)

COW Report of 2009-03-27, Item 3, Sanitary Conveyance and Treatment Capacities in the Greenway Sewershed

ETC Report of 2008-09-08, Item 2, Appointment of Consulting Engineer Greenway Pollution Control Plant Optimization Study and Class Environmental Assessment

BOC Report of 2008-05-28, Item 2, Wastewater and Treatment Emergent Projects

ETC Report of 2008-02-09, Item 9, Greenway Pollution Control Centre Workshop

--	--

BACKGROUND

Purpose

The purpose of this report is to provide an update on the preliminary design for the expansion and upgrade of the Greenway Wastewater Treatment Plant (WWTP). The update includes a discussion of the need, challenges, opportunities, proposed design, public issues and budget for the project.

Context

The Greenway WWTP is the oldest and largest treatment plant and provides wastewater treatment for about 60% of the City and biosolids disposal for all of London. There is a need to expand the plant to service growth and upgrade the processes to better capture and treat wet weather flow. The expansion must integrate well with other park uses including the off leash dog park and multiuse path all while meeting stricter environmental standards. The City has been examining the issues for several years and the design has evolved within regulatory, financial, physical, constructability, and social constraints. This report will highlight the progress, showcase the preliminary design, and recommend steps for moving the project forward.

Introduction

The Greenway WWTP is the largest of London’s six wastewater plants and dates back to the early 1900’s. The facility has undergone several upgrades and expansions over the years and currently consists of three separate conventional activated sludge (CAS) trains at a rated capacity of 152 mega liters per day (MLD). All biosolids are processed at Greenway and recent investments will ensure long-term cost effective biosolids treatment and disposal.

Continued development in the Greenway catchment area (and future Southside area) necessitates treatment capacity creation at Greenway at a more affordable cost. The following key growth interests would be accommodated:

- Southwest Area Plan (SWAP);
- downtown intensification, including SOHO; and,
- Industrial Land Development Strategy;

Environmentally, the City has committed to increasing the volume of wet weather flows captured and improving the level of treatment beyond existing standards. This includes directing and accepting more wet weather flows to Greenway for treatment while minimizing upstream combined sewer overflows (CSOs) as part of our developing Pollution Prevention and Control Plan.

The feasibility of expanding Greenway, while also optimizing the solution with wet weather performance improvements, was considered between 2007 and 2008. Technical issues were quantified and the expansion determined to be possible; however, immediate action was needed to take advantage of the opportunity because of limited remaining capacity. Spare capacity is needed to effect new construction, during which all performance criteria still has to be met. Expanding and optimizing Greenway was considered a more desirable solution than building the Southside plant because of the high initial cost for a new plant (including substantial piping costs to direct flows to it). After accounting for inflation, the cost for conveyance and treatment for a first phase, the Southside WWTP is now estimated to be in the \$95M range.

In 2008, based on a technical Greenway Workshop, Council approved an optimization and expansion of Greenway and deferral of the Southside wastewater treatment plant. The first step was an Environmental Assessment Study that considered options for the optimization and capacity expansion. The City completed a “Schedule C” Municipal Class Environmental Assessment (EA) focused on significant improvements to the wet weather treatment processes at the plant in addition to an 18 MLD capacity expansion. It was completed in 2010 and recommended a staged approach.

Agenda Item #	Page #

A more comprehensive “roadmap” for Greenway was then prepared. The roadmap supported an Expression of Interest (EOI) and the Request for Proposals (RFP) used to hire a design team; it became the basis for the project design assignment now in progress. There had also been success in removing trunk sewer bottlenecks upstream of the plant to allow growth area flows (via a new Wonderland Pumping Station) to reach Greenway.

A more complete list of the Greenway Expansion milestones is provided in Appendix A. Through the EA study process and the progression of the design for this project, several additional needs and opportunities have been identified as described below.

Expansion and Upgrade Needs

The expansion and upgrade is needed to:

Restore Capacity

The Class EA identified bottlenecks in the plant hydraulics and treatment processes which limit the ability for Section 3 to meet its rated capacity of 93 MLD. Through preliminary design, it was determined that the clarifiers are undersized and that only about 82 MLD of treatment capacity is achievable in the current configuration. (See Capacity Table in Appendix B)

Service Growth

The 2009 Development Charges Study identified the need to expand the Greenway WWTP by 9 mega liters per day (MLD) (2 million imperial gallons per day) by 2015.

Service Future Growth Commitments

The expansion will allow for servicing of the Southwestern Area Plan (SWAP), intensification of the downtown core and central London, and ensure servicing for the Industrial Land Development Strategy (ILDS).

Ensure Constructability

Treatment plant expansions are complex because construction must be accomplished on a fully operational plant while meeting effluent criteria limits. It is necessary to proceed with construction before rated capacity is reached so that there is available capacity to take processes off line to ensure continued performance compliance while construction is underway.

Increase Wet Weather Treatment Capacity

It is better to treat or partially treat more flow at the plant than to flood basements or have untreated flows bypass upstream of the plant. Conveyance improvements have been underway to allow more wet weather flow to reach the plant. Improved hydraulics (elimination of plant bottlenecks) and chemically enhanced primary treatment (CEPT) will increase the capture for full and partial treatment.

Meeting Design Challenges

The proposed preliminary design has been developed through a number of iterations whereby three different consulting teams (Stantec, R.V. Anderson and Associates, and Team Greenway [CH2M Hill, AECOM and Eramosa Engineering]) have considered how to meet project objectives and used their expertise to come up with a progression of concepts. The latest concept considered an internal value engineering exercise where the pros and cons of ideas were evaluated to settle on the proposed solution.

There are a number of challenges that were recognized early in the project; others have been identified for the project since the Class EA was completed. Each is described below along with the approach to dealing with them within the design.

Agenda Item #	Page #

Two Phase or Single Phase Expansion

The preferred solution in the Class EA was to expand Greenway in two 9 MLD phases. The Class EA is a high level assessment to select technology, determine effluent limits and assess the environmental impact of an expansion concept. It is not until preliminary design that concepts are further advanced and tested through process and hydraulic modeling that they can be determined to be feasible.

Creating capacity at Greenway has been found to be controlled by technical criteria. Section 3 has been found to be deficient with respect to its rated capacity, meaning that this must be resolved first. It can be overcome and more capacity can be added to achieve the first 9 MLD capacity increase. After that, Sections 1 and 2 have been found to have latent capacity that can be acquired through re-rating (i.e. low capital investment). In short, the second 9 MLD is low-cost and should be included in a single stage project.

Air and Regulatory Approvals

During the application for air approvals for the biosolids upgrades and the research facility presently under construction, an Emission Summary and Dispersion Modeling (ESDM) exercise was completed. Recent changes to the application of air emission standards now apply. Under the new criteria, current emissions are about 95% the 24 hour exposure limit along the western fence line beside the aeration tanks in Section 3. Based on discussions with our consultant regarding a "Limited Operating Flexibility" (LOF) ECA application for the Greenway site, the recommended limit for public exposure is 75% of the 24 hour limit. This limit has been used to set a suitable safety buffer for park users. The standard is conservative in assuming someone standing continuously near the aeration tanks; however, approvals will require a separation distance.

This change does not result in an increase in the plant operating footprint, but does require a design that separates the public from the existing operating boundary. Criteria for detailed design regarding the western side of the plant are discussed further under "Access".

Section 3 Capacity

Process modeling in preliminary design has determined that the capacity of Section 3 is operating at about 11 MLD less than the rated capacity when using current design guidelines developed by the Ontario Ministry of the Environment. This means that a plant expansion would not only require new capacity but it would also need to make up the 11 MLD shortfall in Section 3.

The design is based on the most cost effective way to overcome the deficiency and will also add 6.9 MLD of new capacity to this section; however there is a resulting minor change to the plant operating boundary at the northwest corner of the site. The abandoned ash basins are a prime location for new section 3 tanks, but the rectangular shape does not fit well within the angled fence line that exists around the old, oval basins. A squaring of the operating boundary to add 450 m² is required by the design to fit around the new tank shape. The Ministry of Environment has reviewed this and considers it to be a minor change to the operating boundary of the plant.

Section 3 Final Clarifiers Risk

There are five final clarifiers in Section 3. Final clarifier #4, the largest, treats about 40% of the flow in Section 3 and if it fails (as it did in January, 2012), about 37MLD of rated treatment capacity is lost until the repair can be made. The design removes this risk and will assist in maintaining performance compliance.

Access

The plant will not be able to operate without an alternative access to the west side of the plant. By keeping new facilities within the existing fence line, some internal road corridors are eliminated. A new route to remove ash from the southwest corner of the site will be required.

A partial internal / external access route to the west side of the plant will resolve this. During normal operations, the route would be used 1 – 2 days per month (about 20 trucks) to remove

Agenda Item #	Page #

ash from the site. This is the second influence on design for the west side of the plant, the first being public setback due to air emissions noted earlier. A safe route that minimizes tree loss/damage is at a similar distance from the existing west boundary to that required for emission safety. This suggests options are possible for a final design based on criteria for emission separation, truck turning radii, tree loss and public safety (as described further below).

Constructability

The plant must be safely and economically constructed which means that there must be space to store materials and equipment, to excavate and to construct tanks. As noted previously, space inside the existing fence line is limited; temporary construction space is needed to build the new process facilities.

Secure working areas for temporary use by the contractor will be designed adjacent to the plant to allow for excavation side slopes, equipment/material delivery and temporary material storage. The project will include restoration of disturbed areas. There should be appropriate separation such that park and construction traffic don't mix (see "Public Safety" below).

Public Safety

Ways to address other challenges (constructability and air emissions) have to address public safety first and foremost. Greenway is in a park setting in close proximity to the river, a park access road, parking lot, multi-use pathway and walking routes.

There is a convergence of challenges facing the west side of the plant. Constructability needs are clear, and temporary. The gravel surface of the existing Dog Park parking lot presents the least environmentally disruptive location for contractor materials storage. An extension to another parking lot north of the Dog Park and a hard surfaced connection to it will maintain that service. Public safety requires a barrier around any construction site.

To ensure safety, the construction traffic and internal mobility needs to be separate from the public. The west access road needs to be included within the contractor construction limits. Its design will require a relocation of the park access road and multi-use pathway. The existing park road suffers from a "blind curve" at the northwest corner of the plant; this will be resolved, as well as measures to calm the speed of park access road traffic as requested by the Parks Department.

After construction, the access road to the west side of the plant remains for operational purposes. From a public safety perspective, it would be best to include the access road and the air emissions setback within a public exclusion zone.

Budget

The budget for the plant expansion was developed in 2008 at \$26.68M for half of the 18 MLD expansion needs. There have been no updates to it despite multiple engineering assignments to map and design the expansion. The EA budget estimate noted that its accuracy was within 25%; more precision is not possible at such an early design stage. There have been a number of changes since the Class EA and some of the originally proposed works were underestimated. In particular, the headworks has changed the most, and will cost \$6.7M more than the EA estimate.

The cost of the project has evolved with the design process through three consulting teams, rising to a high estimated value of \$59.7M while achieving the 18 MLD expansion needs. The scope of work has been adjusted downward to mitigate financial impacts. A more complete review of the project budget is provided later in this report.

Opportunities Considered

In light of the needs and challenges, the expansion and upgrades provides numerous opportunities:

Agenda Item #	Page #

Restore Capacity in Section 3 and Eliminate the Risk of Clarifier Breakdown

The proposed expansion will restore the capacity deficiency in Section 3 and add another 6.9 MLD (i.e., from 82 to 93.1 MLD to 100 MLD). The existing, inefficient final tanks will be replaced with new final clarifiers in the former ash lagoon area in the North West corner of the plant.

Significantly improve wet weather performance

The design removes hydraulic bottlenecks from the head works to the outlet, configures the plant for split flows and adds chemically enhanced primary treatment capabilities.

Rerate Capacity in Sections 1 and 2

Modeling during preliminary design has determined that additional capacity can be obtained without building bigger/more tanks. Removal of hydraulic bottlenecks and equipment improvements will increase flow and treatment effectiveness of these sections, allowing an increased capacity of 5 MLD for Section 1 and 5.9 MLD for Section 2. This will increase Section 1 from 25 to 30 MLD and increase Section 2 from 34.1 to 40 MLD. These are achieved at a low construction cost. The bottleneck removal will also allow more peak, wet weather flow to be treated.

Delay Expansion at Other Plants

By increasing capacity at Greenway, there is an opportunity to defer an expansion at the Adelaide plant through toggling flows to Greenway via the Medway pumping station as identified in the 2009 DC Study. Staff is also exploring the opportunity to divert some flows from the Vauxhall plant to Greenway through minor sewer work. This will depend on the ability of downstream sewers to handle the additional flow and may delay or even eliminate an expansion for the Vauxhall plant identified in the 2009 DC Study.

Create Space for Future Works

New final clarifiers in Section 3 will allow the existing final clarifiers in Section 3 to be taken off line and emptied. These tanks could be converted to aeration tanks in the future, and with the addition of a future final clarifier in the extreme North West corner of the plant, Section 1 could be taken off line completely thereby allowing the area of Section 1 to be used for future technology. Space could be created under this scheme for future effluent pumping, (flood remediation) tertiary treatment, or enhanced Wet Weather Flow Management (WWFM) which was identified as occurring outside the eastern fence line in the 2010 ESR. This option was considered during preliminary design but was not advanced in order to reduce rising construction costs.

Other Opportunities not proposed in Design due to Cost Mitigation

The preliminary design considered the following works, which have not been advanced in order to manage rising costs; some of these can be addressed in the future:

- Flood Proofing -- Climate change is producing higher intensity, shorter duration storms that could lead to higher and more frequent flooding. The Greenway WWTP is located within the flood plain and is vulnerable to flooding should Thames River levels rise. New tanks will be constructed with walls above the 250 year storm levels. The proposed design allows the remainder of the plant to be protected in the future with flood barriers and effluent pumping.
- Section 1 Decommissioning -- Operating complexities and cost savings could be realized if Section 1 were decommissioned and if the capacity could be found in Section 3 through additional works. Provisions have been made in the design to accommodate this change in the future.
- Reductions to Project Scope -- The existing plant uses tunnels to provide access to underground piping and works between sections. These tunnels could have been extended into the new facilities. In an effort to keep costs down, tunnels were eliminated from the preliminary design.

Agenda Item #	Page #

Improved Park Roadway

The roadway to the western part of Greenway Park follows the northern boundary of the plant and jogs southerly before continuing on to the off leash dog park, soccer fields, play equipment, public washroom and fishing platform. Greenway staff met with Parks and Recreation to determine if improvements could be made to the roadway and multi-use path to improve safety by providing more separation between the plant and public, improved sight lines so that drivers and pedestrians, cyclists, rollerbladers and runners could better see ahead when navigating the corner, and determine if bends could be introduced to calm traffic. Design guidance was provided in setting proposed alignments for the park access road and multi-use pathway.

Design Summary

The proposed preliminary design has been developed through a number of iterations whereby three different consulting teams have considered how to meet project objectives and used their expertise to come up with a progression of concepts.

Environmental Assessment -- Stantec,

Greenway Roadmap -- R.V. Anderson and Associates, and

Preliminary Design Team -- CH2M Hill, AECOM and Eramosa Engineering

The proposed preliminary design was subjected to an internal value engineering exercise wherein the basic project requirements were evaluated to settle on the proposed solution.

The preliminary design was developed to meet the needs and challenges while taking into account the opportunities, all as described above.

The preliminary design:

- provides sanitary servicing capacity for growth in critical areas
- restores Section 3 capacity and eliminate the risk associated with keeping older clarifiers in service
- addresses hydraulic bottlenecks and a deficiency in Section 3
- is compatible with and accommodates future improvement needs
- meets regulatory requirements for air emissions and wastewater effluent
- places new facilities farther from existing homes
- increases the capture and improves the treatment of wet weather flows with Chemically Enhanced Primary Treatment (CEPT)
- safely manages construction and plant traffic
- minimizes tree loss, improve park road sight lines for safety, and allow for better vegetative screening of plant

The next stage of design will complete the details of these objectives. In particular, there is a need to design a buffer area along the western boundary of the site to provide access during construction, to provide a new route to the ash disposal area and to manage public exposure to air emissions under new regulatory criteria.

This area and roadway is to be configured to provide safe construction of the new clarifiers in Section 3 and provide an area for the contractors to temporarily store equipment, trailers and construction materials. Without the roadway, construction equipment and traffic would have to share the park roadway which runs directly beside the multi-use path. By building a separated roadway, plant and construction traffic can be separated from other users of the park. The only other alternative would be to close the roadway during construction but that would pose a problem after construction is completed because it would still be necessary for tandem dump trucks to haul dewatered ash from the ash disposal area in the southwest part of the site. The existing ash removal route will no longer be available once the expansion is completed because of new works within the plant and the requirement for future flood proofing. The location of the western limit of the fence has also been affected by the requirement to meet air emission limits

Agenda Item #	Page #

along the boundary and the need to keep as many trees as possible to screen the site and reduce environmental impacts.

Topics of Public Interest

Through the EA Study, and recent public contacts, a number of topics of public interest were considered within the preliminary design:

Noise

Past noise complaints were related to biosolids management. Old, noisy equipment that had been mounted on roof tops has now been removed.

The proposed preliminary design moves the new final clarifiers for the expansion to the northern most limit of the property where the ash lagoons currently exist. This change will provide a greater separation distance from residential homes on the south side of the property and will likely result in less construction related noise impact than constructing new finals on the south side of the plant as was proposed in the Class EA. Expanding within the property to the south would have resulted in increased noise due to significant tree removal and complicated shoring in the embankment to create space for future tanks.

Odours

London plant performance has been measured at the median for odour complaints per 1000 population when compared to plants in other municipalities. Significant improvement to this can be expected as a result of recent work on the sludge management system. The old sludge dewatering system exposed the air in the entire building to sludge and its strong odours. It required large volumes of air to be scrubbed and made odour containment difficult. Odours sometimes escaped leading to complaints from nearby home owners. A recently completed sludge dewatering project has provided a completely enclosed sludge reduction process.

Traffic

More capacity at Greenway will not increase tanker traffic to the plant as this is related to production at other plants. Expansion to other plants are being postponed, so growth in traffic is not anticipated.

Operating Space, Operating Area Separation from Homes and Fence Lines

The Environmental Assessment Study completed in 2010 set a goal of maintaining operations within the existing fence line. The fence line is tight to operating facilities on all but the south side of the plant, which is closest to existing homes. The EA contemplated new facilities along the south side of the plant; within the fence line but still closer to existing homes. At that time, ash lagoon space at the north side of the plant was not available for final tank construction, but now is. Even though using this northwest part of the plant requires a minor change on the operating boundary fence line, it does functionally place new facilities further from existing homes.

Maintaining new facilities and operations within the existing fence line also takes up internal truck routes. The plant will require another access point on the west side of the plant. This has been configured to separate truck traffic from park users.

Air emission assessments have been undertaken since the EA; they cover all activities within the site. New criteria for emissions from existing aeration tanks now require a setback for the existing west fence line (operating boundary) to manage public exposure. This overlaps with the same area affected by a new access road.

The next stage of design should carefully consider the west side of the plant, and accommodate public setback, public safety and operating requirements, while matching up well with the dog park, park road and multi-use pathway.

Environmental Impacts

The EA contemplated new facilities along the south side of the plant; within the fence line but still closer to existing homes. This area is heavily treed and is at a rising slope. The plant fence line is at the top of the slope. The EA proposed design would have required the removal of

significant trees on the hill to the south. It also would have been very expensive to construct and would have resulted in replacement of the natural slope with a retaining wall. The proposed design maintains the slope and trees.

The required west access road can be aligned to maintain a number of large trees. The next stage of design should carefully consider the access road, and relocation of the park road and multi-use pathway to minimize tree loss. The design should also incorporate mitigation measures, such as tree planting and screening of the facilities.

Dog Park

An existing off-leash dog park and its parking lot are located west of the Greenway plant. To allow for construction influences, the lot will be relocated to north of the dog park with the expansion of an existing lot. The dog park will remain open and in operation during the plant expansion.

Cost Review

Cost estimates for the expansion and upgrade have evolved throughout the project design as more information has become available and as decisions have been made on how best to the expand and upgrade the plant. The evolution is summarized below along with notes on limitations of each. (None of the estimates below include cost for the EA or the road mapping exercise and all figures represent the maximum amount of the expansion including engineering and contingency.)

- The 2010 Environmental Study Report estimated the cost for the first 9 MLD expansion at \$26.6M or \$2.95 M/ML. This estimate included an undersized head works, and did not include works or equipment associated with the split flow CEPT (i.e. wet weather performance improvements).
- Preliminary Design in April, 2013 estimated the 18 MLD expansion at \$59.7M. The estimate included items not previously contemplated, including an extension of existing plant tunnels, a flood proofing wall along the southern and western boundaries and other enhancements. These have been eliminated from the scope of work or are provided for as an opportunity in the future.
- The cost for an 18 MLD expansion using \$3.0 M/ML (engineering and contingency included) as identified in the 2009 DC Study would be \$54M (\$58M in 2013 dollars).
- The maximum cost for the revised preliminary design as presented herein is \$46.1M (plus \$3M for engineering) for a unit cost of \$2.7 M/ML.

Financial Summary

Additional financing of \$19.463 million is required to complete the expansion based on the revised cost estimate of \$46.1 million, noting that the original financial plan was based on two stages, with the first stage estimated at \$26M. It is proposed that additional financing be sourced as follows:

	Original Plan (\$000's)	Revised Plan (\$000's)	Increase/ Decrease (\$000's)
Total Estimated Project Cost - Greenway:	26,680	46,143	19,463
Transfer from Prior Years Capital:			
Vauxhall WWTP Expansion			(3,000)
Hauled Liquid Waste Receiving			(2,400)
Adelaide WWTP CSO			(2,800)
Adelaide WWTP Expansion Ph 2			(1,900)
TOTAL			(10,100)
Net Additional Cost:			9,363

Funding per 2014 Capital Plan:			
Rate Supported Share	9,391	16,243	1,431
Non Rate Supported Share	17,289	29,900	7,932
Total Financing - Greenway:	26,680	46,143	9,363

The Greenway Expansion project includes specific design functionality that was previously anticipated through the completion of other capital projects, specifically:

- ES5233 – Vauxhall WWTP Expansion -- a 2.3 MLD expansion for the Vauxhall plant is planned to service lands currently occupied by the Regional Mental Health Care Centre. An equivalent amount of flow can be diverted to Greenway from the Vauxhall plant through minor sewer works, freeing up capacity to service the additional lands without expanding Vauxhall.
- ES5143 -- Hauled Liquid Waste --this project was originally intended to receive and pre-treat hauled liquid waste at the W12-A landfill, after which it would be pumped to Greenway through the Dingman-Wonderland system. The cost of the facility was found to be too high and it was found more practical to send the flows to Greenway without pre-treatment. Treatment will occur at Greenway.
- ES5431 -- Adelaide Plant Expansion- \$1.9M in capacity upgrades were identified for the Adelaide Plant from 2010 through 2013. With 18 MLD constructed at Greenway, it can be used to service the growth in the Adelaide sewershed by diverting flows through the Medway pumping station. Additional capacity can then be deferred at the Adelaide plant until more capacity is needed at either the Adelaide or Greenway plant. The Medway Pump Station is an important asset that allows the City to optimally use capacity at both plants.
- ES 5234 -- Adelaide CSO -- sending Adelaide area flows to Greenway will also reduce the CSO impacts and works required at Adelaide noting there will still be \$2M remaining in ES5234 for Adelaide CSO work independent of a future expansion.

The approval of the Greenway Expansion would enable the following capital budgets to be reduced and their funds released to the respective funding sources as noted below:

Funding Sources - Prior Year Capital (\$000's)	Sewage Works Reserve Fund	Debenture	Development Charges	Debenture – City Services Sewer Levies Reserve Fund	Total
ES5233 – Vauxhall WWTP Expansion	(64)	(118)	(1,618)	(1,200)	(3,000)
ES5143 – Hauled Liquid Waste Receiving	(2,400)				(2,400)
ES5234 – Adelaide WWTP CSO	(2,800)				(2,800)
ES5431 – Adelaide WWTP Expansion	(39)		(1,861)		(1,900)
Total	(5,303)	(118)	(3,479)	(1,200)	(10,100)

Expanding Greenway to 18 MLD will allow the above noted flows to be diverted to Greenway thereby eliminating or deferring these projects. Furthermore, completion of the Greenway Expansion delays a forecasted expansion of the Adelaide Wastewater Treatment Plant from 2020-2022 to beyond 2023.

Report Summary

The preliminary design has evolved as more and changing information was taken into account.

The preliminary design:

- minimizes public and environmental impacts as compared to previous design concepts;
- addresses new regulatory requirements and public safety;
- takes advantage of opportunities to resolve park access problems;

Agenda Item #	Page #

- meets regulatory requirements for wet weather flow treatment
- recognizes arising deficiencies;
- consolidates other wastewater system project objectives; and
- allows for future objectives related to enhanced treatment requirements and flood protection.

The proposed financing for the project:

- is based on a technically controlled solution;
- develops 18 MLD instead of two stages of 9 MLD each, at a lower unit cost; and
- attracts funding from other projects, some of the objectives of which are met within this project; and,
- eliminates future costs within the 20 year horizon.

It is recommended that various budget changes be made to existing and future projects in recognition that this preliminary design achieves other purposes and defers future projects.

It is also recommended that the local neighbourhood be given the opportunity to comment on the design and be afforded the opportunity to understand the basis for it.

Acknowledgements

This report was prepared by Richard Todd, Environmental Services Engineer, and Geordie Gauld, Division Manager, Wastewater and Treatment Operations.

SUBMITTED BY:	RECOMMENDED BY:
JOHN LUCAS, P.ENG. DIRECTOR – WATER, WASTEWATER & TREATMENT	JOHN BRAAM, P.ENG. MANAGING DIRECTOR – ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER

C:\Users\jlucas\Documents\2013 reports - Wastewater\CWC Oct 28 Greenway WWTP Expansion Update fnl.docx

Appendix A – Greenway Wastewater Treatment Plant Expansion and Upgrade Milestones

Appendix B – Greenway Capacity Chart

Agenda Item #	Page #

Appendix "A"

Greenway Wastewater Treatment Plant Expansion and Upgrade Milestones

- **September 2007** - City receives proposal from Stantec for Technical Feasibility Investigation for Expanding Greenway PCC.
- **October 2007** – Stantec hired for to investigate feasibility of expansion of Greenway
- **December 2007** – City receives four draft technical memorandums:
 - TM#1 – GPCC Hydraulic Bottleneck Assessment – bottleneck at inlet to 3 Section, plant splitter chamber downstream of Grit process, upstream of UV channel
 - TM#2 – GPCC Comprehensive Performance Evaluation – hydraulic restrictions limit peak flow capability of Section 3, relatively small final clarifiers in Section 3 cause unacceptably high peak surface overflow rates
 - TM#3 – Evaluation of Design Concepts – recommended additional clarifiers and wet weather flow management including chemically enhanced primary treatment (CEPT) or membrane bioreactors
 - TM – Executive Summary – Expanding Greenway is affordable, CSO pre-treatment could be done at low cost, upgrades are needed to meet current rated capacity, existing headworks are a bottleneck during wet weather, there is a short time window of opportunity and there is an urgency to proceed with expansion due to constructability issues.
- **January 14, 2008** Report to Planning Committee, Item 11, Southwest Area Issues Summary Report – report describes sanitary servicing constraints and need to allocate growth to Greenway and optimize capacity
- **January 17, 2008** – Greenway PCC Workshop – with participation from CH2M Hill, Earthtech, UWO, Stantec, Dillon and Spriet Associates. Agenda included City Engineer welcoming remarks, facilitator remarks, conveyance strategies, treatment and expansion objectives, expansion strategies, Environmental Assessment strategy, funding and wrap up.
- **February 11, 2008** – Report to Environment and Transportation Committee, Item 9, Greenway Pollution Control Centre Workshop ES2710 – Recommended information be received stating conveyance capacity and treatment capacity could be provided to allow portion of southwest quadrant to be developed, Greenway optimization would be more cost effective than developing Southside PCP, study needed to confirm Gordon Avenue system capacity. 13.5 to 18 MLD of conveyance capacity could be gained in Gordon Avenue trunk sewer through improvements and real time control
- **May 28, 2008** – Report to Board of Control, Item 2, Wastewater and Treatment Emergent Projects. – Recommended study for Greenway Optimization and Upgrades
- **September 8, 2008** – Report to Environment and Transportation Committee, Item 2, Appointment of Consulting Engineer Greenway Pollution Control Plant Optimization Study and Class Environmental Assessment - Stantec recommended to complete Optimization Study and Class EA
- **March 27, 2009** – Report to Committee of the Whole – Sanitary Conveyance and Treatment Capacities in the Greenway Sewershed – Describes conveyance and treatment capacity initiatives to service the South West Area and sets introduces budgets for Greenway Optimization and Gordon Avenue Trunk sewer improvements
- **June 6, 2009** - Notice of Commencement for the Greenway Municipal Class Environmental Assessment
- **June 25, 2009** and **September 22, 2009** - Public Information Centre's were held to provide the public, neighbours and stakeholders with the opportunity to comment and provide input on the Greenway Expansion.
- **July 19, 2010** – Report to ETC, Item 9, Greenway PCC Class EA – Recommendation to Council to accept the Class EA Environmental Study Report (ESR)

Agenda Item #	Page #

- **July 31 and August 7, 2010** - A Notice of Completion was advertised in the London Free Press along with a posting on the City's website giving details on the completion of the Class EA and inviting the public to review and comment on the project.
- **September 8, 2010** - 30 day review period expired on. The City and Minister of the Environment received no requests to bump up the project under Part II of the Environmental Assessment Act.
- **December 19, 2011** – Report to Civic Works Committee, Item 14, – Request to Increase Scope of RV Anderson to prepare Roadmap for Greenway Expansion. Describes need for a road map to be included in Expression of Interest and Request for Proposals to expand plant by 18 MLD.
- **April 2, 2012** – Report to Civic Works Committee, Item 6, Emergency Repair of Greenway 4 Final – This report describes a request for funds to pay for an emergency repair of a final clarifier in Section 3, which failed on January 13, 2012. The inclusion of this report to the list is to draw attention to the deterioration of existing equipment at Greenway and the vulnerability the City is subject to if aging equipment is left in service.
- **January 2012** – Request for Expression of Interest 12-03 for engineering services for Greenway Expansion issued by City of London
- **February 16, 2012** – Expressions of Interest received
- **April 11, 2012** – Proposals for Expansion of Greenway received
- **May 14, 2012** – Report to Civic Works Committee, Item 11, Consultant Appointment Greenway Wastewater Treatment Plant – Recommends the appointment of the CH2M Hill with AECOM and Eramosa for an 18 MLD expansion of Greenway and describes the process for selection.

--	--

Appendix "B"**Greenway Capacity Chart (MLD)**

	Currently Approved	MOE Design Guideline Capacity	Expansion Capacity	Increase with MOE Design Guideline	Net Capacity Increase
Section 1	25.0	25.0	30.0	5.0	5.0
Section 2	34.1	34.1	40.0	5.9	5.9
Section 3	93.1	82.0	100.0	18.0	6.9
Total	152.2	141.1	170.0	28.9	17.8