City of London

# FINAL Report: Arva Pumping Station to Huron Street Water Transmission Main

## Municipal Class Environmental Assessment Master Plan Project File - Schedule B

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## Revision History

| Revision # | Date | Revised By: | Revision Description |
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| **1** | Jan. 28, 2021 | BAT/PA | First Draft Submission |
| **2** | April 6, 2021 | BAT/PA | Final Submission |
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# Quality Information

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# List of Acronyms

| | |
|---|---|
| **BRT** | Bus Rapid Transit |
| **CMMP** | Construction Mitigation and Monitoring Plan |
| **CHAR** | Cultural Heritage Assessment Report |
| **CSDM** | Complete Streets Design Manual |
| **COTTFN** | Chippewa of the Thames First Nation |
| **CSP** | Corrugated Steel Pipe |
| **CWA** | Clean Water Act |
| **DBH** | Diameter at Breast Height |
| **DCBS** | Development Charges Background Study |
| **EA** | Environmental Assessment |
| **EAA** | Environmental Assessment Act |
| **EBL** | East Bound Left Turn Lane |
| **EBT** | East Bound Through Lane |
| **EBTR** | East Bound Through Right Lane |
| **ECA** | Environmental Compliance Approval |
| **EIS** | Environmental Impact Study |
| **ELC** | Ecological Land Classification |
| **EM** | Electro Magnetic |
| **END** | Endangered |
| **ESA** | Endangered Species Act |
| **ESR** | Environmental Study Report |
| **GMIS** | Growth Management Implementation Strategy |
| **IPZ** | Intake Protection Zone |
| **HVA** | Highly Vulnerable Area |
| **KM** | Kilometre |
| **LOS** | Level of Service |
| **MOECC** | Ministry of the Environment and Climate Change |
| **MECP** | Ministry of the Environment, Conservation and Parks |
| **MHSTCI** | Ministry of Heritage, Sport, Tourism and Culture Industries (Formerly MTCS) |
| **MTCS** | Ontario Ministry of Tourism, Culture & Sport |
| **MUP** | Multi-use Pathway |
| **MCEA** | Municipal Class Environmental Assessment |
| **MEA** | Ontario Municipal Engineers Association |
| **MNRF** | Ontario Ministry of Natural Resources & Forestry |
| **NHRM** | Natural Heritage Reference Manual |
| **NBL** | North Bound Left Turn Lane |
| **NBT** | North Bound Through Lane |
| **OP** | Official Plan |
| **O'Reg.** | Ontario Regulation |
| **PIC** | Public Information Centre |
| **PPS** | Provincial Policy Statement |
| **PS** | Pump Station |
| **PSW** | Provincially Significant Wetland |
| **PTTW** | Permit to Take Water |
| **PVC** | Polyvinyl Chloride |
| **ROW** | Right-of-Way |
| **SAR** | Species at Risk |
| **SARA** | Species at Risk Act |
| **SBL** | South Bound Left Turn Lane |
| **SBT** | South Bound Through Lane |
| **SC** | Special Concern |
| **SGRA** | Significant Groundwater Recharge Area |
| **SPP** | Source Protection Plan |
| **SWAP** | Southwest Area Plan |
| **SWP** | Source Water Protection |
| **SWH** | Significant Wildlife Habitat |
| **SWM** | Stormwater Management |
| **SWMF** | Stormwater Management Facility |

| | |
|---|---|
| **TDM** | Transportation Demand Management |
| **THR** | Threatened |
| **TMP** | Transportation Master Plan |
| **UTRCA** | Upper Thames River Conservation Authority |
| **V/C** | Volume to Capacity Ratio |
| **WBL** | West Bound Left Turn Lane |
| **WBT** | West Bound Through Lane |
| **WBTR** | West Bound Through Right Lane |
| **WHPA** | Well Head Protection Area |
| **WTP** | Water Treatment Plant |
| | |

# Executive Summary

## Introduction and Background

The City of London (the City), through its consultant, AECOM, has completed a Municipal Class Environmental Assessment (Class EA Master Plan) Schedule B to evaluate short- and long-term solutions to maintain and twin the existing high pressure potable water transmission main(s) from the Arva Pumping Station to Chamber 13 on Huron Street. The City is supplied with water from two lake-based sources, 80% comes from Lake Huron utilizing the Lake Huron Water Supply System (LHWSS) and 20% comes from Lake Erie utilizing the Elgin Area Water Supply System (EAWSS). The City utilizes several water storage facilities including the Arva Reservoir (owned and operated by the LHWSS) that supplies water to the north portion of the City. The Arva Pumping station to Huron Street transmission main is the 'main artery' for water supply and distributes potable water to the City's water storage facilities and distribution system. The LHWSS transmission main has been partially twinned from the South Huron Water Treatment Plant (WTP), located north of Grand Bend to the Arva Reservoir and Pumping Station. In 1984, the City twinned its transmission main southerly from the Arva Reservoir and Pumping Station to Fanshawe Park Road, which allows for the LHWSS and the City to provide transmission main redundancy and increased capacity in addition to improved maintenance and operations. South of Fanshawe Park Road, the single transmission main travels through several residential properties, which poses some challenges to inspect, maintain, and repair the transmission main and other infrastructure along the route. The transmission main age is approximately 60 years of its potential 100 year expected lifetime and is not expected to be replaced in the short term. As a result, continuous monitoring, inspections and repairs are expected and may increase over its remaining lifetime.

## Consultation

The involvement of the community – residents, approval agencies, stakeholders, Indigenous communities, and those who may be potentially affected by a project – is an integral part of the Class EA process. The purpose of the Class EA study consultation process is to provide an opportunity for stakeholder groups and the public to gain an understanding of the study process, contribute to the process for the development and selection of alternatives/design concepts, and provide feedback and advice at important stages in the Class EA process. Specifically, the objectives of the consultation efforts are to:

- generate awareness of the project and provide opportunities for involvement throughout the planning process; and
- facilitate constructive input from public and agency stakeholders at key points in the Class EA process, prior to decision-making.

A consultation program was incorporated into the study to meet the above objectives. The consultation program included:

- Posting project milestones on the City of London website;
- Conducting meetings with agencies and stakeholders at key phases during the project **(See Report Section 3)**
- Publishing notices in The Londoner and the City's project website (https://london.ca/projects/arva-pumping-station-huron-street-water-transmission-main-master-plan) for all project milestones **(See Report Section 3.1, Table 3.1)**;
- Notifying stakeholders, affected residents, the general public and review agencies regarding project milestones;
- Conducting two virtual open houses, one for the property owners between Fanshawe Park Road and Huron Street and one for the general public to inform the public, review agencies and stakeholders and obtain input; and
- Issuing a Notice of Completion.

## Identification of the Problem/Opportunity

The Class EA Problem / Opportunity statement provides the basis for the need and justification for this project and is presented below:

*The City receives approximately 80% of its water supply from the LHWSS, making the water transmission main that transports this water a critical and important asset. The water transmission main from the Arva PS and Reservoir to Huron Street was constructed in 1966 and ranges in condition, having fair and good sections. Several portions of the pipe south of Windermere Road and north of the Thames River were proactively replaced in 2017 and the existing easement (50' / 15m wide) was not adequate to allow for replacement by traditional means. Portions of the transmission main run through the backyards of residents where easements are in place and access to repair the transmission main via these easements could be difficult, especially if there are obstacles such as decks, sheds, trees, etc. within the easement and in close proximity to the water transmission main.*

*The MCEA process provides the City the opportunity to develop a short-term strategy and solution that assess the existing easements in place to ensure maintenance access can be properly completed, and the possibility of increasing easement widths to allow for easier access or maintaining the easements at their current width and enforcing the City's rights to access if maintenance and/or repairs are required. The process also provides an opportunity for a long-term solution to be developed by examining twinning of the transmission main in other locations to provide a redundancy of supply and service future growth. This long-term solution also provides the possibility of decommissioning and abandoning the existing water transmission main once it has reached its service life.*

## Short- and Long-Term Alternative Solutions

A list of alternative solutions to meet the project needs was established for both the short- and long-term alternatives. The list was subject to a review and screening process that considered the ability to maximize the use of existing infrastructure, impacts to residents, communities, and existing infrastructure; and the avoidance of excessive capital and operating costs.

Short-term requirements involve regular inspections and maintenance of the transmission main(s), chambers, valves and associated appurtenances to ensure optimal operation of the transmission main, and to facilitate emergency repairs in the event of a transmission main failure. Three short term alternative solutions were developed for evaluation including:

- **Alternative 1: Do Nothing –** no maintenance improvements or changes would be undertaken to address current and future requirements. This represents what would likely occur if none of the other alternative solutions were implemented. All monitoring, maintenance and repair that the City currently undertakes on this transmission main would continue as per current conditions.
- **Alternative 2: Maintain Easements as is (minimum 15m or 50')** - This Alternative would maintain the current easements in place without increasing them, but would require removing or relocating obstructions that impede or prevent access to the transmission main to enhance ongoing maintenance and/or repair needs.
- **Alternative 3: Widen the Easement to greater than 15m or 50' where possible –** This alternative would have the existing easements widened to greater than 15m wherever possible, to allow for easier access to the transmission main to enhance ongoing maintenance and/or repair needs.

For the long-term, solutions to eventually replace the single transmission main and associated valve chambers, located on several privately owned properties between Fanshawe Park Road and Huron Street are required, in addition to providing redundancy of supply and additional supply for future growth servicing purposes. The current location of this infrastructure makes it difficult to access, maintain, repair, and twin the existing infrastructure in the future. Several alternatives to twin the single transmission main were reviewed and analyzed including:

1- **Alternative 1**: Do nothing, where no twinning is considered from Fanshawe Park Road to Huron Street;

2- **Alternative 2**: Twin the transmission main along Adelaide Street with connections to the existing transmission main(s) via Medway Road, Sunningdale Road, or Fanshawe Park Road and ending at the new relocated Chamber 13 on Maitland Street at Regent Street (**See Figure ES-1**); and
3- **Alternative 3**: Twin the transmission main along Richmond Street ending at the new relocated Chamber 13 on Maitland Street at Regent Street. Several options for connections to Richmond Street included:
   a. **3A**: Twin the transmission main along Richmond Street with a connection via Medway Road or Fanshawe Park Road (**See Figure ES-1)**;
   b. **3B**: Twin the transmission main along Richmond Street via Windermere Road and the existing easement between Windermere Road and Huron Street, or via Huron Street **(See Figure ES-1)**.

## Evaluation of Short - Term Alternative Solutions

A qualitative evaluation was undertaken for the evaluation of short-term existing transmission main maintenance alternatives based on Socio-Economic, Cultural Environment, Natural Heritage, Technical and Cost criteria, including environmental components that address the broad definition of the environment as described in the Environmental Assessment Act, to assist in determining the best possible solution.

A summary of the evaluation matrix is shown in **Table ES-1**. For a comprehensive evaluation in matrix form see the full evaluation of the short-term alternative solutions as shown in **Table 6-3** of the Report.

**Table ES-1: Short Term Alternatives Evaluation Matrix Summary**

| Evaluation Criteria Category | Alternative 1 | Alternative 2 | Alternative 3 | Rationale |
|---|---|---|---|---|
| Socio Economic |  |  |  | • Alternative 3 requires significant property/easement agreements<br>• Alternatives 1 restricts quick access to the transmission main in an emergency |
| Cultural Environment |  |  |  | • Alternative 1 and 2 have minimal impact due to less chance of encroachment into areas of significance<br>• Alternative 3 would have more impact due to clearing obstructions and adding easement width. |
| Natural Heritage |  |  |  | • Alternative 1 would have lowest impact. Greater impact if emergency works are required<br>• Alternatives 2 and 3 would have greater impact due to removal of obstructions and/or for the increased easement width |
| Technical |  |  |  | • Alternative 1 does not facilitate easy access for repairs<br>• Alternative 3 provides easier access allowing for lower Monitoring and Maintenance costs. |
| Economic/Financial |  |  |  | • Alternative 1 has high costs associated with access in an emergency due to obstacles<br>• Alternative3 has very high costs associated with significant property and easement agreements |

| | | | | |
|---|---|---|---|---|
| **Overall Alternative Rating** |  |  |  | • Alternative 2 does not require additional easements or property<br>• Alternative 2 has lowest costs associated with easement agreements and emergency repairs |

Low Impact is considered preferred compared to moderate or high impact

| **Legend** | **Low Impact** | **Low to Moderate Impact** | **Moderate Impact** | **Moderate to High Impact** | **High Impact** | **Preferred Alternative Solution** |
|---|---|---|---|---|---|---|
| |  |  |  |  |  | |

Based on the criteria and methodology applied as part of the evaluation process, the preferred Short-term maintenance alternative is **Alternative 2 - Maintain Easements as is (minimum 15m or 50')**. **(See Figures 8.1 - 8.3 in Section 8 of the Report)**. This short-term alternative ensures access to the existing transmission main(s) for ongoing monitoring, maintenance and/or repair purposes using the easements in place without requiring the purchase of additional easements or property..

## Evaluation of Long - Term Alternative Solutions

A qualitative evaluation was undertaken for the evaluation of long-term twinning alternatives to add system capacity and/or redundancy based on the above referenced criteria, including environmental components that address the broad definition of the environment as described in the Environmental Assessment Act, to assist in determining the best possible solution.

A summary of the evaluation matrix is shown in **Table ES-2**. For a comprehensive evaluation in matrix form see the full evaluation of the long-term alternative solutions as shown in **Table 7-3 of** the Report.

**Table ES-2: Long-Term Twinning Alternatives Evaluation Matrix Summary**

| Evaluation Criteria Category | Alternative 1 | Alternative 2 | Alternative 3A | Alternative 3B | Rationale |
|---|---|---|---|---|---|
| Socio Economic |  |  |  |  | • Alternative 1 high impacts in an emergency due to 15m or less easement widths<br>• Alternative 3A and 3B may require easements or property acquisition.<br>• Alternative 2 no apparent property easements or acquisitions required.<br>• Alternatives 2 and 3 have similar construction impacts. |
| Cultural Environment |  |  |  |  | • Alternative 2 and 3B have higher potential for Archaeological impacts.<br>• Alternative 3B has the highest potential for cultural heritage impacts. |
| Natural Heritage |  |  |  |  | • Alternative 1 has high impacts for repairs in significant terrestrial areas.<br>• Alternative 2 has the most water crossings, and a greater potential to Impact SAR |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | • Alternative 3A has less water crossings and a lower potential to impact SAR<br>• Alternative 3B has fewer but more significant water crossings than 3A, a higher potential to impact SAR and a greater impact to climate change due to reduced carbon sequestration capacity resulting from vegetation removal |
| **Technical** |  |  |  |  | • Alternatives are technically (hydraulics/water quality) equal except Alternative 1 which would require increased monitoring and maintenance.<br>• Alternative 3A and 3B have a greater design complexity |
| **Economic / Financial** |  |  |  |  | • All Alternatives have similar costs associated with them.<br>• Alternative 1 has high emergency repair costs. |
| **Overall Alternative Rating** |  |  |  |  | • Alternative 1 has significant emergency repair impacts<br>• Alternative 2 the least impacts and the clearest route for twinning |

Low Impact is considered preferred compared to moderate or high impact

| Legend | Low Impact | Low to Moderate Impact | Moderate Impact | Moderate to High Impact | High Impact | Preferred Alternative Solution |
|---|---|---|---|---|---|---|
| |  |  |  |  |  | |

Based on the criteria and methodology applied as part of the evaluation process, the preferred long-term twinning alternative is **Alternative 2: Twin the Transmission Main Along Adelaide Street** to add system capacity and redundancy with a connection to the existing transmission mains at Fanshawe Park Road and on Regent Street. **(See Figure ES-2)**. The preferred long-term alternative also provides an opportunity for eventual decommissioning of the existing water transmission main between Fanshawe Park Road and Huron Street in the future. **See Section 8** of the Report for complete Short- and Long-Term Project descriptions.

## Preliminary Short- & Long-Term Cost Estimates

The estimated costs for upgrades, inspections, maintenance, and repairs over a 20-year period for the preferred short-term alternative is approximately $10,400,000.

The estimated costs for placing the transmission main along Adelaide Street with connections on Fanshawe Park Road and Regent Street for the preferred long-term alternative is approximately $20,000,000 for a new single main, and $32,000,000 for twinned mains.

## Recommended Mitigation Measures / Monitoring

It is recommended to complete the mitigation and monitoring tasks outlined in **Section 9** of the Report during detailed design for the preferred Short and Long-Term alternatives:

Medway Road Connection Option

MEDWAY ROAD

Medway Road Connection Option

Sunningdale Road Connection Option

SUNNINGDALE RD E

SUNNINGDALE RD W

ADELAIDE ST N

RICHMOND ST

Fanshawe Park Road Connection Option

Fanshawe Park Road Connection Option

FANSHAWE PARK RD E

FANSHAWE PARK RD W

ADELAIDE ST N

WINDERMERE RD

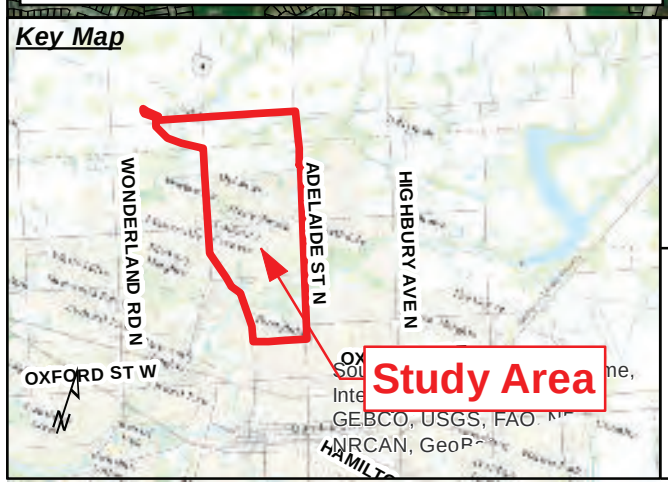
Regent Street Connection

HURON ST

0 300 600 1,200 Metres

Source: Esri, Maxar, GeoEye, Earthstar and the GIS User Community

***Key Map***




# City of London
# Arva Pump Station to Huron Street Water Transmission Main Municipal Class Environmental Assessment Master Plan

**Legend**

- Existing Transmission Main
- Alternative 2: Adelaide Street Twinning Routes
- Alternative 3A: Richmond Street North Twinning Routes
- Alternative 3B: Richmond Street South Twinning Routes

## Figure ES-1: Long-Term Alternative Solutions

| Date: | PN: | Datum: NAD83 UTM17 |
|---|---|---|
| April 2021 | 60619503 | Source: City of London |

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MEDWAY ROAD

SUNNINGDALE RD W

SUNNINGDALE RD E

RICHMOND ST

ADELAIDE ST N

Fanshawe Park Road Connection

FANSHAWE PARK RD W

FANSHAWE PARK RD E

WINDERMERE RD

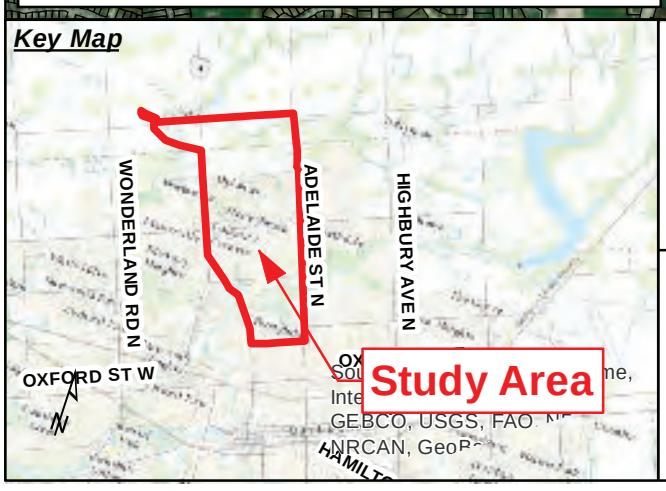
Regent Street Connection

HURON ST

0 300 600 1,200 Metres

Source: Esri, Maxar, GeoEye, Earthstar and the GIS User Community

***Key Map***




# City of London
# Arva Pump Station to Huron Street Water Transmission Main
# Municipal Class Environmental Assessment Master Plan

**Legend**

- Existing Transmission Main
- Recommended Alternative 2: Adelaide Street Twinning Routes
- Potential Future Connecetions

**Figure ES-2:**
**Long-Term Design Concept**

| Date: April 2021 | PN: 60619503 | Datum: NAD83 UTM17<br>Source: City of London |
|---|---|---|

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It is also recommended to perform the following maintenance activities to ensure the existing infrastructure continues to operate adequately for the remainder of its service life, or when a new transmission main(s) is constructed and the existing infrastructure is taken out of service:

- Annual inspection and maintenance of all valve chambers
- Soil sampling and testing every 15 years near the transmission main(s), including coring into ground, sample collection and laboratory testing;
- Complete test pits every 15 years to inspect the surface of the transmission main, including excavating to and inspecting the surface of the concrete pipe for signs of pitting, cracking or damage;
- Utilize Free-Swimming Electro Magnetic (EM) or Pipe Diver tool technology every 15 years to inspect the inside of the transmission main for damage while the line is in service; and
- Proactively repair joints as required based on the above inspection methods and results.

It is recommended to maintain discussions and open lines of communications with the various approval agencies such as the UTRCA, MNRF, DFO, Ministry of Heritage, Sports, Tourism and Culture Industries, and the Ministry of Environment, Conservation and Parks throughout all phases of design and construction.

## Recommended Construction Phasing for the Preferred Long-Term Alternative

It is recommended to construct the new transmission main(s) in several phases to reduce the financial burden to the City, and to reduce traffic congestion and long road closures in major developed areas. The following phasing strategy is suggested and can be modified in the future during preliminary/detailed design:

**Phase 1** – Within 0-5 years: The new relocated Chamber 13 be installed on Maitland Street at Regent Street.

**Phase 2** – Within 5-15 years: It is recommended that portions of the transmission main be installed when 20 to 30% of the life expectancy of the existing PCCP is remaining, or when an opportunity or a requirement to upgrade portions of roadways along the route is required. Fanshawe Park Road is in relatively good condition and does not require reconstruction for 10 to 15 years.

**Phase 3** – Within 15-25 years: All major road and watercourse crossings are on the north to south portion of the transmission main(s) on Adelaide Street. It is preferred that all works on Adelaide Street be completed in one phase to reduce multiple closures of the roadway in the future. Adelaide Street is also relatively new, and reconstruction of the roadway is not required for 15-25 years.

## Summary

The Project File Report outlines the process required to ensure that the proposed short- and long-term solutions to the problem and opportunity statement meet the requirements of the *EAA*. The MCEA planning process has not identified any significant environmental concerns that cannot be addressed by incorporating established mitigation measures during construction.

The proposed projects resolve the Problem/Opportunity statement identified in this report. A preliminary evaluation of potential impacts has been included in the evaluation, which indicates minor and predictable impacts that can be addressed by recommended mitigation measures. The proposed mitigation measures will further be developed at detailed design and will form commitments that will be adhered to by the City. Appropriate public notification and opportunity for comment was provided and no comments were received that could not adequately be addressed. Subject to receiving MCEA clearance following the 30-day review period, the City can start the detailed design and permitting-approvals phase and proceed to construction as outlined in the Project File Report.