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TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON OCTOBER 1, 2012
FROM:	JOHN BRAAM, P.ENG. MANAGING DIRECTOR, ENGINEERING & CITY ENGINEER
SUBJECT	HURON STREET WATERMAIN REPLACEMENT MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT (EW3580)

RECOMMENDATION

That, on the recommendation of the Managing Director, Engineering & City Engineer, the following actions **BE TAKEN** with respect to the Huron Street Watermain Crossing Municipal Class Environmental Assessment Report:

- (a) The Huron Street Watermain Crossing Municipal Class Environmental Assessment Report Executive Summary **BE ACCEPTED**;
- (b) A Notice of Completion of the Huron Street Watermain Crossing Municipal Class Environmental Assessment Report be advertised, and
- (c) The Huron Street Watermain Crossing Municipal Class Environmental Assessment Report be placed on public record for a 30 day review period.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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- [Built and Natural Environment Committee, May 2, 2011, Agenda Item #17, Appointment of Consulting Engineer Huron Street Watermain Replacement Class EA and Preliminary Design EW3580](#)
- [Board of Control, November 4, 2009, Agenda Item #10, Emergency Repair of Watermain Crossing of Thames River EW3580 – Source of Financing](#)
- [Board of Control, October 21, 2009, Agenda Item #20, Emergency Repair of 600 mm Watermain Crossing of Thames River](#)

BACKGROUND

Purpose:

The purpose of this report is to communicate the recommendations of the Huron Street Watermain Crossing Municipal Class Environmental Assessment via the attached Executive Summary (Appendix B).

Context:

An emergency repair was undertaken in the fall of 2009 to the Huron Street Watermain crossing of the Thames River. This 600 mm concrete prestressed watermain was originally constructed in 1959. Since the original construction, the river channel had shifted eastward and erosion had exposed 30 meters (100 feet) of the watermain. The repair included the removal of a large tree which had become wedged under the watermain and protection measures to prevent further erosion.

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Approvals for the emergency repair were obtained contingent upon undertaking a municipal class environmental assessment to determine a permanent solution. The Huron Street Watermain Crossing Municipal Class Environmental Assessment presents the recommended permanent solution.

Discussion:

Stantec Consulting was engaged in 2009 to assist with approvals and oversight of the emergency repair. Subsequently Stantec was also retained to undertake the Environmental Impact Study (EIS) and the Environmental Assessment (EA) for the Huron Watermain Crossing.

The EA was carried out in accordance with the Municipal Engineer's Association Municipal Class Assessment Document, in accordance with Schedule B. Two public meetings were held for this project.

Alternatives considered were:

- 1- Do Nothing
- 2- Retire existing watermain
- 3- Retire existing watermain and replace with new watermain in a new location and
- 4- Retire existing watermain and replace with new watermain in current location by:
 - a. Open cut construction
 - b. Trenchless methods

Option 1 was discarded as unacceptable. Hydraulic modeling indicated that this watermain is needed in order to maintain water pressure, supply and water quality requirements, particularly in the area of the University of Western Ontario and option 2 was found to be unacceptable. Option 3 was found to be cost prohibitive.

The preferred alternative being recommended at this time is to construct a new watermain in the current location (parallel to the existing watermain) by trenchless construction methods. Preliminary geotechnical review of site conditions indicated that trenchless construction is technically feasible, and preferable from the perspective of the potential of disruption to the river and the natural areas on either side of the river.

Financial Impact:

The estimated cost to construct a new watermain crossing of the river to replace the existing watermain river crossing is \$2.6 million. A contingency of 30% should be allowed for this estimate, or allowance for costs up to \$3.4 million.

The estimated cost to abandon the existing watermain crossing the river is \$600,000. A contingency of 30% should be allowed for this estimate or allowance for costs up to \$780,000.

The estimated cost of annual monitoring for the existing section of concrete watermain which has become exposed is \$10,000.

Summary:

It is recommended that the Preferred Alternative of the Environmental Assessment be accepted.

The Preferred Alternative is that a new watermain be constructed to replace the existing watermain in a location parallel to the existing watermain, and that the new watermain be constructed by trenchless means where the watermain crosses the river and in the riparian areas surrounding the river which are environmentally sensitive.

The Preferred Alternative also recommends that the existing watermain which has become exposed by erosion will be left in place initially. It would be very disruptive to remove this watermain at the present time. Monitoring will be used to determine further steps taken as appropriate, and the necessary approvals will be obtained prior to taking further steps.

Pending council approval, a Notice of Completion of the project will be filed, and the Municipal Class Environmental Report will be placed on public record for a 30 day comment period. If no Part II Orders are received, staff intends to proceed to final design, with construction to follow.

Agenda Item # Page #

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Acknowledgements:

This report was prepared by Patricia Lupton, P.Eng., Environmental Services Engineer Water Engineering with the assistance of Jake Blancher, C.E.T., Senior Technologist Water Engineering.

SUBMITTED BY:	RECOMMENDED BY:
ROLAND WELKER, P.ENG. DIVISION MANAGER – WATER ENGINEERING	JOHN BRAAM, P.ENG. MANAGING DIRECTOR, ENGINEERING & CITY ENGINEER

September 21, 2012

PAL/

Appendix A – Project Location Map

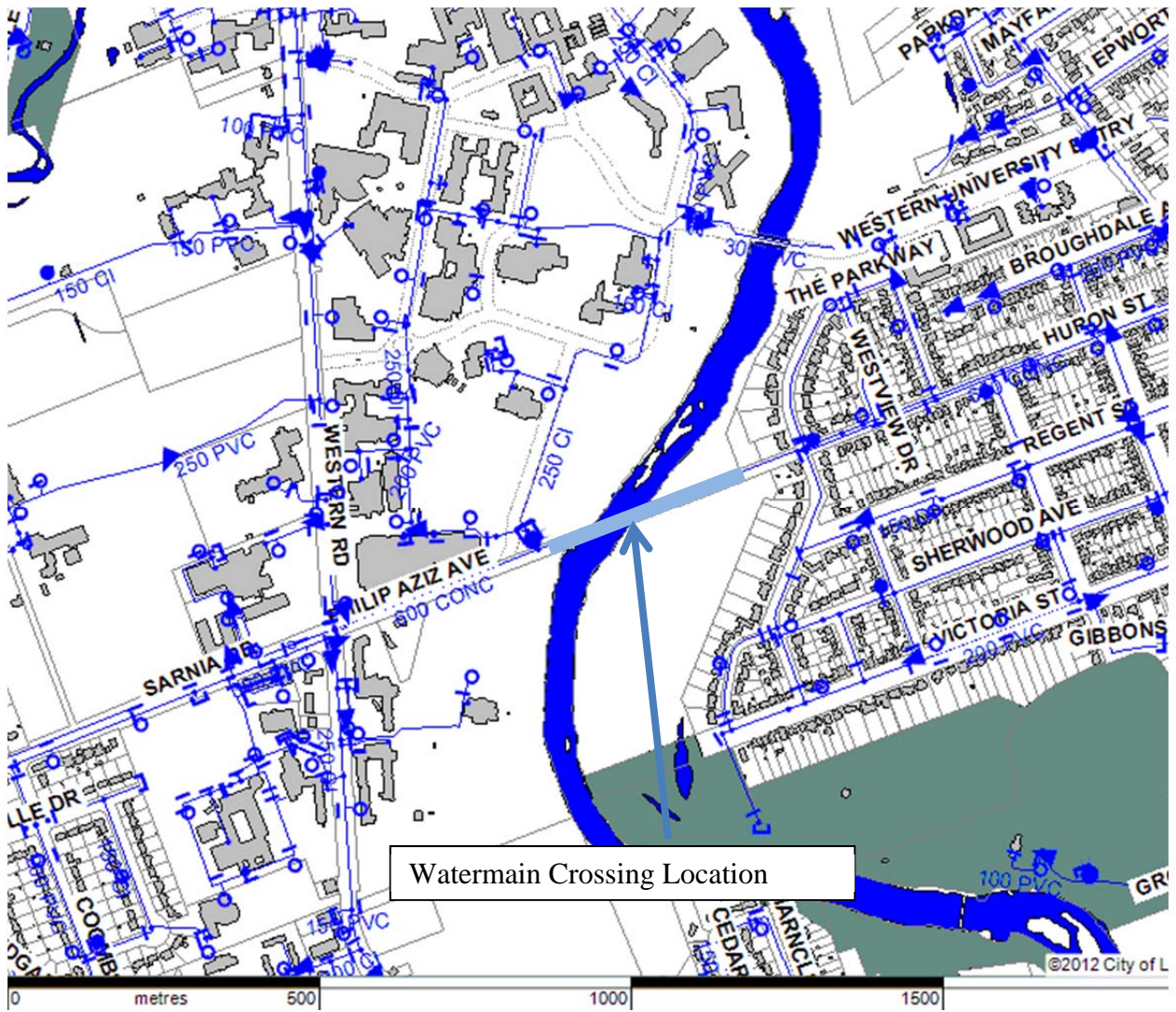
Appendix B – Huron Street Watermain Crossing Municipal Class Assessment Executive Summary

cc: John Tyrrell, Stantec Consulting

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Appendix "A"

Project Location Map



APPENDIX B



Huron Street Watermain Crossing Municipal Class Environmental Assessment

Project File
Executive Summary

September 2012

Executive Summary

OVERVIEW

The City of London (City) retained Stantec Consulting Ltd. (Stantec) to undertake a Municipal Class Environmental Assessment (Class EA) for the replacement of the Huron Street watermain, which crosses the Thames River.

The watermain crosses the North Thames River approximately 500 m downstream of the University Drive Bridge. The watermain is 600 mm diameter reinforced concrete pressure pipe (CPP). Available design information suggests that it was constructed in approximately 1958 using open cut methods at an approximate buried depth of 1.8 m. Figure E.1 shows the location of the watermain within its regional setting.

Since the original watermain crossing construction, the natural river processes have gradually removed the watermain cover material at the river crossing and the streambed material located near an existing valve chamber on the east bank. In autumn of 2009, an emergency repair was completed to mitigate the possibility of damage to the exposed watermain and valve chamber by debris impacts and/or freezing. The repair work involved placing a layer of stone riprap over a layer of aggregate cover on the exposed portion of the watermain and to protect the adjacent valve chamber.

INTENT OF THIS REPORT

The intent of this report is to outline the steps that the proponent, the City has taken to satisfy the requirements of the Municipal Class Environmental Assessment Planning and Design Process (MEA, 2007) for a Schedule B project. The Project File details the following:

- Background to the project and earlier studies;
- Nature and extent of the problem or opportunity, explain the source of the concern or issue and the need for a solution description/inventory of the environment;
- Identifying the solutions that are possible and define a preferred solution for the project; and
- To identify the cost to implement the preferred solution.

The Class EA process currently allows a 10-year window for implementation following completion of the Class EA.

MUNICIPAL CLASS EA CONSULTATION

Potential stakeholders included but were not limited to:

- Public – This includes individual members of the public including property owners who may be affected by the project, individual citizens who may have a general interest in the project, special interest groups, community representatives and the general public;
- Review agencies – This includes government agencies who represent the policy positions of their respective departments, ministries, authorities or agencies;

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- Western University as both a property owner and primary end user of the water supply delivered by the Huron Street watermain and
- City of London internal departments.

A list of relevant Aboriginal communities was developed at the onset of the project. Throughout the process, these communities were provided with letters notifying them of project commencement and invited to attend the Public Information Centres (PIC).

Agency, Aboriginal and stakeholder letters, notifications for each of the two PICs were advertised in the London Free Press (LFP) and the City of London's web site. Notices were published twice in advance of the scheduled PIC. PIC 1 was held June 23, 2011 at King's College in London. PIC 2 was held June 21, 2012 at King's College in London. The PICs were held from 7:00 pm to 9:00 pm with a formal presentation given at 7:30 pm.

PHASE 1 – PROBLEM IDENTIFICATION

Based on the requirements for the project the following problem statement was developed for this project. As part of the consultation process, it was included in the Notice of Commencement dated June 10, 2011.

“The current Huron Street watermain is approximately 50 years old and has become compromised where it crosses the Thames River due to natural stream erosion. There is a need to replace the existing watermain at the crossing location to ensure the long term security of water supply within the City of London.”

REVIEW OF BACKGROUND AND TECHNICAL INFORMATION

In order to develop alternative solutions for the Huron Watermain Crossing, the following technical evaluations were undertaken:

- Review of existing infrastructure;
- Review of water distribution system hydraulics;
- Review river processes; and
- Geotechnical investigation.

NATURAL – SOCIAL – ECONOMIC REVIEW

A Scoped Environmental Impact Study (EIS) was undertaken in support of the Municipal Class EA. The study area for this review includes the riparian vegetation and aquatic habitat within the reach of the Thames River that extends approximately 1 km upstream and downstream from the existing watermain crossing. The corridor functions associated with the Thames River and larger vegetation block to the south have been added to the study area based on comments from the City and Upper Thames River Conservation Authority (UTRCA).

The project area is generally within the floodplain of the Thames River and the land on both sides of the river are currently owned by Western University. The east bank of the river is known as the Baldwin Flats and the predominant use of land is recreational. It is characterized by a linear deciduous forest community and open space meadows. Several multiuse trails traverse both the tablelands and the riparian habitat. The west bank of the river includes a narrow band of deciduous trees separating the active recreation fields and Huron Drive from the river. The

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area is highly disturbed with the existing watermain and infrastructure owned by Western University.

The City's Official Plan designates the Thames River Corridor as Open Space.

The archaeological potential for pre-contact Aboriginal and Euro-Canadian sites is considered to be moderate to high based upon the proximity of the project to the Thames River. An examination of some of the many archaeological sites uncovered along the Thames and its tributaries reveals the importance of the river to its original inhabitants. As such, a Stage 1 Archaeological Assessment will be completed once the staging and construction areas for the project have been determined. A Stage 2 Assessment will be undertaken if the results of the Stage 1 assessment require it.

REVIEW OF ALTERNATIVES

Alternatives

Two sets of alternatives were identified independently to address the considerations of the Problem Statement that was developed for this project (refer to Section 3.3.2.). The first set of alternatives address the replacement of the current watermain while the second set of alternatives address the abandonment of the old watermain once it has been decommissioned.

Watermain Replacement Review

The following alternatives were reviewed:

Alternative 1 - Do Nothing;

Alternative 2 - Retire existing watermain and use existing distribution system;

Alternative 3 - Retire existing watermain and construct a replacement watermain in a new location; and

Alternative 4 - Retire existing watermain and replace with new watermain in current location.

Alternative 4 has been selected as the preferred alternative to replace the watermain based on the following:

- This option maintains current water distribution system redundancy (Options 1 and 2 do not meet this);
- Maintaining a 600 mm diameter watermain meets current and future water demands; and
- Water supply for fire protection and maintenance of water quality are maintained by this option (Option 3 does not meet this).

REVIEW OF WATERMAIN CROSSING OPTIONS FOR REPLACEMENT WATERMAIN

There are two general methods by which to install a replacement crossing. These are by:

- Open Cut construction; or
- Trenchless methods.

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Trenchless construction is the preferred method for replacement of the existing watermain. This involves installation by tunneling, drilling or boring the watermain instead of by an open excavation. This work is done via excavation pits on either side of the riverbank. This type of installation is feasible based on the findings of the geotechnical investigation undertaken to date. There is always a level of uncertainty regarding soil conditions therefore there is some risk in choosing this method. If performed successfully this method will have significant less impact on the natural environment and require reduced regulatory approval requirements when compared to open cut installation.

EXISTING WATERMAIN ABANDONMENT

Following the construction and commissioning of new watermain, it is anticipated that the City will mothball the existing watermain for a certain period to ensure satisfactory performance of the new watermain. Following this period, the existing watermain will be decommissioned (any connection to the distribution physically removed). Following decommissioning, there are three options to abandon the watermain. These are by:

- Leaving existing watermain in place;
- Removing watermain in its entirety; or
- Removing the watermain portion exposed and/or anticipated to be exposed.

Based upon review the solution to remove a portion of the exposed watermain is recommended. In order to remove the long-term hazard of the decommissioned watermain becoming exposed but at the same time not affecting areas of the riverbed where erosion is not likely to occur, the option of a partial removal of the watermain was reviewed. This option would involve removing areas where the watermain has become exposed and potentially some portion of watermain within the eastern bank area which may be subject to future erosion. This option removes the hazard of leaving the exposed watermain in place. While some in-river work may be required, it is limited to relatively shallow excavation work in proximity to the eastern bank.

PROJECT IMPLEMENTATION

The following is the implementation strategy:

1. Undertake Watermain Replacement
 - a. Undertake detailed design and approval process for trenchless installation.
 - b. Undertake Stage 1 and 2 Archaeological Assessment per Ontario requirements once location of work is confirmed.
 - c. Undertake construction and commissioning of new watermain.
 - d. New watermain in service for period of time to ensure satisfactory performance prior to decommissioning of existing watermain.
2. Monitor 2009 Temporary Protection Measures and Erosion Process Related to Existing Watermain; and
3. Existing Watermain Abandonment.
 - a. Undertake detailed design and approval process.
 - b. Time necessary approval applications (and any new or updated study work required by approvals) to meet timeframe for watermain removal.

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- c. Undertake partial watermain abandonment and streambed and bank restoration.

COST OPINION OF PREFERRED ALTERNATIVES

The following table summarizes the cost opinion of the two designs for the preferred alternative.

Cost Opinion (not Including HST)	
Activity	Total
New Watermain Construction	\$2,622,820
Existing Watermain Abandonment	\$600,000
Total	\$3,222,820
Low Limit (-10%)	\$2,810,538
High Limit (+30%)	\$4,309,666

SUMMARY OF COMMITMENTS

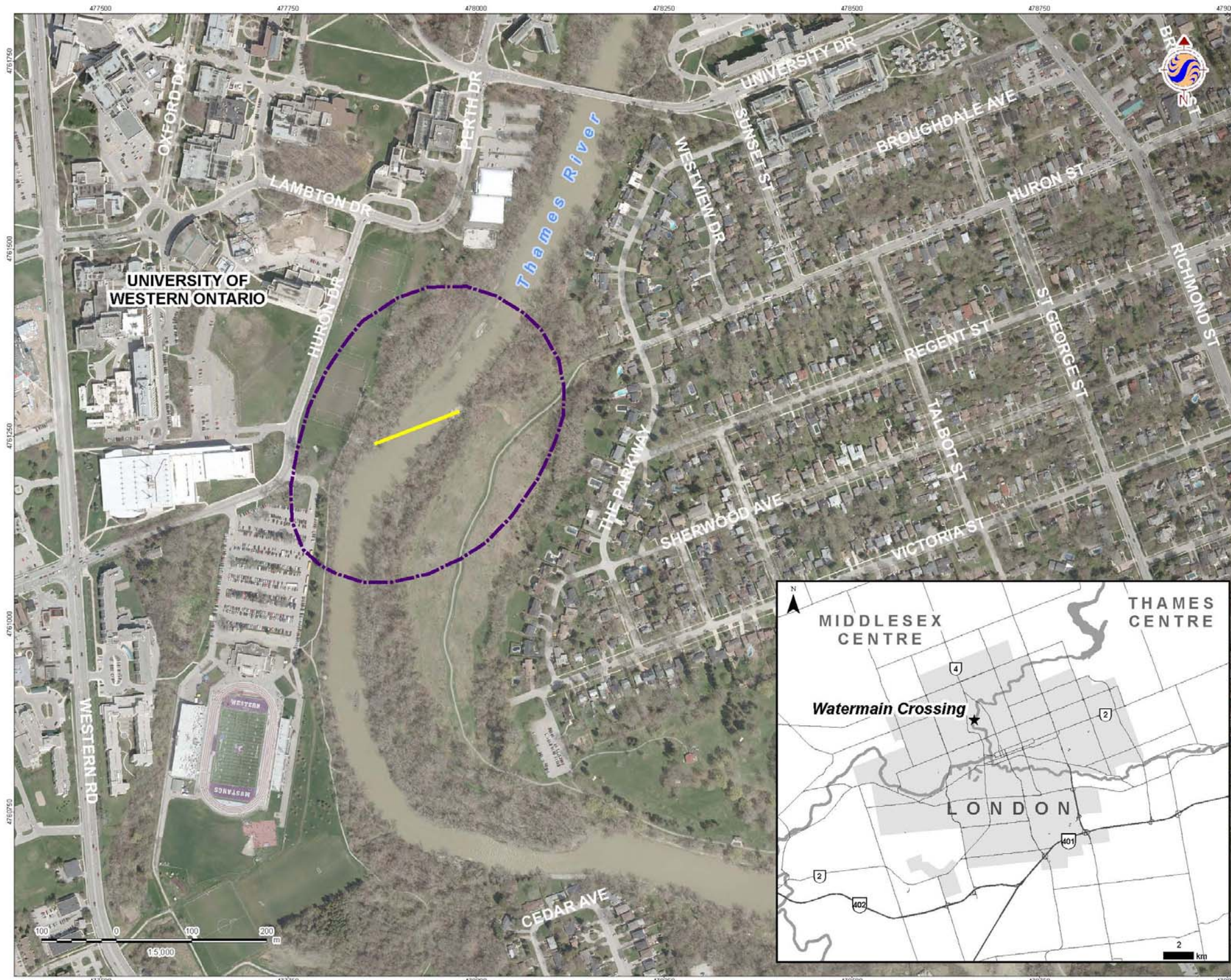
The Project Commitments table below summarizes specific commitments to be made by the City as part of the implementation of this project.

Project Commitments		
Identified Requirement	Commitments	Project Phase
Stage 1 Archaeological Assessment	To determine the potential for archaeological sites to be present within the study areas.	Implementation of Watermain Replacement – To be completed once staging and construction areas for the project have been determined
Stage 2 Archaeological Assessment	To provide an inventory of potential archaeological sites present within the study areas.	Implementation of Watermain Replacement – If the Stage 1 deems it a requirement.
Obtain necessary permits and approvals	To comply with all levels of government policy.	Implementation of Watermain Replacement – During detailed design and prior to construction. Implementation of Existing Watermain Abandonment - During detailed design and prior to removal/restoration.

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Project Commitments		
Identified Requirement	Commitments	Project Phase
Mitigation measures for construction and staging areas.	To undertake mitigation measures as generally described in Section 7.0.	Implementation of Watermain Replacement – Areas to be reviewed prior to construction with implementation as part of construction. Implementation of Existing Watermain Abandonment - Areas to be reviewed prior to work with implementation as part of work.
Monitoring	Monitor 2009 Temporary Protection Measures and Erosion Process Related to Existing Watermain to confirm trigger point to commence work on Implementation of Existing Watermain Abandonment	Following Watermain Replacement

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Legend

- Proposed Watermain Crossing

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. 2011 imagery used under license with the City of London.
3. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.



September, 2012
 165500607

Client/Project
 City of London
 Huron Street River
 Watermain Crossing

Figure No.
 E.1

Title

Project Location

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 Revised: 2012-09-12 By: kbuchanan