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APPENDIX A - SOUTHWEST AREA SANITARY SERVICING MASTER PLAN

Executive Summary

Introduction

The Southwest Area Plan (SWAP) provides a plan for the opportunity for the future development of large areas of residential and non-residential lands within the southwest area of the City. A Master Plan is a necessary planning tool to provide an effective and efficient sanitary servicing layout and strategy, in order to properly allocate both development and capital funds.

The City retained Stantec Consulting Ltd. (Stantec) in March 2013 to complete a Southwest Area Sanitary Servicing (SASS) Master Plan for the following neighbourhoods:

1. Lambeth Village Core Area;
2. Lambeth Village Residential Neighbourhood Area;
3. North Lambeth Village Residential Neighbourhood Area;
4. North Talbot Residential Neighbourhood Area;
5. Bostwick West Residential Neighbourhood Area; and
6. Crestwood Area.

The study area also includes lands outside of the Urban Growth Boundary (UGB) that will eventually drain through the same sanitary sewer infrastructure due to the existing topography, specifically lands northwest of the UGB as referenced in Figure E.1.

The main objective of the Southwest Area Sanitary Servicing Master Plan is to provide a high level servicing strategy, without assigning timelines to specific projects. The *City of London Water and Wastewater Servicing Master Plan Update and 2014 Development Charge Study* will provide the schedule for the construction projects identified in the SASS Master Plan in the context of servicing growth citywide.

The SASS Master Plan analysis also includes evaluating the decommissioning of the Southland Wastewater Treatment Plant (WTP) located in Lambeth, under a Schedule B Municipal Class Environmental Assessment (EA) process.

Master Plan and Public Consultation

This Master Plan is being undertaken in accordance with the Master Planning requirements of the Municipal Class Environmental Assessment (MCEA) October 2000, as amended in 2007 and 2011. Master Plans are not subject to requests from the public or agencies for a Minister's Order (Part II Order). However, individual projects identified within an EA process can be subject to a Part II Order. As such, the Master Plan can be implemented following Council approval.

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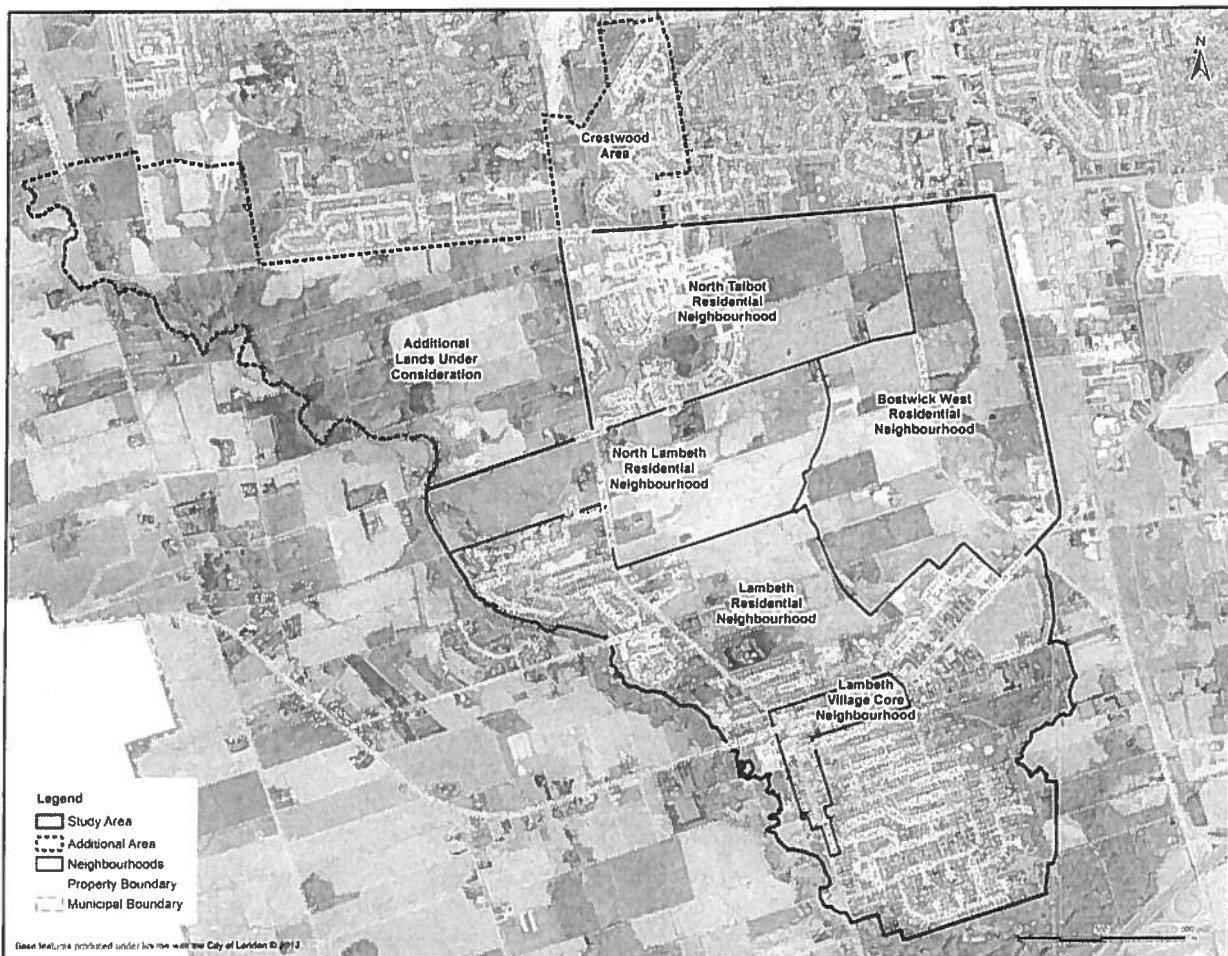


Figure E.1: General Overview of Study Area

The EA component of this Master Plan will allow for the decommissioning of the Southland WTP (Schedule B project) and evaluate its replacement with either a new gravity sewer (Schedule A project) or with a new pumping station (Schedule B project) within the context of an overall servicing solution for the planning area. For the Southland WTP EA component of the Master Plan, a Notice of Completion will be issued and an opportunity for a Part II Order request will be provided.

In letters sent to agencies, stakeholders and the public, the following was included which defines the project problem/opportunity statement:

"The current City of London Water and Wastewater Servicing Master Plan Update and 2014 Development Charge Study is expected to address high level issues such as the ultimate servicing of flows from the South West Area. However a more detailed study is needed to address sanitary servicing planning for the western portion of the South West Area where a major portion of development growth is anticipated to occur within the 20- year horizon.

The Southwest Area Sanitary Servicing Master Plan will evaluate interim and ultimate sanitary servicing strategies for the Lambeth, North Lambeth, North Talbot and Bostwick West neighbourhoods. This is in order to improve operations and accommodate growth within the next 20 years. Additionally, this project will complete the Southland Wastewater Treatment Plant (WTP) Schedule B Municipal Class EA. In addition to the five areas listed above, adjacent areas that may have impacts to sanitary servicing will also be taken into consideration."

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General Setting

Sanitary sewage flows for the ultimate development scenario were based on SWAP land use designations but were modified in instances where landowners/developers expressed an interest to the City and Stantec at pursuing a higher density land use designation. With regard to the topography of study area, elevations are higher to the north and fall to the south and southwest toward Dingman Creek. There are various named and unnamed creeks, drains and channels which provide drainage of the study area to Dingman Creek.

Natural and other land use activities were considered in developing the sanitary solutions for this project. Considerations can include but are not limited to such things as utility corridors, pipelines, major transportation corridors, natural areas, regulated areas, etc. Within the study area the majority of considerations are due to natural features and SWAP's goal of establishing natural corridors.

Review of Existing Infrastructure

A review of existing information that forms the basis for the analysis of the study area's current infrastructure capabilities and deficiencies, ultimate build-out needs, etc. was undertaken. The sewersheds are:

- Greenway Wastewater Treatment Centre (WTC) via the Wonderland Pumping Station (at present, no flow is directed to this sewershed) and Westmount sewer trunk (Crestwood area only);
- Oxford Wastewater Treatment Plant (WTP) via forcemain discharge from existing City and privately operated pumping stations into the Oxford WTP collection system; and
- Southland WTP which services a limited development area within Lambeth.

Major sanitary infrastructure in the study area includes:

1. **Talbot Village Pumping Station** is a temporary pumping station located at 6664 Pack Road. It was built in 2003 and is developer owned. It was designed to service the new Talbot Village subdivision. Flows are ultimately pumped to the Oxford WTP;
2. **Southwinds Pumping Station** is a permanent pumping station located at 3938 West Graham Place. It was built in 1995 and is City owned. It was designed as a remedial system to resolve public health and environmental concerns arising from the inadequate performance of the original private septic tank and leaching bed system. Flows are ultimately pumped to the Oxford WTP;
3. **Crestwood Pumping Station** is a temporary pumping station located at 999 Gabor Street. It was built in 1999 and is City owned. It was designed to service approximately 75 ha of low-density residential development. Flows will ultimately be directed southerly through the Westfield and Talbot Village sewers to a gravity trunk on Colonel Talbot Road;
4. **Westfield Pumping Station** is a temporary pumping station located at 3129 Pomeroy Lane. It was built in 2010 and is developer owned. It was designed to service the new Westfield subdivision. Flows are ultimately directed to the Oxford WTP; and
5. **Southland Wastewater Treatment Plant (WTP)**, located in Lambeth at 85 Dennis Avenue, is London's smallest wastewater treatment plant with a rated capacity of 564 m³/d. However, the actual operational capacity of the Southland WTP is considered to be 300 m³/d. This actual rate is based on operational concerns as the WTP is very susceptible to high wet weather flows and sediment loading. As the Southland WTP was built in phases, some components of the plant are approaching 50 years in age and are nearing the end of their useful life.

While not within the study area, the **Wonderland Pumping Station** is a permanent pumping station located at 4695 Dingman Drive. It was built in 2008 and is City owned. Flow exits the pumping station via a 750 mm forcemain that discharges at a location near

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the intersection of Southdale Road and Wharnccliffe Road, which represents the upstream end of the Gordon Avenue Trunk Sewer leading to Greenway WTC. It is presently sized to take flows from the Dingman PS (peak capacity 510 L/s) but is designed to allow for future expansion of up to 1,000 L/s.

Determination of Ultimate Population

For the study area, ultimate population was determined based upon the following:

- For current developed low density residential areas an aerial lot count was undertaken;
- For undeveloped areas the current zoning of the study area as determined by SWAP; and
- For residential zoning, populations were based on the current *City of London Design Specifications and Requirements Manual (September 2012)*.

For the Crestwood area a lot count was undertaken of the Crestwood subdivision. For areas which drain towards the study area and were outside of hazard or other constraint areas, low- density residential development was assumed. For those areas of the northwest external area which drain towards the study area and were outside of hazard or other constraint areas, low- density residential development was assumed.

The study area was divided into catchment areas based on topography, existing sanitary drainage layout, future allowances in the current sanitary drainage system and property boundaries. Flow in each catchment and subcatchment was determined for the residential areas as based on the 250 L/cap/d per the *City of London Design Specifications and Requirements Manual*. These specifications were also used for institutional and commercial land uses. The entire catchment/subcatchment area was used to calculate infiltration.

Southland WTP Class EA

The Southland WTP Class EA commenced in 2011 but was placed on hold pending the completion of SWAP and subsequently incorporated into the *Southwest Area Sanitary Servicing Master Plan*. Phase 1 of the EA planning process is the problem or opportunity identification. This phase shall lead to the development of a clear problem or opportunity statement. This statement is:

"The Southland WTP is London's smallest wastewater treatment plant with an approved capacity limit of 564 m³/day. On a 'cost per litre treated' basis, operations costs are up to 13 times higher than other City of London treatment facilities. Components of the plant are greater than 49 years old and are approaching the end of their useful life. The plant age has become operational issue and the cost of plant refurbishment is \$1.5M - \$2M. The City has identified decommissioning the treatment process and modifying the plant to pump the existing approved capacity into the City's sanitary sewer system as an option."

The options for the Southland WTP were modified based on the servicing strategies developed for the study area. The options and associated costs were as follows:

1. Option A – Do nothing;
2. Option B – Upgrade the existing facility to the rated treatment capacity as stated in the current C of A (\$2.8M);
3. Option C – Decommission the WTP and replace the facility with a pumping station and forcemain to the Wonderland WTP (\$1.4M); and
4. Option D – Decommission the WTP and replace with a pumping station and forcemain to a new gravity sewer at the intersection of Campbell Street and Hamlyn Street (\$1.0M).

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Option D "Decommission the WTP and replace with a pumping station and forcemain to a new gravity sewer at the intersection of Campbell Street and Hamlyn Street" was selected as the **preferred option**.

Advantages associated with this option are as follows:

- Appropriately sized for flows (does not include flows from north of Main Street which will be rerouted to the gravity sewer);
- Does not tie up Hamlyn Street or Wonderland Road with a forcemain and appurtenances;
- Most cost effective of the alternatives; and
- Removes WTP that may have the potential for noise and odour issues.

The routing for this option is illustrated below in Figure E.2.



Figure E.2: Option D – Proposed Pumping Station and Forcemain Routing

Master Plan Servicing Review

For the entire study area, four alternative servicing solutions were reviewed in detail. The costs for gravity sewers were based upon a construction cost methodology established for the *City of London Water and Wastewater Servicing Master Plan Update and 2014 Development Charge Study*. Forcemains were assigned costs for pipe, construction, and restoration based on our judgment of current market costs using previous benchmarks. Costs include the preferred option for the Southland WTP EA.

1. Alternative 1 – Sanitary sewers along existing road networks to Wonderland PS (\$54.5M);
2. Alternative 2 – Sanitary sewers along existing / future road networks to Wonderland PS (\$44.7M);

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3. Alternative 3 – Sanitary sewers with new permanent pump station and forcemain along existing road networks to Wonderland PS (\$47.7M); and
4. Alternative 4 (\$44.3M) –
 - a. Sanitary sewers along existing / future road networks to Wonderland PS,
 - b. Sanitary sewers along Colonel Talbot Road to new pumping station in the vicinity of Diane Crescent with a new forcemain to Boler Road.

These alternatives were chosen to allow for similar costing to be developed for the provision of conveyance, pumping capacity at the Wonderland PS and possible treatment capacity upgrades to the Greenway WTC sewershed. Elements that were common to all alternatives include:

1. A gravity sewer along Bostwick Road to service the eastern portion of the study area;
2. A common sewer along Wonderland Road connecting the study area and other areas north of Dingman Drive to the Wonderland PS;
3. Decommissioning the existing Southland WTP and replacing it with a pumping station;
4. Decommissioning Crestwood PS, Westfield Village PS and Talbot Village PS and directing their flows to a combined outlet; and
5. Modifying the Southwinds PS to pump to a new gravity sewer along Colonel Talbot Road.

Master Plan Preferred Servicing Alternative

Alternative 4 "Sanitary sewers along existing/future road networks to Wonderland PS / Sanitary sewers along Colonel Talbot Road to new pumping station in the vicinity of Diane Crescent with a new forcemain to Boler Road" was selected as the **preferred alternative**.

Alternative 4 contains the following elements:

1. A gravity sewer running south along Colonel Talbot Road (starting in the vicinity of Pack Road to take flows from Crestwood PS, Westfield Village PS and Talbot Village PS) to Kilborne Road;
2. Flows are then pumped from a new pumping station (Colonel Talbot PS) via a forcemain in the vicinity of Diane Crescent which will send flow to the Oxford WTP sewershed along Colonel Talbot Road to Boler Road;
3. A gravity sewer continues from Kilborne Road through future residential development and then south onto Campbell Street;
4. A gravity sewer running east along Hamlyn Street to Wonderland Road; and
5. Connection to the common sewer along Wonderland Road connecting the study area and other areas north of Dingman Drive to the Wonderland PS.

Alternative 4 is illustrated in Figure E.3.

Major constraints noted for this alternative include:

- Property will need to be acquired for the pumping station;
- Upgrades to the downstream sanitary sewer system along Boler Road may be required; and
- The routing is partially through private lands which may require that implementation of this project is dependent on the development of specific parcels of land.

Major opportunities noted for this alternative include:

- Allows for Wonderland Road PS to be optimally utilized to send flows to Greenway WTC;

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- Allows Colonel Talbot PS to maintain and increase flows to the Oxford WTP sewershed;
- Allows decommissioning of three pumping stations;
- Route avoids major construction along Main Street;
- Overall sewer profile is shallower than Alternative 1, minimizing costs;
- Minimal impacts to the natural environment as routing is along municipal roadways; and
- Allows for development to occur in north and south neighbourhoods of the study area (filling in communities).

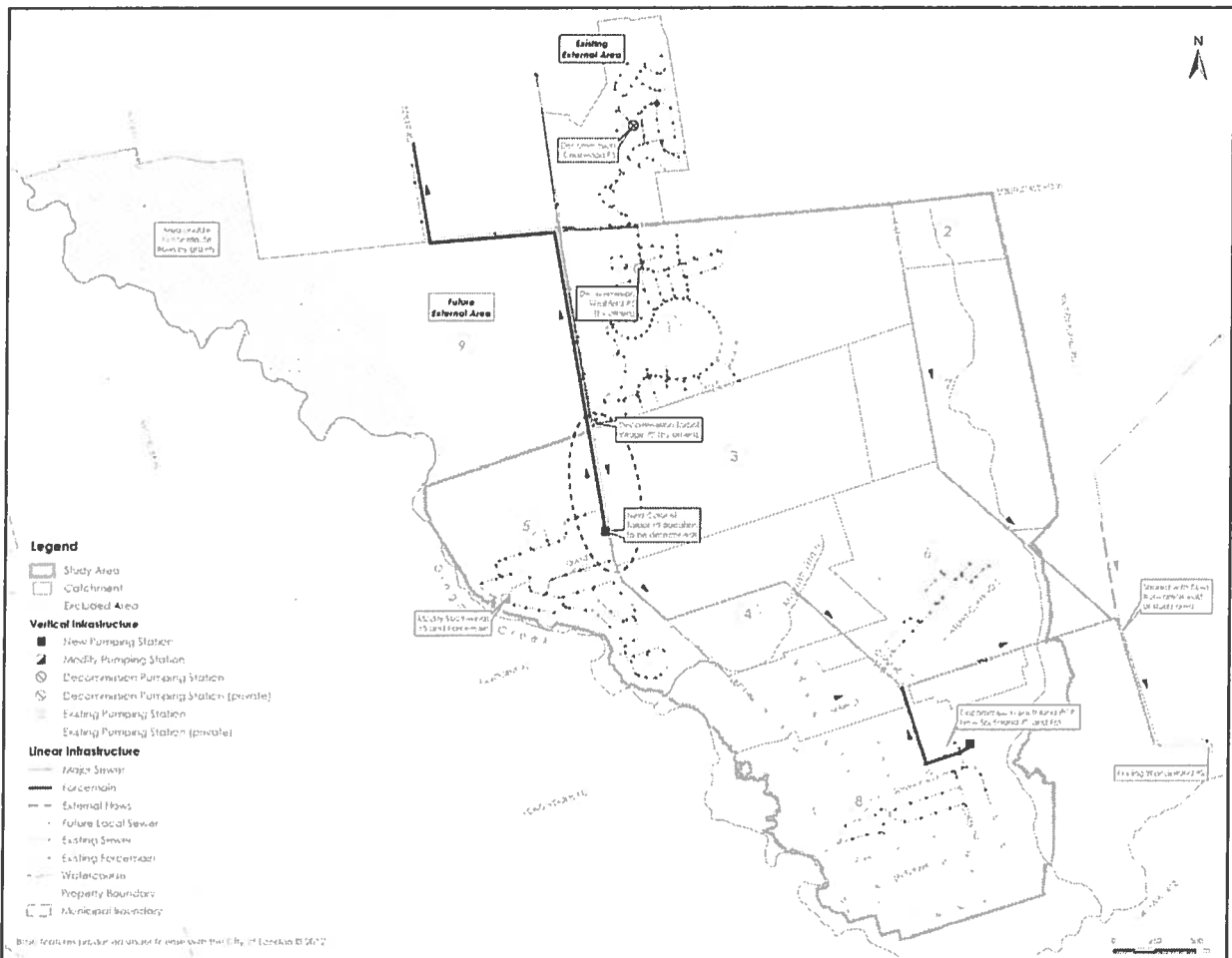


Figure E.3: Alternative 4